

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -3000                  | 7,561352E+22                              | 7,561215E+22 | 6,760277E+22 | 6,760293E+22 | 1,512257E+23                           | 1,352057E+23                           | 2,864314E+23  |
| -2999                  | 7,560938E+22                              | 7,561249E+22 | 6,760441E+22 | 6,760345E+22 | 1,512219E+23                           | 1,352079E+23                           | 2,864297E+23  |
| -2998                  | 7,561261E+22                              | 7,561299E+22 | 6,760427E+22 | 6,760575E+22 | 1,512256E+23                           | 1,352100E+23                           | 2,864356E+23  |
| -2997                  | 7,561246E+22                              | 7,561229E+22 | 6,760510E+22 | 6,760316E+22 | 1,512247E+23                           | 1,352083E+23                           | 2,864330E+23  |
| -2996                  | 7,561062E+22                              | 7,561164E+22 | 6,760646E+22 | 6,760571E+22 | 1,512223E+23                           | 1,352122E+23                           | 2,864344E+23  |
| -2995                  | 7,561444E+22                              | 7,561247E+22 | 6,760557E+22 | 6,760669E+22 | 1,512269E+23                           | 1,352123E+23                           | 2,864392E+23  |
| -2994                  | 7,561159E+22                              | 7,561273E+22 | 6,760601E+22 | 6,760485E+22 | 1,512243E+23                           | 1,352109E+23                           | 2,864352E+23  |
| -2993                  | 7,561209E+22                              | 7,561268E+22 | 6,760592E+22 | 6,760771E+22 | 1,512248E+23                           | 1,352136E+23                           | 2,864384E+23  |
| -2992                  | 7,561485E+22                              | 7,561318E+22 | 6,760513E+22 | 6,760586E+22 | 1,512280E+23                           | 1,352110E+23                           | 2,864390E+23  |
| -2991                  | 7,561099E+22                              | 7,561279E+22 | 6,760651E+22 | 6,760448E+22 | 1,512238E+23                           | 1,352110E+23                           | 2,864348E+23  |
| -2990                  | 7,561353E+22                              | 7,561315E+22 | 6,760583E+22 | 6,760646E+22 | 1,512267E+23                           | 1,352123E+23                           | 2,864390E+23  |
| -2989                  | 7,561368E+22                              | 7,561303E+22 | 6,760527E+22 | 6,760374E+22 | 1,512267E+23                           | 1,352090E+23                           | 2,864357E+23  |
| -2988                  | 7,560992E+22                              | 7,561231E+22 | 6,760568E+22 | 6,760516E+22 | 1,512222E+23                           | 1,352108E+23                           | 2,864331E+23  |
| -2987                  | 7,561313E+22                              | 7,561268E+22 | 6,760442E+22 | 6,760600E+22 | 1,512258E+23                           | 1,352104E+23                           | 2,864362E+23  |
| -2986                  | 7,561104E+22                              | 7,561204E+22 | 6,760452E+22 | 6,760279E+22 | 1,512231E+23                           | 1,352073E+23                           | 2,864304E+23  |
| -2985                  | 7,561078E+22                              | 7,561108E+22 | 6,760432E+22 | 6,760476E+22 | 1,512219E+23                           | 1,352091E+23                           | 2,864309E+23  |
| -2984                  | 7,561443E+22                              | 7,561162E+22 | 6,760316E+22 | 6,760395E+22 | 1,512261E+23                           | 1,352071E+23                           | 2,864332E+23  |
| -2983                  | 7,561045E+22                              | 7,561159E+22 | 6,760415E+22 | 6,760259E+22 | 1,512220E+23                           | 1,352067E+23                           | 2,864288E+23  |
| -2982                  | 7,561172E+22                              | 7,561245E+22 | 6,760376E+22 | 6,760533E+22 | 1,512242E+23                           | 1,352091E+23                           | 2,864333E+23  |
| -2981                  | 7,561327E+22                              | 7,561292E+22 | 6,760379E+22 | 6,760355E+22 | 1,512262E+23                           | 1,352073E+23                           | 2,864335E+23  |
| -2980                  | 7,560959E+22                              | 7,561194E+22 | 6,760546E+22 | 6,760431E+22 | 1,512215E+23                           | 1,352098E+23                           | 2,864313E+23  |
| -2979                  | 7,561324E+22                              | 7,561240E+22 | 6,760567E+22 | 6,760626E+22 | 1,512256E+23                           | 1,352119E+23                           | 2,864376E+23  |
| -2978                  | 7,561268E+22                              | 7,561242E+22 | 6,760629E+22 | 6,760423E+22 | 1,512251E+23                           | 1,352105E+23                           | 2,864356E+23  |
| -2977                  | 7,561102E+22                              | 7,561193E+22 | 6,760657E+22 | 6,760690E+22 | 1,512230E+23                           | 1,352135E+23                           | 2,864364E+23  |
| -2976                  | 7,561482E+22                              | 7,561326E+22 | 6,760566E+22 | 6,760779E+22 | 1,512281E+23                           | 1,352134E+23                           | 2,864415E+23  |
| -2975                  | 7,561155E+22                              | 7,561301E+22 | 6,760679E+22 | 6,760578E+22 | 1,512246E+23                           | 1,352126E+23                           | 2,864371E+23  |
| -2974                  | 7,561217E+22                              | 7,561333E+22 | 6,760668E+22 | 6,760769E+22 | 1,512255E+23                           | 1,352144E+23                           | 2,864399E+23  |
| -2973                  | 7,561533E+22                              | 7,561362E+22 | 6,760642E+22 | 6,760595E+22 | 1,512289E+23                           | 1,352124E+23                           | 2,864413E+23  |
| -2972                  | 7,561123E+22                              | 7,561234E+22 | 6,760735E+22 | 6,760536E+22 | 1,512236E+23                           | 1,352127E+23                           | 2,864363E+23  |
| -2971                  | 7,561327E+22                              | 7,561309E+22 | 6,760662E+22 | 6,760734E+22 | 1,512264E+23                           | 1,352140E+23                           | 2,864403E+23  |
| -2970                  | 7,561304E+22                              | 7,561337E+22 | 6,760589E+22 | 6,760493E+22 | 1,512264E+23                           | 1,352108E+23                           | 2,864372E+23  |
| -2969                  | 7,560998E+22                              | 7,561191E+22 | 6,760558E+22 | 6,760578E+22 | 1,512219E+23                           | 1,352114E+23                           | 2,864333E+23  |
| -2968                  | 7,561389E+22                              | 7,561242E+22 | 6,760457E+22 | 6,760621E+22 | 1,512263E+23                           | 1,352108E+23                           | 2,864371E+23  |
| -2967                  | 7,561170E+22                              | 7,561151E+22 | 6,760519E+22 | 6,760317E+22 | 1,512232E+23                           | 1,352084E+23                           | 2,864316E+23  |
| -2966                  | 7,561106E+22                              | 7,561174E+22 | 6,760462E+22 | 6,760488E+22 | 1,512228E+23                           | 1,352095E+23                           | 2,864323E+23  |
| -2965                  | 7,561455E+22                              | 7,561282E+22 | 6,760384E+22 | 6,760455E+22 | 1,512274E+23                           | 1,352084E+23                           | 2,864358E+23  |
| -2964                  | 7,561027E+22                              | 7,561187E+22 | 6,760480E+22 | 6,760376E+22 | 1,512221E+23                           | 1,352086E+23                           | 2,864307E+23  |
| -2963                  | 7,561151E+22                              | 7,561263E+22 | 6,760509E+22 | 6,760595E+22 | 1,512241E+23                           | 1,352110E+23                           | 2,864352E+23  |
| -2962                  | 7,561314E+22                              | 7,561306E+22 | 6,760536E+22 | 6,760433E+22 | 1,512262E+23                           | 1,352097E+23                           | 2,864359E+23  |
| -2961                  | 7,561022E+22                              | 7,561140E+22 | 6,760629E+22 | 6,760518E+22 | 1,512216E+23                           | 1,352115E+23                           | 2,864331E+23  |
| -2960                  | 7,561393E+22                              | 7,561240E+22 | 6,760620E+22 | 6,760743E+22 | 1,512263E+23                           | 1,352136E+23                           | 2,864400E+23  |
| -2959                  | 7,561261E+22                              | 7,561249E+22 | 6,760684E+22 | 6,760584E+22 | 1,512251E+23                           | 1,352127E+23                           | 2,864378E+23  |
| -2958                  | 7,561086E+22                              | 7,561287E+22 | 6,760668E+22 | 6,760773E+22 | 1,512237E+23                           | 1,352144E+23                           | 2,864381E+23  |
| -2957                  | 7,561516E+22                              | 7,561400E+22 | 6,760642E+22 | 6,760815E+22 | 1,512292E+23                           | 1,352146E+23                           | 2,864437E+23  |
| -2956                  | 7,561214E+22                              | 7,561270E+22 | 6,760769E+22 | 6,760619E+22 | 1,512248E+23                           | 1,352139E+23                           | 2,864387E+23  |
| -2955                  | 7,561281E+22                              | 7,561319E+22 | 6,760802E+22 | 6,760768E+22 | 1,512260E+23                           | 1,352157E+23                           | 2,864417E+23  |
| -2954                  | 7,561520E+22                              | 7,561405E+22 | 6,760757E+22 | 6,760661E+22 | 1,512292E+23                           | 1,352142E+23                           | 2,864434E+23  |
| -2953                  | 7,561118E+22                              | 7,561249E+22 | 6,760757E+22 | 6,760640E+22 | 1,512237E+23                           | 1,352140E+23                           | 2,864376E+23  |
| -2952                  | 7,561317E+22                              | 7,561330E+22 | 6,760677E+22 | 6,760825E+22 | 1,512265E+23                           | 1,352150E+23                           | 2,864415E+23  |

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|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -2951                  | 7,561267E+22                              | 7,561300E+22 | 6,760654E+22 | 6,760584E+22 | 1,512257E+23                           | 1,352124E+23                           | 2,864380E+23  |
| -2950                  | 7,561017E+22                              | 7,561204E+22 | 6,760593E+22 | 6,760580E+22 | 1,512222E+23                           | 1,352117E+23                           | 2,864339E+23  |
| -2949                  | 7,561465E+22                              | 7,561251E+22 | 6,760528E+22 | 6,760635E+22 | 1,512272E+23                           | 1,352116E+23                           | 2,864388E+23  |
| -2948                  | 7,561214E+22                              | 7,561130E+22 | 6,760557E+22 | 6,760404E+22 | 1,512234E+23                           | 1,352096E+23                           | 2,864330E+23  |
| -2947                  | 7,561100E+22                              | 7,561217E+22 | 6,760525E+22 | 6,760548E+22 | 1,512232E+23                           | 1,352107E+23                           | 2,864339E+23  |
| -2946                  | 7,561397E+22                              | 7,561362E+22 | 6,760474E+22 | 6,760543E+22 | 1,512276E+23                           | 1,352102E+23                           | 2,864378E+23  |
| -2945                  | 7,561037E+22                              | 7,561181E+22 | 6,760540E+22 | 6,760448E+22 | 1,512222E+23                           | 1,352099E+23                           | 2,864321E+23  |
| -2944                  | 7,561201E+22                              | 7,561246E+22 | 6,760601E+22 | 6,760650E+22 | 1,512245E+23                           | 1,352125E+23                           | 2,864370E+23  |
| -2943                  | 7,561343E+22                              | 7,561261E+22 | 6,760659E+22 | 6,760546E+22 | 1,512260E+23                           | 1,352121E+23                           | 2,864381E+23  |
| -2942                  | 7,561041E+22                              | 7,561194E+22 | 6,760675E+22 | 6,760600E+22 | 1,512223E+23                           | 1,352128E+23                           | 2,864351E+23  |
| -2941                  | 7,561430E+22                              | 7,561327E+22 | 6,760681E+22 | 6,760855E+22 | 1,512276E+23                           | 1,352154E+23                           | 2,864429E+23  |
| -2940                  | 7,561286E+22                              | 7,561265E+22 | 6,760737E+22 | 6,760708E+22 | 1,512255E+23                           | 1,352144E+23                           | 2,864400E+23  |
| -2939                  | 7,561115E+22                              | 7,561314E+22 | 6,760785E+22 | 6,760796E+22 | 1,512243E+23                           | 1,352158E+23                           | 2,864401E+23  |
| -2938                  | 7,561546E+22                              | 7,561440E+22 | 6,760794E+22 | 6,760842E+22 | 1,512299E+23                           | 1,352164E+23                           | 2,864462E+23  |
| -2937                  | 7,561280E+22                              | 7,561237E+22 | 6,760849E+22 | 6,760664E+22 | 1,512252E+23                           | 1,352151E+23                           | 2,864403E+23  |
| -2936                  | 7,561293E+22                              | 7,561336E+22 | 6,760858E+22 | 6,760852E+22 | 1,512263E+23                           | 1,352171E+23                           | 2,864434E+23  |
| -2935                  | 7,561455E+22                              | 7,561410E+22 | 6,760809E+22 | 6,760810E+22 | 1,512286E+23                           | 1,352162E+23                           | 2,864448E+23  |
| -2934                  | 7,561056E+22                              | 7,561289E+22 | 6,760755E+22 | 6,760712E+22 | 1,512235E+23                           | 1,352147E+23                           | 2,864381E+23  |
| -2933                  | 7,561343E+22                              | 7,561338E+22 | 6,760725E+22 | 6,760864E+22 | 1,512268E+23                           | 1,352159E+23                           | 2,864427E+23  |
| -2932                  | 7,561334E+22                              | 7,561221E+22 | 6,760698E+22 | 6,760625E+22 | 1,512255E+23                           | 1,352132E+23                           | 2,864388E+23  |
| -2931                  | 7,561093E+22                              | 7,561191E+22 | 6,760666E+22 | 6,760569E+22 | 1,512228E+23                           | 1,352124E+23                           | 2,864352E+23  |
| -2930                  | 7,561478E+22                              | 7,561330E+22 | 6,760601E+22 | 6,760681E+22 | 1,512281E+23                           | 1,352128E+23                           | 2,864409E+23  |
| -2929                  | 7,561225E+22                              | 7,561186E+22 | 6,760575E+22 | 6,760485E+22 | 1,512241E+23                           | 1,352106E+23                           | 2,864347E+23  |
| -2928                  | 7,561087E+22                              | 7,561281E+22 | 6,760591E+22 | 6,760620E+22 | 1,512237E+23                           | 1,352121E+23                           | 2,864358E+23  |
| -2927                  | 7,561350E+22                              | 7,561360E+22 | 6,760607E+22 | 6,760640E+22 | 1,512271E+23                           | 1,352125E+23                           | 2,864396E+23  |
| -2926                  | 7,561042E+22                              | 7,561190E+22 | 6,760645E+22 | 6,760494E+22 | 1,512223E+23                           | 1,352114E+23                           | 2,864337E+23  |
| -2925                  | 7,561266E+22                              | 7,561235E+22 | 6,760718E+22 | 6,760735E+22 | 1,512250E+23                           | 1,352145E+23                           | 2,864395E+23  |
| -2924                  | 7,561371E+22                              | 7,561222E+22 | 6,760719E+22 | 6,760706E+22 | 1,512259E+23                           | 1,352142E+23                           | 2,864402E+23  |
| -2923                  | 7,561063E+22                              | 7,561229E+22 | 6,760730E+22 | 6,760702E+22 | 1,512229E+23                           | 1,352143E+23                           | 2,864372E+23  |
| -2922                  | 7,561426E+22                              | 7,561393E+22 | 6,760752E+22 | 6,760933E+22 | 1,512282E+23                           | 1,352169E+23                           | 2,864450E+23  |
| -2921                  | 7,561353E+22                              | 7,561269E+22 | 6,760786E+22 | 6,760750E+22 | 1,512262E+23                           | 1,352154E+23                           | 2,864416E+23  |
| -2920                  | 7,561198E+22                              | 7,561322E+22 | 6,760877E+22 | 6,760802E+22 | 1,512252E+23                           | 1,352168E+23                           | 2,864420E+23  |
| -2919                  | 7,561545E+22                              | 7,561438E+22 | 6,760920E+22 | 6,760919E+22 | 1,512298E+23                           | 1,352184E+23                           | 2,864482E+23  |
| -2918                  | 7,561247E+22                              | 7,561317E+22 | 6,760904E+22 | 6,760740E+22 | 1,512256E+23                           | 1,352164E+23                           | 2,864421E+23  |
| -2917                  | 7,561268E+22                              | 7,561397E+22 | 6,760919E+22 | 6,760963E+22 | 1,512267E+23                           | 1,352188E+23                           | 2,864455E+23  |
| -2916                  | 7,561420E+22                              | 7,561381E+22 | 6,760850E+22 | 6,760939E+22 | 1,512280E+23                           | 1,352179E+23                           | 2,864459E+23  |
| -2915                  | 7,561079E+22                              | 7,561262E+22 | 6,760826E+22 | 6,760730E+22 | 1,512234E+23                           | 1,352156E+23                           | 2,864390E+23  |
| -2914                  | 7,561392E+22                              | 7,561329E+22 | 6,760813E+22 | 6,760875E+22 | 1,512272E+23                           | 1,352169E+23                           | 2,864441E+23  |
| -2913                  | 7,561426E+22                              | 7,561189E+22 | 6,760722E+22 | 6,760659E+22 | 1,512261E+23                           | 1,352138E+23                           | 2,864400E+23  |
| -2912                  | 7,561127E+22                              | 7,561236E+22 | 6,760693E+22 | 6,760618E+22 | 1,512236E+23                           | 1,352131E+23                           | 2,864367E+23  |
| -2911                  | 7,561414E+22                              | 7,561384E+22 | 6,760666E+22 | 6,760789E+22 | 1,512280E+23                           | 1,352145E+23                           | 2,864425E+23  |
| -2910                  | 7,561170E+22                              | 7,561259E+22 | 6,760622E+22 | 6,760534E+22 | 1,512243E+23                           | 1,352116E+23                           | 2,864358E+23  |
| -2909                  | 7,561103E+22                              | 7,561296E+22 | 6,760703E+22 | 6,760673E+22 | 1,512240E+23                           | 1,352138E+23                           | 2,864378E+23  |
| -2908                  | 7,561387E+22                              | 7,561283E+22 | 6,760714E+22 | 6,760734E+22 | 1,512267E+23                           | 1,352145E+23                           | 2,864412E+23  |
| -2907                  | 7,561093E+22                              | 7,561163E+22 | 6,760749E+22 | 6,760554E+22 | 1,512226E+23                           | 1,352130E+23                           | 2,864356E+23  |
| -2906                  | 7,561290E+22                              | 7,561289E+22 | 6,760799E+22 | 6,760847E+22 | 1,512258E+23                           | 1,352165E+23                           | 2,864423E+23  |
| -2905                  | 7,561418E+22                              | 7,561248E+22 | 6,760729E+22 | 6,760821E+22 | 1,512267E+23                           | 1,352155E+23                           | 2,864422E+23  |
| -2904                  | 7,561094E+22                              | 7,561289E+22 | 6,760786E+22 | 6,760764E+22 | 1,512238E+23                           | 1,352155E+23                           | 2,864393E+23  |
| -2903                  | 7,561425E+22                              | 7,561427E+22 | 6,760876E+22 | 6,761001E+22 | 1,512285E+23                           | 1,352188E+23                           | 2,864473E+23  |

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| Years                  |   |              |              |              |  |  |               |
| -2902                  | 7,561375E+22                              | 7,561316E+22 | 6,760888E+22 | 6,760768E+22 | 1,512269E+23                           | 1,352166E+23                           | 2,864435E+23  |
| -2901                  | 7,561237E+22                              | 7,561355E+22 | 6,760998E+22 | 6,760881E+22 | 1,512259E+23                           | 1,352188E+23                           | 2,864447E+23  |
| -2900                  | 7,561508E+22                              | 7,561421E+22 | 6,760989E+22 | 6,761072E+22 | 1,512293E+23                           | 1,352206E+23                           | 2,864499E+23  |
| -2899                  | 7,561211E+22                              | 7,561330E+22 | 6,760961E+22 | 6,760839E+22 | 1,512254E+23                           | 1,352180E+23                           | 2,864434E+23  |
| -2898                  | 7,561250E+22                              | 7,561409E+22 | 6,760981E+22 | 6,761036E+22 | 1,512266E+23                           | 1,352202E+23                           | 2,864468E+23  |
| -2897                  | 7,561493E+22                              | 7,561321E+22 | 6,760867E+22 | 6,760972E+22 | 1,512281E+23                           | 1,352184E+23                           | 2,864465E+23  |
| -2896                  | 7,561185E+22                              | 7,561244E+22 | 6,760869E+22 | 6,760718E+22 | 1,512243E+23                           | 1,352159E+23                           | 2,864402E+23  |
| -2895                  | 7,561419E+22                              | 7,561348E+22 | 6,760879E+22 | 6,760921E+22 | 1,512277E+23                           | 1,352180E+23                           | 2,864457E+23  |
| -2894                  | 7,561412E+22                              | 7,561299E+22 | 6,760745E+22 | 6,760696E+22 | 1,512271E+23                           | 1,352144E+23                           | 2,864415E+23  |
| -2893                  | 7,561115E+22                              | 7,561331E+22 | 6,760765E+22 | 6,760695E+22 | 1,512245E+23                           | 1,352146E+23                           | 2,864391E+23  |
| -2892                  | 7,561349E+22                              | 7,561383E+22 | 6,760761E+22 | 6,760893E+22 | 1,512273E+23                           | 1,352165E+23                           | 2,864439E+23  |
| -2891                  | 7,561171E+22                              | 7,561244E+22 | 6,760755E+22 | 6,760577E+22 | 1,512242E+23                           | 1,352133E+23                           | 2,864375E+23  |
| -2890                  | 7,561131E+22                              | 7,561259E+22 | 6,760833E+22 | 6,760736E+22 | 1,512239E+23                           | 1,352157E+23                           | 2,864396E+23  |
| -2889                  | 7,561451E+22                              | 7,561223E+22 | 6,760753E+22 | 6,760847E+22 | 1,512267E+23                           | 1,352160E+23                           | 2,864427E+23  |
| -2888                  | 7,561140E+22                              | 7,561184E+22 | 6,760764E+22 | 6,760660E+22 | 1,512232E+23                           | 1,352142E+23                           | 2,864375E+23  |
| -2887                  | 7,561260E+22                              | 7,561337E+22 | 6,760837E+22 | 6,760978E+22 | 1,512260E+23                           | 1,352181E+23                           | 2,864441E+23  |
| -2886                  | 7,561417E+22                              | 7,561335E+22 | 6,760766E+22 | 6,760863E+22 | 1,512275E+23                           | 1,352163E+23                           | 2,864438E+23  |
| -2885                  | 7,561163E+22                              | 7,561334E+22 | 6,760898E+22 | 6,760794E+22 | 1,512250E+23                           | 1,352169E+23                           | 2,864419E+23  |
| -2884                  | 7,561452E+22                              | 7,561403E+22 | 6,761005E+22 | 6,761070E+22 | 1,512285E+23                           | 1,352207E+23                           | 2,864493E+23  |
| -2883                  | 7,561399E+22                              | 7,561342E+22 | 6,761012E+22 | 6,760827E+22 | 1,512274E+23                           | 1,352184E+23                           | 2,864458E+23  |
| -2882                  | 7,561214E+22                              | 7,561411E+22 | 6,761102E+22 | 6,760995E+22 | 1,512263E+23                           | 1,352210E+23                           | 2,864472E+23  |
| -2881                  | 7,561508E+22                              | 7,561418E+22 | 6,761017E+22 | 6,761201E+22 | 1,512293E+23                           | 1,352222E+23                           | 2,864514E+23  |
| -2880                  | 7,561237E+22                              | 7,561328E+22 | 6,761010E+22 | 6,760901E+22 | 1,512256E+23                           | 1,352191E+23                           | 2,864448E+23  |
| -2879                  | 7,561269E+22                              | 7,561389E+22 | 6,761063E+22 | 6,761093E+22 | 1,512266E+23                           | 1,352216E+23                           | 2,864481E+23  |
| -2878                  | 7,561550E+22                              | 7,561336E+22 | 6,760912E+22 | 6,760968E+22 | 1,512289E+23                           | 1,352188E+23                           | 2,864477E+23  |
| -2877                  | 7,561250E+22                              | 7,561290E+22 | 6,760928E+22 | 6,760767E+22 | 1,512254E+23                           | 1,352170E+23                           | 2,864424E+23  |
| -2876                  | 7,561380E+22                              | 7,561379E+22 | 6,760919E+22 | 6,761028E+22 | 1,512276E+23                           | 1,352195E+23                           | 2,864471E+23  |
| -2875                  | 7,561362E+22                              | 7,561353E+22 | 6,760800E+22 | 6,760752E+22 | 1,512271E+23                           | 1,352155E+23                           | 2,864427E+23  |
| -2874                  | 7,561082E+22                              | 7,561354E+22 | 6,760866E+22 | 6,760755E+22 | 1,512244E+23                           | 1,352162E+23                           | 2,864406E+23  |
| -2873                  | 7,561386E+22                              | 7,561308E+22 | 6,760820E+22 | 6,760947E+22 | 1,512269E+23                           | 1,352177E+23                           | 2,864446E+23  |
| -2872                  | 7,561238E+22                              | 7,561194E+22 | 6,760828E+22 | 6,760620E+22 | 1,512243E+23                           | 1,352145E+23                           | 2,864388E+23  |
| -2871                  | 7,561146E+22                              | 7,561263E+22 | 6,760899E+22 | 6,760851E+22 | 1,512241E+23                           | 1,352175E+23                           | 2,864416E+23  |
| -2870                  | 7,561456E+22                              | 7,561301E+22 | 6,760762E+22 | 6,760933E+22 | 1,512276E+23                           | 1,352169E+23                           | 2,864445E+23  |
| -2869                  | 7,561177E+22                              | 7,561278E+22 | 6,760814E+22 | 6,760756E+22 | 1,512246E+23                           | 1,352157E+23                           | 2,864403E+23  |
| -2868                  | 7,561252E+22                              | 7,561362E+22 | 6,760927E+22 | 6,761060E+22 | 1,512261E+23                           | 1,352199E+23                           | 2,864460E+23  |
| -2867                  | 7,561454E+22                              | 7,561364E+22 | 6,760907E+22 | 6,760877E+22 | 1,512282E+23                           | 1,352178E+23                           | 2,864460E+23  |
| -2866                  | 7,561207E+22                              | 7,561347E+22 | 6,761069E+22 | 6,760850E+22 | 1,512255E+23                           | 1,352192E+23                           | 2,864447E+23  |
| -2865                  | 7,561474E+22                              | 7,561379E+22 | 6,761088E+22 | 6,761188E+22 | 1,512285E+23                           | 1,352228E+23                           | 2,864513E+23  |
| -2864                  | 7,561399E+22                              | 7,561362E+22 | 6,761071E+22 | 6,760955E+22 | 1,512276E+23                           | 1,352203E+23                           | 2,864479E+23  |
| -2863                  | 7,561166E+22                              | 7,561422E+22 | 6,761155E+22 | 6,761139E+22 | 1,512259E+23                           | 1,352229E+23                           | 2,864488E+23  |
| -2862                  | 7,561514E+22                              | 7,561436E+22 | 6,761040E+22 | 6,761247E+22 | 1,512295E+23                           | 1,352229E+23                           | 2,864524E+23  |
| -2861                  | 7,561339E+22                              | 7,561331E+22 | 6,761067E+22 | 6,760926E+22 | 1,512267E+23                           | 1,352199E+23                           | 2,864466E+23  |
| -2860                  | 7,561313E+22                              | 7,561364E+22 | 6,761123E+22 | 6,761135E+22 | 1,512268E+23                           | 1,352226E+23                           | 2,864493E+23  |
| -2859                  | 7,561582E+22                              | 7,561399E+22 | 6,760973E+22 | 6,760990E+22 | 1,512298E+23                           | 1,352196E+23                           | 2,864494E+23  |
| -2858                  | 7,561231E+22                              | 7,561372E+22 | 6,761001E+22 | 6,760829E+22 | 1,512260E+23                           | 1,352183E+23                           | 2,864443E+23  |
| -2857                  | 7,561339E+22                              | 7,561394E+22 | 6,760956E+22 | 6,761109E+22 | 1,512273E+23                           | 1,352207E+23                           | 2,864480E+23  |
| -2856                  | 7,561358E+22                              | 7,561349E+22 | 6,760880E+22 | 6,760798E+22 | 1,512271E+23                           | 1,352168E+23                           | 2,864438E+23  |
| -2855                  | 7,561069E+22                              | 7,561306E+22 | 6,760973E+22 | 6,760831E+22 | 1,512237E+23                           | 1,352180E+23                           | 2,864418E+23  |
| -2854                  | 7,561418E+22                              | 7,561283E+22 | 6,760877E+22 | 6,760997E+22 | 1,512270E+23                           | 1,352187E+23                           | 2,864458E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -2853             | 7,561304E+22                              | 7,561208E+22 | 6,760867E+22 | 6,760728E+22 | 1,512251E+23                           | 1,352159E+23                           | 2,864411E+23  |
| -2852             | 7,561128E+22                              | 7,561280E+22 | 6,760916E+22 | 6,760985E+22 | 1,512241E+23                           | 1,352190E+23                           | 2,864431E+23  |
| -2851             | 7,561463E+22                              | 7,561366E+22 | 6,760809E+22 | 6,760988E+22 | 1,512283E+23                           | 1,352180E+23                           | 2,864463E+23  |
| -2850             | 7,561213E+22                              | 7,561328E+22 | 6,760931E+22 | 6,760791E+22 | 1,512254E+23                           | 1,352172E+23                           | 2,864426E+23  |
| -2849             | 7,561317E+22                              | 7,561342E+22 | 6,761031E+22 | 6,761096E+22 | 1,512266E+23                           | 1,352213E+23                           | 2,864479E+23  |
| -2848             | 7,561522E+22                              | 7,561368E+22 | 6,761035E+22 | 6,760926E+22 | 1,512289E+23                           | 1,352196E+23                           | 2,864485E+23  |
| -2847             | 7,561191E+22                              | 7,561383E+22 | 6,761188E+22 | 6,760994E+22 | 1,512257E+23                           | 1,352218E+23                           | 2,864476E+23  |
| -2846             | 7,561440E+22                              | 7,561443E+22 | 6,761137E+22 | 6,761307E+22 | 1,512288E+23                           | 1,352244E+23                           | 2,864533E+23  |
| -2845             | 7,561414E+22                              | 7,561413E+22 | 6,761130E+22 | 6,761088E+22 | 1,512283E+23                           | 1,352222E+23                           | 2,864504E+23  |
| -2844             | 7,561165E+22                              | 7,561406E+22 | 6,761221E+22 | 6,761237E+22 | 1,512257E+23                           | 1,352246E+23                           | 2,864503E+23  |
| -2843             | 7,561574E+22                              | 7,561428E+22 | 6,761118E+22 | 6,761248E+22 | 1,512300E+23                           | 1,352237E+23                           | 2,864537E+23  |
| -2842             | 7,561412E+22                              | 7,561345E+22 | 6,761163E+22 | 6,760951E+22 | 1,512276E+23                           | 1,352211E+23                           | 2,864487E+23  |
| -2841             | 7,561343E+22                              | 7,561364E+22 | 6,761142E+22 | 6,761195E+22 | 1,512271E+23                           | 1,352234E+23                           | 2,864504E+23  |
| -2840             | 7,561562E+22                              | 7,561440E+22 | 6,761006E+22 | 6,761051E+22 | 1,512300E+23                           | 1,352206E+23                           | 2,864506E+23  |
| -2839             | 7,561163E+22                              | 7,561400E+22 | 6,761067E+22 | 6,760925E+22 | 1,512256E+23                           | 1,352199E+23                           | 2,864456E+23  |
| -2838             | 7,561311E+22                              | 7,561389E+22 | 6,761008E+22 | 6,761129E+22 | 1,512270E+23                           | 1,352214E+23                           | 2,864484E+23  |
| -2837             | 7,561425E+22                              | 7,561322E+22 | 6,760955E+22 | 6,760848E+22 | 1,512275E+23                           | 1,352180E+23                           | 2,864455E+23  |
| -2836             | 7,561096E+22                              | 7,561254E+22 | 6,761032E+22 | 6,760914E+22 | 1,512235E+23                           | 1,352195E+23                           | 2,864430E+23  |
| -2835             | 7,561450E+22                              | 7,561318E+22 | 6,760919E+22 | 6,761059E+22 | 1,512277E+23                           | 1,352198E+23                           | 2,864475E+23  |
| -2834             | 7,561330E+22                              | 7,561287E+22 | 6,760930E+22 | 6,760816E+22 | 1,512262E+23                           | 1,352175E+23                           | 2,864436E+23  |
| -2833             | 7,561143E+22                              | 7,561311E+22 | 6,760960E+22 | 6,761060E+22 | 1,512245E+23                           | 1,352202E+23                           | 2,864448E+23  |
| -2832             | 7,561506E+22                              | 7,561397E+22 | 6,760924E+22 | 6,761019E+22 | 1,512290E+23                           | 1,352194E+23                           | 2,864485E+23  |
| -2831             | 7,561232E+22                              | 7,561337E+22 | 6,761087E+22 | 6,760867E+22 | 1,512257E+23                           | 1,352195E+23                           | 2,864452E+23  |
| -2830             | 7,561329E+22                              | 7,561362E+22 | 6,761143E+22 | 6,761169E+22 | 1,512269E+23                           | 1,352231E+23                           | 2,864500E+23  |
| -2829             | 7,561548E+22                              | 7,561414E+22 | 6,761114E+22 | 6,761085E+22 | 1,512296E+23                           | 1,352220E+23                           | 2,864516E+23  |
| -2828             | 7,561130E+22                              | 7,561384E+22 | 6,761236E+22 | 6,761171E+22 | 1,512251E+23                           | 1,352241E+23                           | 2,864492E+23  |
| -2827             | 7,561435E+22                              | 7,561465E+22 | 6,761189E+22 | 6,761390E+22 | 1,512290E+23                           | 1,352258E+23                           | 2,864548E+23  |
| -2826             | 7,561478E+22                              | 7,561406E+22 | 6,761213E+22 | 6,761124E+22 | 1,512288E+23                           | 1,352234E+23                           | 2,864522E+23  |
| -2825             | 7,561253E+22                              | 7,561357E+22 | 6,761264E+22 | 6,761253E+22 | 1,512261E+23                           | 1,352252E+23                           | 2,864513E+23  |
| -2824             | 7,561663E+22                              | 7,561437E+22 | 6,761185E+22 | 6,761256E+22 | 1,512310E+23                           | 1,352244E+23                           | 2,864554E+23  |
| -2823             | 7,561399E+22                              | 7,561409E+22 | 6,761231E+22 | 6,761030E+22 | 1,512281E+23                           | 1,352226E+23                           | 2,864507E+23  |
| -2822             | 7,561294E+22                              | 7,561445E+22 | 6,761180E+22 | 6,761245E+22 | 1,512274E+23                           | 1,352242E+23                           | 2,864516E+23  |
| -2821             | 7,561551E+22                              | 7,561491E+22 | 6,761069E+22 | 6,761130E+22 | 1,512304E+23                           | 1,352220E+23                           | 2,864524E+23  |
| -2820             | 7,561123E+22                              | 7,561357E+22 | 6,761160E+22 | 6,761003E+22 | 1,512248E+23                           | 1,352216E+23                           | 2,864464E+23  |
| -2819             | 7,561340E+22                              | 7,561349E+22 | 6,761103E+22 | 6,761152E+22 | 1,512269E+23                           | 1,352225E+23                           | 2,864494E+23  |
| -2818             | 7,561482E+22                              | 7,561301E+22 | 6,761046E+22 | 6,760918E+22 | 1,512278E+23                           | 1,352196E+23                           | 2,864475E+23  |
| -2817             | 7,561125E+22                              | 7,561247E+22 | 6,761031E+22 | 6,761021E+22 | 1,512237E+23                           | 1,352205E+23                           | 2,864442E+23  |
| -2816             | 7,561472E+22                              | 7,561358E+22 | 6,760940E+22 | 6,761135E+22 | 1,512283E+23                           | 1,352208E+23                           | 2,864491E+23  |
| -2815             | 7,561320E+22                              | 7,561344E+22 | 6,761000E+22 | 6,760904E+22 | 1,512266E+23                           | 1,352190E+23                           | 2,864457E+23  |
| -2814             | 7,561169E+22                              | 7,561345E+22 | 6,761047E+22 | 6,761067E+22 | 1,512251E+23                           | 1,352211E+23                           | 2,864463E+23  |
| -2813             | 7,561579E+22                              | 7,561426E+22 | 6,761043E+22 | 6,761078E+22 | 1,512300E+23                           | 1,352212E+23                           | 2,864513E+23  |
| -2812             | 7,561232E+22                              | 7,561338E+22 | 6,761210E+22 | 6,760992E+22 | 1,512257E+23                           | 1,352220E+23                           | 2,864477E+23  |
| -2811             | 7,561311E+22                              | 7,561408E+22 | 6,761228E+22 | 6,761273E+22 | 1,512272E+23                           | 1,352250E+23                           | 2,864522E+23  |
| -2810             | 7,561541E+22                              | 7,561463E+22 | 6,761207E+22 | 6,761218E+22 | 1,512300E+23                           | 1,352242E+23                           | 2,864543E+23  |
| -2809             | 7,561151E+22                              | 7,561366E+22 | 6,761276E+22 | 6,761272E+22 | 1,512252E+23                           | 1,352255E+23                           | 2,864506E+23  |
| -2808             | 7,561505E+22                              | 7,561435E+22 | 6,761273E+22 | 6,761417E+22 | 1,512294E+23                           | 1,352269E+23                           | 2,864563E+23  |
| -2807             | 7,561539E+22                              | 7,561404E+22 | 6,761316E+22 | 6,761175E+22 | 1,512294E+23                           | 1,352249E+23                           | 2,864544E+23  |
| -2806             | 7,561297E+22                              | 7,561383E+22 | 6,761319E+22 | 6,761273E+22 | 1,512268E+23                           | 1,352259E+23                           | 2,864527E+23  |
| -2805             | 7,561681E+22                              | 7,561515E+22 | 6,761223E+22 | 6,761348E+22 | 1,512320E+23                           | 1,352257E+23                           | 2,864577E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -2804                  | 7,561322E+22                              | 7,561443E+22 | 6,761279E+22 | 6,761144E+22 | 1,512276E+23                           | 1,352242E+23                           | 2,864519E+23  |
| -2803                  | 7,561245E+22                              | 7,561469E+22 | 6,761248E+22 | 6,761280E+22 | 1,512271E+23                           | 1,352253E+23                           | 2,864524E+23  |
| -2802                  | 7,561572E+22                              | 7,561473E+22 | 6,761176E+22 | 6,761166E+22 | 1,512305E+23                           | 1,352234E+23                           | 2,864539E+23  |
| -2801                  | 7,561177E+22                              | 7,561278E+22 | 6,761208E+22 | 6,761052E+22 | 1,512246E+23                           | 1,352226E+23                           | 2,864472E+23  |
| -2800                  | 7,561410E+22                              | 7,561321E+22 | 6,761157E+22 | 6,761206E+22 | 1,512273E+23                           | 1,352236E+23                           | 2,864509E+23  |
| -2799                  | 7,561486E+22                              | 7,561353E+22 | 6,761089E+22 | 6,761030E+22 | 1,512284E+23                           | 1,352212E+23                           | 2,864496E+23  |
| -2798                  | 7,561118E+22                              | 7,561326E+22 | 6,761051E+22 | 6,761079E+22 | 1,512244E+23                           | 1,352213E+23                           | 2,864457E+23  |
| -2797                  | 7,561506E+22                              | 7,561441E+22 | 6,761002E+22 | 6,761204E+22 | 1,512295E+23                           | 1,352221E+23                           | 2,864515E+23  |
| -2796                  | 7,561307E+22                              | 7,561345E+22 | 6,761120E+22 | 6,760968E+22 | 1,512265E+23                           | 1,352209E+23                           | 2,864474E+23  |
| -2795                  | 7,561193E+22                              | 7,561352E+22 | 6,761188E+22 | 6,761099E+22 | 1,512254E+23                           | 1,352229E+23                           | 2,864483E+23  |
| -2794                  | 7,561605E+22                              | 7,561434E+22 | 6,761179E+22 | 6,761179E+22 | 1,512304E+23                           | 1,352236E+23                           | 2,864540E+23  |
| -2793                  | 7,561214E+22                              | 7,561320E+22 | 6,761254E+22 | 6,761145E+22 | 1,512253E+23                           | 1,352240E+23                           | 2,864493E+23  |
| -2792                  | 7,561319E+22                              | 7,561402E+22 | 6,761285E+22 | 6,761389E+22 | 1,512272E+23                           | 1,352267E+23                           | 2,864540E+23  |
| -2791                  | 7,561548E+22                              | 7,561467E+22 | 6,761282E+22 | 6,761320E+22 | 1,512302E+23                           | 1,352260E+23                           | 2,864562E+23  |
| -2790                  | 7,561224E+22                              | 7,561364E+22 | 6,761330E+22 | 6,761280E+22 | 1,512259E+23                           | 1,352261E+23                           | 2,864520E+23  |
| -2789                  | 7,561621E+22                              | 7,561468E+22 | 6,761334E+22 | 6,761453E+22 | 1,512309E+23                           | 1,352279E+23                           | 2,864588E+23  |
| -2788                  | 7,561548E+22                              | 7,561445E+22 | 6,761393E+22 | 6,761255E+22 | 1,512299E+23                           | 1,352265E+23                           | 2,864564E+23  |
| -2787                  | 7,561272E+22                              | 7,561481E+22 | 6,761389E+22 | 6,761327E+22 | 1,512275E+23                           | 1,352272E+23                           | 2,864547E+23  |
| -2786                  | 7,561642E+22                              | 7,561592E+22 | 6,761326E+22 | 6,761430E+22 | 1,512323E+23                           | 1,352276E+23                           | 2,864599E+23  |
| -2785                  | 7,561290E+22                              | 7,561426E+22 | 6,761348E+22 | 6,761226E+22 | 1,512272E+23                           | 1,352257E+23                           | 2,864529E+23  |
| -2784                  | 7,561275E+22                              | 7,561405E+22 | 6,761350E+22 | 6,761313E+22 | 1,512268E+23                           | 1,352266E+23                           | 2,864534E+23  |
| -2783                  | 7,561599E+22                              | 7,561432E+22 | 6,761270E+22 | 6,761249E+22 | 1,512303E+23                           | 1,352252E+23                           | 2,864555E+23  |
| -2782                  | 7,561218E+22                              | 7,561270E+22 | 6,761223E+22 | 6,761112E+22 | 1,512249E+23                           | 1,352233E+23                           | 2,864482E+23  |
| -2781                  | 7,561441E+22                              | 7,561382E+22 | 6,761141E+22 | 6,761311E+22 | 1,512282E+23                           | 1,352245E+23                           | 2,864527E+23  |
| -2780                  | 7,561450E+22                              | 7,561396E+22 | 6,761117E+22 | 6,761129E+22 | 1,512285E+23                           | 1,352225E+23                           | 2,864509E+23  |
| -2779                  | 7,561120E+22                              | 7,561369E+22 | 6,761121E+22 | 6,761076E+22 | 1,512249E+23                           | 1,352220E+23                           | 2,864469E+23  |
| -2778                  | 7,561544E+22                              | 7,561459E+22 | 6,761143E+22 | 6,761212E+22 | 1,512300E+23                           | 1,352235E+23                           | 2,864536E+23  |
| -2777                  | 7,561350E+22                              | 7,561314E+22 | 6,761220E+22 | 6,761032E+22 | 1,512266E+23                           | 1,352225E+23                           | 2,864492E+23  |
| -2776                  | 7,561219E+22                              | 7,561340E+22 | 6,761299E+22 | 6,761189E+22 | 1,512256E+23                           | 1,352249E+23                           | 2,864505E+23  |
| -2775                  | 7,561569E+22                              | 7,561483E+22 | 6,761270E+22 | 6,761341E+22 | 1,512305E+23                           | 1,352261E+23                           | 2,864566E+23  |
| -2774                  | 7,561212E+22                              | 7,561349E+22 | 6,761298E+22 | 6,761249E+22 | 1,512256E+23                           | 1,352255E+23                           | 2,864511E+23  |
| -2773                  | 7,561377E+22                              | 7,561438E+22 | 6,761336E+22 | 6,761484E+22 | 1,512281E+23                           | 1,352282E+23                           | 2,864564E+23  |
| -2772                  | 7,561584E+22                              | 7,561457E+22 | 6,761381E+22 | 6,761391E+22 | 1,512304E+23                           | 1,352277E+23                           | 2,864581E+23  |
| -2771                  | 7,561286E+22                              | 7,561396E+22 | 6,761431E+22 | 6,761296E+22 | 1,512268E+23                           | 1,352273E+23                           | 2,864541E+23  |
| -2770                  | 7,561652E+22                              | 7,561538E+22 | 6,761440E+22 | 6,761524E+22 | 1,512319E+23                           | 1,352296E+23                           | 2,864615E+23  |
| -2769                  | 7,561513E+22                              | 7,561483E+22 | 6,761430E+22 | 6,761371E+22 | 1,512300E+23                           | 1,352280E+23                           | 2,864580E+23  |
| -2768                  | 7,561246E+22                              | 7,561489E+22 | 6,761467E+22 | 6,761407E+22 | 1,512273E+23                           | 1,352287E+23                           | 2,864561E+23  |
| -2767                  | 7,561607E+22                              | 7,561586E+22 | 6,761423E+22 | 6,761506E+22 | 1,512319E+23                           | 1,352293E+23                           | 2,864612E+23  |
| -2766                  | 7,561330E+22                              | 7,561374E+22 | 6,761407E+22 | 6,761248E+22 | 1,512270E+23                           | 1,352266E+23                           | 2,864536E+23  |
| -2765                  | 7,561369E+22                              | 7,561391E+22 | 6,761380E+22 | 6,761377E+22 | 1,512276E+23                           | 1,352276E+23                           | 2,864552E+23  |
| -2764                  | 7,561600E+22                              | 7,561430E+22 | 6,761299E+22 | 6,761340E+22 | 1,512303E+23                           | 1,352264E+23                           | 2,864567E+23  |
| -2763                  | 7,561217E+22                              | 7,561351E+22 | 6,761241E+22 | 6,761154E+22 | 1,512257E+23                           | 1,352240E+23                           | 2,864496E+23  |
| -2762                  | 7,561449E+22                              | 7,561462E+22 | 6,761208E+22 | 6,761352E+22 | 1,512291E+23                           | 1,352256E+23                           | 2,864547E+23  |
| -2761                  | 7,561445E+22                              | 7,561402E+22 | 6,761185E+22 | 6,761170E+22 | 1,512285E+23                           | 1,352236E+23                           | 2,864520E+23  |
| -2760                  | 7,561167E+22                              | 7,561337E+22 | 6,761264E+22 | 6,761097E+22 | 1,512250E+23                           | 1,352236E+23                           | 2,864486E+23  |
| -2759                  | 7,561544E+22                              | 7,561451E+22 | 6,761289E+22 | 6,761302E+22 | 1,512299E+23                           | 1,352259E+23                           | 2,864559E+23  |
| -2758                  | 7,561352E+22                              | 7,561319E+22 | 6,761284E+22 | 6,761148E+22 | 1,512267E+23                           | 1,352243E+23                           | 2,864510E+23  |
| -2757                  | 7,561229E+22                              | 7,561385E+22 | 6,761315E+22 | 6,761354E+22 | 1,512261E+23                           | 1,352267E+23                           | 2,864528E+23  |
| -2756                  | 7,561530E+22                              | 7,561491E+22 | 6,761321E+22 | 6,761487E+22 | 1,512302E+23                           | 1,352281E+23                           | 2,864583E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -2755                  | 7,561254E+22                              | 7,561377E+22 | 6,761365E+22 | 6,761283E+22 | 1,512263E+23                           | 1,352265E+23                           | 2,864528E+23  |
| -2754                  | 7,561472E+22                              | 7,561465E+22 | 6,761448E+22 | 6,761507E+22 | 1,512294E+23                           | 1,352296E+23                           | 2,864589E+23  |
| -2753                  | 7,561651E+22                              | 7,561468E+22 | 6,761458E+22 | 6,761451E+22 | 1,512312E+23                           | 1,352291E+23                           | 2,864603E+23  |
| -2752                  | 7,561328E+22                              | 7,561436E+22 | 6,761536E+22 | 6,761359E+22 | 1,512276E+23                           | 1,352290E+23                           | 2,864566E+23  |
| -2751                  | 7,561598E+22                              | 7,561625E+22 | 6,761548E+22 | 6,761638E+22 | 1,512322E+23                           | 1,352319E+23                           | 2,864641E+23  |
| -2750                  | 7,561487E+22                              | 7,561518E+22 | 6,761498E+22 | 6,761452E+22 | 1,512301E+23                           | 1,352295E+23                           | 2,864596E+23  |
| -2749                  | 7,561262E+22                              | 7,561487E+22 | 6,761528E+22 | 6,761485E+22 | 1,512275E+23                           | 1,352301E+23                           | 2,864576E+23  |
| -2748                  | 7,561607E+22                              | 7,561524E+22 | 6,761515E+22 | 6,761583E+22 | 1,512313E+23                           | 1,352310E+23                           | 2,864623E+23  |
| -2747                  | 7,561379E+22                              | 7,561346E+22 | 6,761456E+22 | 6,761275E+22 | 1,512273E+23                           | 1,352273E+23                           | 2,864546E+23  |
| -2746                  | 7,561400E+22                              | 7,561422E+22 | 6,761411E+22 | 6,761445E+22 | 1,512282E+23                           | 1,352286E+23                           | 2,864568E+23  |
| -2745                  | 7,561587E+22                              | 7,561456E+22 | 6,761283E+22 | 6,761429E+22 | 1,512304E+23                           | 1,352271E+23                           | 2,864575E+23  |
| -2744                  | 7,561231E+22                              | 7,561362E+22 | 6,761294E+22 | 6,761182E+22 | 1,512259E+23                           | 1,352248E+23                           | 2,864507E+23  |
| -2743                  | 7,561437E+22                              | 7,561494E+22 | 6,761316E+22 | 6,761376E+22 | 1,512293E+23                           | 1,352269E+23                           | 2,864562E+23  |
| -2742                  | 7,561491E+22                              | 7,561389E+22 | 6,761272E+22 | 6,761186E+22 | 1,512288E+23                           | 1,352246E+23                           | 2,864534E+23  |
| -2741                  | 7,561221E+22                              | 7,561353E+22 | 6,761336E+22 | 6,761192E+22 | 1,512257E+23                           | 1,352253E+23                           | 2,864510E+23  |
| -2740                  | 7,561497E+22                              | 7,561470E+22 | 6,761372E+22 | 6,761455E+22 | 1,512297E+23                           | 1,352283E+23                           | 2,864579E+23  |
| -2739                  | 7,561328E+22                              | 7,561379E+22 | 6,761341E+22 | 6,761261E+22 | 1,512271E+23                           | 1,352260E+23                           | 2,864531E+23  |
| -2738                  | 7,561250E+22                              | 7,561440E+22 | 6,761399E+22 | 6,761456E+22 | 1,512269E+23                           | 1,352285E+23                           | 2,864554E+23  |
| -2737                  | 7,561568E+22                              | 7,561476E+22 | 6,761393E+22 | 6,761561E+22 | 1,512304E+23                           | 1,352295E+23                           | 2,864600E+23  |
| -2736                  | 7,561362E+22                              | 7,561350E+22 | 6,761494E+22 | 6,761312E+22 | 1,512271E+23                           | 1,352281E+23                           | 2,864552E+23  |
| -2735                  | 7,561513E+22                              | 7,561503E+22 | 6,761579E+22 | 6,761576E+22 | 1,512302E+23                           | 1,352316E+23                           | 2,864617E+23  |
| -2734                  | 7,561661E+22                              | 7,561517E+22 | 6,761518E+22 | 6,761545E+22 | 1,512318E+23                           | 1,352306E+23                           | 2,864624E+23  |
| -2733                  | 7,561327E+22                              | 7,561507E+22 | 6,761575E+22 | 6,761494E+22 | 1,512283E+23                           | 1,352307E+23                           | 2,864590E+23  |
| -2732                  | 7,561523E+22                              | 7,561621E+22 | 6,761629E+22 | 6,761743E+22 | 1,512314E+23                           | 1,352337E+23                           | 2,864652E+23  |
| -2731                  | 7,561492E+22                              | 7,561504E+22 | 6,761575E+22 | 6,761476E+22 | 1,512300E+23                           | 1,352305E+23                           | 2,864605E+23  |
| -2730                  | 7,561339E+22                              | 7,561462E+22 | 6,761609E+22 | 6,761515E+22 | 1,512280E+23                           | 1,352312E+23                           | 2,864593E+23  |
| -2729                  | 7,561645E+22                              | 7,561482E+22 | 6,761537E+22 | 6,761650E+22 | 1,512313E+23                           | 1,352319E+23                           | 2,864631E+23  |
| -2728                  | 7,561429E+22                              | 7,561362E+22 | 6,761492E+22 | 6,761331E+22 | 1,512279E+23                           | 1,352282E+23                           | 2,864561E+23  |
| -2727                  | 7,561375E+22                              | 7,561505E+22 | 6,761459E+22 | 6,761513E+22 | 1,512288E+23                           | 1,352297E+23                           | 2,864585E+23  |
| -2726                  | 7,561586E+22                              | 7,561505E+22 | 6,761320E+22 | 6,761462E+22 | 1,512309E+23                           | 1,352278E+23                           | 2,864587E+23  |
| -2725                  | 7,561272E+22                              | 7,561396E+22 | 6,761362E+22 | 6,761225E+22 | 1,512267E+23                           | 1,352259E+23                           | 2,864525E+23  |
| -2724                  | 7,561413E+22                              | 7,561469E+22 | 6,761448E+22 | 6,761440E+22 | 1,512288E+23                           | 1,352289E+23                           | 2,864577E+23  |
| -2723                  | 7,561496E+22                              | 7,561400E+22 | 6,761369E+22 | 6,761259E+22 | 1,512290E+23                           | 1,352263E+23                           | 2,864552E+23  |
| -2722                  | 7,561221E+22                              | 7,561388E+22 | 6,761407E+22 | 6,761325E+22 | 1,512261E+23                           | 1,352273E+23                           | 2,864534E+23  |
| -2721                  | 7,561468E+22                              | 7,561465E+22 | 6,761397E+22 | 6,761605E+22 | 1,512293E+23                           | 1,352300E+23                           | 2,864593E+23  |
| -2720                  | 7,561381E+22                              | 7,561355E+22 | 6,761415E+22 | 6,761332E+22 | 1,512274E+23                           | 1,352275E+23                           | 2,864548E+23  |
| -2719                  | 7,561302E+22                              | 7,561458E+22 | 6,761507E+22 | 6,761498E+22 | 1,512276E+23                           | 1,352301E+23                           | 2,864576E+23  |
| -2718                  | 7,561675E+22                              | 7,561481E+22 | 6,761472E+22 | 6,761589E+22 | 1,512316E+23                           | 1,352306E+23                           | 2,864622E+23  |
| -2717                  | 7,561445E+22                              | 7,561410E+22 | 6,761559E+22 | 6,761390E+22 | 1,512286E+23                           | 1,352295E+23                           | 2,864580E+23  |
| -2716                  | 7,561463E+22                              | 7,561574E+22 | 6,761682E+22 | 6,761696E+22 | 1,512304E+23                           | 1,352338E+23                           | 2,864641E+23  |
| -2715                  | 7,561621E+22                              | 7,561595E+22 | 6,761599E+22 | 6,761630E+22 | 1,512322E+23                           | 1,352323E+23                           | 2,864645E+23  |
| -2714                  | 7,561310E+22                              | 7,561542E+22 | 6,761680E+22 | 6,761583E+22 | 1,512285E+23                           | 1,352326E+23                           | 2,864611E+23  |
| -2713                  | 7,561517E+22                              | 7,561564E+22 | 6,761710E+22 | 6,761821E+22 | 1,512308E+23                           | 1,352353E+23                           | 2,864661E+23  |
| -2712                  | 7,561573E+22                              | 7,561421E+22 | 6,761672E+22 | 6,761519E+22 | 1,512299E+23                           | 1,352319E+23                           | 2,864618E+23  |
| -2711                  | 7,561367E+22                              | 7,561470E+22 | 6,761671E+22 | 6,761588E+22 | 1,512284E+23                           | 1,352326E+23                           | 2,864610E+23  |
| -2710                  | 7,561669E+22                              | 7,561510E+22 | 6,761516E+22 | 6,761727E+22 | 1,512318E+23                           | 1,352324E+23                           | 2,864642E+23  |
| -2709                  | 7,561449E+22                              | 7,561431E+22 | 6,761471E+22 | 6,761410E+22 | 1,512288E+23                           | 1,352288E+23                           | 2,864576E+23  |
| -2708                  | 7,561328E+22                              | 7,561531E+22 | 6,761529E+22 | 6,761553E+22 | 1,512286E+23                           | 1,352308E+23                           | 2,864594E+23  |
| -2707                  | 7,561599E+22                              | 7,561524E+22 | 6,761413E+22 | 6,761445E+22 | 1,512312E+23                           | 1,352286E+23                           | 2,864598E+23  |



| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -2706             | 7,561324E+22                              | 7,561406E+22 | 6,761483E+22 | 6,761265E+22 | 1,512273E+23                           | 1,352275E+23                           | 2,864548E+23  |
| -2705             | 7,561400E+22                              | 7,561444E+22 | 6,761523E+22 | 6,761544E+22 | 1,512284E+23                           | 1,352307E+23                           | 2,864591E+23  |
| -2704             | 7,561513E+22                              | 7,561398E+22 | 6,761452E+22 | 6,761375E+22 | 1,512291E+23                           | 1,352283E+23                           | 2,864574E+23  |
| -2703             | 7,561206E+22                              | 7,561438E+22 | 6,761485E+22 | 6,761442E+22 | 1,512264E+23                           | 1,352293E+23                           | 2,864557E+23  |
| -2702             | 7,561505E+22                              | 7,561466E+22 | 6,761442E+22 | 6,761679E+22 | 1,512297E+23                           | 1,352312E+23                           | 2,864609E+23  |
| -2701             | 7,561485E+22                              | 7,561376E+22 | 6,761479E+22 | 6,761394E+22 | 1,512286E+23                           | 1,352287E+23                           | 2,864573E+23  |
| -2700             | 7,561338E+22                              | 7,561452E+22 | 6,761630E+22 | 6,761555E+22 | 1,512279E+23                           | 1,352318E+23                           | 2,864598E+23  |
| -2699             | 7,561694E+22                              | 7,561542E+22 | 6,761565E+22 | 6,761650E+22 | 1,512324E+23                           | 1,352322E+23                           | 2,864645E+23  |
| -2698             | 7,561442E+22                              | 7,561504E+22 | 6,761645E+22 | 6,761515E+22 | 1,512295E+23                           | 1,352316E+23                           | 2,864611E+23  |
| -2697             | 7,561389E+22                              | 7,561588E+22 | 6,761744E+22 | 6,761829E+22 | 1,512298E+23                           | 1,352357E+23                           | 2,864655E+23  |
| -2696             | 7,561635E+22                              | 7,561562E+22 | 6,761705E+22 | 6,761704E+22 | 1,512320E+23                           | 1,352341E+23                           | 2,864661E+23  |
| -2695             | 7,561341E+22                              | 7,561518E+22 | 6,761789E+22 | 6,761632E+22 | 1,512286E+23                           | 1,352342E+23                           | 2,864628E+23  |
| -2694             | 7,561602E+22                              | 7,561514E+22 | 6,761751E+22 | 6,761867E+22 | 1,512312E+23                           | 1,352362E+23                           | 2,864673E+23  |
| -2693             | 7,561659E+22                              | 7,561454E+22 | 6,761674E+22 | 6,761597E+22 | 1,512311E+23                           | 1,352327E+23                           | 2,864638E+23  |
| -2692             | 7,561339E+22                              | 7,561530E+22 | 6,761710E+22 | 6,761669E+22 | 1,512287E+23                           | 1,352338E+23                           | 2,864625E+23  |
| -2691             | 7,561649E+22                              | 7,561603E+22 | 6,761555E+22 | 6,761756E+22 | 1,512325E+23                           | 1,352331E+23                           | 2,864656E+23  |
| -2690             | 7,561457E+22                              | 7,561499E+22 | 6,761562E+22 | 6,761438E+22 | 1,512296E+23                           | 1,352300E+23                           | 2,864596E+23  |
| -2689             | 7,561312E+22                              | 7,561498E+22 | 6,761637E+22 | 6,761590E+22 | 1,512281E+23                           | 1,352323E+23                           | 2,864604E+23  |
| -2688             | 7,561649E+22                              | 7,561462E+22 | 6,761548E+22 | 6,761489E+22 | 1,512311E+23                           | 1,352304E+23                           | 2,864615E+23  |
| -2687             | 7,561310E+22                              | 7,561412E+22 | 6,761584E+22 | 6,761376E+22 | 1,512272E+23                           | 1,352296E+23                           | 2,864568E+23  |
| -2686             | 7,561399E+22                              | 7,561441E+22 | 6,761535E+22 | 6,761680E+22 | 1,512284E+23                           | 1,352322E+23                           | 2,864605E+23  |
| -2685             | 7,561540E+22                              | 7,561417E+22 | 6,761447E+22 | 6,761492E+22 | 1,512296E+23                           | 1,352294E+23                           | 2,864590E+23  |
| -2684             | 7,561204E+22                              | 7,561439E+22 | 6,761554E+22 | 6,761508E+22 | 1,512264E+23                           | 1,352306E+23                           | 2,864571E+23  |
| -2683             | 7,561578E+22                              | 7,561488E+22 | 6,761515E+22 | 6,761678E+22 | 1,512307E+23                           | 1,352319E+23                           | 2,864626E+23  |
| -2682             | 7,561568E+22                              | 7,561432E+22 | 6,761580E+22 | 6,761440E+22 | 1,512300E+23                           | 1,352302E+23                           | 2,864602E+23  |
| -2681             | 7,561328E+22                              | 7,561494E+22 | 6,761723E+22 | 6,761656E+22 | 1,512282E+23                           | 1,352338E+23                           | 2,864620E+23  |
| -2680             | 7,561691E+22                              | 7,561584E+22 | 6,761681E+22 | 6,761756E+22 | 1,512328E+23                           | 1,352344E+23                           | 2,864671E+23  |
| -2679             | 7,561395E+22                              | 7,561568E+22 | 6,761773E+22 | 6,761632E+22 | 1,512296E+23                           | 1,352340E+23                           | 2,864637E+23  |
| -2678             | 7,561397E+22                              | 7,561564E+22 | 6,761824E+22 | 6,761915E+22 | 1,512296E+23                           | 1,352374E+23                           | 2,864670E+23  |
| -2677             | 7,561712E+22                              | 7,561531E+22 | 6,761773E+22 | 6,761779E+22 | 1,512324E+23                           | 1,352355E+23                           | 2,864679E+23  |
| -2676             | 7,561375E+22                              | 7,561481E+22 | 6,761878E+22 | 6,761709E+22 | 1,512286E+23                           | 1,352359E+23                           | 2,864644E+23  |
| -2675             | 7,561633E+22                              | 7,561549E+22 | 6,761777E+22 | 6,761924E+22 | 1,512318E+23                           | 1,352370E+23                           | 2,864688E+23  |
| -2674             | 7,561677E+22                              | 7,561546E+22 | 6,761694E+22 | 6,761683E+22 | 1,512322E+23                           | 1,352338E+23                           | 2,864660E+23  |
| -2673             | 7,561297E+22                              | 7,561554E+22 | 6,761746E+22 | 6,761727E+22 | 1,512285E+23                           | 1,352347E+23                           | 2,864632E+23  |
| -2672             | 7,561674E+22                              | 7,561591E+22 | 6,761663E+22 | 6,761756E+22 | 1,512327E+23                           | 1,352342E+23                           | 2,864668E+23  |
| -2671             | 7,561478E+22                              | 7,561507E+22 | 6,761695E+22 | 6,761455E+22 | 1,512299E+23                           | 1,352315E+23                           | 2,864614E+23  |
| -2670             | 7,561341E+22                              | 7,561457E+22 | 6,761704E+22 | 6,761649E+22 | 1,512280E+23                           | 1,352335E+23                           | 2,864615E+23  |
| -2669             | 7,561673E+22                              | 7,561485E+22 | 6,761577E+22 | 6,761609E+22 | 1,512316E+23                           | 1,352319E+23                           | 2,864634E+23  |
| -2668             | 7,561263E+22                              | 7,561432E+22 | 6,761632E+22 | 6,761504E+22 | 1,512269E+23                           | 1,352314E+23                           | 2,864583E+23  |
| -2667             | 7,561387E+22                              | 7,561481E+22 | 6,761565E+22 | 6,761749E+22 | 1,512287E+23                           | 1,352331E+23                           | 2,864618E+23  |
| -2666             | 7,561594E+22                              | 7,561468E+22 | 6,761517E+22 | 6,761550E+22 | 1,512306E+23                           | 1,352307E+23                           | 2,864613E+23  |
| -2665             | 7,561239E+22                              | 7,561418E+22 | 6,761651E+22 | 6,761549E+22 | 1,512266E+23                           | 1,352320E+23                           | 2,864586E+23  |
| -2664             | 7,561653E+22                              | 7,561484E+22 | 6,761649E+22 | 6,761720E+22 | 1,512314E+23                           | 1,352337E+23                           | 2,864651E+23  |
| -2663             | 7,561562E+22                              | 7,561508E+22 | 6,761701E+22 | 6,761543E+22 | 1,512307E+23                           | 1,352324E+23                           | 2,864631E+23  |
| -2662             | 7,561303E+22                              | 7,561525E+22 | 6,761779E+22 | 6,761791E+22 | 1,512283E+23                           | 1,352357E+23                           | 2,864640E+23  |
| -2661             | 7,561691E+22                              | 7,561611E+22 | 6,761740E+22 | 6,761877E+22 | 1,512330E+23                           | 1,352362E+23                           | 2,864692E+23  |
| -2660             | 7,561383E+22                              | 7,561539E+22 | 6,761889E+22 | 6,761718E+22 | 1,512292E+23                           | 1,352361E+23                           | 2,864653E+23  |
| -2659             | 7,561462E+22                              | 7,561544E+22 | 6,761904E+22 | 6,761949E+22 | 1,512301E+23                           | 1,352385E+23                           | 2,864686E+23  |
| -2658             | 7,561800E+22                              | 7,561562E+22 | 6,761837E+22 | 6,761848E+22 | 1,512336E+23                           | 1,352368E+23                           | 2,864705E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -2657             | 7,561382E+22                              | 7,561511E+22 | 6,761918E+22 | 6,761799E+22 | 1,512289E+23                           | 1,352372E+23                           | 2,864661E+23  |
| -2656             | 7,561657E+22                              | 7,561602E+22 | 6,761839E+22 | 6,761983E+22 | 1,512326E+23                           | 1,352382E+23                           | 2,864708E+23  |
| -2655             | 7,561644E+22                              | 7,561633E+22 | 6,761791E+22 | 6,761730E+22 | 1,512328E+23                           | 1,352352E+23                           | 2,864680E+23  |
| -2654             | 7,561308E+22                              | 7,561549E+22 | 6,761823E+22 | 6,761764E+22 | 1,512286E+23                           | 1,352359E+23                           | 2,864644E+23  |
| -2653             | 7,561714E+22                              | 7,561562E+22 | 6,761744E+22 | 6,761792E+22 | 1,512328E+23                           | 1,352354E+23                           | 2,864681E+23  |
| -2652             | 7,561453E+22                              | 7,561470E+22 | 6,761799E+22 | 6,761545E+22 | 1,512292E+23                           | 1,352334E+23                           | 2,864627E+23  |
| -2651             | 7,561322E+22                              | 7,561470E+22 | 6,761725E+22 | 6,761747E+22 | 1,512279E+23                           | 1,352347E+23                           | 2,864626E+23  |
| -2650             | 7,561660E+22                              | 7,561534E+22 | 6,761582E+22 | 6,761734E+22 | 1,512319E+23                           | 1,352332E+23                           | 2,864651E+23  |
| -2649             | 7,561242E+22                              | 7,561420E+22 | 6,761657E+22 | 6,761588E+22 | 1,512266E+23                           | 1,352325E+23                           | 2,864591E+23  |
| -2648             | 7,561467E+22                              | 7,561455E+22 | 6,761647E+22 | 6,761754E+22 | 1,512292E+23                           | 1,352340E+23                           | 2,864632E+23  |
| -2647             | 7,561662E+22                              | 7,561502E+22 | 6,761639E+22 | 6,761561E+22 | 1,512316E+23                           | 1,352320E+23                           | 2,864636E+23  |
| -2646             | 7,561306E+22                              | 7,561432E+22 | 6,761732E+22 | 6,761608E+22 | 1,512274E+23                           | 1,352334E+23                           | 2,864608E+23  |
| -2645             | 7,561671E+22                              | 7,561557E+22 | 6,761727E+22 | 6,761823E+22 | 1,512323E+23                           | 1,352355E+23                           | 2,864678E+23  |
| -2644             | 7,561501E+22                              | 7,561570E+22 | 6,761823E+22 | 6,761685E+22 | 1,512307E+23                           | 1,352351E+23                           | 2,864658E+23  |
| -2643             | 7,561273E+22                              | 7,561563E+22 | 6,761874E+22 | 6,761887E+22 | 1,512284E+23                           | 1,352376E+23                           | 2,864660E+23  |
| -2642             | 7,561725E+22                              | 7,561634E+22 | 6,761846E+22 | 6,761975E+22 | 1,512336E+23                           | 1,352382E+23                           | 2,864718E+23  |
| -2641             | 7,561426E+22                              | 7,561477E+22 | 6,761989E+22 | 6,761803E+22 | 1,512290E+23                           | 1,352379E+23                           | 2,864669E+23  |
| -2640             | 7,561547E+22                              | 7,561519E+22 | 6,761991E+22 | 6,762019E+22 | 1,512307E+23                           | 1,352401E+23                           | 2,864708E+23  |
| -2639             | 7,561816E+22                              | 7,561644E+22 | 6,761901E+22 | 6,761943E+22 | 1,512346E+23                           | 1,352384E+23                           | 2,864730E+23  |
| -2638             | 7,561382E+22                              | 7,561549E+22 | 6,761921E+22 | 6,761883E+22 | 1,512293E+23                           | 1,352380E+23                           | 2,864674E+23  |
| -2637             | 7,561665E+22                              | 7,561643E+22 | 6,761878E+22 | 6,762022E+22 | 1,512331E+23                           | 1,352390E+23                           | 2,864721E+23  |
| -2636             | 7,561631E+22                              | 7,561624E+22 | 6,761897E+22 | 6,761755E+22 | 1,512325E+23                           | 1,352365E+23                           | 2,864691E+23  |
| -2635             | 7,561325E+22                              | 7,561529E+22 | 6,761900E+22 | 6,761776E+22 | 1,512285E+23                           | 1,352368E+23                           | 2,864653E+23  |
| -2634             | 7,561733E+22                              | 7,561593E+22 | 6,761801E+22 | 6,761877E+22 | 1,512333E+23                           | 1,352368E+23                           | 2,864700E+23  |
| -2633             | 7,561415E+22                              | 7,561460E+22 | 6,761836E+22 | 6,761663E+22 | 1,512288E+23                           | 1,352350E+23                           | 2,864637E+23  |
| -2632             | 7,561334E+22                              | 7,561478E+22 | 6,761769E+22 | 6,761829E+22 | 1,512281E+23                           | 1,352360E+23                           | 2,864641E+23  |
| -2631             | 7,561665E+22                              | 7,561582E+22 | 6,761660E+22 | 6,761785E+22 | 1,512325E+23                           | 1,352345E+23                           | 2,864669E+23  |
| -2630             | 7,561306E+22                              | 7,561402E+22 | 6,761714E+22 | 6,761618E+22 | 1,512271E+23                           | 1,352333E+23                           | 2,864604E+23  |
| -2629             | 7,561557E+22                              | 7,561459E+22 | 6,761734E+22 | 6,761777E+22 | 1,512302E+23                           | 1,352351E+23                           | 2,864653E+23  |
| -2628             | 7,561665E+22                              | 7,561532E+22 | 6,761764E+22 | 6,761651E+22 | 1,512320E+23                           | 1,352342E+23                           | 2,864661E+23  |
| -2627             | 7,561281E+22                              | 7,561500E+22 | 6,761803E+22 | 6,761723E+22 | 1,512278E+23                           | 1,352353E+23                           | 2,864631E+23  |
| -2626             | 7,561634E+22                              | 7,561639E+22 | 6,761796E+22 | 6,761967E+22 | 1,512327E+23                           | 1,352376E+23                           | 2,864704E+23  |
| -2625             | 7,561462E+22                              | 7,561549E+22 | 6,761922E+22 | 6,761811E+22 | 1,512301E+23                           | 1,352373E+23                           | 2,864674E+23  |
| -2624             | 7,561347E+22                              | 7,561515E+22 | 6,761988E+22 | 6,761947E+22 | 1,512286E+23                           | 1,352394E+23                           | 2,864680E+23  |
| -2623             | 7,561788E+22                              | 7,561637E+22 | 6,761961E+22 | 6,762033E+22 | 1,512343E+23                           | 1,352399E+23                           | 2,864742E+23  |
| -2622             | 7,561508E+22                              | 7,561480E+22 | 6,762023E+22 | 6,761894E+22 | 1,512299E+23                           | 1,352392E+23                           | 2,864691E+23  |
| -2621             | 7,561596E+22                              | 7,561581E+22 | 6,762010E+22 | 6,762096E+22 | 1,512318E+23                           | 1,352411E+23                           | 2,864728E+23  |
| -2620             | 7,561773E+22                              | 7,561718E+22 | 6,761977E+22 | 6,762027E+22 | 1,512349E+23                           | 1,352400E+23                           | 2,864749E+23  |
| -2619             | 7,561367E+22                              | 7,561605E+22 | 6,761991E+22 | 6,761913E+22 | 1,512297E+23                           | 1,352390E+23                           | 2,864688E+23  |
| -2618             | 7,561672E+22                              | 7,561674E+22 | 6,761974E+22 | 6,762054E+22 | 1,512335E+23                           | 1,352403E+23                           | 2,864737E+23  |
| -2617             | 7,561626E+22                              | 7,561561E+22 | 6,762005E+22 | 6,761822E+22 | 1,512319E+23                           | 1,352383E+23                           | 2,864701E+23  |
| -2616             | 7,561355E+22                              | 7,561483E+22 | 6,761975E+22 | 6,761853E+22 | 1,512284E+23                           | 1,352383E+23                           | 2,864667E+23  |
| -2615             | 7,561703E+22                              | 7,561629E+22 | 6,761848E+22 | 6,761982E+22 | 1,512333E+23                           | 1,352383E+23                           | 2,864716E+23  |
| -2614             | 7,561427E+22                              | 7,561447E+22 | 6,761820E+22 | 6,761763E+22 | 1,512287E+23                           | 1,352358E+23                           | 2,864646E+23  |
| -2613             | 7,561390E+22                              | 7,561479E+22 | 6,761789E+22 | 6,761857E+22 | 1,512287E+23                           | 1,352365E+23                           | 2,864651E+23  |
| -2612             | 7,561705E+22                              | 7,561587E+22 | 6,761758E+22 | 6,761806E+22 | 1,512329E+23                           | 1,352356E+23                           | 2,864686E+23  |
| -2611             | 7,561370E+22                              | 7,561434E+22 | 6,761792E+22 | 6,761632E+22 | 1,512280E+23                           | 1,352342E+23                           | 2,864623E+23  |
| -2610             | 7,561578E+22                              | 7,561558E+22 | 6,761818E+22 | 6,761864E+22 | 1,512314E+23                           | 1,352368E+23                           | 2,864682E+23  |
| -2609             | 7,561614E+22                              | 7,561578E+22 | 6,761861E+22 | 6,761795E+22 | 1,512319E+23                           | 1,352366E+23                           | 2,864685E+23  |



| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -2608                  | 7,561263E+22                              | 7,561529E+22 | 6,761917E+22 | 6,761846E+22 | 1,512279E+23                           | 1,352376E+23                           | 2,864655E+23  |
| -2607                  | 7,561617E+22                              | 7,561678E+22 | 6,761935E+22 | 6,762069E+22 | 1,512329E+23                           | 1,352400E+23                           | 2,864730E+23  |
| -2606                  | 7,561528E+22                              | 7,561483E+22 | 6,762001E+22 | 6,761898E+22 | 1,512301E+23                           | 1,352390E+23                           | 2,864691E+23  |
| -2605                  | 7,561451E+22                              | 7,561478E+22 | 6,762061E+22 | 6,762012E+22 | 1,512293E+23                           | 1,352407E+23                           | 2,864700E+23  |
| -2604                  | 7,561819E+22                              | 7,561657E+22 | 6,762038E+22 | 6,762136E+22 | 1,512348E+23                           | 1,352417E+23                           | 2,864765E+23  |
| -2603                  | 7,561512E+22                              | 7,561552E+22 | 6,762036E+22 | 6,761978E+22 | 1,512306E+23                           | 1,352401E+23                           | 2,864708E+23  |
| -2602                  | 7,561587E+22                              | 7,561686E+22 | 6,762044E+22 | 6,762170E+22 | 1,512327E+23                           | 1,352421E+23                           | 2,864749E+23  |
| -2601                  | 7,561748E+22                              | 7,561710E+22 | 6,762069E+22 | 6,762076E+22 | 1,512346E+23                           | 1,352414E+23                           | 2,864760E+23  |
| -2600                  | 7,561416E+22                              | 7,561571E+22 | 6,762109E+22 | 6,761924E+22 | 1,512299E+23                           | 1,352403E+23                           | 2,864702E+23  |
| -2599                  | 7,561684E+22                              | 7,561680E+22 | 6,762095E+22 | 6,762091E+22 | 1,512336E+23                           | 1,352419E+23                           | 2,864755E+23  |
| -2598                  | 7,561647E+22                              | 7,561535E+22 | 6,762034E+22 | 6,761925E+22 | 1,512318E+23                           | 1,352396E+23                           | 2,864714E+23  |
| -2597                  | 7,561376E+22                              | 7,561500E+22 | 6,761987E+22 | 6,761947E+22 | 1,512288E+23                           | 1,352393E+23                           | 2,864681E+23  |
| -2596                  | 7,561674E+22                              | 7,561657E+22 | 6,761901E+22 | 6,762075E+22 | 1,512333E+23                           | 1,352398E+23                           | 2,864731E+23  |
| -2595                  | 7,561453E+22                              | 7,561478E+22 | 6,761854E+22 | 6,761794E+22 | 1,512293E+23                           | 1,352365E+23                           | 2,864658E+23  |
| -2594                  | 7,561451E+22                              | 7,561526E+22 | 6,761857E+22 | 6,761876E+22 | 1,512298E+23                           | 1,352373E+23                           | 2,864671E+23  |
| -2593                  | 7,561726E+22                              | 7,561574E+22 | 6,761870E+22 | 6,761870E+22 | 1,512330E+23                           | 1,352374E+23                           | 2,864704E+23  |
| -2592                  | 7,561395E+22                              | 7,561466E+22 | 6,761893E+22 | 6,761725E+22 | 1,512286E+23                           | 1,352362E+23                           | 2,864648E+23  |
| -2591                  | 7,561510E+22                              | 7,561636E+22 | 6,761920E+22 | 6,761982E+22 | 1,512315E+23                           | 1,352390E+23                           | 2,864705E+23  |
| -2590                  | 7,561596E+22                              | 7,561566E+22 | 6,761913E+22 | 6,761934E+22 | 1,512316E+23                           | 1,352385E+23                           | 2,864701E+23  |
| -2589                  | 7,561318E+22                              | 7,561481E+22 | 6,761991E+22 | 6,761913E+22 | 1,512280E+23                           | 1,352390E+23                           | 2,864670E+23  |
| -2588                  | 7,561662E+22                              | 7,561633E+22 | 6,762049E+22 | 6,762136E+22 | 1,512329E+23                           | 1,352419E+23                           | 2,864748E+23  |
| -2587                  | 7,561618E+22                              | 7,561490E+22 | 6,762053E+22 | 6,761955E+22 | 1,512311E+23                           | 1,352401E+23                           | 2,864712E+23  |
| -2586                  | 7,561509E+22                              | 7,561574E+22 | 6,762094E+22 | 6,762099E+22 | 1,512308E+23                           | 1,352419E+23                           | 2,864728E+23  |
| -2585                  | 7,561801E+22                              | 7,561718E+22 | 6,762108E+22 | 6,762245E+22 | 1,512352E+23                           | 1,352435E+23                           | 2,864787E+23  |
| -2584                  | 7,561519E+22                              | 7,561617E+22 | 6,762132E+22 | 6,762038E+22 | 1,512314E+23                           | 1,352417E+23                           | 2,864731E+23  |
| -2583                  | 7,561560E+22                              | 7,561747E+22 | 6,762189E+22 | 6,762199E+22 | 1,512331E+23                           | 1,352439E+23                           | 2,864770E+23  |
| -2582                  | 7,561785E+22                              | 7,561657E+22 | 6,762166E+22 | 6,762137E+22 | 1,512344E+23                           | 1,352430E+23                           | 2,864774E+23  |
| -2581                  | 7,561470E+22                              | 7,561515E+22 | 6,762196E+22 | 6,761989E+22 | 1,512299E+23                           | 1,352419E+23                           | 2,864717E+23  |
| -2580                  | 7,561654E+22                              | 7,561677E+22 | 6,762163E+22 | 6,762216E+22 | 1,512333E+23                           | 1,352438E+23                           | 2,864771E+23  |
| -2579                  | 7,561631E+22                              | 7,561564E+22 | 6,762015E+22 | 6,762029E+22 | 1,512319E+23                           | 1,352404E+23                           | 2,864724E+23  |
| -2578                  | 7,561387E+22                              | 7,561564E+22 | 6,761976E+22 | 6,762018E+22 | 1,512295E+23                           | 1,352399E+23                           | 2,864695E+23  |
| -2577                  | 7,561693E+22                              | 7,561635E+22 | 6,761961E+22 | 6,762110E+22 | 1,512333E+23                           | 1,352407E+23                           | 2,864740E+23  |
| -2576                  | 7,561532E+22                              | 7,561478E+22 | 6,761943E+22 | 6,761786E+22 | 1,512301E+23                           | 1,352373E+23                           | 2,864674E+23  |
| -2575                  | 7,561478E+22                              | 7,561589E+22 | 6,761983E+22 | 6,761897E+22 | 1,512307E+23                           | 1,352388E+23                           | 2,864695E+23  |
| -2574                  | 7,561734E+22                              | 7,561588E+22 | 6,761929E+22 | 6,761969E+22 | 1,512332E+23                           | 1,352390E+23                           | 2,864722E+23  |
| -2573                  | 7,561388E+22                              | 7,561490E+22 | 6,761973E+22 | 6,761833E+22 | 1,512288E+23                           | 1,352381E+23                           | 2,864668E+23  |
| -2572                  | 7,561458E+22                              | 7,561654E+22 | 6,762038E+22 | 6,762104E+22 | 1,512311E+23                           | 1,352414E+23                           | 2,864725E+23  |
| -2571                  | 7,561613E+22                              | 7,561553E+22 | 6,761988E+22 | 6,762012E+22 | 1,512317E+23                           | 1,352400E+23                           | 2,864716E+23  |
| -2570                  | 7,561400E+22                              | 7,561491E+22 | 6,762062E+22 | 6,761984E+22 | 1,512289E+23                           | 1,352405E+23                           | 2,864694E+23  |
| -2569                  | 7,561715E+22                              | 7,561596E+22 | 6,762140E+22 | 6,762238E+22 | 1,512331E+23                           | 1,352438E+23                           | 2,864769E+23  |
| -2568                  | 7,561667E+22                              | 7,561545E+22 | 6,762112E+22 | 6,762050E+22 | 1,512321E+23                           | 1,352416E+23                           | 2,864737E+23  |
| -2567                  | 7,561487E+22                              | 7,561690E+22 | 6,762178E+22 | 6,762179E+22 | 1,512318E+23                           | 1,352436E+23                           | 2,864753E+23  |
| -2566                  | 7,561800E+22                              | 7,561737E+22 | 6,762171E+22 | 6,762328E+22 | 1,512354E+23                           | 1,352450E+23                           | 2,864804E+23  |
| -2565                  | 7,561565E+22                              | 7,561602E+22 | 6,762245E+22 | 6,762069E+22 | 1,512317E+23                           | 1,352431E+23                           | 2,864748E+23  |
| -2564                  | 7,561562E+22                              | 7,561726E+22 | 6,762330E+22 | 6,762256E+22 | 1,512329E+23                           | 1,352459E+23                           | 2,864787E+23  |
| -2563                  | 7,561809E+22                              | 7,561655E+22 | 6,762218E+22 | 6,762217E+22 | 1,512346E+23                           | 1,352443E+23                           | 2,864790E+23  |
| -2562                  | 7,561488E+22                              | 7,561573E+22 | 6,762204E+22 | 6,762099E+22 | 1,512306E+23                           | 1,352430E+23                           | 2,864737E+23  |
| -2561                  | 7,561623E+22                              | 7,561679E+22 | 6,762200E+22 | 6,762336E+22 | 1,512330E+23                           | 1,352454E+23                           | 2,864784E+23  |
| -2560                  | 7,561657E+22                              | 7,561598E+22 | 6,762061E+22 | 6,762077E+22 | 1,512326E+23                           | 1,352414E+23                           | 2,864739E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -2559                  | 7,561405E+22                              | 7,561608E+22 | 6,762073E+22 | 6,762004E+22 | 1,512301E+23                           | 1,352408E+23                           | 2,864709E+23  |
| -2558                  | 7,561757E+22                              | 7,561596E+22 | 6,762035E+22 | 6,762132E+22 | 1,512335E+23                           | 1,352417E+23                           | 2,864752E+23  |
| -2557                  | 7,561597E+22                              | 7,561458E+22 | 6,762035E+22 | 6,761823E+22 | 1,512306E+23                           | 1,352386E+23                           | 2,864691E+23  |
| -2556                  | 7,561416E+22                              | 7,561623E+22 | 6,762080E+22 | 6,762011E+22 | 1,512304E+23                           | 1,352409E+23                           | 2,864713E+23  |
| -2555                  | 7,561685E+22                              | 7,561628E+22 | 6,761961E+22 | 6,762090E+22 | 1,512331E+23                           | 1,352405E+23                           | 2,864736E+23  |
| -2554                  | 7,561389E+22                              | 7,561522E+22 | 6,762015E+22 | 6,761935E+22 | 1,512291E+23                           | 1,352395E+23                           | 2,864686E+23  |
| -2553                  | 7,561479E+22                              | 7,561590E+22 | 6,762140E+22 | 6,762191E+22 | 1,512307E+23                           | 1,352433E+23                           | 2,864740E+23  |
| -2552                  | 7,561707E+22                              | 7,561539E+22 | 6,762077E+22 | 6,762060E+22 | 1,512325E+23                           | 1,352414E+23                           | 2,864738E+23  |
| -2551                  | 7,561454E+22                              | 7,561563E+22 | 6,762163E+22 | 6,762040E+22 | 1,512302E+23                           | 1,352420E+23                           | 2,864722E+23  |
| -2550                  | 7,561754E+22                              | 7,561646E+22 | 6,762183E+22 | 6,762353E+22 | 1,512340E+23                           | 1,352454E+23                           | 2,864794E+23  |
| -2549                  | 7,561692E+22                              | 7,561610E+22 | 6,762199E+22 | 6,762135E+22 | 1,512330E+23                           | 1,352433E+23                           | 2,864764E+23  |
| -2548                  | 7,561445E+22                              | 7,561753E+22 | 6,762323E+22 | 6,762267E+22 | 1,512320E+23                           | 1,352459E+23                           | 2,864779E+23  |
| -2547                  | 7,561807E+22                              | 7,561747E+22 | 6,762275E+22 | 6,762380E+22 | 1,512355E+23                           | 1,352466E+23                           | 2,864821E+23  |
| -2546                  | 7,561614E+22                              | 7,561609E+22 | 6,762341E+22 | 6,762145E+22 | 1,512322E+23                           | 1,352449E+23                           | 2,864771E+23  |
| -2545                  | 7,561562E+22                              | 7,561671E+22 | 6,762426E+22 | 6,762381E+22 | 1,512323E+23                           | 1,352481E+23                           | 2,864804E+23  |
| -2544                  | 7,561802E+22                              | 7,561675E+22 | 6,762244E+22 | 6,762326E+22 | 1,512348E+23                           | 1,352457E+23                           | 2,864805E+23  |
| -2543                  | 7,561470E+22                              | 7,561638E+22 | 6,762237E+22 | 6,762171E+22 | 1,512311E+23                           | 1,352441E+23                           | 2,864752E+23  |
| -2542                  | 7,561659E+22                              | 7,561642E+22 | 6,762202E+22 | 6,762379E+22 | 1,512330E+23                           | 1,352458E+23                           | 2,864788E+23  |
| -2541                  | 7,561738E+22                              | 7,561563E+22 | 6,762130E+22 | 6,762051E+22 | 1,512330E+23                           | 1,352418E+23                           | 2,864748E+23  |
| -2540                  | 7,561436E+22                              | 7,561620E+22 | 6,762188E+22 | 6,762013E+22 | 1,512306E+23                           | 1,352420E+23                           | 2,864726E+23  |
| -2539                  | 7,561765E+22                              | 7,561632E+22 | 6,762089E+22 | 6,762176E+22 | 1,512340E+23                           | 1,352426E+23                           | 2,864766E+23  |
| -2538                  | 7,561583E+22                              | 7,561552E+22 | 6,762077E+22 | 6,761933E+22 | 1,512314E+23                           | 1,352401E+23                           | 2,864715E+23  |
| -2537                  | 7,561348E+22                              | 7,561625E+22 | 6,762172E+22 | 6,762155E+22 | 1,512297E+23                           | 1,352433E+23                           | 2,864730E+23  |
| -2536                  | 7,561667E+22                              | 7,561646E+22 | 6,762047E+22 | 6,762182E+22 | 1,512331E+23                           | 1,352423E+23                           | 2,864754E+23  |
| -2535                  | 7,561420E+22                              | 7,561538E+22 | 6,762134E+22 | 6,761986E+22 | 1,512296E+23                           | 1,352412E+23                           | 2,864708E+23  |
| -2534                  | 7,561569E+22                              | 7,561525E+22 | 6,762210E+22 | 6,762275E+22 | 1,512309E+23                           | 1,352449E+23                           | 2,864758E+23  |
| -2533                  | 7,561798E+22                              | 7,561537E+22 | 6,762160E+22 | 6,762140E+22 | 1,512333E+23                           | 1,352430E+23                           | 2,864764E+23  |
| -2532                  | 7,561438E+22                              | 7,561645E+22 | 6,762252E+22 | 6,762157E+22 | 1,512308E+23                           | 1,352441E+23                           | 2,864749E+23  |
| -2531                  | 7,561737E+22                              | 7,561724E+22 | 6,762230E+22 | 6,762447E+22 | 1,512346E+23                           | 1,352468E+23                           | 2,864814E+23  |
| -2530                  | 7,561714E+22                              | 7,561678E+22 | 6,762276E+22 | 6,762208E+22 | 1,512339E+23                           | 1,352448E+23                           | 2,864788E+23  |
| -2529                  | 7,561448E+22                              | 7,561707E+22 | 6,762469E+22 | 6,762344E+22 | 1,512316E+23                           | 1,352481E+23                           | 2,864797E+23  |
| -2528                  | 7,561849E+22                              | 7,561744E+22 | 6,762385E+22 | 6,762441E+22 | 1,512359E+23                           | 1,352483E+23                           | 2,864842E+23  |
| -2527                  | 7,561630E+22                              | 7,561644E+22 | 6,762429E+22 | 6,762219E+22 | 1,512327E+23                           | 1,352465E+23                           | 2,864792E+23  |
| -2526                  | 7,561574E+22                              | 7,561657E+22 | 6,762437E+22 | 6,762503E+22 | 1,512323E+23                           | 1,352494E+23                           | 2,864817E+23  |
| -2525                  | 7,561839E+22                              | 7,561678E+22 | 6,762284E+22 | 6,762388E+22 | 1,512352E+23                           | 1,352467E+23                           | 2,864819E+23  |
| -2524                  | 7,561457E+22                              | 7,561670E+22 | 6,762318E+22 | 6,762205E+22 | 1,512313E+23                           | 1,352452E+23                           | 2,864765E+23  |
| -2523                  | 7,561700E+22                              | 7,561653E+22 | 6,762250E+22 | 6,762377E+22 | 1,512335E+23                           | 1,352463E+23                           | 2,864798E+23  |
| -2522                  | 7,561801E+22                              | 7,561598E+22 | 6,762187E+22 | 6,762080E+22 | 1,512340E+23                           | 1,352427E+23                           | 2,864767E+23  |
| -2521                  | 7,561408E+22                              | 7,561611E+22 | 6,762284E+22 | 6,762120E+22 | 1,512302E+23                           | 1,352440E+23                           | 2,864742E+23  |
| -2520                  | 7,561705E+22                              | 7,561695E+22 | 6,762139E+22 | 6,762283E+22 | 1,512340E+23                           | 1,352442E+23                           | 2,864782E+23  |
| -2519                  | 7,561530E+22                              | 7,561611E+22 | 6,762157E+22 | 6,762029E+22 | 1,512314E+23                           | 1,352419E+23                           | 2,864733E+23  |
| -2518                  | 7,561367E+22                              | 7,561561E+22 | 6,762225E+22 | 6,762251E+22 | 1,512293E+23                           | 1,352448E+23                           | 2,864740E+23  |
| -2517                  | 7,561761E+22                              | 7,561578E+22 | 6,762146E+22 | 6,762217E+22 | 1,512334E+23                           | 1,352436E+23                           | 2,864770E+23  |
| -2516                  | 7,561481E+22                              | 7,561548E+22 | 6,762242E+22 | 6,762048E+22 | 1,512303E+23                           | 1,352429E+23                           | 2,864732E+23  |
| -2515                  | 7,561627E+22                              | 7,561580E+22 | 6,762242E+22 | 6,762351E+22 | 1,512321E+23                           | 1,352459E+23                           | 2,864780E+23  |
| -2514                  | 7,561829E+22                              | 7,561664E+22 | 6,762203E+22 | 6,762249E+22 | 1,512349E+23                           | 1,352445E+23                           | 2,864794E+23  |
| -2513                  | 7,561408E+22                              | 7,561693E+22 | 6,762380E+22 | 6,762282E+22 | 1,512310E+23                           | 1,352466E+23                           | 2,864776E+23  |
| -2512                  | 7,561710E+22                              | 7,561780E+22 | 6,762357E+22 | 6,762503E+22 | 1,512349E+23                           | 1,352486E+23                           | 2,864835E+23  |
| -2511                  | 7,561733E+22                              | 7,561704E+22 | 6,762439E+22 | 6,762261E+22 | 1,512344E+23                           | 1,352470E+23                           | 2,864814E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -2510             | 7,561501E+22                              | 7,561616E+22 | 6,762558E+22 | 6,762449E+22 | 1,512312E+23                           | 1,352501E+23                           | 2,864812E+23  |
| -2509             | 7,561884E+22                              | 7,561700E+22 | 6,762454E+22 | 6,762543E+22 | 1,512358E+23                           | 1,352500E+23                           | 2,864858E+23  |
| -2508             | 7,561602E+22                              | 7,561685E+22 | 6,762470E+22 | 6,762343E+22 | 1,512329E+23                           | 1,352481E+23                           | 2,864810E+23  |
| -2507             | 7,561581E+22                              | 7,561680E+22 | 6,762414E+22 | 6,762569E+22 | 1,512326E+23                           | 1,352498E+23                           | 2,864824E+23  |
| -2506             | 7,561894E+22                              | 7,561724E+22 | 6,762298E+22 | 6,762409E+22 | 1,512362E+23                           | 1,352471E+23                           | 2,864832E+23  |
| -2505             | 7,561493E+22                              | 7,561643E+22 | 6,762416E+22 | 6,762225E+22 | 1,512314E+23                           | 1,352464E+23                           | 2,864778E+23  |
| -2504             | 7,561716E+22                              | 7,561700E+22 | 6,762329E+22 | 6,762383E+22 | 1,512342E+23                           | 1,352471E+23                           | 2,864813E+23  |
| -2503             | 7,561786E+22                              | 7,561686E+22 | 6,762279E+22 | 6,762141E+22 | 1,512347E+23                           | 1,352442E+23                           | 2,864789E+23  |
| -2502             | 7,561376E+22                              | 7,561603E+22 | 6,762332E+22 | 6,762253E+22 | 1,512298E+23                           | 1,352458E+23                           | 2,864756E+23  |
| -2501             | 7,561693E+22                              | 7,561680E+22 | 6,762229E+22 | 6,762373E+22 | 1,512337E+23                           | 1,352460E+23                           | 2,864798E+23  |
| -2500             | 7,561518E+22                              | 7,561607E+22 | 6,762270E+22 | 6,762108E+22 | 1,512313E+23                           | 1,352438E+23                           | 2,864750E+23  |
| -2499             | 7,561440E+22                              | 7,561524E+22 | 6,762278E+22 | 6,762301E+22 | 1,512296E+23                           | 1,352458E+23                           | 2,864754E+23  |
| -2498             | 7,561868E+22                              | 7,561597E+22 | 6,762195E+22 | 6,762290E+22 | 1,512346E+23                           | 1,352448E+23                           | 2,864795E+23  |
| -2497             | 7,561494E+22                              | 7,561567E+22 | 6,762325E+22 | 6,762174E+22 | 1,512306E+23                           | 1,352450E+23                           | 2,864756E+23  |
| -2496             | 7,561604E+22                              | 7,561694E+22 | 6,762297E+22 | 6,762444E+22 | 1,512330E+23                           | 1,352474E+23                           | 2,864804E+23  |
| -2495             | 7,561814E+22                              | 7,561755E+22 | 6,762307E+22 | 6,762317E+22 | 1,512357E+23                           | 1,352462E+23                           | 2,864819E+23  |
| -2494             | 7,561426E+22                              | 7,561648E+22 | 6,762487E+22 | 6,762367E+22 | 1,512307E+23                           | 1,352485E+23                           | 2,864793E+23  |
| -2493             | 7,561771E+22                              | 7,561726E+22 | 6,762502E+22 | 6,762548E+22 | 1,512350E+23                           | 1,352505E+23                           | 2,864855E+23  |
| -2492             | 7,561747E+22                              | 7,561704E+22 | 6,762563E+22 | 6,762358E+22 | 1,512345E+23                           | 1,352492E+23                           | 2,864837E+23  |
| -2491             | 7,561527E+22                              | 7,561638E+22 | 6,762572E+22 | 6,762565E+22 | 1,512316E+23                           | 1,352514E+23                           | 2,864830E+23  |
| -2490             | 7,561914E+22                              | 7,561770E+22 | 6,762453E+22 | 6,762656E+22 | 1,512368E+23                           | 1,352511E+23                           | 2,864879E+23  |
| -2489             | 7,561593E+22                              | 7,561702E+22 | 6,762535E+22 | 6,762439E+22 | 1,512329E+23                           | 1,352497E+23                           | 2,864827E+23  |
| -2488             | 7,561594E+22                              | 7,561740E+22 | 6,762474E+22 | 6,762568E+22 | 1,512333E+23                           | 1,352504E+23                           | 2,864838E+23  |
| -2487             | 7,561940E+22                              | 7,561768E+22 | 6,762413E+22 | 6,762400E+22 | 1,512371E+23                           | 1,352481E+23                           | 2,864852E+23  |
| -2486             | 7,561530E+22                              | 7,561599E+22 | 6,762498E+22 | 6,762295E+22 | 1,512313E+23                           | 1,352479E+23                           | 2,864792E+23  |
| -2485             | 7,561702E+22                              | 7,561696E+22 | 6,762417E+22 | 6,762457E+22 | 1,512340E+23                           | 1,352487E+23                           | 2,864827E+23  |
| -2484             | 7,561713E+22                              | 7,561729E+22 | 6,762356E+22 | 6,762265E+22 | 1,512344E+23                           | 1,352462E+23                           | 2,864806E+23  |
| -2483             | 7,561370E+22                              | 7,561583E+22 | 6,762344E+22 | 6,762342E+22 | 1,512295E+23                           | 1,352469E+23                           | 2,864764E+23  |
| -2482             | 7,561755E+22                              | 7,561665E+22 | 6,762267E+22 | 6,762429E+22 | 1,512342E+23                           | 1,352470E+23                           | 2,864812E+23  |
| -2481             | 7,561588E+22                              | 7,561556E+22 | 6,762364E+22 | 6,762178E+22 | 1,512314E+23                           | 1,352454E+23                           | 2,864769E+23  |
| -2480             | 7,561491E+22                              | 7,561577E+22 | 6,762326E+22 | 6,762333E+22 | 1,512307E+23                           | 1,352466E+23                           | 2,864773E+23  |
| -2479             | 7,561893E+22                              | 7,561715E+22 | 6,762272E+22 | 6,762362E+22 | 1,512361E+23                           | 1,352463E+23                           | 2,864824E+23  |
| -2478             | 7,561498E+22                              | 7,561600E+22 | 6,762391E+22 | 6,762297E+22 | 1,512310E+23                           | 1,352469E+23                           | 2,864779E+23  |
| -2477             | 7,561588E+22                              | 7,561719E+22 | 6,762431E+22 | 6,762509E+22 | 1,512331E+23                           | 1,352494E+23                           | 2,864825E+23  |
| -2476             | 7,561794E+22                              | 7,561786E+22 | 6,762472E+22 | 6,762401E+22 | 1,512358E+23                           | 1,352487E+23                           | 2,864845E+23  |
| -2475             | 7,561479E+22                              | 7,561599E+22 | 6,762580E+22 | 6,762452E+22 | 1,512308E+23                           | 1,352503E+23                           | 2,864811E+23  |
| -2474             | 7,561831E+22                              | 7,561723E+22 | 6,762566E+22 | 6,762665E+22 | 1,512355E+23                           | 1,352523E+23                           | 2,864878E+23  |
| -2473             | 7,561741E+22                              | 7,561699E+22 | 6,762625E+22 | 6,762522E+22 | 1,512344E+23                           | 1,352515E+23                           | 2,864859E+23  |
| -2472             | 7,561507E+22                              | 7,561716E+22 | 6,762575E+22 | 6,762653E+22 | 1,512322E+23                           | 1,352523E+23                           | 2,864845E+23  |
| -2471             | 7,561940E+22                              | 7,561839E+22 | 6,762511E+22 | 6,762694E+22 | 1,512378E+23                           | 1,352520E+23                           | 2,864898E+23  |
| -2470             | 7,561654E+22                              | 7,561660E+22 | 6,762600E+22 | 6,762466E+22 | 1,512331E+23                           | 1,352507E+23                           | 2,864838E+23  |
| -2469             | 7,561665E+22                              | 7,561717E+22 | 6,762595E+22 | 6,762546E+22 | 1,512338E+23                           | 1,352514E+23                           | 2,864852E+23  |
| -2468             | 7,561940E+22                              | 7,561813E+22 | 6,762528E+22 | 6,762448E+22 | 1,512375E+23                           | 1,352498E+23                           | 2,864873E+23  |
| -2467             | 7,561521E+22                              | 7,561626E+22 | 6,762531E+22 | 6,762395E+22 | 1,512315E+23                           | 1,352493E+23                           | 2,864807E+23  |
| -2466             | 7,561684E+22                              | 7,561744E+22 | 6,762451E+22 | 6,762571E+22 | 1,512343E+23                           | 1,352502E+23                           | 2,864845E+23  |
| -2465             | 7,561669E+22                              | 7,561703E+22 | 6,762445E+22 | 6,762384E+22 | 1,512337E+23                           | 1,352483E+23                           | 2,864820E+23  |
| -2464             | 7,561385E+22                              | 7,561598E+22 | 6,762399E+22 | 6,762376E+22 | 1,512298E+23                           | 1,352477E+23                           | 2,864776E+23  |
| -2463             | 7,561838E+22                              | 7,561666E+22 | 6,762350E+22 | 6,762458E+22 | 1,512350E+23                           | 1,352481E+23                           | 2,864831E+23  |
| -2462             | 7,561648E+22                              | 7,561517E+22 | 6,762410E+22 | 6,762273E+22 | 1,512317E+23                           | 1,352468E+23                           | 2,864785E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -2461                  | 7,561510E+22                              | 7,561621E+22 | 6,762396E+22 | 6,762404E+22 | 1,512313E+23                           | 1,352480E+23                           | 2,864793E+23  |
| -2460                  | 7,561844E+22                              | 7,561807E+22 | 6,762366E+22 | 6,762462E+22 | 1,512365E+23                           | 1,352483E+23                           | 2,864848E+23  |
| -2459                  | 7,561504E+22                              | 7,561617E+22 | 6,762459E+22 | 6,762381E+22 | 1,512312E+23                           | 1,352484E+23                           | 2,864796E+23  |
| -2458                  | 7,561634E+22                              | 7,561721E+22 | 6,762534E+22 | 6,762571E+22 | 1,512335E+23                           | 1,352511E+23                           | 2,864846E+23  |
| -2457                  | 7,561821E+22                              | 7,561741E+22 | 6,762613E+22 | 6,762514E+22 | 1,512356E+23                           | 1,352513E+23                           | 2,864869E+23  |
| -2456                  | 7,561502E+22                              | 7,561644E+22 | 6,762641E+22 | 6,762540E+22 | 1,512315E+23                           | 1,352518E+23                           | 2,864833E+23  |
| -2455                  | 7,561858E+22                              | 7,561798E+22 | 6,762630E+22 | 6,762773E+22 | 1,512366E+23                           | 1,352540E+23                           | 2,864906E+23  |
| -2454                  | 7,561763E+22                              | 7,561706E+22 | 6,762667E+22 | 6,762648E+22 | 1,512347E+23                           | 1,352532E+23                           | 2,864878E+23  |
| -2453                  | 7,561541E+22                              | 7,561736E+22 | 6,762673E+22 | 6,762675E+22 | 1,512328E+23                           | 1,352535E+23                           | 2,864862E+23  |
| -2452                  | 7,561961E+22                              | 7,561880E+22 | 6,762644E+22 | 6,762714E+22 | 1,512384E+23                           | 1,352536E+23                           | 2,864920E+23  |
| -2451                  | 7,561721E+22                              | 7,561640E+22 | 6,762676E+22 | 6,762501E+22 | 1,512336E+23                           | 1,352518E+23                           | 2,864854E+23  |
| -2450                  | 7,561682E+22                              | 7,561742E+22 | 6,762659E+22 | 6,762622E+22 | 1,512342E+23                           | 1,352528E+23                           | 2,864871E+23  |
| -2449                  | 7,561876E+22                              | 7,561828E+22 | 6,762599E+22 | 6,762600E+22 | 1,512370E+23                           | 1,352520E+23                           | 2,864890E+23  |
| -2448                  | 7,561457E+22                              | 7,561668E+22 | 6,762541E+22 | 6,762480E+22 | 1,512313E+23                           | 1,352502E+23                           | 2,864815E+23  |
| -2447                  | 7,561688E+22                              | 7,561751E+22 | 6,762508E+22 | 6,762625E+22 | 1,512344E+23                           | 1,352513E+23                           | 2,864857E+23  |
| -2446                  | 7,561734E+22                              | 7,561614E+22 | 6,762494E+22 | 6,762440E+22 | 1,512335E+23                           | 1,352493E+23                           | 2,864828E+23  |
| -2445                  | 7,561467E+22                              | 7,561564E+22 | 6,762477E+22 | 6,762375E+22 | 1,512303E+23                           | 1,352485E+23                           | 2,864788E+23  |
| -2444                  | 7,561863E+22                              | 7,561737E+22 | 6,762430E+22 | 6,762517E+22 | 1,512360E+23                           | 1,352495E+23                           | 2,864855E+23  |
| -2443                  | 7,561674E+22                              | 7,561578E+22 | 6,762433E+22 | 6,762365E+22 | 1,512325E+23                           | 1,352480E+23                           | 2,864805E+23  |
| -2442                  | 7,561507E+22                              | 7,561703E+22 | 6,762469E+22 | 6,762491E+22 | 1,512321E+23                           | 1,352496E+23                           | 2,864817E+23  |
| -2441                  | 7,561805E+22                              | 7,561823E+22 | 6,762515E+22 | 6,762571E+22 | 1,512363E+23                           | 1,352509E+23                           | 2,864871E+23  |
| -2440                  | 7,561506E+22                              | 7,561639E+22 | 6,762582E+22 | 6,762435E+22 | 1,512315E+23                           | 1,352502E+23                           | 2,864816E+23  |
| -2439                  | 7,561692E+22                              | 7,561717E+22 | 6,762672E+22 | 6,762659E+22 | 1,512341E+23                           | 1,352533E+23                           | 2,864874E+23  |
| -2438                  | 7,561856E+22                              | 7,561688E+22 | 6,762687E+22 | 6,762672E+22 | 1,512354E+23                           | 1,352536E+23                           | 2,864890E+23  |
| -2437                  | 7,561524E+22                              | 7,561666E+22 | 6,762700E+22 | 6,762649E+22 | 1,512319E+23                           | 1,352535E+23                           | 2,864854E+23  |
| -2436                  | 7,561855E+22                              | 7,561865E+22 | 6,762696E+22 | 6,762867E+22 | 1,512372E+23                           | 1,352556E+23                           | 2,864928E+23  |
| -2435                  | 7,561823E+22                              | 7,561715E+22 | 6,762704E+22 | 6,762697E+22 | 1,512354E+23                           | 1,352540E+23                           | 2,864894E+23  |
| -2434                  | 7,561626E+22                              | 7,561760E+22 | 6,762756E+22 | 6,762683E+22 | 1,512339E+23                           | 1,352544E+23                           | 2,864883E+23  |
| -2433                  | 7,561971E+22                              | 7,561876E+22 | 6,762769E+22 | 6,762775E+22 | 1,512385E+23                           | 1,352554E+23                           | 2,864939E+23  |
| -2432                  | 7,561694E+22                              | 7,561719E+22 | 6,762734E+22 | 6,762562E+22 | 1,512341E+23                           | 1,352530E+23                           | 2,864871E+23  |
| -2431                  | 7,561653E+22                              | 7,561806E+22 | 6,762721E+22 | 6,762720E+22 | 1,512346E+23                           | 1,352544E+23                           | 2,864890E+23  |
| -2430                  | 7,561827E+22                              | 7,561792E+22 | 6,762643E+22 | 6,762729E+22 | 1,512362E+23                           | 1,352537E+23                           | 2,864899E+23  |
| -2429                  | 7,561469E+22                              | 7,561639E+22 | 6,762618E+22 | 6,762514E+22 | 1,512311E+23                           | 1,352513E+23                           | 2,864824E+23  |
| -2428                  | 7,561727E+22                              | 7,561733E+22 | 6,762602E+22 | 6,762652E+22 | 1,512346E+23                           | 1,352525E+23                           | 2,864871E+23  |
| -2427                  | 7,561829E+22                              | 7,561574E+22 | 6,762526E+22 | 6,762486E+22 | 1,512340E+23                           | 1,352501E+23                           | 2,864842E+23  |
| -2426                  | 7,561523E+22                              | 7,561609E+22 | 6,762511E+22 | 6,762436E+22 | 1,512313E+23                           | 1,352495E+23                           | 2,864808E+23  |
| -2425                  | 7,561815E+22                              | 7,561797E+22 | 6,762505E+22 | 6,762638E+22 | 1,512361E+23                           | 1,352514E+23                           | 2,864875E+23  |
| -2424                  | 7,561628E+22                              | 7,561673E+22 | 6,762490E+22 | 6,762432E+22 | 1,512330E+23                           | 1,352492E+23                           | 2,864822E+23  |
| -2423                  | 7,561517E+22                              | 7,561735E+22 | 6,762596E+22 | 6,762551E+22 | 1,512325E+23                           | 1,352515E+23                           | 2,864840E+23  |
| -2422                  | 7,561837E+22                              | 7,561752E+22 | 6,762640E+22 | 6,762670E+22 | 1,512359E+23                           | 1,352531E+23                           | 2,864890E+23  |
| -2421                  | 7,561567E+22                              | 7,561608E+22 | 6,762708E+22 | 6,762502E+22 | 1,512318E+23                           | 1,352521E+23                           | 2,864839E+23  |
| -2420                  | 7,561710E+22                              | 7,561764E+22 | 6,762772E+22 | 6,762783E+22 | 1,512347E+23                           | 1,352556E+23                           | 2,864903E+23  |
| -2419                  | 7,561899E+22                              | 7,561722E+22 | 6,762708E+22 | 6,762809E+22 | 1,512362E+23                           | 1,352552E+23                           | 2,864914E+23  |
| -2418                  | 7,561558E+22                              | 7,561731E+22 | 6,762752E+22 | 6,762732E+22 | 1,512329E+23                           | 1,352548E+23                           | 2,864877E+23  |
| -2417                  | 7,561857E+22                              | 7,561898E+22 | 6,762814E+22 | 6,762946E+22 | 1,512376E+23                           | 1,352576E+23                           | 2,864952E+23  |
| -2416                  | 7,561852E+22                              | 7,561759E+22 | 6,762791E+22 | 6,762703E+22 | 1,512361E+23                           | 1,352549E+23                           | 2,864910E+23  |
| -2415                  | 7,561664E+22                              | 7,561785E+22 | 6,762871E+22 | 6,762733E+22 | 1,512345E+23                           | 1,352560E+23                           | 2,864905E+23  |
| -2414                  | 7,561942E+22                              | 7,561853E+22 | 6,762835E+22 | 6,762904E+22 | 1,512380E+23                           | 1,352574E+23                           | 2,864953E+23  |
| -2413                  | 7,561650E+22                              | 7,561726E+22 | 6,762791E+22 | 6,762654E+22 | 1,512338E+23                           | 1,352544E+23                           | 2,864882E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -2412                  | 7,561611E+22                              | 7,561819E+22 | 6,762786E+22 | 6,762805E+22 | 1,512343E+23                           | 1,352559E+23                           | 2,864902E+23  |
| -2411                  | 7,561881E+22                              | 7,561727E+22 | 6,762659E+22 | 6,762776E+22 | 1,512361E+23                           | 1,352544E+23                           | 2,864904E+23  |
| -2410                  | 7,561570E+22                              | 7,561611E+22 | 6,762660E+22 | 6,762516E+22 | 1,512318E+23                           | 1,352518E+23                           | 2,864836E+23  |
| -2409                  | 7,561772E+22                              | 7,561736E+22 | 6,762674E+22 | 6,762708E+22 | 1,512351E+23                           | 1,352538E+23                           | 2,864889E+23  |
| -2408                  | 7,561833E+22                              | 7,561681E+22 | 6,762553E+22 | 6,762528E+22 | 1,512351E+23                           | 1,352508E+23                           | 2,864859E+23  |
| -2407                  | 7,561521E+22                              | 7,561720E+22 | 6,762592E+22 | 6,762519E+22 | 1,512324E+23                           | 1,352511E+23                           | 2,864835E+23  |
| -2406                  | 7,561765E+22                              | 7,561810E+22 | 6,762611E+22 | 6,762748E+22 | 1,512357E+23                           | 1,352536E+23                           | 2,864893E+23  |
| -2405                  | 7,561627E+22                              | 7,561677E+22 | 6,762641E+22 | 6,762489E+22 | 1,512330E+23                           | 1,352513E+23                           | 2,864843E+23  |
| -2404                  | 7,561541E+22                              | 7,561720E+22 | 6,762757E+22 | 6,762634E+22 | 1,512326E+23                           | 1,352539E+23                           | 2,864865E+23  |
| -2403                  | 7,561900E+22                              | 7,561699E+22 | 6,762711E+22 | 6,762800E+22 | 1,512360E+23                           | 1,352551E+23                           | 2,864911E+23  |
| -2402                  | 7,561622E+22                              | 7,561635E+22 | 6,762751E+22 | 6,762637E+22 | 1,512326E+23                           | 1,352539E+23                           | 2,864864E+23  |
| -2401                  | 7,561690E+22                              | 7,561803E+22 | 6,762820E+22 | 6,762935E+22 | 1,512349E+23                           | 1,352576E+23                           | 2,864925E+23  |
| -2400                  | 7,561898E+22                              | 7,561805E+22 | 6,762740E+22 | 6,762865E+22 | 1,512370E+23                           | 1,352560E+23                           | 2,864931E+23  |
| -2399                  | 7,561630E+22                              | 7,561775E+22 | 6,762851E+22 | 6,762752E+22 | 1,512340E+23                           | 1,352560E+23                           | 2,864901E+23  |
| -2398                  | 7,561890E+22                              | 7,561862E+22 | 6,762927E+22 | 6,762991E+22 | 1,512375E+23                           | 1,352592E+23                           | 2,864967E+23  |
| -2397                  | 7,561883E+22                              | 7,561781E+22 | 6,762909E+22 | 6,762739E+22 | 1,512366E+23                           | 1,352565E+23                           | 2,864931E+23  |
| -2396                  | 7,561636E+22                              | 7,561839E+22 | 6,762972E+22 | 6,762831E+22 | 1,512347E+23                           | 1,352580E+23                           | 2,864928E+23  |
| -2395                  | 7,561923E+22                              | 7,561854E+22 | 6,762861E+22 | 6,763027E+22 | 1,512378E+23                           | 1,352589E+23                           | 2,864967E+23  |
| -2394                  | 7,561662E+22                              | 7,561728E+22 | 6,762838E+22 | 6,762726E+22 | 1,512339E+23                           | 1,352556E+23                           | 2,864895E+23  |
| -2393                  | 7,561614E+22                              | 7,561789E+22 | 6,762868E+22 | 6,762873E+22 | 1,512340E+23                           | 1,352574E+23                           | 2,864914E+23  |
| -2392                  | 7,561933E+22                              | 7,561735E+22 | 6,762703E+22 | 6,762782E+22 | 1,512367E+23                           | 1,352549E+23                           | 2,864915E+23  |
| -2391                  | 7,561646E+22                              | 7,561643E+22 | 6,762722E+22 | 6,762560E+22 | 1,512329E+23                           | 1,352528E+23                           | 2,864857E+23  |
| -2390                  | 7,561751E+22                              | 7,561761E+22 | 6,762717E+22 | 6,762815E+22 | 1,512351E+23                           | 1,352553E+23                           | 2,864904E+23  |
| -2389                  | 7,561802E+22                              | 7,561749E+22 | 6,762618E+22 | 6,762596E+22 | 1,512355E+23                           | 1,352521E+23                           | 2,864877E+23  |
| -2388                  | 7,561485E+22                              | 7,561766E+22 | 6,762711E+22 | 6,762598E+22 | 1,512325E+23                           | 1,352531E+23                           | 2,864856E+23  |
| -2387                  | 7,561795E+22                              | 7,561765E+22 | 6,762699E+22 | 6,762825E+22 | 1,512356E+23                           | 1,352552E+23                           | 2,864908E+23  |
| -2386                  | 7,561695E+22                              | 7,561639E+22 | 6,762745E+22 | 6,762554E+22 | 1,512333E+23                           | 1,352530E+23                           | 2,864863E+23  |
| -2385                  | 7,561562E+22                              | 7,561713E+22 | 6,762855E+22 | 6,762771E+22 | 1,512327E+23                           | 1,352563E+23                           | 2,864890E+23  |
| -2384                  | 7,561912E+22                              | 7,561766E+22 | 6,762732E+22 | 6,762900E+22 | 1,512368E+23                           | 1,352563E+23                           | 2,864931E+23  |
| -2383                  | 7,561657E+22                              | 7,561717E+22 | 6,762802E+22 | 6,762742E+22 | 1,512337E+23                           | 1,352554E+23                           | 2,864892E+23  |
| -2382                  | 7,561693E+22                              | 7,561825E+22 | 6,762901E+22 | 6,763028E+22 | 1,512352E+23                           | 1,352593E+23                           | 2,864945E+23  |
| -2381                  | 7,561941E+22                              | 7,561834E+22 | 6,762870E+22 | 6,762875E+22 | 1,512377E+23                           | 1,352574E+23                           | 2,864952E+23  |
| -2380                  | 7,561673E+22                              | 7,561796E+22 | 6,763015E+22 | 6,762795E+22 | 1,512347E+23                           | 1,352581E+23                           | 2,864928E+23  |
| -2379                  | 7,561919E+22                              | 7,561839E+22 | 6,763010E+22 | 6,763086E+22 | 1,512376E+23                           | 1,352610E+23                           | 2,864985E+23  |
| -2378                  | 7,561879E+22                              | 7,561806E+22 | 6,762968E+22 | 6,762856E+22 | 1,512369E+23                           | 1,352582E+23                           | 2,864951E+23  |
| -2377                  | 7,561576E+22                              | 7,561850E+22 | 6,763026E+22 | 6,762979E+22 | 1,512343E+23                           | 1,352601E+23                           | 2,864943E+23  |
| -2376                  | 7,561906E+22                              | 7,561870E+22 | 6,762878E+22 | 6,763078E+22 | 1,512378E+23                           | 1,352596E+23                           | 2,864973E+23  |
| -2375                  | 7,561747E+22                              | 7,561723E+22 | 6,762891E+22 | 6,762754E+22 | 1,512347E+23                           | 1,352564E+23                           | 2,864911E+23  |
| -2374                  | 7,561670E+22                              | 7,561745E+22 | 6,762921E+22 | 6,762913E+22 | 1,512342E+23                           | 1,352583E+23                           | 2,864925E+23  |
| -2373                  | 7,561979E+22                              | 7,561785E+22 | 6,762766E+22 | 6,762802E+22 | 1,512376E+23                           | 1,352557E+23                           | 2,864933E+23  |
| -2372                  | 7,561640E+22                              | 7,561741E+22 | 6,762805E+22 | 6,762632E+22 | 1,512338E+23                           | 1,352544E+23                           | 2,864882E+23  |
| -2371                  | 7,561721E+22                              | 7,561799E+22 | 6,762769E+22 | 6,762908E+22 | 1,512352E+23                           | 1,352568E+23                           | 2,864920E+23  |
| -2370                  | 7,561804E+22                              | 7,561776E+22 | 6,762721E+22 | 6,762667E+22 | 1,512358E+23                           | 1,352539E+23                           | 2,864897E+23  |
| -2369                  | 7,561474E+22                              | 7,561728E+22 | 6,762844E+22 | 6,762693E+22 | 1,512320E+23                           | 1,352554E+23                           | 2,864874E+23  |
| -2368                  | 7,561819E+22                              | 7,561743E+22 | 6,762782E+22 | 6,762887E+22 | 1,512356E+23                           | 1,352567E+23                           | 2,864923E+23  |
| -2367                  | 7,561768E+22                              | 7,561646E+22 | 6,762810E+22 | 6,762671E+22 | 1,512341E+23                           | 1,352548E+23                           | 2,864889E+23  |
| -2366                  | 7,561551E+22                              | 7,561714E+22 | 6,762884E+22 | 6,762922E+22 | 1,512327E+23                           | 1,352581E+23                           | 2,864907E+23  |
| -2365                  | 7,561923E+22                              | 7,561830E+22 | 6,762783E+22 | 6,762979E+22 | 1,512375E+23                           | 1,352576E+23                           | 2,864952E+23  |
| -2364                  | 7,561693E+22                              | 7,561771E+22 | 6,762912E+22 | 6,762790E+22 | 1,512346E+23                           | 1,352570E+23                           | 2,864917E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -2363             | 7,561761E+22                              | 7,561810E+22 | 6,762995E+22 | 6,763061E+22 | 1,512357E+23                           | 1,352606E+23                           | 2,864963E+23  |
| -2362             | 7,562020E+22                              | 7,561843E+22 | 6,762992E+22 | 6,762913E+22 | 1,512386E+23                           | 1,352590E+23                           | 2,864977E+23  |
| -2361             | 7,561659E+22                              | 7,561826E+22 | 6,763135E+22 | 6,762922E+22 | 1,512349E+23                           | 1,352606E+23                           | 2,864954E+23  |
| -2360             | 7,561871E+22                              | 7,561911E+22 | 6,763058E+22 | 6,763193E+22 | 1,512378E+23                           | 1,352625E+23                           | 2,865003E+23  |
| -2359             | 7,561879E+22                              | 7,561853E+22 | 6,763024E+22 | 6,762980E+22 | 1,512373E+23                           | 1,352600E+23                           | 2,864974E+23  |
| -2358             | 7,561558E+22                              | 7,561820E+22 | 6,763087E+22 | 6,763080E+22 | 1,512338E+23                           | 1,352617E+23                           | 2,864955E+23  |
| -2357             | 7,561962E+22                              | 7,561855E+22 | 6,762954E+22 | 6,763088E+22 | 1,512382E+23                           | 1,352604E+23                           | 2,864986E+23  |
| -2356             | 7,561819E+22                              | 7,561728E+22 | 6,762987E+22 | 6,762782E+22 | 1,512355E+23                           | 1,352577E+23                           | 2,864932E+23  |
| -2355             | 7,561718E+22                              | 7,561747E+22 | 6,762948E+22 | 6,762980E+22 | 1,512347E+23                           | 1,352593E+23                           | 2,864939E+23  |
| -2354             | 7,561979E+22                              | 7,561836E+22 | 6,762803E+22 | 6,762869E+22 | 1,512381E+23                           | 1,352567E+23                           | 2,864949E+23  |
| -2353             | 7,561579E+22                              | 7,561781E+22 | 6,762882E+22 | 6,762743E+22 | 1,512336E+23                           | 1,352562E+23                           | 2,864898E+23  |
| -2352             | 7,561690E+22                              | 7,561810E+22 | 6,762832E+22 | 6,762937E+22 | 1,512350E+23                           | 1,352577E+23                           | 2,864927E+23  |
| -2351             | 7,561859E+22                              | 7,561751E+22 | 6,762815E+22 | 6,762721E+22 | 1,512361E+23                           | 1,352554E+23                           | 2,864915E+23  |
| -2350             | 7,561505E+22                              | 7,561669E+22 | 6,762927E+22 | 6,762791E+22 | 1,512317E+23                           | 1,352572E+23                           | 2,864889E+23  |
| -2349             | 7,561859E+22                              | 7,561765E+22 | 6,762845E+22 | 6,762965E+22 | 1,512362E+23                           | 1,352581E+23                           | 2,864943E+23  |
| -2348             | 7,561793E+22                              | 7,561724E+22 | 6,762885E+22 | 6,762782E+22 | 1,512352E+23                           | 1,352567E+23                           | 2,864918E+23  |
| -2347             | 7,561579E+22                              | 7,561750E+22 | 6,762928E+22 | 6,763019E+22 | 1,512333E+23                           | 1,352595E+23                           | 2,864928E+23  |
| -2346             | 7,561971E+22                              | 7,561872E+22 | 6,762893E+22 | 6,763025E+22 | 1,512384E+23                           | 1,352592E+23                           | 2,864976E+23  |
| -2345             | 7,561719E+22                              | 7,561791E+22 | 6,763067E+22 | 6,762870E+22 | 1,512351E+23                           | 1,352594E+23                           | 2,864945E+23  |
| -2344             | 7,561777E+22                              | 7,561836E+22 | 6,763107E+22 | 6,763114E+22 | 1,512361E+23                           | 1,352622E+23                           | 2,864983E+23  |
| -2343             | 7,562047E+22                              | 7,561891E+22 | 6,763080E+22 | 6,763050E+22 | 1,512394E+23                           | 1,352613E+23                           | 2,865007E+23  |
| -2342             | 7,561602E+22                              | 7,561828E+22 | 6,763189E+22 | 6,763093E+22 | 1,512343E+23                           | 1,352628E+23                           | 2,864971E+23  |
| -2341             | 7,561849E+22                              | 7,561932E+22 | 6,763114E+22 | 6,763281E+22 | 1,512378E+23                           | 1,352639E+23                           | 2,865018E+23  |
| -2340             | 7,561922E+22                              | 7,561853E+22 | 6,763111E+22 | 6,763031E+22 | 1,512377E+23                           | 1,352614E+23                           | 2,864992E+23  |
| -2339             | 7,561643E+22                              | 7,561763E+22 | 6,763126E+22 | 6,763102E+22 | 1,512341E+23                           | 1,352623E+23                           | 2,864963E+23  |
| -2338             | 7,562061E+22                              | 7,561854E+22 | 6,763016E+22 | 6,763099E+22 | 1,512392E+23                           | 1,352611E+23                           | 2,865003E+23  |
| -2337             | 7,561825E+22                              | 7,561778E+22 | 6,763047E+22 | 6,762855E+22 | 1,512360E+23                           | 1,352590E+23                           | 2,864951E+23  |
| -2336             | 7,561671E+22                              | 7,561832E+22 | 6,762978E+22 | 6,763022E+22 | 1,512350E+23                           | 1,352600E+23                           | 2,864950E+23  |
| -2335             | 7,561970E+22                              | 7,561903E+22 | 6,762871E+22 | 6,762948E+22 | 1,512387E+23                           | 1,352582E+23                           | 2,864969E+23  |
| -2334             | 7,561533E+22                              | 7,561747E+22 | 6,762985E+22 | 6,762831E+22 | 1,512328E+23                           | 1,352582E+23                           | 2,864910E+23  |
| -2333             | 7,561708E+22                              | 7,561780E+22 | 6,762948E+22 | 6,762976E+22 | 1,512349E+23                           | 1,352592E+23                           | 2,864941E+23  |
| -2332             | 7,561912E+22                              | 7,561728E+22 | 6,762931E+22 | 6,762808E+22 | 1,512364E+23                           | 1,352574E+23                           | 2,864938E+23  |
| -2331             | 7,561543E+22                              | 7,561651E+22 | 6,762945E+22 | 6,762917E+22 | 1,512319E+23                           | 1,352586E+23                           | 2,864906E+23  |
| -2330             | 7,561893E+22                              | 7,561805E+22 | 6,762875E+22 | 6,763071E+22 | 1,512370E+23                           | 1,352595E+23                           | 2,864964E+23  |
| -2329             | 7,561787E+22                              | 7,561780E+22 | 6,762955E+22 | 6,762892E+22 | 1,512357E+23                           | 1,352585E+23                           | 2,864941E+23  |
| -2328             | 7,561605E+22                              | 7,561797E+22 | 6,763010E+22 | 6,763035E+22 | 1,512340E+23                           | 1,352605E+23                           | 2,864945E+23  |
| -2327             | 7,562054E+22                              | 7,561906E+22 | 6,763015E+22 | 6,763074E+22 | 1,512396E+23                           | 1,352609E+23                           | 2,865005E+23  |
| -2326             | 7,561727E+22                              | 7,561791E+22 | 6,763198E+22 | 6,762983E+22 | 1,512352E+23                           | 1,352618E+23                           | 2,864970E+23  |
| -2325             | 7,561765E+22                              | 7,561893E+22 | 6,763210E+22 | 6,763215E+22 | 1,512366E+23                           | 1,352643E+23                           | 2,865008E+23  |
| -2324             | 7,562027E+22                              | 7,561949E+22 | 6,763185E+22 | 6,763187E+22 | 1,512398E+23                           | 1,352637E+23                           | 2,865035E+23  |
| -2323             | 7,561614E+22                              | 7,561814E+22 | 6,763236E+22 | 6,763210E+22 | 1,512343E+23                           | 1,352645E+23                           | 2,864987E+23  |
| -2322             | 7,561912E+22                              | 7,561895E+22 | 6,763192E+22 | 6,763316E+22 | 1,512381E+23                           | 1,352651E+23                           | 2,865031E+23  |
| -2321             | 7,561976E+22                              | 7,561832E+22 | 6,763205E+22 | 6,763082E+22 | 1,512381E+23                           | 1,352629E+23                           | 2,865010E+23  |
| -2320             | 7,561696E+22                              | 7,561775E+22 | 6,763165E+22 | 6,763107E+22 | 1,512347E+23                           | 1,352627E+23                           | 2,864974E+23  |
| -2319             | 7,562085E+22                              | 7,561921E+22 | 6,763043E+22 | 6,763174E+22 | 1,512401E+23                           | 1,352622E+23                           | 2,865022E+23  |
| -2318             | 7,561754E+22                              | 7,561820E+22 | 6,763090E+22 | 6,762968E+22 | 1,512357E+23                           | 1,352606E+23                           | 2,864963E+23  |
| -2317             | 7,561621E+22                              | 7,561869E+22 | 6,763049E+22 | 6,763062E+22 | 1,512349E+23                           | 1,352611E+23                           | 2,864960E+23  |
| -2316             | 7,561975E+22                              | 7,561899E+22 | 6,762992E+22 | 6,762992E+22 | 1,512387E+23                           | 1,352598E+23                           | 2,864986E+23  |
| -2315             | 7,561589E+22                              | 7,561672E+22 | 6,763052E+22 | 6,762894E+22 | 1,512326E+23                           | 1,352595E+23                           | 2,864921E+23  |



| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -2314                  | 7,561779E+22                              | 7,561746E+22 | 6,763024E+22 | 6,763044E+22 | 1,512352E+23                           | 1,352607E+23                           | 2,864959E+23  |
| -2313                  | 7,561920E+22                              | 7,561774E+22 | 6,762991E+22 | 6,762943E+22 | 1,512369E+23                           | 1,352593E+23                           | 2,864963E+23  |
| -2312                  | 7,561542E+22                              | 7,561730E+22 | 6,762970E+22 | 6,762991E+22 | 1,512327E+23                           | 1,352596E+23                           | 2,864923E+23  |
| -2311                  | 7,561932E+22                              | 7,561892E+22 | 6,762942E+22 | 6,763156E+22 | 1,512382E+23                           | 1,352610E+23                           | 2,864992E+23  |
| -2310                  | 7,561792E+22                              | 7,561796E+22 | 6,763082E+22 | 6,762970E+22 | 1,512359E+23                           | 1,352605E+23                           | 2,864964E+23  |
| -2309                  | 7,561640E+22                              | 7,561821E+22 | 6,763167E+22 | 6,763070E+22 | 1,512346E+23                           | 1,352624E+23                           | 2,864970E+23  |
| -2308                  | 7,562088E+22                              | 7,561933E+22 | 6,763179E+22 | 6,763176E+22 | 1,512402E+23                           | 1,352636E+23                           | 2,865038E+23  |
| -2307                  | 7,561719E+22                              | 7,561781E+22 | 6,763264E+22 | 6,763139E+22 | 1,512350E+23                           | 1,352640E+23                           | 2,864990E+23  |
| -2306                  | 7,561763E+22                              | 7,561895E+22 | 6,763277E+22 | 6,763345E+22 | 1,512366E+23                           | 1,352662E+23                           | 2,865028E+23  |
| -2305                  | 7,562021E+22                              | 7,561943E+22 | 6,763254E+22 | 6,763300E+22 | 1,512396E+23                           | 1,352655E+23                           | 2,865052E+23  |
| -2304                  | 7,561665E+22                              | 7,561796E+22 | 6,763273E+22 | 6,763216E+22 | 1,512346E+23                           | 1,352649E+23                           | 2,864995E+23  |
| -2303                  | 7,562026E+22                              | 7,561908E+22 | 6,763238E+22 | 6,763344E+22 | 1,512393E+23                           | 1,352658E+23                           | 2,865052E+23  |
| -2302                  | 7,561995E+22                              | 7,561851E+22 | 6,763264E+22 | 6,763147E+22 | 1,512385E+23                           | 1,352641E+23                           | 2,865026E+23  |
| -2301                  | 7,561678E+22                              | 7,561872E+22 | 6,763225E+22 | 6,763149E+22 | 1,512355E+23                           | 1,352637E+23                           | 2,864992E+23  |
| -2300                  | 7,562046E+22                              | 7,562006E+22 | 6,763143E+22 | 6,763246E+22 | 1,512405E+23                           | 1,352639E+23                           | 2,865044E+23  |
| -2299                  | 7,561719E+22                              | 7,561813E+22 | 6,763161E+22 | 6,763052E+22 | 1,512353E+23                           | 1,352621E+23                           | 2,864975E+23  |
| -2298                  | 7,561641E+22                              | 7,561819E+22 | 6,763163E+22 | 6,763108E+22 | 1,512346E+23                           | 1,352627E+23                           | 2,864973E+23  |
| -2297                  | 7,561991E+22                              | 7,561852E+22 | 6,763103E+22 | 6,763085E+22 | 1,512384E+23                           | 1,352619E+23                           | 2,865003E+23  |
| -2296                  | 7,561628E+22                              | 7,561657E+22 | 6,763084E+22 | 6,762964E+22 | 1,512329E+23                           | 1,352605E+23                           | 2,864933E+23  |
| -2295                  | 7,561825E+22                              | 7,561796E+22 | 6,763026E+22 | 6,763166E+22 | 1,512362E+23                           | 1,352619E+23                           | 2,864981E+23  |
| -2294                  | 7,561893E+22                              | 7,561816E+22 | 6,763029E+22 | 6,763069E+22 | 1,512371E+23                           | 1,352610E+23                           | 2,864981E+23  |
| -2293                  | 7,561556E+22                              | 7,561794E+22 | 6,763054E+22 | 6,763017E+22 | 1,512335E+23                           | 1,352607E+23                           | 2,864942E+23  |
| -2292                  | 7,561979E+22                              | 7,561927E+22 | 6,763099E+22 | 6,763179E+22 | 1,512391E+23                           | 1,352628E+23                           | 2,865018E+23  |
| -2291                  | 7,561853E+22                              | 7,561778E+22 | 6,763201E+22 | 6,763042E+22 | 1,512363E+23                           | 1,352624E+23                           | 2,864987E+23  |
| -2290                  | 7,561683E+22                              | 7,561813E+22 | 6,763294E+22 | 6,763159E+22 | 1,512350E+23                           | 1,352645E+23                           | 2,864995E+23  |
| -2289                  | 7,562046E+22                              | 7,561981E+22 | 6,763282E+22 | 6,763340E+22 | 1,512403E+23                           | 1,352662E+23                           | 2,865065E+23  |
| -2288                  | 7,561707E+22                              | 7,561814E+22 | 6,763308E+22 | 6,763249E+22 | 1,512352E+23                           | 1,352656E+23                           | 2,865008E+23  |
| -2287                  | 7,561803E+22                              | 7,561919E+22 | 6,763326E+22 | 6,763446E+22 | 1,512372E+23                           | 1,352677E+23                           | 2,865049E+23  |
| -2286                  | 7,562044E+22                              | 7,561926E+22 | 6,763342E+22 | 6,763379E+22 | 1,512397E+23                           | 1,352672E+23                           | 2,865069E+23  |
| -2285                  | 7,561732E+22                              | 7,561815E+22 | 6,763359E+22 | 6,763224E+22 | 1,512355E+23                           | 1,352658E+23                           | 2,865013E+23  |
| -2284                  | 7,562066E+22                              | 7,561965E+22 | 6,763333E+22 | 6,763396E+22 | 1,512403E+23                           | 1,352673E+23                           | 2,865076E+23  |
| -2283                  | 7,561977E+22                              | 7,561890E+22 | 6,763290E+22 | 6,763248E+22 | 1,512387E+23                           | 1,352654E+23                           | 2,865041E+23  |
| -2282                  | 7,561651E+22                              | 7,561890E+22 | 6,763296E+22 | 6,763220E+22 | 1,512354E+23                           | 1,352652E+23                           | 2,865006E+23  |
| -2281                  | 7,561996E+22                              | 7,562012E+22 | 6,763242E+22 | 6,763324E+22 | 1,512401E+23                           | 1,352657E+23                           | 2,865057E+23  |
| -2280                  | 7,561745E+22                              | 7,561767E+22 | 6,763227E+22 | 6,763071E+22 | 1,512351E+23                           | 1,352630E+23                           | 2,864981E+23  |
| -2279                  | 7,561725E+22                              | 7,561795E+22 | 6,763212E+22 | 6,763178E+22 | 1,512352E+23                           | 1,352639E+23                           | 2,864991E+23  |
| -2278                  | 7,562000E+22                              | 7,561846E+22 | 6,763154E+22 | 6,763198E+22 | 1,512385E+23                           | 1,352635E+23                           | 2,865020E+23  |
| -2277                  | 7,561634E+22                              | 7,561739E+22 | 6,763120E+22 | 6,763032E+22 | 1,512337E+23                           | 1,352615E+23                           | 2,864953E+23  |
| -2276                  | 7,561843E+22                              | 7,561889E+22 | 6,763111E+22 | 6,763239E+22 | 1,512373E+23                           | 1,352635E+23                           | 2,865008E+23  |
| -2275                  | 7,561906E+22                              | 7,561832E+22 | 6,763106E+22 | 6,763133E+22 | 1,512374E+23                           | 1,352624E+23                           | 2,864998E+23  |
| -2274                  | 7,561612E+22                              | 7,561778E+22 | 6,763210E+22 | 6,763051E+22 | 1,512339E+23                           | 1,352626E+23                           | 2,864965E+23  |
| -2273                  | 7,561990E+22                              | 7,561924E+22 | 6,763259E+22 | 6,763269E+22 | 1,512391E+23                           | 1,352653E+23                           | 2,865044E+23  |
| -2272                  | 7,561854E+22                              | 7,561783E+22 | 6,763280E+22 | 6,763152E+22 | 1,512364E+23                           | 1,352643E+23                           | 2,865007E+23  |
| -2271                  | 7,561687E+22                              | 7,561861E+22 | 6,763328E+22 | 6,763333E+22 | 1,512355E+23                           | 1,352666E+23                           | 2,865021E+23  |
| -2270                  | 7,561996E+22                              | 7,561987E+22 | 6,763336E+22 | 6,763501E+22 | 1,512398E+23                           | 1,352684E+23                           | 2,865082E+23  |
| -2269                  | 7,561735E+22                              | 7,561837E+22 | 6,763373E+22 | 6,763296E+22 | 1,512357E+23                           | 1,352667E+23                           | 2,865024E+23  |
| -2268                  | 7,561895E+22                              | 7,561931E+22 | 6,763430E+22 | 6,763469E+22 | 1,512383E+23                           | 1,352690E+23                           | 2,865073E+23  |
| -2267                  | 7,562120E+22                              | 7,561916E+22 | 6,763405E+22 | 6,763426E+22 | 1,512404E+23                           | 1,352683E+23                           | 2,865087E+23  |
| -2266                  | 7,561786E+22                              | 7,561849E+22 | 6,763449E+22 | 6,763270E+22 | 1,512363E+23                           | 1,352672E+23                           | 2,865035E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -2265             | 7,562014E+22                              | 7,562049E+22 | 6,763424E+22 | 6,763491E+22 | 1,512406E+23                           | 1,352692E+23                           | 2,865098E+23  |
| -2264             | 7,561941E+22                              | 7,561935E+22 | 6,763347E+22 | 6,763314E+22 | 1,512388E+23                           | 1,352666E+23                           | 2,865054E+23  |
| -2263             | 7,561662E+22                              | 7,561899E+22 | 6,763363E+22 | 6,763298E+22 | 1,512356E+23                           | 1,352666E+23                           | 2,865022E+23  |
| -2262             | 7,561980E+22                              | 7,561956E+22 | 6,763348E+22 | 6,763409E+22 | 1,512394E+23                           | 1,352676E+23                           | 2,865069E+23  |
| -2261             | 7,561793E+22                              | 7,561745E+22 | 6,763304E+22 | 6,763116E+22 | 1,512354E+23                           | 1,352642E+23                           | 2,864996E+23  |
| -2260             | 7,561763E+22                              | 7,561818E+22 | 6,763270E+22 | 6,763265E+22 | 1,512358E+23                           | 1,352654E+23                           | 2,865012E+23  |
| -2259             | 7,562002E+22                              | 7,561869E+22 | 6,763152E+22 | 6,763315E+22 | 1,512387E+23                           | 1,352647E+23                           | 2,865034E+23  |
| -2258             | 7,561665E+22                              | 7,561754E+22 | 6,763174E+22 | 6,763082E+22 | 1,512342E+23                           | 1,352626E+23                           | 2,864968E+23  |
| -2257             | 7,561834E+22                              | 7,561924E+22 | 6,763219E+22 | 6,763279E+22 | 1,512376E+23                           | 1,352650E+23                           | 2,865026E+23  |
| -2256             | 7,561959E+22                              | 7,561836E+22 | 6,763199E+22 | 6,763151E+22 | 1,512379E+23                           | 1,352635E+23                           | 2,865014E+23  |
| -2255             | 7,561674E+22                              | 7,561796E+22 | 6,763301E+22 | 6,763146E+22 | 1,512347E+23                           | 1,352645E+23                           | 2,864992E+23  |
| -2254             | 7,561943E+22                              | 7,561953E+22 | 6,763363E+22 | 6,763428E+22 | 1,512390E+23                           | 1,352679E+23                           | 2,865069E+23  |
| -2253             | 7,561830E+22                              | 7,561851E+22 | 6,763356E+22 | 6,763275E+22 | 1,512368E+23                           | 1,352663E+23                           | 2,865031E+23  |
| -2252             | 7,561699E+22                              | 7,561912E+22 | 6,763425E+22 | 6,763448E+22 | 1,512361E+23                           | 1,352687E+23                           | 2,865048E+23  |
| -2251             | 7,562033E+22                              | 7,561967E+22 | 6,763407E+22 | 6,763590E+22 | 1,512400E+23                           | 1,352700E+23                           | 2,865100E+23  |
| -2250             | 7,561842E+22                              | 7,561802E+22 | 6,763492E+22 | 6,763322E+22 | 1,512364E+23                           | 1,352681E+23                           | 2,865046E+23  |
| -2249             | 7,561943E+22                              | 7,561958E+22 | 6,763547E+22 | 6,763528E+22 | 1,512390E+23                           | 1,352708E+23                           | 2,865098E+23  |
| -2248             | 7,562142E+22                              | 7,561962E+22 | 6,763450E+22 | 6,763494E+22 | 1,512410E+23                           | 1,352694E+23                           | 2,865105E+23  |
| -2247             | 7,561782E+22                              | 7,561926E+22 | 6,763480E+22 | 6,763391E+22 | 1,512371E+23                           | 1,352687E+23                           | 2,865058E+23  |
| -2246             | 7,561931E+22                              | 7,562065E+22 | 6,763506E+22 | 6,763599E+22 | 1,512400E+23                           | 1,352710E+23                           | 2,865110E+23  |
| -2245             | 7,561930E+22                              | 7,561935E+22 | 6,763434E+22 | 6,763343E+22 | 1,512387E+23                           | 1,352678E+23                           | 2,865064E+23  |
| -2244             | 7,561727E+22                              | 7,561873E+22 | 6,763464E+22 | 6,763339E+22 | 1,512360E+23                           | 1,352680E+23                           | 2,865040E+23  |
| -2243             | 7,562025E+22                              | 7,561897E+22 | 6,763381E+22 | 6,763483E+22 | 1,512392E+23                           | 1,352686E+23                           | 2,865079E+23  |
| -2242             | 7,561845E+22                              | 7,561746E+22 | 6,763347E+22 | 6,763185E+22 | 1,512359E+23                           | 1,352653E+23                           | 2,865012E+23  |
| -2241             | 7,561748E+22                              | 7,561893E+22 | 6,763313E+22 | 6,763350E+22 | 1,512364E+23                           | 1,352666E+23                           | 2,865030E+23  |
| -2240             | 7,562002E+22                              | 7,561917E+22 | 6,763185E+22 | 6,763358E+22 | 1,512392E+23                           | 1,352654E+23                           | 2,865046E+23  |
| -2239             | 7,561709E+22                              | 7,561802E+22 | 6,763248E+22 | 6,763142E+22 | 1,512351E+23                           | 1,352639E+23                           | 2,864990E+23  |
| -2238             | 7,561819E+22                              | 7,561911E+22 | 6,763363E+22 | 6,763350E+22 | 1,512373E+23                           | 1,352671E+23                           | 2,865044E+23  |
| -2237             | 7,561975E+22                              | 7,561857E+22 | 6,763319E+22 | 6,763225E+22 | 1,512383E+23                           | 1,352654E+23                           | 2,865038E+23  |
| -2236             | 7,561684E+22                              | 7,561835E+22 | 6,763402E+22 | 6,763286E+22 | 1,512352E+23                           | 1,352669E+23                           | 2,865021E+23  |
| -2235             | 7,561912E+22                              | 7,561950E+22 | 6,763405E+22 | 6,763593E+22 | 1,512386E+23                           | 1,352700E+23                           | 2,865086E+23  |
| -2234             | 7,561874E+22                              | 7,561830E+22 | 6,763440E+22 | 6,763369E+22 | 1,512370E+23                           | 1,352681E+23                           | 2,865051E+23  |
| -2233             | 7,561746E+22                              | 7,561918E+22 | 6,763529E+22 | 6,763504E+22 | 1,512366E+23                           | 1,352703E+23                           | 2,865070E+23  |
| -2232             | 7,562137E+22                              | 7,561960E+22 | 6,763478E+22 | 6,763612E+22 | 1,512410E+23                           | 1,352709E+23                           | 2,865119E+23  |
| -2231             | 7,561943E+22                              | 7,561858E+22 | 6,763550E+22 | 6,763392E+22 | 1,512380E+23                           | 1,352694E+23                           | 2,865074E+23  |
| -2230             | 7,561903E+22                              | 7,562033E+22 | 6,763642E+22 | 6,763637E+22 | 1,512394E+23                           | 1,352728E+23                           | 2,865122E+23  |
| -2229             | 7,562105E+22                              | 7,562063E+22 | 6,763533E+22 | 6,763575E+22 | 1,512417E+23                           | 1,352711E+23                           | 2,865128E+23  |
| -2228             | 7,561759E+22                              | 7,561971E+22 | 6,763592E+22 | 6,763476E+22 | 1,512373E+23                           | 1,352707E+23                           | 2,865080E+23  |
| -2227             | 7,561912E+22                              | 7,562015E+22 | 6,763591E+22 | 6,763680E+22 | 1,512393E+23                           | 1,352727E+23                           | 2,865120E+23  |
| -2226             | 7,562003E+22                              | 7,561845E+22 | 6,763534E+22 | 6,763385E+22 | 1,512385E+23                           | 1,352692E+23                           | 2,865077E+23  |
| -2225             | 7,561749E+22                              | 7,561854E+22 | 6,763528E+22 | 6,763414E+22 | 1,512360E+23                           | 1,352694E+23                           | 2,865054E+23  |
| -2224             | 7,562052E+22                              | 7,561914E+22 | 6,763360E+22 | 6,763564E+22 | 1,512397E+23                           | 1,352692E+23                           | 2,865089E+23  |
| -2223             | 7,561872E+22                              | 7,561812E+22 | 6,763322E+22 | 6,763278E+22 | 1,512368E+23                           | 1,352660E+23                           | 2,865028E+23  |
| -2222             | 7,561706E+22                              | 7,561930E+22 | 6,763382E+22 | 6,763409E+22 | 1,512364E+23                           | 1,352679E+23                           | 2,865043E+23  |
| -2221             | 7,562026E+22                              | 7,561952E+22 | 6,763285E+22 | 6,763350E+22 | 1,512398E+23                           | 1,352663E+23                           | 2,865061E+23  |
| -2220             | 7,561769E+22                              | 7,561819E+22 | 6,763390E+22 | 6,763183E+22 | 1,512359E+23                           | 1,352657E+23                           | 2,865016E+23  |
| -2219             | 7,561818E+22                              | 7,561896E+22 | 6,763461E+22 | 6,763460E+22 | 1,512371E+23                           | 1,352692E+23                           | 2,865063E+23  |
| -2218             | 7,561991E+22                              | 7,561861E+22 | 6,763423E+22 | 6,763349E+22 | 1,512385E+23                           | 1,352677E+23                           | 2,865062E+23  |
| -2217             | 7,561661E+22                              | 7,561885E+22 | 6,763495E+22 | 6,763426E+22 | 1,512355E+23                           | 1,352692E+23                           | 2,865047E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -2216                  | 7,561946E+22                              | 7,561952E+22 | 6,763459E+22 | 6,763683E+22 | 1,512390E+23                           | 1,352714E+23                           | 2,865104E+23  |
| -2215                  | 7,561970E+22                              | 7,561851E+22 | 6,763508E+22 | 6,763450E+22 | 1,512382E+23                           | 1,352696E+23                           | 2,865078E+23  |
| -2214                  | 7,561790E+22                              | 7,561921E+22 | 6,763654E+22 | 6,763575E+22 | 1,512371E+23                           | 1,352723E+23                           | 2,865094E+23  |
| -2213                  | 7,562171E+22                              | 7,562022E+22 | 6,763574E+22 | 6,763670E+22 | 1,512419E+23                           | 1,352724E+23                           | 2,865144E+23  |
| -2212                  | 7,561950E+22                              | 7,561956E+22 | 6,763641E+22 | 6,763511E+22 | 1,512391E+23                           | 1,352715E+23                           | 2,865106E+23  |
| -2211                  | 7,561836E+22                              | 7,562052E+22 | 6,763696E+22 | 6,763758E+22 | 1,512389E+23                           | 1,352745E+23                           | 2,865134E+23  |
| -2210                  | 7,562102E+22                              | 7,562032E+22 | 6,763632E+22 | 6,763638E+22 | 1,512413E+23                           | 1,352727E+23                           | 2,865140E+23  |
| -2209                  | 7,561774E+22                              | 7,561939E+22 | 6,763695E+22 | 6,763523E+22 | 1,512371E+23                           | 1,352722E+23                           | 2,865093E+23  |
| -2208                  | 7,561978E+22                              | 7,561946E+22 | 6,763630E+22 | 6,763715E+22 | 1,512392E+23                           | 1,352735E+23                           | 2,865127E+23  |
| -2207                  | 7,562081E+22                              | 7,561861E+22 | 6,763537E+22 | 6,763468E+22 | 1,512394E+23                           | 1,352701E+23                           | 2,865095E+23  |
| -2206                  | 7,561725E+22                              | 7,561903E+22 | 6,763559E+22 | 6,763505E+22 | 1,512363E+23                           | 1,352706E+23                           | 2,865069E+23  |
| -2205                  | 7,562040E+22                              | 7,562005E+22 | 6,763395E+22 | 6,763603E+22 | 1,512405E+23                           | 1,352700E+23                           | 2,865104E+23  |
| -2204                  | 7,561892E+22                              | 7,561886E+22 | 6,763416E+22 | 6,763317E+22 | 1,512378E+23                           | 1,352673E+23                           | 2,865051E+23  |
| -2203                  | 7,561699E+22                              | 7,561910E+22 | 6,763496E+22 | 6,763449E+22 | 1,512361E+23                           | 1,352694E+23                           | 2,865055E+23  |
| -2202                  | 7,562082E+22                              | 7,561905E+22 | 6,763440E+22 | 6,763396E+22 | 1,512399E+23                           | 1,352684E+23                           | 2,865082E+23  |
| -2201                  | 7,561764E+22                              | 7,561828E+22 | 6,763516E+22 | 6,763300E+22 | 1,512359E+23                           | 1,352682E+23                           | 2,865041E+23  |
| -2200                  | 7,561809E+22                              | 7,561900E+22 | 6,763497E+22 | 6,763608E+22 | 1,512371E+23                           | 1,352711E+23                           | 2,865082E+23  |
| -2199                  | 7,562014E+22                              | 7,561896E+22 | 6,763441E+22 | 6,763503E+22 | 1,512391E+23                           | 1,352694E+23                           | 2,865085E+23  |
| -2198                  | 7,561655E+22                              | 7,561893E+22 | 6,763577E+22 | 6,763528E+22 | 1,512355E+23                           | 1,352710E+23                           | 2,865065E+23  |
| -2197                  | 7,562025E+22                              | 7,561981E+22 | 6,763547E+22 | 6,763709E+22 | 1,512401E+23                           | 1,352726E+23                           | 2,865126E+23  |
| -2196                  | 7,562072E+22                              | 7,561898E+22 | 6,763616E+22 | 6,763497E+22 | 1,512397E+23                           | 1,352711E+23                           | 2,865108E+23  |
| -2195                  | 7,561799E+22                              | 7,561959E+22 | 6,763742E+22 | 6,763667E+22 | 1,512376E+23                           | 1,352741E+23                           | 2,865117E+23  |
| -2194                  | 7,562182E+22                              | 7,562067E+22 | 6,763684E+22 | 6,763757E+22 | 1,512425E+23                           | 1,352744E+23                           | 2,865169E+23  |
| -2193                  | 7,561894E+22                              | 7,562019E+22 | 6,763760E+22 | 6,763614E+22 | 1,512391E+23                           | 1,352737E+23                           | 2,865129E+23  |
| -2192                  | 7,561824E+22                              | 7,562037E+22 | 6,763770E+22 | 6,763835E+22 | 1,512386E+23                           | 1,352761E+23                           | 2,865147E+23  |
| -2191                  | 7,562158E+22                              | 7,562000E+22 | 6,763695E+22 | 6,763712E+22 | 1,512416E+23                           | 1,352741E+23                           | 2,865157E+23  |
| -2190                  | 7,561796E+22                              | 7,561891E+22 | 6,763783E+22 | 6,763600E+22 | 1,512369E+23                           | 1,352738E+23                           | 2,865107E+23  |
| -2189                  | 7,562013E+22                              | 7,561965E+22 | 6,763657E+22 | 6,763772E+22 | 1,512398E+23                           | 1,352743E+23                           | 2,865141E+23  |
| -2188                  | 7,562101E+22                              | 7,561939E+22 | 6,763557E+22 | 6,763556E+22 | 1,512404E+23                           | 1,352711E+23                           | 2,865115E+23  |
| -2187                  | 7,561691E+22                              | 7,561932E+22 | 6,763586E+22 | 6,763573E+22 | 1,512362E+23                           | 1,352716E+23                           | 2,865078E+23  |
| -2186                  | 7,562068E+22                              | 7,561999E+22 | 6,763498E+22 | 6,763606E+22 | 1,512407E+23                           | 1,352710E+23                           | 2,865117E+23  |
| -2185                  | 7,561913E+22                              | 7,561900E+22 | 6,763553E+22 | 6,763337E+22 | 1,512381E+23                           | 1,352689E+23                           | 2,865070E+23  |
| -2184                  | 7,561738E+22                              | 7,561879E+22 | 6,763582E+22 | 6,763507E+22 | 1,512362E+23                           | 1,352709E+23                           | 2,865071E+23  |
| -2183                  | 7,562105E+22                              | 7,561939E+22 | 6,763497E+22 | 6,763529E+22 | 1,512404E+23                           | 1,352703E+23                           | 2,865107E+23  |
| -2182                  | 7,561716E+22                              | 7,561867E+22 | 6,763596E+22 | 6,763461E+22 | 1,512358E+23                           | 1,352706E+23                           | 2,865064E+23  |
| -2181                  | 7,561797E+22                              | 7,561946E+22 | 6,763556E+22 | 6,763710E+22 | 1,512374E+23                           | 1,352727E+23                           | 2,865101E+23  |
| -2180                  | 7,562067E+22                              | 7,561946E+22 | 6,763533E+22 | 6,763592E+22 | 1,512401E+23                           | 1,352713E+23                           | 2,865114E+23  |
| -2179                  | 7,561705E+22                              | 7,561865E+22 | 6,763673E+22 | 6,763583E+22 | 1,512357E+23                           | 1,352726E+23                           | 2,865083E+23  |
| -2178                  | 7,562113E+22                              | 7,561964E+22 | 6,763678E+22 | 6,763748E+22 | 1,512408E+23                           | 1,352743E+23                           | 2,865150E+23  |
| -2177                  | 7,562083E+22                              | 7,561971E+22 | 6,763733E+22 | 6,763592E+22 | 1,512405E+23                           | 1,352733E+23                           | 2,865138E+23  |
| -2176                  | 7,561778E+22                              | 7,561995E+22 | 6,763794E+22 | 6,763786E+22 | 1,512377E+23                           | 1,352758E+23                           | 2,865135E+23  |
| -2175                  | 7,562169E+22                              | 7,562108E+22 | 6,763740E+22 | 6,763876E+22 | 1,512428E+23                           | 1,352762E+23                           | 2,865189E+23  |
| -2174                  | 7,561868E+22                              | 7,561996E+22 | 6,763872E+22 | 6,763701E+22 | 1,512386E+23                           | 1,352757E+23                           | 2,865144E+23  |
| -2173                  | 7,561871E+22                              | 7,562008E+22 | 6,763853E+22 | 6,763863E+22 | 1,512388E+23                           | 1,352772E+23                           | 2,865159E+23  |
| -2172                  | 7,562240E+22                              | 7,562013E+22 | 6,763760E+22 | 6,763777E+22 | 1,512425E+23                           | 1,352754E+23                           | 2,865179E+23  |
| -2171                  | 7,561805E+22                              | 7,561903E+22 | 6,763810E+22 | 6,763684E+22 | 1,512371E+23                           | 1,352749E+23                           | 2,865120E+23  |
| -2170                  | 7,562041E+22                              | 7,562008E+22 | 6,763707E+22 | 6,763830E+22 | 1,512405E+23                           | 1,352754E+23                           | 2,865159E+23  |
| -2169                  | 7,562078E+22                              | 7,562023E+22 | 6,763641E+22 | 6,763604E+22 | 1,512410E+23                           | 1,352725E+23                           | 2,865135E+23  |
| -2168                  | 7,561699E+22                              | 7,561940E+22 | 6,763662E+22 | 6,763608E+22 | 1,512364E+23                           | 1,352727E+23                           | 2,865091E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -2167             | 7,562110E+22                              | 7,561999E+22 | 6,763595E+22 | 6,763654E+22 | 1,512411E+23                           | 1,352725E+23                           | 2,865136E+23  |
| -2166             | 7,561895E+22                              | 7,561881E+22 | 6,763685E+22 | 6,763441E+22 | 1,512378E+23                           | 1,352713E+23                           | 2,865090E+23  |
| -2165             | 7,561726E+22                              | 7,561905E+22 | 6,763643E+22 | 6,763625E+22 | 1,512363E+23                           | 1,352727E+23                           | 2,865090E+23  |
| -2164             | 7,562096E+22                              | 7,561989E+22 | 6,763532E+22 | 6,763677E+22 | 1,512409E+23                           | 1,352721E+23                           | 2,865129E+23  |
| -2163             | 7,561693E+22                              | 7,561853E+22 | 6,763635E+22 | 6,763573E+22 | 1,512355E+23                           | 1,352721E+23                           | 2,865075E+23  |
| -2162             | 7,561883E+22                              | 7,561913E+22 | 6,763646E+22 | 6,763737E+22 | 1,512380E+23                           | 1,352738E+23                           | 2,865118E+23  |
| -2161             | 7,562139E+22                              | 7,561965E+22 | 6,763656E+22 | 6,763613E+22 | 1,512410E+23                           | 1,352727E+23                           | 2,865137E+23  |
| -2160             | 7,561783E+22                              | 7,561881E+22 | 6,763755E+22 | 6,763639E+22 | 1,512366E+23                           | 1,352739E+23                           | 2,865106E+23  |
| -2159             | 7,562144E+22                              | 7,562044E+22 | 6,763753E+22 | 6,763849E+22 | 1,512419E+23                           | 1,352760E+23                           | 2,865179E+23  |
| -2158             | 7,562023E+22                              | 7,562046E+22 | 6,763853E+22 | 6,763732E+22 | 1,512407E+23                           | 1,352759E+23                           | 2,865165E+23  |
| -2157             | 7,561743E+22                              | 7,562045E+22 | 6,763893E+22 | 6,763881E+22 | 1,512379E+23                           | 1,352777E+23                           | 2,865156E+23  |
| -2156             | 7,562184E+22                              | 7,562131E+22 | 6,763849E+22 | 6,763969E+22 | 1,512431E+23                           | 1,352782E+23                           | 2,865213E+23  |
| -2155             | 7,561896E+22                              | 7,561929E+22 | 6,763969E+22 | 6,763784E+22 | 1,512382E+23                           | 1,352775E+23                           | 2,865158E+23  |
| -2154             | 7,561954E+22                              | 7,561956E+22 | 6,763938E+22 | 6,763923E+22 | 1,512391E+23                           | 1,352786E+23                           | 2,865177E+23  |
| -2153             | 7,562252E+22                              | 7,562070E+22 | 6,763815E+22 | 6,763866E+22 | 1,512432E+23                           | 1,352768E+23                           | 2,865200E+23  |
| -2152             | 7,561811E+22                              | 7,561941E+22 | 6,763801E+22 | 6,763767E+22 | 1,512375E+23                           | 1,352757E+23                           | 2,865132E+23  |
| -2151             | 7,562049E+22                              | 7,562061E+22 | 6,763736E+22 | 6,763879E+22 | 1,512411E+23                           | 1,352761E+23                           | 2,865173E+23  |
| -2150             | 7,562067E+22                              | 7,562036E+22 | 6,763753E+22 | 6,763641E+22 | 1,512410E+23                           | 1,352739E+23                           | 2,865150E+23  |
| -2149             | 7,561724E+22                              | 7,561930E+22 | 6,763757E+22 | 6,763623E+22 | 1,512365E+23                           | 1,352738E+23                           | 2,865103E+23  |
| -2148             | 7,562131E+22                              | 7,562030E+22 | 6,763682E+22 | 6,763741E+22 | 1,512416E+23                           | 1,352742E+23                           | 2,865158E+23  |
| -2147             | 7,561864E+22                              | 7,561871E+22 | 6,763740E+22 | 6,763569E+22 | 1,512373E+23                           | 1,352731E+23                           | 2,865104E+23  |
| -2146             | 7,561733E+22                              | 7,561901E+22 | 6,763706E+22 | 6,763724E+22 | 1,512363E+23                           | 1,352743E+23                           | 2,865106E+23  |
| -2145             | 7,562098E+22                              | 7,562033E+22 | 6,763622E+22 | 6,763757E+22 | 1,512413E+23                           | 1,352738E+23                           | 2,865151E+23  |
| -2144             | 7,561759E+22                              | 7,561834E+22 | 6,763696E+22 | 6,763622E+22 | 1,512359E+23                           | 1,352732E+23                           | 2,865091E+23  |
| -2143             | 7,561982E+22                              | 7,561923E+22 | 6,763735E+22 | 6,763780E+22 | 1,512390E+23                           | 1,352751E+23                           | 2,865142E+23  |
| -2142             | 7,562163E+22                              | 7,561999E+22 | 6,763787E+22 | 6,763708E+22 | 1,512416E+23                           | 1,352749E+23                           | 2,865166E+23  |
| -2141             | 7,561772E+22                              | 7,561958E+22 | 6,763838E+22 | 6,763750E+22 | 1,512373E+23                           | 1,352759E+23                           | 2,865132E+23  |
| -2140             | 7,562108E+22                              | 7,562143E+22 | 6,763833E+22 | 6,763993E+22 | 1,512425E+23                           | 1,352783E+23                           | 2,865208E+23  |
| -2139             | 7,561977E+22                              | 7,562035E+22 | 6,763951E+22 | 6,763855E+22 | 1,512401E+23                           | 1,352781E+23                           | 2,865182E+23  |
| -2138             | 7,561802E+22                              | 7,561993E+22 | 6,764012E+22 | 6,763938E+22 | 1,512379E+23                           | 1,352795E+23                           | 2,865174E+23  |
| -2137             | 7,562241E+22                              | 7,562121E+22 | 6,763964E+22 | 6,764021E+22 | 1,512436E+23                           | 1,352798E+23                           | 2,865235E+23  |
| -2136             | 7,561972E+22                              | 7,561916E+22 | 6,763999E+22 | 6,763866E+22 | 1,512389E+23                           | 1,352787E+23                           | 2,865175E+23  |
| -2135             | 7,562005E+22                              | 7,562019E+22 | 6,763950E+22 | 6,764009E+22 | 1,512402E+23                           | 1,352796E+23                           | 2,865198E+23  |
| -2134             | 7,562214E+22                              | 7,562145E+22 | 6,763883E+22 | 6,763955E+22 | 1,512436E+23                           | 1,352784E+23                           | 2,865220E+23  |
| -2133             | 7,561802E+22                              | 7,562006E+22 | 6,763870E+22 | 6,763800E+22 | 1,512381E+23                           | 1,352767E+23                           | 2,865148E+23  |
| -2132             | 7,562061E+22                              | 7,562098E+22 | 6,763831E+22 | 6,763904E+22 | 1,512416E+23                           | 1,352774E+23                           | 2,865189E+23  |
| -2131             | 7,562061E+22                              | 7,561979E+22 | 6,763864E+22 | 6,763700E+22 | 1,512404E+23                           | 1,352756E+23                           | 2,865160E+23  |
| -2130             | 7,561762E+22                              | 7,561881E+22 | 6,763852E+22 | 6,763699E+22 | 1,512364E+23                           | 1,352755E+23                           | 2,865119E+23  |
| -2129             | 7,562094E+22                              | 7,562059E+22 | 6,763747E+22 | 6,763858E+22 | 1,512415E+23                           | 1,352760E+23                           | 2,865176E+23  |
| -2128             | 7,561864E+22                              | 7,561863E+22 | 6,763740E+22 | 6,763693E+22 | 1,512373E+23                           | 1,352743E+23                           | 2,865116E+23  |
| -2127             | 7,561785E+22                              | 7,561903E+22 | 6,763733E+22 | 6,763788E+22 | 1,512369E+23                           | 1,352752E+23                           | 2,865121E+23  |
| -2126             | 7,562140E+22                              | 7,562034E+22 | 6,763726E+22 | 6,763802E+22 | 1,512417E+23                           | 1,352753E+23                           | 2,865170E+23  |
| -2125             | 7,561840E+22                              | 7,561866E+22 | 6,763782E+22 | 6,763646E+22 | 1,512371E+23                           | 1,352743E+23                           | 2,865113E+23  |
| -2124             | 7,562021E+22                              | 7,562022E+22 | 6,763827E+22 | 6,763863E+22 | 1,512404E+23                           | 1,352769E+23                           | 2,865173E+23  |
| -2123             | 7,562123E+22                              | 7,562059E+22 | 6,763888E+22 | 6,763849E+22 | 1,512418E+23                           | 1,352774E+23                           | 2,865192E+23  |
| -2122             | 7,561762E+22                              | 7,561992E+22 | 6,763962E+22 | 6,763870E+22 | 1,512375E+23                           | 1,352783E+23                           | 2,865159E+23  |
| -2121             | 7,562074E+22                              | 7,562187E+22 | 6,763981E+22 | 6,764096E+22 | 1,512426E+23                           | 1,352808E+23                           | 2,865234E+23  |
| -2120             | 7,562030E+22                              | 7,561981E+22 | 6,764041E+22 | 6,763951E+22 | 1,512401E+23                           | 1,352799E+23                           | 2,865200E+23  |
| -2119             | 7,561897E+22                              | 7,561952E+22 | 6,764090E+22 | 6,764015E+22 | 1,512385E+23                           | 1,352810E+23                           | 2,865195E+23  |

| 1           | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------|---|--------------|--------------|--------------|--|--|---------------|
|             | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|             | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude ° | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years       |   |              |              |              |  |  |               |
| -2118       | 7,562275E+22                              | 7,562131E+22 | 6,764046E+22 | 6,764133E+22 | 1,512441E+23                           | 1,352818E+23                           | 2,865258E+23  |
| -2117       | 7,561986E+22                              | 7,561977E+22 | 6,764005E+22 | 6,763946E+22 | 1,512396E+23                           | 1,352795E+23                           | 2,865191E+23  |
| -2116       | 7,562000E+22                              | 7,562118E+22 | 6,763971E+22 | 6,764078E+22 | 1,512412E+23                           | 1,352805E+23                           | 2,865217E+23  |
| -2115       | 7,562194E+22                              | 7,562141E+22 | 6,763954E+22 | 6,763994E+22 | 1,512434E+23                           | 1,352795E+23                           | 2,865228E+23  |
| -2114       | 7,561847E+22                              | 7,561966E+22 | 6,763983E+22 | 6,763796E+22 | 1,512381E+23                           | 1,352778E+23                           | 2,865159E+23  |
| -2113       | 7,562067E+22                              | 7,562106E+22 | 6,763958E+22 | 6,763932E+22 | 1,512417E+23                           | 1,352789E+23                           | 2,865206E+23  |
| -2112       | 7,562079E+22                              | 7,561953E+22 | 6,763905E+22 | 6,763801E+22 | 1,512403E+23                           | 1,352771E+23                           | 2,865174E+23  |
| -2111       | 7,561775E+22                              | 7,561902E+22 | 6,763877E+22 | 6,763813E+22 | 1,512368E+23                           | 1,352769E+23                           | 2,865137E+23  |
| -2110       | 7,562064E+22                              | 7,562087E+22 | 6,763813E+22 | 6,763977E+22 | 1,512415E+23                           | 1,352779E+23                           | 2,865194E+23  |
| -2109       | 7,561889E+22                              | 7,561895E+22 | 6,763786E+22 | 6,763747E+22 | 1,512378E+23                           | 1,352753E+23                           | 2,865132E+23  |
| -2108       | 7,561853E+22                              | 7,561956E+22 | 6,763809E+22 | 6,763828E+22 | 1,512381E+23                           | 1,352764E+23                           | 2,865145E+23  |
| -2107       | 7,562179E+22                              | 7,562023E+22 | 6,763841E+22 | 6,763871E+22 | 1,512420E+23                           | 1,352771E+23                           | 2,865191E+23  |
| -2106       | 7,561886E+22                              | 7,561897E+22 | 6,763899E+22 | 6,763736E+22 | 1,512378E+23                           | 1,352764E+23                           | 2,865142E+23  |
| -2105       | 7,561969E+22                              | 7,562117E+22 | 6,763945E+22 | 6,763982E+22 | 1,512409E+23                           | 1,352793E+23                           | 2,865201E+23  |
| -2104       | 7,562102E+22                              | 7,562069E+22 | 6,763958E+22 | 6,763995E+22 | 1,512417E+23                           | 1,352795E+23                           | 2,865212E+23  |
| -2103       | 7,561806E+22                              | 7,561969E+22 | 6,764058E+22 | 6,763963E+22 | 1,512378E+23                           | 1,352802E+23                           | 2,865180E+23  |
| -2102       | 7,562107E+22                              | 7,562143E+22 | 6,764112E+22 | 6,764178E+22 | 1,512425E+23                           | 1,352829E+23                           | 2,865254E+23  |
| -2101       | 7,562115E+22                              | 7,561977E+22 | 6,764103E+22 | 6,764013E+22 | 1,512409E+23                           | 1,352812E+23                           | 2,865221E+23  |
| -2100       | 7,561963E+22                              | 7,562027E+22 | 6,764113E+22 | 6,764097E+22 | 1,512399E+23                           | 1,352821E+23                           | 2,865220E+23  |
| -2099       | 7,562257E+22                              | 7,562176E+22 | 6,764092E+22 | 6,764232E+22 | 1,512443E+23                           | 1,352832E+23                           | 2,865276E+23  |
| -2098       | 7,562000E+22                              | 7,562035E+22 | 6,764082E+22 | 6,763995E+22 | 1,512403E+23                           | 1,352808E+23                           | 2,865211E+23  |
| -2097       | 7,561969E+22                              | 7,562178E+22 | 6,764099E+22 | 6,764093E+22 | 1,512415E+23                           | 1,352819E+23                           | 2,865234E+23  |
| -2096       | 7,562221E+22                              | 7,562100E+22 | 6,764046E+22 | 6,764041E+22 | 1,512432E+23                           | 1,352809E+23                           | 2,865241E+23  |
| -2095       | 7,561900E+22                              | 7,561915E+22 | 6,764076E+22 | 6,763859E+22 | 1,512381E+23                           | 1,352794E+23                           | 2,865175E+23  |
| -2094       | 7,562030E+22                              | 7,562098E+22 | 6,764042E+22 | 6,764062E+22 | 1,512413E+23                           | 1,352810E+23                           | 2,865223E+23  |
| -2093       | 7,562056E+22                              | 7,561983E+22 | 6,763903E+22 | 6,763921E+22 | 1,512404E+23                           | 1,352782E+23                           | 2,865186E+23  |
| -2092       | 7,561781E+22                              | 7,561961E+22 | 6,763873E+22 | 6,763905E+22 | 1,512374E+23                           | 1,352778E+23                           | 2,865152E+23  |
| -2091       | 7,562084E+22                              | 7,562063E+22 | 6,763875E+22 | 6,764033E+22 | 1,512415E+23                           | 1,352791E+23                           | 2,865206E+23  |
| -2090       | 7,561988E+22                              | 7,561886E+22 | 6,763882E+22 | 6,763750E+22 | 1,512387E+23                           | 1,352763E+23                           | 2,865151E+23  |
| -2089       | 7,561894E+22                              | 7,562019E+22 | 6,763945E+22 | 6,763853E+22 | 1,512391E+23                           | 1,352780E+23                           | 2,865171E+23  |
| -2088       | 7,562205E+22                              | 7,562059E+22 | 6,763920E+22 | 6,763978E+22 | 1,512426E+23                           | 1,352790E+23                           | 2,865216E+23  |
| -2087       | 7,561887E+22                              | 7,561947E+22 | 6,764001E+22 | 6,763862E+22 | 1,512383E+23                           | 1,352786E+23                           | 2,865170E+23  |
| -2086       | 7,561916E+22                              | 7,562155E+22 | 6,764089E+22 | 6,764128E+22 | 1,512407E+23                           | 1,352822E+23                           | 2,865229E+23  |
| -2085       | 7,562113E+22                              | 7,562064E+22 | 6,764050E+22 | 6,764086E+22 | 1,512418E+23                           | 1,352814E+23                           | 2,865231E+23  |
| -2084       | 7,561878E+22                              | 7,561972E+22 | 6,764138E+22 | 6,764046E+22 | 1,512385E+23                           | 1,352818E+23                           | 2,865203E+23  |
| -2083       | 7,562166E+22                              | 7,562091E+22 | 6,764201E+22 | 6,764279E+22 | 1,512426E+23                           | 1,352848E+23                           | 2,865274E+23  |
| -2082       | 7,562171E+22                              | 7,562005E+22 | 6,764157E+22 | 6,764101E+22 | 1,512418E+23                           | 1,352826E+23                           | 2,865243E+23  |
| -2081       | 7,561941E+22                              | 7,562139E+22 | 6,764179E+22 | 6,764174E+22 | 1,512408E+23                           | 1,352835E+23                           | 2,865243E+23  |
| -2080       | 7,562256E+22                              | 7,562199E+22 | 6,764132E+22 | 6,764306E+22 | 1,512446E+23                           | 1,352844E+23                           | 2,865289E+23  |
| -2079       | 7,562039E+22                              | 7,562030E+22 | 6,764179E+22 | 6,764018E+22 | 1,512407E+23                           | 1,352820E+23                           | 2,865227E+23  |
| -2078       | 7,561968E+22                              | 7,562161E+22 | 6,764236E+22 | 6,764137E+22 | 1,512413E+23                           | 1,352837E+23                           | 2,865250E+23  |
| -2077       | 7,562236E+22                              | 7,562096E+22 | 6,764106E+22 | 6,764104E+22 | 1,512433E+23                           | 1,352821E+23                           | 2,865254E+23  |
| -2076       | 7,561910E+22                              | 7,561972E+22 | 6,764095E+22 | 6,763972E+22 | 1,512388E+23                           | 1,352807E+23                           | 2,865195E+23  |
| -2075       | 7,561995E+22                              | 7,562093E+22 | 6,764085E+22 | 6,764189E+22 | 1,512409E+23                           | 1,352827E+23                           | 2,865236E+23  |
| -2074       | 7,562079E+22                              | 7,562005E+22 | 6,763959E+22 | 6,763986E+22 | 1,512408E+23                           | 1,352794E+23                           | 2,865203E+23  |
| -2073       | 7,561803E+22                              | 7,562011E+22 | 6,763977E+22 | 6,763916E+22 | 1,512381E+23                           | 1,352789E+23                           | 2,865171E+23  |
| -2072       | 7,562157E+22                              | 7,562035E+22 | 6,763958E+22 | 6,764073E+22 | 1,512419E+23                           | 1,352803E+23                           | 2,865222E+23  |
| -2071       | 7,562073E+22                              | 7,561886E+22 | 6,763993E+22 | 6,763809E+22 | 1,512396E+23                           | 1,352780E+23                           | 2,865176E+23  |
| -2070       | 7,561854E+22                              | 7,562063E+22 | 6,764066E+22 | 6,763979E+22 | 1,512392E+23                           | 1,352805E+23                           | 2,865196E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -2069                  | 7,562159E+22                              | 7,562116E+22 | 6,763977E+22 | 6,764111E+22 | 1,512427E+23                           | 1,352809E+23                           | 2,865236E+23  |
| -2068                  | 7,561886E+22                              | 7,561989E+22 | 6,764058E+22 | 6,763981E+22 | 1,512388E+23                           | 1,352804E+23                           | 2,865191E+23  |
| -2067                  | 7,561921E+22                              | 7,562088E+22 | 6,764200E+22 | 6,764226E+22 | 1,512401E+23                           | 1,352843E+23                           | 2,865244E+23  |
| -2066                  | 7,562203E+22                              | 7,562038E+22 | 6,764149E+22 | 6,764143E+22 | 1,512424E+23                           | 1,352829E+23                           | 2,865253E+23  |
| -2065                  | 7,561934E+22                              | 7,562024E+22 | 6,764235E+22 | 6,764103E+22 | 1,512396E+23                           | 1,352834E+23                           | 2,865230E+23  |
| -2064                  | 7,562209E+22                              | 7,562129E+22 | 6,764233E+22 | 6,764392E+22 | 1,512434E+23                           | 1,352863E+23                           | 2,865296E+23  |
| -2063                  | 7,562204E+22                              | 7,562069E+22 | 6,764225E+22 | 6,764184E+22 | 1,512427E+23                           | 1,352841E+23                           | 2,865268E+23  |
| -2062                  | 7,561899E+22                              | 7,562203E+22 | 6,764308E+22 | 6,764250E+22 | 1,512410E+23                           | 1,352856E+23                           | 2,865266E+23  |
| -2061                  | 7,562255E+22                              | 7,562219E+22 | 6,764227E+22 | 6,764343E+22 | 1,512447E+23                           | 1,352857E+23                           | 2,865305E+23  |
| -2060                  | 7,562079E+22                              | 7,562038E+22 | 6,764269E+22 | 6,764076E+22 | 1,512412E+23                           | 1,352835E+23                           | 2,865246E+23  |
| -2059                  | 7,561960E+22                              | 7,562101E+22 | 6,764335E+22 | 6,764249E+22 | 1,512406E+23                           | 1,352858E+23                           | 2,865265E+23  |
| -2058                  | 7,562233E+22                              | 7,562106E+22 | 6,764144E+22 | 6,764212E+22 | 1,512434E+23                           | 1,352836E+23                           | 2,865269E+23  |
| -2057                  | 7,561881E+22                              | 7,562032E+22 | 6,764136E+22 | 6,764057E+22 | 1,512391E+23                           | 1,352819E+23                           | 2,865211E+23  |
| -2056                  | 7,562029E+22                              | 7,562064E+22 | 6,764098E+22 | 6,764260E+22 | 1,512409E+23                           | 1,352836E+23                           | 2,865245E+23  |
| -2055                  | 7,562167E+22                              | 7,561975E+22 | 6,764036E+22 | 6,763988E+22 | 1,512414E+23                           | 1,352802E+23                           | 2,865217E+23  |
| -2054                  | 7,561849E+22                              | 7,562026E+22 | 6,764104E+22 | 6,763942E+22 | 1,512388E+23                           | 1,352805E+23                           | 2,865192E+23  |
| -2053                  | 7,562187E+22                              | 7,562075E+22 | 6,764023E+22 | 6,764118E+22 | 1,512426E+23                           | 1,352814E+23                           | 2,865240E+23  |
| -2052                  | 7,562066E+22                              | 7,561990E+22 | 6,764047E+22 | 6,763924E+22 | 1,512406E+23                           | 1,352797E+23                           | 2,865203E+23  |
| -2051                  | 7,561791E+22                              | 7,562083E+22 | 6,764174E+22 | 6,764131E+22 | 1,512387E+23                           | 1,352831E+23                           | 2,865218E+23  |
| -2050                  | 7,562137E+22                              | 7,562138E+22 | 6,764083E+22 | 6,764215E+22 | 1,512428E+23                           | 1,352830E+23                           | 2,865257E+23  |
| -2049                  | 7,561904E+22                              | 7,562012E+22 | 6,764195E+22 | 6,764051E+22 | 1,512392E+23                           | 1,352825E+23                           | 2,865216E+23  |
| -2048                  | 7,562010E+22                              | 7,562018E+22 | 6,764282E+22 | 6,764324E+22 | 1,512403E+23                           | 1,352861E+23                           | 2,865263E+23  |
| -2047                  | 7,562300E+22                              | 7,562024E+22 | 6,764237E+22 | 6,764233E+22 | 1,512432E+23                           | 1,352847E+23                           | 2,865279E+23  |
| -2046                  | 7,561931E+22                              | 7,562099E+22 | 6,764319E+22 | 6,764224E+22 | 1,512403E+23                           | 1,352854E+23                           | 2,865257E+23  |
| -2045                  | 7,562195E+22                              | 7,562209E+22 | 6,764265E+22 | 6,764477E+22 | 1,512440E+23                           | 1,352874E+23                           | 2,865315E+23  |
| -2044                  | 7,562222E+22                              | 7,562148E+22 | 6,764286E+22 | 6,764249E+22 | 1,512437E+23                           | 1,352853E+23                           | 2,865290E+23  |
| -2043                  | 7,561900E+22                              | 7,562161E+22 | 6,764443E+22 | 6,764307E+22 | 1,512406E+23                           | 1,352875E+23                           | 2,865281E+23  |
| -2042                  | 7,562289E+22                              | 7,562210E+22 | 6,764340E+22 | 6,764383E+22 | 1,512450E+23                           | 1,352872E+23                           | 2,865322E+23  |
| -2041                  | 7,562086E+22                              | 7,562077E+22 | 6,764368E+22 | 6,764146E+22 | 1,512416E+23                           | 1,352851E+23                           | 2,865268E+23  |
| -2040                  | 7,561962E+22                              | 7,562086E+22 | 6,764357E+22 | 6,764380E+22 | 1,512405E+23                           | 1,352874E+23                           | 2,865278E+23  |
| -2039                  | 7,562262E+22                              | 7,562111E+22 | 6,764193E+22 | 6,764300E+22 | 1,512437E+23                           | 1,352849E+23                           | 2,865287E+23  |
| -2038                  | 7,561871E+22                              | 7,562055E+22 | 6,764217E+22 | 6,764111E+22 | 1,512393E+23                           | 1,352833E+23                           | 2,865225E+23  |
| -2037                  | 7,562071E+22                              | 7,562072E+22 | 6,764145E+22 | 6,764270E+22 | 1,512414E+23                           | 1,352841E+23                           | 2,865256E+23  |
| -2036                  | 7,562245E+22                              | 7,562010E+22 | 6,764093E+22 | 6,764022E+22 | 1,512426E+23                           | 1,352811E+23                           | 2,865237E+23  |
| -2035                  | 7,561835E+22                              | 7,562015E+22 | 6,764209E+22 | 6,764045E+22 | 1,512385E+23                           | 1,352825E+23                           | 2,865210E+23  |
| -2034                  | 7,562138E+22                              | 7,562147E+22 | 6,764094E+22 | 6,764230E+22 | 1,512428E+23                           | 1,352832E+23                           | 2,865261E+23  |
| -2033                  | 7,562011E+22                              | 7,562063E+22 | 6,764144E+22 | 6,764034E+22 | 1,512407E+23                           | 1,352818E+23                           | 2,865225E+23  |
| -2032                  | 7,561801E+22                              | 7,562029E+22 | 6,764246E+22 | 6,764249E+22 | 1,512383E+23                           | 1,352850E+23                           | 2,865232E+23  |
| -2031                  | 7,562226E+22                              | 7,562073E+22 | 6,764197E+22 | 6,764273E+22 | 1,512430E+23                           | 1,352847E+23                           | 2,865277E+23  |
| -2030                  | 7,561966E+22                              | 7,562007E+22 | 6,764315E+22 | 6,764127E+22 | 1,512397E+23                           | 1,352844E+23                           | 2,865242E+23  |
| -2029                  | 7,562075E+22                              | 7,562063E+22 | 6,764318E+22 | 6,764408E+22 | 1,512414E+23                           | 1,352873E+23                           | 2,865286E+23  |
| -2028                  | 7,562341E+22                              | 7,562143E+22 | 6,764271E+22 | 6,764340E+22 | 1,512448E+23                           | 1,352861E+23                           | 2,865309E+23  |
| -2027                  | 7,561906E+22                              | 7,562150E+22 | 6,764435E+22 | 6,764338E+22 | 1,512406E+23                           | 1,352877E+23                           | 2,865283E+23  |
| -2026                  | 7,562180E+22                              | 7,562273E+22 | 6,764388E+22 | 6,764524E+22 | 1,512445E+23                           | 1,352891E+23                           | 2,865337E+23  |
| -2025                  | 7,562230E+22                              | 7,562188E+22 | 6,764448E+22 | 6,764289E+22 | 1,512442E+23                           | 1,352874E+23                           | 2,865316E+23  |
| -2024                  | 7,561948E+22                              | 7,562084E+22 | 6,764545E+22 | 6,764410E+22 | 1,512403E+23                           | 1,352895E+23                           | 2,865299E+23  |
| -2023                  | 7,562320E+22                              | 7,562164E+22 | 6,764421E+22 | 6,764486E+22 | 1,512448E+23                           | 1,352891E+23                           | 2,865339E+23  |
| -2022                  | 7,562051E+22                              | 7,562109E+22 | 6,764417E+22 | 6,764281E+22 | 1,512416E+23                           | 1,352870E+23                           | 2,865286E+23  |
| -2021                  | 7,561964E+22                              | 7,562098E+22 | 6,764328E+22 | 6,764454E+22 | 1,512406E+23                           | 1,352878E+23                           | 2,865284E+23  |



| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -2020             | 7,562308E+22                              | 7,562144E+22 | 6,764196E+22 | 6,764330E+22 | 1,512445E+23                           | 1,352853E+23                           | 2,865298E+23  |
| -2019             | 7,561914E+22                              | 7,562027E+22 | 6,764307E+22 | 6,764133E+22 | 1,512394E+23                           | 1,352844E+23                           | 2,865238E+23  |
| -2018             | 7,562105E+22                              | 7,562112E+22 | 6,764226E+22 | 6,764270E+22 | 1,512422E+23                           | 1,352850E+23                           | 2,865271E+23  |
| -2017             | 7,562239E+22                              | 7,562110E+22 | 6,764196E+22 | 6,764080E+22 | 1,512435E+23                           | 1,352828E+23                           | 2,865262E+23  |
| -2016             | 7,561813E+22                              | 7,562024E+22 | 6,764276E+22 | 6,764185E+22 | 1,512384E+23                           | 1,352846E+23                           | 2,865230E+23  |
| -2015             | 7,562122E+22                              | 7,562146E+22 | 6,764207E+22 | 6,764336E+22 | 1,512427E+23                           | 1,352854E+23                           | 2,865281E+23  |
| -2014             | 7,561993E+22                              | 7,562070E+22 | 6,764280E+22 | 6,764139E+22 | 1,512406E+23                           | 1,352842E+23                           | 2,865248E+23  |
| -2013             | 7,561865E+22                              | 7,561991E+22 | 6,764316E+22 | 6,764316E+22 | 1,512386E+23                           | 1,352863E+23                           | 2,865249E+23  |
| -2012             | 7,562332E+22                              | 7,562085E+22 | 6,764257E+22 | 6,764362E+22 | 1,512442E+23                           | 1,352862E+23                           | 2,865304E+23  |
| -2011             | 7,561999E+22                              | 7,562016E+22 | 6,764403E+22 | 6,764258E+22 | 1,512402E+23                           | 1,352866E+23                           | 2,865268E+23  |
| -2010             | 7,562066E+22                              | 7,562174E+22 | 6,764372E+22 | 6,764504E+22 | 1,512424E+23                           | 1,352888E+23                           | 2,865312E+23  |
| -2009             | 7,562329E+22                              | 7,562256E+22 | 6,764377E+22 | 6,764415E+22 | 1,512459E+23                           | 1,352879E+23                           | 2,865338E+23  |
| -2008             | 7,561925E+22                              | 7,562122E+22 | 6,764543E+22 | 6,764425E+22 | 1,512405E+23                           | 1,352897E+23                           | 2,865301E+23  |
| -2007             | 7,562237E+22                              | 7,562230E+22 | 6,764540E+22 | 6,764565E+22 | 1,512447E+23                           | 1,352911E+23                           | 2,865357E+23  |
| -2006             | 7,562243E+22                              | 7,562180E+22 | 6,764574E+22 | 6,764375E+22 | 1,512442E+23                           | 1,352895E+23                           | 2,865337E+23  |
| -2005             | 7,561959E+22                              | 7,562088E+22 | 6,764558E+22 | 6,764515E+22 | 1,512405E+23                           | 1,352907E+23                           | 2,865312E+23  |
| -2004             | 7,562340E+22                              | 7,562223E+22 | 6,764410E+22 | 6,764600E+22 | 1,512456E+23                           | 1,352901E+23                           | 2,865357E+23  |
| -2003             | 7,562033E+22                              | 7,562107E+22 | 6,764469E+22 | 6,764378E+22 | 1,512414E+23                           | 1,352885E+23                           | 2,865299E+23  |
| -2002             | 7,561976E+22                              | 7,562148E+22 | 6,764378E+22 | 6,764461E+22 | 1,512412E+23                           | 1,352884E+23                           | 2,865296E+23  |
| -2001             | 7,562357E+22                              | 7,562188E+22 | 6,764302E+22 | 6,764321E+22 | 1,512455E+23                           | 1,352862E+23                           | 2,865317E+23  |
| -2000             | 7,561966E+22                              | 7,561984E+22 | 6,764392E+22 | 6,764200E+22 | 1,512395E+23                           | 1,352859E+23                           | 2,865254E+23  |
| -1999             | 7,562109E+22                              | 7,562118E+22 | 6,764327E+22 | 6,764346E+22 | 1,512423E+23                           | 1,352867E+23                           | 2,865290E+23  |
| -1998             | 7,562169E+22                              | 7,562164E+22 | 6,764290E+22 | 6,764212E+22 | 1,512433E+23                           | 1,352850E+23                           | 2,865283E+23  |
| -1997             | 7,561798E+22                              | 7,562017E+22 | 6,764310E+22 | 6,764293E+22 | 1,512382E+23                           | 1,352860E+23                           | 2,865242E+23  |
| -1996             | 7,562174E+22                              | 7,562135E+22 | 6,764262E+22 | 6,764414E+22 | 1,512431E+23                           | 1,352868E+23                           | 2,865299E+23  |
| -1995             | 7,562056E+22                              | 7,562012E+22 | 6,764393E+22 | 6,764226E+22 | 1,512407E+23                           | 1,352862E+23                           | 2,865269E+23  |
| -1994             | 7,561932E+22                              | 7,562038E+22 | 6,764381E+22 | 6,764370E+22 | 1,512397E+23                           | 1,352875E+23                           | 2,865272E+23  |
| -1993             | 7,562367E+22                              | 7,562206E+22 | 6,764346E+22 | 6,764450E+22 | 1,512457E+23                           | 1,352880E+23                           | 2,865337E+23  |
| -1992             | 7,562019E+22                              | 7,562068E+22 | 6,764477E+22 | 6,764397E+22 | 1,512409E+23                           | 1,352887E+23                           | 2,865296E+23  |
| -1991             | 7,562067E+22                              | 7,562212E+22 | 6,764510E+22 | 6,764574E+22 | 1,512428E+23                           | 1,352908E+23                           | 2,865336E+23  |
| -1990             | 7,562310E+22                              | 7,562298E+22 | 6,764543E+22 | 6,764497E+22 | 1,512461E+23                           | 1,352904E+23                           | 2,865365E+23  |
| -1989             | 7,561973E+22                              | 7,562078E+22 | 6,764635E+22 | 6,764496E+22 | 1,512405E+23                           | 1,352913E+23                           | 2,865318E+23  |
| -1988             | 7,562281E+22                              | 7,562217E+22 | 6,764603E+22 | 6,764668E+22 | 1,512450E+23                           | 1,352927E+23                           | 2,865377E+23  |
| -1987             | 7,562228E+22                              | 7,562164E+22 | 6,764637E+22 | 6,764531E+22 | 1,512439E+23                           | 1,352917E+23                           | 2,865356E+23  |
| -1986             | 7,561935E+22                              | 7,562150E+22 | 6,764554E+22 | 6,764604E+22 | 1,512408E+23                           | 1,352916E+23                           | 2,865324E+23  |
| -1985             | 7,562352E+22                              | 7,562284E+22 | 6,764456E+22 | 6,764641E+22 | 1,512464E+23                           | 1,352910E+23                           | 2,865373E+23  |
| -1984             | 7,562097E+22                              | 7,562059E+22 | 6,764519E+22 | 6,764407E+22 | 1,512416E+23                           | 1,352893E+23                           | 2,865308E+23  |
| -1983             | 7,562055E+22                              | 7,562121E+22 | 6,764490E+22 | 6,764434E+22 | 1,512418E+23                           | 1,352892E+23                           | 2,865310E+23  |
| -1982             | 7,562367E+22                              | 7,562236E+22 | 6,764418E+22 | 6,764364E+22 | 1,512460E+23                           | 1,352878E+23                           | 2,865338E+23  |
| -1981             | 7,561960E+22                              | 7,562019E+22 | 6,764431E+22 | 6,764293E+22 | 1,512398E+23                           | 1,352872E+23                           | 2,865270E+23  |
| -1980             | 7,562083E+22                              | 7,562180E+22 | 6,764374E+22 | 6,764467E+22 | 1,512426E+23                           | 1,352884E+23                           | 2,865310E+23  |
| -1979             | 7,562124E+22                              | 7,562149E+22 | 6,764400E+22 | 6,764348E+22 | 1,512427E+23                           | 1,352875E+23                           | 2,865302E+23  |
| -1978             | 7,561807E+22                              | 7,562035E+22 | 6,764390E+22 | 6,764354E+22 | 1,512384E+23                           | 1,352874E+23                           | 2,865259E+23  |
| -1977             | 7,562254E+22                              | 7,562146E+22 | 6,764374E+22 | 6,764473E+22 | 1,512440E+23                           | 1,352885E+23                           | 2,865325E+23  |
| -1976             | 7,562133E+22                              | 7,561971E+22 | 6,764460E+22 | 6,764346E+22 | 1,512410E+23                           | 1,352881E+23                           | 2,865291E+23  |
| -1975             | 7,561974E+22                              | 7,562082E+22 | 6,764466E+22 | 6,764464E+22 | 1,512406E+23                           | 1,352893E+23                           | 2,865299E+23  |
| -1974             | 7,562337E+22                              | 7,562299E+22 | 6,764438E+22 | 6,764560E+22 | 1,512464E+23                           | 1,352900E+23                           | 2,865363E+23  |
| -1973             | 7,562024E+22                              | 7,562092E+22 | 6,764542E+22 | 6,764478E+22 | 1,512412E+23                           | 1,352902E+23                           | 2,865313E+23  |
| -1972             | 7,562109E+22                              | 7,562227E+22 | 6,764608E+22 | 6,764632E+22 | 1,512434E+23                           | 1,352924E+23                           | 2,865358E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -1971             | 7,562331E+22                              | 7,562247E+22 | 6,764686E+22 | 6,764595E+22 | 1,512458E+23                           | 1,352928E+23                           | 2,865386E+23  |
| -1970             | 7,561990E+22                              | 7,562112E+22 | 6,764704E+22 | 6,764578E+22 | 1,512410E+23                           | 1,352928E+23                           | 2,865338E+23  |
| -1969             | 7,562296E+22                              | 7,562282E+22 | 6,764667E+22 | 6,764771E+22 | 1,512458E+23                           | 1,352944E+23                           | 2,865402E+23  |
| -1968             | 7,562242E+22                              | 7,562158E+22 | 6,764669E+22 | 6,764658E+22 | 1,512440E+23                           | 1,352933E+23                           | 2,865373E+23  |
| -1967             | 7,561970E+22                              | 7,562161E+22 | 6,764636E+22 | 6,764631E+22 | 1,512413E+23                           | 1,352927E+23                           | 2,865340E+23  |
| -1966             | 7,562371E+22                              | 7,562318E+22 | 6,764569E+22 | 6,764658E+22 | 1,512469E+23                           | 1,352923E+23                           | 2,865392E+23  |
| -1965             | 7,562165E+22                              | 7,562042E+22 | 6,764584E+22 | 6,764430E+22 | 1,512421E+23                           | 1,352901E+23                           | 2,865322E+23  |
| -1964             | 7,562086E+22                              | 7,562149E+22 | 6,764552E+22 | 6,764496E+22 | 1,512424E+23                           | 1,352905E+23                           | 2,865328E+23  |
| -1963             | 7,562305E+22                              | 7,562258E+22 | 6,764503E+22 | 6,764510E+22 | 1,512456E+23                           | 1,352901E+23                           | 2,865358E+23  |
| -1962             | 7,561897E+22                              | 7,562083E+22 | 6,764466E+22 | 6,764399E+22 | 1,512398E+23                           | 1,352887E+23                           | 2,865285E+23  |
| -1961             | 7,562072E+22                              | 7,562205E+22 | 6,764460E+22 | 6,764548E+22 | 1,512428E+23                           | 1,352901E+23                           | 2,865329E+23  |
| -1960             | 7,562186E+22                              | 7,562070E+22 | 6,764478E+22 | 6,764439E+22 | 1,512426E+23                           | 1,352892E+23                           | 2,865317E+23  |
| -1959             | 7,561904E+22                              | 7,561990E+22 | 6,764485E+22 | 6,764378E+22 | 1,512389E+23                           | 1,352886E+23                           | 2,865276E+23  |
| -1958             | 7,562293E+22                              | 7,562203E+22 | 6,764465E+22 | 6,764550E+22 | 1,512450E+23                           | 1,352901E+23                           | 2,865351E+23  |
| -1957             | 7,562176E+22                              | 7,562031E+22 | 6,764484E+22 | 6,764445E+22 | 1,512421E+23                           | 1,352893E+23                           | 2,865314E+23  |
| -1956             | 7,561979E+22                              | 7,562171E+22 | 6,764534E+22 | 6,764555E+22 | 1,512415E+23                           | 1,352909E+23                           | 2,865324E+23  |
| -1955             | 7,562301E+22                              | 7,562331E+22 | 6,764592E+22 | 6,764671E+22 | 1,512463E+23                           | 1,352926E+23                           | 2,865389E+23  |
| -1954             | 7,562025E+22                              | 7,562126E+22 | 6,764670E+22 | 6,764533E+22 | 1,512415E+23                           | 1,352920E+23                           | 2,865335E+23  |
| -1953             | 7,562152E+22                              | 7,562231E+22 | 6,764757E+22 | 6,764713E+22 | 1,512438E+23                           | 1,352947E+23                           | 2,865385E+23  |
| -1952             | 7,562364E+22                              | 7,562189E+22 | 6,764767E+22 | 6,764750E+22 | 1,512455E+23                           | 1,352952E+23                           | 2,865407E+23  |
| -1951             | 7,562008E+22                              | 7,562119E+22 | 6,764761E+22 | 6,764688E+22 | 1,512413E+23                           | 1,352945E+23                           | 2,865358E+23  |
| -1950             | 7,562282E+22                              | 7,562337E+22 | 6,764722E+22 | 6,764871E+22 | 1,512462E+23                           | 1,352959E+23                           | 2,865421E+23  |
| -1949             | 7,562293E+22                              | 7,562154E+22 | 6,764685E+22 | 6,764701E+22 | 1,512445E+23                           | 1,352939E+23                           | 2,865383E+23  |
| -1948             | 7,562049E+22                              | 7,562179E+22 | 6,764697E+22 | 6,764630E+22 | 1,512423E+23                           | 1,352933E+23                           | 2,865355E+23  |
| -1947             | 7,562393E+22                              | 7,562314E+22 | 6,764686E+22 | 6,764704E+22 | 1,512471E+23                           | 1,352939E+23                           | 2,865410E+23  |
| -1946             | 7,562145E+22                              | 7,562126E+22 | 6,764647E+22 | 6,764484E+22 | 1,512427E+23                           | 1,352913E+23                           | 2,865340E+23  |
| -1945             | 7,562053E+22                              | 7,562236E+22 | 6,764636E+22 | 6,764601E+22 | 1,512429E+23                           | 1,352924E+23                           | 2,865353E+23  |
| -1944             | 7,562256E+22                              | 7,562233E+22 | 6,764569E+22 | 6,764654E+22 | 1,512449E+23                           | 1,352922E+23                           | 2,865371E+23  |
| -1943             | 7,561906E+22                              | 7,562056E+22 | 6,764567E+22 | 6,764461E+22 | 1,512396E+23                           | 1,352903E+23                           | 2,865299E+23  |
| -1942             | 7,562110E+22                              | 7,562179E+22 | 6,764567E+22 | 6,764598E+22 | 1,512429E+23                           | 1,352917E+23                           | 2,865345E+23  |
| -1941             | 7,562280E+22                              | 7,562015E+22 | 6,764518E+22 | 6,764499E+22 | 1,512429E+23                           | 1,352902E+23                           | 2,865331E+23  |
| -1940             | 7,561975E+22                              | 7,562034E+22 | 6,764524E+22 | 6,764455E+22 | 1,512401E+23                           | 1,352898E+23                           | 2,865299E+23  |
| -1939             | 7,562264E+22                              | 7,562261E+22 | 6,764543E+22 | 6,764681E+22 | 1,512453E+23                           | 1,352922E+23                           | 2,865375E+23  |
| -1938             | 7,562139E+22                              | 7,562140E+22 | 6,764547E+22 | 6,764524E+22 | 1,512428E+23                           | 1,352907E+23                           | 2,865335E+23  |
| -1937             | 7,561991E+22                              | 7,562221E+22 | 6,764672E+22 | 6,764618E+22 | 1,512421E+23                           | 1,352929E+23                           | 2,865350E+23  |
| -1936             | 7,562332E+22                              | 7,562268E+22 | 6,764730E+22 | 6,764768E+22 | 1,512460E+23                           | 1,352950E+23                           | 2,865410E+23  |
| -1935             | 7,562089E+22                              | 7,562095E+22 | 6,764810E+22 | 6,764602E+22 | 1,512418E+23                           | 1,352941E+23                           | 2,865360E+23  |
| -1934             | 7,562162E+22                              | 7,562267E+22 | 6,764862E+22 | 6,764835E+22 | 1,512443E+23                           | 1,352970E+23                           | 2,865413E+23  |
| -1933             | 7,562392E+22                              | 7,562215E+22 | 6,764783E+22 | 6,764886E+22 | 1,512461E+23                           | 1,352967E+23                           | 2,865428E+23  |
| -1932             | 7,562041E+22                              | 7,562178E+22 | 6,764796E+22 | 6,764772E+22 | 1,512422E+23                           | 1,352957E+23                           | 2,865379E+23  |
| -1931             | 7,562282E+22                              | 7,562361E+22 | 6,764825E+22 | 6,764947E+22 | 1,512464E+23                           | 1,352977E+23                           | 2,865442E+23  |
| -1930             | 7,562325E+22                              | 7,562209E+22 | 6,764765E+22 | 6,764707E+22 | 1,512453E+23                           | 1,352947E+23                           | 2,865401E+23  |
| -1929             | 7,562092E+22                              | 7,562212E+22 | 6,764816E+22 | 6,764668E+22 | 1,512430E+23                           | 1,352948E+23                           | 2,865379E+23  |
| -1928             | 7,562375E+22                              | 7,562299E+22 | 6,764766E+22 | 6,764826E+22 | 1,512467E+23                           | 1,352959E+23                           | 2,865427E+23  |
| -1927             | 7,562111E+22                              | 7,562137E+22 | 6,764715E+22 | 6,764575E+22 | 1,512425E+23                           | 1,352929E+23                           | 2,865354E+23  |
| -1926             | 7,561996E+22                              | 7,562250E+22 | 6,764711E+22 | 6,764698E+22 | 1,512425E+23                           | 1,352941E+23                           | 2,865366E+23  |
| -1925             | 7,562296E+22                              | 7,562170E+22 | 6,764594E+22 | 6,764717E+22 | 1,512447E+23                           | 1,352931E+23                           | 2,865378E+23  |
| -1924             | 7,561999E+22                              | 7,562018E+22 | 6,764613E+22 | 6,764482E+22 | 1,512402E+23                           | 1,352909E+23                           | 2,865311E+23  |
| -1923             | 7,562161E+22                              | 7,562170E+22 | 6,764651E+22 | 6,764672E+22 | 1,512433E+23                           | 1,352932E+23                           | 2,865365E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -1922             | 7,562299E+22                              | 7,562117E+22 | 6,764552E+22 | 6,764556E+22 | 1,512442E+23                           | 1,352911E+23                           | 2,865352E+23  |
| -1921             | 7,561982E+22                              | 7,562154E+22 | 6,764614E+22 | 6,764545E+22 | 1,512414E+23                           | 1,352916E+23                           | 2,865329E+23  |
| -1920             | 7,562230E+22                              | 7,562290E+22 | 6,764658E+22 | 6,764801E+22 | 1,512452E+23                           | 1,352946E+23                           | 2,865398E+23  |
| -1919             | 7,562144E+22                              | 7,562157E+22 | 6,764710E+22 | 6,764586E+22 | 1,512430E+23                           | 1,352930E+23                           | 2,865360E+23  |
| -1918             | 7,562007E+22                              | 7,562219E+22 | 6,764847E+22 | 6,764708E+22 | 1,512423E+23                           | 1,352955E+23                           | 2,865378E+23  |
| -1917             | 7,562389E+22                              | 7,562213E+22 | 6,764813E+22 | 6,764894E+22 | 1,512460E+23                           | 1,352971E+23                           | 2,865431E+23  |
| -1916             | 7,562135E+22                              | 7,562114E+22 | 6,764859E+22 | 6,764741E+22 | 1,512425E+23                           | 1,352960E+23                           | 2,865385E+23  |
| -1915             | 7,562142E+22                              | 7,562300E+22 | 6,764916E+22 | 6,765000E+22 | 1,512444E+23                           | 1,352992E+23                           | 2,865436E+23  |
| -1914             | 7,562387E+22                              | 7,562296E+22 | 6,764810E+22 | 6,764954E+22 | 1,512468E+23                           | 1,352976E+23                           | 2,865445E+23  |
| -1913             | 7,562110E+22                              | 7,562229E+22 | 6,764889E+22 | 6,764798E+22 | 1,512434E+23                           | 1,352969E+23                           | 2,865403E+23  |
| -1912             | 7,562328E+22                              | 7,562319E+22 | 6,764926E+22 | 6,764980E+22 | 1,512465E+23                           | 1,352991E+23                           | 2,865455E+23  |
| -1911             | 7,562368E+22                              | 7,562223E+22 | 6,764878E+22 | 6,764725E+22 | 1,512459E+23                           | 1,352960E+23                           | 2,865419E+23  |
| -1910             | 7,562068E+22                              | 7,562263E+22 | 6,764913E+22 | 6,764749E+22 | 1,512433E+23                           | 1,352966E+23                           | 2,865399E+23  |
| -1909             | 7,562340E+22                              | 7,562298E+22 | 6,764791E+22 | 6,764939E+22 | 1,512464E+23                           | 1,352973E+23                           | 2,865437E+23  |
| -1908             | 7,562109E+22                              | 7,562147E+22 | 6,764766E+22 | 6,764659E+22 | 1,512426E+23                           | 1,352942E+23                           | 2,865368E+23  |
| -1907             | 7,561989E+22                              | 7,562213E+22 | 6,764802E+22 | 6,764785E+22 | 1,512420E+23                           | 1,352959E+23                           | 2,865379E+23  |
| -1906             | 7,562342E+22                              | 7,562174E+22 | 6,764649E+22 | 6,764743E+22 | 1,512452E+23                           | 1,352939E+23                           | 2,865391E+23  |
| -1905             | 7,562085E+22                              | 7,562047E+22 | 6,764687E+22 | 6,764538E+22 | 1,512413E+23                           | 1,352922E+23                           | 2,865336E+23  |
| -1904             | 7,562163E+22                              | 7,562189E+22 | 6,764702E+22 | 6,764790E+22 | 1,512435E+23                           | 1,352949E+23                           | 2,865384E+23  |
| -1903             | 7,562288E+22                              | 7,562197E+22 | 6,764627E+22 | 6,764639E+22 | 1,512449E+23                           | 1,352927E+23                           | 2,865375E+23  |
| -1902             | 7,561952E+22                              | 7,562215E+22 | 6,764742E+22 | 6,764632E+22 | 1,512417E+23                           | 1,352937E+23                           | 2,865354E+23  |
| -1901             | 7,562254E+22                              | 7,562261E+22 | 6,764760E+22 | 6,764880E+22 | 1,512451E+23                           | 1,352964E+23                           | 2,865415E+23  |
| -1900             | 7,562216E+22                              | 7,562134E+22 | 6,764830E+22 | 6,764657E+22 | 1,512435E+23                           | 1,352949E+23                           | 2,865384E+23  |
| -1899             | 7,562026E+22                              | 7,562208E+22 | 6,764969E+22 | 6,764853E+22 | 1,512423E+23                           | 1,352982E+23                           | 2,865406E+23  |
| -1898             | 7,562397E+22                              | 7,562288E+22 | 6,764855E+22 | 6,765013E+22 | 1,512469E+23                           | 1,352987E+23                           | 2,865455E+23  |
| -1897             | 7,562169E+22                              | 7,562196E+22 | 6,764921E+22 | 6,764859E+22 | 1,512436E+23                           | 1,352978E+23                           | 2,865414E+23  |
| -1896             | 7,562152E+22                              | 7,562314E+22 | 6,764993E+22 | 6,765104E+22 | 1,512447E+23                           | 1,353010E+23                           | 2,865456E+23  |
| -1895             | 7,562441E+22                              | 7,562315E+22 | 6,764923E+22 | 6,764960E+22 | 1,512476E+23                           | 1,352988E+23                           | 2,865464E+23  |
| -1894             | 7,562149E+22                              | 7,562243E+22 | 6,765034E+22 | 6,764821E+22 | 1,512439E+23                           | 1,352986E+23                           | 2,865425E+23  |
| -1893             | 7,562360E+22                              | 7,562296E+22 | 6,764997E+22 | 6,765050E+22 | 1,512466E+23                           | 1,353005E+23                           | 2,865470E+23  |
| -1892             | 7,562360E+22                              | 7,562249E+22 | 6,764928E+22 | 6,764826E+22 | 1,512461E+23                           | 1,352975E+23                           | 2,865436E+23  |
| -1891             | 7,561995E+22                              | 7,562275E+22 | 6,764972E+22 | 6,764899E+22 | 1,512427E+23                           | 1,352987E+23                           | 2,865414E+23  |
| -1890             | 7,562305E+22                              | 7,562317E+22 | 6,764813E+22 | 6,765001E+22 | 1,512462E+23                           | 1,352981E+23                           | 2,865444E+23  |
| -1889             | 7,562176E+22                              | 7,562136E+22 | 6,764828E+22 | 6,764698E+22 | 1,512431E+23                           | 1,352953E+23                           | 2,865384E+23  |
| -1888             | 7,562052E+22                              | 7,562156E+22 | 6,764862E+22 | 6,764839E+22 | 1,512421E+23                           | 1,352970E+23                           | 2,865391E+23  |
| -1887             | 7,562404E+22                              | 7,562207E+22 | 6,764717E+22 | 6,764771E+22 | 1,512461E+23                           | 1,352949E+23                           | 2,865410E+23  |
| -1886             | 7,562090E+22                              | 7,562146E+22 | 6,764773E+22 | 6,764618E+22 | 1,512424E+23                           | 1,352939E+23                           | 2,865363E+23  |
| -1885             | 7,562150E+22                              | 7,562238E+22 | 6,764758E+22 | 6,764886E+22 | 1,512439E+23                           | 1,352964E+23                           | 2,865403E+23  |
| -1884             | 7,562293E+22                              | 7,562244E+22 | 6,764739E+22 | 6,764720E+22 | 1,512454E+23                           | 1,352946E+23                           | 2,865400E+23  |
| -1883             | 7,561943E+22                              | 7,562201E+22 | 6,764903E+22 | 6,764748E+22 | 1,512414E+23                           | 1,352965E+23                           | 2,865380E+23  |
| -1882             | 7,562271E+22                              | 7,562258E+22 | 6,764873E+22 | 6,764959E+22 | 1,512453E+23                           | 1,352983E+23                           | 2,865436E+23  |
| -1881             | 7,562288E+22                              | 7,562148E+22 | 6,764931E+22 | 6,764793E+22 | 1,512444E+23                           | 1,352972E+23                           | 2,865416E+23  |
| -1880             | 7,562029E+22                              | 7,562195E+22 | 6,765015E+22 | 6,765020E+22 | 1,512422E+23                           | 1,353003E+23                           | 2,865426E+23  |
| -1879             | 7,562412E+22                              | 7,562336E+22 | 6,764908E+22 | 6,765104E+22 | 1,512475E+23                           | 1,353001E+23                           | 2,865476E+23  |
| -1878             | 7,562207E+22                              | 7,562243E+22 | 6,765015E+22 | 6,764910E+22 | 1,512445E+23                           | 1,352993E+23                           | 2,865437E+23  |
| -1877             | 7,562219E+22                              | 7,562290E+22 | 6,765063E+22 | 6,765124E+22 | 1,512451E+23                           | 1,353019E+23                           | 2,865470E+23  |
| -1876             | 7,562521E+22                              | 7,562329E+22 | 6,765026E+22 | 6,764981E+22 | 1,512485E+23                           | 1,353001E+23                           | 2,865486E+23  |
| -1875             | 7,562139E+22                              | 7,562271E+22 | 6,765146E+22 | 6,764928E+22 | 1,512441E+23                           | 1,353007E+23                           | 2,865448E+23  |
| -1874             | 7,562300E+22                              | 7,562376E+22 | 6,765044E+22 | 6,765143E+22 | 1,512468E+23                           | 1,353019E+23                           | 2,865486E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -1873             | 7,562347E+22                              | 7,562304E+22 | 6,764989E+22 | 6,764945E+22 | 1,512465E+23                           | 1,352993E+23                           | 2,865458E+23  |
| -1872             | 7,561968E+22                              | 7,562237E+22 | 6,765037E+22 | 6,765006E+22 | 1,512420E+23                           | 1,353004E+23                           | 2,865425E+23  |
| -1871             | 7,562355E+22                              | 7,562294E+22 | 6,764894E+22 | 6,765024E+22 | 1,512465E+23                           | 1,352992E+23                           | 2,865457E+23  |
| -1870             | 7,562250E+22                              | 7,562128E+22 | 6,764925E+22 | 6,764731E+22 | 1,512438E+23                           | 1,352966E+23                           | 2,865403E+23  |
| -1869             | 7,562111E+22                              | 7,562150E+22 | 6,764888E+22 | 6,764908E+22 | 1,512426E+23                           | 1,352980E+23                           | 2,865406E+23  |
| -1868             | 7,562424E+22                              | 7,562273E+22 | 6,764758E+22 | 6,764850E+22 | 1,512470E+23                           | 1,352961E+23                           | 2,865431E+23  |
| -1867             | 7,562038E+22                              | 7,562205E+22 | 6,764865E+22 | 6,764746E+22 | 1,512424E+23                           | 1,352961E+23                           | 2,865385E+23  |
| -1866             | 7,562118E+22                              | 7,562284E+22 | 6,764847E+22 | 6,764938E+22 | 1,512440E+23                           | 1,352979E+23                           | 2,865419E+23  |
| -1865             | 7,562348E+22                              | 7,562238E+22 | 6,764864E+22 | 6,764790E+22 | 1,512459E+23                           | 1,352965E+23                           | 2,865424E+23  |
| -1864             | 7,561980E+22                              | 7,562139E+22 | 6,765016E+22 | 6,764864E+22 | 1,512412E+23                           | 1,352988E+23                           | 2,865400E+23  |
| -1863             | 7,562320E+22                              | 7,562267E+22 | 6,764955E+22 | 6,765049E+22 | 1,512459E+23                           | 1,353000E+23                           | 2,865459E+23  |
| -1862             | 7,562304E+22                              | 7,562212E+22 | 6,765010E+22 | 6,764914E+22 | 1,512452E+23                           | 1,352992E+23                           | 2,865444E+23  |
| -1861             | 7,562057E+22                              | 7,562228E+22 | 6,765050E+22 | 6,765128E+22 | 1,512428E+23                           | 1,353018E+23                           | 2,865446E+23  |
| -1860             | 7,562462E+22                              | 7,562376E+22 | 6,765001E+22 | 6,765156E+22 | 1,512484E+23                           | 1,353016E+23                           | 2,865500E+23  |
| -1859             | 7,562232E+22                              | 7,562264E+22 | 6,765158E+22 | 6,764986E+22 | 1,512450E+23                           | 1,353014E+23                           | 2,865464E+23  |
| -1858             | 7,562239E+22                              | 7,562322E+22 | 6,765165E+22 | 6,765159E+22 | 1,512456E+23                           | 1,353032E+23                           | 2,865489E+23  |
| -1857             | 7,562547E+22                              | 7,562376E+22 | 6,765115E+22 | 6,765093E+22 | 1,512492E+23                           | 1,353021E+23                           | 2,865513E+23  |
| -1856             | 7,562081E+22                              | 7,562272E+22 | 6,765202E+22 | 6,765090E+22 | 1,512435E+23                           | 1,353029E+23                           | 2,865465E+23  |
| -1855             | 7,562264E+22                              | 7,562392E+22 | 6,765098E+22 | 6,765227E+22 | 1,512466E+23                           | 1,353033E+23                           | 2,865498E+23  |
| -1854             | 7,562365E+22                              | 7,562296E+22 | 6,765075E+22 | 6,764999E+22 | 1,512466E+23                           | 1,353007E+23                           | 2,865474E+23  |
| -1853             | 7,562050E+22                              | 7,562167E+22 | 6,765069E+22 | 6,765031E+22 | 1,512422E+23                           | 1,353010E+23                           | 2,865432E+23  |
| -1852             | 7,562456E+22                              | 7,562281E+22 | 6,764953E+22 | 6,765041E+22 | 1,512474E+23                           | 1,352999E+23                           | 2,865473E+23  |
| -1851             | 7,562270E+22                              | 7,562181E+22 | 6,764994E+22 | 6,764820E+22 | 1,512445E+23                           | 1,352981E+23                           | 2,865427E+23  |
| -1850             | 7,562076E+22                              | 7,562251E+22 | 6,764929E+22 | 6,764962E+22 | 1,512433E+23                           | 1,352989E+23                           | 2,865422E+23  |
| -1849             | 7,562426E+22                              | 7,562361E+22 | 6,764848E+22 | 6,764943E+22 | 1,512479E+23                           | 1,352979E+23                           | 2,865458E+23  |
| -1848             | 7,562007E+22                              | 7,562183E+22 | 6,764986E+22 | 6,764849E+22 | 1,512419E+23                           | 1,352984E+23                           | 2,865403E+23  |
| -1847             | 7,562132E+22                              | 7,562262E+22 | 6,764985E+22 | 6,764990E+22 | 1,512439E+23                           | 1,352997E+23                           | 2,865437E+23  |
| -1846             | 7,562398E+22                              | 7,562219E+22 | 6,765001E+22 | 6,764887E+22 | 1,512462E+23                           | 1,352989E+23                           | 2,865451E+23  |
| -1845             | 7,562021E+22                              | 7,562108E+22 | 6,765049E+22 | 6,765002E+22 | 1,512413E+23                           | 1,353005E+23                           | 2,865418E+23  |
| -1844             | 7,562354E+22                              | 7,562307E+22 | 6,764992E+22 | 6,765176E+22 | 1,512466E+23                           | 1,353017E+23                           | 2,865483E+23  |
| -1843             | 7,562303E+22                              | 7,562265E+22 | 6,765080E+22 | 6,765043E+22 | 1,512457E+23                           | 1,353012E+23                           | 2,865469E+23  |
| -1842             | 7,562083E+22                              | 7,562282E+22 | 6,765123E+22 | 6,765151E+22 | 1,512436E+23                           | 1,353027E+23                           | 2,865464E+23  |
| -1841             | 7,562552E+22                              | 7,562416E+22 | 6,765118E+22 | 6,765195E+22 | 1,512497E+23                           | 1,353031E+23                           | 2,865528E+23  |
| -1840             | 7,562251E+22                              | 7,562260E+22 | 6,765283E+22 | 6,765078E+22 | 1,512451E+23                           | 1,353036E+23                           | 2,865487E+23  |
| -1839             | 7,562228E+22                              | 7,562380E+22 | 6,765269E+22 | 6,765240E+22 | 1,512461E+23                           | 1,353051E+23                           | 2,865512E+23  |
| -1838             | 7,562516E+22                              | 7,562434E+22 | 6,765217E+22 | 6,765212E+22 | 1,512495E+23                           | 1,353043E+23                           | 2,865538E+23  |
| -1837             | 7,562075E+22                              | 7,562252E+22 | 6,765245E+22 | 6,765203E+22 | 1,512433E+23                           | 1,353045E+23                           | 2,865477E+23  |
| -1836             | 7,562313E+22                              | 7,562359E+22 | 6,765175E+22 | 6,765276E+22 | 1,512467E+23                           | 1,353045E+23                           | 2,865512E+23  |
| -1835             | 7,562409E+22                              | 7,562270E+22 | 6,765172E+22 | 6,765067E+22 | 1,512468E+23                           | 1,353024E+23                           | 2,865492E+23  |
| -1834             | 7,562106E+22                              | 7,562183E+22 | 6,765114E+22 | 6,765051E+22 | 1,512429E+23                           | 1,353016E+23                           | 2,865445E+23  |
| -1833             | 7,562499E+22                              | 7,562344E+22 | 6,764986E+22 | 6,765119E+22 | 1,512484E+23                           | 1,353011E+23                           | 2,865495E+23  |
| -1832             | 7,562217E+22                              | 7,562224E+22 | 6,765041E+22 | 6,764942E+22 | 1,512444E+23                           | 1,352998E+23                           | 2,865442E+23  |
| -1831             | 7,562039E+22                              | 7,562297E+22 | 6,765007E+22 | 6,765010E+22 | 1,512434E+23                           | 1,353002E+23                           | 2,865435E+23  |
| -1830             | 7,562419E+22                              | 7,562364E+22 | 6,764982E+22 | 6,764991E+22 | 1,512478E+23                           | 1,352997E+23                           | 2,865476E+23  |
| -1829             | 7,562058E+22                              | 7,562116E+22 | 6,765071E+22 | 6,764923E+22 | 1,512417E+23                           | 1,352999E+23                           | 2,865417E+23  |
| -1828             | 7,562202E+22                              | 7,562226E+22 | 6,765080E+22 | 6,765073E+22 | 1,512443E+23                           | 1,353015E+23                           | 2,865458E+23  |
| -1827             | 7,562402E+22                              | 7,562258E+22 | 6,765079E+22 | 6,765045E+22 | 1,512466E+23                           | 1,353012E+23                           | 2,865478E+23  |
| -1826             | 7,562022E+22                              | 7,562189E+22 | 6,765079E+22 | 6,765097E+22 | 1,512421E+23                           | 1,353018E+23                           | 2,865439E+23  |
| -1825             | 7,562400E+22                              | 7,562389E+22 | 6,765061E+22 | 6,765276E+22 | 1,512479E+23                           | 1,353034E+23                           | 2,865513E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -1824             | 7,562319E+22                              | 7,562284E+22 | 6,765202E+22 | 6,765129E+22 | 1,512460E+23                           | 1,353033E+23                           | 2,865493E+23  |
| -1823             | 7,562129E+22                              | 7,562306E+22 | 6,765273E+22 | 6,765172E+22 | 1,512444E+23                           | 1,353045E+23                           | 2,865488E+23  |
| -1822             | 7,562587E+22                              | 7,562444E+22 | 6,765282E+22 | 6,765273E+22 | 1,512503E+23                           | 1,353056E+23                           | 2,865559E+23  |
| -1821             | 7,562250E+22                              | 7,562255E+22 | 6,765351E+22 | 6,765218E+22 | 1,512450E+23                           | 1,353057E+23                           | 2,865507E+23  |
| -1820             | 7,562213E+22                              | 7,562390E+22 | 6,765339E+22 | 6,765367E+22 | 1,512460E+23                           | 1,353071E+23                           | 2,865531E+23  |
| -1819             | 7,562489E+22                              | 7,562438E+22 | 6,765293E+22 | 6,765343E+22 | 1,512493E+23                           | 1,353064E+23                           | 2,865556E+23  |
| -1818             | 7,562110E+22                              | 7,562233E+22 | 6,765282E+22 | 6,765221E+22 | 1,512434E+23                           | 1,353050E+23                           | 2,865485E+23  |
| -1817             | 7,562426E+22                              | 7,562358E+22 | 6,765223E+22 | 6,765310E+22 | 1,512478E+23                           | 1,353053E+23                           | 2,865532E+23  |
| -1816             | 7,562447E+22                              | 7,562267E+22 | 6,765221E+22 | 6,765128E+22 | 1,512471E+23                           | 1,353035E+23                           | 2,865506E+23  |
| -1815             | 7,562099E+22                              | 7,562270E+22 | 6,765166E+22 | 6,765084E+22 | 1,512437E+23                           | 1,353025E+23                           | 2,865462E+23  |
| -1814             | 7,562465E+22                              | 7,562440E+22 | 6,765083E+22 | 6,765186E+22 | 1,512491E+23                           | 1,353027E+23                           | 2,865518E+23  |
| -1813             | 7,562187E+22                              | 7,562228E+22 | 6,765115E+22 | 6,765028E+22 | 1,512442E+23                           | 1,353014E+23                           | 2,865456E+23  |
| -1812             | 7,562052E+22                              | 7,562268E+22 | 6,765138E+22 | 6,765069E+22 | 1,512432E+23                           | 1,353021E+23                           | 2,865453E+23  |
| -1811             | 7,562430E+22                              | 7,562327E+22 | 6,765116E+22 | 6,765101E+22 | 1,512476E+23                           | 1,353022E+23                           | 2,865497E+23  |
| -1810             | 7,562094E+22                              | 7,562101E+22 | 6,765130E+22 | 6,765009E+22 | 1,512420E+23                           | 1,353014E+23                           | 2,865433E+23  |
| -1809             | 7,562256E+22                              | 7,562271E+22 | 6,765106E+22 | 6,765216E+22 | 1,512453E+23                           | 1,353032E+23                           | 2,865485E+23  |
| -1808             | 7,562384E+22                              | 7,562294E+22 | 6,765125E+22 | 6,765192E+22 | 1,512468E+23                           | 1,353032E+23                           | 2,865499E+23  |
| -1807             | 7,562044E+22                              | 7,562255E+22 | 6,765164E+22 | 6,765139E+22 | 1,512430E+23                           | 1,353030E+23                           | 2,865460E+23  |
| -1806             | 7,562455E+22                              | 7,562429E+22 | 6,765214E+22 | 6,765298E+22 | 1,512488E+23                           | 1,353051E+23                           | 2,865540E+23  |
| -1805             | 7,562387E+22                              | 7,562268E+22 | 6,765319E+22 | 6,765192E+22 | 1,512466E+23                           | 1,353051E+23                           | 2,865517E+23  |
| -1804             | 7,562179E+22                              | 7,562316E+22 | 6,765409E+22 | 6,765257E+22 | 1,512449E+23                           | 1,353067E+23                           | 2,865516E+23  |
| -1803             | 7,562539E+22                              | 7,562501E+22 | 6,765396E+22 | 6,765437E+22 | 1,512504E+23                           | 1,353083E+23                           | 2,865587E+23  |
| -1802             | 7,562223E+22                              | 7,562302E+22 | 6,765405E+22 | 6,765335E+22 | 1,512452E+23                           | 1,353074E+23                           | 2,865526E+23  |
| -1801             | 7,562243E+22                              | 7,562404E+22 | 6,765390E+22 | 6,765474E+22 | 1,512465E+23                           | 1,353086E+23                           | 2,865551E+23  |
| -1800             | 7,562500E+22                              | 7,562402E+22 | 6,765372E+22 | 6,765426E+22 | 1,512490E+23                           | 1,353080E+23                           | 2,865570E+23  |
| -1799             | 7,562180E+22                              | 7,562234E+22 | 6,765352E+22 | 6,765223E+22 | 1,512441E+23                           | 1,353057E+23                           | 2,865499E+23  |
| -1798             | 7,562469E+22                              | 7,562391E+22 | 6,765304E+22 | 6,765348E+22 | 1,512486E+23                           | 1,353065E+23                           | 2,865551E+23  |
| -1797             | 7,562440E+22                              | 7,562304E+22 | 6,765238E+22 | 6,765221E+22 | 1,512474E+23                           | 1,353046E+23                           | 2,865520E+23  |
| -1796             | 7,562079E+22                              | 7,562301E+22 | 6,765233E+22 | 6,765156E+22 | 1,512438E+23                           | 1,353039E+23                           | 2,865477E+23  |
| -1795             | 7,562407E+22                              | 7,562459E+22 | 6,765193E+22 | 6,765273E+22 | 1,512487E+23                           | 1,353047E+23                           | 2,865533E+23  |
| -1794             | 7,562204E+22                              | 7,562199E+22 | 6,765198E+22 | 6,765057E+22 | 1,512440E+23                           | 1,353025E+23                           | 2,865466E+23  |
| -1793             | 7,562132E+22                              | 7,562240E+22 | 6,765213E+22 | 6,765150E+22 | 1,512437E+23                           | 1,353036E+23                           | 2,865473E+23  |
| -1792             | 7,562442E+22                              | 7,562311E+22 | 6,765188E+22 | 6,765232E+22 | 1,512475E+23                           | 1,353042E+23                           | 2,865517E+23  |
| -1791             | 7,562110E+22                              | 7,562173E+22 | 6,765178E+22 | 6,765093E+22 | 1,512428E+23                           | 1,353027E+23                           | 2,865455E+23  |
| -1790             | 7,562277E+22                              | 7,562357E+22 | 6,765198E+22 | 6,765305E+22 | 1,512463E+23                           | 1,353050E+23                           | 2,865514E+23  |
| -1789             | 7,562414E+22                              | 7,562320E+22 | 6,765207E+22 | 6,765275E+22 | 1,512473E+23                           | 1,353048E+23                           | 2,865522E+23  |
| -1788             | 7,562107E+22                              | 7,562261E+22 | 6,765326E+22 | 6,765184E+22 | 1,512437E+23                           | 1,353051E+23                           | 2,865488E+23  |
| -1787             | 7,562474E+22                              | 7,562449E+22 | 6,765390E+22 | 6,765398E+22 | 1,512492E+23                           | 1,353079E+23                           | 2,865571E+23  |
| -1786             | 7,562397E+22                              | 7,562286E+22 | 6,765414E+22 | 6,765297E+22 | 1,512468E+23                           | 1,353071E+23                           | 2,865539E+23  |
| -1785             | 7,562184E+22                              | 7,562367E+22 | 6,765459E+22 | 6,765432E+22 | 1,512455E+23                           | 1,353089E+23                           | 2,865544E+23  |
| -1784             | 7,562483E+22                              | 7,562502E+22 | 6,765450E+22 | 6,765599E+22 | 1,512499E+23                           | 1,353105E+23                           | 2,865603E+23  |
| -1783             | 7,562233E+22                              | 7,562310E+22 | 6,765461E+22 | 6,765381E+22 | 1,512454E+23                           | 1,353084E+23                           | 2,865539E+23  |
| -1782             | 7,562320E+22                              | 7,562401E+22 | 6,765484E+22 | 6,765492E+22 | 1,512472E+23                           | 1,353098E+23                           | 2,865570E+23  |
| -1781             | 7,562581E+22                              | 7,562369E+22 | 6,765417E+22 | 6,765461E+22 | 1,512495E+23                           | 1,353088E+23                           | 2,865583E+23  |
| -1780             | 7,562240E+22                              | 7,562260E+22 | 6,765429E+22 | 6,765258E+22 | 1,512450E+23                           | 1,353069E+23                           | 2,865519E+23  |
| -1779             | 7,562426E+22                              | 7,562478E+22 | 6,765384E+22 | 6,765436E+22 | 1,512490E+23                           | 1,353082E+23                           | 2,865572E+23  |
| -1778             | 7,562401E+22                              | 7,562363E+22 | 6,765291E+22 | 6,765280E+22 | 1,512476E+23                           | 1,353057E+23                           | 2,865533E+23  |
| -1777             | 7,562088E+22                              | 7,562324E+22 | 6,765311E+22 | 6,765241E+22 | 1,512441E+23                           | 1,353055E+23                           | 2,865496E+23  |
| -1776             | 7,562381E+22                              | 7,562411E+22 | 6,765311E+22 | 6,765364E+22 | 1,512479E+23                           | 1,353068E+23                           | 2,865547E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -1775                  | 7,562245E+22                              | 7,562178E+22 | 6,765296E+22 | 6,765112E+22 | 1,512442E+23                           | 1,353041E+23                           | 2,865483E+23  |
| -1774                  | 7,562176E+22                              | 7,562252E+22 | 6,765295E+22 | 6,765249E+22 | 1,512443E+23                           | 1,353054E+23                           | 2,865497E+23  |
| -1773                  | 7,562452E+22                              | 7,562328E+22 | 6,765203E+22 | 6,765373E+22 | 1,512478E+23                           | 1,353058E+23                           | 2,865536E+23  |
| -1772                  | 7,562148E+22                              | 7,562206E+22 | 6,765246E+22 | 6,765178E+22 | 1,512435E+23                           | 1,353042E+23                           | 2,865478E+23  |
| -1771                  | 7,562278E+22                              | 7,562404E+22 | 6,765316E+22 | 6,765375E+22 | 1,512468E+23                           | 1,353069E+23                           | 2,865537E+23  |
| -1770                  | 7,562475E+22                              | 7,562340E+22 | 6,765312E+22 | 6,765304E+22 | 1,512482E+23                           | 1,353062E+23                           | 2,865543E+23  |
| -1769                  | 7,562188E+22                              | 7,562281E+22 | 6,765429E+22 | 6,765274E+22 | 1,512447E+23                           | 1,353070E+23                           | 2,865517E+23  |
| -1768                  | 7,562429E+22                              | 7,562474E+22 | 6,765504E+22 | 6,765548E+22 | 1,512490E+23                           | 1,353105E+23                           | 2,865596E+23  |
| -1767                  | 7,562371E+22                              | 7,562358E+22 | 6,765494E+22 | 6,765416E+22 | 1,512473E+23                           | 1,353091E+23                           | 2,865564E+23  |
| -1766                  | 7,562180E+22                              | 7,562405E+22 | 6,765558E+22 | 6,765545E+22 | 1,512458E+23                           | 1,353110E+23                           | 2,865569E+23  |
| -1765                  | 7,562507E+22                              | 7,562473E+22 | 6,765514E+22 | 6,765694E+22 | 1,512498E+23                           | 1,353121E+23                           | 2,865619E+23  |
| -1764                  | 7,562333E+22                              | 7,562266E+22 | 6,765566E+22 | 6,765409E+22 | 1,512460E+23                           | 1,353097E+23                           | 2,865557E+23  |
| -1763                  | 7,562370E+22                              | 7,562410E+22 | 6,765585E+22 | 6,765545E+22 | 1,512478E+23                           | 1,353113E+23                           | 2,865591E+23  |
| -1762                  | 7,562612E+22                              | 7,562410E+22 | 6,765450E+22 | 6,765513E+22 | 1,512502E+23                           | 1,353096E+23                           | 2,865599E+23  |
| -1761                  | 7,562244E+22                              | 7,562338E+22 | 6,765451E+22 | 6,765365E+22 | 1,512458E+23                           | 1,353082E+23                           | 2,865540E+23  |
| -1760                  | 7,562340E+22                              | 7,562506E+22 | 6,765461E+22 | 6,765540E+22 | 1,512485E+23                           | 1,353100E+23                           | 2,865585E+23  |
| -1759                  | 7,562386E+22                              | 7,562373E+22 | 6,765382E+22 | 6,765306E+22 | 1,512476E+23                           | 1,353069E+23                           | 2,865545E+23  |
| -1758                  | 7,562138E+22                              | 7,562297E+22 | 6,765431E+22 | 6,765285E+22 | 1,512443E+23                           | 1,353072E+23                           | 2,865515E+23  |
| -1757                  | 7,562429E+22                              | 7,562354E+22 | 6,765368E+22 | 6,765455E+22 | 1,512478E+23                           | 1,353082E+23                           | 2,865561E+23  |
| -1756                  | 7,562300E+22                              | 7,562182E+22 | 6,765363E+22 | 6,765207E+22 | 1,512448E+23                           | 1,353057E+23                           | 2,865505E+23  |
| -1755                  | 7,562168E+22                              | 7,562335E+22 | 6,765358E+22 | 6,765372E+22 | 1,512450E+23                           | 1,353073E+23                           | 2,865523E+23  |
| -1754                  | 7,562466E+22                              | 7,562381E+22 | 6,765245E+22 | 6,765439E+22 | 1,512485E+23                           | 1,353068E+23                           | 2,865553E+23  |
| -1753                  | 7,562205E+22                              | 7,562260E+22 | 6,765329E+22 | 6,765254E+22 | 1,512447E+23                           | 1,353058E+23                           | 2,865505E+23  |
| -1752                  | 7,562280E+22                              | 7,562402E+22 | 6,765463E+22 | 6,765449E+22 | 1,512468E+23                           | 1,353091E+23                           | 2,865559E+23  |
| -1751                  | 7,562499E+22                              | 7,562363E+22 | 6,765442E+22 | 6,765368E+22 | 1,512486E+23                           | 1,353081E+23                           | 2,865567E+23  |
| -1750                  | 7,562200E+22                              | 7,562324E+22 | 6,765551E+22 | 6,765410E+22 | 1,512452E+23                           | 1,353096E+23                           | 2,865548E+23  |
| -1749                  | 7,562394E+22                              | 7,562475E+22 | 6,765555E+22 | 6,765717E+22 | 1,512487E+23                           | 1,353127E+23                           | 2,865614E+23  |
| -1748                  | 7,562398E+22                              | 7,562342E+22 | 6,765582E+22 | 6,765521E+22 | 1,512474E+23                           | 1,353110E+23                           | 2,865584E+23  |
| -1747                  | 7,562214E+22                              | 7,562403E+22 | 6,765655E+22 | 6,765614E+22 | 1,512462E+23                           | 1,353127E+23                           | 2,865589E+23  |
| -1746                  | 7,562602E+22                              | 7,562450E+22 | 6,765571E+22 | 6,765709E+22 | 1,512505E+23                           | 1,353128E+23                           | 2,865633E+23  |
| -1745                  | 7,562440E+22                              | 7,562307E+22 | 6,765608E+22 | 6,765468E+22 | 1,512475E+23                           | 1,353108E+23                           | 2,865582E+23  |
| -1744                  | 7,562340E+22                              | 7,562474E+22 | 6,765658E+22 | 6,765634E+22 | 1,512481E+23                           | 1,353129E+23                           | 2,865611E+23  |
| -1743                  | 7,562574E+22                              | 7,562516E+22 | 6,765518E+22 | 6,765574E+22 | 1,512509E+23                           | 1,353109E+23                           | 2,865618E+23  |
| -1742                  | 7,562220E+22                              | 7,562394E+22 | 6,765565E+22 | 6,765441E+22 | 1,512461E+23                           | 1,353101E+23                           | 2,865562E+23  |
| -1741                  | 7,562309E+22                              | 7,562469E+22 | 6,765556E+22 | 6,765625E+22 | 1,512478E+23                           | 1,353118E+23                           | 2,865596E+23  |
| -1740                  | 7,562447E+22                              | 7,562301E+22 | 6,765506E+22 | 6,765367E+22 | 1,512475E+23                           | 1,353087E+23                           | 2,865562E+23  |
| -1739                  | 7,562161E+22                              | 7,562270E+22 | 6,765518E+22 | 6,765383E+22 | 1,512443E+23                           | 1,353090E+23                           | 2,865533E+23  |
| -1738                  | 7,562463E+22                              | 7,562361E+22 | 6,765369E+22 | 6,765557E+22 | 1,512482E+23                           | 1,353093E+23                           | 2,865575E+23  |
| -1737                  | 7,562343E+22                              | 7,562241E+22 | 6,765343E+22 | 6,765323E+22 | 1,512458E+23                           | 1,353067E+23                           | 2,865525E+23  |
| -1736                  | 7,562133E+22                              | 7,562369E+22 | 6,765423E+22 | 6,765450E+22 | 1,512450E+23                           | 1,353087E+23                           | 2,865537E+23  |
| -1735                  | 7,562499E+22                              | 7,562429E+22 | 6,765346E+22 | 6,765441E+22 | 1,512493E+23                           | 1,353079E+23                           | 2,865572E+23  |
| -1734                  | 7,562274E+22                              | 7,562280E+22 | 6,765482E+22 | 6,765292E+22 | 1,512455E+23                           | 1,353077E+23                           | 2,865533E+23  |
| -1733                  | 7,562289E+22                              | 7,562394E+22 | 6,765577E+22 | 6,765557E+22 | 1,512468E+23                           | 1,353113E+23                           | 2,865582E+23  |
| -1732                  | 7,562519E+22                              | 7,562378E+22 | 6,765563E+22 | 6,765496E+22 | 1,512490E+23                           | 1,353106E+23                           | 2,865596E+23  |
| -1731                  | 7,562169E+22                              | 7,562374E+22 | 6,765656E+22 | 6,765563E+22 | 1,512454E+23                           | 1,353122E+23                           | 2,865576E+23  |
| -1730                  | 7,562416E+22                              | 7,562479E+22 | 6,765615E+22 | 6,765818E+22 | 1,512490E+23                           | 1,353143E+23                           | 2,865633E+23  |
| -1729                  | 7,562484E+22                              | 7,562356E+22 | 6,765645E+22 | 6,765610E+22 | 1,512484E+23                           | 1,353125E+23                           | 2,865609E+23  |
| -1728                  | 7,562254E+22                              | 7,562398E+22 | 6,765764E+22 | 6,765684E+22 | 1,512465E+23                           | 1,353145E+23                           | 2,865610E+23  |
| -1727                  | 7,562651E+22                              | 7,562501E+22 | 6,765652E+22 | 6,765749E+22 | 1,512515E+23                           | 1,353140E+23                           | 2,865655E+23  |



| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -1726             | 7,562454E+22                              | 7,562398E+22 | 6,765692E+22 | 6,765564E+22 | 1,512485E+23                           | 1,353126E+23                           | 2,865611E+23  |
| -1725             | 7,562280E+22                              | 7,562511E+22 | 6,765709E+22 | 6,765749E+22 | 1,512479E+23                           | 1,353146E+23                           | 2,865625E+23  |
| -1724             | 7,562564E+22                              | 7,562505E+22 | 6,765624E+22 | 6,765639E+22 | 1,512507E+23                           | 1,353126E+23                           | 2,865633E+23  |
| -1723             | 7,562224E+22                              | 7,562373E+22 | 6,765684E+22 | 6,765502E+22 | 1,512460E+23                           | 1,353119E+23                           | 2,865578E+23  |
| -1722             | 7,562369E+22                              | 7,562393E+22 | 6,765608E+22 | 6,765663E+22 | 1,512476E+23                           | 1,353127E+23                           | 2,865603E+23  |
| -1721             | 7,562522E+22                              | 7,562300E+22 | 6,765523E+22 | 6,765460E+22 | 1,512482E+23                           | 1,353098E+23                           | 2,865581E+23  |
| -1720             | 7,562145E+22                              | 7,562309E+22 | 6,765550E+22 | 6,765489E+22 | 1,512445E+23                           | 1,353104E+23                           | 2,865549E+23  |
| -1719             | 7,562457E+22                              | 7,562445E+22 | 6,765402E+22 | 6,765609E+22 | 1,512490E+23                           | 1,353101E+23                           | 2,865591E+23  |
| -1718             | 7,562369E+22                              | 7,562320E+22 | 6,765442E+22 | 6,765377E+22 | 1,512469E+23                           | 1,353082E+23                           | 2,865551E+23  |
| -1717             | 7,562139E+22                              | 7,562364E+22 | 6,765540E+22 | 6,765502E+22 | 1,512450E+23                           | 1,353104E+23                           | 2,865555E+23  |
| -1716             | 7,562561E+22                              | 7,562399E+22 | 6,765518E+22 | 6,765491E+22 | 1,512496E+23                           | 1,353101E+23                           | 2,865597E+23  |
| -1715             | 7,562279E+22                              | 7,562297E+22 | 6,765632E+22 | 6,765416E+22 | 1,512458E+23                           | 1,353105E+23                           | 2,865562E+23  |
| -1714             | 7,562277E+22                              | 7,562404E+22 | 6,765634E+22 | 6,765709E+22 | 1,512468E+23                           | 1,353134E+23                           | 2,865602E+23  |
| -1713             | 7,562532E+22                              | 7,562421E+22 | 6,765594E+22 | 6,765668E+22 | 1,512495E+23                           | 1,353126E+23                           | 2,865621E+23  |
| -1712             | 7,562155E+22                              | 7,562376E+22 | 6,765736E+22 | 6,765682E+22 | 1,512453E+23                           | 1,353142E+23                           | 2,865595E+23  |
| -1711             | 7,562486E+22                              | 7,562495E+22 | 6,765697E+22 | 6,765847E+22 | 1,512498E+23                           | 1,353154E+23                           | 2,865653E+23  |
| -1710             | 7,562593E+22                              | 7,562393E+22 | 6,765751E+22 | 6,765652E+22 | 1,512499E+23                           | 1,353140E+23                           | 2,865639E+23  |
| -1709             | 7,562278E+22                              | 7,562430E+22 | 6,765843E+22 | 6,765766E+22 | 1,512471E+23                           | 1,353161E+23                           | 2,865632E+23  |
| -1708             | 7,562668E+22                              | 7,562560E+22 | 6,765760E+22 | 6,765831E+22 | 1,512523E+23                           | 1,353159E+23                           | 2,865682E+23  |
| -1707             | 7,562400E+22                              | 7,562467E+22 | 6,765805E+22 | 6,765663E+22 | 1,512487E+23                           | 1,353147E+23                           | 2,865633E+23  |
| -1706             | 7,562257E+22                              | 7,562502E+22 | 6,765785E+22 | 6,765820E+22 | 1,512476E+23                           | 1,353160E+23                           | 2,865636E+23  |
| -1705             | 7,562608E+22                              | 7,562475E+22 | 6,765685E+22 | 6,765712E+22 | 1,512508E+23                           | 1,353140E+23                           | 2,865648E+23  |
| -1704             | 7,562231E+22                              | 7,562309E+22 | 6,765771E+22 | 6,765580E+22 | 1,512454E+23                           | 1,353135E+23                           | 2,865589E+23  |
| -1703             | 7,562404E+22                              | 7,562398E+22 | 6,765644E+22 | 6,765723E+22 | 1,512480E+23                           | 1,353137E+23                           | 2,865617E+23  |
| -1702             | 7,562547E+22                              | 7,562362E+22 | 6,765550E+22 | 6,765557E+22 | 1,512491E+23                           | 1,353111E+23                           | 2,865602E+23  |
| -1701             | 7,562118E+22                              | 7,562342E+22 | 6,765575E+22 | 6,765577E+22 | 1,512446E+23                           | 1,353115E+23                           | 2,865561E+23  |
| -1700             | 7,562494E+22                              | 7,562451E+22 | 6,765507E+22 | 6,765630E+22 | 1,512495E+23                           | 1,353114E+23                           | 2,865608E+23  |
| -1699             | 7,562397E+22                              | 7,562343E+22 | 6,765587E+22 | 6,765409E+22 | 1,512474E+23                           | 1,353100E+23                           | 2,865574E+23  |
| -1698             | 7,562189E+22                              | 7,562345E+22 | 6,765644E+22 | 6,765560E+22 | 1,512453E+23                           | 1,353120E+23                           | 2,865574E+23  |
| -1697             | 7,562591E+22                              | 7,562440E+22 | 6,765593E+22 | 6,765626E+22 | 1,512503E+23                           | 1,353122E+23                           | 2,865625E+23  |
| -1696             | 7,562226E+22                              | 7,562344E+22 | 6,765730E+22 | 6,765589E+22 | 1,512457E+23                           | 1,353132E+23                           | 2,865589E+23  |
| -1695             | 7,562263E+22                              | 7,562457E+22 | 6,765710E+22 | 6,765826E+22 | 1,512472E+23                           | 1,353154E+23                           | 2,865626E+23  |
| -1694             | 7,562574E+22                              | 7,562467E+22 | 6,765701E+22 | 6,765774E+22 | 1,512504E+23                           | 1,353148E+23                           | 2,865652E+23  |
| -1693             | 7,562208E+22                              | 7,562357E+22 | 6,765837E+22 | 6,765759E+22 | 1,512456E+23                           | 1,353160E+23                           | 2,865616E+23  |
| -1692             | 7,562587E+22                              | 7,562475E+22 | 6,765832E+22 | 6,765891E+22 | 1,512506E+23                           | 1,353172E+23                           | 2,865678E+23  |
| -1691             | 7,562621E+22                              | 7,562459E+22 | 6,765867E+22 | 6,765743E+22 | 1,512508E+23                           | 1,353161E+23                           | 2,865669E+23  |
| -1690             | 7,562270E+22                              | 7,562467E+22 | 6,765884E+22 | 6,765865E+22 | 1,512474E+23                           | 1,353175E+23                           | 2,865649E+23  |
| -1689             | 7,562645E+22                              | 7,562606E+22 | 6,765803E+22 | 6,765937E+22 | 1,512525E+23                           | 1,353174E+23                           | 2,865699E+23  |
| -1688             | 7,562357E+22                              | 7,562452E+22 | 6,765907E+22 | 6,765744E+22 | 1,512481E+23                           | 1,353165E+23                           | 2,865646E+23  |
| -1687             | 7,562283E+22                              | 7,562465E+22 | 6,765865E+22 | 6,765840E+22 | 1,512475E+23                           | 1,353170E+23                           | 2,865645E+23  |
| -1686             | 7,562674E+22                              | 7,562472E+22 | 6,765759E+22 | 6,765774E+22 | 1,512515E+23                           | 1,353153E+23                           | 2,865668E+23  |
| -1685             | 7,562244E+22                              | 7,562306E+22 | 6,765797E+22 | 6,765670E+22 | 1,512455E+23                           | 1,353147E+23                           | 2,865602E+23  |
| -1684             | 7,562435E+22                              | 7,562432E+22 | 6,765694E+22 | 6,765792E+22 | 1,512487E+23                           | 1,353149E+23                           | 2,865635E+23  |
| -1683             | 7,562533E+22                              | 7,562446E+22 | 6,765633E+22 | 6,765623E+22 | 1,512498E+23                           | 1,353126E+23                           | 2,865623E+23  |
| -1682             | 7,562132E+22                              | 7,562359E+22 | 6,765652E+22 | 6,765616E+22 | 1,512449E+23                           | 1,353127E+23                           | 2,865576E+23  |
| -1681             | 7,562539E+22                              | 7,562468E+22 | 6,765612E+22 | 6,765686E+22 | 1,512501E+23                           | 1,353130E+23                           | 2,865631E+23  |
| -1680             | 7,562391E+22                              | 7,562333E+22 | 6,765733E+22 | 6,765514E+22 | 1,512472E+23                           | 1,353125E+23                           | 2,865597E+23  |
| -1679             | 7,562179E+22                              | 7,562374E+22 | 6,765734E+22 | 6,765681E+22 | 1,512455E+23                           | 1,353142E+23                           | 2,865597E+23  |
| -1678             | 7,562581E+22                              | 7,562504E+22 | 6,765661E+22 | 6,765795E+22 | 1,512508E+23                           | 1,353146E+23                           | 2,865654E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -1677                  | 7,562200E+22                              | 7,562341E+22 | 6,765789E+22 | 6,765735E+22 | 1,512454E+23                           | 1,353152E+23                           | 2,865607E+23  |
| -1676                  | 7,562347E+22                              | 7,562428E+22 | 6,765820E+22 | 6,765887E+22 | 1,512477E+23                           | 1,353171E+23                           | 2,865648E+23  |
| -1675                  | 7,562656E+22                              | 7,562473E+22 | 6,765828E+22 | 6,765810E+22 | 1,512513E+23                           | 1,353164E+23                           | 2,865677E+23  |
| -1674                  | 7,562299E+22                              | 7,562359E+22 | 6,765914E+22 | 6,765806E+22 | 1,512466E+23                           | 1,353172E+23                           | 2,865638E+23  |
| -1673                  | 7,562636E+22                              | 7,562550E+22 | 6,765890E+22 | 6,765979E+22 | 1,512519E+23                           | 1,353187E+23                           | 2,865706E+23  |
| -1672                  | 7,562560E+22                              | 7,562534E+22 | 6,765968E+22 | 6,765865E+22 | 1,512509E+23                           | 1,353183E+23                           | 2,865693E+23  |
| -1671                  | 7,562226E+22                              | 7,562529E+22 | 6,765975E+22 | 6,765945E+22 | 1,512476E+23                           | 1,353192E+23                           | 2,865668E+23  |
| -1670                  | 7,562642E+22                              | 7,562633E+22 | 6,765912E+22 | 6,766020E+22 | 1,512527E+23                           | 1,353193E+23                           | 2,865721E+23  |
| -1669                  | 7,562367E+22                              | 7,562388E+22 | 6,766003E+22 | 6,765826E+22 | 1,512475E+23                           | 1,353183E+23                           | 2,865658E+23  |
| -1668                  | 7,562362E+22                              | 7,562399E+22 | 6,765957E+22 | 6,765900E+22 | 1,512476E+23                           | 1,353186E+23                           | 2,865662E+23  |
| -1667                  | 7,562687E+22                              | 7,562506E+22 | 6,765816E+22 | 6,765867E+22 | 1,512519E+23                           | 1,353168E+23                           | 2,865688E+23  |
| -1666                  | 7,562255E+22                              | 7,562340E+22 | 6,765784E+22 | 6,765758E+22 | 1,512459E+23                           | 1,353154E+23                           | 2,865614E+23  |
| -1665                  | 7,562451E+22                              | 7,562489E+22 | 6,765711E+22 | 6,765851E+22 | 1,512494E+23                           | 1,353166E+23                           | 2,865650E+23  |
| -1664                  | 7,562523E+22                              | 7,562469E+22 | 6,765741E+22 | 6,765666E+22 | 1,512499E+23                           | 1,353141E+23                           | 2,865640E+23  |
| -1663                  | 7,562169E+22                              | 7,562366E+22 | 6,765765E+22 | 6,765632E+22 | 1,512453E+23                           | 1,353140E+23                           | 2,865593E+23  |
| -1662                  | 7,562566E+22                              | 7,562509E+22 | 6,765731E+22 | 6,765775E+22 | 1,512507E+23                           | 1,353151E+23                           | 2,865658E+23  |
| -1661                  | 7,562365E+22                              | 7,562345E+22 | 6,765823E+22 | 6,765665E+22 | 1,512471E+23                           | 1,353149E+23                           | 2,865620E+23  |
| -1660                  | 7,562189E+22                              | 7,562377E+22 | 6,765830E+22 | 6,765809E+22 | 1,512457E+23                           | 1,353164E+23                           | 2,865621E+23  |
| -1659                  | 7,562579E+22                              | 7,562547E+22 | 6,765773E+22 | 6,765908E+22 | 1,512513E+23                           | 1,353168E+23                           | 2,865681E+23  |
| -1658                  | 7,562272E+22                              | 7,562317E+22 | 6,765854E+22 | 6,765801E+22 | 1,512459E+23                           | 1,353165E+23                           | 2,865624E+23  |
| -1657                  | 7,562447E+22                              | 7,562430E+22 | 6,765901E+22 | 6,765941E+22 | 1,512488E+23                           | 1,353184E+23                           | 2,865672E+23  |
| -1656                  | 7,562690E+22                              | 7,562503E+22 | 6,765952E+22 | 6,765902E+22 | 1,512519E+23                           | 1,353185E+23                           | 2,865705E+23  |
| -1655                  | 7,562300E+22                              | 7,562433E+22 | 6,765992E+22 | 6,765900E+22 | 1,512473E+23                           | 1,353189E+23                           | 2,865662E+23  |
| -1654                  | 7,562598E+22                              | 7,562657E+22 | 6,765970E+22 | 6,766109E+22 | 1,512525E+23                           | 1,353208E+23                           | 2,865733E+23  |
| -1653                  | 7,562506E+22                              | 7,562537E+22 | 6,766056E+22 | 6,765983E+22 | 1,512504E+23                           | 1,353204E+23                           | 2,865708E+23  |
| -1652                  | 7,562268E+22                              | 7,562473E+22 | 6,766095E+22 | 6,765998E+22 | 1,512474E+23                           | 1,353209E+23                           | 2,865683E+23  |
| -1651                  | 7,562683E+22                              | 7,562610E+22 | 6,766026E+22 | 6,766069E+22 | 1,512529E+23                           | 1,353209E+23                           | 2,865739E+23  |
| -1650                  | 7,562437E+22                              | 7,562351E+22 | 6,766030E+22 | 6,765896E+22 | 1,512479E+23                           | 1,353193E+23                           | 2,865671E+23  |
| -1649                  | 7,562411E+22                              | 7,562447E+22 | 6,765959E+22 | 6,765988E+22 | 1,512486E+23                           | 1,353195E+23                           | 2,865680E+23  |
| -1648                  | 7,562656E+22                              | 7,562573E+22 | 6,765871E+22 | 6,765959E+22 | 1,512523E+23                           | 1,353183E+23                           | 2,865706E+23  |
| -1647                  | 7,562248E+22                              | 7,562408E+22 | 6,765849E+22 | 6,765793E+22 | 1,512466E+23                           | 1,353164E+23                           | 2,865630E+23  |
| -1646                  | 7,562468E+22                              | 7,562548E+22 | 6,765819E+22 | 6,765887E+22 | 1,512502E+23                           | 1,353171E+23                           | 2,865672E+23  |
| -1645                  | 7,562526E+22                              | 7,562434E+22 | 6,765870E+22 | 6,765735E+22 | 1,512496E+23                           | 1,353161E+23                           | 2,865657E+23  |
| -1644                  | 7,562221E+22                              | 7,562326E+22 | 6,765898E+22 | 6,765723E+22 | 1,512455E+23                           | 1,353162E+23                           | 2,865617E+23  |
| -1643                  | 7,562537E+22                              | 7,562537E+22 | 6,765827E+22 | 6,765906E+22 | 1,512507E+23                           | 1,353173E+23                           | 2,865681E+23  |
| -1642                  | 7,562359E+22                              | 7,562340E+22 | 6,765843E+22 | 6,765809E+22 | 1,512470E+23                           | 1,353165E+23                           | 2,865635E+23  |
| -1641                  | 7,562238E+22                              | 7,562384E+22 | 6,765863E+22 | 6,765904E+22 | 1,512462E+23                           | 1,353177E+23                           | 2,865639E+23  |
| -1640                  | 7,562617E+22                              | 7,562538E+22 | 6,765877E+22 | 6,765973E+22 | 1,512515E+23                           | 1,353185E+23                           | 2,865700E+23  |
| -1639                  | 7,562359E+22                              | 7,562346E+22 | 6,765942E+22 | 6,765829E+22 | 1,512470E+23                           | 1,353177E+23                           | 2,865648E+23  |
| -1638                  | 7,562505E+22                              | 7,562525E+22 | 6,765993E+22 | 6,766018E+22 | 1,512503E+23                           | 1,353201E+23                           | 2,865704E+23  |
| -1637                  | 7,562662E+22                              | 7,562572E+22 | 6,766049E+22 | 6,766033E+22 | 1,512523E+23                           | 1,353208E+23                           | 2,865732E+23  |
| -1636                  | 7,562296E+22                              | 7,562480E+22 | 6,766119E+22 | 6,766012E+22 | 1,512478E+23                           | 1,353213E+23                           | 2,865691E+23  |
| -1635                  | 7,562550E+22                              | 7,562705E+22 | 6,766118E+22 | 6,766203E+22 | 1,512526E+23                           | 1,353232E+23                           | 2,865758E+23  |
| -1634                  | 7,562540E+22                              | 7,562488E+22 | 6,766146E+22 | 6,766071E+22 | 1,512503E+23                           | 1,353222E+23                           | 2,865724E+23  |
| -1633                  | 7,562352E+22                              | 7,562421E+22 | 6,766167E+22 | 6,766068E+22 | 1,512477E+23                           | 1,353224E+23                           | 2,865701E+23  |
| -1632                  | 7,562711E+22                              | 7,562596E+22 | 6,766104E+22 | 6,766173E+22 | 1,512531E+23                           | 1,353228E+23                           | 2,865758E+23  |
| -1631                  | 7,562457E+22                              | 7,562406E+22 | 6,766034E+22 | 6,765975E+22 | 1,512486E+23                           | 1,353201E+23                           | 2,865687E+23  |
| -1630                  | 7,562407E+22                              | 7,562549E+22 | 6,765975E+22 | 6,766067E+22 | 1,512496E+23                           | 1,353204E+23                           | 2,865700E+23  |
| -1629                  | 7,562639E+22                              | 7,562590E+22 | 6,765941E+22 | 6,766014E+22 | 1,512523E+23                           | 1,353196E+23                           | 2,865719E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -1628                  | 7,562305E+22                              | 7,562376E+22 | 6,765972E+22 | 6,765797E+22 | 1,512468E+23                           | 1,353177E+23                           | 2,865645E+23  |
| -1627                  | 7,562479E+22                              | 7,562557E+22 | 6,765964E+22 | 6,765917E+22 | 1,512504E+23                           | 1,353188E+23                           | 2,865692E+23  |
| -1626                  | 7,562554E+22                              | 7,562409E+22 | 6,765927E+22 | 6,765834E+22 | 1,512496E+23                           | 1,353176E+23                           | 2,865672E+23  |
| -1625                  | 7,562228E+22                              | 7,562345E+22 | 6,765936E+22 | 6,765851E+22 | 1,512457E+23                           | 1,353179E+23                           | 2,865636E+23  |
| -1624                  | 7,562498E+22                              | 7,562569E+22 | 6,765907E+22 | 6,766051E+22 | 1,512507E+23                           | 1,353196E+23                           | 2,865702E+23  |
| -1623                  | 7,562379E+22                              | 7,562370E+22 | 6,765901E+22 | 6,765887E+22 | 1,512475E+23                           | 1,353179E+23                           | 2,865654E+23  |
| -1622                  | 7,562305E+22                              | 7,562436E+22 | 6,765947E+22 | 6,765968E+22 | 1,512474E+23                           | 1,353191E+23                           | 2,865666E+23  |
| -1621                  | 7,562670E+22                              | 7,562528E+22 | 6,765993E+22 | 6,766053E+22 | 1,512520E+23                           | 1,353205E+23                           | 2,865724E+23  |
| -1620                  | 7,562427E+22                              | 7,562369E+22 | 6,766068E+22 | 6,765915E+22 | 1,512480E+23                           | 1,353198E+23                           | 2,865678E+23  |
| -1619                  | 7,562468E+22                              | 7,562624E+22 | 6,766115E+22 | 6,766131E+22 | 1,512509E+23                           | 1,353225E+23                           | 2,865734E+23  |
| -1618                  | 7,562641E+22                              | 7,562594E+22 | 6,766115E+22 | 6,766167E+22 | 1,512524E+23                           | 1,353228E+23                           | 2,865752E+23  |
| -1617                  | 7,562323E+22                              | 7,562467E+22 | 6,766211E+22 | 6,766106E+22 | 1,512479E+23                           | 1,353232E+23                           | 2,865711E+23  |
| -1616                  | 7,562569E+22                              | 7,562660E+22 | 6,766249E+22 | 6,766283E+22 | 1,512523E+23                           | 1,353253E+23                           | 2,865776E+23  |
| -1615                  | 7,562610E+22                              | 7,562470E+22 | 6,766213E+22 | 6,766126E+22 | 1,512508E+23                           | 1,353234E+23                           | 2,865742E+23  |
| -1614                  | 7,562415E+22                              | 7,562487E+22 | 6,766196E+22 | 6,766157E+22 | 1,512490E+23                           | 1,353235E+23                           | 2,865725E+23  |
| -1613                  | 7,562698E+22                              | 7,562636E+22 | 6,766141E+22 | 6,766278E+22 | 1,512533E+23                           | 1,353242E+23                           | 2,865775E+23  |
| -1612                  | 7,562482E+22                              | 7,562460E+22 | 6,766106E+22 | 6,766030E+22 | 1,512494E+23                           | 1,353214E+23                           | 2,865708E+23  |
| -1611                  | 7,562388E+22                              | 7,562610E+22 | 6,766092E+22 | 6,766080E+22 | 1,512500E+23                           | 1,353217E+23                           | 2,865717E+23  |
| -1610                  | 7,562662E+22                              | 7,562559E+22 | 6,766028E+22 | 6,766052E+22 | 1,512522E+23                           | 1,353208E+23                           | 2,865730E+23  |
| -1609                  | 7,562360E+22                              | 7,562340E+22 | 6,766071E+22 | 6,765861E+22 | 1,512470E+23                           | 1,353193E+23                           | 2,865663E+23  |
| -1608                  | 7,562441E+22                              | 7,562546E+22 | 6,766066E+22 | 6,766048E+22 | 1,512499E+23                           | 1,353211E+23                           | 2,865710E+23  |
| -1607                  | 7,562525E+22                              | 7,562445E+22 | 6,765951E+22 | 6,765969E+22 | 1,512497E+23                           | 1,353192E+23                           | 2,865689E+23  |
| -1606                  | 7,562230E+22                              | 7,562407E+22 | 6,765949E+22 | 6,765973E+22 | 1,512464E+23                           | 1,353192E+23                           | 2,865656E+23  |
| -1605                  | 7,562517E+22                              | 7,562545E+22 | 6,765978E+22 | 6,766135E+22 | 1,512506E+23                           | 1,353211E+23                           | 2,865718E+23  |
| -1604                  | 7,562491E+22                              | 7,562357E+22 | 6,766009E+22 | 6,765908E+22 | 1,512485E+23                           | 1,353192E+23                           | 2,865676E+23  |
| -1603                  | 7,562363E+22                              | 7,562491E+22 | 6,766088E+22 | 6,765994E+22 | 1,512485E+23                           | 1,353208E+23                           | 2,865694E+23  |
| -1602                  | 7,562712E+22                              | 7,562569E+22 | 6,766076E+22 | 6,766154E+22 | 1,512528E+23                           | 1,353223E+23                           | 2,865751E+23  |
| -1601                  | 7,562439E+22                              | 7,562434E+22 | 6,766169E+22 | 6,766037E+22 | 1,512487E+23                           | 1,353221E+23                           | 2,865708E+23  |
| -1600                  | 7,562405E+22                              | 7,562675E+22 | 6,766263E+22 | 6,766275E+22 | 1,512508E+23                           | 1,353254E+23                           | 2,865762E+23  |
| -1599                  | 7,562638E+22                              | 7,562609E+22 | 6,766220E+22 | 6,766264E+22 | 1,512525E+23                           | 1,353248E+23                           | 2,865773E+23  |
| -1598                  | 7,562377E+22                              | 7,562475E+22 | 6,766303E+22 | 6,766200E+22 | 1,512485E+23                           | 1,353250E+23                           | 2,865735E+23  |
| -1597                  | 7,562620E+22                              | 7,562603E+22 | 6,766347E+22 | 6,766392E+22 | 1,512522E+23                           | 1,353274E+23                           | 2,865796E+23  |
| -1596                  | 7,562679E+22                              | 7,562471E+22 | 6,766269E+22 | 6,766211E+22 | 1,512515E+23                           | 1,353248E+23                           | 2,865763E+23  |
| -1595                  | 7,562396E+22                              | 7,562580E+22 | 6,766247E+22 | 6,766230E+22 | 1,512498E+23                           | 1,353248E+23                           | 2,865745E+23  |
| -1594                  | 7,562702E+22                              | 7,562658E+22 | 6,766155E+22 | 6,766345E+22 | 1,512536E+23                           | 1,353250E+23                           | 2,865786E+23  |
| -1593                  | 7,562515E+22                              | 7,562456E+22 | 6,766180E+22 | 6,766047E+22 | 1,512497E+23                           | 1,353223E+23                           | 2,865720E+23  |
| -1592                  | 7,562381E+22                              | 7,562599E+22 | 6,766226E+22 | 6,766115E+22 | 1,512498E+23                           | 1,353234E+23                           | 2,865732E+23  |
| -1591                  | 7,562677E+22                              | 7,562556E+22 | 6,766101E+22 | 6,766103E+22 | 1,512523E+23                           | 1,353220E+23                           | 2,865744E+23  |
| -1590                  | 7,562366E+22                              | 7,562397E+22 | 6,766112E+22 | 6,765980E+22 | 1,512476E+23                           | 1,353209E+23                           | 2,865685E+23  |
| -1589                  | 7,562402E+22                              | 7,562546E+22 | 6,766126E+22 | 6,766195E+22 | 1,512495E+23                           | 1,353232E+23                           | 2,865727E+23  |
| -1588                  | 7,562547E+22                              | 7,562460E+22 | 6,766024E+22 | 6,766059E+22 | 1,512501E+23                           | 1,353208E+23                           | 2,865709E+23  |
| -1587                  | 7,562254E+22                              | 7,562456E+22 | 6,766061E+22 | 6,766010E+22 | 1,512471E+23                           | 1,353207E+23                           | 2,865678E+23  |
| -1586                  | 7,562602E+22                              | 7,562516E+22 | 6,766061E+22 | 6,766186E+22 | 1,512512E+23                           | 1,353225E+23                           | 2,865736E+23  |
| -1585                  | 7,562590E+22                              | 7,562359E+22 | 6,766123E+22 | 6,765972E+22 | 1,512495E+23                           | 1,353209E+23                           | 2,865704E+23  |
| -1584                  | 7,562347E+22                              | 7,562546E+22 | 6,766223E+22 | 6,766121E+22 | 1,512489E+23                           | 1,353234E+23                           | 2,865724E+23  |
| -1583                  | 7,562670E+22                              | 7,562648E+22 | 6,766152E+22 | 6,766289E+22 | 1,512532E+23                           | 1,353244E+23                           | 2,865776E+23  |
| -1582                  | 7,562431E+22                              | 7,562507E+22 | 6,766248E+22 | 6,766178E+22 | 1,512494E+23                           | 1,353243E+23                           | 2,865736E+23  |
| -1581                  | 7,562399E+22                              | 7,562622E+22 | 6,766387E+22 | 6,766389E+22 | 1,512502E+23                           | 1,353278E+23                           | 2,865780E+23  |
| -1580                  | 7,562723E+22                              | 7,562571E+22 | 6,766333E+22 | 6,766328E+22 | 1,512529E+23                           | 1,353266E+23                           | 2,865795E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -1579             | 7,562438E+22                              | 7,562502E+22 | 6,766394E+22 | 6,766251E+22 | 1,512494E+23                           | 1,353265E+23                           | 2,865759E+23  |
| -1578             | 7,562664E+22                              | 7,562617E+22 | 6,766362E+22 | 6,766492E+22 | 1,512528E+23                           | 1,353285E+23                           | 2,865813E+23  |
| -1577             | 7,562712E+22                              | 7,562533E+22 | 6,766312E+22 | 6,766289E+22 | 1,512524E+23                           | 1,353260E+23                           | 2,865785E+23  |
| -1576             | 7,562354E+22                              | 7,562641E+22 | 6,766354E+22 | 6,766296E+22 | 1,512499E+23                           | 1,353265E+23                           | 2,865764E+23  |
| -1575             | 7,562693E+22                              | 7,562691E+22 | 6,766242E+22 | 6,766370E+22 | 1,512538E+23                           | 1,353261E+23                           | 2,865800E+23  |
| -1574             | 7,562551E+22                              | 7,562477E+22 | 6,766271E+22 | 6,766099E+22 | 1,512503E+23                           | 1,353237E+23                           | 2,865740E+23  |
| -1573             | 7,562372E+22                              | 7,562540E+22 | 6,766339E+22 | 6,766220E+22 | 1,512491E+23                           | 1,353256E+23                           | 2,865747E+23  |
| -1572             | 7,562679E+22                              | 7,562561E+22 | 6,766163E+22 | 6,766216E+22 | 1,512524E+23                           | 1,353238E+23                           | 2,865762E+23  |
| -1571             | 7,562331E+22                              | 7,562453E+22 | 6,766166E+22 | 6,766081E+22 | 1,512478E+23                           | 1,353225E+23                           | 2,865703E+23  |
| -1570             | 7,562428E+22                              | 7,562518E+22 | 6,766146E+22 | 6,766290E+22 | 1,512495E+23                           | 1,353244E+23                           | 2,865738E+23  |
| -1569             | 7,562638E+22                              | 7,562432E+22 | 6,766104E+22 | 6,766087E+22 | 1,512507E+23                           | 1,353219E+23                           | 2,865726E+23  |
| -1568             | 7,562306E+22                              | 7,562467E+22 | 6,766195E+22 | 6,766050E+22 | 1,512477E+23                           | 1,353225E+23                           | 2,865702E+23  |
| -1567             | 7,562649E+22                              | 7,562569E+22 | 6,766144E+22 | 6,766242E+22 | 1,512522E+23                           | 1,353239E+23                           | 2,865760E+23  |
| -1566             | 7,562599E+22                              | 7,562479E+22 | 6,766196E+22 | 6,766099E+22 | 1,512508E+23                           | 1,353230E+23                           | 2,865737E+23  |
| -1565             | 7,562293E+22                              | 7,562588E+22 | 6,766351E+22 | 6,766287E+22 | 1,512488E+23                           | 1,353264E+23                           | 2,865752E+23  |
| -1564             | 7,562655E+22                              | 7,562674E+22 | 6,766275E+22 | 6,766401E+22 | 1,512533E+23                           | 1,353268E+23                           | 2,865801E+23  |
| -1563             | 7,562434E+22                              | 7,562528E+22 | 6,766395E+22 | 6,766256E+22 | 1,512496E+23                           | 1,353265E+23                           | 2,865761E+23  |
| -1562             | 7,562480E+22                              | 7,562545E+22 | 6,766469E+22 | 6,766488E+22 | 1,512502E+23                           | 1,353296E+23                           | 2,865798E+23  |
| -1561             | 7,562816E+22                              | 7,562533E+22 | 6,766414E+22 | 6,766414E+22 | 1,512535E+23                           | 1,353283E+23                           | 2,865818E+23  |
| -1560             | 7,562438E+22                              | 7,562559E+22 | 6,766466E+22 | 6,766367E+22 | 1,512500E+23                           | 1,353283E+23                           | 2,865783E+23  |
| -1559             | 7,562654E+22                              | 7,562692E+22 | 6,766374E+22 | 6,766569E+22 | 1,512535E+23                           | 1,353294E+23                           | 2,865829E+23  |
| -1558             | 7,562724E+22                              | 7,562616E+22 | 6,766353E+22 | 6,766347E+22 | 1,512534E+23                           | 1,353270E+23                           | 2,865804E+23  |
| -1557             | 7,562355E+22                              | 7,562607E+22 | 6,766478E+22 | 6,766341E+22 | 1,512496E+23                           | 1,353282E+23                           | 2,865778E+23  |
| -1556             | 7,562727E+22                              | 7,562673E+22 | 6,766360E+22 | 6,766390E+22 | 1,512540E+23                           | 1,353275E+23                           | 2,865815E+23  |
| -1555             | 7,562555E+22                              | 7,562512E+22 | 6,766382E+22 | 6,766158E+22 | 1,512507E+23                           | 1,353254E+23                           | 2,865761E+23  |
| -1554             | 7,562373E+22                              | 7,562520E+22 | 6,766368E+22 | 6,766351E+22 | 1,512489E+23                           | 1,353272E+23                           | 2,865761E+23  |
| -1553             | 7,562696E+22                              | 7,562566E+22 | 6,766219E+22 | 6,766322E+22 | 1,512526E+23                           | 1,353254E+23                           | 2,865780E+23  |
| -1552             | 7,562321E+22                              | 7,562483E+22 | 6,766257E+22 | 6,766166E+22 | 1,512480E+23                           | 1,353242E+23                           | 2,865723E+23  |
| -1551             | 7,562470E+22                              | 7,562536E+22 | 6,766207E+22 | 6,766327E+22 | 1,512501E+23                           | 1,353253E+23                           | 2,865754E+23  |
| -1550             | 7,562727E+22                              | 7,562483E+22 | 6,766180E+22 | 6,766148E+22 | 1,512521E+23                           | 1,353233E+23                           | 2,865754E+23  |
| -1549             | 7,562320E+22                              | 7,562462E+22 | 6,766321E+22 | 6,766161E+22 | 1,512478E+23                           | 1,353248E+23                           | 2,865726E+23  |
| -1548             | 7,562625E+22                              | 7,562643E+22 | 6,766241E+22 | 6,766358E+22 | 1,512527E+23                           | 1,353260E+23                           | 2,865787E+23  |
| -1547             | 7,562553E+22                              | 7,562567E+22 | 6,766305E+22 | 6,766215E+22 | 1,512512E+23                           | 1,353252E+23                           | 2,865764E+23  |
| -1546             | 7,562292E+22                              | 7,562542E+22 | 6,766431E+22 | 6,766412E+22 | 1,512483E+23                           | 1,353284E+23                           | 2,865768E+23  |
| -1545             | 7,562727E+22                              | 7,562617E+22 | 6,766397E+22 | 6,766470E+22 | 1,512534E+23                           | 1,353287E+23                           | 2,865821E+23  |
| -1544             | 7,562491E+22                              | 7,562507E+22 | 6,766519E+22 | 6,766336E+22 | 1,512500E+23                           | 1,353286E+23                           | 2,865785E+23  |
| -1543             | 7,562543E+22                              | 7,562573E+22 | 6,766508E+22 | 6,766569E+22 | 1,512512E+23                           | 1,353308E+23                           | 2,865819E+23  |
| -1542             | 7,562861E+22                              | 7,562645E+22 | 6,766435E+22 | 6,766522E+22 | 1,512551E+23                           | 1,353296E+23                           | 2,865846E+23  |
| -1541             | 7,562416E+22                              | 7,562608E+22 | 6,766560E+22 | 6,766472E+22 | 1,512502E+23                           | 1,353303E+23                           | 2,865806E+23  |
| -1540             | 7,562645E+22                              | 7,562756E+22 | 6,766482E+22 | 6,766604E+22 | 1,512540E+23                           | 1,353309E+23                           | 2,865849E+23  |
| -1539             | 7,562726E+22                              | 7,562663E+22 | 6,766500E+22 | 6,766367E+22 | 1,512539E+23                           | 1,353287E+23                           | 2,865826E+23  |
| -1538             | 7,562393E+22                              | 7,562534E+22 | 6,766578E+22 | 6,766425E+22 | 1,512493E+23                           | 1,353300E+23                           | 2,865793E+23  |
| -1537             | 7,562756E+22                              | 7,562628E+22 | 6,766452E+22 | 6,766486E+22 | 1,512538E+23                           | 1,353294E+23                           | 2,865832E+23  |
| -1536             | 7,562510E+22                              | 7,562538E+22 | 6,766446E+22 | 6,766303E+22 | 1,512505E+23                           | 1,353275E+23                           | 2,865780E+23  |
| -1535             | 7,562363E+22                              | 7,562541E+22 | 6,766357E+22 | 6,766456E+22 | 1,512490E+23                           | 1,353281E+23                           | 2,865772E+23  |
| -1534             | 7,562738E+22                              | 7,562601E+22 | 6,766232E+22 | 6,766388E+22 | 1,512534E+23                           | 1,353262E+23                           | 2,865796E+23  |
| -1533             | 7,562374E+22                              | 7,562454E+22 | 6,766355E+22 | 6,766210E+22 | 1,512483E+23                           | 1,353257E+23                           | 2,865739E+23  |
| -1532             | 7,562536E+22                              | 7,562563E+22 | 6,766295E+22 | 6,766331E+22 | 1,512510E+23                           | 1,353263E+23                           | 2,865773E+23  |
| -1531             | 7,562736E+22                              | 7,562579E+22 | 6,766292E+22 | 6,766202E+22 | 1,512532E+23                           | 1,353249E+23                           | 2,865781E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -1530             | 7,562311E+22                              | 7,562487E+22 | 6,766398E+22 | 6,766302E+22 | 1,512480E+23                           | 1,353270E+23                           | 2,865750E+23  |
| -1529             | 7,562605E+22                              | 7,562655E+22 | 6,766366E+22 | 6,766474E+22 | 1,512526E+23                           | 1,353284E+23                           | 2,865810E+23  |
| -1528             | 7,562522E+22                              | 7,562584E+22 | 6,766459E+22 | 6,766337E+22 | 1,512511E+23                           | 1,353280E+23                           | 2,865790E+23  |
| -1527             | 7,562344E+22                              | 7,562508E+22 | 6,766516E+22 | 6,766495E+22 | 1,512485E+23                           | 1,353301E+23                           | 2,865786E+23  |
| -1526             | 7,562828E+22                              | 7,562620E+22 | 6,766467E+22 | 6,766570E+22 | 1,512545E+23                           | 1,353304E+23                           | 2,865848E+23  |
| -1525             | 7,562537E+22                              | 7,562503E+22 | 6,766609E+22 | 6,766467E+22 | 1,512504E+23                           | 1,353308E+23                           | 2,865812E+23  |
| -1524             | 7,562550E+22                              | 7,562667E+22 | 6,766553E+22 | 6,76661E+22  | 1,512522E+23                           | 1,353321E+23                           | 2,865843E+23  |
| -1523             | 7,562847E+22                              | 7,562763E+22 | 6,766523E+22 | 6,766589E+22 | 1,512561E+23                           | 1,353311E+23                           | 2,865872E+23  |
| -1522             | 7,562436E+22                              | 7,562589E+22 | 6,766649E+22 | 6,766543E+22 | 1,512503E+23                           | 1,353319E+23                           | 2,865822E+23  |
| -1521             | 7,562690E+22                              | 7,562719E+22 | 6,766625E+22 | 6,766628E+22 | 1,512541E+23                           | 1,353325E+23                           | 2,865866E+23  |
| -1520             | 7,562734E+22                              | 7,562661E+22 | 6,766634E+22 | 6,766444E+22 | 1,512540E+23                           | 1,353308E+23                           | 2,865847E+23  |
| -1519             | 7,562398E+22                              | 7,562537E+22 | 6,766608E+22 | 6,766530E+22 | 1,512494E+23                           | 1,353314E+23                           | 2,865807E+23  |
| -1518             | 7,562766E+22                              | 7,562692E+22 | 6,766455E+22 | 6,766619E+22 | 1,512546E+23                           | 1,353307E+23                           | 2,865853E+23  |
| -1517             | 7,562493E+22                              | 7,562530E+22 | 6,766505E+22 | 6,766417E+22 | 1,512502E+23                           | 1,353292E+23                           | 2,865794E+23  |
| -1516             | 7,562381E+22                              | 7,562579E+22 | 6,766412E+22 | 6,766481E+22 | 1,512496E+23                           | 1,353289E+23                           | 2,865785E+23  |
| -1515             | 7,562795E+22                              | 7,562645E+22 | 6,766336E+22 | 6,766386E+22 | 1,512544E+23                           | 1,353272E+23                           | 2,865816E+23  |
| -1514             | 7,562440E+22                              | 7,562408E+22 | 6,766441E+22 | 6,766274E+22 | 1,512485E+23                           | 1,353271E+23                           | 2,865756E+23  |
| -1513             | 7,562558E+22                              | 7,562577E+22 | 6,766410E+22 | 6,766407E+22 | 1,512513E+23                           | 1,353282E+23                           | 2,865795E+23  |
| -1512             | 7,562677E+22                              | 7,562648E+22 | 6,766400E+22 | 6,766342E+22 | 1,512533E+23                           | 1,353274E+23                           | 2,865807E+23  |
| -1511             | 7,562286E+22                              | 7,562500E+22 | 6,766453E+22 | 6,766428E+22 | 1,512479E+23                           | 1,353288E+23                           | 2,865767E+23  |
| -1510             | 7,562642E+22                              | 7,562663E+22 | 6,766438E+22 | 6,766577E+22 | 1,512530E+23                           | 1,353301E+23                           | 2,865832E+23  |
| -1509             | 7,562576E+22                              | 7,562521E+22 | 6,766588E+22 | 6,766438E+22 | 1,512510E+23                           | 1,353303E+23                           | 2,865812E+23  |
| -1508             | 7,562420E+22                              | 7,562535E+22 | 6,766593E+22 | 6,766559E+22 | 1,512495E+23                           | 1,353315E+23                           | 2,865811E+23  |
| -1507             | 7,562872E+22                              | 7,562722E+22 | 6,766552E+22 | 6,766653E+22 | 1,512559E+23                           | 1,353320E+23                           | 2,865880E+23  |
| -1506             | 7,562562E+22                              | 7,562550E+22 | 6,766667E+22 | 6,766599E+22 | 1,512511E+23                           | 1,353327E+23                           | 2,865838E+23  |
| -1505             | 7,562560E+22                              | 7,562716E+22 | 6,766675E+22 | 6,766727E+22 | 1,512528E+23                           | 1,353340E+23                           | 2,865868E+23  |
| -1504             | 7,562822E+22                              | 7,562817E+22 | 6,766682E+22 | 6,766665E+22 | 1,512564E+23                           | 1,353335E+23                           | 2,865899E+23  |
| -1503             | 7,562472E+22                              | 7,562566E+22 | 6,766748E+22 | 6,766611E+22 | 1,512504E+23                           | 1,353336E+23                           | 2,865840E+23  |
| -1502             | 7,562728E+22                              | 7,562708E+22 | 6,766697E+22 | 6,766725E+22 | 1,512544E+23                           | 1,353342E+23                           | 2,865886E+23  |
| -1501             | 7,562718E+22                              | 7,562632E+22 | 6,766710E+22 | 6,766596E+22 | 1,512535E+23                           | 1,353331E+23                           | 2,865866E+23  |
| -1500             | 7,562379E+22                              | 7,562580E+22 | 6,766605E+22 | 6,766623E+22 | 1,512496E+23                           | 1,353323E+23                           | 2,865819E+23  |
| -1499             | 7,562764E+22                              | 7,562740E+22 | 6,766492E+22 | 6,766669E+22 | 1,512550E+23                           | 1,353316E+23                           | 2,865867E+23  |
| -1498             | 7,562555E+22                              | 7,562481E+22 | 6,766545E+22 | 6,766458E+22 | 1,512504E+23                           | 1,353300E+23                           | 2,865804E+23  |
| -1497             | 7,562468E+22                              | 7,562546E+22 | 6,766517E+22 | 6,766459E+22 | 1,512501E+23                           | 1,353298E+23                           | 2,865799E+23  |
| -1496             | 7,562818E+22                              | 7,562691E+22 | 6,766459E+22 | 6,766430E+22 | 1,512551E+23                           | 1,353289E+23                           | 2,865840E+23  |
| -1495             | 7,562447E+22                              | 7,562456E+22 | 6,766493E+22 | 6,766370E+22 | 1,512490E+23                           | 1,353286E+23                           | 2,865777E+23  |
| -1494             | 7,562532E+22                              | 7,562659E+22 | 6,766472E+22 | 6,766540E+22 | 1,512519E+23                           | 1,353301E+23                           | 2,865820E+23  |
| -1493             | 7,562630E+22                              | 7,562652E+22 | 6,766531E+22 | 6,766496E+22 | 1,512528E+23                           | 1,353303E+23                           | 2,865831E+23  |
| -1492             | 7,562292E+22                              | 7,562519E+22 | 6,766554E+22 | 6,766508E+22 | 1,512481E+23                           | 1,353306E+23                           | 2,865787E+23  |
| -1491             | 7,562710E+22                              | 7,562674E+22 | 6,766567E+22 | 6,76649E+22  | 1,512538E+23                           | 1,353322E+23                           | 2,865860E+23  |
| -1490             | 7,562667E+22                              | 7,562471E+22 | 6,766667E+22 | 6,766565E+22 | 1,512514E+23                           | 1,353323E+23                           | 2,865837E+23  |
| -1489             | 7,562475E+22                              | 7,562569E+22 | 6,766682E+22 | 6,766660E+22 | 1,512504E+23                           | 1,353334E+23                           | 2,865839E+23  |
| -1488             | 7,562851E+22                              | 7,562828E+22 | 6,766645E+22 | 6,766777E+22 | 1,512568E+23                           | 1,353342E+23                           | 2,865910E+23  |
| -1487             | 7,562567E+22                              | 7,562592E+22 | 6,766728E+22 | 6,766685E+22 | 1,512516E+23                           | 1,353341E+23                           | 2,865857E+23  |
| -1486             | 7,562599E+22                              | 7,562749E+22 | 6,766773E+22 | 6,766783E+22 | 1,512535E+23                           | 1,353356E+23                           | 2,865890E+23  |
| -1485             | 7,562847E+22                              | 7,562764E+22 | 6,766824E+22 | 6,766742E+22 | 1,512561E+23                           | 1,353357E+23                           | 2,865918E+23  |
| -1484             | 7,562486E+22                              | 7,562581E+22 | 6,766821E+22 | 6,76675E+22  | 1,512507E+23                           | 1,353350E+23                           | 2,865856E+23  |
| -1483             | 7,562730E+22                              | 7,562765E+22 | 6,766760E+22 | 6,766817E+22 | 1,512549E+23                           | 1,353358E+23                           | 2,865907E+23  |
| -1482             | 7,562718E+22                              | 7,562613E+22 | 6,766733E+22 | 6,766724E+22 | 1,512533E+23                           | 1,353346E+23                           | 2,865879E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -1481             | 7,562404E+22                              | 7,562584E+22 | 6,766676E+22 | 6,766663E+22 | 1,512499E+23                           | 1,353334E+23                           | 2,865833E+23  |
| -1480             | 7,562782E+22                              | 7,562769E+22 | 6,766594E+22 | 6,766697E+22 | 1,512555E+23                           | 1,353329E+23                           | 2,865884E+23  |
| -1479             | 7,562625E+22                              | 7,562467E+22 | 6,766606E+22 | 6,766483E+22 | 1,512509E+23                           | 1,353309E+23                           | 2,865818E+23  |
| -1478             | 7,562516E+22                              | 7,562582E+22 | 6,766586E+22 | 6,766522E+22 | 1,512510E+23                           | 1,353311E+23                           | 2,865821E+23  |
| -1477             | 7,562771E+22                              | 7,562718E+22 | 6,766561E+22 | 6,766572E+22 | 1,512549E+23                           | 1,353313E+23                           | 2,865862E+23  |
| -1476             | 7,562389E+22                              | 7,562533E+22 | 6,766550E+22 | 6,766489E+22 | 1,512492E+23                           | 1,353304E+23                           | 2,865796E+23  |
| -1475             | 7,562510E+22                              | 7,562697E+22 | 6,766576E+22 | 6,766636E+22 | 1,512521E+23                           | 1,353321E+23                           | 2,865842E+23  |
| -1474             | 7,562678E+22                              | 7,562576E+22 | 6,766625E+22 | 6,766605E+22 | 1,512525E+23                           | 1,353323E+23                           | 2,865848E+23  |
| -1473             | 7,562395E+22                              | 7,562473E+22 | 6,766670E+22 | 6,766556E+22 | 1,512487E+23                           | 1,353323E+23                           | 2,865809E+23  |
| -1472             | 7,562760E+22                              | 7,562719E+22 | 6,766675E+22 | 6,766745E+22 | 1,512548E+23                           | 1,353342E+23                           | 2,865890E+23  |
| -1471             | 7,562720E+22                              | 7,562538E+22 | 6,766702E+22 | 6,766682E+22 | 1,512526E+23                           | 1,353338E+23                           | 2,865864E+23  |
| -1470             | 7,562496E+22                              | 7,562666E+22 | 6,766744E+22 | 6,766761E+22 | 1,512516E+23                           | 1,353351E+23                           | 2,865867E+23  |
| -1469             | 7,562822E+22                              | 7,562863E+22 | 6,766795E+22 | 6,766886E+22 | 1,512569E+23                           | 1,353368E+23                           | 2,865937E+23  |
| -1468             | 7,562574E+22                              | 7,562632E+22 | 6,766849E+22 | 6,766729E+22 | 1,512521E+23                           | 1,353358E+23                           | 2,865878E+23  |
| -1467             | 7,562626E+22                              | 7,562751E+22 | 6,766918E+22 | 6,766841E+22 | 1,512538E+23                           | 1,353376E+23                           | 2,865914E+23  |
| -1466             | 7,562872E+22                              | 7,562700E+22 | 6,766906E+22 | 6,766881E+22 | 1,512557E+23                           | 1,353379E+23                           | 2,865936E+23  |
| -1465             | 7,562500E+22                              | 7,562572E+22 | 6,766878E+22 | 6,766781E+22 | 1,512507E+23                           | 1,353366E+23                           | 2,865873E+23  |
| -1464             | 7,562701E+22                              | 7,562809E+22 | 6,766809E+22 | 6,766927E+22 | 1,512551E+23                           | 1,353374E+23                           | 2,865925E+23  |
| -1463             | 7,562757E+22                              | 7,562607E+22 | 6,766737E+22 | 6,766778E+22 | 1,512536E+23                           | 1,353351E+23                           | 2,865888E+23  |
| -1462             | 7,562479E+22                              | 7,562600E+22 | 6,766722E+22 | 6,766668E+22 | 1,512508E+23                           | 1,353339E+23                           | 2,865847E+23  |
| -1461             | 7,562816E+22                              | 7,562762E+22 | 6,766708E+22 | 6,766738E+22 | 1,512558E+23                           | 1,353345E+23                           | 2,865902E+23  |
| -1460             | 7,562627E+22                              | 7,562547E+22 | 6,766673E+22 | 6,766526E+22 | 1,512517E+23                           | 1,353320E+23                           | 2,865837E+23  |
| -1459             | 7,562485E+22                              | 7,562680E+22 | 6,766684E+22 | 6,766620E+22 | 1,512516E+23                           | 1,353330E+23                           | 2,865847E+23  |
| -1458             | 7,562727E+22                              | 7,562713E+22 | 6,766646E+22 | 6,766725E+22 | 1,512544E+23                           | 1,353337E+23                           | 2,865881E+23  |
| -1457             | 7,562391E+22                              | 7,562519E+22 | 6,766678E+22 | 6,766578E+22 | 1,512491E+23                           | 1,353326E+23                           | 2,865817E+23  |
| -1456             | 7,562538E+22                              | 7,562687E+22 | 6,766716E+22 | 6,766725E+22 | 1,512522E+23                           | 1,353344E+23                           | 2,865866E+23  |
| -1455             | 7,562772E+22                              | 7,562522E+22 | 6,766692E+22 | 6,766694E+22 | 1,512529E+23                           | 1,353339E+23                           | 2,865868E+23  |
| -1454             | 7,562483E+22                              | 7,562510E+22 | 6,766724E+22 | 6,766655E+22 | 1,512499E+23                           | 1,353338E+23                           | 2,865837E+23  |
| -1453             | 7,562758E+22                              | 7,562769E+22 | 6,766755E+22 | 6,766885E+22 | 1,512553E+23                           | 1,353364E+23                           | 2,865917E+23  |
| -1452             | 7,562692E+22                              | 7,562648E+22 | 6,766758E+22 | 6,766765E+22 | 1,512534E+23                           | 1,353352E+23                           | 2,865886E+23  |
| -1451             | 7,562504E+22                              | 7,562736E+22 | 6,766875E+22 | 6,766820E+22 | 1,512524E+23                           | 1,353369E+23                           | 2,865893E+23  |
| -1450             | 7,562847E+22                              | 7,562805E+22 | 6,766928E+22 | 6,766968E+22 | 1,512565E+23                           | 1,353390E+23                           | 2,865955E+23  |
| -1449             | 7,562631E+22                              | 7,562597E+22 | 6,766994E+22 | 6,766786E+22 | 1,512523E+23                           | 1,353378E+23                           | 2,865901E+23  |
| -1448             | 7,562627E+22                              | 7,562776E+22 | 6,767025E+22 | 6,766956E+22 | 1,512540E+23                           | 1,353398E+23                           | 2,865938E+23  |
| -1447             | 7,562883E+22                              | 7,562717E+22 | 6,766915E+22 | 6,767014E+22 | 1,512560E+23                           | 1,353393E+23                           | 2,865953E+23  |
| -1446             | 7,562524E+22                              | 7,562627E+22 | 6,766896E+22 | 6,766874E+22 | 1,512515E+23                           | 1,353377E+23                           | 2,865892E+23  |
| -1445             | 7,562698E+22                              | 7,562818E+22 | 6,766896E+22 | 6,767003E+22 | 1,512552E+23                           | 1,353390E+23                           | 2,865941E+23  |
| -1444             | 7,562788E+22                              | 7,562656E+22 | 6,766805E+22 | 6,766781E+22 | 1,512544E+23                           | 1,353359E+23                           | 2,865903E+23  |
| -1443             | 7,562533E+22                              | 7,562633E+22 | 6,766837E+22 | 6,766690E+22 | 1,512517E+23                           | 1,353353E+23                           | 2,865869E+23  |
| -1442             | 7,562811E+22                              | 7,562745E+22 | 6,766797E+22 | 6,766847E+22 | 1,512556E+23                           | 1,353364E+23                           | 2,865920E+23  |
| -1441             | 7,562604E+22                              | 7,562577E+22 | 6,766763E+22 | 6,766628E+22 | 1,512518E+23                           | 1,353339E+23                           | 2,865857E+23  |
| -1440             | 7,562422E+22                              | 7,562714E+22 | 6,766784E+22 | 6,766744E+22 | 1,512514E+23                           | 1,353353E+23                           | 2,865866E+23  |
| -1439             | 7,562753E+22                              | 7,562669E+22 | 6,766700E+22 | 6,766823E+22 | 1,512542E+23                           | 1,353352E+23                           | 2,865894E+23  |
| -1438             | 7,562485E+22                              | 7,562480E+22 | 6,766742E+22 | 6,766626E+22 | 1,512497E+23                           | 1,353337E+23                           | 2,865833E+23  |
| -1437             | 7,562599E+22                              | 7,562656E+22 | 6,766818E+22 | 6,766815E+22 | 1,512525E+23                           | 1,353363E+23                           | 2,865889E+23  |
| -1436             | 7,562812E+22                              | 7,562612E+22 | 6,766732E+22 | 6,766762E+22 | 1,512542E+23                           | 1,353349E+23                           | 2,865892E+23  |
| -1435             | 7,562498E+22                              | 7,562629E+22 | 6,766810E+22 | 6,766747E+22 | 1,512513E+23                           | 1,353356E+23                           | 2,865868E+23  |
| -1434             | 7,562734E+22                              | 7,562811E+22 | 6,766865E+22 | 6,767010E+22 | 1,512554E+23                           | 1,353387E+23                           | 2,865942E+23  |
| -1433             | 7,562704E+22                              | 7,562678E+22 | 6,766920E+22 | 6,766827E+22 | 1,512538E+23                           | 1,353375E+23                           | 2,865913E+23  |



| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -1432                  | 7,562509E+22                              | 7,562746E+22 | 6,767055E+22 | 6,766906E+22 | 1,512526E+23                           | 1,353396E+23                           | 2,865922E+23  |
| -1431                  | 7,562896E+22                              | 7,562755E+22 | 6,767019E+22 | 6,767084E+22 | 1,512565E+23                           | 1,353410E+23                           | 2,865975E+23  |
| -1430                  | 7,562672E+22                              | 7,562606E+22 | 6,767048E+22 | 6,766919E+22 | 1,512528E+23                           | 1,353397E+23                           | 2,865925E+23  |
| -1429                  | 7,562602E+22                              | 7,562794E+22 | 6,767079E+22 | 6,767120E+22 | 1,512540E+23                           | 1,353420E+23                           | 2,865959E+23  |
| -1428                  | 7,562871E+22                              | 7,562784E+22 | 6,766926E+22 | 6,767082E+22 | 1,512566E+23                           | 1,353401E+23                           | 2,865966E+23  |
| -1427                  | 7,562578E+22                              | 7,562670E+22 | 6,766972E+22 | 6,766891E+22 | 1,512525E+23                           | 1,353386E+23                           | 2,865911E+23  |
| -1426                  | 7,562754E+22                              | 7,562775E+22 | 6,766985E+22 | 6,767030E+22 | 1,512553E+23                           | 1,353401E+23                           | 2,865954E+23  |
| -1425                  | 7,562844E+22                              | 7,562668E+22 | 6,766920E+22 | 6,766790E+22 | 1,512551E+23                           | 1,353371E+23                           | 2,865922E+23  |
| -1424                  | 7,562516E+22                              | 7,562699E+22 | 6,766951E+22 | 6,766776E+22 | 1,512521E+23                           | 1,353373E+23                           | 2,865894E+23  |
| -1423                  | 7,562775E+22                              | 7,562761E+22 | 6,766839E+22 | 6,766967E+22 | 1,512554E+23                           | 1,353381E+23                           | 2,865934E+23  |
| -1422                  | 7,562595E+22                              | 7,562601E+22 | 6,766831E+22 | 6,766735E+22 | 1,512520E+23                           | 1,353357E+23                           | 2,865876E+23  |
| -1421                  | 7,562413E+22                              | 7,562675E+22 | 6,766892E+22 | 6,766852E+22 | 1,512509E+23                           | 1,353374E+23                           | 2,865883E+23  |
| -1420                  | 7,562788E+22                              | 7,562665E+22 | 6,766766E+22 | 6,766867E+22 | 1,512545E+23                           | 1,353363E+23                           | 2,865909E+23  |
| -1419                  | 7,562573E+22                              | 7,562504E+22 | 6,766829E+22 | 6,766695E+22 | 1,512508E+23                           | 1,353352E+23                           | 2,865860E+23  |
| -1418                  | 7,562623E+22                              | 7,562662E+22 | 6,766876E+22 | 6,766944E+22 | 1,512529E+23                           | 1,353382E+23                           | 2,865910E+23  |
| -1417                  | 7,562817E+22                              | 7,562694E+22 | 6,766814E+22 | 6,766859E+22 | 1,512551E+23                           | 1,353367E+23                           | 2,865918E+23  |
| -1416                  | 7,562474E+22                              | 7,562707E+22 | 6,766941E+22 | 6,766846E+22 | 1,512518E+23                           | 1,353379E+23                           | 2,865897E+23  |
| -1415                  | 7,562752E+22                              | 7,562797E+22 | 6,766970E+22 | 6,767088E+22 | 1,512555E+23                           | 1,353406E+23                           | 2,865961E+23  |
| -1414                  | 7,562773E+22                              | 7,562667E+22 | 6,767044E+22 | 6,766897E+22 | 1,512544E+23                           | 1,353394E+23                           | 2,865938E+23  |
| -1413                  | 7,562529E+22                              | 7,562721E+22 | 6,767186E+22 | 6,767039E+22 | 1,512525E+23                           | 1,353423E+23                           | 2,865948E+23  |
| -1412                  | 7,562893E+22                              | 7,562819E+22 | 6,767064E+22 | 6,767196E+22 | 1,512571E+23                           | 1,353426E+23                           | 2,865997E+23  |
| -1411                  | 7,562698E+22                              | 7,562681E+22 | 6,767104E+22 | 6,767033E+22 | 1,512538E+23                           | 1,353414E+23                           | 2,865952E+23  |
| -1410                  | 7,562606E+22                              | 7,562794E+22 | 6,767143E+22 | 6,767228E+22 | 1,512540E+23                           | 1,353437E+23                           | 2,865977E+23  |
| -1409                  | 7,562925E+22                              | 7,562805E+22 | 6,767033E+22 | 6,767097E+22 | 1,512573E+23                           | 1,353413E+23                           | 2,865986E+23  |
| -1408                  | 7,562620E+22                              | 7,562689E+22 | 6,767110E+22 | 6,766913E+22 | 1,512531E+23                           | 1,353402E+23                           | 2,865933E+23  |
| -1407                  | 7,562797E+22                              | 7,562757E+22 | 6,767058E+22 | 6,767089E+22 | 1,512555E+23                           | 1,353415E+23                           | 2,865970E+23  |
| -1406                  | 7,562854E+22                              | 7,562699E+22 | 6,766971E+22 | 6,766882E+22 | 1,512555E+23                           | 1,353385E+23                           | 2,865941E+23  |
| -1405                  | 7,562441E+22                              | 7,562713E+22 | 6,767021E+22 | 6,766929E+22 | 1,512515E+23                           | 1,353395E+23                           | 2,865910E+23  |
| -1404                  | 7,562726E+22                              | 7,562794E+22 | 6,766871E+22 | 6,767046E+22 | 1,512552E+23                           | 1,353392E+23                           | 2,865944E+23  |
| -1403                  | 7,562642E+22                              | 7,562591E+22 | 6,766907E+22 | 6,766790E+22 | 1,512523E+23                           | 1,353370E+23                           | 2,865893E+23  |
| -1402                  | 7,562476E+22                              | 7,562608E+22 | 6,766966E+22 | 6,766925E+22 | 1,512508E+23                           | 1,353389E+23                           | 2,865897E+23  |
| -1401                  | 7,562869E+22                              | 7,562681E+22 | 6,766848E+22 | 6,766911E+22 | 1,512555E+23                           | 1,353376E+23                           | 2,865931E+23  |
| -1400                  | 7,562592E+22                              | 7,562600E+22 | 6,766923E+22 | 6,766786E+22 | 1,512519E+23                           | 1,353371E+23                           | 2,865890E+23  |
| -1399                  | 7,562626E+22                              | 7,562725E+22 | 6,766933E+22 | 6,767050E+22 | 1,512535E+23                           | 1,353398E+23                           | 2,865933E+23  |
| -1398                  | 7,562830E+22                              | 7,562759E+22 | 6,766928E+22 | 6,766945E+22 | 1,512559E+23                           | 1,353387E+23                           | 2,865946E+23  |
| -1397                  | 7,562465E+22                              | 7,562709E+22 | 6,767115E+22 | 6,766965E+22 | 1,512517E+23                           | 1,353408E+23                           | 2,865925E+23  |
| -1396                  | 7,562765E+22                              | 7,562804E+22 | 6,767095E+22 | 6,767161E+22 | 1,512557E+23                           | 1,353426E+23                           | 2,865983E+23  |
| -1395                  | 7,562835E+22                              | 7,562677E+22 | 6,767162E+22 | 6,767023E+22 | 1,512551E+23                           | 1,353419E+23                           | 2,865970E+23  |
| -1394                  | 7,562534E+22                              | 7,562704E+22 | 6,767246E+22 | 6,767213E+22 | 1,512524E+23                           | 1,353446E+23                           | 2,865970E+23  |
| -1393                  | 7,562905E+22                              | 7,562860E+22 | 6,767121E+22 | 6,767301E+22 | 1,512577E+23                           | 1,353442E+23                           | 2,866019E+23  |
| -1392                  | 7,562726E+22                              | 7,562732E+22 | 6,767192E+22 | 6,767102E+22 | 1,512546E+23                           | 1,353429E+23                           | 2,865975E+23  |
| -1391                  | 7,562676E+22                              | 7,562764E+22 | 6,767195E+22 | 6,767246E+22 | 1,512544E+23                           | 1,353444E+23                           | 2,865988E+23  |
| -1390                  | 7,563011E+22                              | 7,562812E+22 | 6,767119E+22 | 6,767104E+22 | 1,512582E+23                           | 1,353422E+23                           | 2,866005E+23  |
| -1389                  | 7,562625E+22                              | 7,562706E+22 | 6,767212E+22 | 6,766998E+22 | 1,512533E+23                           | 1,353421E+23                           | 2,865954E+23  |
| -1388                  | 7,562730E+22                              | 7,562835E+22 | 6,767099E+22 | 6,767164E+22 | 1,512557E+23                           | 1,353426E+23                           | 2,865983E+23  |
| -1387                  | 7,562824E+22                              | 7,562767E+22 | 6,767038E+22 | 6,766997E+22 | 1,512559E+23                           | 1,353404E+23                           | 2,865963E+23  |
| -1386                  | 7,562406E+22                              | 7,562672E+22 | 6,767095E+22 | 6,767050E+22 | 1,512508E+23                           | 1,353414E+23                           | 2,865922E+23  |
| -1385                  | 7,562765E+22                              | 7,562766E+22 | 6,766969E+22 | 6,767089E+22 | 1,512553E+23                           | 1,353406E+23                           | 2,865959E+23  |
| -1384                  | 7,562715E+22                              | 7,562578E+22 | 6,767016E+22 | 6,766843E+22 | 1,512529E+23                           | 1,353386E+23                           | 2,865915E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -1383             | 7,562548E+22                              | 7,562589E+22 | 6,767002E+22 | 6,767005E+22 | 1,512514E+23                           | 1,353401E+23                           | 2,865914E+23  |
| -1382             | 7,562911E+22                              | 7,562750E+22 | 6,766894E+22 | 6,767005E+22 | 1,512566E+23                           | 1,353390E+23                           | 2,865956E+23  |
| -1381             | 7,562558E+22                              | 7,562666E+22 | 6,767019E+22 | 6,766923E+22 | 1,512522E+23                           | 1,353394E+23                           | 2,865916E+23  |
| -1380             | 7,562593E+22                              | 7,562791E+22 | 6,767029E+22 | 6,767108E+22 | 1,512538E+23                           | 1,353414E+23                           | 2,865952E+23  |
| -1379             | 7,562884E+22                              | 7,562776E+22 | 6,767069E+22 | 6,767017E+22 | 1,512566E+23                           | 1,353409E+23                           | 2,865975E+23  |
| -1378             | 7,562503E+22                              | 7,562648E+22 | 6,767252E+22 | 6,767086E+22 | 1,512515E+23                           | 1,353434E+23                           | 2,865949E+23  |
| -1377             | 7,562813E+22                              | 7,562816E+22 | 6,767206E+22 | 6,767266E+22 | 1,512563E+23                           | 1,353447E+23                           | 2,866010E+23  |
| -1376             | 7,562847E+22                              | 7,562739E+22 | 6,767255E+22 | 6,767159E+22 | 1,512559E+23                           | 1,353441E+23                           | 2,866000E+23  |
| -1375             | 7,562562E+22                              | 7,562730E+22 | 6,767276E+22 | 6,767335E+22 | 1,512529E+23                           | 1,353461E+23                           | 2,865990E+23  |
| -1374             | 7,562962E+22                              | 7,562894E+22 | 6,767191E+22 | 6,767356E+22 | 1,512586E+23                           | 1,353455E+23                           | 2,866040E+23  |
| -1373             | 7,562747E+22                              | 7,562743E+22 | 6,767312E+22 | 6,767165E+22 | 1,512549E+23                           | 1,353448E+23                           | 2,865997E+23  |
| -1372             | 7,562697E+22                              | 7,562800E+22 | 6,767280E+22 | 6,767259E+22 | 1,512550E+23                           | 1,353454E+23                           | 2,866004E+23  |
| -1371             | 7,563039E+22                              | 7,562856E+22 | 6,767204E+22 | 6,767188E+22 | 1,512590E+23                           | 1,353439E+23                           | 2,866029E+23  |
| -1370             | 7,562569E+22                              | 7,562709E+22 | 6,767274E+22 | 6,767150E+22 | 1,512528E+23                           | 1,353442E+23                           | 2,865970E+23  |
| -1369             | 7,562687E+22                              | 7,562858E+22 | 6,767161E+22 | 6,767255E+22 | 1,512554E+23                           | 1,353442E+23                           | 2,865996E+23  |
| -1368             | 7,562821E+22                              | 7,562762E+22 | 6,767134E+22 | 6,767066E+22 | 1,512558E+23                           | 1,353420E+23                           | 2,865978E+23  |
| -1367             | 7,562481E+22                              | 7,562599E+22 | 6,767134E+22 | 6,767092E+22 | 1,512508E+23                           | 1,353423E+23                           | 2,865931E+23  |
| -1366             | 7,562873E+22                              | 7,562740E+22 | 6,767032E+22 | 6,767116E+22 | 1,512561E+23                           | 1,353415E+23                           | 2,865976E+23  |
| -1365             | 7,562749E+22                              | 7,562619E+22 | 6,767092E+22 | 6,766943E+22 | 1,512537E+23                           | 1,353403E+23                           | 2,865940E+23  |
| -1364             | 7,562530E+22                              | 7,562700E+22 | 6,767043E+22 | 6,767069E+22 | 1,512523E+23                           | 1,353411E+23                           | 2,865934E+23  |
| -1363             | 7,562914E+22                              | 7,562855E+22 | 6,766993E+22 | 6,767106E+22 | 1,512577E+23                           | 1,353410E+23                           | 2,865987E+23  |
| -1362             | 7,562535E+22                              | 7,562672E+22 | 6,767161E+22 | 6,767046E+22 | 1,512521E+23                           | 1,353421E+23                           | 2,865941E+23  |
| -1361             | 7,562608E+22                              | 7,562790E+22 | 6,767195E+22 | 6,767177E+22 | 1,512540E+23                           | 1,353437E+23                           | 2,865977E+23  |
| -1360             | 7,562930E+22                              | 7,562770E+22 | 6,767238E+22 | 6,767130E+22 | 1,512570E+23                           | 1,353437E+23                           | 2,866007E+23  |
| -1359             | 7,562555E+22                              | 7,562606E+22 | 6,767304E+22 | 6,767233E+22 | 1,512516E+23                           | 1,353454E+23                           | 2,865970E+23  |
| -1358             | 7,562847E+22                              | 7,562843E+22 | 6,767248E+22 | 6,767403E+22 | 1,512569E+23                           | 1,353465E+23                           | 2,866034E+23  |
| -1357             | 7,562844E+22                              | 7,562783E+22 | 6,767313E+22 | 6,767299E+22 | 1,512563E+23                           | 1,353461E+23                           | 2,866024E+23  |
| -1356             | 7,562577E+22                              | 7,562777E+22 | 6,767323E+22 | 6,767357E+22 | 1,512535E+23                           | 1,353468E+23                           | 2,866003E+23  |
| -1355             | 7,563046E+22                              | 7,562931E+22 | 6,767290E+22 | 6,767381E+22 | 1,512598E+23                           | 1,353467E+23                           | 2,866065E+23  |
| -1354             | 7,562778E+22                              | 7,562728E+22 | 6,767422E+22 | 6,767234E+22 | 1,512551E+23                           | 1,353466E+23                           | 2,866016E+23  |
| -1353             | 7,562692E+22                              | 7,562851E+22 | 6,767381E+22 | 6,767317E+22 | 1,512554E+23                           | 1,353470E+23                           | 2,866024E+23  |
| -1352             | 7,563000E+22                              | 7,562921E+22 | 6,767306E+22 | 6,767294E+22 | 1,512592E+23                           | 1,353460E+23                           | 2,866052E+23  |
| -1351             | 7,562551E+22                              | 7,562688E+22 | 6,767318E+22 | 6,767262E+22 | 1,512524E+23                           | 1,353458E+23                           | 2,865982E+23  |
| -1350             | 7,562720E+22                              | 7,562827E+22 | 6,767242E+22 | 6,767317E+22 | 1,512555E+23                           | 1,353456E+23                           | 2,866011E+23  |
| -1349             | 7,562857E+22                              | 7,562726E+22 | 6,767233E+22 | 6,767145E+22 | 1,512558E+23                           | 1,353438E+23                           | 2,865996E+23  |
| -1348             | 7,562535E+22                              | 7,562608E+22 | 6,767181E+22 | 6,767118E+22 | 1,512514E+23                           | 1,353430E+23                           | 2,865944E+23  |
| -1347             | 7,562936E+22                              | 7,562804E+22 | 6,767078E+22 | 6,767206E+22 | 1,512574E+23                           | 1,353428E+23                           | 2,866002E+23  |
| -1346             | 7,562716E+22                              | 7,562673E+22 | 6,767152E+22 | 6,767083E+22 | 1,512539E+23                           | 1,353423E+23                           | 2,865962E+23  |
| -1345             | 7,562506E+22                              | 7,562773E+22 | 6,767144E+22 | 6,767142E+22 | 1,512528E+23                           | 1,353429E+23                           | 2,865957E+23  |
| -1344             | 7,562912E+22                              | 7,562880E+22 | 6,767149E+22 | 6,767171E+22 | 1,512579E+23                           | 1,353432E+23                           | 2,866011E+23  |
| -1343             | 7,562588E+22                              | 7,562614E+22 | 6,767270E+22 | 6,767132E+22 | 1,512520E+23                           | 1,353440E+23                           | 2,865960E+23  |
| -1342             | 7,562684E+22                              | 7,562754E+22 | 6,767306E+22 | 6,767266E+22 | 1,512544E+23                           | 1,353457E+23                           | 2,866001E+23  |
| -1341             | 7,562929E+22                              | 7,562793E+22 | 6,767327E+22 | 6,767294E+22 | 1,512572E+23                           | 1,353462E+23                           | 2,866034E+23  |
| -1340             | 7,562550E+22                              | 7,562688E+22 | 6,767332E+22 | 6,767339E+22 | 1,512524E+23                           | 1,353467E+23                           | 2,865991E+23  |
| -1339             | 7,562891E+22                              | 7,562918E+22 | 6,767310E+22 | 6,767509E+22 | 1,512581E+23                           | 1,353482E+23                           | 2,866063E+23  |
| -1338             | 7,562861E+22                              | 7,562798E+22 | 6,767424E+22 | 6,767387E+22 | 1,512566E+23                           | 1,353481E+23                           | 2,866047E+23  |
| -1337             | 7,562631E+22                              | 7,562804E+22 | 6,767461E+22 | 6,767368E+22 | 1,512544E+23                           | 1,353483E+23                           | 2,866026E+23  |
| -1336             | 7,563082E+22                              | 7,562956E+22 | 6,767447E+22 | 6,767434E+22 | 1,512604E+23                           | 1,353488E+23                           | 2,866092E+23  |
| -1335             | 7,562783E+22                              | 7,562725E+22 | 6,767486E+22 | 6,767353E+22 | 1,512551E+23                           | 1,353484E+23                           | 2,866035E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -1334             | 7,562668E+22                              | 7,562866E+22 | 6,767445E+22 | 6,767433E+22 | 1,512553E+23                           | 1,353488E+23                           | 2,866041E+23  |
| -1333             | 7,562948E+22                              | 7,562926E+22 | 6,767380E+22 | 6,767429E+22 | 1,512587E+23                           | 1,353481E+23                           | 2,866068E+23  |
| -1332             | 7,562567E+22                              | 7,562671E+22 | 6,767353E+22 | 6,767291E+22 | 1,512524E+23                           | 1,353464E+23                           | 2,865988E+23  |
| -1331             | 7,562821E+22                              | 7,562812E+22 | 6,767296E+22 | 6,767360E+22 | 1,512563E+23                           | 1,353466E+23                           | 2,866029E+23  |
| -1330             | 7,562907E+22                              | 7,562715E+22 | 6,767296E+22 | 6,767225E+22 | 1,512562E+23                           | 1,353452E+23                           | 2,866014E+23  |
| -1329             | 7,562549E+22                              | 7,562693E+22 | 6,767243E+22 | 6,767166E+22 | 1,512524E+23                           | 1,353441E+23                           | 2,865965E+23  |
| -1328             | 7,562915E+22                              | 7,562913E+22 | 6,767186E+22 | 6,767287E+22 | 1,512583E+23                           | 1,353447E+23                           | 2,866030E+23  |
| -1327             | 7,562705E+22                              | 7,562689E+22 | 6,767231E+22 | 6,767178E+22 | 1,512539E+23                           | 1,353441E+23                           | 2,865980E+23  |
| -1326             | 7,562518E+22                              | 7,562758E+22 | 6,767288E+22 | 6,767211E+22 | 1,512528E+23                           | 1,353450E+23                           | 2,865977E+23  |
| -1325             | 7,562917E+22                              | 7,562854E+22 | 6,767301E+22 | 6,767291E+22 | 1,512577E+23                           | 1,353459E+23                           | 2,866036E+23  |
| -1324             | 7,562618E+22                              | 7,562596E+22 | 6,767347E+22 | 6,767226E+22 | 1,512521E+23                           | 1,353457E+23                           | 2,865979E+23  |
| -1323             | 7,562737E+22                              | 7,562789E+22 | 6,767354E+22 | 6,767424E+22 | 1,512553E+23                           | 1,353478E+23                           | 2,866030E+23  |
| -1322             | 7,562917E+22                              | 7,562821E+22 | 6,767378E+22 | 6,767460E+22 | 1,512574E+23                           | 1,353484E+23                           | 2,866058E+23  |
| -1321             | 7,562575E+22                              | 7,562750E+22 | 6,767411E+22 | 6,767395E+22 | 1,512532E+23                           | 1,353481E+23                           | 2,866013E+23  |
| -1320             | 7,562949E+22                              | 7,562959E+22 | 6,767451E+22 | 6,767533E+22 | 1,512591E+23                           | 1,353498E+23                           | 2,866089E+23  |
| -1319             | 7,562939E+22                              | 7,562777E+22 | 6,767526E+22 | 6,767431E+22 | 1,512572E+23                           | 1,353496E+23                           | 2,866067E+23  |
| -1318             | 7,562687E+22                              | 7,562815E+22 | 6,767589E+22 | 6,767429E+22 | 1,512550E+23                           | 1,353502E+23                           | 2,866052E+23  |
| -1317             | 7,563033E+22                              | 7,563012E+22 | 6,767555E+22 | 6,767576E+22 | 1,512604E+23                           | 1,353513E+23                           | 2,866118E+23  |
| -1316             | 7,562734E+22                              | 7,562779E+22 | 6,767536E+22 | 6,767460E+22 | 1,512551E+23                           | 1,353500E+23                           | 2,866051E+23  |
| -1315             | 7,562680E+22                              | 7,562889E+22 | 6,767504E+22 | 6,767549E+22 | 1,512557E+23                           | 1,353505E+23                           | 2,866062E+23  |
| -1314             | 7,562945E+22                              | 7,562888E+22 | 6,767466E+22 | 6,767530E+22 | 1,512583E+23                           | 1,353500E+23                           | 2,866083E+23  |
| -1313             | 7,562638E+22                              | 7,562670E+22 | 6,767434E+22 | 6,767311E+22 | 1,512531E+23                           | 1,353475E+23                           | 2,866005E+23  |
| -1312             | 7,562883E+22                              | 7,562831E+22 | 6,767384E+22 | 6,767403E+22 | 1,512571E+23                           | 1,353479E+23                           | 2,866050E+23  |
| -1311             | 7,562923E+22                              | 7,562742E+22 | 6,767316E+22 | 6,767321E+22 | 1,512566E+23                           | 1,353464E+23                           | 2,866030E+23  |
| -1310             | 7,562548E+22                              | 7,562737E+22 | 6,767310E+22 | 6,767243E+22 | 1,512529E+23                           | 1,353455E+23                           | 2,865984E+23  |
| -1309             | 7,562853E+22                              | 7,562942E+22 | 6,767300E+22 | 6,767380E+22 | 1,512580E+23                           | 1,353468E+23                           | 2,866048E+23  |
| -1308             | 7,562711E+22                              | 7,562684E+22 | 6,767328E+22 | 6,767217E+22 | 1,512539E+23                           | 1,353454E+23                           | 2,865994E+23  |
| -1307             | 7,562595E+22                              | 7,562733E+22 | 6,767387E+22 | 6,767301E+22 | 1,512533E+23                           | 1,353469E+23                           | 2,866002E+23  |
| -1306             | 7,562928E+22                              | 7,562833E+22 | 6,767398E+22 | 6,767437E+22 | 1,512576E+23                           | 1,353484E+23                           | 2,866060E+23  |
| -1305             | 7,562641E+22                              | 7,562663E+22 | 6,767411E+22 | 6,767330E+22 | 1,512530E+23                           | 1,353474E+23                           | 2,866004E+23  |
| -1304             | 7,562757E+22                              | 7,562869E+22 | 6,767451E+22 | 6,767529E+22 | 1,512563E+23                           | 1,353498E+23                           | 2,866061E+23  |
| -1303             | 7,562954E+22                              | 7,562846E+22 | 6,767456E+22 | 6,767556E+22 | 1,512580E+23                           | 1,353501E+23                           | 2,866081E+23  |
| -1302             | 7,562645E+22                              | 7,562760E+22 | 6,767559E+22 | 6,767436E+22 | 1,512540E+23                           | 1,353499E+23                           | 2,866040E+23  |
| -1301             | 7,562968E+22                              | 7,562980E+22 | 6,767617E+22 | 6,767617E+22 | 1,512595E+23                           | 1,353523E+23                           | 2,866118E+23  |
| -1300             | 7,562954E+22                              | 7,562805E+22 | 6,767618E+22 | 6,767516E+22 | 1,512576E+23                           | 1,353513E+23                           | 2,866089E+23  |
| -1299             | 7,562687E+22                              | 7,562869E+22 | 6,767647E+22 | 6,767592E+22 | 1,512556E+23                           | 1,353524E+23                           | 2,866080E+23  |
| -1298             | 7,562963E+22                              | 7,563025E+22 | 6,767618E+22 | 6,767749E+22 | 1,512599E+23                           | 1,353537E+23                           | 2,866136E+23  |
| -1297             | 7,562731E+22                              | 7,562786E+22 | 6,767597E+22 | 6,767520E+22 | 1,512552E+23                           | 1,353512E+23                           | 2,866063E+23  |
| -1296             | 7,562746E+22                              | 7,562871E+22 | 6,767601E+22 | 6,767575E+22 | 1,512562E+23                           | 1,353518E+23                           | 2,866079E+23  |
| -1295             | 7,563038E+22                              | 7,562829E+22 | 6,767503E+22 | 6,767562E+22 | 1,512587E+23                           | 1,353506E+23                           | 2,866093E+23  |
| -1294             | 7,562707E+22                              | 7,562676E+22 | 6,767498E+22 | 6,767338E+22 | 1,512538E+23                           | 1,353484E+23                           | 2,866022E+23  |
| -1293             | 7,562850E+22                              | 7,562918E+22 | 6,767454E+22 | 6,767491E+22 | 1,512577E+23                           | 1,353495E+23                           | 2,866071E+23  |
| -1292             | 7,562887E+22                              | 7,562813E+22 | 6,767365E+22 | 6,767379E+22 | 1,512570E+23                           | 1,353474E+23                           | 2,866044E+23  |
| -1291             | 7,562555E+22                              | 7,562777E+22 | 6,767404E+22 | 6,767339E+22 | 1,512533E+23                           | 1,353474E+23                           | 2,866007E+23  |
| -1290             | 7,562826E+22                              | 7,562910E+22 | 6,767439E+22 | 6,767486E+22 | 1,512574E+23                           | 1,353492E+23                           | 2,866066E+23  |
| -1289             | 7,562750E+22                              | 7,562669E+22 | 6,767453E+22 | 6,767285E+22 | 1,512542E+23                           | 1,353474E+23                           | 2,866016E+23  |
| -1288             | 7,562644E+22                              | 7,562740E+22 | 6,767499E+22 | 6,767415E+22 | 1,512538E+23                           | 1,353491E+23                           | 2,866030E+23  |
| -1287             | 7,562948E+22                              | 7,562840E+22 | 6,767426E+22 | 6,767595E+22 | 1,512579E+23                           | 1,353502E+23                           | 2,866081E+23  |
| -1286             | 7,562681E+22                              | 7,562699E+22 | 6,767482E+22 | 6,767434E+22 | 1,512538E+23                           | 1,353492E+23                           | 2,866030E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -1285             | 7,562766E+22                              | 7,562919E+22 | 6,767561E+22 | 6,767615E+22 | 1,512568E+23                           | 1,353518E+23                           | 2,866086E+23  |
| -1284             | 7,563012E+22                              | 7,562873E+22 | 6,767555E+22 | 6,767582E+22 | 1,512589E+23                           | 1,353514E+23                           | 2,866102E+23  |
| -1283             | 7,562735E+22                              | 7,562795E+22 | 6,767671E+22 | 6,767521E+22 | 1,512553E+23                           | 1,353519E+23                           | 2,866072E+23  |
| -1282             | 7,562932E+22                              | 7,563011E+22 | 6,767742E+22 | 6,767757E+22 | 1,512594E+23                           | 1,353550E+23                           | 2,866144E+23  |
| -1281             | 7,562928E+22                              | 7,562887E+22 | 6,767710E+22 | 6,767631E+22 | 1,512582E+23                           | 1,353534E+23                           | 2,866116E+23  |
| -1280             | 7,562677E+22                              | 7,562901E+22 | 6,767749E+22 | 6,767701E+22 | 1,512558E+23                           | 1,353545E+23                           | 2,866103E+23  |
| -1279             | 7,562973E+22                              | 7,562983E+22 | 6,767677E+22 | 6,767843E+22 | 1,512596E+23                           | 1,353552E+23                           | 2,866148E+23  |
| -1278             | 7,562821E+22                              | 7,562735E+22 | 6,767689E+22 | 6,767547E+22 | 1,512556E+23                           | 1,353524E+23                           | 2,866079E+23  |
| -1277             | 7,562791E+22                              | 7,562857E+22 | 6,767686E+22 | 6,767626E+22 | 1,512565E+23                           | 1,353531E+23                           | 2,866096E+23  |
| -1276             | 7,563072E+22                              | 7,562864E+22 | 6,767526E+22 | 6,767607E+22 | 1,512594E+23                           | 1,353513E+23                           | 2,866107E+23  |
| -1275             | 7,562724E+22                              | 7,562756E+22 | 6,767516E+22 | 6,767444E+22 | 1,512548E+23                           | 1,353496E+23                           | 2,866044E+23  |
| -1274             | 7,562767E+22                              | 7,562960E+22 | 6,767534E+22 | 6,767600E+22 | 1,512573E+23                           | 1,353513E+23                           | 2,866086E+23  |
| -1273             | 7,562873E+22                              | 7,562844E+22 | 6,767466E+22 | 6,767415E+22 | 1,512572E+23                           | 1,353488E+23                           | 2,866060E+23  |
| -1272             | 7,562599E+22                              | 7,562753E+22 | 6,767545E+22 | 6,767389E+22 | 1,512535E+23                           | 1,353493E+23                           | 2,866029E+23  |
| -1271             | 7,562874E+22                              | 7,562850E+22 | 6,767520E+22 | 6,767587E+22 | 1,512572E+23                           | 1,353511E+23                           | 2,866083E+23  |
| -1270             | 7,562810E+22                              | 7,562664E+22 | 6,767537E+22 | 6,767391E+22 | 1,512547E+23                           | 1,353493E+23                           | 2,866040E+23  |
| -1269             | 7,562633E+22                              | 7,562813E+22 | 6,767570E+22 | 6,767560E+22 | 1,512545E+23                           | 1,353513E+23                           | 2,866058E+23  |
| -1268             | 7,562965E+22                              | 7,562903E+22 | 6,767475E+22 | 6,767684E+22 | 1,512587E+23                           | 1,353516E+23                           | 2,866103E+23  |
| -1267             | 7,562745E+22                              | 7,562763E+22 | 6,767573E+22 | 6,767529E+22 | 1,512551E+23                           | 1,353510E+23                           | 2,866061E+23  |
| -1266             | 7,562779E+22                              | 7,562935E+22 | 6,767717E+22 | 6,767704E+22 | 1,512571E+23                           | 1,353542E+23                           | 2,866114E+23  |
| -1265             | 7,563055E+22                              | 7,562903E+22 | 6,767695E+22 | 6,767640E+22 | 1,512596E+23                           | 1,353534E+23                           | 2,866129E+23  |
| -1264             | 7,562755E+22                              | 7,562834E+22 | 6,767807E+22 | 6,767644E+22 | 1,512559E+23                           | 1,353545E+23                           | 2,866104E+23  |
| -1263             | 7,562901E+22                              | 7,563011E+22 | 6,767792E+22 | 6,767915E+22 | 1,512591E+23                           | 1,353571E+23                           | 2,866162E+23  |
| -1262             | 7,562934E+22                              | 7,562866E+22 | 6,767790E+22 | 6,767733E+22 | 1,512580E+23                           | 1,353552E+23                           | 2,866132E+23  |
| -1261             | 7,562688E+22                              | 7,562890E+22 | 6,767835E+22 | 6,767776E+22 | 1,512558E+23                           | 1,353561E+23                           | 2,866119E+23  |
| -1260             | 7,563054E+22                              | 7,562943E+22 | 6,767718E+22 | 6,767853E+22 | 1,512600E+23                           | 1,353557E+23                           | 2,866157E+23  |
| -1259             | 7,562930E+22                              | 7,562757E+22 | 6,767721E+22 | 6,767600E+22 | 1,512569E+23                           | 1,353532E+23                           | 2,866101E+23  |
| -1258             | 7,562775E+22                              | 7,562913E+22 | 6,767746E+22 | 6,767710E+22 | 1,512569E+23                           | 1,353546E+23                           | 2,866114E+23  |
| -1257             | 7,563043E+22                              | 7,562975E+22 | 6,767586E+22 | 6,767659E+22 | 1,512602E+23                           | 1,353525E+23                           | 2,866126E+23  |
| -1256             | 7,562703E+22                              | 7,562827E+22 | 6,767635E+22 | 6,767519E+22 | 1,512553E+23                           | 1,353515E+23                           | 2,866068E+23  |
| -1255             | 7,562736E+22                              | 7,562935E+22 | 6,767637E+22 | 6,767686E+22 | 1,512567E+23                           | 1,353532E+23                           | 2,866099E+23  |
| -1254             | 7,562922E+22                              | 7,562786E+22 | 6,767610E+22 | 6,767483E+22 | 1,512571E+23                           | 1,353509E+23                           | 2,866080E+23  |
| -1253             | 7,562624E+22                              | 7,562725E+22 | 6,767657E+22 | 6,767504E+22 | 1,512535E+23                           | 1,353516E+23                           | 2,866051E+23  |
| -1252             | 7,562906E+22                              | 7,562852E+22 | 6,767547E+22 | 6,767706E+22 | 1,512576E+23                           | 1,353525E+23                           | 2,866101E+23  |
| -1251             | 7,562859E+22                              | 7,562734E+22 | 6,767543E+22 | 6,767545E+22 | 1,512559E+23                           | 1,353509E+23                           | 2,866068E+23  |
| -1250             | 7,562609E+22                              | 7,562857E+22 | 6,767645E+22 | 6,767673E+22 | 1,512547E+23                           | 1,353532E+23                           | 2,866079E+23  |
| -1249             | 7,563011E+22                              | 7,562961E+22 | 6,767586E+22 | 6,767706E+22 | 1,512597E+23                           | 1,353529E+23                           | 2,866126E+23  |
| -1248             | 7,562831E+22                              | 7,562784E+22 | 6,767732E+22 | 6,767562E+22 | 1,512562E+23                           | 1,353529E+23                           | 2,866091E+23  |
| -1247             | 7,562801E+22                              | 7,562924E+22 | 6,767834E+22 | 6,767797E+22 | 1,512572E+23                           | 1,353563E+23                           | 2,866135E+23  |
| -1246             | 7,563077E+22                              | 7,562927E+22 | 6,767818E+22 | 6,767756E+22 | 1,512600E+23                           | 1,353557E+23                           | 2,866158E+23  |
| -1245             | 7,562709E+22                              | 7,562881E+22 | 6,767910E+22 | 6,767797E+22 | 1,512559E+23                           | 1,353571E+23                           | 2,866130E+23  |
| -1244             | 7,562896E+22                              | 7,563015E+22 | 6,767849E+22 | 6,768018E+22 | 1,512591E+23                           | 1,353587E+23                           | 2,866178E+23  |
| -1243             | 7,563004E+22                              | 7,562873E+22 | 6,767845E+22 | 6,767827E+22 | 1,512588E+23                           | 1,353567E+23                           | 2,866155E+23  |
| -1242             | 7,562720E+22                              | 7,562871E+22 | 6,767929E+22 | 6,767846E+22 | 1,512559E+23                           | 1,353578E+23                           | 2,866137E+23  |
| -1241             | 7,563113E+22                              | 7,562980E+22 | 6,767787E+22 | 6,767883E+22 | 1,512609E+23                           | 1,353567E+23                           | 2,866176E+23  |
| -1240             | 7,562954E+22                              | 7,562833E+22 | 6,767794E+22 | 6,767677E+22 | 1,512579E+23                           | 1,353547E+23                           | 2,866126E+23  |
| -1239             | 7,562724E+22                              | 7,562955E+22 | 6,767786E+22 | 6,767815E+22 | 1,512568E+23                           | 1,353560E+23                           | 2,866128E+23  |
| -1238             | 7,563032E+22                              | 7,562978E+22 | 6,767688E+22 | 6,767718E+22 | 1,512601E+23                           | 1,353541E+23                           | 2,866142E+23  |
| -1237             | 7,562692E+22                              | 7,562814E+22 | 6,767763E+22 | 6,767587E+22 | 1,512551E+23                           | 1,353535E+23                           | 2,866085E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -1236             | 7,562784E+22                              | 7,562873E+22 | 6,767712E+22 | 6,767736E+22 | 1,512566E+23                           | 1,353545E+23                           | 2,866111E+23  |
| -1235             | 7,562995E+22                              | 7,562784E+22 | 6,767656E+22 | 6,767599E+22 | 1,512578E+23                           | 1,353526E+23                           | 2,866103E+23  |
| -1234             | 7,562615E+22                              | 7,562764E+22 | 6,767714E+22 | 6,767643E+22 | 1,512538E+23                           | 1,353536E+23                           | 2,866074E+23  |
| -1233             | 7,562918E+22                              | 7,562931E+22 | 6,767591E+22 | 6,767784E+22 | 1,512585E+23                           | 1,353538E+23                           | 2,866122E+23  |
| -1232             | 7,562896E+22                              | 7,562809E+22 | 6,767650E+22 | 6,767616E+22 | 1,512570E+23                           | 1,353527E+23                           | 2,866097E+23  |
| -1231             | 7,562636E+22                              | 7,562860E+22 | 6,767759E+22 | 6,767734E+22 | 1,512550E+23                           | 1,353549E+23                           | 2,866099E+23  |
| -1230             | 7,563079E+22                              | 7,562939E+22 | 6,767758E+22 | 6,767752E+22 | 1,512602E+23                           | 1,353551E+23                           | 2,866153E+23  |
| -1229             | 7,562841E+22                              | 7,562809E+22 | 6,767891E+22 | 6,767684E+22 | 1,512565E+23                           | 1,353557E+23                           | 2,866122E+23  |
| -1228             | 7,562787E+22                              | 7,562942E+22 | 6,767901E+22 | 6,767941E+22 | 1,512573E+23                           | 1,353584E+23                           | 2,866157E+23  |
| -1227             | 7,563076E+22                              | 7,562977E+22 | 6,767856E+22 | 6,767935E+22 | 1,512605E+23                           | 1,353579E+23                           | 2,866185E+23  |
| -1226             | 7,562683E+22                              | 7,562883E+22 | 6,767988E+22 | 6,767929E+22 | 1,512557E+23                           | 1,353592E+23                           | 2,866148E+23  |
| -1225             | 7,562954E+22                              | 7,563017E+22 | 6,767926E+22 | 6,768047E+22 | 1,512597E+23                           | 1,353597E+23                           | 2,866194E+23  |
| -1224             | 7,563111E+22                              | 7,562891E+22 | 6,767942E+22 | 6,767860E+22 | 1,512600E+23                           | 1,353580E+23                           | 2,866180E+23  |
| -1223             | 7,562758E+22                              | 7,562885E+22 | 6,767987E+22 | 6,767908E+22 | 1,512564E+23                           | 1,353589E+23                           | 2,866154E+23  |
| -1222             | 7,563133E+22                              | 7,563036E+22 | 6,767877E+22 | 6,767945E+22 | 1,512617E+23                           | 1,353582E+23                           | 2,866199E+23  |
| -1221             | 7,562903E+22                              | 7,562915E+22 | 6,767899E+22 | 6,767769E+22 | 1,512582E+23                           | 1,353567E+23                           | 2,866149E+23  |
| -1220             | 7,562691E+22                              | 7,562962E+22 | 6,767869E+22 | 6,767883E+22 | 1,512565E+23                           | 1,353575E+23                           | 2,866141E+23  |
| -1219             | 7,563063E+22                              | 7,562973E+22 | 6,767773E+22 | 6,767809E+22 | 1,512604E+23                           | 1,353558E+23                           | 2,866162E+23  |
| -1218             | 7,562697E+22                              | 7,562756E+22 | 6,767874E+22 | 6,767686E+22 | 1,512545E+23                           | 1,353556E+23                           | 2,866101E+23  |
| -1217             | 7,562825E+22                              | 7,562870E+22 | 6,767776E+22 | 6,767815E+22 | 1,512569E+23                           | 1,353559E+23                           | 2,866128E+23  |
| -1216             | 7,563034E+22                              | 7,562833E+22 | 6,767699E+22 | 6,767712E+22 | 1,512587E+23                           | 1,353541E+23                           | 2,866128E+23  |
| -1215             | 7,562595E+22                              | 7,562791E+22 | 6,767736E+22 | 6,767751E+22 | 1,512539E+23                           | 1,353549E+23                           | 2,866087E+23  |
| -1214             | 7,562962E+22                              | 7,562948E+22 | 6,767694E+22 | 6,767826E+22 | 1,512591E+23                           | 1,353552E+23                           | 2,866143E+23  |
| -1213             | 7,562929E+22                              | 7,562835E+22 | 6,767794E+22 | 6,767659E+22 | 1,512576E+23                           | 1,353545E+23                           | 2,866122E+23  |
| -1212             | 7,562691E+22                              | 7,562850E+22 | 6,767873E+22 | 6,767788E+22 | 1,512554E+23                           | 1,353566E+23                           | 2,866120E+23  |
| -1211             | 7,563118E+22                              | 7,562988E+22 | 6,767847E+22 | 6,767885E+22 | 1,512611E+23                           | 1,353573E+23                           | 2,866184E+23  |
| -1210             | 7,562786E+22                              | 7,562861E+22 | 6,768001E+22 | 6,767860E+22 | 1,512565E+23                           | 1,353586E+23                           | 2,866151E+23  |
| -1209             | 7,562764E+22                              | 7,563000E+22 | 6,767986E+22 | 6,768065E+22 | 1,512576E+23                           | 1,353605E+23                           | 2,866181E+23  |
| -1208             | 7,563105E+22                              | 7,563013E+22 | 6,767966E+22 | 6,768043E+22 | 1,512612E+23                           | 1,353601E+23                           | 2,866213E+23  |
| -1207             | 7,562728E+22                              | 7,562854E+22 | 6,768076E+22 | 6,768008E+22 | 1,512558E+23                           | 1,353608E+23                           | 2,866167E+23  |
| -1206             | 7,563061E+22                              | 7,562982E+22 | 6,768045E+22 | 6,768083E+22 | 1,512604E+23                           | 1,353613E+23                           | 2,866217E+23  |
| -1205             | 7,563143E+22                              | 7,562940E+22 | 6,768045E+22 | 6,767938E+22 | 1,512608E+23                           | 1,353598E+23                           | 2,866207E+23  |
| -1204             | 7,562756E+22                              | 7,562932E+22 | 6,768022E+22 | 6,767996E+22 | 1,512569E+23                           | 1,353602E+23                           | 2,866171E+23  |
| -1203             | 7,563111E+22                              | 7,563099E+22 | 6,767920E+22 | 6,768052E+22 | 1,512621E+23                           | 1,353597E+23                           | 2,866218E+23  |
| -1202             | 7,562855E+22                              | 7,562917E+22 | 6,768009E+22 | 6,767860E+22 | 1,512577E+23                           | 1,353587E+23                           | 2,866164E+23  |
| -1201             | 7,562715E+22                              | 7,562927E+22 | 6,767960E+22 | 6,767905E+22 | 1,512564E+23                           | 1,353586E+23                           | 2,866151E+23  |
| -1200             | 7,563121E+22                              | 7,562955E+22 | 6,767864E+22 | 6,767873E+22 | 1,512608E+23                           | 1,353574E+23                           | 2,866181E+23  |
| -1199             | 7,562716E+22                              | 7,562742E+22 | 6,767905E+22 | 6,767787E+22 | 1,512546E+23                           | 1,353569E+23                           | 2,866115E+23  |
| -1198             | 7,562858E+22                              | 7,562891E+22 | 6,767830E+22 | 6,767899E+22 | 1,512575E+23                           | 1,353573E+23                           | 2,866148E+23  |
| -1197             | 7,563021E+22                              | 7,562916E+22 | 6,767784E+22 | 6,767802E+22 | 1,512594E+23                           | 1,353559E+23                           | 2,866152E+23  |
| -1196             | 7,562618E+22                              | 7,562818E+22 | 6,767816E+22 | 6,767803E+22 | 1,512544E+23                           | 1,353562E+23                           | 2,866106E+23  |
| -1195             | 7,563014E+22                              | 7,562981E+22 | 6,767807E+22 | 6,767893E+22 | 1,512600E+23                           | 1,353570E+23                           | 2,866169E+23  |
| -1194             | 7,562936E+22                              | 7,562841E+22 | 6,767954E+22 | 6,767769E+22 | 1,512578E+23                           | 1,353572E+23                           | 2,866150E+23  |
| -1193             | 7,562692E+22                              | 7,562884E+22 | 6,767986E+22 | 6,767904E+22 | 1,512558E+23                           | 1,353589E+23                           | 2,866147E+23  |
| -1192             | 7,563105E+22                              | 7,563058E+22 | 6,767938E+22 | 6,768054E+22 | 1,512616E+23                           | 1,353599E+23                           | 2,866216E+23  |
| -1191             | 7,562758E+22                              | 7,562861E+22 | 6,768065E+22 | 6,768015E+22 | 1,512562E+23                           | 1,353608E+23                           | 2,866170E+23  |
| -1190             | 7,562832E+22                              | 7,562964E+22 | 6,768099E+22 | 6,768136E+22 | 1,512580E+23                           | 1,353624E+23                           | 2,866203E+23  |
| -1189             | 7,563180E+22                              | 7,563013E+22 | 6,768091E+22 | 6,768089E+22 | 1,512619E+23                           | 1,353618E+23                           | 2,866237E+23  |
| -1188             | 7,562821E+22                              | 7,562847E+22 | 6,768146E+22 | 6,768049E+22 | 1,512567E+23                           | 1,353619E+23                           | 2,866186E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -1187             | 7,563121E+22                              | 7,563060E+22 | 6,768097E+22 | 6,768171E+22 | 1,512618E+23                           | 1,353627E+23                           | 2,866245E+23  |
| -1186             | 7,563092E+22                              | 7,563018E+22 | 6,768132E+22 | 6,768051E+22 | 1,512611E+23                           | 1,353618E+23                           | 2,866229E+23  |
| -1185             | 7,562713E+22                              | 7,562998E+22 | 6,768109E+22 | 6,768065E+22 | 1,512571E+23                           | 1,353617E+23                           | 2,866189E+23  |
| -1184             | 7,563099E+22                              | 7,563129E+22 | 6,768028E+22 | 6,768122E+22 | 1,512623E+23                           | 1,353615E+23                           | 2,866238E+23  |
| -1183             | 7,562848E+22                              | 7,562849E+22 | 6,768104E+22 | 6,767937E+22 | 1,512570E+23                           | 1,353604E+23                           | 2,866174E+23  |
| -1182             | 7,562784E+22                              | 7,562854E+22 | 6,768062E+22 | 6,767970E+22 | 1,512564E+23                           | 1,353603E+23                           | 2,866167E+23  |
| -1181             | 7,563132E+22                              | 7,562969E+22 | 6,767930E+22 | 6,767978E+22 | 1,512610E+23                           | 1,353591E+23                           | 2,866201E+23  |
| -1180             | 7,562728E+22                              | 7,562770E+22 | 6,767898E+22 | 6,767890E+22 | 1,512550E+23                           | 1,353579E+23                           | 2,866129E+23  |
| -1179             | 7,562884E+22                              | 7,562953E+22 | 6,767845E+22 | 6,767984E+22 | 1,512584E+23                           | 1,353583E+23                           | 2,866167E+23  |
| -1178             | 7,563019E+22                              | 7,562945E+22 | 6,767894E+22 | 6,767861E+22 | 1,512596E+23                           | 1,353575E+23                           | 2,866172E+23  |
| -1177             | 7,562667E+22                              | 7,562838E+22 | 6,767941E+22 | 6,767822E+22 | 1,512550E+23                           | 1,353576E+23                           | 2,866127E+23  |
| -1176             | 7,563052E+22                              | 7,563023E+22 | 6,767946E+22 | 6,767973E+22 | 1,512608E+23                           | 1,353592E+23                           | 2,866199E+23  |
| -1175             | 7,562914E+22                              | 7,562860E+22 | 6,768060E+22 | 6,767919E+22 | 1,512577E+23                           | 1,353598E+23                           | 2,866175E+23  |
| -1174             | 7,562704E+22                              | 7,562896E+22 | 6,768102E+22 | 6,768044E+22 | 1,512560E+23                           | 1,353615E+23                           | 2,866174E+23  |
| -1173             | 7,563089E+22                              | 7,563101E+22 | 6,768064E+22 | 6,768188E+22 | 1,512619E+23                           | 1,353625E+23                           | 2,866244E+23  |
| -1172             | 7,562819E+22                              | 7,562845E+22 | 6,768142E+22 | 6,768105E+22 | 1,512566E+23                           | 1,353625E+23                           | 2,866191E+23  |
| -1171             | 7,562934E+22                              | 7,562965E+22 | 6,768180E+22 | 6,768208E+22 | 1,512590E+23                           | 1,353639E+23                           | 2,866229E+23  |
| -1170             | 7,563227E+22                              | 7,563033E+22 | 6,768211E+22 | 6,768183E+22 | 1,512626E+23                           | 1,353639E+23                           | 2,866265E+23  |
| -1169             | 7,562843E+22                              | 7,562914E+22 | 6,768211E+22 | 6,768123E+22 | 1,512576E+23                           | 1,353633E+23                           | 2,866209E+23  |
| -1168             | 7,563084E+22                              | 7,563163E+22 | 6,768164E+22 | 6,768277E+22 | 1,512625E+23                           | 1,353644E+23                           | 2,866269E+23  |
| -1167             | 7,563034E+22                              | 7,563036E+22 | 6,768204E+22 | 6,768156E+22 | 1,512607E+23                           | 1,353636E+23                           | 2,866243E+23  |
| -1166             | 7,562740E+22                              | 7,562941E+22 | 6,768226E+22 | 6,768109E+22 | 1,512568E+23                           | 1,353634E+23                           | 2,866202E+23  |
| -1165             | 7,563121E+22                              | 7,563101E+22 | 6,768147E+22 | 6,768170E+22 | 1,512622E+23                           | 1,353632E+23                           | 2,866254E+23  |
| -1164             | 7,562912E+22                              | 7,562803E+22 | 6,768137E+22 | 6,768007E+22 | 1,512571E+23                           | 1,353614E+23                           | 2,866186E+23  |
| -1163             | 7,562831E+22                              | 7,562891E+22 | 6,768069E+22 | 6,768070E+22 | 1,512572E+23                           | 1,353614E+23                           | 2,866186E+23  |
| -1162             | 7,563108E+22                              | 7,563033E+22 | 6,767986E+22 | 6,768087E+22 | 1,512614E+23                           | 1,353607E+23                           | 2,866221E+23  |
| -1161             | 7,562731E+22                              | 7,562840E+22 | 6,767964E+22 | 6,767933E+22 | 1,512557E+23                           | 1,353590E+23                           | 2,866147E+23  |
| -1160             | 7,562908E+22                              | 7,563022E+22 | 6,767961E+22 | 6,768026E+22 | 1,512593E+23                           | 1,353599E+23                           | 2,866192E+23  |
| -1159             | 7,563037E+22                              | 7,562927E+22 | 6,768028E+22 | 6,767933E+22 | 1,512596E+23                           | 1,353596E+23                           | 2,866192E+23  |
| -1158             | 7,562725E+22                              | 7,562805E+22 | 6,768099E+22 | 6,767915E+22 | 1,512553E+23                           | 1,353601E+23                           | 2,866154E+23  |
| -1157             | 7,563024E+22                              | 7,563068E+22 | 6,768073E+22 | 6,768121E+22 | 1,512609E+23                           | 1,353619E+23                           | 2,866229E+23  |
| -1156             | 7,562902E+22                              | 7,562870E+22 | 6,768108E+22 | 6,768086E+22 | 1,512577E+23                           | 1,353619E+23                           | 2,866197E+23  |
| -1155             | 7,562745E+22                              | 7,562913E+22 | 6,768155E+22 | 6,768176E+22 | 1,512566E+23                           | 1,353633E+23                           | 2,866199E+23  |
| -1154             | 7,563129E+22                              | 7,563082E+22 | 6,768173E+22 | 6,768275E+22 | 1,512621E+23                           | 1,353645E+23                           | 2,866266E+23  |
| -1153             | 7,562911E+22                              | 7,562858E+22 | 6,768228E+22 | 6,768133E+22 | 1,512577E+23                           | 1,353636E+23                           | 2,866213E+23  |
| -1152             | 7,563009E+22                              | 7,563044E+22 | 6,768258E+22 | 6,768272E+22 | 1,512605E+23                           | 1,353653E+23                           | 2,866258E+23  |
| -1151             | 7,563205E+22                              | 7,563095E+22 | 6,768284E+22 | 6,768293E+22 | 1,512630E+23                           | 1,353658E+23                           | 2,866288E+23  |
| -1150             | 7,562837E+22                              | 7,562966E+22 | 6,768325E+22 | 6,768217E+22 | 1,512580E+23                           | 1,353654E+23                           | 2,866235E+23  |
| -1149             | 7,563026E+22                              | 7,563214E+22 | 6,768303E+22 | 6,768358E+22 | 1,512624E+23                           | 1,353666E+23                           | 2,866290E+23  |
| -1148             | 7,563047E+22                              | 7,562992E+22 | 6,768293E+22 | 6,768233E+22 | 1,512604E+23                           | 1,353653E+23                           | 2,866256E+23  |
| -1147             | 7,562811E+22                              | 7,562888E+22 | 6,768299E+22 | 6,768183E+22 | 1,512570E+23                           | 1,353648E+23                           | 2,866218E+23  |
| -1146             | 7,563142E+22                              | 7,563067E+22 | 6,768228E+22 | 6,768275E+22 | 1,512621E+23                           | 1,353650E+23                           | 2,866271E+23  |
| -1145             | 7,562935E+22                              | 7,562844E+22 | 6,768146E+22 | 6,768090E+22 | 1,512578E+23                           | 1,353624E+23                           | 2,866202E+23  |
| -1144             | 7,562836E+22                              | 7,562985E+22 | 6,768081E+22 | 6,768156E+22 | 1,512582E+23                           | 1,353624E+23                           | 2,866206E+23  |
| -1143             | 7,563095E+22                              | 7,563055E+22 | 6,768050E+22 | 6,768152E+22 | 1,512615E+23                           | 1,353620E+23                           | 2,866235E+23  |
| -1142             | 7,562800E+22                              | 7,562823E+22 | 6,768096E+22 | 6,767947E+22 | 1,512562E+23                           | 1,353604E+23                           | 2,866167E+23  |
| -1141             | 7,562925E+22                              | 7,563043E+22 | 6,768125E+22 | 6,768063E+22 | 1,512597E+23                           | 1,353619E+23                           | 2,866216E+23  |
| -1140             | 7,563072E+22                              | 7,562924E+22 | 6,768117E+22 | 6,768044E+22 | 1,512600E+23                           | 1,353616E+23                           | 2,866216E+23  |
| -1139             | 7,562740E+22                              | 7,562837E+22 | 6,768165E+22 | 6,768067E+22 | 1,512558E+23                           | 1,353623E+23                           | 2,866181E+23  |



| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -1138             | 7,562982E+22                              | 7,563106E+22 | 6,768177E+22 | 6,768291E+22 | 1,512609E+23                           | 1,353647E+23                           | 2,866255E+23  |
| -1137             | 7,562924E+22                              | 7,562899E+22 | 6,768179E+22 | 6,768180E+22 | 1,512582E+23                           | 1,353636E+23                           | 2,866218E+23  |
| -1136             | 7,562806E+22                              | 7,562953E+22 | 6,768242E+22 | 6,768252E+22 | 1,512576E+23                           | 1,353649E+23                           | 2,866225E+23  |
| -1135             | 7,563187E+22                              | 7,563070E+22 | 6,768282E+22 | 6,768357E+22 | 1,512626E+23                           | 1,353664E+23                           | 2,866290E+23  |
| -1134             | 7,562995E+22                              | 7,562869E+22 | 6,768347E+22 | 6,768207E+22 | 1,512586E+23                           | 1,353655E+23                           | 2,866242E+23  |
| -1133             | 7,562980E+22                              | 7,563143E+22 | 6,768373E+22 | 6,768371E+22 | 1,512612E+23                           | 1,353674E+23                           | 2,866287E+23  |
| -1132             | 7,563185E+22                              | 7,563131E+22 | 6,768340E+22 | 6,768411E+22 | 1,512632E+23                           | 1,353675E+23                           | 2,866307E+23  |
| -1131             | 7,562850E+22                              | 7,562965E+22 | 6,768410E+22 | 6,768305E+22 | 1,512581E+23                           | 1,353672E+23                           | 2,866253E+23  |
| -1130             | 7,563025E+22                              | 7,563172E+22 | 6,768433E+22 | 6,768433E+22 | 1,512620E+23                           | 1,353687E+23                           | 2,866306E+23  |
| -1129             | 7,563102E+22                              | 7,562961E+22 | 6,768361E+22 | 6,768276E+22 | 1,512606E+23                           | 1,353664E+23                           | 2,866270E+23  |
| -1128             | 7,562866E+22                              | 7,562933E+22 | 6,768329E+22 | 6,768268E+22 | 1,512580E+23                           | 1,353660E+23                           | 2,866239E+23  |
| -1127             | 7,563135E+22                              | 7,563096E+22 | 6,768256E+22 | 6,768384E+22 | 1,512623E+23                           | 1,353664E+23                           | 2,866287E+23  |
| -1126             | 7,562963E+22                              | 7,562891E+22 | 6,768214E+22 | 6,768154E+22 | 1,512585E+23                           | 1,353637E+23                           | 2,866222E+23  |
| -1125             | 7,562822E+22                              | 7,563060E+22 | 6,768202E+22 | 6,768187E+22 | 1,512588E+23                           | 1,353639E+23                           | 2,866227E+23  |
| -1124             | 7,563126E+22                              | 7,563045E+22 | 6,768148E+22 | 6,768200E+22 | 1,512617E+23                           | 1,353635E+23                           | 2,866252E+23  |
| -1123             | 7,562865E+22                              | 7,562807E+22 | 6,768218E+22 | 6,768027E+22 | 1,512567E+23                           | 1,353624E+23                           | 2,866192E+23  |
| -1122             | 7,562901E+22                              | 7,563035E+22 | 6,768252E+22 | 6,768201E+22 | 1,512594E+23                           | 1,353645E+23                           | 2,866239E+23  |
| -1121             | 7,563041E+22                              | 7,562962E+22 | 6,768165E+22 | 6,768188E+22 | 1,512600E+23                           | 1,353635E+23                           | 2,866236E+23  |
| -1120             | 7,562739E+22                              | 7,562903E+22 | 6,768195E+22 | 6,768211E+22 | 1,512564E+23                           | 1,353641E+23                           | 2,866205E+23  |
| -1119             | 7,562993E+22                              | 7,563075E+22 | 6,768251E+22 | 6,768397E+22 | 1,512607E+23                           | 1,353665E+23                           | 2,866272E+23  |
| -1118             | 7,563036E+22                              | 7,562877E+22 | 6,768293E+22 | 6,768218E+22 | 1,512591E+23                           | 1,353651E+23                           | 2,866242E+23  |
| -1117             | 7,562878E+22                              | 7,562998E+22 | 6,768377E+22 | 6,768283E+22 | 1,512588E+23                           | 1,353666E+23                           | 2,866254E+23  |
| -1116             | 7,563241E+22                              | 7,563108E+22 | 6,768359E+22 | 6,768448E+22 | 1,512635E+23                           | 1,353681E+23                           | 2,866316E+23  |
| -1115             | 7,563017E+22                              | 7,562945E+22 | 6,768438E+22 | 6,768321E+22 | 1,512596E+23                           | 1,353676E+23                           | 2,866272E+23  |
| -1114             | 7,562914E+22                              | 7,563199E+22 | 6,768513E+22 | 6,768499E+22 | 1,512611E+23                           | 1,353701E+23                           | 2,866313E+23  |
| -1113             | 7,563168E+22                              | 7,563155E+22 | 6,768444E+22 | 6,768494E+22 | 1,512632E+23                           | 1,353694E+23                           | 2,866326E+23  |
| -1112             | 7,562890E+22                              | 7,562970E+22 | 6,768501E+22 | 6,768390E+22 | 1,512586E+23                           | 1,353689E+23                           | 2,866275E+23  |
| -1111             | 7,563059E+22                              | 7,563104E+22 | 6,768528E+22 | 6,768535E+22 | 1,512616E+23                           | 1,353706E+23                           | 2,866323E+23  |
| -1110             | 7,563171E+22                              | 7,562949E+22 | 6,768424E+22 | 6,768366E+22 | 1,512612E+23                           | 1,353679E+23                           | 2,866291E+23  |
| -1109             | 7,562848E+22                              | 7,563019E+22 | 6,768378E+22 | 6,768352E+22 | 1,512587E+23                           | 1,353673E+23                           | 2,866260E+23  |
| -1108             | 7,563144E+22                              | 7,563130E+22 | 6,768269E+22 | 6,768468E+22 | 1,512627E+23                           | 1,353674E+23                           | 2,866301E+23  |
| -1107             | 7,563009E+22                              | 7,562898E+22 | 6,768285E+22 | 6,768184E+22 | 1,512591E+23                           | 1,353647E+23                           | 2,866238E+23  |
| -1106             | 7,562825E+22                              | 7,563054E+22 | 6,768343E+22 | 6,768225E+22 | 1,512588E+23                           | 1,353657E+23                           | 2,866245E+23  |
| -1105             | 7,563153E+22                              | 7,563049E+22 | 6,768235E+22 | 6,768243E+22 | 1,512620E+23                           | 1,353648E+23                           | 2,866268E+23  |
| -1104             | 7,562870E+22                              | 7,562864E+22 | 6,768277E+22 | 6,768148E+22 | 1,512573E+23                           | 1,353643E+23                           | 2,866216E+23  |
| -1103             | 7,562854E+22                              | 7,563046E+22 | 6,768329E+22 | 6,768364E+22 | 1,512590E+23                           | 1,353669E+23                           | 2,866259E+23  |
| -1102             | 7,563060E+22                              | 7,562974E+22 | 6,768257E+22 | 6,768301E+22 | 1,512603E+23                           | 1,353656E+23                           | 2,866259E+23  |
| -1101             | 7,562757E+22                              | 7,562947E+22 | 6,768318E+22 | 6,768274E+22 | 1,512570E+23                           | 1,353659E+23                           | 2,866230E+23  |
| -1100             | 7,563085E+22                              | 7,563047E+22 | 6,768336E+22 | 6,768466E+22 | 1,512613E+23                           | 1,353680E+23                           | 2,866293E+23  |
| -1099             | 7,563147E+22                              | 7,562878E+22 | 6,768405E+22 | 6,768288E+22 | 1,512603E+23                           | 1,353669E+23                           | 2,866272E+23  |
| -1098             | 7,562878E+22                              | 7,563055E+22 | 6,768511E+22 | 6,768404E+22 | 1,512593E+23                           | 1,353691E+23                           | 2,866285E+23  |
| -1097             | 7,563207E+22                              | 7,563195E+22 | 6,768431E+22 | 6,768566E+22 | 1,512640E+23                           | 1,353700E+23                           | 2,866340E+23  |
| -1096             | 7,562997E+22                              | 7,563029E+22 | 6,768515E+22 | 6,768454E+22 | 1,512603E+23                           | 1,353697E+23                           | 2,866300E+23  |
| -1095             | 7,562894E+22                              | 7,563157E+22 | 6,768636E+22 | 6,768608E+22 | 1,512605E+23                           | 1,353724E+23                           | 2,866330E+23  |
| -1094             | 7,563235E+22                              | 7,563108E+22 | 6,768563E+22 | 6,768554E+22 | 1,512634E+23                           | 1,353712E+23                           | 2,866346E+23  |
| -1093             | 7,562941E+22                              | 7,562987E+22 | 6,768599E+22 | 6,768448E+22 | 1,512593E+23                           | 1,353705E+23                           | 2,866297E+23  |
| -1092             | 7,563105E+22                              | 7,563101E+22 | 6,768541E+22 | 6,768639E+22 | 1,512621E+23                           | 1,353718E+23                           | 2,866339E+23  |
| -1091             | 7,563208E+22                              | 7,563004E+22 | 6,768458E+22 | 6,768452E+22 | 1,512621E+23                           | 1,353691E+23                           | 2,866312E+23  |
| -1090             | 7,562818E+22                              | 7,563073E+22 | 6,768468E+22 | 6,768418E+22 | 1,512589E+23                           | 1,353689E+23                           | 2,866278E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -1089             | 7,563133E+22                              | 7,563163E+22 | 6,768347E+22 | 6,768484E+22 | 1,512630E+23                           | 1,353683E+23                           | 2,866313E+23  |
| -1088             | 7,563047E+22                              | 7,562933E+22 | 6,768377E+22 | 6,768234E+22 | 1,512598E+23                           | 1,353661E+23                           | 2,866259E+23  |
| -1087             | 7,562819E+22                              | 7,562998E+22 | 6,768467E+22 | 6,768328E+22 | 1,512582E+23                           | 1,353679E+23                           | 2,866261E+23  |
| -1086             | 7,563157E+22                              | 7,563053E+22 | 6,768325E+22 | 6,768363E+22 | 1,512621E+23                           | 1,353669E+23                           | 2,866290E+23  |
| -1085             | 7,562834E+22                              | 7,562925E+22 | 6,768352E+22 | 6,768271E+22 | 1,512576E+23                           | 1,353662E+23                           | 2,866238E+23  |
| -1084             | 7,562875E+22                              | 7,563020E+22 | 6,768367E+22 | 6,768485E+22 | 1,512590E+23                           | 1,353685E+23                           | 2,866275E+23  |
| -1083             | 7,563151E+22                              | 7,562950E+22 | 6,768346E+22 | 6,768359E+22 | 1,512610E+23                           | 1,353670E+23                           | 2,866281E+23  |
| -1082             | 7,562819E+22                              | 7,562950E+22 | 6,768454E+22 | 6,768327E+22 | 1,512577E+23                           | 1,353678E+23                           | 2,866255E+23  |
| -1081             | 7,563145E+22                              | 7,563099E+22 | 6,768422E+22 | 6,768521E+22 | 1,512624E+23                           | 1,353694E+23                           | 2,866319E+23  |
| -1080             | 7,563173E+22                              | 7,563004E+22 | 6,768477E+22 | 6,768409E+22 | 1,512618E+23                           | 1,353689E+23                           | 2,866306E+23  |
| -1079             | 7,562826E+22                              | 7,563111E+22 | 6,768637E+22 | 6,768562E+22 | 1,512594E+23                           | 1,353720E+23                           | 2,866314E+23  |
| -1078             | 7,563190E+22                              | 7,563239E+22 | 6,768569E+22 | 6,768679E+22 | 1,512643E+23                           | 1,353725E+23                           | 2,866368E+23  |
| -1077             | 7,562986E+22                              | 7,563061E+22 | 6,768675E+22 | 6,768537E+22 | 1,512605E+23                           | 1,353721E+23                           | 2,866326E+23  |
| -1076             | 7,562963E+22                              | 7,563084E+22 | 6,768730E+22 | 6,768714E+22 | 1,512605E+23                           | 1,353744E+23                           | 2,866349E+23  |
| -1075             | 7,563330E+22                              | 7,563055E+22 | 6,768642E+22 | 6,768642E+22 | 1,512638E+23                           | 1,353728E+23                           | 2,866367E+23  |
| -1074             | 7,562942E+22                              | 7,563018E+22 | 6,768660E+22 | 6,768560E+22 | 1,512596E+23                           | 1,353722E+23                           | 2,866318E+23  |
| -1073             | 7,563100E+22                              | 7,563168E+22 | 6,768532E+22 | 6,768709E+22 | 1,512627E+23                           | 1,353724E+23                           | 2,866351E+23  |
| -1072             | 7,563217E+22                              | 7,563083E+22 | 6,768479E+22 | 6,768505E+22 | 1,512630E+23                           | 1,353698E+23                           | 2,866328E+23  |
| -1071             | 7,562816E+22                              | 7,563050E+22 | 6,768583E+22 | 6,768457E+22 | 1,512587E+23                           | 1,353704E+23                           | 2,866291E+23  |
| -1070             | 7,563173E+22                              | 7,563147E+22 | 6,768472E+22 | 6,768496E+22 | 1,512632E+23                           | 1,353697E+23                           | 2,866329E+23  |
| -1069             | 7,563048E+22                              | 7,562970E+22 | 6,768503E+22 | 6,768293E+22 | 1,512602E+23                           | 1,353680E+23                           | 2,866281E+23  |
| -1068             | 7,562819E+22                              | 7,562986E+22 | 6,768514E+22 | 6,768469E+22 | 1,512580E+23                           | 1,353698E+23                           | 2,866279E+23  |
| -1067             | 7,563165E+22                              | 7,563061E+22 | 6,768395E+22 | 6,768489E+22 | 1,512623E+23                           | 1,353688E+23                           | 2,866311E+23  |
| -1066             | 7,562820E+22                              | 7,562952E+22 | 6,768456E+22 | 6,768382E+22 | 1,512577E+23                           | 1,353684E+23                           | 2,866261E+23  |
| -1065             | 7,562920E+22                              | 7,563033E+22 | 6,768434E+22 | 6,768539E+22 | 1,512595E+23                           | 1,353697E+23                           | 2,866293E+23  |
| -1064             | 7,563242E+22                              | 7,562999E+22 | 6,768428E+22 | 6,768433E+22 | 1,512624E+23                           | 1,353686E+23                           | 2,866310E+23  |
| -1063             | 7,562853E+22                              | 7,562954E+22 | 6,768588E+22 | 6,768442E+22 | 1,512581E+23                           | 1,353703E+23                           | 2,866284E+23  |
| -1062             | 7,563141E+22                              | 7,563178E+22 | 6,768534E+22 | 6,768639E+22 | 1,512632E+23                           | 1,353717E+23                           | 2,866349E+23  |
| -1061             | 7,563131E+22                              | 7,563115E+22 | 6,768602E+22 | 6,768536E+22 | 1,512625E+23                           | 1,353714E+23                           | 2,866338E+23  |
| -1060             | 7,562825E+22                              | 7,563079E+22 | 6,768728E+22 | 6,768695E+22 | 1,512590E+23                           | 1,353742E+23                           | 2,866333E+23  |
| -1059             | 7,563251E+22                              | 7,563184E+22 | 6,768698E+22 | 6,768755E+22 | 1,512644E+23                           | 1,353745E+23                           | 2,866389E+23  |
| -1058             | 7,563040E+22                              | 7,563024E+22 | 6,768795E+22 | 6,768614E+22 | 1,512606E+23                           | 1,353741E+23                           | 2,866347E+23  |
| -1057             | 7,563015E+22                              | 7,563083E+22 | 6,768759E+22 | 6,768783E+22 | 1,512610E+23                           | 1,353754E+23                           | 2,866364E+23  |
| -1056             | 7,563368E+22                              | 7,563152E+22 | 6,768646E+22 | 6,768745E+22 | 1,512652E+23                           | 1,353739E+23                           | 2,866391E+23  |
| -1055             | 7,562922E+22                              | 7,563057E+22 | 6,768730E+22 | 6,768655E+22 | 1,512598E+23                           | 1,353739E+23                           | 2,866336E+23  |
| -1054             | 7,563097E+22                              | 7,563227E+22 | 6,768628E+22 | 6,768736E+22 | 1,512632E+23                           | 1,353736E+23                           | 2,866369E+23  |
| -1053             | 7,563220E+22                              | 7,563140E+22 | 6,768617E+22 | 6,768517E+22 | 1,512636E+23                           | 1,353713E+23                           | 2,866349E+23  |
| -1052             | 7,562855E+22                              | 7,562986E+22 | 6,768687E+22 | 6,768532E+22 | 1,512584E+23                           | 1,353722E+23                           | 2,866306E+23  |
| -1051             | 7,563202E+22                              | 7,563111E+22 | 6,768580E+22 | 6,768592E+22 | 1,512631E+23                           | 1,353717E+23                           | 2,866348E+23  |
| -1050             | 7,563001E+22                              | 7,562995E+22 | 6,768585E+22 | 6,768444E+22 | 1,512600E+23                           | 1,353703E+23                           | 2,866303E+23  |
| -1049             | 7,562798E+22                              | 7,563009E+22 | 6,768521E+22 | 6,768591E+22 | 1,512581E+23                           | 1,353711E+23                           | 2,866292E+23  |
| -1048             | 7,563205E+22                              | 7,563099E+22 | 6,768420E+22 | 6,768584E+22 | 1,512630E+23                           | 1,353700E+23                           | 2,866331E+23  |
| -1047             | 7,562873E+22                              | 7,562921E+22 | 6,768564E+22 | 6,768448E+22 | 1,512579E+23                           | 1,353701E+23                           | 2,866281E+23  |
| -1046             | 7,563008E+22                              | 7,563063E+22 | 6,768541E+22 | 6,768565E+22 | 1,512607E+23                           | 1,353711E+23                           | 2,866318E+23  |
| -1045             | 7,563271E+22                              | 7,563102E+22 | 6,768556E+22 | 6,768498E+22 | 1,512637E+23                           | 1,353705E+23                           | 2,866343E+23  |
| -1044             | 7,562862E+22                              | 7,562996E+22 | 6,768683E+22 | 6,768591E+22 | 1,512586E+23                           | 1,353727E+23                           | 2,866313E+23  |
| -1043             | 7,563132E+22                              | 7,563205E+22 | 6,768668E+22 | 6,768756E+22 | 1,512634E+23                           | 1,353742E+23                           | 2,866376E+23  |
| -1042             | 7,563092E+22                              | 7,563136E+22 | 6,768763E+22 | 6,768660E+22 | 1,512623E+23                           | 1,353742E+23                           | 2,866365E+23  |
| -1041             | 7,562862E+22                              | 7,563050E+22 | 6,768817E+22 | 6,768780E+22 | 1,512591E+23                           | 1,353760E+23                           | 2,866351E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -1040                  | 7,563334E+22                              | 7,563175E+22 | 6,768764E+22 | 6,768854E+22 | 1,512651E+23                           | 1,353762E+23                           | 2,866413E+23  |
| -1039                  | 7,563081E+22                              | 7,563003E+22 | 6,768879E+22 | 6,768741E+22 | 1,512608E+23                           | 1,353762E+23                           | 2,866370E+23  |
| -1038                  | 7,563032E+22                              | 7,563158E+22 | 6,768792E+22 | 6,768871E+22 | 1,512619E+23                           | 1,353766E+23                           | 2,866385E+23  |
| -1037                  | 7,563351E+22                              | 7,563264E+22 | 6,768716E+22 | 6,768805E+22 | 1,512662E+23                           | 1,353752E+23                           | 2,866414E+23  |
| -1036                  | 7,562945E+22                              | 7,563045E+22 | 6,768801E+22 | 6,768716E+22 | 1,512599E+23                           | 1,353752E+23                           | 2,866351E+23  |
| -1035                  | 7,563140E+22                              | 7,563193E+22 | 6,768760E+22 | 6,768744E+22 | 1,512633E+23                           | 1,353750E+23                           | 2,866384E+23  |
| -1034                  | 7,563225E+22                              | 7,563139E+22 | 6,768751E+22 | 6,768580E+22 | 1,512636E+23                           | 1,353733E+23                           | 2,866370E+23  |
| -1033                  | 7,562858E+22                              | 7,562987E+22 | 6,768726E+22 | 6,768629E+22 | 1,512584E+23                           | 1,353735E+23                           | 2,866320E+23  |
| -1032                  | 7,563195E+22                              | 7,563176E+22 | 6,768596E+22 | 6,768734E+22 | 1,512637E+23                           | 1,353733E+23                           | 2,866370E+23  |
| -1031                  | 7,562978E+22                              | 7,562995E+22 | 6,768662E+22 | 6,768583E+22 | 1,512597E+23                           | 1,353724E+23                           | 2,866322E+23  |
| -1030                  | 7,562820E+22                              | 7,563043E+22 | 6,768596E+22 | 6,768648E+22 | 1,512586E+23                           | 1,353724E+23                           | 2,866311E+23  |
| -1029                  | 7,563268E+22                              | 7,563149E+22 | 6,768544E+22 | 6,768614E+22 | 1,512642E+23                           | 1,353716E+23                           | 2,866357E+23  |
| -1028                  | 7,562966E+22                              | 7,562877E+22 | 6,768660E+22 | 6,768525E+22 | 1,512584E+23                           | 1,353718E+23                           | 2,866303E+23  |
| -1027                  | 7,563054E+22                              | 7,563079E+22 | 6,768666E+22 | 6,768645E+22 | 1,512613E+23                           | 1,353731E+23                           | 2,866344E+23  |
| -1026                  | 7,563231E+22                              | 7,563182E+22 | 6,768670E+22 | 6,768638E+22 | 1,512641E+23                           | 1,353731E+23                           | 2,866372E+23  |
| -1025                  | 7,562830E+22                              | 7,563021E+22 | 6,768746E+22 | 6,768717E+22 | 1,512585E+23                           | 1,353746E+23                           | 2,866331E+23  |
| -1024                  | 7,563149E+22                              | 7,563229E+22 | 6,768751E+22 | 6,768869E+22 | 1,512638E+23                           | 1,353762E+23                           | 2,866400E+23  |
| -1023                  | 7,563134E+22                              | 7,563070E+22 | 6,768900E+22 | 6,768765E+22 | 1,512620E+23                           | 1,353767E+23                           | 2,866387E+23  |
| -1022                  | 7,562936E+22                              | 7,563056E+22 | 6,768902E+22 | 6,768846E+22 | 1,512599E+23                           | 1,353775E+23                           | 2,866374E+23  |
| -1021                  | 7,563380E+22                              | 7,563261E+22 | 6,768843E+22 | 6,768935E+22 | 1,512664E+23                           | 1,353778E+23                           | 2,866442E+23  |
| -1020                  | 7,563111E+22                              | 7,563041E+22 | 6,768918E+22 | 6,768863E+22 | 1,512615E+23                           | 1,353778E+23                           | 2,866393E+23  |
| -1019                  | 7,563048E+22                              | 7,563208E+22 | 6,768892E+22 | 6,768928E+22 | 1,512626E+23                           | 1,353782E+23                           | 2,866408E+23  |
| -1018                  | 7,563328E+22                              | 7,563319E+22 | 6,768855E+22 | 6,768862E+22 | 1,512665E+23                           | 1,353772E+23                           | 2,866436E+23  |
| -1017                  | 7,562968E+22                              | 7,563031E+22 | 6,768893E+22 | 6,768765E+22 | 1,512600E+23                           | 1,353766E+23                           | 2,866366E+23  |
| -1016                  | 7,563173E+22                              | 7,563194E+22 | 6,768838E+22 | 6,768833E+22 | 1,512637E+23                           | 1,353767E+23                           | 2,866404E+23  |
| -1015                  | 7,563202E+22                              | 7,563110E+22 | 6,768846E+22 | 6,768731E+22 | 1,512631E+23                           | 1,353758E+23                           | 2,866389E+23  |
| -1014                  | 7,562839E+22                              | 7,563032E+22 | 6,768750E+22 | 6,768745E+22 | 1,512587E+23                           | 1,353750E+23                           | 2,866337E+23  |
| -1013                  | 7,563190E+22                              | 7,563224E+22 | 6,768652E+22 | 6,768811E+22 | 1,512641E+23                           | 1,353746E+23                           | 2,866388E+23  |
| -1012                  | 7,563046E+22                              | 7,562947E+22 | 6,768713E+22 | 6,768652E+22 | 1,512599E+23                           | 1,353737E+23                           | 2,866336E+23  |
| -1011                  | 7,562926E+22                              | 7,563005E+22 | 6,768701E+22 | 6,768642E+22 | 1,512593E+23                           | 1,353734E+23                           | 2,866327E+23  |
| -1010                  | 7,563303E+22                              | 7,563186E+22 | 6,768667E+22 | 6,768662E+22 | 1,512649E+23                           | 1,353733E+23                           | 2,866382E+23  |
| -1009                  | 7,562984E+22                              | 7,562937E+22 | 6,768718E+22 | 6,768620E+22 | 1,512592E+23                           | 1,353734E+23                           | 2,866326E+23  |
| -1008                  | 7,563030E+22                              | 7,563175E+22 | 6,768735E+22 | 6,768782E+22 | 1,512621E+23                           | 1,353752E+23                           | 2,866372E+23  |
| -1007                  | 7,563180E+22                              | 7,563201E+22 | 6,768816E+22 | 6,768797E+22 | 1,512638E+23                           | 1,353761E+23                           | 2,866399E+23  |
| -1006                  | 7,562836E+22                              | 7,563044E+22 | 6,768865E+22 | 6,768811E+22 | 1,512588E+23                           | 1,353768E+23                           | 2,866355E+23  |
| -1005                  | 7,563201E+22                              | 7,563239E+22 | 6,768893E+22 | 6,768949E+22 | 1,512644E+23                           | 1,353784E+23                           | 2,866428E+23  |
| -1004                  | 7,563225E+22                              | 7,563011E+22 | 6,768984E+22 | 6,768897E+22 | 1,512624E+23                           | 1,353788E+23                           | 2,866412E+23  |
| -1003                  | 7,562999E+22                              | 7,563071E+22 | 6,768982E+22 | 6,768945E+22 | 1,512607E+23                           | 1,353793E+23                           | 2,866400E+23  |
| -1002                  | 7,563361E+22                              | 7,563355E+22 | 6,768919E+22 | 6,769054E+22 | 1,512672E+23                           | 1,353797E+23                           | 2,866469E+23  |
| -1001                  | 7,563117E+22                              | 7,563086E+22 | 6,768955E+22 | 6,768936E+22 | 1,512620E+23                           | 1,353789E+23                           | 2,866409E+23  |
| -1000                  | 7,563078E+22                              | 7,563246E+22 | 6,768972E+22 | 6,768970E+22 | 1,512632E+23                           | 1,353794E+23                           | 2,866427E+23  |
| -999                   | 7,563348E+22                              | 7,563279E+22 | 6,768998E+22 | 6,768927E+22 | 1,512663E+23                           | 1,353793E+23                           | 2,866455E+23  |
| -998                   | 7,562984E+22                              | 7,563045E+22 | 6,768981E+22 | 6,768825E+22 | 1,512603E+23                           | 1,353781E+23                           | 2,866384E+23  |
| -997                   | 7,563165E+22                              | 7,563253E+22 | 6,768920E+22 | 6,768931E+22 | 1,512642E+23                           | 1,353785E+23                           | 2,866427E+23  |
| -996                   | 7,563203E+22                              | 7,563085E+22 | 6,768877E+22 | 6,768870E+22 | 1,512629E+23                           | 1,353775E+23                           | 2,866404E+23  |
| -995                   | 7,562863E+22                              | 7,563025E+22 | 6,768823E+22 | 6,768804E+22 | 1,512589E+23                           | 1,353763E+23                           | 2,866351E+23  |
| -994                   | 7,563213E+22                              | 7,563248E+22 | 6,768749E+22 | 6,768858E+22 | 1,512646E+23                           | 1,353761E+23                           | 2,866407E+23  |
| -993                   | 7,563118E+22                              | 7,562931E+22 | 6,768769E+22 | 6,768686E+22 | 1,512605E+23                           | 1,353745E+23                           | 2,866350E+23  |
| -992                   | 7,562985E+22                              | 7,563051E+22 | 6,768775E+22 | 6,768713E+22 | 1,512604E+23                           | 1,353749E+23                           | 2,866352E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -991              | 7,563276E+22                              | 7,563223E+22 | 6,768782E+22 | 6,768806E+22 | 1,512650E+23                           | 1,353759E+23                           | 2,866409E+23  |
| -990              | 7,562934E+22                              | 7,563028E+22 | 6,768796E+22 | 6,768749E+22 | 1,512596E+23                           | 1,353755E+23                           | 2,866351E+23  |
| -989              | 7,563003E+22                              | 7,563234E+22 | 6,768860E+22 | 6,768892E+22 | 1,512624E+23                           | 1,353775E+23                           | 2,866399E+23  |
| -988              | 7,563220E+22                              | 7,563131E+22 | 6,768926E+22 | 6,768918E+22 | 1,512635E+23                           | 1,353784E+23                           | 2,866420E+23  |
| -987              | 7,562936E+22                              | 7,562991E+22 | 6,768993E+22 | 6,768870E+22 | 1,512593E+23                           | 1,353786E+23                           | 2,866379E+23  |
| -986              | 7,563256E+22                              | 7,563263E+22 | 6,769002E+22 | 6,769047E+22 | 1,512652E+23                           | 1,353805E+23                           | 2,866457E+23  |
| -985              | 7,563274E+22                              | 7,563067E+22 | 6,769012E+22 | 6,769010E+22 | 1,512634E+23                           | 1,353802E+23                           | 2,866436E+23  |
| -984              | 7,563023E+22                              | 7,563178E+22 | 6,769029E+22 | 6,769048E+22 | 1,512620E+23                           | 1,353808E+23                           | 2,866428E+23  |
| -983              | 7,563334E+22                              | 7,563397E+22 | 6,769058E+22 | 6,769157E+22 | 1,512673E+23                           | 1,353821E+23                           | 2,866495E+23  |
| -982              | 7,563125E+22                              | 7,563140E+22 | 6,769078E+22 | 6,768978E+22 | 1,512626E+23                           | 1,353806E+23                           | 2,866432E+23  |
| -981              | 7,563102E+22                              | 7,563256E+22 | 6,769120E+22 | 6,769015E+22 | 1,512636E+23                           | 1,353814E+23                           | 2,866449E+23  |
| -980              | 7,563372E+22                              | 7,563212E+22 | 6,769087E+22 | 6,769054E+22 | 1,512658E+23                           | 1,353814E+23                           | 2,866473E+23  |
| -979              | 7,563001E+22                              | 7,563025E+22 | 6,769040E+22 | 6,768928E+22 | 1,512603E+23                           | 1,353797E+23                           | 2,866399E+23  |
| -978              | 7,563121E+22                              | 7,563282E+22 | 6,768966E+22 | 6,769048E+22 | 1,512640E+23                           | 1,353801E+23                           | 2,866442E+23  |
| -977              | 7,563226E+22                              | 7,563077E+22 | 6,768878E+22 | 6,768940E+22 | 1,512630E+23                           | 1,353782E+23                           | 2,866412E+23  |
| -976              | 7,562935E+22                              | 7,563036E+22 | 6,768860E+22 | 6,768825E+22 | 1,512597E+23                           | 1,353768E+23                           | 2,866366E+23  |
| -975              | 7,563257E+22                              | 7,563235E+22 | 6,768864E+22 | 6,768905E+22 | 1,512649E+23                           | 1,353777E+23                           | 2,866426E+23  |
| -974              | 7,563143E+22                              | 7,563011E+22 | 6,768843E+22 | 6,768732E+22 | 1,512615E+23                           | 1,353758E+23                           | 2,866373E+23  |
| -973              | 7,562963E+22                              | 7,563160E+22 | 6,768887E+22 | 6,768809E+22 | 1,512612E+23                           | 1,353770E+23                           | 2,866382E+23  |
| -972              | 7,563238E+22                              | 7,563238E+22 | 6,768884E+22 | 6,768965E+22 | 1,512648E+23                           | 1,353785E+23                           | 2,866432E+23  |
| -971              | 7,562937E+22                              | 7,563021E+22 | 6,768944E+22 | 6,768849E+22 | 1,512596E+23                           | 1,353779E+23                           | 2,866375E+23  |
| -970              | 7,563015E+22                              | 7,563226E+22 | 6,769017E+22 | 6,768997E+22 | 1,512624E+23                           | 1,353801E+23                           | 2,866426E+23  |
| -969              | 7,563307E+22                              | 7,563078E+22 | 6,769005E+22 | 6,769020E+22 | 1,512638E+23                           | 1,353802E+23                           | 2,866441E+23  |
| -968              | 7,563026E+22                              | 7,563018E+22 | 6,769052E+22 | 6,768984E+22 | 1,512604E+23                           | 1,353804E+23                           | 2,866408E+23  |
| -967              | 7,563268E+22                              | 7,563312E+22 | 6,769087E+22 | 6,769200E+22 | 1,512658E+23                           | 1,353829E+23                           | 2,866487E+23  |
| -966              | 7,563260E+22                              | 7,563181E+22 | 6,769065E+22 | 6,769099E+22 | 1,512644E+23                           | 1,353816E+23                           | 2,866461E+23  |
| -965              | 7,563034E+22                              | 7,563260E+22 | 6,769156E+22 | 6,769103E+22 | 1,512629E+23                           | 1,353826E+23                           | 2,866455E+23  |
| -964              | 7,563368E+22                              | 7,563342E+22 | 6,769181E+22 | 6,769221E+22 | 1,512671E+23                           | 1,353840E+23                           | 2,866511E+23  |
| -963              | 7,563176E+22                              | 7,563098E+22 | 6,769217E+22 | 6,769016E+22 | 1,512627E+23                           | 1,353823E+23                           | 2,866451E+23  |
| -962              | 7,563093E+22                              | 7,563275E+22 | 6,769224E+22 | 6,769117E+22 | 1,512637E+23                           | 1,353834E+23                           | 2,866471E+23  |
| -961              | 7,563362E+22                              | 7,563220E+22 | 6,769090E+22 | 6,769181E+22 | 1,512658E+23                           | 1,353827E+23                           | 2,866485E+23  |
| -960              | 7,563008E+22                              | 7,563076E+22 | 6,769052E+22 | 6,769031E+22 | 1,512608E+23                           | 1,353808E+23                           | 2,866417E+23  |
| -959              | 7,563118E+22                              | 7,563280E+22 | 6,769049E+22 | 6,769137E+22 | 1,512640E+23                           | 1,353819E+23                           | 2,866458E+23  |
| -958              | 7,563260E+22                              | 7,563120E+22 | 6,768947E+22 | 6,768953E+22 | 1,512638E+23                           | 1,353790E+23                           | 2,866428E+23  |
| -957              | 7,562998E+22                              | 7,563077E+22 | 6,768980E+22 | 6,768848E+22 | 1,512608E+23                           | 1,353783E+23                           | 2,866390E+23  |
| -956              | 7,563273E+22                              | 7,563220E+22 | 6,768962E+22 | 6,769009E+22 | 1,512649E+23                           | 1,353797E+23                           | 2,866446E+23  |
| -955              | 7,563134E+22                              | 7,563053E+22 | 6,768949E+22 | 6,768838E+22 | 1,512619E+23                           | 1,353779E+23                           | 2,866397E+23  |
| -954              | 7,562903E+22                              | 7,563209E+22 | 6,769003E+22 | 6,768944E+22 | 1,512611E+23                           | 1,353795E+23                           | 2,866406E+23  |
| -953              | 7,563244E+22                              | 7,563208E+22 | 6,768957E+22 | 6,769077E+22 | 1,512645E+23                           | 1,353803E+23                           | 2,866449E+23  |
| -952              | 7,563020E+22                              | 7,562999E+22 | 6,769030E+22 | 6,768929E+22 | 1,512602E+23                           | 1,353796E+23                           | 2,866398E+23  |
| -951              | 7,563078E+22                              | 7,563188E+22 | 6,769142E+22 | 6,769112E+22 | 1,512627E+23                           | 1,353825E+23                           | 2,866452E+23  |
| -950              | 7,563358E+22                              | 7,563161E+22 | 6,769065E+22 | 6,769112E+22 | 1,512652E+23                           | 1,353818E+23                           | 2,866470E+23  |
| -949              | 7,563056E+22                              | 7,563134E+22 | 6,769137E+22 | 6,769081E+22 | 1,512619E+23                           | 1,353822E+23                           | 2,866441E+23  |
| -948              | 7,563258E+22                              | 7,563351E+22 | 6,769186E+22 | 6,769322E+22 | 1,512661E+23                           | 1,353851E+23                           | 2,866512E+23  |
| -947              | 7,563284E+22                              | 7,563215E+22 | 6,769210E+22 | 6,769150E+22 | 1,512650E+23                           | 1,353836E+23                           | 2,866486E+23  |
| -946              | 7,563029E+22                              | 7,563271E+22 | 6,769323E+22 | 6,769170E+22 | 1,512630E+23                           | 1,353849E+23                           | 2,866479E+23  |
| -945              | 7,563398E+22                              | 7,563297E+22 | 6,769269E+22 | 6,769317E+22 | 1,512669E+23                           | 1,353859E+23                           | 2,866528E+23  |
| -944              | 7,563207E+22                              | 7,563100E+22 | 6,769268E+22 | 6,769139E+22 | 1,512631E+23                           | 1,353841E+23                           | 2,866472E+23  |
| -943              | 7,563056E+22                              | 7,563277E+22 | 6,769280E+22 | 6,769281E+22 | 1,512633E+23                           | 1,353856E+23                           | 2,866489E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -942                   | 7,563343E+22                              | 7,563277E+22 | 6,769097E+22 | 6,769260E+22 | 1,512662E+23                           | 1,353836E+23                           | 2,866498E+23  |
| -941                   | 7,563054E+22                              | 7,563111E+22 | 6,769119E+22 | 6,769053E+22 | 1,512617E+23                           | 1,353817E+23                           | 2,866434E+23  |
| -940                   | 7,563183E+22                              | 7,563231E+22 | 6,769129E+22 | 6,769165E+22 | 1,512641E+23                           | 1,353829E+23                           | 2,866471E+23  |
| -939                   | 7,563336E+22                              | 7,563123E+22 | 6,769058E+22 | 6,768954E+22 | 1,512646E+23                           | 1,353801E+23                           | 2,866447E+23  |
| -938                   | 7,562989E+22                              | 7,563144E+22 | 6,769101E+22 | 6,768929E+22 | 1,512613E+23                           | 1,353803E+23                           | 2,866416E+23  |
| -937                   | 7,563240E+22                              | 7,563257E+22 | 6,769020E+22 | 6,769132E+22 | 1,512650E+23                           | 1,353815E+23                           | 2,866465E+23  |
| -936                   | 7,563119E+22                              | 7,563099E+22 | 6,769037E+22 | 6,768965E+22 | 1,512622E+23                           | 1,353800E+23                           | 2,866422E+23  |
| -935                   | 7,562889E+22                              | 7,563187E+22 | 6,769146E+22 | 6,769085E+22 | 1,512608E+23                           | 1,353823E+23                           | 2,866431E+23  |
| -934                   | 7,563278E+22                              | 7,563211E+22 | 6,769051E+22 | 6,769153E+22 | 1,512649E+23                           | 1,353820E+23                           | 2,866469E+23  |
| -933                   | 7,563113E+22                              | 7,563019E+22 | 6,769140E+22 | 6,769017E+22 | 1,512613E+23                           | 1,353816E+23                           | 2,866429E+23  |
| -932                   | 7,563129E+22                              | 7,563179E+22 | 6,769206E+22 | 6,769251E+22 | 1,512631E+23                           | 1,353846E+23                           | 2,866476E+23  |
| -931                   | 7,563376E+22                              | 7,563231E+22 | 6,769143E+22 | 6,769211E+22 | 1,512661E+23                           | 1,353835E+23                           | 2,866496E+23  |
| -930                   | 7,563035E+22                              | 7,563223E+22 | 6,769257E+22 | 6,769179E+22 | 1,512626E+23                           | 1,353844E+23                           | 2,866469E+23  |
| -929                   | 7,563272E+22                              | 7,563346E+22 | 6,769280E+22 | 6,769387E+22 | 1,512662E+23                           | 1,353867E+23                           | 2,866529E+23  |
| -928                   | 7,563345E+22                              | 7,563214E+22 | 6,769329E+22 | 6,769207E+22 | 1,512656E+23                           | 1,353854E+23                           | 2,866510E+23  |
| -927                   | 7,563047E+22                              | 7,563240E+22 | 6,769457E+22 | 6,769289E+22 | 1,512629E+23                           | 1,353875E+23                           | 2,866503E+23  |
| -926                   | 7,563383E+22                              | 7,563352E+22 | 6,769317E+22 | 6,769419E+22 | 1,512673E+23                           | 1,353874E+23                           | 2,866547E+23  |
| -925                   | 7,563217E+22                              | 7,563171E+22 | 6,769324E+22 | 6,769250E+22 | 1,512639E+23                           | 1,353857E+23                           | 2,866496E+23  |
| -924                   | 7,563056E+22                              | 7,563260E+22 | 6,769334E+22 | 6,769388E+22 | 1,512632E+23                           | 1,353872E+23                           | 2,866504E+23  |
| -923                   | 7,563394E+22                              | 7,563284E+22 | 6,769194E+22 | 6,769278E+22 | 1,512668E+23                           | 1,353847E+23                           | 2,866515E+23  |
| -922                   | 7,563101E+22                              | 7,563128E+22 | 6,769245E+22 | 6,769072E+22 | 1,512623E+23                           | 1,353832E+23                           | 2,866455E+23  |
| -921                   | 7,563230E+22                              | 7,563215E+22 | 6,769199E+22 | 6,769216E+22 | 1,512645E+23                           | 1,353842E+23                           | 2,866486E+23  |
| -920                   | 7,563357E+22                              | 7,563176E+22 | 6,769121E+22 | 6,769053E+22 | 1,512653E+23                           | 1,353817E+23                           | 2,866471E+23  |
| -919                   | 7,562922E+22                              | 7,563175E+22 | 6,769196E+22 | 6,769099E+22 | 1,512610E+23                           | 1,353829E+23                           | 2,866439E+23  |
| -918                   | 7,563185E+22                              | 7,563310E+22 | 6,769084E+22 | 6,769238E+22 | 1,512650E+23                           | 1,353832E+23                           | 2,866482E+23  |
| -917                   | 7,563162E+22                              | 7,563095E+22 | 6,769139E+22 | 6,769041E+22 | 1,512626E+23                           | 1,353818E+23                           | 2,866444E+23  |
| -916                   | 7,562952E+22                              | 7,563105E+22 | 6,769238E+22 | 6,769177E+22 | 1,512606E+23                           | 1,353842E+23                           | 2,866447E+23  |
| -915                   | 7,563374E+22                              | 7,563209E+22 | 6,769143E+22 | 6,769211E+22 | 1,512658E+23                           | 1,353835E+23                           | 2,866494E+23  |
| -914                   | 7,563140E+22                              | 7,563101E+22 | 6,769231E+22 | 6,769116E+22 | 1,512624E+23                           | 1,353835E+23                           | 2,866459E+23  |
| -913                   | 7,563138E+22                              | 7,563247E+22 | 6,769256E+22 | 6,769362E+22 | 1,512639E+23                           | 1,353862E+23                           | 2,866500E+23  |
| -912                   | 7,563397E+22                              | 7,563309E+22 | 6,769247E+22 | 6,769300E+22 | 1,512671E+23                           | 1,353855E+23                           | 2,866525E+23  |
| -911                   | 7,563026E+22                              | 7,563234E+22 | 6,769432E+22 | 6,769293E+22 | 1,512626E+23                           | 1,353873E+23                           | 2,866499E+23  |
| -910                   | 7,563279E+22                              | 7,563366E+22 | 6,769408E+22 | 6,769451E+22 | 1,512664E+23                           | 1,353886E+23                           | 2,866550E+23  |
| -909                   | 7,563397E+22                              | 7,563221E+22 | 6,769453E+22 | 6,769316E+22 | 1,512662E+23                           | 1,353877E+23                           | 2,866539E+23  |
| -908                   | 7,563050E+22                              | 7,563208E+22 | 6,769519E+22 | 6,769454E+22 | 1,512626E+23                           | 1,353897E+23                           | 2,866523E+23  |
| -907                   | 7,563391E+22                              | 7,563377E+22 | 6,769365E+22 | 6,769521E+22 | 1,512677E+23                           | 1,353889E+23                           | 2,866565E+23  |
| -906                   | 7,563227E+22                              | 7,563211E+22 | 6,769397E+22 | 6,769320E+22 | 1,512644E+23                           | 1,353872E+23                           | 2,866515E+23  |
| -905                   | 7,563121E+22                              | 7,563233E+22 | 6,769372E+22 | 6,769412E+22 | 1,512635E+23                           | 1,353878E+23                           | 2,866514E+23  |
| -904                   | 7,563482E+22                              | 7,563295E+22 | 6,769272E+22 | 6,769287E+22 | 1,512678E+23                           | 1,353856E+23                           | 2,866534E+23  |
| -903                   | 7,563120E+22                              | 7,563152E+22 | 6,769358E+22 | 6,769161E+22 | 1,512627E+23                           | 1,353852E+23                           | 2,866479E+23  |
| -902                   | 7,563178E+22                              | 7,563305E+22 | 6,769253E+22 | 6,769292E+22 | 1,512648E+23                           | 1,353854E+23                           | 2,866503E+23  |
| -901                   | 7,563328E+22                              | 7,563259E+22 | 6,769208E+22 | 6,769173E+22 | 1,512659E+23                           | 1,353838E+23                           | 2,866497E+23  |
| -900                   | 7,562894E+22                              | 7,563139E+22 | 6,769287E+22 | 6,769232E+22 | 1,512603E+23                           | 1,353852E+23                           | 2,866455E+23  |
| -899                   | 7,563214E+22                              | 7,563277E+22 | 6,769200E+22 | 6,769297E+22 | 1,512649E+23                           | 1,353850E+23                           | 2,866499E+23  |
| -898                   | 7,563223E+22                              | 7,563084E+22 | 6,769265E+22 | 6,769115E+22 | 1,512631E+23                           | 1,353838E+23                           | 2,866469E+23  |
| -897                   | 7,563033E+22                              | 7,563075E+22 | 6,769283E+22 | 6,769273E+22 | 1,512611E+23                           | 1,353856E+23                           | 2,866466E+23  |
| -896                   | 7,563428E+22                              | 7,563275E+22 | 6,769194E+22 | 6,769321E+22 | 1,512670E+23                           | 1,353852E+23                           | 2,866522E+23  |
| -895                   | 7,563122E+22                              | 7,563174E+22 | 6,769328E+22 | 6,769263E+22 | 1,512630E+23                           | 1,353859E+23                           | 2,866489E+23  |
| -894                   | 7,563110E+22                              | 7,563330E+22 | 6,769350E+22 | 6,769422E+22 | 1,512644E+23                           | 1,353877E+23                           | 2,866521E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -893                   | 7,563448E+22                              | 7,563344E+22 | 6,769394E+22 | 6,769364E+22 | 1,512679E+23                           | 1,353876E+23                           | 2,866555E+23  |
| -892                   | 7,563066E+22                              | 7,563172E+22 | 6,769574E+22 | 6,769401E+22 | 1,512624E+23                           | 1,353898E+23                           | 2,866521E+23  |
| -891                   | 7,563317E+22                              | 7,563367E+22 | 6,769527E+22 | 6,769544E+22 | 1,512668E+23                           | 1,353907E+23                           | 2,866576E+23  |
| -890                   | 7,563396E+22                              | 7,563276E+22 | 6,769545E+22 | 6,769448E+22 | 1,512667E+23                           | 1,353899E+23                           | 2,866566E+23  |
| -889                   | 7,563060E+22                              | 7,563224E+22 | 6,769540E+22 | 6,769578E+22 | 1,512628E+23                           | 1,353912E+23                           | 2,866540E+23  |
| -888                   | 7,563441E+22                              | 7,563411E+22 | 6,769426E+22 | 6,769589E+22 | 1,512685E+23                           | 1,353901E+23                           | 2,866587E+23  |
| -887                   | 7,563253E+22                              | 7,563217E+22 | 6,769508E+22 | 6,769389E+22 | 1,512647E+23                           | 1,353890E+23                           | 2,866537E+23  |
| -886                   | 7,563150E+22                              | 7,563271E+22 | 6,769451E+22 | 6,769423E+22 | 1,512642E+23                           | 1,353887E+23                           | 2,866530E+23  |
| -885                   | 7,563527E+22                              | 7,563338E+22 | 6,769356E+22 | 6,769353E+22 | 1,512686E+23                           | 1,353871E+23                           | 2,866557E+23  |
| -884                   | 7,563074E+22                              | 7,563150E+22 | 6,769424E+22 | 6,769304E+22 | 1,512622E+23                           | 1,353873E+23                           | 2,866495E+23  |
| -883                   | 7,563132E+22                              | 7,563337E+22 | 6,769325E+22 | 6,769388E+22 | 1,512647E+23                           | 1,353871E+23                           | 2,866518E+23  |
| -882                   | 7,563307E+22                              | 7,563259E+22 | 6,769314E+22 | 6,769255E+22 | 1,512657E+23                           | 1,353857E+23                           | 2,866514E+23  |
| -881                   | 7,562957E+22                              | 7,563066E+22 | 6,769341E+22 | 6,769294E+22 | 1,512602E+23                           | 1,353864E+23                           | 2,866466E+23  |
| -880                   | 7,563328E+22                              | 7,563244E+22 | 6,769274E+22 | 6,769345E+22 | 1,512657E+23                           | 1,353862E+23                           | 2,866519E+23  |
| -879                   | 7,563270E+22                              | 7,563112E+22 | 6,769353E+22 | 6,769231E+22 | 1,512638E+23                           | 1,353858E+23                           | 2,866497E+23  |
| -878                   | 7,563030E+22                              | 7,563192E+22 | 6,769327E+22 | 6,769351E+22 | 1,512622E+23                           | 1,353868E+23                           | 2,866490E+23  |
| -877                   | 7,563442E+22                              | 7,563390E+22 | 6,769295E+22 | 6,769426E+22 | 1,512683E+23                           | 1,353872E+23                           | 2,866555E+23  |
| -876                   | 7,563109E+22                              | 7,563192E+22 | 6,769475E+22 | 6,769387E+22 | 1,512630E+23                           | 1,353886E+23                           | 2,866516E+23  |
| -875                   | 7,563130E+22                              | 7,563341E+22 | 6,769522E+22 | 6,769485E+22 | 1,512647E+23                           | 1,353901E+23                           | 2,866548E+23  |
| -874                   | 7,563480E+22                              | 7,563346E+22 | 6,769571E+22 | 6,769469E+22 | 1,512683E+23                           | 1,353904E+23                           | 2,866587E+23  |
| -873                   | 7,563112E+22                              | 7,563134E+22 | 6,769642E+22 | 6,769551E+22 | 1,512625E+23                           | 1,353919E+23                           | 2,866544E+23  |
| -872                   | 7,563344E+22                              | 7,563393E+22 | 6,769578E+22 | 6,769692E+22 | 1,512674E+23                           | 1,353927E+23                           | 2,866601E+23  |
| -871                   | 7,563386E+22                              | 7,563318E+22 | 6,769607E+22 | 6,769606E+22 | 1,512670E+23                           | 1,353921E+23                           | 2,866592E+23  |
| -870                   | 7,563076E+22                              | 7,563265E+22 | 6,769572E+22 | 6,769605E+22 | 1,512634E+23                           | 1,353918E+23                           | 2,866552E+23  |
| -869                   | 7,563525E+22                              | 7,563437E+22 | 6,769508E+22 | 6,769604E+22 | 1,512696E+23                           | 1,353911E+23                           | 2,866607E+23  |
| -868                   | 7,563300E+22                              | 7,563193E+22 | 6,769600E+22 | 6,769437E+22 | 1,512649E+23                           | 1,353904E+23                           | 2,866553E+23  |
| -867                   | 7,563153E+22                              | 7,563312E+22 | 6,769544E+22 | 6,769458E+22 | 1,512647E+23                           | 1,353900E+23                           | 2,866547E+23  |
| -866                   | 7,563477E+22                              | 7,563415E+22 | 6,769460E+22 | 6,769449E+22 | 1,512689E+23                           | 1,353891E+23                           | 2,866580E+23  |
| -865                   | 7,563047E+22                              | 7,563139E+22 | 6,769475E+22 | 6,769421E+22 | 1,512619E+23                           | 1,353890E+23                           | 2,866508E+23  |
| -864                   | 7,563150E+22                              | 7,563315E+22 | 6,769420E+22 | 6,769469E+22 | 1,512646E+23                           | 1,353889E+23                           | 2,866535E+23  |
| -863                   | 7,563335E+22                              | 7,563223E+22 | 6,769429E+22 | 6,769360E+22 | 1,512656E+23                           | 1,353879E+23                           | 2,866535E+23  |
| -862                   | 7,563010E+22                              | 7,563070E+22 | 6,769397E+22 | 6,769339E+22 | 1,512608E+23                           | 1,353874E+23                           | 2,866482E+23  |
| -861                   | 7,563405E+22                              | 7,563300E+22 | 6,769332E+22 | 6,769447E+22 | 1,512670E+23                           | 1,353878E+23                           | 2,866548E+23  |
| -860                   | 7,563260E+22                              | 7,563161E+22 | 6,769415E+22 | 6,769378E+22 | 1,512642E+23                           | 1,353879E+23                           | 2,866521E+23  |
| -859                   | 7,563016E+22                              | 7,563274E+22 | 6,769433E+22 | 6,769431E+22 | 1,512629E+23                           | 1,353886E+23                           | 2,866515E+23  |
| -858                   | 7,563440E+22                              | 7,563439E+22 | 6,769461E+22 | 6,769497E+22 | 1,512688E+23                           | 1,353896E+23                           | 2,866584E+23  |
| -857                   | 7,563158E+22                              | 7,563147E+22 | 6,769599E+22 | 6,769478E+22 | 1,512631E+23                           | 1,353908E+23                           | 2,866538E+23  |
| -856                   | 7,563204E+22                              | 7,563318E+22 | 6,769654E+22 | 6,769586E+22 | 1,512652E+23                           | 1,353924E+23                           | 2,866576E+23  |
| -855                   | 7,563480E+22                              | 7,563362E+22 | 6,769677E+22 | 6,769642E+22 | 1,512684E+23                           | 1,353932E+23                           | 2,866616E+23  |
| -854                   | 7,563102E+22                              | 7,563209E+22 | 6,769671E+22 | 6,769666E+22 | 1,512631E+23                           | 1,353934E+23                           | 2,866565E+23  |
| -853                   | 7,563389E+22                              | 7,563452E+22 | 6,769628E+22 | 6,769795E+22 | 1,512684E+23                           | 1,353942E+23                           | 2,866626E+23  |
| -852                   | 7,563401E+22                              | 7,563311E+22 | 6,769696E+22 | 6,769687E+22 | 1,512671E+23                           | 1,353938E+23                           | 2,866610E+23  |
| -851                   | 7,563131E+22                              | 7,563287E+22 | 6,769688E+22 | 6,769604E+22 | 1,512642E+23                           | 1,353929E+23                           | 2,866571E+23  |
| -850                   | 7,563561E+22                              | 7,563457E+22 | 6,769649E+22 | 6,769634E+22 | 1,512702E+23                           | 1,353928E+23                           | 2,866630E+23  |
| -849                   | 7,563310E+22                              | 7,563188E+22 | 6,769660E+22 | 6,769538E+22 | 1,512650E+23                           | 1,353920E+23                           | 2,866570E+23  |
| -848                   | 7,563131E+22                              | 7,563339E+22 | 6,769610E+22 | 6,769570E+22 | 1,512647E+23                           | 1,353918E+23                           | 2,866565E+23  |
| -847                   | 7,563411E+22                              | 7,563427E+22 | 6,769544E+22 | 6,769591E+22 | 1,512684E+23                           | 1,353913E+23                           | 2,866597E+23  |
| -846                   | 7,563047E+22                              | 7,563132E+22 | 6,769521E+22 | 6,769469E+22 | 1,512618E+23                           | 1,353899E+23                           | 2,866517E+23  |
| -845                   | 7,563244E+22                              | 7,563291E+22 | 6,769489E+22 | 6,769525E+22 | 1,512653E+23                           | 1,353901E+23                           | 2,866555E+23  |



| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -844                   | 7,563392E+22                              | 7,563196E+22 | 6,769504E+22 | 6,769454E+22 | 1,512659E+23                           | 1,353896E+23                           | 2,866555E+23  |
| -843                   | 7,563046E+22                              | 7,563148E+22 | 6,769465E+22 | 6,769398E+22 | 1,512619E+23                           | 1,353886E+23                           | 2,866506E+23  |
| -842                   | 7,563392E+22                              | 7,563417E+22 | 6,769444E+22 | 6,769539E+22 | 1,512681E+23                           | 1,353898E+23                           | 2,866579E+23  |
| -841                   | 7,563262E+22                              | 7,563203E+22 | 6,769508E+22 | 6,769491E+22 | 1,512647E+23                           | 1,353900E+23                           | 2,866546E+23  |
| -840                   | 7,563036E+22                              | 7,563285E+22 | 6,769596E+22 | 6,769516E+22 | 1,512632E+23                           | 1,353911E+23                           | 2,866543E+23  |
| -839                   | 7,563445E+22                              | 7,563431E+22 | 6,769641E+22 | 6,769631E+22 | 1,512688E+23                           | 1,353927E+23                           | 2,866615E+23  |
| -838                   | 7,563193E+22                              | 7,563134E+22 | 6,769696E+22 | 6,769577E+22 | 1,512633E+23                           | 1,353927E+23                           | 2,866560E+23  |
| -837                   | 7,563252E+22                              | 7,563341E+22 | 6,769718E+22 | 6,769745E+22 | 1,512659E+23                           | 1,353946E+23                           | 2,866606E+23  |
| -836                   | 7,563469E+22                              | 7,563380E+22 | 6,769724E+22 | 6,769814E+22 | 1,512685E+23                           | 1,353954E+23                           | 2,866639E+23  |
| -835                   | 7,563122E+22                              | 7,563257E+22 | 6,769732E+22 | 6,769725E+22 | 1,512638E+23                           | 1,353946E+23                           | 2,866584E+23  |
| -834                   | 7,563437E+22                              | 7,563487E+22 | 6,769749E+22 | 6,769816E+22 | 1,512692E+23                           | 1,353957E+23                           | 2,866649E+23  |
| -833                   | 7,563483E+22                              | 7,563285E+22 | 6,769777E+22 | 6,769715E+22 | 1,512677E+23                           | 1,353949E+23                           | 2,866626E+23  |
| -832                   | 7,563192E+22                              | 7,563295E+22 | 6,769803E+22 | 6,769644E+22 | 1,512649E+23                           | 1,353945E+23                           | 2,866593E+23  |
| -831                   | 7,563513E+22                              | 7,563514E+22 | 6,769753E+22 | 6,769760E+22 | 1,512703E+23                           | 1,353951E+23                           | 2,866654E+23  |
| -830                   | 7,563248E+22                              | 7,563251E+22 | 6,769707E+22 | 6,769634E+22 | 1,512650E+23                           | 1,353934E+23                           | 2,866584E+23  |
| -829                   | 7,563127E+22                              | 7,563365E+22 | 6,769676E+22 | 6,769688E+22 | 1,512649E+23                           | 1,353936E+23                           | 2,866586E+23  |
| -828                   | 7,563401E+22                              | 7,563382E+22 | 6,769636E+22 | 6,769701E+22 | 1,512678E+23                           | 1,353934E+23                           | 2,866612E+23  |
| -827                   | 7,563109E+22                              | 7,563121E+22 | 6,769610E+22 | 6,769502E+22 | 1,512623E+23                           | 1,353911E+23                           | 2,866534E+23  |
| -826                   | 7,563312E+22                              | 7,563305E+22 | 6,769590E+22 | 6,769584E+22 | 1,512662E+23                           | 1,353917E+23                           | 2,866579E+23  |
| -825                   | 7,563427E+22                              | 7,563220E+22 | 6,769537E+22 | 6,769568E+22 | 1,512665E+23                           | 1,353911E+23                           | 2,866575E+23  |
| -824                   | 7,563063E+22                              | 7,563213E+22 | 6,769548E+22 | 6,769499E+22 | 1,512628E+23                           | 1,353905E+23                           | 2,866532E+23  |
| -823                   | 7,563347E+22                              | 7,563462E+22 | 6,769571E+22 | 6,769651E+22 | 1,512681E+23                           | 1,353922E+23                           | 2,866603E+23  |
| -822                   | 7,563269E+22                              | 7,563217E+22 | 6,769619E+22 | 6,769540E+22 | 1,512649E+23                           | 1,353916E+23                           | 2,866564E+23  |
| -821                   | 7,563119E+22                              | 7,563267E+22 | 6,769713E+22 | 6,769606E+22 | 1,512639E+23                           | 1,353932E+23                           | 2,866570E+23  |
| -820                   | 7,563454E+22                              | 7,563398E+22 | 6,769751E+22 | 6,769777E+22 | 1,512685E+23                           | 1,353953E+23                           | 2,866638E+23  |
| -819                   | 7,563211E+22                              | 7,563195E+22 | 6,769770E+22 | 6,769689E+22 | 1,512641E+23                           | 1,353946E+23                           | 2,866586E+23  |
| -818                   | 7,563265E+22                              | 7,563409E+22 | 6,769813E+22 | 6,769859E+22 | 1,512667E+23                           | 1,353967E+23                           | 2,866635E+23  |
| -817                   | 7,563503E+22                              | 7,563395E+22 | 6,769792E+22 | 6,769915E+22 | 1,512690E+23                           | 1,353971E+23                           | 2,866661E+23  |
| -816                   | 7,563196E+22                              | 7,563271E+22 | 6,769860E+22 | 6,769763E+22 | 1,512647E+23                           | 1,353962E+23                           | 2,866609E+23  |
| -815                   | 7,563459E+22                              | 7,563506E+22 | 6,769897E+22 | 6,769885E+22 | 1,512696E+23                           | 1,353978E+23                           | 2,866675E+23  |
| -814                   | 7,563500E+22                              | 7,563319E+22 | 6,769858E+22 | 6,769775E+22 | 1,512682E+23                           | 1,353963E+23                           | 2,866645E+23  |
| -813                   | 7,563195E+22                              | 7,563347E+22 | 6,769861E+22 | 6,769782E+22 | 1,512654E+23                           | 1,353964E+23                           | 2,866618E+23  |
| -812                   | 7,563430E+22                              | 7,563531E+22 | 6,769818E+22 | 6,769924E+22 | 1,512696E+23                           | 1,353974E+23                           | 2,866670E+23  |
| -811                   | 7,563233E+22                              | 7,563263E+22 | 6,769775E+22 | 6,769701E+22 | 1,512650E+23                           | 1,353948E+23                           | 2,866597E+23  |
| -810                   | 7,563173E+22                              | 7,563340E+22 | 6,769784E+22 | 6,769727E+22 | 1,512651E+23                           | 1,353951E+23                           | 2,866602E+23  |
| -809                   | 7,563495E+22                              | 7,563319E+22 | 6,769688E+22 | 6,769755E+22 | 1,512681E+23                           | 1,353944E+23                           | 2,866626E+23  |
| -808                   | 7,563197E+22                              | 7,563123E+22 | 6,769685E+22 | 6,769546E+22 | 1,512632E+23                           | 1,353923E+23                           | 2,866555E+23  |
| -807                   | 7,563299E+22                              | 7,563392E+22 | 6,769669E+22 | 6,769691E+22 | 1,512669E+23                           | 1,353936E+23                           | 2,866605E+23  |
| -806                   | 7,563408E+22                              | 7,563305E+22 | 6,769586E+22 | 6,769634E+22 | 1,512671E+23                           | 1,353922E+23                           | 2,866593E+23  |
| -805                   | 7,563073E+22                              | 7,563263E+22 | 6,769652E+22 | 6,769600E+22 | 1,512634E+23                           | 1,353925E+23                           | 2,866559E+23  |
| -804                   | 7,563318E+22                              | 7,563448E+22 | 6,769725E+22 | 6,769764E+22 | 1,512677E+23                           | 1,353949E+23                           | 2,866625E+23  |
| -803                   | 7,563305E+22                              | 7,563207E+22 | 6,769760E+22 | 6,769614E+22 | 1,512651E+23                           | 1,353937E+23                           | 2,866589E+23  |
| -802                   | 7,563162E+22                              | 7,563268E+22 | 6,769848E+22 | 6,769729E+22 | 1,512643E+23                           | 1,353958E+23                           | 2,866601E+23  |
| -801                   | 7,563479E+22                              | 7,563397E+22 | 6,769791E+22 | 6,769946E+22 | 1,512688E+23                           | 1,353974E+23                           | 2,866661E+23  |
| -800                   | 7,563250E+22                              | 7,563228E+22 | 6,769840E+22 | 6,769808E+22 | 1,512648E+23                           | 1,353965E+23                           | 2,866613E+23  |
| -799                   | 7,563274E+22                              | 7,563455E+22 | 6,769912E+22 | 6,769958E+22 | 1,512673E+23                           | 1,353987E+23                           | 2,866660E+23  |
| -798                   | 7,563559E+22                              | 7,563419E+22 | 6,769874E+22 | 6,769932E+22 | 1,512698E+23                           | 1,353981E+23                           | 2,866678E+23  |
| -797                   | 7,563289E+22                              | 7,563301E+22 | 6,769960E+22 | 6,769826E+22 | 1,512659E+23                           | 1,353979E+23                           | 2,866638E+23  |
| -796                   | 7,563435E+22                              | 7,563530E+22 | 6,770010E+22 | 6,769997E+22 | 1,512697E+23                           | 1,354001E+23                           | 2,866697E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -795              | 7,563468E+22                              | 7,563402E+22 | 6,769943E+22 | 6,769869E+22 | 1,512687E+23                           | 1,353981E+23                           | 2,866668E+23  |
| -794              | 7,563169E+22                              | 7,563390E+22 | 6,769969E+22 | 6,769890E+22 | 1,512656E+23                           | 1,353986E+23                           | 2,866642E+23  |
| -793              | 7,563426E+22                              | 7,563489E+22 | 6,769885E+22 | 6,770030E+22 | 1,512692E+23                           | 1,353991E+23                           | 2,866683E+23  |
| -792              | 7,563313E+22                              | 7,563215E+22 | 6,769879E+22 | 6,769750E+22 | 1,512653E+23                           | 1,353963E+23                           | 2,866616E+23  |
| -791              | 7,563225E+22                              | 7,563311E+22 | 6,769873E+22 | 6,769794E+22 | 1,512654E+23                           | 1,353967E+23                           | 2,866620E+23  |
| -790              | 7,563540E+22                              | 7,563338E+22 | 6,769714E+22 | 6,769804E+22 | 1,512688E+23                           | 1,353952E+23                           | 2,866640E+23  |
| -789              | 7,563236E+22                              | 7,563203E+22 | 6,769702E+22 | 6,769654E+22 | 1,512644E+23                           | 1,353936E+23                           | 2,866579E+23  |
| -788              | 7,563227E+22                              | 7,563441E+22 | 6,769746E+22 | 6,769805E+22 | 1,512667E+23                           | 1,353955E+23                           | 2,866622E+23  |
| -787              | 7,563395E+22                              | 7,563359E+22 | 6,769697E+22 | 6,769680E+22 | 1,512675E+23                           | 1,353938E+23                           | 2,866613E+23  |
| -786              | 7,563113E+22                              | 7,563253E+22 | 6,769815E+22 | 6,769658E+22 | 1,512637E+23                           | 1,353947E+23                           | 2,866584E+23  |
| -785              | 7,563363E+22                              | 7,563391E+22 | 6,769830E+22 | 6,769875E+22 | 1,512675E+23                           | 1,353971E+23                           | 2,866646E+23  |
| -784              | 7,563366E+22                              | 7,563205E+22 | 6,769867E+22 | 6,769734E+22 | 1,512657E+23                           | 1,353960E+23                           | 2,866617E+23  |
| -783              | 7,563150E+22                              | 7,563332E+22 | 6,769930E+22 | 6,769891E+22 | 1,512648E+23                           | 1,353982E+23                           | 2,866630E+23  |
| -782              | 7,563493E+22                              | 7,563459E+22 | 6,769839E+22 | 6,770047E+22 | 1,512695E+23                           | 1,353989E+23                           | 2,866684E+23  |
| -781              | 7,563320E+22                              | 7,563287E+22 | 6,769922E+22 | 6,769903E+22 | 1,512661E+23                           | 1,353983E+23                           | 2,866643E+23  |
| -780              | 7,563289E+22                              | 7,563472E+22 | 6,770055E+22 | 6,770039E+22 | 1,512676E+23                           | 1,354009E+23                           | 2,866685E+23  |
| -779              | 7,563610E+22                              | 7,563458E+22 | 6,770008E+22 | 6,769975E+22 | 1,512707E+23                           | 1,353998E+23                           | 2,866705E+23  |
| -778              | 7,563310E+22                              | 7,563342E+22 | 6,770102E+22 | 6,769930E+22 | 1,512665E+23                           | 1,354003E+23                           | 2,866668E+23  |
| -777              | 7,563401E+22                              | 7,563542E+22 | 6,770070E+22 | 6,770152E+22 | 1,512694E+23                           | 1,354022E+23                           | 2,866716E+23  |
| -776              | 7,563464E+22                              | 7,563390E+22 | 6,770027E+22 | 6,769976E+22 | 1,512685E+23                           | 1,354000E+23                           | 2,866686E+23  |
| -775              | 7,563164E+22                              | 7,563371E+22 | 6,770058E+22 | 6,769979E+22 | 1,512654E+23                           | 1,354004E+23                           | 2,866657E+23  |
| -774              | 7,563499E+22                              | 7,563437E+22 | 6,769919E+22 | 6,770041E+22 | 1,512694E+23                           | 1,353996E+23                           | 2,866690E+23  |
| -773              | 7,563419E+22                              | 7,563213E+22 | 6,769905E+22 | 6,769801E+22 | 1,512663E+23                           | 1,353971E+23                           | 2,866634E+23  |
| -772              | 7,563220E+22                              | 7,563358E+22 | 6,769924E+22 | 6,769880E+22 | 1,512658E+23                           | 1,353980E+23                           | 2,866638E+23  |
| -771              | 7,563521E+22                              | 7,563450E+22 | 6,769766E+22 | 6,769858E+22 | 1,512697E+23                           | 1,353962E+23                           | 2,866659E+23  |
| -770              | 7,563218E+22                              | 7,563285E+22 | 6,769828E+22 | 6,769732E+22 | 1,512650E+23                           | 1,353956E+23                           | 2,866606E+23  |
| -769              | 7,563204E+22                              | 7,563433E+22 | 6,769861E+22 | 6,769898E+22 | 1,512664E+23                           | 1,353976E+23                           | 2,866640E+23  |
| -768              | 7,563440E+22                              | 7,563318E+22 | 6,769860E+22 | 6,769755E+22 | 1,512676E+23                           | 1,353962E+23                           | 2,866637E+23  |
| -767              | 7,563137E+22                              | 7,563227E+22 | 6,769953E+22 | 6,769789E+22 | 1,512636E+23                           | 1,353974E+23                           | 2,866611E+23  |
| -766              | 7,563394E+22                              | 7,563385E+22 | 6,769878E+22 | 6,770002E+22 | 1,512678E+23                           | 1,353988E+23                           | 2,866666E+23  |
| -765              | 7,563414E+22                              | 7,563267E+22 | 6,769887E+22 | 6,769904E+22 | 1,512668E+23                           | 1,353979E+23                           | 2,866647E+23  |
| -764              | 7,563135E+22                              | 7,563374E+22 | 6,770000E+22 | 6,770025E+22 | 1,512651E+23                           | 1,354002E+23                           | 2,866653E+23  |
| -763              | 7,563539E+22                              | 7,563517E+22 | 6,769945E+22 | 6,770078E+22 | 1,512706E+23                           | 1,354002E+23                           | 2,866708E+23  |
| -762              | 7,563411E+22                              | 7,563319E+22 | 6,770084E+22 | 6,769935E+22 | 1,512673E+23                           | 1,354002E+23                           | 2,866675E+23  |
| -761              | 7,563328E+22                              | 7,563463E+22 | 6,770174E+22 | 6,770120E+22 | 1,512679E+23                           | 1,354029E+23                           | 2,866708E+23  |
| -760              | 7,563640E+22                              | 7,563491E+22 | 6,770138E+22 | 6,770079E+22 | 1,512713E+23                           | 1,354022E+23                           | 2,866735E+23  |
| -759              | 7,563263E+22                              | 7,563389E+22 | 6,770202E+22 | 6,770077E+22 | 1,512665E+23                           | 1,354028E+23                           | 2,866693E+23  |
| -758              | 7,563372E+22                              | 7,563543E+22 | 6,770122E+22 | 6,770248E+22 | 1,512692E+23                           | 1,354037E+23                           | 2,866729E+23  |
| -757              | 7,563516E+22                              | 7,563393E+22 | 6,770075E+22 | 6,770073E+22 | 1,512691E+23                           | 1,354015E+23                           | 2,866706E+23  |
| -756              | 7,563184E+22                              | 7,563336E+22 | 6,770136E+22 | 6,770052E+22 | 1,512652E+23                           | 1,354019E+23                           | 2,866671E+23  |
| -755              | 7,563559E+22                              | 7,563461E+22 | 6,769981E+22 | 6,770070E+22 | 1,512702E+23                           | 1,354005E+23                           | 2,866707E+23  |
| -754              | 7,563459E+22                              | 7,563279E+22 | 6,769976E+22 | 6,769872E+22 | 1,512674E+23                           | 1,353985E+23                           | 2,866659E+23  |
| -753              | 7,563185E+22                              | 7,563405E+22 | 6,769963E+22 | 6,769985E+22 | 1,512659E+23                           | 1,353995E+23                           | 2,866654E+23  |
| -752              | 7,563518E+22                              | 7,563477E+22 | 6,769874E+22 | 6,769923E+22 | 1,512699E+23                           | 1,353980E+23                           | 2,866679E+23  |
| -751              | 7,563203E+22                              | 7,563285E+22 | 6,769968E+22 | 6,769811E+22 | 1,512649E+23                           | 1,353978E+23                           | 2,866627E+23  |
| -750              | 7,563242E+22                              | 7,563383E+22 | 6,769959E+22 | 6,769953E+22 | 1,512663E+23                           | 1,353991E+23                           | 2,866654E+23  |
| -749              | 7,563515E+22                              | 7,563314E+22 | 6,769929E+22 | 6,769879E+22 | 1,512683E+23                           | 1,353981E+23                           | 2,866664E+23  |
| -748              | 7,563127E+22                              | 7,563257E+22 | 6,770027E+22 | 6,769946E+22 | 1,512638E+23                           | 1,353997E+23                           | 2,866636E+23  |
| -747              | 7,563410E+22                              | 7,563469E+22 | 6,769937E+22 | 6,770106E+22 | 1,512688E+23                           | 1,354004E+23                           | 2,866692E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -746                   | 7,563453E+22                              | 7,563345E+22 | 6,770006E+22 | 6,769999E+22 | 1,512680E+23                           | 1,354000E+23                           | 2,866680E+23  |
| -745                   | 7,563174E+22                              | 7,563390E+22 | 6,770120E+22 | 6,770107E+22 | 1,512656E+23                           | 1,354023E+23                           | 2,866679E+23  |
| -744                   | 7,563623E+22                              | 7,563506E+22 | 6,770116E+22 | 6,770126E+22 | 1,512713E+23                           | 1,354024E+23                           | 2,866737E+23  |
| -743                   | 7,563430E+22                              | 7,563343E+22 | 6,770244E+22 | 6,770047E+22 | 1,512677E+23                           | 1,354029E+23                           | 2,866706E+23  |
| -742                   | 7,563319E+22                              | 7,563483E+22 | 6,770238E+22 | 6,770241E+22 | 1,512680E+23                           | 1,354048E+23                           | 2,866728E+23  |
| -741                   | 7,563624E+22                              | 7,563538E+22 | 6,770169E+22 | 6,770246E+22 | 1,512716E+23                           | 1,354042E+23                           | 2,866758E+23  |
| -740                   | 7,563214E+22                              | 7,563391E+22 | 6,770272E+22 | 6,770212E+22 | 1,512660E+23                           | 1,354048E+23                           | 2,866709E+23  |
| -739                   | 7,563412E+22                              | 7,563532E+22 | 6,770190E+22 | 6,770278E+22 | 1,512694E+23                           | 1,354047E+23                           | 2,866741E+23  |
| -738                   | 7,563610E+22                              | 7,563389E+22 | 6,770169E+22 | 6,770101E+22 | 1,512700E+23                           | 1,354027E+23                           | 2,866727E+23  |
| -737                   | 7,563236E+22                              | 7,563332E+22 | 6,770181E+22 | 6,770108E+22 | 1,512657E+23                           | 1,354029E+23                           | 2,866686E+23  |
| -736                   | 7,563592E+22                              | 7,563509E+22 | 6,770058E+22 | 6,770124E+22 | 1,512710E+23                           | 1,354018E+23                           | 2,866728E+23  |
| -735                   | 7,563415E+22                              | 7,563368E+22 | 6,770073E+22 | 6,769965E+22 | 1,512678E+23                           | 1,354004E+23                           | 2,866682E+23  |
| -734                   | 7,563154E+22                              | 7,563424E+22 | 6,770046E+22 | 6,770047E+22 | 1,512658E+23                           | 1,354009E+23                           | 2,866667E+23  |
| -733                   | 7,563539E+22                              | 7,563485E+22 | 6,769974E+22 | 6,770018E+22 | 1,512702E+23                           | 1,353999E+23                           | 2,866702E+23  |
| -732                   | 7,563205E+22                              | 7,563241E+22 | 6,770101E+22 | 6,769926E+22 | 1,512645E+23                           | 1,354003E+23                           | 2,866647E+23  |
| -731                   | 7,563280E+22                              | 7,563377E+22 | 6,770053E+22 | 6,770049E+22 | 1,512666E+23                           | 1,354010E+23                           | 2,866676E+23  |
| -730                   | 7,563556E+22                              | 7,563364E+22 | 6,770007E+22 | 6,770022E+22 | 1,512692E+23                           | 1,354003E+23                           | 2,866695E+23  |
| -729                   | 7,563123E+22                              | 7,563287E+22 | 6,770062E+22 | 6,770087E+22 | 1,512641E+23                           | 1,354015E+23                           | 2,866656E+23  |
| -728                   | 7,563467E+22                              | 7,563493E+22 | 6,770046E+22 | 6,770177E+22 | 1,512696E+23                           | 1,354022E+23                           | 2,866718E+23  |
| -727                   | 7,563501E+22                              | 7,563374E+22 | 6,770145E+22 | 6,770052E+22 | 1,512687E+23                           | 1,354020E+23                           | 2,866707E+23  |
| -726                   | 7,563233E+22                              | 7,563381E+22 | 6,770230E+22 | 6,770147E+22 | 1,512661E+23                           | 1,354038E+23                           | 2,866699E+23  |
| -725                   | 7,563669E+22                              | 7,563560E+22 | 6,770207E+22 | 6,770243E+22 | 1,512723E+23                           | 1,354045E+23                           | 2,866768E+23  |
| -724                   | 7,563373E+22                              | 7,563396E+22 | 6,770350E+22 | 6,770211E+22 | 1,512677E+23                           | 1,354056E+23                           | 2,866733E+23  |
| -723                   | 7,563280E+22                              | 7,563546E+22 | 6,770324E+22 | 6,770359E+22 | 1,512683E+23                           | 1,354068E+23                           | 2,866751E+23  |
| -722                   | 7,563636E+22                              | 7,563570E+22 | 6,770279E+22 | 6,770351E+22 | 1,512721E+23                           | 1,354063E+23                           | 2,866784E+23  |
| -721                   | 7,563247E+22                              | 7,563350E+22 | 6,770352E+22 | 6,770292E+22 | 1,512660E+23                           | 1,354064E+23                           | 2,866724E+23  |
| -720                   | 7,563517E+22                              | 7,563485E+22 | 6,770299E+22 | 6,770312E+22 | 1,512700E+23                           | 1,354061E+23                           | 2,866761E+23  |
| -719                   | 7,563649E+22                              | 7,563416E+22 | 6,770260E+22 | 6,770170E+22 | 1,512706E+23                           | 1,354043E+23                           | 2,866749E+23  |
| -718                   | 7,563241E+22                              | 7,563376E+22 | 6,770207E+22 | 6,770182E+22 | 1,512662E+23                           | 1,354039E+23                           | 2,866701E+23  |
| -717                   | 7,563577E+22                              | 7,563585E+22 | 6,770092E+22 | 6,770226E+22 | 1,512716E+23                           | 1,354032E+23                           | 2,866748E+23  |
| -716                   | 7,563358E+22                              | 7,563386E+22 | 6,770183E+22 | 6,770060E+22 | 1,512674E+23                           | 1,354024E+23                           | 2,866699E+23  |
| -715                   | 7,563169E+22                              | 7,563412E+22 | 6,770160E+22 | 6,770084E+22 | 1,512658E+23                           | 1,354024E+23                           | 2,866682E+23  |
| -714                   | 7,563590E+22                              | 7,563472E+22 | 6,770099E+22 | 6,770096E+22 | 1,512706E+23                           | 1,354020E+23                           | 2,866726E+23  |
| -713                   | 7,563232E+22                              | 7,563225E+22 | 6,770164E+22 | 6,770055E+22 | 1,512646E+23                           | 1,354022E+23                           | 2,866668E+23  |
| -712                   | 7,563327E+22                              | 7,563390E+22 | 6,770125E+22 | 6,770159E+22 | 1,512672E+23                           | 1,354028E+23                           | 2,866700E+23  |
| -711                   | 7,563548E+22                              | 7,563438E+22 | 6,770097E+22 | 6,770138E+22 | 1,512699E+23                           | 1,354024E+23                           | 2,866722E+23  |
| -710                   | 7,563156E+22                              | 7,563319E+22 | 6,770136E+22 | 6,770150E+22 | 1,512647E+23                           | 1,354029E+23                           | 2,866676E+23  |
| -709                   | 7,563524E+22                              | 7,563531E+22 | 6,770151E+22 | 6,770249E+22 | 1,512706E+23                           | 1,354040E+23                           | 2,866746E+23  |
| -708                   | 7,563513E+22                              | 7,563389E+22 | 6,770305E+22 | 6,770159E+22 | 1,512690E+23                           | 1,354046E+23                           | 2,866737E+23  |
| -707                   | 7,563246E+22                              | 7,563418E+22 | 6,770352E+22 | 6,770251E+22 | 1,512666E+23                           | 1,354060E+23                           | 2,866727E+23  |
| -706                   | 7,563652E+22                              | 7,563630E+22 | 6,770313E+22 | 6,770401E+22 | 1,512728E+23                           | 1,354071E+23                           | 2,866800E+23  |
| -705                   | 7,563338E+22                              | 7,563401E+22 | 6,770415E+22 | 6,770371E+22 | 1,512674E+23                           | 1,354079E+23                           | 2,866753E+23  |
| -704                   | 7,563331E+22                              | 7,563503E+22 | 6,770433E+22 | 6,770434E+22 | 1,512683E+23                           | 1,354087E+23                           | 2,866770E+23  |
| -703                   | 7,563695E+22                              | 7,563554E+22 | 6,770394E+22 | 6,770400E+22 | 1,512725E+23                           | 1,354079E+23                           | 2,866804E+23  |
| -702                   | 7,563341E+22                              | 7,563322E+22 | 6,770402E+22 | 6,770316E+22 | 1,512666E+23                           | 1,354072E+23                           | 2,866738E+23  |
| -701                   | 7,563582E+22                              | 7,563547E+22 | 6,770332E+22 | 6,770385E+22 | 1,512713E+23                           | 1,354072E+23                           | 2,866785E+23  |
| -700                   | 7,563606E+22                              | 7,563502E+22 | 6,770333E+22 | 6,770276E+22 | 1,512711E+23                           | 1,354061E+23                           | 2,866772E+23  |
| -699                   | 7,563198E+22                              | 7,563457E+22 | 6,770294E+22 | 6,770248E+22 | 1,512665E+23                           | 1,354054E+23                           | 2,866720E+23  |
| -698                   | 7,563559E+22                              | 7,563637E+22 | 6,770223E+22 | 6,770304E+22 | 1,512720E+23                           | 1,354053E+23                           | 2,866772E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -697                   | 7,563353E+22                              | 7,563334E+22 | 6,770296E+22 | 6,770152E+22 | 1,512669E+23                           | 1,354045E+23                           | 2,866714E+23  |
| -696                   | 7,563238E+22                              | 7,563339E+22 | 6,770289E+22 | 6,770165E+22 | 1,512658E+23                           | 1,354045E+23                           | 2,866703E+23  |
| -695                   | 7,563611E+22                              | 7,563473E+22 | 6,770184E+22 | 6,770216E+22 | 1,512708E+23                           | 1,354040E+23                           | 2,866748E+23  |
| -694                   | 7,563245E+22                              | 7,563242E+22 | 6,770165E+22 | 6,770171E+22 | 1,512649E+23                           | 1,354034E+23                           | 2,866682E+23  |
| -693                   | 7,563357E+22                              | 7,563458E+22 | 6,770141E+22 | 6,770271E+22 | 1,512682E+23                           | 1,354041E+23                           | 2,866723E+23  |
| -692                   | 7,563551E+22                              | 7,563470E+22 | 6,770204E+22 | 6,770216E+22 | 1,512702E+23                           | 1,354042E+23                           | 2,866744E+23  |
| -691                   | 7,563213E+22                              | 7,563347E+22 | 6,770269E+22 | 6,770170E+22 | 1,512656E+23                           | 1,354044E+23                           | 2,866700E+23  |
| -690                   | 7,563577E+22                              | 7,563579E+22 | 6,770305E+22 | 6,770319E+22 | 1,512716E+23                           | 1,354062E+23                           | 2,866778E+23  |
| -689                   | 7,563503E+22                              | 7,563415E+22 | 6,770421E+22 | 6,770300E+22 | 1,512692E+23                           | 1,354072E+23                           | 2,866764E+23  |
| -688                   | 7,563255E+22                              | 7,563440E+22 | 6,770478E+22 | 6,770390E+22 | 1,512670E+23                           | 1,354087E+23                           | 2,866756E+23  |
| -687                   | 7,563620E+22                              | 7,563670E+22 | 6,770438E+22 | 6,770538E+22 | 1,512729E+23                           | 1,354098E+23                           | 2,866827E+23  |
| -686                   | 7,563378E+22                              | 7,563380E+22 | 6,770489E+22 | 6,770462E+22 | 1,512676E+23                           | 1,354095E+23                           | 2,866771E+23  |
| -685                   | 7,563424E+22                              | 7,563496E+22 | 6,770501E+22 | 6,770510E+22 | 1,512692E+23                           | 1,354101E+23                           | 2,866793E+23  |
| -684                   | 7,563737E+22                              | 7,563557E+22 | 6,770499E+22 | 6,770487E+22 | 1,512729E+23                           | 1,354099E+23                           | 2,866828E+23  |
| -683                   | 7,563374E+22                              | 7,563386E+22 | 6,770464E+22 | 6,770380E+22 | 1,512676E+23                           | 1,354084E+23                           | 2,866760E+23  |
| -682                   | 7,563557E+22                              | 7,563652E+22 | 6,770397E+22 | 6,770484E+22 | 1,512721E+23                           | 1,354088E+23                           | 2,866809E+23  |
| -681                   | 7,563553E+22                              | 7,563535E+22 | 6,770402E+22 | 6,770384E+22 | 1,512709E+23                           | 1,354079E+23                           | 2,866787E+23  |
| -680                   | 7,563227E+22                              | 7,563408E+22 | 6,770415E+22 | 6,770294E+22 | 1,512663E+23                           | 1,354071E+23                           | 2,866734E+23  |
| -679                   | 7,563564E+22                              | 7,563602E+22 | 6,770352E+22 | 6,770355E+22 | 1,512717E+23                           | 1,354071E+23                           | 2,866787E+23  |
| -678                   | 7,563412E+22                              | 7,563281E+22 | 6,770343E+22 | 6,770223E+22 | 1,512669E+23                           | 1,354057E+23                           | 2,866726E+23  |
| -677                   | 7,563286E+22                              | 7,563360E+22 | 6,770303E+22 | 6,770278E+22 | 1,512665E+23                           | 1,354058E+23                           | 2,866723E+23  |
| -676                   | 7,563586E+22                              | 7,563530E+22 | 6,770245E+22 | 6,770348E+22 | 1,512712E+23                           | 1,354059E+23                           | 2,866771E+23  |
| -675                   | 7,563258E+22                              | 7,563314E+22 | 6,770233E+22 | 6,770231E+22 | 1,512657E+23                           | 1,354046E+23                           | 2,866704E+23  |
| -674                   | 7,563391E+22                              | 7,563531E+22 | 6,770265E+22 | 6,770325E+22 | 1,512692E+23                           | 1,354059E+23                           | 2,866751E+23  |
| -673                   | 7,563583E+22                              | 7,563470E+22 | 6,770344E+22 | 6,770295E+22 | 1,512705E+23                           | 1,354064E+23                           | 2,866769E+23  |
| -672                   | 7,563285E+22                              | 7,563320E+22 | 6,770443E+22 | 6,770259E+22 | 1,512661E+23                           | 1,354070E+23                           | 2,866731E+23  |
| -671                   | 7,563553E+22                              | 7,563627E+22 | 6,770451E+22 | 6,770464E+22 | 1,512718E+23                           | 1,354091E+23                           | 2,866809E+23  |
| -670                   | 7,563489E+22                              | 7,563432E+22 | 6,770478E+22 | 6,770465E+22 | 1,512692E+23                           | 1,354094E+23                           | 2,866786E+23  |
| -669                   | 7,563278E+22                              | 7,563461E+22 | 6,770533E+22 | 6,770537E+22 | 1,512674E+23                           | 1,354107E+23                           | 2,866781E+23  |
| -668                   | 7,563642E+22                              | 7,563655E+22 | 6,770548E+22 | 6,770642E+22 | 1,512730E+23                           | 1,354119E+23                           | 2,866849E+23  |
| -667                   | 7,563464E+22                              | 7,563384E+22 | 6,770574E+22 | 6,770494E+22 | 1,512685E+23                           | 1,354107E+23                           | 2,866792E+23  |
| -666                   | 7,563509E+22                              | 7,563563E+22 | 6,770581E+22 | 6,770572E+22 | 1,512707E+23                           | 1,354115E+23                           | 2,866822E+23  |
| -665                   | 7,563738E+22                              | 7,563610E+22 | 6,770558E+22 | 6,770586E+22 | 1,512735E+23                           | 1,354114E+23                           | 2,866849E+23  |
| -664                   | 7,563377E+22                              | 7,563439E+22 | 6,770566E+22 | 6,770460E+22 | 1,512682E+23                           | 1,354103E+23                           | 2,866784E+23  |
| -663                   | 7,563499E+22                              | 7,563709E+22 | 6,770525E+22 | 6,770551E+22 | 1,512721E+23                           | 1,354108E+23                           | 2,866828E+23  |
| -662                   | 7,563550E+22                              | 7,563497E+22 | 6,770487E+22 | 6,770446E+22 | 1,512705E+23                           | 1,354093E+23                           | 2,866798E+23  |
| -661                   | 7,563282E+22                              | 7,563363E+22 | 6,770495E+22 | 6,770373E+22 | 1,512664E+23                           | 1,354087E+23                           | 2,866751E+23  |
| -660                   | 7,563579E+22                              | 7,563558E+22 | 6,770446E+22 | 6,770468E+22 | 1,512714E+23                           | 1,354091E+23                           | 2,866805E+23  |
| -659                   | 7,563435E+22                              | 7,563312E+22 | 6,770371E+22 | 6,770319E+22 | 1,512675E+23                           | 1,354069E+23                           | 2,866744E+23  |
| -658                   | 7,563299E+22                              | 7,563452E+22 | 6,770325E+22 | 6,770386E+22 | 1,512675E+23                           | 1,354071E+23                           | 2,866746E+23  |
| -657                   | 7,563581E+22                              | 7,563558E+22 | 6,770307E+22 | 6,770436E+22 | 1,512714E+23                           | 1,354074E+23                           | 2,866788E+23  |
| -656                   | 7,563337E+22                              | 7,563308E+22 | 6,770372E+22 | 6,770258E+22 | 1,512665E+23                           | 1,354063E+23                           | 2,866728E+23  |
| -655                   | 7,563420E+22                              | 7,563555E+22 | 6,770436E+22 | 6,770360E+22 | 1,512698E+23                           | 1,354080E+23                           | 2,866777E+23  |
| -654                   | 7,563625E+22                              | 7,563473E+22 | 6,770447E+22 | 6,770396E+22 | 1,512710E+23                           | 1,354084E+23                           | 2,866794E+23  |
| -653                   | 7,563304E+22                              | 7,563368E+22 | 6,770526E+22 | 6,770418E+22 | 1,512667E+23                           | 1,354094E+23                           | 2,866762E+23  |
| -652                   | 7,563495E+22                              | 7,563674E+22 | 6,770569E+22 | 6,770648E+22 | 1,512717E+23                           | 1,354122E+23                           | 2,866839E+23  |
| -651                   | 7,563497E+22                              | 7,563472E+22 | 6,770569E+22 | 6,770581E+22 | 1,512697E+23                           | 1,354115E+23                           | 2,866812E+23  |
| -650                   | 7,563336E+22                              | 7,563495E+22 | 6,770630E+22 | 6,770629E+22 | 1,512683E+23                           | 1,354126E+23                           | 2,866809E+23  |
| -649                   | 7,563707E+22                              | 7,563632E+22 | 6,770653E+22 | 6,770731E+22 | 1,512734E+23                           | 1,354138E+23                           | 2,866872E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -648              | 7,563570E+22                              | 7,563376E+22 | 6,770680E+22 | 6,770552E+22 | 1,512695E+23                           | 1,354123E+23                           | 2,866818E+23  |
| -647              | 7,563490E+22                              | 7,563642E+22 | 6,770676E+22 | 6,770649E+22 | 1,512713E+23                           | 1,354133E+23                           | 2,866846E+23  |
| -646              | 7,563717E+22                              | 7,563656E+22 | 6,770593E+22 | 6,770684E+22 | 1,512737E+23                           | 1,354128E+23                           | 2,866865E+23  |
| -645              | 7,563378E+22                              | 7,563448E+22 | 6,770634E+22 | 6,770541E+22 | 1,512683E+23                           | 1,354117E+23                           | 2,866800E+23  |
| -644              | 7,563476E+22                              | 7,563673E+22 | 6,770654E+22 | 6,770622E+22 | 1,512715E+23                           | 1,354128E+23                           | 2,866843E+23  |
| -643              | 7,563594E+22                              | 7,563462E+22 | 6,770567E+22 | 6,770485E+22 | 1,512706E+23                           | 1,354105E+23                           | 2,866811E+23  |
| -642              | 7,563333E+22                              | 7,563389E+22 | 6,770540E+22 | 6,770461E+22 | 1,512672E+23                           | 1,354100E+23                           | 2,866772E+23  |
| -641              | 7,563578E+22                              | 7,563579E+22 | 6,770479E+22 | 6,770591E+22 | 1,512716E+23                           | 1,354107E+23                           | 2,866823E+23  |
| -640              | 7,563472E+22                              | 7,563353E+22 | 6,770439E+22 | 6,770398E+22 | 1,512682E+23                           | 1,354084E+23                           | 2,866766E+23  |
| -639              | 7,563289E+22                              | 7,563530E+22 | 6,770445E+22 | 6,770434E+22 | 1,512682E+23                           | 1,354088E+23                           | 2,866770E+23  |
| -638              | 7,563623E+22                              | 7,563564E+22 | 6,770406E+22 | 6,770489E+22 | 1,512719E+23                           | 1,354090E+23                           | 2,866808E+23  |
| -637              | 7,563406E+22                              | 7,563311E+22 | 6,770504E+22 | 6,770344E+22 | 1,512672E+23                           | 1,354085E+23                           | 2,866756E+23  |
| -636              | 7,563405E+22                              | 7,563566E+22 | 6,770592E+22 | 6,770508E+22 | 1,512697E+23                           | 1,354110E+23                           | 2,866807E+23  |
| -635              | 7,563599E+22                              | 7,563526E+22 | 6,770529E+22 | 6,770551E+22 | 1,512712E+23                           | 1,354108E+23                           | 2,866820E+23  |
| -634              | 7,563302E+22                              | 7,563443E+22 | 6,770588E+22 | 6,770590E+22 | 1,512674E+23                           | 1,354118E+23                           | 2,866792E+23  |
| -633              | 7,563507E+22                              | 7,563644E+22 | 6,770652E+22 | 6,770777E+22 | 1,512715E+23                           | 1,354143E+23                           | 2,866858E+23  |
| -632              | 7,563606E+22                              | 7,563434E+22 | 6,770686E+22 | 6,770628E+22 | 1,512704E+23                           | 1,354131E+23                           | 2,866835E+23  |
| -631              | 7,563414E+22                              | 7,563523E+22 | 6,770750E+22 | 6,770656E+22 | 1,512694E+23                           | 1,354141E+23                           | 2,866834E+23  |
| -630              | 7,563769E+22                              | 7,563653E+22 | 6,770708E+22 | 6,770800E+22 | 1,512742E+23                           | 1,354151E+23                           | 2,866893E+23  |
| -629              | 7,563592E+22                              | 7,563458E+22 | 6,770748E+22 | 6,770651E+22 | 1,512705E+23                           | 1,354140E+23                           | 2,866845E+23  |
| -628              | 7,563420E+22                              | 7,563706E+22 | 6,770798E+22 | 6,770761E+22 | 1,512713E+23                           | 1,354156E+23                           | 2,866869E+23  |
| -627              | 7,563683E+22                              | 7,563690E+22 | 6,770694E+22 | 6,770751E+22 | 1,512737E+23                           | 1,354145E+23                           | 2,866882E+23  |
| -626              | 7,563402E+22                              | 7,563459E+22 | 6,770731E+22 | 6,770622E+22 | 1,512686E+23                           | 1,354135E+23                           | 2,866821E+23  |
| -625              | 7,563496E+22                              | 7,563599E+22 | 6,770753E+22 | 6,770724E+22 | 1,512710E+23                           | 1,354148E+23                           | 2,866857E+23  |
| -624              | 7,563662E+22                              | 7,563432E+22 | 6,770643E+22 | 6,770577E+22 | 1,512709E+23                           | 1,354122E+23                           | 2,866831E+23  |
| -623              | 7,563323E+22                              | 7,563457E+22 | 6,770588E+22 | 6,770553E+22 | 1,512678E+23                           | 1,354114E+23                           | 2,866792E+23  |
| -622              | 7,563588E+22                              | 7,563611E+22 | 6,770486E+22 | 6,770687E+22 | 1,512720E+23                           | 1,354117E+23                           | 2,866837E+23  |
| -621              | 7,563523E+22                              | 7,563379E+22 | 6,770507E+22 | 6,770452E+22 | 1,512690E+23                           | 1,354096E+23                           | 2,866786E+23  |
| -620              | 7,563298E+22                              | 7,563536E+22 | 6,770597E+22 | 6,770486E+22 | 1,512683E+23                           | 1,354108E+23                           | 2,866792E+23  |
| -619              | 7,563662E+22                              | 7,563585E+22 | 6,770524E+22 | 6,770540E+22 | 1,512725E+23                           | 1,354106E+23                           | 2,866831E+23  |
| -618              | 7,563428E+22                              | 7,563373E+22 | 6,770595E+22 | 6,770474E+22 | 1,512680E+23                           | 1,354107E+23                           | 2,866787E+23  |
| -617              | 7,563363E+22                              | 7,563586E+22 | 6,770692E+22 | 6,770685E+22 | 1,512695E+23                           | 1,354138E+23                           | 2,866833E+23  |
| -616              | 7,563620E+22                              | 7,563538E+22 | 6,770635E+22 | 6,770679E+22 | 1,512716E+23                           | 1,354131E+23                           | 2,866847E+23  |
| -615              | 7,563309E+22                              | 7,563474E+22 | 6,770713E+22 | 6,770669E+22 | 1,512678E+23                           | 1,354138E+23                           | 2,866817E+23  |
| -614              | 7,563592E+22                              | 7,563613E+22 | 6,770734E+22 | 6,770854E+22 | 1,512721E+23                           | 1,354159E+23                           | 2,866879E+23  |
| -613              | 7,563722E+22                              | 7,563428E+22 | 6,770785E+22 | 6,770699E+22 | 1,512715E+23                           | 1,354148E+23                           | 2,866863E+23  |
| -612              | 7,563426E+22                              | 7,563571E+22 | 6,770874E+22 | 6,770765E+22 | 1,512700E+23                           | 1,354164E+23                           | 2,866864E+23  |
| -611              | 7,563745E+22                              | 7,563745E+22 | 6,770770E+22 | 6,770900E+22 | 1,512749E+23                           | 1,354167E+23                           | 2,866916E+23  |
| -610              | 7,563566E+22                              | 7,563553E+22 | 6,770816E+22 | 6,770771E+22 | 1,512712E+23                           | 1,354159E+23                           | 2,866871E+23  |
| -609              | 7,563387E+22                              | 7,563678E+22 | 6,770914E+22 | 6,770862E+22 | 1,512707E+23                           | 1,354178E+23                           | 2,866884E+23  |
| -608              | 7,563737E+22                              | 7,563636E+22 | 6,770815E+22 | 6,770799E+22 | 1,512737E+23                           | 1,354161E+23                           | 2,866899E+23  |
| -607              | 7,563439E+22                              | 7,563458E+22 | 6,770833E+22 | 6,770675E+22 | 1,512690E+23                           | 1,354151E+23                           | 2,866840E+23  |
| -606              | 7,563544E+22                              | 7,563582E+22 | 6,770767E+22 | 6,770826E+22 | 1,512713E+23                           | 1,354159E+23                           | 2,866872E+23  |
| -605              | 7,563696E+22                              | 7,563481E+22 | 6,770672E+22 | 6,770678E+22 | 1,512718E+23                           | 1,354135E+23                           | 2,866853E+23  |
| -604              | 7,563296E+22                              | 7,563522E+22 | 6,770681E+22 | 6,770641E+22 | 1,512682E+23                           | 1,354132E+23                           | 2,866814E+23  |
| -603              | 7,563588E+22                              | 7,563658E+22 | 6,770574E+22 | 6,770718E+22 | 1,512725E+23                           | 1,354129E+23                           | 2,866854E+23  |
| -602              | 7,563572E+22                              | 7,563431E+22 | 6,770617E+22 | 6,770516E+22 | 1,512700E+23                           | 1,354113E+23                           | 2,866814E+23  |
| -601              | 7,563313E+22                              | 7,563491E+22 | 6,770738E+22 | 6,770590E+22 | 1,512680E+23                           | 1,354133E+23                           | 2,866813E+23  |
| -600              | 7,563675E+22                              | 7,563585E+22 | 6,770641E+22 | 6,770660E+22 | 1,512726E+23                           | 1,354130E+23                           | 2,866856E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -599              | 7,563392E+22                              | 7,563442E+22 | 6,770689E+22 | 6,770612E+22 | 1,512683E+23                           | 1,354130E+23                           | 2,866813E+23  |
| -598              | 7,563371E+22                              | 7,563564E+22 | 6,770736E+22 | 6,770827E+22 | 1,512693E+23                           | 1,354156E+23                           | 2,866850E+23  |
| -597              | 7,563695E+22                              | 7,563518E+22 | 6,770728E+22 | 6,770764E+22 | 1,512721E+23                           | 1,354149E+23                           | 2,866871E+23  |
| -596              | 7,563372E+22                              | 7,563469E+22 | 6,770846E+22 | 6,770734E+22 | 1,512684E+23                           | 1,354158E+23                           | 2,866842E+23  |
| -595              | 7,563663E+22                              | 7,563651E+22 | 6,770816E+22 | 6,770904E+22 | 1,512731E+23                           | 1,354172E+23                           | 2,866903E+23  |
| -594              | 7,563762E+22                              | 7,563551E+22 | 6,770850E+22 | 6,770810E+22 | 1,512731E+23                           | 1,354166E+23                           | 2,866897E+23  |
| -593              | 7,563380E+22                              | 7,563632E+22 | 6,770984E+22 | 6,770906E+22 | 1,512701E+23                           | 1,354189E+23                           | 2,866890E+23  |
| -592              | 7,563725E+22                              | 7,563793E+22 | 6,770903E+22 | 6,770995E+22 | 1,512752E+23                           | 1,354190E+23                           | 2,866942E+23  |
| -591              | 7,563543E+22                              | 7,563587E+22 | 6,770969E+22 | 6,770841E+22 | 1,512713E+23                           | 1,354181E+23                           | 2,866894E+23  |
| -590              | 7,563431E+22                              | 7,563602E+22 | 6,771006E+22 | 6,770957E+22 | 1,512703E+23                           | 1,354196E+23                           | 2,866900E+23  |
| -589              | 7,563818E+22                              | 7,563581E+22 | 6,770898E+22 | 6,770892E+22 | 1,512740E+23                           | 1,354179E+23                           | 2,866919E+23  |
| -588              | 7,563440E+22                              | 7,563472E+22 | 6,770900E+22 | 6,770795E+22 | 1,512691E+23                           | 1,354170E+23                           | 2,866861E+23  |
| -587              | 7,563545E+22                              | 7,563645E+22 | 6,770765E+22 | 6,770914E+22 | 1,512719E+23                           | 1,354168E+23                           | 2,866887E+23  |
| -586              | 7,563717E+22                              | 7,563561E+22 | 6,770690E+22 | 6,770748E+22 | 1,512728E+23                           | 1,354144E+23                           | 2,866872E+23  |
| -585              | 7,563303E+22                              | 7,563506E+22 | 6,770793E+22 | 6,770687E+22 | 1,512681E+23                           | 1,354148E+23                           | 2,866829E+23  |
| -584              | 7,563645E+22                              | 7,563646E+22 | 6,770707E+22 | 6,770724E+22 | 1,512729E+23                           | 1,354143E+23                           | 2,866872E+23  |
| -583              | 7,563579E+22                              | 7,563467E+22 | 6,770756E+22 | 6,770569E+22 | 1,512705E+23                           | 1,354132E+23                           | 2,866837E+23  |
| -582              | 7,563313E+22                              | 7,563488E+22 | 6,770805E+22 | 6,770736E+22 | 1,512680E+23                           | 1,354154E+23                           | 2,866834E+23  |
| -581              | 7,563676E+22                              | 7,563607E+22 | 6,770724E+22 | 6,770808E+22 | 1,512728E+23                           | 1,354153E+23                           | 2,866881E+23  |
| -580              | 7,563367E+22                              | 7,563471E+22 | 6,770808E+22 | 6,770750E+22 | 1,512684E+23                           | 1,354156E+23                           | 2,866840E+23  |
| -579              | 7,563414E+22                              | 7,563578E+22 | 6,770815E+22 | 6,770904E+22 | 1,512699E+23                           | 1,354172E+23                           | 2,866871E+23  |
| -578              | 7,563788E+22                              | 7,563563E+22 | 6,770815E+22 | 6,770851E+22 | 1,512735E+23                           | 1,354167E+23                           | 2,866902E+23  |
| -577              | 7,563424E+22                              | 7,563471E+22 | 6,770978E+22 | 6,770845E+22 | 1,512689E+23                           | 1,354182E+23                           | 2,866872E+23  |
| -576              | 7,563685E+22                              | 7,563720E+22 | 6,770927E+22 | 6,771004E+22 | 1,512741E+23                           | 1,354193E+23                           | 2,866934E+23  |
| -575              | 7,563720E+22                              | 7,563669E+22 | 6,770968E+22 | 6,770922E+22 | 1,512739E+23                           | 1,354189E+23                           | 2,866928E+23  |
| -574              | 7,563372E+22                              | 7,563621E+22 | 6,771070E+22 | 6,771031E+22 | 1,512699E+23                           | 1,354210E+23                           | 2,866909E+23  |
| -573              | 7,563762E+22                              | 7,563749E+22 | 6,771032E+22 | 6,771070E+22 | 1,512751E+23                           | 1,354210E+23                           | 2,866961E+23  |
| -572              | 7,563580E+22                              | 7,563549E+22 | 6,771101E+22 | 6,770922E+22 | 1,512713E+23                           | 1,354202E+23                           | 2,866915E+23  |
| -571              | 7,563482E+22                              | 7,563584E+22 | 6,771045E+22 | 6,771026E+22 | 1,512707E+23                           | 1,354207E+23                           | 2,866914E+23  |
| -570              | 7,563859E+22                              | 7,563661E+22 | 6,770903E+22 | 6,771002E+22 | 1,512752E+23                           | 1,354191E+23                           | 2,866943E+23  |
| -569              | 7,563431E+22                              | 7,563504E+22 | 6,770951E+22 | 6,770892E+22 | 1,512693E+23                           | 1,354184E+23                           | 2,866878E+23  |
| -568              | 7,563548E+22                              | 7,563694E+22 | 6,770847E+22 | 6,770940E+22 | 1,512724E+23                           | 1,354179E+23                           | 2,866903E+23  |
| -567              | 7,563720E+22                              | 7,563629E+22 | 6,770821E+22 | 6,770759E+22 | 1,512735E+23                           | 1,354158E+23                           | 2,866893E+23  |
| -566              | 7,563345E+22                              | 7,563453E+22 | 6,770898E+22 | 6,770759E+22 | 1,512680E+23                           | 1,354166E+23                           | 2,866846E+23  |
| -565              | 7,563674E+22                              | 7,563619E+22 | 6,770834E+22 | 6,770822E+22 | 1,512729E+23                           | 1,354166E+23                           | 2,866895E+23  |
| -564              | 7,563537E+22                              | 7,563496E+22 | 6,770862E+22 | 6,770731E+22 | 1,512703E+23                           | 1,354159E+23                           | 2,866863E+23  |
| -563              | 7,563285E+22                              | 7,563516E+22 | 6,770835E+22 | 6,770878E+22 | 1,512680E+23                           | 1,354171E+23                           | 2,866851E+23  |
| -562              | 7,563707E+22                              | 7,563651E+22 | 6,770764E+22 | 6,770934E+22 | 1,512736E+23                           | 1,354170E+23                           | 2,866906E+23  |
| -561              | 7,563420E+22                              | 7,563434E+22 | 6,770920E+22 | 6,770834E+22 | 1,512685E+23                           | 1,354175E+23                           | 2,866861E+23  |
| -560              | 7,563515E+22                              | 7,563591E+22 | 6,770928E+22 | 6,770937E+22 | 1,512711E+23                           | 1,354186E+23                           | 2,866897E+23  |
| -559              | 7,563839E+22                              | 7,563657E+22 | 6,770942E+22 | 6,770908E+22 | 1,512750E+23                           | 1,354185E+23                           | 2,866935E+23  |
| -558              | 7,563443E+22                              | 7,563519E+22 | 6,771068E+22 | 6,770982E+22 | 1,512696E+23                           | 1,354205E+23                           | 2,866901E+23  |
| -557              | 7,563676E+22                              | 7,563773E+22 | 6,771062E+22 | 6,771122E+22 | 1,512745E+23                           | 1,354218E+23                           | 2,866963E+23  |
| -556              | 7,563675E+22                              | 7,563703E+22 | 6,771134E+22 | 6,771048E+22 | 1,512738E+23                           | 1,354218E+23                           | 2,866956E+23  |
| -555              | 7,563395E+22                              | 7,563600E+22 | 6,771173E+22 | 6,771119E+22 | 1,512699E+23                           | 1,354229E+23                           | 2,866929E+23  |
| -554              | 7,563837E+22                              | 7,563733E+22 | 6,771098E+22 | 6,771168E+22 | 1,512757E+23                           | 1,354227E+23                           | 2,866984E+23  |
| -553              | 7,563617E+22                              | 7,563504E+22 | 6,771180E+22 | 6,771042E+22 | 1,512712E+23                           | 1,354222E+23                           | 2,866934E+23  |
| -552              | 7,563510E+22                              | 7,563636E+22 | 6,771066E+22 | 6,771108E+22 | 1,512715E+23                           | 1,354217E+23                           | 2,866932E+23  |
| -551              | 7,563839E+22                              | 7,563761E+22 | 6,770951E+22 | 6,771060E+22 | 1,512760E+23                           | 1,354201E+23                           | 2,866961E+23  |



| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -550                   | 7,563451E+22                              | 7,563501E+22 | 6,771005E+22 | 6,770953E+22 | 1,512695E+23                           | 1,354196E+23                           | 2,866891E+23  |
| -549                   | 7,563595E+22                              | 7,563672E+22 | 6,770971E+22 | 6,770947E+22 | 1,512727E+23                           | 1,354192E+23                           | 2,866918E+23  |
| -548                   | 7,563728E+22                              | 7,563632E+22 | 6,770965E+22 | 6,770817E+22 | 1,512736E+23                           | 1,354178E+23                           | 2,866914E+23  |
| -547                   | 7,563354E+22                              | 7,563461E+22 | 6,770961E+22 | 6,770855E+22 | 1,512681E+23                           | 1,354182E+23                           | 2,866863E+23  |
| -546                   | 7,563662E+22                              | 7,563689E+22 | 6,770871E+22 | 6,770975E+22 | 1,512735E+23                           | 1,354185E+23                           | 2,866920E+23  |
| -545                   | 7,563506E+22                              | 7,563504E+22 | 6,770956E+22 | 6,770890E+22 | 1,512701E+23                           | 1,354185E+23                           | 2,866886E+23  |
| -544                   | 7,563312E+22                              | 7,563541E+22 | 6,770925E+22 | 6,770955E+22 | 1,512685E+23                           | 1,354188E+23                           | 2,866873E+23  |
| -543                   | 7,563765E+22                              | 7,563695E+22 | 6,770897E+22 | 6,770981E+22 | 1,512746E+23                           | 1,354188E+23                           | 2,866934E+23  |
| -542                   | 7,563526E+22                              | 7,563400E+22 | 6,771024E+22 | 6,770923E+22 | 1,512693E+23                           | 1,354195E+23                           | 2,866887E+23  |
| -541                   | 7,563582E+22                              | 7,563612E+22 | 6,771062E+22 | 6,771025E+22 | 1,512719E+23                           | 1,354209E+23                           | 2,866928E+23  |
| -540                   | 7,563813E+22                              | 7,563751E+22 | 6,771070E+22 | 6,771057E+22 | 1,512756E+23                           | 1,354213E+23                           | 2,866969E+23  |
| -539                   | 7,563417E+22                              | 7,563563E+22 | 6,771139E+22 | 6,771112E+22 | 1,512698E+23                           | 1,354225E+23                           | 2,866923E+23  |
| -538                   | 7,563679E+22                              | 7,563810E+22 | 6,771149E+22 | 6,771240E+22 | 1,512749E+23                           | 1,354239E+23                           | 2,866988E+23  |
| -537                   | 7,563706E+22                              | 7,563637E+22 | 6,771268E+22 | 6,771146E+22 | 1,512734E+23                           | 1,354241E+23                           | 2,866976E+23  |
| -536                   | 7,563460E+22                              | 7,563575E+22 | 6,771255E+22 | 6,771173E+22 | 1,512704E+23                           | 1,354243E+23                           | 2,866946E+23  |
| -535                   | 7,563873E+22                              | 7,563795E+22 | 6,771169E+22 | 6,771239E+22 | 1,512767E+23                           | 1,354241E+23                           | 2,867008E+23  |
| -534                   | 7,563646E+22                              | 7,563527E+22 | 6,771197E+22 | 6,771157E+22 | 1,512717E+23                           | 1,354235E+23                           | 2,866953E+23  |
| -533                   | 7,563525E+22                              | 7,563681E+22 | 6,771143E+22 | 6,771165E+22 | 1,512721E+23                           | 1,354231E+23                           | 2,866951E+23  |
| -532                   | 7,563817E+22                              | 7,563818E+22 | 6,771074E+22 | 6,771113E+22 | 1,512764E+23                           | 1,354219E+23                           | 2,866982E+23  |
| -531                   | 7,563472E+22                              | 7,563497E+22 | 6,771095E+22 | 6,770991E+22 | 1,512697E+23                           | 1,354209E+23                           | 2,866905E+23  |
| -530                   | 7,563626E+22                              | 7,563684E+22 | 6,771059E+22 | 6,771029E+22 | 1,512731E+23                           | 1,354209E+23                           | 2,866940E+23  |
| -529                   | 7,563711E+22                              | 7,563602E+22 | 6,771077E+22 | 6,770960E+22 | 1,512731E+23                           | 1,354204E+23                           | 2,866935E+23  |
| -528                   | 7,563337E+22                              | 7,563499E+22 | 6,771009E+22 | 6,770982E+22 | 1,512684E+23                           | 1,354199E+23                           | 2,866883E+23  |
| -527                   | 7,563651E+22                              | 7,563744E+22 | 6,770943E+22 | 6,771077E+22 | 1,512739E+23                           | 1,354202E+23                           | 2,866941E+23  |
| -526                   | 7,563566E+22                              | 7,563459E+22 | 6,771020E+22 | 6,770988E+22 | 1,512703E+23                           | 1,354201E+23                           | 2,866903E+23  |
| -525                   | 7,563423E+22                              | 7,563512E+22 | 6,771045E+22 | 6,770983E+22 | 1,512694E+23                           | 1,354203E+23                           | 2,866896E+23  |
| -524                   | 7,563821E+22                              | 7,563729E+22 | 6,771034E+22 | 6,771048E+22 | 1,512755E+23                           | 1,354208E+23                           | 2,866963E+23  |
| -523                   | 7,563565E+22                              | 7,563465E+22 | 6,771097E+22 | 6,771024E+22 | 1,512703E+23                           | 1,354212E+23                           | 2,866915E+23  |
| -522                   | 7,563576E+22                              | 7,563723E+22 | 6,771131E+22 | 6,771161E+22 | 1,512730E+23                           | 1,354229E+23                           | 2,866959E+23  |
| -521                   | 7,563760E+22                              | 7,563781E+22 | 6,771215E+22 | 6,771211E+22 | 1,512754E+23                           | 1,354243E+23                           | 2,866997E+23  |
| -520                   | 7,563416E+22                              | 7,563593E+22 | 6,771264E+22 | 6,771205E+22 | 1,512701E+23                           | 1,354247E+23                           | 2,866948E+23  |
| -519                   | 7,563708E+22                              | 7,563818E+22 | 6,771292E+22 | 6,771314E+22 | 1,512753E+23                           | 1,354261E+23                           | 2,867013E+23  |
| -518                   | 7,563785E+22                              | 7,563568E+22 | 6,771353E+22 | 6,771272E+22 | 1,512735E+23                           | 1,354262E+23                           | 2,866998E+23  |
| -517                   | 7,563527E+22                              | 7,563570E+22 | 6,771327E+22 | 6,771268E+22 | 1,512710E+23                           | 1,354259E+23                           | 2,866969E+23  |
| -516                   | 7,563857E+22                              | 7,563871E+22 | 6,771230E+22 | 6,771355E+22 | 1,512773E+23                           | 1,354259E+23                           | 2,867031E+23  |
| -515                   | 7,563652E+22                              | 7,563576E+22 | 6,771215E+22 | 6,771225E+22 | 1,512723E+23                           | 1,354244E+23                           | 2,866967E+23  |
| -514                   | 7,563552E+22                              | 7,563725E+22 | 6,771205E+22 | 6,771200E+22 | 1,512728E+23                           | 1,354241E+23                           | 2,866968E+23  |
| -513                   | 7,563835E+22                              | 7,563785E+22 | 6,771214E+22 | 6,771161E+22 | 1,512762E+23                           | 1,354238E+23                           | 2,867000E+23  |
| -512                   | 7,563499E+22                              | 7,563506E+22 | 6,771193E+22 | 6,771037E+22 | 1,512701E+23                           | 1,354223E+23                           | 2,866924E+23  |
| -511                   | 7,563608E+22                              | 7,563743E+22 | 6,771158E+22 | 6,771125E+22 | 1,512735E+23                           | 1,354228E+23                           | 2,866963E+23  |
| -510                   | 7,563704E+22                              | 7,563593E+22 | 6,771128E+22 | 6,771120E+22 | 1,512730E+23                           | 1,354225E+23                           | 2,866954E+23  |
| -509                   | 7,563355E+22                              | 7,563498E+22 | 6,771100E+22 | 6,771076E+22 | 1,512685E+23                           | 1,354218E+23                           | 2,866903E+23  |
| -508                   | 7,563674E+22                              | 7,563768E+22 | 6,771062E+22 | 6,771162E+22 | 1,512744E+23                           | 1,354222E+23                           | 2,866967E+23  |
| -507                   | 7,563651E+22                              | 7,563445E+22 | 6,771084E+22 | 6,771043E+22 | 1,512710E+23                           | 1,354213E+23                           | 2,866922E+23  |
| -506                   | 7,563500E+22                              | 7,563557E+22 | 6,771123E+22 | 6,771065E+22 | 1,512706E+23                           | 1,354219E+23                           | 2,866925E+23  |
| -505                   | 7,563820E+22                              | 7,563768E+22 | 6,771154E+22 | 6,771187E+22 | 1,512759E+23                           | 1,354234E+23                           | 2,866993E+23  |
| -504                   | 7,563527E+22                              | 7,563558E+22 | 6,771180E+22 | 6,771148E+22 | 1,512709E+23                           | 1,354233E+23                           | 2,866941E+23  |
| -503                   | 7,563535E+22                              | 7,563801E+22 | 6,771262E+22 | 6,771273E+22 | 1,512734E+23                           | 1,354253E+23                           | 2,866987E+23  |
| -502                   | 7,563787E+22                              | 7,563720E+22 | 6,771330E+22 | 6,771225E+22 | 1,512751E+23                           | 1,354255E+23                           | 2,867006E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -501                   | 7,563504E+22                              | 7,563531E+22 | 6,771399E+22 | 6,771269E+22 | 1,512704E+23                           | 1,354267E+23                           | 2,866970E+23  |
| -500                   | 7,563761E+22                              | 7,563821E+22 | 6,771403E+22 | 6,771410E+22 | 1,512758E+23                           | 1,354281E+23                           | 2,867039E+23  |
| -499                   | 7,563830E+22                              | 7,563605E+22 | 6,771370E+22 | 6,771376E+22 | 1,512744E+23                           | 1,354275E+23                           | 2,867018E+23  |
| -498                   | 7,563550E+22                              | 7,563673E+22 | 6,771350E+22 | 6,771367E+22 | 1,512722E+23                           | 1,354272E+23                           | 2,866994E+23  |
| -497                   | 7,563835E+22                              | 7,563908E+22 | 6,771343E+22 | 6,771443E+22 | 1,512774E+23                           | 1,354279E+23                           | 2,867053E+23  |
| -496                   | 7,563657E+22                              | 7,563629E+22 | 6,771324E+22 | 6,771251E+22 | 1,512729E+23                           | 1,354257E+23                           | 2,866986E+23  |
| -495                   | 7,563571E+22                              | 7,563751E+22 | 6,771353E+22 | 6,771231E+22 | 1,512732E+23                           | 1,354258E+23                           | 2,866991E+23  |
| -494                   | 7,563857E+22                              | 7,563725E+22 | 6,771316E+22 | 6,771280E+22 | 1,512758E+23                           | 1,354260E+23                           | 2,867018E+23  |
| -493                   | 7,563516E+22                              | 7,563495E+22 | 6,771280E+22 | 6,771157E+22 | 1,512701E+23                           | 1,354244E+23                           | 2,866945E+23  |
| -492                   | 7,563563E+22                              | 7,563774E+22 | 6,771224E+22 | 6,771270E+22 | 1,512734E+23                           | 1,354249E+23                           | 2,866983E+23  |
| -491                   | 7,563718E+22                              | 7,563590E+22 | 6,771144E+22 | 6,771222E+22 | 1,512731E+23                           | 1,354237E+23                           | 2,866967E+23  |
| -490                   | 7,563432E+22                              | 7,563510E+22 | 6,771136E+22 | 6,771123E+22 | 1,512694E+23                           | 1,354226E+23                           | 2,866920E+23  |
| -489                   | 7,563730E+22                              | 7,563742E+22 | 6,771177E+22 | 6,771218E+22 | 1,512747E+23                           | 1,354239E+23                           | 2,866987E+23  |
| -488                   | 7,563698E+22                              | 7,563521E+22 | 6,771166E+22 | 6,771092E+22 | 1,512722E+23                           | 1,354226E+23                           | 2,866948E+23  |
| -487                   | 7,563492E+22                              | 7,563672E+22 | 6,771242E+22 | 6,771155E+22 | 1,512716E+23                           | 1,354240E+23                           | 2,866956E+23  |
| -486                   | 7,563787E+22                              | 7,563801E+22 | 6,771266E+22 | 6,771346E+22 | 1,512759E+23                           | 1,354261E+23                           | 2,867020E+23  |
| -485                   | 7,563530E+22                              | 7,563568E+22 | 6,771341E+22 | 6,771257E+22 | 1,512710E+23                           | 1,354260E+23                           | 2,866970E+23  |
| -484                   | 7,563533E+22                              | 7,563799E+22 | 6,771433E+22 | 6,771388E+22 | 1,512733E+23                           | 1,354282E+23                           | 2,867015E+23  |
| -483                   | 7,563859E+22                              | 7,563670E+22 | 6,771417E+22 | 6,771441E+22 | 1,512753E+23                           | 1,354286E+23                           | 2,867039E+23  |
| -482                   | 7,563593E+22                              | 7,563541E+22 | 6,771453E+22 | 6,771383E+22 | 1,512713E+23                           | 1,354284E+23                           | 2,866997E+23  |
| -481                   | 7,563778E+22                              | 7,563848E+22 | 6,771480E+22 | 6,771557E+22 | 1,512763E+23                           | 1,354304E+23                           | 2,867066E+23  |
| -480                   | 7,563826E+22                              | 7,563711E+22 | 6,771403E+22 | 6,771460E+22 | 1,512754E+23                           | 1,354286E+23                           | 2,867040E+23  |
| -479                   | 7,563550E+22                              | 7,563760E+22 | 6,771456E+22 | 6,771411E+22 | 1,512731E+23                           | 1,354287E+23                           | 2,867018E+23  |
| -478                   | 7,563864E+22                              | 7,563871E+22 | 6,771460E+22 | 6,771501E+22 | 1,512773E+23                           | 1,354296E+23                           | 2,867069E+23  |
| -477                   | 7,563710E+22                              | 7,563592E+22 | 6,771469E+22 | 6,771281E+22 | 1,512730E+23                           | 1,354275E+23                           | 2,867005E+23  |
| -476                   | 7,563563E+22                              | 7,563766E+22 | 6,771474E+22 | 6,771332E+22 | 1,512733E+23                           | 1,354281E+23                           | 2,867013E+23  |
| -475                   | 7,563845E+22                              | 7,563730E+22 | 6,771329E+22 | 6,771408E+22 | 1,512757E+23                           | 1,354274E+23                           | 2,867031E+23  |
| -474                   | 7,563512E+22                              | 7,563541E+22 | 6,771292E+22 | 6,771278E+22 | 1,512705E+23                           | 1,354257E+23                           | 2,866962E+23  |
| -473                   | 7,563558E+22                              | 7,563766E+22 | 6,771309E+22 | 6,771375E+22 | 1,512732E+23                           | 1,354268E+23                           | 2,867001E+23  |
| -472                   | 7,563754E+22                              | 7,563621E+22 | 6,771213E+22 | 6,771250E+22 | 1,512737E+23                           | 1,354246E+23                           | 2,866984E+23  |
| -471                   | 7,563499E+22                              | 7,563553E+22 | 6,771261E+22 | 6,771153E+22 | 1,512705E+23                           | 1,354241E+23                           | 2,866947E+23  |
| -470                   | 7,563771E+22                              | 7,563728E+22 | 6,771282E+22 | 6,771323E+22 | 1,512750E+23                           | 1,354261E+23                           | 2,867010E+23  |
| -469                   | 7,563709E+22                              | 7,563569E+22 | 6,771286E+22 | 6,771201E+22 | 1,512728E+23                           | 1,354249E+23                           | 2,866977E+23  |
| -468                   | 7,563439E+22                              | 7,563739E+22 | 6,771373E+22 | 6,771301E+22 | 1,512718E+23                           | 1,354267E+23                           | 2,866985E+23  |
| -467                   | 7,563780E+22                              | 7,563789E+22 | 6,771351E+22 | 6,771466E+22 | 1,512757E+23                           | 1,354282E+23                           | 2,867039E+23  |
| -466                   | 7,563599E+22                              | 7,563555E+22 | 6,771439E+22 | 6,771351E+22 | 1,512715E+23                           | 1,354279E+23                           | 2,866994E+23  |
| -465                   | 7,563595E+22                              | 7,563745E+22 | 6,771567E+22 | 6,771503E+22 | 1,512734E+23                           | 1,354307E+23                           | 2,867041E+23  |
| -464                   | 7,563909E+22                              | 7,563730E+22 | 6,771480E+22 | 6,771532E+22 | 1,512764E+23                           | 1,354301E+23                           | 2,867065E+23  |
| -463                   | 7,563623E+22                              | 7,563658E+22 | 6,771531E+22 | 6,771481E+22 | 1,512728E+23                           | 1,354301E+23                           | 2,867029E+23  |
| -462                   | 7,563774E+22                              | 7,563889E+22 | 6,771561E+22 | 6,771680E+22 | 1,512766E+23                           | 1,354324E+23                           | 2,867090E+23  |
| -461                   | 7,563853E+22                              | 7,563756E+22 | 6,771542E+22 | 6,771512E+22 | 1,512761E+23                           | 1,354305E+23                           | 2,867066E+23  |
| -460                   | 7,563550E+22                              | 7,563778E+22 | 6,771617E+22 | 6,771469E+22 | 1,512733E+23                           | 1,354309E+23                           | 2,867041E+23  |
| -459                   | 7,563887E+22                              | 7,563831E+22 | 6,771549E+22 | 6,771578E+22 | 1,512772E+23                           | 1,354313E+23                           | 2,867085E+23  |
| -458                   | 7,563743E+22                              | 7,563593E+22 | 6,771521E+22 | 6,771392E+22 | 1,512734E+23                           | 1,354291E+23                           | 2,867025E+23  |
| -457                   | 7,563519E+22                              | 7,563752E+22 | 6,771535E+22 | 6,771492E+22 | 1,512727E+23                           | 1,354303E+23                           | 2,867030E+23  |
| -456                   | 7,563813E+22                              | 7,563784E+22 | 6,771340E+22 | 6,771502E+22 | 1,512760E+23                           | 1,354284E+23                           | 2,867044E+23  |
| -455                   | 7,563547E+22                              | 7,563574E+22 | 6,771358E+22 | 6,771316E+22 | 1,512712E+23                           | 1,354267E+23                           | 2,866979E+23  |
| -454                   | 7,563628E+22                              | 7,563711E+22 | 6,771391E+22 | 6,771418E+22 | 1,512734E+23                           | 1,354281E+23                           | 2,867015E+23  |
| -453                   | 7,563850E+22                              | 7,563620E+22 | 6,771330E+22 | 6,771260E+22 | 1,512747E+23                           | 1,354259E+23                           | 2,867006E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -452              | 7,563508E+22                              | 7,563621E+22 | 6,771392E+22 | 6,771235E+22 | 1,512713E+23                           | 1,354263E+23                           | 2,866976E+23  |
| -451              | 7,563745E+22                              | 7,563785E+22 | 6,771352E+22 | 6,771447E+22 | 1,512753E+23                           | 1,354280E+23                           | 2,867033E+23  |
| -450              | 7,563694E+22                              | 7,563635E+22 | 6,771382E+22 | 6,771337E+22 | 1,512733E+23                           | 1,354272E+23                           | 2,867005E+23  |
| -449              | 7,563414E+22                              | 7,563725E+22 | 6,771534E+22 | 6,771454E+22 | 1,512714E+23                           | 1,354299E+23                           | 2,867013E+23  |
| -448              | 7,563805E+22                              | 7,563800E+22 | 6,771462E+22 | 6,771558E+22 | 1,512760E+23                           | 1,354302E+23                           | 2,867062E+23  |
| -447              | 7,563680E+22                              | 7,563570E+22 | 6,771564E+22 | 6,771450E+22 | 1,512725E+23                           | 1,354301E+23                           | 2,867026E+23  |
| -446              | 7,563657E+22                              | 7,563727E+22 | 6,771645E+22 | 6,771657E+22 | 1,512738E+23                           | 1,354330E+23                           | 2,867069E+23  |
| -445              | 7,563945E+22                              | 7,563790E+22 | 6,771560E+22 | 6,771641E+22 | 1,512773E+23                           | 1,354320E+23                           | 2,867094E+23  |
| -444              | 7,563611E+22                              | 7,563749E+22 | 6,771639E+22 | 6,771583E+22 | 1,512736E+23                           | 1,354322E+23                           | 2,867058E+23  |
| -443              | 7,563794E+22                              | 7,563889E+22 | 6,771634E+22 | 6,771731E+22 | 1,512768E+23                           | 1,354337E+23                           | 2,867105E+23  |
| -442              | 7,563907E+22                              | 7,563755E+22 | 6,771641E+22 | 6,771550E+22 | 1,512766E+23                           | 1,354319E+23                           | 2,867085E+23  |
| -441              | 7,563565E+22                              | 7,563742E+22 | 6,771746E+22 | 6,771564E+22 | 1,512731E+23                           | 1,354331E+23                           | 2,867062E+23  |
| -440              | 7,563863E+22                              | 7,563872E+22 | 6,771596E+22 | 6,771664E+22 | 1,512774E+23                           | 1,354326E+23                           | 2,867100E+23  |
| -439              | 7,563733E+22                              | 7,563660E+22 | 6,771580E+22 | 6,771501E+22 | 1,512739E+23                           | 1,354308E+23                           | 2,867047E+23  |
| -438              | 7,563514E+22                              | 7,563728E+22 | 6,771587E+22 | 6,771612E+22 | 1,512724E+23                           | 1,354320E+23                           | 2,867044E+23  |
| -437              | 7,563862E+22                              | 7,563779E+22 | 6,771440E+22 | 6,771536E+22 | 1,512764E+23                           | 1,354298E+23                           | 2,867062E+23  |
| -436              | 7,563598E+22                              | 7,563592E+22 | 6,771483E+22 | 6,771348E+22 | 1,512719E+23                           | 1,354283E+23                           | 2,867002E+23  |
| -435              | 7,563689E+22                              | 7,563696E+22 | 6,771460E+22 | 6,771469E+22 | 1,512738E+23                           | 1,354293E+23                           | 2,867031E+23  |
| -434              | 7,563888E+22                              | 7,563682E+22 | 6,771401E+22 | 6,771361E+22 | 1,512757E+23                           | 1,354276E+23                           | 2,867033E+23  |
| -433              | 7,563457E+22                              | 7,563665E+22 | 6,771502E+22 | 6,771407E+22 | 1,512712E+23                           | 1,354291E+23                           | 2,867003E+23  |
| -432              | 7,563680E+22                              | 7,563857E+22 | 6,771434E+22 | 6,771566E+22 | 1,512754E+23                           | 1,354300E+23                           | 2,867054E+23  |
| -431              | 7,563719E+22                              | 7,563658E+22 | 6,771513E+22 | 6,771436E+22 | 1,512738E+23                           | 1,354295E+23                           | 2,867033E+23  |
| -430              | 7,563476E+22                              | 7,563644E+22 | 6,771654E+22 | 6,771571E+22 | 1,512712E+23                           | 1,354322E+23                           | 2,867035E+23  |
| -429              | 7,563910E+22                              | 7,563787E+22 | 6,771581E+22 | 6,771638E+22 | 1,512770E+23                           | 1,354322E+23                           | 2,867092E+23  |
| -428              | 7,563726E+22                              | 7,563637E+22 | 6,771660E+22 | 6,771558E+22 | 1,512736E+23                           | 1,354322E+23                           | 2,867058E+23  |
| -427              | 7,563675E+22                              | 7,563790E+22 | 6,771681E+22 | 6,771769E+22 | 1,512746E+23                           | 1,354345E+23                           | 2,867091E+23  |
| -426              | 7,563974E+22                              | 7,563875E+22 | 6,771640E+22 | 6,771724E+22 | 1,512785E+23                           | 1,354336E+23                           | 2,867121E+23  |
| -425              | 7,563598E+22                              | 7,563759E+22 | 6,771797E+22 | 6,771677E+22 | 1,512736E+23                           | 1,354347E+23                           | 2,867083E+23  |
| -424              | 7,563787E+22                              | 7,563918E+22 | 6,771755E+22 | 6,771775E+22 | 1,512771E+23                           | 1,354353E+23                           | 2,867124E+23  |
| -423              | 7,563948E+22                              | 7,563764E+22 | 6,771765E+22 | 6,771635E+22 | 1,512771E+23                           | 1,354340E+23                           | 2,867111E+23  |
| -422              | 7,563564E+22                              | 7,563696E+22 | 6,771815E+22 | 6,771720E+22 | 1,512726E+23                           | 1,354354E+23                           | 2,867079E+23  |
| -421              | 7,563865E+22                              | 7,563889E+22 | 6,771647E+22 | 6,771772E+22 | 1,512775E+23                           | 1,354342E+23                           | 2,867117E+23  |
| -420              | 7,563728E+22                              | 7,563692E+22 | 6,771647E+22 | 6,771584E+22 | 1,512742E+23                           | 1,354323E+23                           | 2,867065E+23  |
| -419              | 7,563570E+22                              | 7,563698E+22 | 6,771617E+22 | 6,771647E+22 | 1,512727E+23                           | 1,354326E+23                           | 2,867053E+23  |
| -418              | 7,563958E+22                              | 7,563783E+22 | 6,771507E+22 | 6,771548E+22 | 1,512774E+23                           | 1,354305E+23                           | 2,867080E+23  |
| -417              | 7,563630E+22                              | 7,563607E+22 | 6,771598E+22 | 6,771430E+22 | 1,512724E+23                           | 1,354303E+23                           | 2,867026E+23  |
| -416              | 7,563652E+22                              | 7,563799E+22 | 6,771525E+22 | 6,771545E+22 | 1,512745E+23                           | 1,354307E+23                           | 2,867052E+23  |
| -415              | 7,563858E+22                              | 7,563787E+22 | 6,771505E+22 | 6,771487E+22 | 1,512765E+23                           | 1,354299E+23                           | 2,867064E+23  |
| -414              | 7,563430E+22                              | 7,563651E+22 | 6,771624E+22 | 6,771567E+22 | 1,512708E+23                           | 1,354319E+23                           | 2,867027E+23  |
| -413              | 7,563710E+22                              | 7,563831E+22 | 6,771581E+22 | 6,771653E+22 | 1,512754E+23                           | 1,354323E+23                           | 2,867078E+23  |
| -412              | 7,563776E+22                              | 7,563646E+22 | 6,771663E+22 | 6,771534E+22 | 1,512742E+23                           | 1,354320E+23                           | 2,867062E+23  |
| -411              | 7,563569E+22                              | 7,563600E+22 | 6,771706E+22 | 6,771677E+22 | 1,512717E+23                           | 1,354338E+23                           | 2,867055E+23  |
| -410              | 7,563975E+22                              | 7,563834E+22 | 6,771628E+22 | 6,771754E+22 | 1,512781E+23                           | 1,354338E+23                           | 2,867119E+23  |
| -409              | 7,563717E+22                              | 7,563709E+22 | 6,771745E+22 | 6,771706E+22 | 1,512743E+23                           | 1,354345E+23                           | 2,867088E+23  |
| -408              | 7,563650E+22                              | 7,563880E+22 | 6,771755E+22 | 6,771825E+22 | 1,512753E+23                           | 1,354358E+23                           | 2,867111E+23  |
| -407              | 7,564015E+22                              | 7,563923E+22 | 6,771779E+22 | 6,771773E+22 | 1,512794E+23                           | 1,354355E+23                           | 2,867149E+23  |
| -406              | 7,563639E+22                              | 7,563701E+22 | 6,771936E+22 | 6,771768E+22 | 1,512734E+23                           | 1,354370E+23                           | 2,867104E+23  |
| -405              | 7,563820E+22                              | 7,563909E+22 | 6,771880E+22 | 6,771849E+22 | 1,512773E+23                           | 1,354373E+23                           | 2,867146E+23  |
| -404              | 7,563933E+22                              | 7,563814E+22 | 6,771858E+22 | 6,771760E+22 | 1,512775E+23                           | 1,354362E+23                           | 2,867136E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -403              | 7,563561E+22                              | 7,563702E+22 | 6,771825E+22 | 6,771842E+22 | 1,512726E+23                           | 1,354367E+23                           | 2,867093E+23  |
| -402              | 7,563902E+22                              | 7,563915E+22 | 6,771694E+22 | 6,771848E+22 | 1,512782E+23                           | 1,354354E+23                           | 2,867136E+23  |
| -401              | 7,563755E+22                              | 7,563693E+22 | 6,771748E+22 | 6,771657E+22 | 1,512745E+23                           | 1,354341E+23                           | 2,867085E+23  |
| -400              | 7,563600E+22                              | 7,563738E+22 | 6,771690E+22 | 6,771659E+22 | 1,512734E+23                           | 1,354335E+23                           | 2,867069E+23  |
| -399              | 7,564013E+22                              | 7,563840E+22 | 6,771606E+22 | 6,771615E+22 | 1,512785E+23                           | 1,354322E+23                           | 2,867107E+23  |
| -398              | 7,563608E+22                              | 7,563616E+22 | 6,771687E+22 | 6,771581E+22 | 1,512722E+23                           | 1,354327E+23                           | 2,867049E+23  |
| -397              | 7,563618E+22                              | 7,563847E+22 | 6,771628E+22 | 6,771659E+22 | 1,512747E+23                           | 1,354329E+23                           | 2,867075E+23  |
| -396              | 7,563837E+22                              | 7,563803E+22 | 6,771631E+22 | 6,771590E+22 | 1,512764E+23                           | 1,354322E+23                           | 2,867086E+23  |
| -395              | 7,563482E+22                              | 7,563578E+22 | 6,771696E+22 | 6,771648E+22 | 1,512706E+23                           | 1,354334E+23                           | 2,867040E+23  |
| -394              | 7,563822E+22                              | 7,563796E+22 | 6,771666E+22 | 6,771718E+22 | 1,512762E+23                           | 1,354338E+23                           | 2,867100E+23  |
| -393              | 7,563828E+22                              | 7,563653E+22 | 6,771758E+22 | 6,771659E+22 | 1,512748E+23                           | 1,354342E+23                           | 2,867090E+23  |
| -392              | 7,563571E+22                              | 7,563715E+22 | 6,771748E+22 | 6,771766E+22 | 1,512729E+23                           | 1,354351E+23                           | 2,867080E+23  |
| -391              | 7,563994E+22                              | 7,563956E+22 | 6,771720E+22 | 6,771860E+22 | 1,512795E+23                           | 1,354358E+23                           | 2,867153E+23  |
| -390              | 7,563710E+22                              | 7,563732E+22 | 6,771886E+22 | 6,771826E+22 | 1,512744E+23                           | 1,354371E+23                           | 2,867115E+23  |
| -389              | 7,563674E+22                              | 7,563900E+22 | 6,771926E+22 | 6,771877E+22 | 1,512757E+23                           | 1,354380E+23                           | 2,867138E+23  |
| -388              | 7,564038E+22                              | 7,563928E+22 | 6,771954E+22 | 6,771858E+22 | 1,512797E+23                           | 1,354381E+23                           | 2,867178E+23  |
| -387              | 7,563676E+22                              | 7,563656E+22 | 6,772006E+22 | 6,771901E+22 | 1,512733E+23                           | 1,354391E+23                           | 2,867124E+23  |
| -386              | 7,563839E+22                              | 7,563924E+22 | 6,771924E+22 | 6,771988E+22 | 1,512776E+23                           | 1,354391E+23                           | 2,867168E+23  |
| -385              | 7,563904E+22                              | 7,563840E+22 | 6,771912E+22 | 6,771919E+22 | 1,512774E+23                           | 1,354383E+23                           | 2,867158E+23  |
| -384              | 7,563563E+22                              | 7,563745E+22 | 6,771846E+22 | 6,771883E+22 | 1,512731E+23                           | 1,354373E+23                           | 2,867104E+23  |
| -383              | 7,563981E+22                              | 7,563937E+22 | 6,771771E+22 | 6,771869E+22 | 1,512792E+23                           | 1,354364E+23                           | 2,867156E+23  |
| -382              | 7,563819E+22                              | 7,563666E+22 | 6,771845E+22 | 6,771711E+22 | 1,512749E+23                           | 1,354356E+23                           | 2,867104E+23  |
| -381              | 7,563633E+22                              | 7,563773E+22 | 6,771791E+22 | 6,771690E+22 | 1,512741E+23                           | 1,354348E+23                           | 2,867089E+23  |
| -380              | 7,563973E+22                              | 7,563925E+22 | 6,771721E+22 | 6,771708E+22 | 1,512790E+23                           | 1,354343E+23                           | 2,867133E+23  |
| -379              | 7,563585E+22                              | 7,563621E+22 | 6,771746E+22 | 6,771703E+22 | 1,512721E+23                           | 1,354345E+23                           | 2,867066E+23  |
| -378              | 7,563622E+22                              | 7,563833E+22 | 6,771734E+22 | 6,771755E+22 | 1,512745E+23                           | 1,354349E+23                           | 2,867094E+23  |
| -377              | 7,563849E+22                              | 7,563772E+22 | 6,771765E+22 | 6,771715E+22 | 1,512762E+23                           | 1,354348E+23                           | 2,867110E+23  |
| -376              | 7,563533E+22                              | 7,563579E+22 | 6,771763E+22 | 6,771713E+22 | 1,512711E+23                           | 1,354348E+23                           | 2,867059E+23  |
| -375              | 7,563907E+22                              | 7,563841E+22 | 6,771740E+22 | 6,771833E+22 | 1,512775E+23                           | 1,354357E+23                           | 2,867132E+23  |
| -374              | 7,563842E+22                              | 7,563699E+22 | 6,771825E+22 | 6,771819E+22 | 1,512754E+23                           | 1,354364E+23                           | 2,867119E+23  |
| -373              | 7,563572E+22                              | 7,563803E+22 | 6,771851E+22 | 6,771854E+22 | 1,512738E+23                           | 1,354370E+23                           | 2,867108E+23  |
| -372              | 7,563992E+22                              | 7,564021E+22 | 6,771883E+22 | 6,771931E+22 | 1,512801E+23                           | 1,354381E+23                           | 2,867183E+23  |
| -371              | 7,563760E+22                              | 7,563697E+22 | 6,772006E+22 | 6,771903E+22 | 1,512746E+23                           | 1,354391E+23                           | 2,867137E+23  |
| -370              | 7,563738E+22                              | 7,563880E+22 | 6,772060E+22 | 6,771961E+22 | 1,512762E+23                           | 1,354402E+23                           | 2,867164E+23  |
| -369              | 7,564032E+22                              | 7,563939E+22 | 6,772064E+22 | 6,772018E+22 | 1,512797E+23                           | 1,354408E+23                           | 2,867205E+23  |
| -368              | 7,563649E+22                              | 7,563727E+22 | 6,772034E+22 | 6,772016E+22 | 1,512738E+23                           | 1,354405E+23                           | 2,867143E+23  |
| -367              | 7,563869E+22                              | 7,563983E+22 | 6,771978E+22 | 6,772102E+22 | 1,512785E+23                           | 1,354408E+23                           | 2,867193E+23  |
| -366              | 7,563921E+22                              | 7,563824E+22 | 6,771997E+22 | 6,772012E+22 | 1,512775E+23                           | 1,354401E+23                           | 2,867176E+23  |
| -365              | 7,563626E+22                              | 7,563761E+22 | 6,771957E+22 | 6,771887E+22 | 1,512739E+23                           | 1,354384E+23                           | 2,867123E+23  |
| -364              | 7,564031E+22                              | 7,563955E+22 | 6,771900E+22 | 6,771890E+22 | 1,512799E+23                           | 1,354379E+23                           | 2,867178E+23  |
| -363              | 7,563840E+22                              | 7,563656E+22 | 6,771900E+22 | 6,771797E+22 | 1,512750E+23                           | 1,354370E+23                           | 2,867119E+23  |
| -362              | 7,563616E+22                              | 7,563815E+22 | 6,771858E+22 | 6,771800E+22 | 1,512743E+23                           | 1,354366E+23                           | 2,867109E+23  |
| -361              | 7,563897E+22                              | 7,563948E+22 | 6,771813E+22 | 6,771858E+22 | 1,512785E+23                           | 1,354367E+23                           | 2,867152E+23  |
| -360              | 7,563564E+22                              | 7,563628E+22 | 6,771809E+22 | 6,771772E+22 | 1,512719E+23                           | 1,354358E+23                           | 2,867077E+23  |
| -359              | 7,563706E+22                              | 7,563809E+22 | 6,771824E+22 | 6,771830E+22 | 1,512751E+23                           | 1,354365E+23                           | 2,867117E+23  |
| -358              | 7,563912E+22                              | 7,563729E+22 | 6,771858E+22 | 6,771827E+22 | 1,512764E+23                           | 1,354369E+23                           | 2,867133E+23  |
| -357              | 7,563588E+22                              | 7,563645E+22 | 6,771841E+22 | 6,771787E+22 | 1,512723E+23                           | 1,354363E+23                           | 2,867086E+23  |
| -356              | 7,563908E+22                              | 7,563955E+22 | 6,771847E+22 | 6,771933E+22 | 1,512786E+23                           | 1,354378E+23                           | 2,867164E+23  |
| -355              | 7,563851E+22                              | 7,563751E+22 | 6,771912E+22 | 6,771934E+22 | 1,512760E+23                           | 1,354385E+23                           | 2,867145E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -354              | 7,563601E+22                              | 7,563832E+22 | 6,772009E+22 | 6,771934E+22 | 1,512743E+23                           | 1,354394E+23                           | 2,867138E+23  |
| -353              | 7,563987E+22                              | 7,564023E+22 | 6,772069E+22 | 6,772056E+22 | 1,512801E+23                           | 1,354413E+23                           | 2,867214E+23  |
| -352              | 7,563784E+22                              | 7,563699E+22 | 6,772117E+22 | 6,772000E+22 | 1,512748E+23                           | 1,354412E+23                           | 2,867160E+23  |
| -351              | 7,563780E+22                              | 7,563897E+22 | 6,772142E+22 | 6,772119E+22 | 1,512768E+23                           | 1,354426E+23                           | 2,867194E+23  |
| -350              | 7,564019E+22                              | 7,563948E+22 | 6,772121E+22 | 6,772203E+22 | 1,512797E+23                           | 1,354432E+23                           | 2,867229E+23  |
| -349              | 7,563673E+22                              | 7,563761E+22 | 6,772083E+22 | 6,772084E+22 | 1,512743E+23                           | 1,354417E+23                           | 2,867160E+23  |
| -348              | 7,563911E+22                              | 7,564004E+22 | 6,772080E+22 | 6,772124E+22 | 1,512792E+23                           | 1,354420E+23                           | 2,867212E+23  |
| -347              | 7,564009E+22                              | 7,563790E+22 | 6,772055E+22 | 6,772026E+22 | 1,512780E+23                           | 1,354408E+23                           | 2,867188E+23  |
| -346              | 7,563694E+22                              | 7,563761E+22 | 6,772054E+22 | 6,771906E+22 | 1,512745E+23                           | 1,354396E+23                           | 2,867141E+23  |
| -345              | 7,563985E+22                              | 7,564013E+22 | 6,772003E+22 | 6,772001E+22 | 1,512800E+23                           | 1,354400E+23                           | 2,867200E+23  |
| -344              | 7,563774E+22                              | 7,563735E+22 | 6,771947E+22 | 6,771890E+22 | 1,512751E+23                           | 1,354384E+23                           | 2,867135E+23  |
| -343              | 7,563600E+22                              | 7,563853E+22 | 6,771942E+22 | 6,771927E+22 | 1,512745E+23                           | 1,354387E+23                           | 2,867132E+23  |
| -342              | 7,563880E+22                              | 7,563910E+22 | 6,771925E+22 | 6,771988E+22 | 1,512779E+23                           | 1,354391E+23                           | 2,867170E+23  |
| -341              | 7,563624E+22                              | 7,563613E+22 | 6,771916E+22 | 6,771825E+22 | 1,512724E+23                           | 1,354374E+23                           | 2,867098E+23  |
| -340              | 7,563779E+22                              | 7,563813E+22 | 6,771943E+22 | 6,771906E+22 | 1,512759E+23                           | 1,354385E+23                           | 2,867144E+23  |
| -339              | 7,563969E+22                              | 7,563739E+22 | 6,771900E+22 | 6,771950E+22 | 1,512771E+23                           | 1,354385E+23                           | 2,867156E+23  |
| -338              | 7,563616E+22                              | 7,563715E+22 | 6,771924E+22 | 6,771896E+22 | 1,512733E+23                           | 1,354382E+23                           | 2,867115E+23  |
| -337              | 7,563872E+22                              | 7,564021E+22 | 6,771978E+22 | 6,772059E+22 | 1,512789E+23                           | 1,354404E+23                           | 2,867193E+23  |
| -336              | 7,563854E+22                              | 7,563789E+22 | 6,772031E+22 | 6,771990E+22 | 1,512764E+23                           | 1,354402E+23                           | 2,867166E+23  |
| -335              | 7,563681E+22                              | 7,563832E+22 | 6,772150E+22 | 6,772030E+22 | 1,512751E+23                           | 1,354418E+23                           | 2,867169E+23  |
| -334              | 7,564004E+22                              | 7,563987E+22 | 6,772198E+22 | 6,772202E+22 | 1,512799E+23                           | 1,354440E+23                           | 2,867239E+23  |
| -333              | 7,563803E+22                              | 7,563748E+22 | 6,772203E+22 | 6,772116E+22 | 1,512755E+23                           | 1,354432E+23                           | 2,867187E+23  |
| -332              | 7,563786E+22                              | 7,563954E+22 | 6,772228E+22 | 6,772233E+22 | 1,512774E+23                           | 1,354446E+23                           | 2,867220E+23  |
| -331              | 7,564042E+22                              | 7,563943E+22 | 6,772167E+22 | 6,772301E+22 | 1,512799E+23                           | 1,354447E+23                           | 2,867245E+23  |
| -330              | 7,563739E+22                              | 7,563771E+22 | 6,772185E+22 | 6,772116E+22 | 1,512751E+23                           | 1,354430E+23                           | 2,867181E+23  |
| -329              | 7,563933E+22                              | 7,564013E+22 | 6,772202E+22 | 6,772180E+22 | 1,512795E+23                           | 1,354438E+23                           | 2,867233E+23  |
| -328              | 7,564026E+22                              | 7,563825E+22 | 6,772124E+22 | 6,772067E+22 | 1,512785E+23                           | 1,354419E+23                           | 2,867204E+23  |
| -327              | 7,563705E+22                              | 7,563816E+22 | 6,772115E+22 | 6,772029E+22 | 1,512752E+23                           | 1,354414E+23                           | 2,867166E+23  |
| -326              | 7,563900E+22                              | 7,564035E+22 | 6,772076E+22 | 6,772161E+22 | 1,512793E+23                           | 1,354424E+23                           | 2,867217E+23  |
| -325              | 7,563750E+22                              | 7,563757E+22 | 6,772029E+22 | 6,771970E+22 | 1,512751E+23                           | 1,354400E+23                           | 2,867151E+23  |
| -324              | 7,563633E+22                              | 7,563824E+22 | 6,772063E+22 | 6,771980E+22 | 1,512746E+23                           | 1,354404E+23                           | 2,867150E+23  |
| -323              | 7,563969E+22                              | 7,563834E+22 | 6,771989E+22 | 6,772056E+22 | 1,512780E+23                           | 1,354405E+23                           | 2,867185E+23  |
| -322              | 7,563726E+22                              | 7,563607E+22 | 6,771997E+22 | 6,771883E+22 | 1,512733E+23                           | 1,354388E+23                           | 2,867121E+23  |
| -321              | 7,563777E+22                              | 7,563893E+22 | 6,772027E+22 | 6,772029E+22 | 1,512767E+23                           | 1,354406E+23                           | 2,867173E+23  |
| -320              | 7,563957E+22                              | 7,563848E+22 | 6,771958E+22 | 6,772037E+22 | 1,512780E+23                           | 1,354399E+23                           | 2,867180E+23  |
| -319              | 7,563639E+22                              | 7,563785E+22 | 6,772046E+22 | 6,772012E+22 | 1,512742E+23                           | 1,354406E+23                           | 2,867148E+23  |
| -318              | 7,563853E+22                              | 7,564024E+22 | 6,772153E+22 | 6,772184E+22 | 1,512788E+23                           | 1,354434E+23                           | 2,867221E+23  |
| -317              | 7,563901E+22                              | 7,563788E+22 | 6,772186E+22 | 6,772065E+22 | 1,512769E+23                           | 1,354425E+23                           | 2,867194E+23  |
| -316              | 7,563720E+22                              | 7,563826E+22 | 6,772298E+22 | 6,772149E+22 | 1,512755E+23                           | 1,354445E+23                           | 2,867199E+23  |
| -315              | 7,564026E+22                              | 7,563980E+22 | 6,772240E+22 | 6,772370E+22 | 1,512801E+23                           | 1,354461E+23                           | 2,867262E+23  |
| -314              | 7,563832E+22                              | 7,563774E+22 | 6,772259E+22 | 6,772238E+22 | 1,512761E+23                           | 1,354450E+23                           | 2,867210E+23  |
| -313              | 7,563782E+22                              | 7,563990E+22 | 6,772312E+22 | 6,772339E+22 | 1,512777E+23                           | 1,354465E+23                           | 2,867242E+23  |
| -312              | 7,564091E+22                              | 7,563963E+22 | 6,772227E+22 | 6,772312E+22 | 1,512805E+23                           | 1,354454E+23                           | 2,867259E+23  |
| -311              | 7,563836E+22                              | 7,563793E+22 | 6,772273E+22 | 6,772158E+22 | 1,512763E+23                           | 1,354443E+23                           | 2,867206E+23  |
| -310              | 7,563924E+22                              | 7,564033E+22 | 6,772306E+22 | 6,772270E+22 | 1,512796E+23                           | 1,354458E+23                           | 2,867253E+23  |
| -309              | 7,564000E+22                              | 7,563909E+22 | 6,772204E+22 | 6,772141E+22 | 1,512791E+23                           | 1,354434E+23                           | 2,867225E+23  |
| -308              | 7,563668E+22                              | 7,563867E+22 | 6,772228E+22 | 6,772130E+22 | 1,512754E+23                           | 1,354436E+23                           | 2,867189E+23  |
| -307              | 7,563886E+22                              | 7,563997E+22 | 6,772149E+22 | 6,772271E+22 | 1,512788E+23                           | 1,354442E+23                           | 2,867230E+23  |
| -306              | 7,563810E+22                              | 7,563711E+22 | 6,772145E+22 | 6,772033E+22 | 1,512752E+23                           | 1,354418E+23                           | 2,867170E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -305              | 7,563679E+22                              | 7,563796E+22 | 6,772168E+22 | 6,772072E+22 | 1,512747E+23                           | 1,354424E+23                           | 2,867172E+23  |
| -304              | 7,564021E+22                              | 7,563848E+22 | 6,772032E+22 | 6,772127E+22 | 1,512787E+23                           | 1,354416E+23                           | 2,867203E+23  |
| -303              | 7,563784E+22                              | 7,563692E+22 | 6,772035E+22 | 6,772013E+22 | 1,512748E+23                           | 1,354405E+23                           | 2,867152E+23  |
| -302              | 7,563734E+22                              | 7,563951E+22 | 6,772110E+22 | 6,772161E+22 | 1,512769E+23                           | 1,354427E+23                           | 2,867196E+23  |
| -301              | 7,563956E+22                              | 7,563916E+22 | 6,772077E+22 | 6,772094E+22 | 1,512787E+23                           | 1,354417E+23                           | 2,867204E+23  |
| -300              | 7,563683E+22                              | 7,563789E+22 | 6,772220E+22 | 6,772070E+22 | 1,512747E+23                           | 1,354429E+23                           | 2,867176E+23  |
| -299              | 7,563893E+22                              | 7,563964E+22 | 6,772268E+22 | 6,772289E+22 | 1,512786E+23                           | 1,354456E+23                           | 2,867241E+23  |
| -298              | 7,563956E+22                              | 7,563785E+22 | 6,772305E+22 | 6,772185E+22 | 1,512774E+23                           | 1,354449E+23                           | 2,867223E+23  |
| -297              | 7,563702E+22                              | 7,563876E+22 | 6,772381E+22 | 6,772319E+22 | 1,512758E+23                           | 1,354470E+23                           | 2,867228E+23  |
| -296              | 7,564026E+22                              | 7,564034E+22 | 6,772281E+22 | 6,772475E+22 | 1,512806E+23                           | 1,354476E+23                           | 2,867282E+23  |
| -295              | 7,563900E+22                              | 7,563827E+22 | 6,772329E+22 | 6,772334E+22 | 1,512773E+23                           | 1,354466E+23                           | 2,867239E+23  |
| -294              | 7,563802E+22                              | 7,563997E+22 | 6,772434E+22 | 6,772412E+22 | 1,512780E+23                           | 1,354485E+23                           | 2,867264E+23  |
| -293              | 7,564149E+22                              | 7,564000E+22 | 6,772346E+22 | 6,772335E+22 | 1,512815E+23                           | 1,354468E+23                           | 2,867283E+23  |
| -292              | 7,563864E+22                              | 7,563826E+22 | 6,772405E+22 | 6,772233E+22 | 1,512769E+23                           | 1,354464E+23                           | 2,867233E+23  |
| -291              | 7,563888E+22                              | 7,564044E+22 | 6,772362E+22 | 6,772405E+22 | 1,512793E+23                           | 1,354477E+23                           | 2,867270E+23  |
| -290              | 7,563986E+22                              | 7,563914E+22 | 6,772288E+22 | 6,772247E+22 | 1,512790E+23                           | 1,354454E+23                           | 2,867244E+23  |
| -289              | 7,563644E+22                              | 7,563850E+22 | 6,772325E+22 | 6,772236E+22 | 1,512749E+23                           | 1,354456E+23                           | 2,867206E+23  |
| -288              | 7,563942E+22                              | 7,563953E+22 | 6,772202E+22 | 6,772306E+22 | 1,512789E+23                           | 1,354451E+23                           | 2,867240E+23  |
| -287              | 7,563924E+22                              | 7,563701E+22 | 6,772189E+22 | 6,772105E+22 | 1,512762E+23                           | 1,354429E+23                           | 2,867192E+23  |
| -286              | 7,563696E+22                              | 7,563832E+22 | 6,772230E+22 | 6,772179E+22 | 1,512753E+23                           | 1,354441E+23                           | 2,867194E+23  |
| -285              | 7,564029E+22                              | 7,563960E+22 | 6,772084E+22 | 6,772192E+22 | 1,512799E+23                           | 1,354428E+23                           | 2,867227E+23  |
| -284              | 7,563774E+22                              | 7,563781E+22 | 6,772161E+22 | 6,772095E+22 | 1,512755E+23                           | 1,354426E+23                           | 2,867181E+23  |
| -283              | 7,563719E+22                              | 7,563963E+22 | 6,772231E+22 | 6,772258E+22 | 1,512768E+23                           | 1,354449E+23                           | 2,867217E+23  |
| -282              | 7,563999E+22                              | 7,563894E+22 | 6,772250E+22 | 6,772172E+22 | 1,512789E+23                           | 1,354442E+23                           | 2,867231E+23  |
| -281              | 7,563700E+22                              | 7,563769E+22 | 6,772381E+22 | 6,772210E+22 | 1,512747E+23                           | 1,354459E+23                           | 2,867206E+23  |
| -280              | 7,563919E+22                              | 7,563960E+22 | 6,772337E+22 | 6,772421E+22 | 1,512788E+23                           | 1,354476E+23                           | 2,867264E+23  |
| -279              | 7,564000E+22                              | 7,563840E+22 | 6,772340E+22 | 6,772365E+22 | 1,512784E+23                           | 1,354470E+23                           | 2,867254E+23  |
| -278              | 7,563687E+22                              | 7,563914E+22 | 6,772447E+22 | 6,772468E+22 | 1,512760E+23                           | 1,354491E+23                           | 2,867252E+23  |
| -277              | 7,564075E+22                              | 7,564082E+22 | 6,772371E+22 | 6,772508E+22 | 1,512816E+23                           | 1,354488E+23                           | 2,867304E+23  |
| -276              | 7,563989E+22                              | 7,563853E+22 | 6,772474E+22 | 6,772350E+22 | 1,512784E+23                           | 1,354482E+23                           | 2,867267E+23  |
| -275              | 7,563855E+22                              | 7,563984E+22 | 6,772533E+22 | 6,772466E+22 | 1,512784E+23                           | 1,354500E+23                           | 2,867284E+23  |
| -274              | 7,564176E+22                              | 7,564034E+22 | 6,772465E+22 | 6,772414E+22 | 1,512821E+23                           | 1,354488E+23                           | 2,867309E+23  |
| -273              | 7,563805E+22                              | 7,563888E+22 | 6,772507E+22 | 6,772378E+22 | 1,512769E+23                           | 1,354489E+23                           | 2,867258E+23  |
| -272              | 7,563838E+22                              | 7,564057E+22 | 6,772422E+22 | 6,772506E+22 | 1,512790E+23                           | 1,354493E+23                           | 2,867282E+23  |
| -271              | 7,564023E+22                              | 7,563919E+22 | 6,772356E+22 | 6,772361E+22 | 1,512794E+23                           | 1,354472E+23                           | 2,867266E+23  |
| -270              | 7,563667E+22                              | 7,563804E+22 | 6,772408E+22 | 6,772324E+22 | 1,512747E+23                           | 1,354473E+23                           | 2,867220E+23  |
| -269              | 7,564010E+22                              | 7,563957E+22 | 6,772267E+22 | 6,772343E+22 | 1,512797E+23                           | 1,354461E+23                           | 2,867258E+23  |
| -268              | 7,563980E+22                              | 7,563756E+22 | 6,772261E+22 | 6,772179E+22 | 1,512774E+23                           | 1,354444E+23                           | 2,867218E+23  |
| -267              | 7,563677E+22                              | 7,563875E+22 | 6,772263E+22 | 6,772289E+22 | 1,512755E+23                           | 1,354455E+23                           | 2,867210E+23  |
| -266              | 7,564030E+22                              | 7,564006E+22 | 6,772194E+22 | 6,772267E+22 | 1,512804E+23                           | 1,354446E+23                           | 2,867250E+23  |
| -265              | 7,563760E+22                              | 7,563796E+22 | 6,772312E+22 | 6,772186E+22 | 1,512756E+23                           | 1,354450E+23                           | 2,867205E+23  |
| -264              | 7,563749E+22                              | 7,563926E+22 | 6,772349E+22 | 6,772317E+22 | 1,512768E+23                           | 1,354467E+23                           | 2,867234E+23  |
| -263              | 7,564076E+22                              | 7,563894E+22 | 6,772343E+22 | 6,772302E+22 | 1,512797E+23                           | 1,354464E+23                           | 2,867261E+23  |
| -262              | 7,563693E+22                              | 7,563789E+22 | 6,772470E+22 | 6,772377E+22 | 1,512748E+23                           | 1,354485E+23                           | 2,867233E+23  |
| -261              | 7,563934E+22                              | 7,564038E+22 | 6,772403E+22 | 6,772537E+22 | 1,512797E+23                           | 1,354494E+23                           | 2,867291E+23  |
| -260              | 7,564038E+22                              | 7,563908E+22 | 6,772454E+22 | 6,772463E+22 | 1,512795E+23                           | 1,354492E+23                           | 2,867286E+23  |
| -259              | 7,563726E+22                              | 7,563924E+22 | 6,772550E+22 | 6,772550E+22 | 1,512765E+23                           | 1,354510E+23                           | 2,867275E+23  |
| -258              | 7,564161E+22                              | 7,564082E+22 | 6,772528E+22 | 6,772550E+22 | 1,512824E+23                           | 1,354508E+23                           | 2,867332E+23  |
| -257              | 7,564010E+22                              | 7,563879E+22 | 6,772627E+22 | 6,772450E+22 | 1,512789E+23                           | 1,354508E+23                           | 2,867297E+23  |



| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -256              | 7,563846E+22                              | 7,564016E+22 | 6,772604E+22 | 6,772574E+22 | 1,512786E+23                           | 1,354518E+23                           | 2,867304E+23  |
| -255              | 7,564161E+22                              | 7,564090E+22 | 6,772502E+22 | 6,772574E+22 | 1,512825E+23                           | 1,354508E+23                           | 2,867333E+23  |
| -254              | 7,563745E+22                              | 7,563891E+22 | 6,772581E+22 | 6,772520E+22 | 1,512764E+23                           | 1,354510E+23                           | 2,867274E+23  |
| -253              | 7,563869E+22                              | 7,564039E+22 | 6,772489E+22 | 6,772540E+22 | 1,512791E+23                           | 1,354503E+23                           | 2,867294E+23  |
| -252              | 7,564103E+22                              | 7,563893E+22 | 6,772448E+22 | 6,772388E+22 | 1,512800E+23                           | 1,354484E+23                           | 2,867283E+23  |
| -251              | 7,563725E+22                              | 7,563786E+22 | 6,772447E+22 | 6,772384E+22 | 1,512751E+23                           | 1,354483E+23                           | 2,867234E+23  |
| -250              | 7,564057E+22                              | 7,563998E+22 | 6,772337E+22 | 6,772400E+22 | 1,512805E+23                           | 1,354474E+23                           | 2,867279E+23  |
| -249              | 7,563944E+22                              | 7,563851E+22 | 6,772355E+22 | 6,772280E+22 | 1,512779E+23                           | 1,354464E+23                           | 2,867243E+23  |
| -248              | 7,563653E+22                              | 7,563915E+22 | 6,772353E+22 | 6,772355E+22 | 1,512757E+23                           | 1,354471E+23                           | 2,867227E+23  |
| -247              | 7,564052E+22                              | 7,564033E+22 | 6,772313E+22 | 6,772367E+22 | 1,512808E+23                           | 1,354468E+23                           | 2,867276E+23  |
| -246              | 7,563760E+22                              | 7,563769E+22 | 6,772467E+22 | 6,772314E+22 | 1,512753E+23                           | 1,354478E+23                           | 2,867231E+23  |
| -245              | 7,563788E+22                              | 7,563919E+22 | 6,772465E+22 | 6,772421E+22 | 1,512771E+23                           | 1,354489E+23                           | 2,867259E+23  |
| -244              | 7,564111E+22                              | 7,563935E+22 | 6,772443E+22 | 6,772453E+22 | 1,512805E+23                           | 1,354490E+23                           | 2,867294E+23  |
| -243              | 7,563697E+22                              | 7,563817E+22 | 6,772507E+22 | 6,772537E+22 | 1,512751E+23                           | 1,354504E+23                           | 2,867256E+23  |
| -242              | 7,563987E+22                              | 7,564061E+22 | 6,772508E+22 | 6,772625E+22 | 1,512805E+23                           | 1,354513E+23                           | 2,867318E+23  |
| -241              | 7,564084E+22                              | 7,563943E+22 | 6,772592E+22 | 6,772534E+22 | 1,512803E+23                           | 1,354513E+23                           | 2,867315E+23  |
| -240              | 7,563793E+22                              | 7,563920E+22 | 6,772656E+22 | 6,772584E+22 | 1,512771E+23                           | 1,354524E+23                           | 2,867295E+23  |
| -239              | 7,564221E+22                              | 7,564135E+22 | 6,772622E+22 | 6,772654E+22 | 1,512836E+23                           | 1,354528E+23                           | 2,867363E+23  |
| -238              | 7,563964E+22                              | 7,563930E+22 | 6,772724E+22 | 6,772597E+22 | 1,512789E+23                           | 1,354532E+23                           | 2,867322E+23  |
| -237              | 7,563796E+22                              | 7,564075E+22 | 6,772682E+22 | 6,772677E+22 | 1,512787E+23                           | 1,354536E+23                           | 2,867323E+23  |
| -236              | 7,564152E+22                              | 7,564121E+22 | 6,772607E+22 | 6,772670E+22 | 1,512827E+23                           | 1,354528E+23                           | 2,867355E+23  |
| -235              | 7,563764E+22                              | 7,563837E+22 | 6,772650E+22 | 6,772600E+22 | 1,512760E+23                           | 1,354525E+23                           | 2,867285E+23  |
| -234              | 7,563963E+22                              | 7,563981E+22 | 6,772594E+22 | 6,772578E+22 | 1,512794E+23                           | 1,354517E+23                           | 2,867312E+23  |
| -233              | 7,564148E+22                              | 7,563902E+22 | 6,772536E+22 | 6,772463E+22 | 1,512805E+23                           | 1,354500E+23                           | 2,867305E+23  |
| -232              | 7,563740E+22                              | 7,563824E+22 | 6,772470E+22 | 6,772456E+22 | 1,512756E+23                           | 1,354493E+23                           | 2,867249E+23  |
| -231              | 7,564056E+22                              | 7,564086E+22 | 6,772370E+22 | 6,772509E+22 | 1,512814E+23                           | 1,354488E+23                           | 2,867302E+23  |
| -230              | 7,563895E+22                              | 7,563884E+22 | 6,772468E+22 | 6,772383E+22 | 1,512778E+23                           | 1,354485E+23                           | 2,867263E+23  |
| -229              | 7,563667E+22                              | 7,563919E+22 | 6,772484E+22 | 6,772396E+22 | 1,512759E+23                           | 1,354488E+23                           | 2,867247E+23  |
| -228              | 7,564101E+22                              | 7,564026E+22 | 6,772461E+22 | 6,772446E+22 | 1,512813E+23                           | 1,354491E+23                           | 2,867303E+23  |
| -227              | 7,563786E+22                              | 7,563749E+22 | 6,772552E+22 | 6,772454E+22 | 1,512753E+23                           | 1,354501E+23                           | 2,867254E+23  |
| -226              | 7,563833E+22                              | 7,563938E+22 | 6,772560E+22 | 6,772557E+22 | 1,512777E+23                           | 1,354512E+23                           | 2,867289E+23  |
| -225              | 7,564100E+22                              | 7,564008E+22 | 6,772546E+22 | 6,772601E+22 | 1,512811E+23                           | 1,354515E+23                           | 2,867326E+23  |
| -224              | 7,563735E+22                              | 7,563855E+22 | 6,772589E+22 | 6,772621E+22 | 1,512759E+23                           | 1,354521E+23                           | 2,867280E+23  |
| -223              | 7,564065E+22                              | 7,564102E+22 | 6,772608E+22 | 6,772706E+22 | 1,512817E+23                           | 1,354531E+23                           | 2,867348E+23  |
| -222              | 7,564108E+22                              | 7,563961E+22 | 6,772744E+22 | 6,772632E+22 | 1,512807E+23                           | 1,354538E+23                           | 2,867345E+23  |
| -221              | 7,563820E+22                              | 7,563960E+22 | 6,772773E+22 | 6,772663E+22 | 1,512778E+23                           | 1,354544E+23                           | 2,867322E+23  |
| -220              | 7,564197E+22                              | 7,564199E+22 | 6,772726E+22 | 6,772785E+22 | 1,512840E+23                           | 1,354551E+23                           | 2,867391E+23  |
| -219              | 7,563915E+22                              | 7,563941E+22 | 6,772783E+22 | 6,772749E+22 | 1,512786E+23                           | 1,354553E+23                           | 2,867339E+23  |
| -218              | 7,563827E+22                              | 7,564029E+22 | 6,772785E+22 | 6,772752E+22 | 1,512786E+23                           | 1,354554E+23                           | 2,867339E+23  |
| -217              | 7,564189E+22                              | 7,564090E+22 | 6,772716E+22 | 6,772725E+22 | 1,512828E+23                           | 1,354544E+23                           | 2,867372E+23  |
| -216              | 7,563853E+22                              | 7,563796E+22 | 6,772691E+22 | 6,772621E+22 | 1,512765E+23                           | 1,354531E+23                           | 2,867296E+23  |
| -215              | 7,564037E+22                              | 7,564025E+22 | 6,772617E+22 | 6,772650E+22 | 1,512806E+23                           | 1,354527E+23                           | 2,867333E+23  |
| -214              | 7,564115E+22                              | 7,563986E+22 | 6,772599E+22 | 6,772569E+22 | 1,512810E+23                           | 1,354517E+23                           | 2,867327E+23  |
| -213              | 7,563707E+22                              | 7,563913E+22 | 6,772553E+22 | 6,772517E+22 | 1,512762E+23                           | 1,354507E+23                           | 2,867269E+23  |
| -212              | 7,564032E+22                              | 7,564147E+22 | 6,772514E+22 | 6,772582E+22 | 1,512818E+23                           | 1,354510E+23                           | 2,867327E+23  |
| -211              | 7,563892E+22                              | 7,563854E+22 | 6,772596E+22 | 6,772485E+22 | 1,512775E+23                           | 1,354508E+23                           | 2,867283E+23  |
| -210              | 7,563731E+22                              | 7,563855E+22 | 6,772640E+22 | 6,772493E+22 | 1,512759E+23                           | 1,354513E+23                           | 2,867272E+23  |
| -209              | 7,564119E+22                              | 7,564030E+22 | 6,772581E+22 | 6,772597E+22 | 1,512815E+23                           | 1,354518E+23                           | 2,867333E+23  |
| -208              | 7,563806E+22                              | 7,563764E+22 | 6,772576E+22 | 6,772597E+22 | 1,512757E+23                           | 1,354517E+23                           | 2,867274E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -207                   | 7,563874E+22                              | 7,564003E+22 | 6,772588E+22 | 6,772701E+22 | 1,512788E+23                           | 1,354529E+23                           | 2,867317E+23  |
| -206                   | 7,564117E+22                              | 7,564038E+22 | 6,772648E+22 | 6,772697E+22 | 1,512815E+23                           | 1,354534E+23                           | 2,867350E+23  |
| -205                   | 7,563798E+22                              | 7,563879E+22 | 6,772713E+22 | 6,772637E+22 | 1,512768E+23                           | 1,354535E+23                           | 2,867303E+23  |
| -204                   | 7,564126E+22                              | 7,564151E+22 | 6,772758E+22 | 6,772757E+22 | 1,512828E+23                           | 1,354551E+23                           | 2,867379E+23  |
| -203                   | 7,564108E+22                              | 7,563985E+22 | 6,772849E+22 | 6,772753E+22 | 1,512809E+23                           | 1,354560E+23                           | 2,867370E+23  |
| -202                   | 7,563822E+22                              | 7,563987E+22 | 6,772898E+22 | 6,772789E+22 | 1,512781E+23                           | 1,354569E+23                           | 2,867350E+23  |
| -201                   | 7,564148E+22                              | 7,564241E+22 | 6,772848E+22 | 6,772919E+22 | 1,512839E+23                           | 1,354577E+23                           | 2,867416E+23  |
| -200                   | 7,563932E+22                              | 7,563915E+22 | 6,772855E+22 | 6,772836E+22 | 1,512785E+23                           | 1,354569E+23                           | 2,867354E+23  |
| -199                   | 7,563907E+22                              | 7,564014E+22 | 6,772846E+22 | 6,772833E+22 | 1,512792E+23                           | 1,354568E+23                           | 2,867360E+23  |
| -198                   | 7,564231E+22                              | 7,564073E+22 | 6,772808E+22 | 6,772809E+22 | 1,512830E+23                           | 1,354562E+23                           | 2,867392E+23  |
| -197                   | 7,563894E+22                              | 7,563846E+22 | 6,772743E+22 | 6,772673E+22 | 1,512774E+23                           | 1,354542E+23                           | 2,867316E+23  |
| -196                   | 7,564027E+22                              | 7,564131E+22 | 6,772674E+22 | 6,772738E+22 | 1,512816E+23                           | 1,354541E+23                           | 2,867357E+23  |
| -195                   | 7,564066E+22                              | 7,564034E+22 | 6,772664E+22 | 6,772677E+22 | 1,512810E+23                           | 1,354534E+23                           | 2,867344E+23  |
| -194                   | 7,563734E+22                              | 7,563891E+22 | 6,772693E+22 | 6,772577E+22 | 1,512762E+23                           | 1,354527E+23                           | 2,867289E+23  |
| -193                   | 7,564032E+22                              | 7,564126E+22 | 6,772671E+22 | 6,772651E+22 | 1,512816E+23                           | 1,354532E+23                           | 2,867348E+23  |
| -192                   | 7,563949E+22                              | 7,563808E+22 | 6,772678E+22 | 6,772574E+22 | 1,512776E+23                           | 1,354525E+23                           | 2,867301E+23  |
| -191                   | 7,563791E+22                              | 7,563869E+22 | 6,772676E+22 | 6,772628E+22 | 1,512766E+23                           | 1,354530E+23                           | 2,867296E+23  |
| -190                   | 7,564098E+22                              | 7,564078E+22 | 6,772651E+22 | 6,772750E+22 | 1,512818E+23                           | 1,354540E+23                           | 2,867358E+23  |
| -189                   | 7,563827E+22                              | 7,563838E+22 | 6,772645E+22 | 6,772671E+22 | 1,512767E+23                           | 1,354532E+23                           | 2,867298E+23  |
| -188                   | 7,563913E+22                              | 7,564071E+22 | 6,772709E+22 | 6,772762E+22 | 1,512798E+23                           | 1,354547E+23                           | 2,867346E+23  |
| -187                   | 7,564155E+22                              | 7,564047E+22 | 6,772784E+22 | 6,772778E+22 | 1,512820E+23                           | 1,354556E+23                           | 2,867376E+23  |
| -186                   | 7,563881E+22                              | 7,563861E+22 | 6,772889E+22 | 6,772716E+22 | 1,512774E+23                           | 1,354561E+23                           | 2,867335E+23  |
| -185                   | 7,564103E+22                              | 7,564199E+22 | 6,772911E+22 | 6,772890E+22 | 1,512830E+23                           | 1,354580E+23                           | 2,867410E+23  |
| -184                   | 7,564090E+22                              | 7,564013E+22 | 6,772909E+22 | 6,772907E+22 | 1,512810E+23                           | 1,354582E+23                           | 2,867392E+23  |
| -183                   | 7,563830E+22                              | 7,564008E+22 | 6,772949E+22 | 6,772936E+22 | 1,512784E+23                           | 1,354589E+23                           | 2,867372E+23  |
| -182                   | 7,564149E+22                              | 7,564219E+22 | 6,772951E+22 | 6,773025E+22 | 1,512837E+23                           | 1,354598E+23                           | 2,867434E+23  |
| -181                   | 7,564009E+22                              | 7,563901E+22 | 6,772927E+22 | 6,772859E+22 | 1,512791E+23                           | 1,354579E+23                           | 2,867370E+23  |
| -180                   | 7,563987E+22                              | 7,564054E+22 | 6,772915E+22 | 6,772881E+22 | 1,512804E+23                           | 1,354580E+23                           | 2,867384E+23  |
| -179                   | 7,564241E+22                              | 7,564121E+22 | 6,772853E+22 | 6,772902E+22 | 1,512836E+23                           | 1,354575E+23                           | 2,867412E+23  |
| -178                   | 7,563904E+22                              | 7,563903E+22 | 6,772839E+22 | 6,772750E+22 | 1,512781E+23                           | 1,354559E+23                           | 2,867340E+23  |
| -177                   | 7,563972E+22                              | 7,564203E+22 | 6,772809E+22 | 6,772812E+22 | 1,512817E+23                           | 1,354562E+23                           | 2,867380E+23  |
| -176                   | 7,564067E+22                              | 7,564011E+22 | 6,772760E+22 | 6,772742E+22 | 1,512808E+23                           | 1,354550E+23                           | 2,867358E+23  |
| -175                   | 7,563787E+22                              | 7,563856E+22 | 6,772792E+22 | 6,772671E+22 | 1,512764E+23                           | 1,354546E+23                           | 2,867311E+23  |
| -174                   | 7,564047E+22                              | 7,564080E+22 | 6,772782E+22 | 6,772775E+22 | 1,512813E+23                           | 1,354556E+23                           | 2,867369E+23  |
| -173                   | 7,563970E+22                              | 7,563824E+22 | 6,772722E+22 | 6,772680E+22 | 1,512779E+23                           | 1,354540E+23                           | 2,867320E+23  |
| -172                   | 7,563805E+22                              | 7,563955E+22 | 6,772711E+22 | 6,772755E+22 | 1,512776E+23                           | 1,354547E+23                           | 2,867323E+23  |
| -171                   | 7,564102E+22                              | 7,564104E+22 | 6,772711E+22 | 6,772860E+22 | 1,512821E+23                           | 1,354557E+23                           | 2,867378E+23  |
| -170                   | 7,563913E+22                              | 7,563837E+22 | 6,772787E+22 | 6,772710E+22 | 1,512775E+23                           | 1,354550E+23                           | 2,867325E+23  |
| -169                   | 7,563956E+22                              | 7,564103E+22 | 6,772881E+22 | 6,772801E+22 | 1,512806E+23                           | 1,354568E+23                           | 2,867374E+23  |
| -168                   | 7,564206E+22                              | 7,564057E+22 | 6,772892E+22 | 6,772866E+22 | 1,512826E+23                           | 1,354576E+23                           | 2,867402E+23  |
| -167                   | 7,563903E+22                              | 7,563921E+22 | 6,772978E+22 | 6,772871E+22 | 1,512782E+23                           | 1,354585E+23                           | 2,867367E+23  |
| -166                   | 7,564035E+22                              | 7,564250E+22 | 6,773029E+22 | 6,773068E+22 | 1,512828E+23                           | 1,354610E+23                           | 2,867438E+23  |
| -165                   | 7,564077E+22                              | 7,564052E+22 | 6,773003E+22 | 6,773018E+22 | 1,512813E+23                           | 1,354602E+23                           | 2,867415E+23  |
| -164                   | 7,563875E+22                              | 7,564034E+22 | 6,773045E+22 | 6,773027E+22 | 1,512791E+23                           | 1,354607E+23                           | 2,867398E+23  |
| -163                   | 7,564205E+22                              | 7,564183E+22 | 6,773044E+22 | 6,773113E+22 | 1,512839E+23                           | 1,354616E+23                           | 2,867455E+23  |
| -162                   | 7,564119E+22                              | 7,563886E+22 | 6,773032E+22 | 6,772917E+22 | 1,512800E+23                           | 1,354595E+23                           | 2,867395E+23  |
| -161                   | 7,563983E+22                              | 7,564124E+22 | 6,773004E+22 | 6,772958E+22 | 1,512811E+23                           | 1,354596E+23                           | 2,867407E+23  |
| -160                   | 7,564230E+22                              | 7,564175E+22 | 6,772883E+22 | 6,772995E+22 | 1,512840E+23                           | 1,354588E+23                           | 2,867428E+23  |
| -159                   | 7,563914E+22                              | 7,563927E+22 | 6,772899E+22 | 6,772831E+22 | 1,512784E+23                           | 1,354573E+23                           | 2,867357E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| -158                   | 7,563937E+22                              | 7,564172E+22 | 6,772940E+22 | 6,772883E+22 | 1,512811E+23                           | 1,354582E+23                           | 2,867393E+23  |
| -157                   | 7,564102E+22                              | 7,563986E+22 | 6,772853E+22 | 6,772780E+22 | 1,512809E+23                           | 1,354563E+23                           | 2,867372E+23  |
| -156                   | 7,563834E+22                              | 7,563869E+22 | 6,772855E+22 | 6,772764E+22 | 1,512770E+23                           | 1,354562E+23                           | 2,867332E+23  |
| -155                   | 7,564045E+22                              | 7,564094E+22 | 6,772829E+22 | 6,772917E+22 | 1,512814E+23                           | 1,354575E+23                           | 2,867388E+23  |
| -154                   | 7,564012E+22                              | 7,563863E+22 | 6,772800E+22 | 6,772782E+22 | 1,512787E+23                           | 1,354558E+23                           | 2,867346E+23  |
| -153                   | 7,563801E+22                              | 7,564031E+22 | 6,772834E+22 | 6,772825E+22 | 1,512783E+23                           | 1,354566E+23                           | 2,867349E+23  |
| -152                   | 7,564154E+22                              | 7,564120E+22 | 6,772812E+22 | 6,772924E+22 | 1,512827E+23                           | 1,354574E+23                           | 2,867401E+23  |
| -151                   | 7,563994E+22                              | 7,563851E+22 | 6,772919E+22 | 6,772798E+22 | 1,512785E+23                           | 1,354572E+23                           | 2,867356E+23  |
| -150                   | 7,563948E+22                              | 7,564121E+22 | 6,773045E+22 | 6,772939E+22 | 1,512807E+23                           | 1,354598E+23                           | 2,867405E+23  |
| -149                   | 7,564187E+22                              | 7,564116E+22 | 6,772984E+22 | 6,773008E+22 | 1,512830E+23                           | 1,354599E+23                           | 2,867430E+23  |
| -148                   | 7,563887E+22                              | 7,563997E+22 | 6,773052E+22 | 6,773043E+22 | 1,512788E+23                           | 1,354609E+23                           | 2,867398E+23  |
| -147                   | 7,564029E+22                              | 7,564229E+22 | 6,773120E+22 | 6,773211E+22 | 1,512826E+23                           | 1,354633E+23                           | 2,867459E+23  |
| -146                   | 7,564173E+22                              | 7,564005E+22 | 6,773126E+22 | 6,773077E+22 | 1,512818E+23                           | 1,354620E+23                           | 2,867438E+23  |
| -145                   | 7,563953E+22                              | 7,564047E+22 | 6,773163E+22 | 6,773063E+22 | 1,512800E+23                           | 1,354623E+23                           | 2,867423E+23  |
| -144                   | 7,564285E+22                              | 7,564185E+22 | 6,773083E+22 | 6,773172E+22 | 1,512847E+23                           | 1,354625E+23                           | 2,867472E+23  |
| -143                   | 7,564152E+22                              | 7,563962E+22 | 6,773077E+22 | 6,773005E+22 | 1,512811E+23                           | 1,354608E+23                           | 2,867420E+23  |
| -142                   | 7,563921E+22                              | 7,564194E+22 | 6,773103E+22 | 6,773053E+22 | 1,512811E+23                           | 1,354616E+23                           | 2,867427E+23  |
| -141                   | 7,564187E+22                              | 7,564214E+22 | 6,772976E+22 | 6,773043E+22 | 1,512840E+23                           | 1,354602E+23                           | 2,867442E+23  |
| -140                   | 7,563922E+22                              | 7,563948E+22 | 6,773006E+22 | 6,772910E+22 | 1,512787E+23                           | 1,354592E+23                           | 2,867379E+23  |
| -139                   | 7,563948E+22                              | 7,564103E+22 | 6,773048E+22 | 6,772990E+22 | 1,512805E+23                           | 1,354604E+23                           | 2,867409E+23  |
| -138                   | 7,564166E+22                              | 7,563945E+22 | 6,772952E+22 | 6,772882E+22 | 1,512811E+23                           | 1,354583E+23                           | 2,867394E+23  |
| -137                   | 7,563829E+22                              | 7,563930E+22 | 6,772916E+22 | 6,772877E+22 | 1,512776E+23                           | 1,354579E+23                           | 2,867355E+23  |
| -136                   | 7,564062E+22                              | 7,564123E+22 | 6,772840E+22 | 6,773031E+22 | 1,512819E+23                           | 1,354587E+23                           | 2,867406E+23  |
| -135                   | 7,564071E+22                              | 7,563900E+22 | 6,772868E+22 | 6,772858E+22 | 1,512797E+23                           | 1,354573E+23                           | 2,867370E+23  |
| -134                   | 7,563822E+22                              | 7,564042E+22 | 6,772986E+22 | 6,772884E+22 | 1,512786E+23                           | 1,354587E+23                           | 2,867373E+23  |
| -133                   | 7,564199E+22                              | 7,564149E+22 | 6,772941E+22 | 6,772968E+22 | 1,512835E+23                           | 1,354591E+23                           | 2,867426E+23  |
| -132                   | 7,564026E+22                              | 7,563927E+22 | 6,773031E+22 | 6,772925E+22 | 1,512795E+23                           | 1,354596E+23                           | 2,867391E+23  |
| -131                   | 7,563904E+22                              | 7,564155E+22 | 6,773160E+22 | 6,773121E+22 | 1,512806E+23                           | 1,354628E+23                           | 2,867434E+23  |
| -130                   | 7,564199E+22                              | 7,564142E+22 | 6,773114E+22 | 6,773151E+22 | 1,512834E+23                           | 1,354627E+23                           | 2,867461E+23  |
| -129                   | 7,563890E+22                              | 7,564025E+22 | 6,773188E+22 | 6,773141E+22 | 1,512791E+23                           | 1,354633E+23                           | 2,867424E+23  |
| -128                   | 7,564109E+22                              | 7,564189E+22 | 6,773202E+22 | 6,773297E+22 | 1,512830E+23                           | 1,354650E+23                           | 2,867480E+23  |
| -127                   | 7,564295E+22                              | 7,563989E+22 | 6,773206E+22 | 6,773147E+22 | 1,512828E+23                           | 1,354635E+23                           | 2,867464E+23  |
| -126                   | 7,563968E+22                              | 7,564072E+22 | 6,773262E+22 | 6,773156E+22 | 1,512804E+23                           | 1,354642E+23                           | 2,867446E+23  |
| -125                   | 7,564265E+22                              | 7,564276E+22 | 6,773125E+22 | 6,773250E+22 | 1,512854E+23                           | 1,354637E+23                           | 2,867492E+23  |
| -124                   | 7,564123E+22                              | 7,564061E+22 | 6,773128E+22 | 6,773106E+22 | 1,512818E+23                           | 1,354623E+23                           | 2,867442E+23  |
| -123                   | 7,563876E+22                              | 7,564177E+22 | 6,773214E+22 | 6,773144E+22 | 1,512805E+23                           | 1,354636E+23                           | 2,867441E+23  |
| -122                   | 7,564231E+22                              | 7,564163E+22 | 6,773106E+22 | 6,773086E+22 | 1,512839E+23                           | 1,354619E+23                           | 2,867459E+23  |
| -121                   | 7,563948E+22                              | 7,563936E+22 | 6,773121E+22 | 6,772966E+22 | 1,512788E+23                           | 1,354609E+23                           | 2,867397E+23  |
| -120                   | 7,563993E+22                              | 7,564076E+22 | 6,773075E+22 | 6,773101E+22 | 1,512807E+23                           | 1,354618E+23                           | 2,867425E+23  |
| -119                   | 7,564201E+22                              | 7,563987E+22 | 6,772982E+22 | 6,773001E+22 | 1,512819E+23                           | 1,354598E+23                           | 2,867417E+23  |
| -118                   | 7,563803E+22                              | 7,563991E+22 | 6,773005E+22 | 6,772982E+22 | 1,512779E+23                           | 1,354599E+23                           | 2,867378E+23  |
| -117                   | 7,564075E+22                              | 7,564177E+22 | 6,772928E+22 | 6,773072E+22 | 1,512825E+23                           | 1,354600E+23                           | 2,867425E+23  |
| -116                   | 7,564124E+22                              | 7,563962E+22 | 6,772987E+22 | 6,772930E+22 | 1,512809E+23                           | 1,354592E+23                           | 2,867400E+23  |
| -115                   | 7,563848E+22                              | 7,564021E+22 | 6,773147E+22 | 6,772997E+22 | 1,512787E+23                           | 1,354614E+23                           | 2,867401E+23  |
| -114                   | 7,564227E+22                              | 7,564158E+22 | 6,773090E+22 | 6,773094E+22 | 1,512839E+23                           | 1,354618E+23                           | 2,867457E+23  |
| -113                   | 7,563994E+22                              | 7,564004E+22 | 6,773154E+22 | 6,773080E+22 | 1,512800E+23                           | 1,354623E+23                           | 2,867423E+23  |
| -112                   | 7,563914E+22                              | 7,564139E+22 | 6,773215E+22 | 6,773277E+22 | 1,512805E+23                           | 1,354649E+23                           | 2,867454E+23  |
| -111                   | 7,564262E+22                              | 7,564120E+22 | 6,773205E+22 | 6,773252E+22 | 1,512838E+23                           | 1,354646E+23                           | 2,867484E+23  |
| -110                   | 7,563948E+22                              | 7,564010E+22 | 6,773308E+22 | 6,773210E+22 | 1,512796E+23                           | 1,354652E+23                           | 2,867448E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -109              | 7,564181E+22                              | 7,564206E+22 | 6,773268E+22 | 6,773334E+22 | 1,512839E+23                           | 1,354660E+23                           | 2,867499E+23  |
| -108              | 7,564338E+22                              | 7,564101E+22 | 6,773256E+22 | 6,773243E+22 | 1,512844E+23                           | 1,354650E+23                           | 2,867494E+23  |
| -107              | 7,563929E+22                              | 7,564137E+22 | 6,773351E+22 | 6,773278E+22 | 1,512807E+23                           | 1,354663E+23                           | 2,867470E+23  |
| -106              | 7,564242E+22                              | 7,564326E+22 | 6,773251E+22 | 6,773326E+22 | 1,512857E+23                           | 1,354658E+23                           | 2,867515E+23  |
| -105              | 7,564092E+22                              | 7,564103E+22 | 6,773279E+22 | 6,773166E+22 | 1,512819E+23                           | 1,354645E+23                           | 2,867464E+23  |
| -104              | 7,563908E+22                              | 7,564104E+22 | 6,773307E+22 | 6,773231E+22 | 1,512801E+23                           | 1,354654E+23                           | 2,867455E+23  |
| -103              | 7,564299E+22                              | 7,564109E+22 | 6,773197E+22 | 6,773182E+22 | 1,512841E+23                           | 1,354638E+23                           | 2,867479E+23  |
| -102              | 7,563951E+22                              | 7,563935E+22 | 6,773193E+22 | 6,773092E+22 | 1,512789E+23                           | 1,354629E+23                           | 2,867417E+23  |
| -101              | 7,563991E+22                              | 7,564129E+22 | 6,773080E+22 | 6,773199E+22 | 1,512812E+23                           | 1,354628E+23                           | 2,867440E+23  |
| -100              | 7,564224E+22                              | 7,564075E+22 | 6,773006E+22 | 6,773096E+22 | 1,512830E+23                           | 1,354610E+23                           | 2,867440E+23  |
| -99               | 7,563818E+22                              | 7,563988E+22 | 6,773123E+22 | 6,773049E+22 | 1,512781E+23                           | 1,354617E+23                           | 2,867398E+23  |
| -98               | 7,564149E+22                              | 7,564178E+22 | 6,773084E+22 | 6,773095E+22 | 1,512833E+23                           | 1,354618E+23                           | 2,867451E+23  |
| -97               | 7,564153E+22                              | 7,564005E+22 | 6,773144E+22 | 6,772990E+22 | 1,512816E+23                           | 1,354613E+23                           | 2,867429E+23  |
| -96               | 7,563860E+22                              | 7,564026E+22 | 6,773235E+22 | 6,773147E+22 | 1,512789E+23                           | 1,354638E+23                           | 2,867427E+23  |
| -95               | 7,564227E+22                              | 7,564194E+22 | 6,773181E+22 | 6,773251E+22 | 1,512842E+23                           | 1,354643E+23                           | 2,867485E+23  |
| -94               | 7,563955E+22                              | 7,564026E+22 | 6,773278E+22 | 6,773230E+22 | 1,512798E+23                           | 1,354651E+23                           | 2,867449E+23  |
| -93               | 7,563942E+22                              | 7,564148E+22 | 6,773300E+22 | 6,773364E+22 | 1,512809E+23                           | 1,354666E+23                           | 2,867475E+23  |
| -92               | 7,564350E+22                              | 7,564153E+22 | 6,773287E+22 | 6,773345E+22 | 1,512850E+23                           | 1,354663E+23                           | 2,867513E+23  |
| -91               | 7,564005E+22                              | 7,564001E+22 | 6,773427E+22 | 6,773314E+22 | 1,512801E+23                           | 1,354674E+23                           | 2,867475E+23  |
| -90               | 7,564223E+22                              | 7,564263E+22 | 6,773367E+22 | 6,773418E+22 | 1,512849E+23                           | 1,354679E+23                           | 2,867527E+23  |
| -89               | 7,564300E+22                              | 7,564217E+22 | 6,773357E+22 | 6,773336E+22 | 1,512852E+23                           | 1,354669E+23                           | 2,867521E+23  |
| -88               | 7,563917E+22                              | 7,564138E+22 | 6,773425E+22 | 6,773387E+22 | 1,512806E+23                           | 1,354681E+23                           | 2,867487E+23  |
| -87               | 7,564266E+22                              | 7,564289E+22 | 6,773370E+22 | 6,773388E+22 | 1,512856E+23                           | 1,354676E+23                           | 2,867531E+23  |
| -86               | 7,564108E+22                              | 7,564058E+22 | 6,773412E+22 | 6,773239E+22 | 1,512817E+23                           | 1,354665E+23                           | 2,867482E+23  |
| -85               | 7,563951E+22                              | 7,564077E+22 | 6,773353E+22 | 6,773297E+22 | 1,512803E+23                           | 1,354665E+23                           | 2,867468E+23  |
| -84               | 7,564330E+22                              | 7,564175E+22 | 6,773209E+22 | 6,773302E+22 | 1,512851E+23                           | 1,354651E+23                           | 2,867502E+23  |
| -83               | 7,563942E+22                              | 7,563972E+22 | 6,773250E+22 | 6,773212E+22 | 1,512791E+23                           | 1,354646E+23                           | 2,867438E+23  |
| -82               | 7,564013E+22                              | 7,564175E+22 | 6,773170E+22 | 6,773248E+22 | 1,512819E+23                           | 1,354642E+23                           | 2,867461E+23  |
| -81               | 7,564241E+22                              | 7,564150E+22 | 6,773148E+22 | 6,773126E+22 | 1,512839E+23                           | 1,354627E+23                           | 2,867466E+23  |
| -80               | 7,563881E+22                              | 7,563950E+22 | 6,773235E+22 | 6,773124E+22 | 1,512783E+23                           | 1,354636E+23                           | 2,867419E+23  |
| -79               | 7,564186E+22                              | 7,564161E+22 | 6,773223E+22 | 6,773192E+22 | 1,512835E+23                           | 1,354641E+23                           | 2,867476E+23  |
| -78               | 7,564114E+22                              | 7,564046E+22 | 6,773268E+22 | 6,773156E+22 | 1,512816E+23                           | 1,354642E+23                           | 2,867458E+23  |
| -77               | 7,563825E+22                              | 7,564060E+22 | 6,773281E+22 | 6,773299E+22 | 1,512788E+23                           | 1,354658E+23                           | 2,867446E+23  |
| -76               | 7,564242E+22                              | 7,564243E+22 | 6,773237E+22 | 6,773399E+22 | 1,512848E+23                           | 1,354664E+23                           | 2,867512E+23  |
| -75               | 7,564004E+22                              | 7,563989E+22 | 6,773395E+22 | 6,773332E+22 | 1,512799E+23                           | 1,354673E+23                           | 2,867472E+23  |
| -74               | 7,564051E+22                              | 7,564143E+22 | 6,773416E+22 | 6,773404E+22 | 1,512819E+23                           | 1,354682E+23                           | 2,867501E+23  |
| -73               | 7,564411E+22                              | 7,564234E+22 | 6,773408E+22 | 6,773397E+22 | 1,512865E+23                           | 1,354680E+23                           | 2,867545E+23  |
| -72               | 7,564038E+22                              | 7,564046E+22 | 6,773499E+22 | 6,773430E+22 | 1,512808E+23                           | 1,354693E+23                           | 2,867501E+23  |
| -71               | 7,564215E+22                              | 7,564327E+22 | 6,773483E+22 | 6,773517E+22 | 1,512854E+23                           | 1,354700E+23                           | 2,867554E+23  |
| -70               | 7,564249E+22                              | 7,564259E+22 | 6,773509E+22 | 6,773443E+22 | 1,512851E+23                           | 1,354695E+23                           | 2,867546E+23  |
| -69               | 7,563916E+22                              | 7,564121E+22 | 6,773526E+22 | 6,773461E+22 | 1,512804E+23                           | 1,354699E+23                           | 2,867502E+23  |
| -68               | 7,564316E+22                              | 7,564282E+22 | 6,773446E+22 | 6,773491E+22 | 1,512860E+23                           | 1,354694E+23                           | 2,867553E+23  |
| -67               | 7,564136E+22                              | 7,564005E+22 | 6,773503E+22 | 6,773367E+22 | 1,512814E+23                           | 1,354687E+23                           | 2,867501E+23  |
| -66               | 7,563988E+22                              | 7,564110E+22 | 6,773391E+22 | 6,773395E+22 | 1,512810E+23                           | 1,354679E+23                           | 2,867488E+23  |
| -65               | 7,564325E+22                              | 7,564263E+22 | 6,773255E+22 | 6,773374E+22 | 1,512859E+23                           | 1,354663E+23                           | 2,867522E+23  |
| -64               | 7,563972E+22                              | 7,563970E+22 | 6,773296E+22 | 6,773281E+22 | 1,512794E+23                           | 1,354658E+23                           | 2,867452E+23  |
| -63               | 7,564072E+22                              | 7,564166E+22 | 6,773285E+22 | 6,773258E+22 | 1,512824E+23                           | 1,354654E+23                           | 2,867478E+23  |
| -62               | 7,564255E+22                              | 7,564154E+22 | 6,773293E+22 | 6,773179E+22 | 1,512841E+23                           | 1,354647E+23                           | 2,867488E+23  |
| -61               | 7,563891E+22                              | 7,563966E+22 | 6,773317E+22 | 6,773218E+22 | 1,512786E+23                           | 1,354654E+23                           | 2,867439E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -60               | 7,564169E+22                              | 7,564239E+22 | 6,773279E+22 | 6,773355E+22 | 1,512841E+23                           | 1,354663E+23                           | 2,867504E+23  |
| -59               | 7,564075E+22                              | 7,564061E+22 | 6,773381E+22 | 6,773330E+22 | 1,512814E+23                           | 1,354671E+23                           | 2,867485E+23  |
| -58               | 7,563855E+22                              | 7,564078E+22 | 6,773391E+22 | 6,773397E+22 | 1,512793E+23                           | 1,354679E+23                           | 2,867472E+23  |
| -57               | 7,564296E+22                              | 7,564278E+22 | 6,773378E+22 | 6,773460E+22 | 1,512857E+23                           | 1,354684E+23                           | 2,867541E+23  |
| -56               | 7,564116E+22                              | 7,563951E+22 | 6,773496E+22 | 6,773425E+22 | 1,512807E+23                           | 1,354692E+23                           | 2,867499E+23  |
| -55               | 7,564135E+22                              | 7,564156E+22 | 6,773537E+22 | 6,773485E+22 | 1,512829E+23                           | 1,354702E+23                           | 2,867531E+23  |
| -54               | 7,564392E+22                              | 7,564323E+22 | 6,773524E+22 | 6,773531E+22 | 1,512871E+23                           | 1,354705E+23                           | 2,867577E+23  |
| -53               | 7,564010E+22                              | 7,564110E+22 | 6,773562E+22 | 6,773548E+22 | 1,512812E+23                           | 1,354711E+23                           | 2,867523E+23  |
| -52               | 7,564201E+22                              | 7,564378E+22 | 6,773569E+22 | 6,773629E+22 | 1,512858E+23                           | 1,354720E+23                           | 2,867578E+23  |
| -51               | 7,564265E+22                              | 7,564206E+22 | 6,773651E+22 | 6,773541E+22 | 1,512847E+23                           | 1,354719E+23                           | 2,867566E+23  |
| -50               | 7,563983E+22                              | 7,564082E+22 | 6,773620E+22 | 6,773515E+22 | 1,512806E+23                           | 1,354714E+23                           | 2,867520E+23  |
| -49               | 7,564350E+22                              | 7,564324E+22 | 6,773522E+22 | 6,773564E+22 | 1,512867E+23                           | 1,354709E+23                           | 2,867576E+23  |
| -48               | 7,564173E+22                              | 7,564016E+22 | 6,773507E+22 | 6,773482E+22 | 1,512819E+23                           | 1,354699E+23                           | 2,867518E+23  |
| -47               | 7,564002E+22                              | 7,564147E+22 | 6,773448E+22 | 6,773457E+22 | 1,512815E+23                           | 1,354691E+23                           | 2,867505E+23  |
| -46               | 7,564305E+22                              | 7,564322E+22 | 6,773368E+22 | 6,773431E+22 | 1,512863E+23                           | 1,354680E+23                           | 2,867542E+23  |
| -45               | 7,563997E+22                              | 7,563976E+22 | 6,773384E+22 | 6,773315E+22 | 1,512797E+23                           | 1,354670E+23                           | 2,867467E+23  |
| -44               | 7,564105E+22                              | 7,564192E+22 | 6,773387E+22 | 6,773340E+22 | 1,512830E+23                           | 1,354673E+23                           | 2,867502E+23  |
| -43               | 7,564248E+22                              | 7,564136E+22 | 6,773426E+22 | 6,773323E+22 | 1,512838E+23                           | 1,354675E+23                           | 2,867513E+23  |
| -42               | 7,563881E+22                              | 7,564004E+22 | 6,773396E+22 | 6,773357E+22 | 1,512789E+23                           | 1,354675E+23                           | 2,867464E+23  |
| -41               | 7,564149E+22                              | 7,564302E+22 | 6,773373E+22 | 6,773478E+22 | 1,512845E+23                           | 1,354685E+23                           | 2,867530E+23  |
| -40               | 7,564129E+22                              | 7,564017E+22 | 6,773455E+22 | 6,773449E+22 | 1,512815E+23                           | 1,354690E+23                           | 2,867505E+23  |
| -39               | 7,563963E+22                              | 7,564045E+22 | 6,773513E+22 | 6,773444E+22 | 1,512801E+23                           | 1,354696E+23                           | 2,867496E+23  |
| -38               | 7,564364E+22                              | 7,564301E+22 | 6,773512E+22 | 6,773533E+22 | 1,512867E+23                           | 1,354705E+23                           | 2,867571E+23  |
| -37               | 7,564161E+22                              | 7,564014E+22 | 6,773565E+22 | 6,773517E+22 | 1,512817E+23                           | 1,354708E+23                           | 2,867526E+23  |
| -36               | 7,564134E+22                              | 7,564285E+22 | 6,773605E+22 | 6,773621E+22 | 1,512842E+23                           | 1,354723E+23                           | 2,867565E+23  |
| -35               | 7,564341E+22                              | 7,564368E+22 | 6,773670E+22 | 6,773680E+22 | 1,512871E+23                           | 1,354735E+23                           | 2,867606E+23  |
| -34               | 7,564009E+22                              | 7,564143E+22 | 6,773699E+22 | 6,773640E+22 | 1,512815E+23                           | 1,354734E+23                           | 2,867549E+23  |
| -33               | 7,564220E+22                              | 7,564384E+22 | 6,773712E+22 | 6,773695E+22 | 1,512860E+23                           | 1,354741E+23                           | 2,867601E+23  |
| -32               | 7,564329E+22                              | 7,564124E+22 | 6,773731E+22 | 6,773657E+22 | 1,512845E+23                           | 1,354739E+23                           | 2,867584E+23  |
| -31               | 7,564047E+22                              | 7,564060E+22 | 6,773682E+22 | 6,773605E+22 | 1,512811E+23                           | 1,354729E+23                           | 2,867539E+23  |
| -30               | 7,564331E+22                              | 7,564376E+22 | 6,773565E+22 | 6,773677E+22 | 1,512871E+23                           | 1,354724E+23                           | 2,867595E+23  |
| -29               | 7,564172E+22                              | 7,564062E+22 | 6,773511E+22 | 6,773551E+22 | 1,512823E+23                           | 1,354706E+23                           | 2,867530E+23  |
| -28               | 7,564032E+22                              | 7,564198E+22 | 6,773497E+22 | 6,773496E+22 | 1,512823E+23                           | 1,354699E+23                           | 2,867522E+23  |
| -27               | 7,564328E+22                              | 7,564295E+22 | 6,773508E+22 | 6,773474E+22 | 1,512862E+23                           | 1,354698E+23                           | 2,867561E+23  |
| -26               | 7,564040E+22                              | 7,563990E+22 | 6,773497E+22 | 6,773359E+22 | 1,512803E+23                           | 1,354686E+23                           | 2,867489E+23  |
| -25               | 7,564089E+22                              | 7,564255E+22 | 6,773505E+22 | 6,773434E+22 | 1,512834E+23                           | 1,354694E+23                           | 2,867528E+23  |
| -24               | 7,564236E+22                              | 7,564139E+22 | 6,773495E+22 | 6,773492E+22 | 1,512838E+23                           | 1,354699E+23                           | 2,867536E+23  |
| -23               | 7,563897E+22                              | 7,564006E+22 | 6,773499E+22 | 6,773471E+22 | 1,512790E+23                           | 1,354697E+23                           | 2,867487E+23  |
| -22               | 7,564163E+22                              | 7,564319E+22 | 6,773505E+22 | 6,773587E+22 | 1,512848E+23                           | 1,354709E+23                           | 2,867557E+23  |
| -21               | 7,564210E+22                              | 7,564012E+22 | 6,773532E+22 | 6,773528E+22 | 1,512822E+23                           | 1,354706E+23                           | 2,867528E+23  |
| -20               | 7,564049E+22                              | 7,564094E+22 | 6,773597E+22 | 6,773545E+22 | 1,512814E+23                           | 1,354714E+23                           | 2,867528E+23  |
| -19               | 7,564384E+22                              | 7,564347E+22 | 6,773644E+22 | 6,773680E+22 | 1,512873E+23                           | 1,354732E+23                           | 2,867605E+23  |
| -18               | 7,564151E+22                              | 7,564112E+22 | 6,773654E+22 | 6,773639E+22 | 1,512826E+23                           | 1,354729E+23                           | 2,867556E+23  |
| -17               | 7,564094E+22                              | 7,564375E+22 | 6,773738E+22 | 6,773724E+22 | 1,512847E+23                           | 1,354746E+23                           | 2,867593E+23  |
| -16               | 7,564365E+22                              | 7,564319E+22 | 6,773779E+22 | 6,773790E+22 | 1,512868E+23                           | 1,354757E+23                           | 2,867625E+23  |
| -15               | 7,564080E+22                              | 7,564071E+22 | 6,773828E+22 | 6,773694E+22 | 1,512815E+23                           | 1,354752E+23                           | 2,867567E+23  |
| -14               | 7,564255E+22                              | 7,564368E+22 | 6,773820E+22 | 6,773785E+22 | 1,512862E+23                           | 1,354760E+23                           | 2,867623E+23  |
| -13               | 7,564365E+22                              | 7,564142E+22 | 6,773737E+22 | 6,773753E+22 | 1,512851E+23                           | 1,354749E+23                           | 2,867600E+23  |
| -12               | 7,564063E+22                              | 7,564153E+22 | 6,773687E+22 | 6,773705E+22 | 1,512822E+23                           | 1,354739E+23                           | 2,867561E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| -11               | 7,564314E+22                              | 7,564410E+22 | 6,773661E+22 | 6,773763E+22 | 1,512872E+23                           | 1,354742E+23                           | 2,867615E+23  |
| -10               | 7,564186E+22                              | 7,564114E+22 | 6,773613E+22 | 6,773571E+22 | 1,512830E+23                           | 1,354718E+23                           | 2,867548E+23  |
| -9                | 7,564051E+22                              | 7,564236E+22 | 6,773647E+22 | 6,773520E+22 | 1,512829E+23                           | 1,354717E+23                           | 2,867545E+23  |
| -8                | 7,564357E+22                              | 7,564243E+22 | 6,773619E+22 | 6,773583E+22 | 1,512860E+23                           | 1,354720E+23                           | 2,867580E+23  |
| -7                | 7,564056E+22                              | 7,563981E+22 | 6,773604E+22 | 6,773482E+22 | 1,512804E+23                           | 1,354709E+23                           | 2,867512E+23  |
| -6                | 7,564039E+22                              | 7,564293E+22 | 6,773591E+22 | 6,773598E+22 | 1,512833E+23                           | 1,354719E+23                           | 2,867552E+23  |
| -5                | 7,564234E+22                              | 7,564143E+22 | 6,773530E+22 | 6,773621E+22 | 1,512838E+23                           | 1,354715E+23                           | 2,867553E+23  |
| -4                | 7,563969E+22                              | 7,564028E+22 | 6,773554E+22 | 6,773557E+22 | 1,512800E+23                           | 1,354711E+23                           | 2,867511E+23  |
| -3                | 7,564235E+22                              | 7,564287E+22 | 6,773633E+22 | 6,773668E+22 | 1,512852E+23                           | 1,354730E+23                           | 2,867582E+23  |
| -2                | 7,564285E+22                              | 7,564078E+22 | 6,773627E+22 | 6,773589E+22 | 1,512836E+23                           | 1,354722E+23                           | 2,867558E+23  |
| -1                | 7,564066E+22                              | 7,564211E+22 | 6,773712E+22 | 6,773630E+22 | 1,512828E+23                           | 1,354734E+23                           | 2,867562E+23  |
| 1                 | 7,564359E+22                              | 7,564387E+22 | 6,773748E+22 | 6,773827E+22 | 1,512875E+23                           | 1,354757E+23                           | 2,867632E+23  |
| 2                 | 7,564151E+22                              | 7,564137E+22 | 6,773812E+22 | 6,773740E+22 | 1,512829E+23                           | 1,354755E+23                           | 2,867584E+23  |
| 3                 | 7,564076E+22                              | 7,564373E+22 | 6,773906E+22 | 6,773832E+22 | 1,512845E+23                           | 1,354774E+23                           | 2,867619E+23  |
| 4                 | 7,564410E+22                              | 7,564269E+22 | 6,773867E+22 | 6,773890E+22 | 1,512868E+23                           | 1,354776E+23                           | 2,867644E+23  |
| 5                 | 7,564158E+22                              | 7,564069E+22 | 6,773877E+22 | 6,773807E+22 | 1,512823E+23                           | 1,354768E+23                           | 2,867591E+23  |
| 6                 | 7,564272E+22                              | 7,564370E+22 | 6,773890E+22 | 6,773926E+22 | 1,512864E+23                           | 1,354782E+23                           | 2,867646E+23  |
| 7                 | 7,564367E+22                              | 7,564235E+22 | 6,773758E+22 | 6,773836E+22 | 1,512860E+23                           | 1,354759E+23                           | 2,867620E+23  |
| 8                 | 7,564064E+22                              | 7,564239E+22 | 6,773772E+22 | 6,773740E+22 | 1,512830E+23                           | 1,354751E+23                           | 2,867581E+23  |
| 9                 | 7,564345E+22                              | 7,564381E+22 | 6,773764E+22 | 6,773809E+22 | 1,512873E+23                           | 1,354757E+23                           | 2,867630E+23  |
| 10                | 7,564247E+22                              | 7,564084E+22 | 6,773754E+22 | 6,773590E+22 | 1,512833E+23                           | 1,354734E+23                           | 2,867568E+23  |
| 11                | 7,564039E+22                              | 7,564251E+22 | 6,773779E+22 | 6,773616E+22 | 1,512829E+23                           | 1,354740E+23                           | 2,867569E+23  |
| 12                | 7,564333E+22                              | 7,564266E+22 | 6,773657E+22 | 6,773721E+22 | 1,512860E+23                           | 1,354738E+23                           | 2,867598E+23  |
| 13                | 7,564043E+22                              | 7,564041E+22 | 6,773639E+22 | 6,773634E+22 | 1,512808E+23                           | 1,354727E+23                           | 2,867536E+23  |
| 14                | 7,564035E+22                              | 7,564286E+22 | 6,773705E+22 | 6,773737E+22 | 1,512832E+23                           | 1,354744E+23                           | 2,867576E+23  |
| 15                | 7,564287E+22                              | 7,564167E+22 | 6,773616E+22 | 6,773678E+22 | 1,512845E+23                           | 1,354729E+23                           | 2,867575E+23  |
| 16                | 7,564044E+22                              | 7,564069E+22 | 6,773685E+22 | 6,773600E+22 | 1,512811E+23                           | 1,354728E+23                           | 2,867540E+23  |
| 17                | 7,564302E+22                              | 7,564276E+22 | 6,773737E+22 | 6,773774E+22 | 1,512858E+23                           | 1,354751E+23                           | 2,867609E+23  |
| 18                | 7,564312E+22                              | 7,564126E+22 | 6,773746E+22 | 6,773692E+22 | 1,512844E+23                           | 1,354744E+23                           | 2,867588E+23  |
| 19                | 7,564013E+22                              | 7,564292E+22 | 6,773847E+22 | 6,773775E+22 | 1,512830E+23                           | 1,354762E+23                           | 2,867593E+23  |
| 20                | 7,564340E+22                              | 7,564392E+22 | 6,773836E+22 | 6,773945E+22 | 1,512873E+23                           | 1,354778E+23                           | 2,867651E+23  |
| 21                | 7,564201E+22                              | 7,564131E+22 | 6,773915E+22 | 6,773839E+22 | 1,512833E+23                           | 1,354775E+23                           | 2,867609E+23  |
| 22                | 7,564128E+22                              | 7,564310E+22 | 6,774045E+22 | 6,773945E+22 | 1,512844E+23                           | 1,354799E+23                           | 2,867643E+23  |
| 23                | 7,564458E+22                              | 7,564304E+22 | 6,773928E+22 | 6,773975E+22 | 1,512876E+23                           | 1,354790E+23                           | 2,867666E+23  |
| 24                | 7,564183E+22                              | 7,564171E+22 | 6,773940E+22 | 6,773896E+22 | 1,512835E+23                           | 1,354784E+23                           | 2,867619E+23  |
| 25                | 7,564276E+22                              | 7,564399E+22 | 6,773944E+22 | 6,774037E+22 | 1,512868E+23                           | 1,354798E+23                           | 2,867666E+23  |
| 26                | 7,564391E+22                              | 7,564272E+22 | 6,773876E+22 | 6,773876E+22 | 1,512866E+23                           | 1,354775E+23                           | 2,867642E+23  |
| 27                | 7,564061E+22                              | 7,564267E+22 | 6,773923E+22 | 6,773790E+22 | 1,512833E+23                           | 1,354771E+23                           | 2,867604E+23  |
| 28                | 7,564360E+22                              | 7,564353E+22 | 6,773857E+22 | 6,773877E+22 | 1,512871E+23                           | 1,354773E+23                           | 2,867645E+23  |
| 29                | 7,564278E+22                              | 7,564099E+22 | 6,773827E+22 | 6,773710E+22 | 1,512838E+23                           | 1,354754E+23                           | 2,867591E+23  |
| 30                | 7,564004E+22                              | 7,564235E+22 | 6,773865E+22 | 6,773788E+22 | 1,512824E+23                           | 1,354765E+23                           | 2,867589E+23  |
| 31                | 7,564302E+22                              | 7,564318E+22 | 6,773689E+22 | 6,773840E+22 | 1,512862E+23                           | 1,354753E+23                           | 2,867615E+23  |
| 32                | 7,564077E+22                              | 7,564074E+22 | 6,773711E+22 | 6,773694E+22 | 1,512815E+23                           | 1,354741E+23                           | 2,867556E+23  |
| 33                | 7,564109E+22                              | 7,564218E+22 | 6,773787E+22 | 6,773798E+22 | 1,512833E+23                           | 1,354758E+23                           | 2,867591E+23  |
| 34                | 7,564394E+22                              | 7,564160E+22 | 6,773737E+22 | 6,773699E+22 | 1,512855E+23                           | 1,354744E+23                           | 2,867599E+23  |
| 35                | 7,564071E+22                              | 7,564132E+22 | 6,773816E+22 | 6,773682E+22 | 1,512820E+23                           | 1,354750E+23                           | 2,867570E+23  |
| 36                | 7,564283E+22                              | 7,564345E+22 | 6,773812E+22 | 6,773895E+22 | 1,512863E+23                           | 1,354771E+23                           | 2,867634E+23  |
| 37                | 7,564301E+22                              | 7,564215E+22 | 6,773844E+22 | 6,773832E+22 | 1,512852E+23                           | 1,354768E+23                           | 2,867619E+23  |
| 38                | 7,563984E+22                              | 7,564287E+22 | 6,774020E+22 | 6,773928E+22 | 1,512827E+23                           | 1,354795E+23                           | 2,867622E+23  |



| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 39                | 7,564354E+22                              | 7,564410E+22 | 6,773959E+22 | 6,774040E+22 | 1,512876E+23                           | 1,354800E+23                           | 2,867676E+23  |
| 40                | 7,564270E+22                              | 7,564140E+22 | 6,774043E+22 | 6,773934E+22 | 1,512841E+23                           | 1,354798E+23                           | 2,867639E+23  |
| 41                | 7,564188E+22                              | 7,564272E+22 | 6,774120E+22 | 6,774093E+22 | 1,512846E+23                           | 1,354821E+23                           | 2,867667E+23  |
| 42                | 7,564502E+22                              | 7,564348E+22 | 6,773996E+22 | 6,774079E+22 | 1,512885E+23                           | 1,354808E+23                           | 2,867693E+23  |
| 43                | 7,564166E+22                              | 7,564256E+22 | 6,774028E+22 | 6,773992E+22 | 1,512842E+23                           | 1,354802E+23                           | 2,867644E+23  |
| 44                | 7,564290E+22                              | 7,564415E+22 | 6,774005E+22 | 6,774086E+22 | 1,512870E+23                           | 1,354809E+23                           | 2,867680E+23  |
| 45                | 7,564447E+22                              | 7,564285E+22 | 6,773969E+22 | 6,773910E+22 | 1,512873E+23                           | 1,354788E+23                           | 2,867661E+23  |
| 46                | 7,564084E+22                              | 7,564232E+22 | 6,774065E+22 | 6,773879E+22 | 1,512832E+23                           | 1,354794E+23                           | 2,867626E+23  |
| 47                | 7,564345E+22                              | 7,564391E+22 | 6,773916E+22 | 6,773956E+22 | 1,512874E+23                           | 1,354787E+23                           | 2,867661E+23  |
| 48                | 7,564256E+22                              | 7,564165E+22 | 6,773896E+22 | 6,773820E+22 | 1,512842E+23                           | 1,354772E+23                           | 2,867614E+23  |
| 49                | 7,563995E+22                              | 7,564212E+22 | 6,773923E+22 | 6,773922E+22 | 1,512821E+23                           | 1,354784E+23                           | 2,867605E+23  |
| 50                | 7,564347E+22                              | 7,564300E+22 | 6,773794E+22 | 6,773892E+22 | 1,512865E+23                           | 1,354769E+23                           | 2,867633E+23  |
| 51                | 7,564124E+22                              | 7,564089E+22 | 6,773841E+22 | 6,773746E+22 | 1,512821E+23                           | 1,354759E+23                           | 2,867580E+23  |
| 52                | 7,564180E+22                              | 7,564206E+22 | 6,773858E+22 | 6,773860E+22 | 1,512839E+23                           | 1,354772E+23                           | 2,867610E+23  |
| 53                | 7,564448E+22                              | 7,564225E+22 | 6,773814E+22 | 6,773807E+22 | 1,512867E+23                           | 1,354762E+23                           | 2,867629E+23  |
| 54                | 7,564038E+22                              | 7,564187E+22 | 6,773940E+22 | 6,773856E+22 | 1,512823E+23                           | 1,354780E+23                           | 2,867602E+23  |
| 55                | 7,564222E+22                              | 7,564432E+22 | 6,773905E+22 | 6,774016E+22 | 1,512865E+23                           | 1,354792E+23                           | 2,867658E+23  |
| 56                | 7,564313E+22                              | 7,564254E+22 | 6,773990E+22 | 6,773934E+22 | 1,512857E+23                           | 1,354792E+23                           | 2,867649E+23  |
| 57                | 7,564043E+22                              | 7,564203E+22 | 6,774149E+22 | 6,774048E+22 | 1,512825E+23                           | 1,354820E+23                           | 2,867644E+23  |
| 58                | 7,564448E+22                              | 7,564377E+22 | 6,774085E+22 | 6,774120E+22 | 1,512883E+23                           | 1,354821E+23                           | 2,867703E+23  |
| 59                | 7,564311E+22                              | 7,564196E+22 | 6,774138E+22 | 6,774048E+22 | 1,512851E+23                           | 1,354819E+23                           | 2,867669E+23  |
| 60                | 7,564205E+22                              | 7,564328E+22 | 6,774144E+22 | 6,774209E+22 | 1,512853E+23                           | 1,354835E+23                           | 2,867688E+23  |
| 61                | 7,564533E+22                              | 7,564438E+22 | 6,774062E+22 | 6,774167E+22 | 1,512897E+23                           | 1,354823E+23                           | 2,867720E+23  |
| 62                | 7,564167E+22                              | 7,564265E+22 | 6,774172E+22 | 6,774076E+22 | 1,512843E+23                           | 1,354825E+23                           | 2,867668E+23  |
| 63                | 7,564287E+22                              | 7,564446E+22 | 6,774118E+22 | 6,774113E+22 | 1,512873E+23                           | 1,354823E+23                           | 2,867696E+23  |
| 64                | 7,564486E+22                              | 7,564301E+22 | 6,774088E+22 | 6,773972E+22 | 1,512879E+23                           | 1,354806E+23                           | 2,867685E+23  |
| 65                | 7,564081E+22                              | 7,564174E+22 | 6,774137E+22 | 6,774022E+22 | 1,512825E+23                           | 1,354816E+23                           | 2,867641E+23  |
| 66                | 7,564335E+22                              | 7,564403E+22 | 6,773977E+22 | 6,774070E+22 | 1,512874E+23                           | 1,354805E+23                           | 2,867679E+23  |
| 67                | 7,564238E+22                              | 7,564195E+22 | 6,773966E+22 | 6,773921E+22 | 1,512843E+23                           | 1,354789E+23                           | 2,867632E+23  |
| 68                | 7,564041E+22                              | 7,564180E+22 | 6,773957E+22 | 6,773978E+22 | 1,512822E+23                           | 1,354793E+23                           | 2,867616E+23  |
| 69                | 7,564450E+22                              | 7,564304E+22 | 6,773862E+22 | 6,773924E+22 | 1,512875E+23                           | 1,354779E+23                           | 2,867654E+23  |
| 70                | 7,564175E+22                              | 7,564098E+22 | 6,773963E+22 | 6,773831E+22 | 1,512827E+23                           | 1,354779E+23                           | 2,867607E+23  |
| 71                | 7,564165E+22                              | 7,564316E+22 | 6,773933E+22 | 6,773937E+22 | 1,512848E+23                           | 1,354787E+23                           | 2,867635E+23  |
| 72                | 7,564427E+22                              | 7,564347E+22 | 6,773926E+22 | 6,773929E+22 | 1,512877E+23                           | 1,354785E+23                           | 2,867663E+23  |
| 73                | 7,564010E+22                              | 7,564187E+22 | 6,774077E+22 | 6,774020E+22 | 1,512820E+23                           | 1,354810E+23                           | 2,867629E+23  |
| 74                | 7,564245E+22                              | 7,564421E+22 | 6,774073E+22 | 6,774114E+22 | 1,512867E+23                           | 1,354819E+23                           | 2,867685E+23  |
| 75                | 7,564352E+22                              | 7,564245E+22 | 6,774159E+22 | 6,774045E+22 | 1,512860E+23                           | 1,354820E+23                           | 2,867680E+23  |
| 76                | 7,564129E+22                              | 7,564159E+22 | 6,774220E+22 | 6,774171E+22 | 1,512829E+23                           | 1,354839E+23                           | 2,867668E+23  |
| 77                | 7,564525E+22                              | 7,564412E+22 | 6,774137E+22 | 6,774249E+22 | 1,512894E+23                           | 1,354839E+23                           | 2,867732E+23  |
| 78                | 7,564316E+22                              | 7,564258E+22 | 6,774218E+22 | 6,774200E+22 | 1,512857E+23                           | 1,354842E+23                           | 2,867699E+23  |
| 79                | 7,564193E+22                              | 7,564418E+22 | 6,774193E+22 | 6,774258E+22 | 1,512861E+23                           | 1,354845E+23                           | 2,867706E+23  |
| 80                | 7,564566E+22                              | 7,564487E+22 | 6,774179E+22 | 6,774195E+22 | 1,512905E+23                           | 1,354837E+23                           | 2,867743E+23  |
| 81                | 7,564205E+22                              | 7,564212E+22 | 6,774298E+22 | 6,774144E+22 | 1,512842E+23                           | 1,354844E+23                           | 2,867686E+23  |
| 82                | 7,564315E+22                              | 7,564427E+22 | 6,774239E+22 | 6,774166E+22 | 1,512874E+23                           | 1,354841E+23                           | 2,867715E+23  |
| 83                | 7,564455E+22                              | 7,564345E+22 | 6,774187E+22 | 6,774088E+22 | 1,512880E+23                           | 1,354827E+23                           | 2,867707E+23  |
| 84                | 7,564066E+22                              | 7,564178E+22 | 6,774148E+22 | 6,774150E+22 | 1,512824E+23                           | 1,354830E+23                           | 2,867654E+23  |
| 85                | 7,564361E+22                              | 7,564423E+22 | 6,774024E+22 | 6,774163E+22 | 1,512878E+23                           | 1,354819E+23                           | 2,867697E+23  |
| 86                | 7,564265E+22                              | 7,564189E+22 | 6,774071E+22 | 6,774011E+22 | 1,512845E+23                           | 1,354808E+23                           | 2,867654E+23  |
| 87                | 7,564080E+22                              | 7,564218E+22 | 6,774026E+22 | 6,774000E+22 | 1,512830E+23                           | 1,354803E+23                           | 2,867632E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 88                     | 7,564516E+22                              | 7,564363E+22 | 6,773968E+22 | 6,773990E+22 | 1,512888E+23                           | 1,354796E+23                           | 2,867684E+23  |
| 89                     | 7,564179E+22                              | 7,564113E+22 | 6,774061E+22 | 6,773979E+22 | 1,512829E+23                           | 1,354804E+23                           | 2,867633E+23  |
| 90                     | 7,564137E+22                              | 7,564376E+22 | 6,774052E+22 | 6,774055E+22 | 1,512851E+23                           | 1,354811E+23                           | 2,867662E+23  |
| 91                     | 7,564397E+22                              | 7,564392E+22 | 6,774075E+22 | 6,774051E+22 | 1,512879E+23                           | 1,354813E+23                           | 2,867692E+23  |
| 92                     | 7,564054E+22                              | 7,564127E+22 | 6,774175E+22 | 6,774125E+22 | 1,512818E+23                           | 1,354830E+23                           | 2,867648E+23  |
| 93                     | 7,564353E+22                              | 7,564388E+22 | 6,774182E+22 | 6,774204E+22 | 1,512874E+23                           | 1,354839E+23                           | 2,867713E+23  |
| 94                     | 7,564418E+22                              | 7,564234E+22 | 6,774265E+22 | 6,774181E+22 | 1,512865E+23                           | 1,354845E+23                           | 2,867710E+23  |
| 95                     | 7,564139E+22                              | 7,564258E+22 | 6,774254E+22 | 6,774265E+22 | 1,512840E+23                           | 1,354852E+23                           | 2,867692E+23  |
| 96                     | 7,564549E+22                              | 7,564534E+22 | 6,774209E+22 | 6,774348E+22 | 1,512908E+23                           | 1,354856E+23                           | 2,867764E+23  |
| 97                     | 7,564312E+22                              | 7,564277E+22 | 6,774333E+22 | 6,774305E+22 | 1,512859E+23                           | 1,354864E+23                           | 2,867723E+23  |
| 98                     | 7,564213E+22                              | 7,564443E+22 | 6,774351E+22 | 6,774293E+22 | 1,512866E+23                           | 1,354864E+23                           | 2,867730E+23  |
| 99                     | 7,564580E+22                              | 7,564500E+22 | 6,774344E+22 | 6,774260E+22 | 1,512908E+23                           | 1,354860E+23                           | 2,867768E+23  |
| 100                    | 7,564232E+22                              | 7,564166E+22 | 6,774371E+22 | 6,774260E+22 | 1,512840E+23                           | 1,354863E+23                           | 2,867703E+23  |
| 101                    | 7,564326E+22                              | 7,564441E+22 | 6,774287E+22 | 6,774302E+22 | 1,512877E+23                           | 1,354859E+23                           | 2,867736E+23  |
| 102                    | 7,564415E+22                              | 7,564363E+22 | 6,774244E+22 | 6,774251E+22 | 1,512878E+23                           | 1,354850E+23                           | 2,867727E+23  |
| 103                    | 7,564056E+22                              | 7,564219E+22 | 6,774167E+22 | 6,774205E+22 | 1,512828E+23                           | 1,354837E+23                           | 2,867665E+23  |
| 104                    | 7,564440E+22                              | 7,564438E+22 | 6,774098E+22 | 6,774190E+22 | 1,512888E+23                           | 1,354829E+23                           | 2,867717E+23  |
| 105                    | 7,564339E+22                              | 7,564153E+22 | 6,774166E+22 | 6,774067E+22 | 1,512849E+23                           | 1,354823E+23                           | 2,867673E+23  |
| 106                    | 7,564133E+22                              | 7,564258E+22 | 6,774136E+22 | 6,774036E+22 | 1,512839E+23                           | 1,354817E+23                           | 2,867656E+23  |
| 107                    | 7,564485E+22                              | 7,564463E+22 | 6,774097E+22 | 6,774090E+22 | 1,512895E+23                           | 1,354819E+23                           | 2,867713E+23  |
| 108                    | 7,564159E+22                              | 7,564146E+22 | 6,774145E+22 | 6,774121E+22 | 1,512830E+23                           | 1,354827E+23                           | 2,867657E+23  |
| 109                    | 7,564144E+22                              | 7,564381E+22 | 6,774180E+22 | 6,774173E+22 | 1,512852E+23                           | 1,354835E+23                           | 2,867688E+23  |
| 110                    | 7,564403E+22                              | 7,564367E+22 | 6,774235E+22 | 6,774197E+22 | 1,512877E+23                           | 1,354843E+23                           | 2,867720E+23  |
| 111                    | 7,564104E+22                              | 7,564128E+22 | 6,774252E+22 | 6,774205E+22 | 1,512823E+23                           | 1,354846E+23                           | 2,867669E+23  |
| 112                    | 7,564436E+22                              | 7,564412E+22 | 6,774261E+22 | 6,774322E+22 | 1,512885E+23                           | 1,354858E+23                           | 2,867743E+23  |
| 113                    | 7,564441E+22                              | 7,564268E+22 | 6,774328E+22 | 6,774343E+22 | 1,512871E+23                           | 1,354867E+23                           | 2,867738E+23  |
| 114                    | 7,564151E+22                              | 7,564342E+22 | 6,774338E+22 | 6,774351E+22 | 1,512849E+23                           | 1,354869E+23                           | 2,867718E+23  |
| 115                    | 7,564543E+22                              | 7,564604E+22 | 6,774356E+22 | 6,774412E+22 | 1,512915E+23                           | 1,354877E+23                           | 2,867791E+23  |
| 116                    | 7,564360E+22                              | 7,564250E+22 | 6,774440E+22 | 6,774364E+22 | 1,512861E+23                           | 1,354880E+23                           | 2,867741E+23  |
| 117                    | 7,564272E+22                              | 7,564422E+22 | 6,774478E+22 | 6,774355E+22 | 1,512869E+23                           | 1,354883E+23                           | 2,867753E+23  |
| 118                    | 7,564567E+22                              | 7,564503E+22 | 6,774455E+22 | 6,774401E+22 | 1,512907E+23                           | 1,354886E+23                           | 2,867793E+23  |
| 119                    | 7,564193E+22                              | 7,564227E+22 | 6,774393E+22 | 6,774367E+22 | 1,512842E+23                           | 1,354876E+23                           | 2,867718E+23  |
| 120                    | 7,564335E+22                              | 7,564491E+22 | 6,774338E+22 | 6,774415E+22 | 1,512883E+23                           | 1,354875E+23                           | 2,867758E+23  |
| 121                    | 7,564428E+22                              | 7,564337E+22 | 6,774324E+22 | 6,774353E+22 | 1,512877E+23                           | 1,354868E+23                           | 2,867744E+23  |
| 122                    | 7,564117E+22                              | 7,564226E+22 | 6,774273E+22 | 6,774218E+22 | 1,512834E+23                           | 1,354849E+23                           | 2,867684E+23  |
| 123                    | 7,564495E+22                              | 7,564464E+22 | 6,774232E+22 | 6,774223E+22 | 1,512896E+23                           | 1,354846E+23                           | 2,867741E+23  |
| 124                    | 7,564382E+22                              | 7,564148E+22 | 6,774233E+22 | 6,774161E+22 | 1,512853E+23                           | 1,354839E+23                           | 2,867692E+23  |
| 125                    | 7,564137E+22                              | 7,564314E+22 | 6,774223E+22 | 6,774156E+22 | 1,512845E+23                           | 1,354838E+23                           | 2,867683E+23  |
| 126                    | 7,564422E+22                              | 7,564502E+22 | 6,774204E+22 | 6,774251E+22 | 1,512892E+23                           | 1,354845E+23                           | 2,867738E+23  |
| 127                    | 7,564127E+22                              | 7,564168E+22 | 6,774223E+22 | 6,774206E+22 | 1,512830E+23                           | 1,354843E+23                           | 2,867673E+23  |
| 128                    | 7,564215E+22                              | 7,564366E+22 | 6,774289E+22 | 6,774263E+22 | 1,512858E+23                           | 1,354855E+23                           | 2,867713E+23  |
| 129                    | 7,564466E+22                              | 7,564309E+22 | 6,774340E+22 | 6,774321E+22 | 1,512877E+23                           | 1,354866E+23                           | 2,867744E+23  |
| 130                    | 7,564168E+22                              | 7,564177E+22 | 6,774339E+22 | 6,774291E+22 | 1,512834E+23                           | 1,354863E+23                           | 2,867697E+23  |
| 131                    | 7,564447E+22                              | 7,564521E+22 | 6,774363E+22 | 6,774431E+22 | 1,512897E+23                           | 1,354879E+23                           | 2,867776E+23  |
| 132                    | 7,564457E+22                              | 7,564323E+22 | 6,774404E+22 | 6,774457E+22 | 1,512878E+23                           | 1,354886E+23                           | 2,867764E+23  |
| 133                    | 7,564186E+22                              | 7,564385E+22 | 6,774484E+22 | 6,774422E+22 | 1,512857E+23                           | 1,354891E+23                           | 2,867748E+23  |
| 134                    | 7,564537E+22                              | 7,564611E+22 | 6,774535E+22 | 6,774516E+22 | 1,512915E+23                           | 1,354905E+23                           | 2,867820E+23  |
| 135                    | 7,564372E+22                              | 7,564260E+22 | 6,774549E+22 | 6,774442E+22 | 1,512863E+23                           | 1,354899E+23                           | 2,867762E+23  |
| 136                    | 7,564307E+22                              | 7,564433E+22 | 6,774563E+22 | 6,774492E+22 | 1,512874E+23                           | 1,354906E+23                           | 2,867780E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 137                    | 7,564539E+22                              | 7,564499E+22 | 6,774511E+22 | 6,774580E+22 | 1,512904E+23                           | 1,354909E+23                           | 2,867813E+23  |
| 138                    | 7,564204E+22                              | 7,564261E+22 | 6,774441E+22 | 6,774449E+22 | 1,512846E+23                           | 1,354889E+23                           | 2,867735E+23  |
| 139                    | 7,564366E+22                              | 7,564506E+22 | 6,774435E+22 | 6,774455E+22 | 1,512887E+23                           | 1,354889E+23                           | 2,867776E+23  |
| 140                    | 7,564520E+22                              | 7,564300E+22 | 6,774384E+22 | 6,774382E+22 | 1,512882E+23                           | 1,354877E+23                           | 2,867759E+23  |
| 141                    | 7,564209E+22                              | 7,564224E+22 | 6,774367E+22 | 6,774239E+22 | 1,512843E+23                           | 1,354861E+23                           | 2,867704E+23  |
| 142                    | 7,564467E+22                              | 7,564519E+22 | 6,774340E+22 | 6,774329E+22 | 1,512899E+23                           | 1,354867E+23                           | 2,867766E+23  |
| 143                    | 7,564325E+22                              | 7,564246E+22 | 6,774281E+22 | 6,774253E+22 | 1,512857E+23                           | 1,354853E+23                           | 2,867711E+23  |
| 144                    | 7,564112E+22                              | 7,564361E+22 | 6,774318E+22 | 6,774286E+22 | 1,512847E+23                           | 1,354860E+23                           | 2,867708E+23  |
| 145                    | 7,564392E+22                              | 7,564472E+22 | 6,774336E+22 | 6,774395E+22 | 1,512886E+23                           | 1,354873E+23                           | 2,867760E+23  |
| 146                    | 7,564181E+22                              | 7,564151E+22 | 6,774348E+22 | 6,774279E+22 | 1,512833E+23                           | 1,354863E+23                           | 2,867696E+23  |
| 147                    | 7,564284E+22                              | 7,564360E+22 | 6,774426E+22 | 6,774356E+22 | 1,512864E+23                           | 1,354878E+23                           | 2,867743E+23  |
| 148                    | 7,564536E+22                              | 7,564307E+22 | 6,774391E+22 | 6,774457E+22 | 1,512884E+23                           | 1,354885E+23                           | 2,867769E+23  |
| 149                    | 7,564212E+22                              | 7,564245E+22 | 6,774417E+22 | 6,774407E+22 | 1,512846E+23                           | 1,354882E+23                           | 2,867728E+23  |
| 150                    | 7,564421E+22                              | 7,564594E+22 | 6,774484E+22 | 6,774559E+22 | 1,512901E+23                           | 1,354904E+23                           | 2,867806E+23  |
| 151                    | 7,564461E+22                              | 7,564373E+22 | 6,774508E+22 | 6,774503E+22 | 1,512883E+23                           | 1,354901E+23                           | 2,867785E+23  |
| 152                    | 7,564256E+22                              | 7,564390E+22 | 6,774624E+22 | 6,774499E+22 | 1,512865E+23                           | 1,354912E+23                           | 2,867777E+23  |
| 153                    | 7,564551E+22                              | 7,564576E+22 | 6,774667E+22 | 6,774645E+22 | 1,512913E+23                           | 1,354931E+23                           | 2,867844E+23  |
| 154                    | 7,564382E+22                              | 7,564301E+22 | 6,774641E+22 | 6,774549E+22 | 1,512868E+23                           | 1,354919E+23                           | 2,867787E+23  |
| 155                    | 7,564296E+22                              | 7,564489E+22 | 6,774656E+22 | 6,774615E+22 | 1,512878E+23                           | 1,354927E+23                           | 2,867806E+23  |
| 156                    | 7,564557E+22                              | 7,564485E+22 | 6,774553E+22 | 6,774691E+22 | 1,512904E+23                           | 1,354924E+23                           | 2,867829E+23  |
| 157                    | 7,564271E+22                              | 7,564264E+22 | 6,774534E+22 | 6,774491E+22 | 1,512854E+23                           | 1,354902E+23                           | 2,867756E+23  |
| 158                    | 7,564400E+22                              | 7,564509E+22 | 6,774541E+22 | 6,774510E+22 | 1,512891E+23                           | 1,354905E+23                           | 2,867796E+23  |
| 159                    | 7,564542E+22                              | 7,564331E+22 | 6,774440E+22 | 6,774410E+22 | 1,512887E+23                           | 1,354885E+23                           | 2,867772E+23  |
| 160                    | 7,564232E+22                              | 7,564285E+22 | 6,774434E+22 | 6,774349E+22 | 1,512852E+23                           | 1,354878E+23                           | 2,867730E+23  |
| 161                    | 7,564390E+22                              | 7,564548E+22 | 6,774422E+22 | 6,774487E+22 | 1,512894E+23                           | 1,354891E+23                           | 2,867785E+23  |
| 162                    | 7,564295E+22                              | 7,564283E+22 | 6,774382E+22 | 6,774345E+22 | 1,512858E+23                           | 1,354873E+23                           | 2,867730E+23  |
| 163                    | 7,564134E+22                              | 7,564342E+22 | 6,774461E+22 | 6,774358E+22 | 1,512848E+23                           | 1,354882E+23                           | 2,867730E+23  |
| 164                    | 7,564476E+22                              | 7,564392E+22 | 6,774421E+22 | 6,774481E+22 | 1,512887E+23                           | 1,354890E+23                           | 2,867777E+23  |
| 165                    | 7,564291E+22                              | 7,564140E+22 | 6,774443E+22 | 6,774354E+22 | 1,512843E+23                           | 1,354880E+23                           | 2,867723E+23  |
| 166                    | 7,564299E+22                              | 7,564424E+22 | 6,774513E+22 | 6,774493E+22 | 1,512872E+23                           | 1,354901E+23                           | 2,867773E+23  |
| 167                    | 7,564527E+22                              | 7,564421E+22 | 6,774445E+22 | 6,774550E+22 | 1,512895E+23                           | 1,354900E+23                           | 2,867794E+23  |
| 168                    | 7,564243E+22                              | 7,564328E+22 | 6,774534E+22 | 6,774519E+22 | 1,512857E+23                           | 1,354905E+23                           | 2,867762E+23  |
| 169                    | 7,564402E+22                              | 7,564605E+22 | 6,774658E+22 | 6,774677E+22 | 1,512901E+23                           | 1,354933E+23                           | 2,867834E+23  |
| 170                    | 7,564504E+22                              | 7,564390E+22 | 6,774673E+22 | 6,774576E+22 | 1,512889E+23                           | 1,354925E+23                           | 2,867814E+23  |
| 171                    | 7,564290E+22                              | 7,564385E+22 | 6,774787E+22 | 6,774615E+22 | 1,512868E+23                           | 1,354940E+23                           | 2,867808E+23  |
| 172                    | 7,564571E+22                              | 7,564561E+22 | 6,774723E+22 | 6,774813E+22 | 1,512913E+23                           | 1,354954E+23                           | 2,867867E+23  |
| 173                    | 7,564411E+22                              | 7,564319E+22 | 6,774689E+22 | 6,774675E+22 | 1,512873E+23                           | 1,354936E+23                           | 2,867809E+23  |
| 174                    | 7,564281E+22                              | 7,564508E+22 | 6,774723E+22 | 6,774726E+22 | 1,512879E+23                           | 1,354945E+23                           | 2,867824E+23  |
| 175                    | 7,564597E+22                              | 7,564499E+22 | 6,774591E+22 | 6,774698E+22 | 1,512910E+23                           | 1,354929E+23                           | 2,867839E+23  |
| 176                    | 7,564367E+22                              | 7,564270E+22 | 6,774602E+22 | 6,774517E+22 | 1,512864E+23                           | 1,354912E+23                           | 2,867776E+23  |
| 177                    | 7,564403E+22                              | 7,564519E+22 | 6,774637E+22 | 6,774584E+22 | 1,512892E+23                           | 1,354922E+23                           | 2,867814E+23  |
| 178                    | 7,564529E+22                              | 7,564417E+22 | 6,774518E+22 | 6,774474E+22 | 1,512895E+23                           | 1,354899E+23                           | 2,867794E+23  |
| 179                    | 7,564190E+22                              | 7,564348E+22 | 6,774557E+22 | 6,774452E+22 | 1,512854E+23                           | 1,354901E+23                           | 2,867755E+23  |
| 180                    | 7,564369E+22                              | 7,564524E+22 | 6,774512E+22 | 6,774607E+22 | 1,512889E+23                           | 1,354912E+23                           | 2,867801E+23  |
| 181                    | 7,564345E+22                              | 7,564244E+22 | 6,774515E+22 | 6,774425E+22 | 1,512859E+23                           | 1,354894E+23                           | 2,867753E+23  |
| 182                    | 7,564174E+22                              | 7,564310E+22 | 6,774585E+22 | 6,774472E+22 | 1,512848E+23                           | 1,354906E+23                           | 2,867754E+23  |
| 183                    | 7,564534E+22                              | 7,564397E+22 | 6,774474E+22 | 6,774565E+22 | 1,512893E+23                           | 1,354904E+23                           | 2,867797E+23  |
| 184                    | 7,564358E+22                              | 7,564215E+22 | 6,774491E+22 | 6,774494E+22 | 1,512857E+23                           | 1,354898E+23                           | 2,867756E+23  |
| 185                    | 7,564272E+22                              | 7,564496E+22 | 6,774596E+22 | 6,774643E+22 | 1,512877E+23                           | 1,354924E+23                           | 2,867801E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 186               | 7,564534E+22                              | 7,564507E+22 | 6,774568E+22 | 6,774621E+22 | 1,512904E+23                           | 1,354919E+23                           | 2,867823E+23  |
| 187               | 7,564286E+22                              | 7,564355E+22 | 6,774725E+22 | 6,774586E+22 | 1,512864E+23                           | 1,354931E+23                           | 2,867795E+23  |
| 188               | 7,564451E+22                              | 7,564552E+22 | 6,774787E+22 | 6,774778E+22 | 1,512900E+23                           | 1,354956E+23                           | 2,867857E+23  |
| 189               | 7,564561E+22                              | 7,564385E+22 | 6,774803E+22 | 6,774689E+22 | 1,512895E+23                           | 1,354949E+23                           | 2,867844E+23  |
| 190               | 7,564270E+22                              | 7,564424E+22 | 6,774866E+22 | 6,774779E+22 | 1,512869E+23                           | 1,354965E+23                           | 2,867834E+23  |
| 191               | 7,564550E+22                              | 7,564603E+22 | 6,774747E+22 | 6,774914E+22 | 1,512915E+23                           | 1,354966E+23                           | 2,867881E+23  |
| 192               | 7,564464E+22                              | 7,564364E+22 | 6,774745E+22 | 6,774767E+22 | 1,512883E+23                           | 1,354951E+23                           | 2,867834E+23  |
| 193               | 7,564300E+22                              | 7,564502E+22 | 6,774822E+22 | 6,774793E+22 | 1,512880E+23                           | 1,354962E+23                           | 2,867842E+23  |
| 194               | 7,564658E+22                              | 7,564529E+22 | 6,774696E+22 | 6,774708E+22 | 1,512919E+23                           | 1,354940E+23                           | 2,867859E+23  |
| 195               | 7,564406E+22                              | 7,564304E+22 | 6,774732E+22 | 6,774574E+22 | 1,512871E+23                           | 1,354931E+23                           | 2,867802E+23  |
| 196               | 7,564376E+22                              | 7,564532E+22 | 6,774696E+22 | 6,774705E+22 | 1,512891E+23                           | 1,354940E+23                           | 2,867831E+23  |
| 197               | 7,564512E+22                              | 7,564444E+22 | 6,774609E+22 | 6,774582E+22 | 1,512896E+23                           | 1,354919E+23                           | 2,867815E+23  |
| 198               | 7,564155E+22                              | 7,564338E+22 | 6,774663E+22 | 6,774572E+22 | 1,512849E+23                           | 1,354924E+23                           | 2,867773E+23  |
| 199               | 7,564402E+22                              | 7,564483E+22 | 6,774581E+22 | 6,774657E+22 | 1,512888E+23                           | 1,354924E+23                           | 2,867812E+23  |
| 200               | 7,564456E+22                              | 7,564230E+22 | 6,774579E+22 | 6,774513E+22 | 1,512869E+23                           | 1,354909E+23                           | 2,867778E+23  |
| 201               | 7,564200E+22                              | 7,564329E+22 | 6,774659E+22 | 6,774597E+22 | 1,512853E+23                           | 1,354926E+23                           | 2,867779E+23  |
| 202               | 7,564558E+22                              | 7,564511E+22 | 6,774540E+22 | 6,774655E+22 | 1,512907E+23                           | 1,354919E+23                           | 2,867826E+23  |
| 203               | 7,564364E+22                              | 7,564315E+22 | 6,774626E+22 | 6,774592E+22 | 1,512868E+23                           | 1,354922E+23                           | 2,867790E+23  |
| 204               | 7,564275E+22                              | 7,564521E+22 | 6,774727E+22 | 6,774748E+22 | 1,512880E+23                           | 1,354948E+23                           | 2,867827E+23  |
| 205               | 7,564592E+22                              | 7,564503E+22 | 6,774743E+22 | 6,774695E+22 | 1,512909E+23                           | 1,354944E+23                           | 2,867853E+23  |
| 206               | 7,564299E+22                              | 7,564335E+22 | 6,774891E+22 | 6,774721E+22 | 1,512863E+23                           | 1,354961E+23                           | 2,867825E+23  |
| 207               | 7,564465E+22                              | 7,564549E+22 | 6,774862E+22 | 6,774900E+22 | 1,512901E+23                           | 1,354976E+23                           | 2,867878E+23  |
| 208               | 7,564593E+22                              | 7,564425E+22 | 6,774838E+22 | 6,774863E+22 | 1,512902E+23                           | 1,354970E+23                           | 2,867872E+23  |
| 209               | 7,564244E+22                              | 7,564450E+22 | 6,774922E+22 | 6,774934E+22 | 1,512869E+23                           | 1,354986E+23                           | 2,867855E+23  |
| 210               | 7,564595E+22                              | 7,564639E+22 | 6,774818E+22 | 6,774950E+22 | 1,512923E+23                           | 1,354977E+23                           | 2,867900E+23  |
| 211               | 7,564548E+22                              | 7,564377E+22 | 6,774872E+22 | 6,774773E+22 | 1,512892E+23                           | 1,354964E+23                           | 2,867857E+23  |
| 212               | 7,564367E+22                              | 7,564482E+22 | 6,774904E+22 | 6,774829E+22 | 1,512885E+23                           | 1,354973E+23                           | 2,867858E+23  |
| 213               | 7,564697E+22                              | 7,564562E+22 | 6,774802E+22 | 6,774763E+22 | 1,512926E+23                           | 1,354957E+23                           | 2,867882E+23  |
| 214               | 7,564345E+22                              | 7,564372E+22 | 6,774831E+22 | 6,774708E+22 | 1,512872E+23                           | 1,354954E+23                           | 2,867826E+23  |
| 215               | 7,564313E+22                              | 7,564562E+22 | 6,774757E+22 | 6,774803E+22 | 1,512887E+23                           | 1,354956E+23                           | 2,867843E+23  |
| 216               | 7,564527E+22                              | 7,564453E+22 | 6,774691E+22 | 6,774704E+22 | 1,512898E+23                           | 1,354940E+23                           | 2,867838E+23  |
| 217               | 7,564167E+22                              | 7,564300E+22 | 6,774767E+22 | 6,774687E+22 | 1,512847E+23                           | 1,354945E+23                           | 2,867792E+23  |
| 218               | 7,564474E+22                              | 7,564482E+22 | 6,774667E+22 | 6,774720E+22 | 1,512896E+23                           | 1,354939E+23                           | 2,867834E+23  |
| 219               | 7,564528E+22                              | 7,564279E+22 | 6,774677E+22 | 6,774610E+22 | 1,512881E+23                           | 1,354929E+23                           | 2,867809E+23  |
| 220               | 7,564217E+22                              | 7,564372E+22 | 6,774699E+22 | 6,774724E+22 | 1,512859E+23                           | 1,354942E+23                           | 2,867801E+23  |
| 221               | 7,564576E+22                              | 7,564571E+22 | 6,774651E+22 | 6,774744E+22 | 1,512915E+23                           | 1,354939E+23                           | 2,867854E+23  |
| 222               | 7,564358E+22                              | 7,564349E+22 | 6,774776E+22 | 6,774688E+22 | 1,512871E+23                           | 1,354946E+23                           | 2,867817E+23  |
| 223               | 7,564297E+22                              | 7,564495E+22 | 6,774850E+22 | 6,774800E+22 | 1,512879E+23                           | 1,354965E+23                           | 2,867844E+23  |
| 224               | 7,564660E+22                              | 7,564507E+22 | 6,774853E+22 | 6,774818E+22 | 1,512917E+23                           | 1,354967E+23                           | 2,867884E+23  |
| 225               | 7,564291E+22                              | 7,564347E+22 | 6,774989E+22 | 6,774888E+22 | 1,512864E+23                           | 1,354988E+23                           | 2,867851E+23  |
| 226               | 7,564469E+22                              | 7,564618E+22 | 6,774931E+22 | 6,775019E+22 | 1,512909E+23                           | 1,354995E+23                           | 2,867904E+23  |
| 227               | 7,564621E+22                              | 7,564488E+22 | 6,774946E+22 | 6,774965E+22 | 1,512911E+23                           | 1,354991E+23                           | 2,867902E+23  |
| 228               | 7,564282E+22                              | 7,564448E+22 | 6,775005E+22 | 6,775013E+22 | 1,512873E+23                           | 1,355002E+23                           | 2,867875E+23  |
| 229               | 7,564681E+22                              | 7,564637E+22 | 6,774954E+22 | 6,774981E+22 | 1,512932E+23                           | 1,354993E+23                           | 2,867925E+23  |
| 230               | 7,564574E+22                              | 7,564396E+22 | 6,775003E+22 | 6,774852E+22 | 1,512897E+23                           | 1,354986E+23                           | 2,867883E+23  |
| 231               | 7,564355E+22                              | 7,564510E+22 | 6,774967E+22 | 6,774909E+22 | 1,512887E+23                           | 1,354988E+23                           | 2,867874E+23  |
| 232               | 7,564678E+22                              | 7,564631E+22 | 6,774842E+22 | 6,774911E+22 | 1,512931E+23                           | 1,354975E+23                           | 2,867906E+23  |
| 233               | 7,564272E+22                              | 7,564385E+22 | 6,774912E+22 | 6,774860E+22 | 1,512866E+23                           | 1,354977E+23                           | 2,867843E+23  |
| 234               | 7,564328E+22                              | 7,564554E+22 | 6,774845E+22 | 6,774863E+22 | 1,512888E+23                           | 1,354971E+23                           | 2,867859E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 235               | 7,564603E+22                              | 7,564420E+22 | 6,774808E+22 | 6,774753E+22 | 1,512902E+23                           | 1,354956E+23                           | 2,867858E+23  |
| 236               | 7,564242E+22                              | 7,564265E+22 | 6,774819E+22 | 6,774766E+22 | 1,512851E+23                           | 1,354958E+23                           | 2,867809E+23  |
| 237               | 7,564549E+22                              | 7,564513E+22 | 6,774736E+22 | 6,774788E+22 | 1,512906E+23                           | 1,354952E+23                           | 2,867859E+23  |
| 238               | 7,564503E+22                              | 7,564370E+22 | 6,774762E+22 | 6,774723E+22 | 1,512887E+23                           | 1,354949E+23                           | 2,867836E+23  |
| 239               | 7,564195E+22                              | 7,564432E+22 | 6,774786E+22 | 6,774794E+22 | 1,512863E+23                           | 1,354958E+23                           | 2,867821E+23  |
| 240               | 7,564600E+22                              | 7,564612E+22 | 6,774777E+22 | 6,774844E+22 | 1,512921E+23                           | 1,354962E+23                           | 2,867883E+23  |
| 241               | 7,564354E+22                              | 7,564335E+22 | 6,774948E+22 | 6,774819E+22 | 1,512869E+23                           | 1,354977E+23                           | 2,867846E+23  |
| 242               | 7,564336E+22                              | 7,564494E+22 | 6,774985E+22 | 6,774906E+22 | 1,512883E+23                           | 1,354989E+23                           | 2,867872E+23  |
| 243               | 7,564690E+22                              | 7,564540E+22 | 6,774973E+22 | 6,774969E+22 | 1,512923E+23                           | 1,354994E+23                           | 2,867917E+23  |
| 244               | 7,564298E+22                              | 7,564369E+22 | 6,775027E+22 | 6,775058E+22 | 1,512867E+23                           | 1,355009E+23                           | 2,867875E+23  |
| 245               | 7,564520E+22                              | 7,564635E+22 | 6,775022E+22 | 6,775114E+22 | 1,512916E+23                           | 1,355014E+23                           | 2,867929E+23  |
| 246               | 7,564657E+22                              | 7,564516E+22 | 6,775066E+22 | 6,775037E+22 | 1,512917E+23                           | 1,355010E+23                           | 2,867927E+23  |
| 247               | 7,564348E+22                              | 7,564443E+22 | 6,775090E+22 | 6,775029E+22 | 1,512879E+23                           | 1,355012E+23                           | 2,867891E+23  |
| 248               | 7,564742E+22                              | 7,564683E+22 | 6,775036E+22 | 6,775060E+22 | 1,512943E+23                           | 1,355010E+23                           | 2,867952E+23  |
| 249               | 7,564531E+22                              | 7,564455E+22 | 6,775100E+22 | 6,774987E+22 | 1,512899E+23                           | 1,355009E+23                           | 2,867907E+23  |
| 250               | 7,564304E+22                              | 7,564580E+22 | 6,775050E+22 | 6,775009E+22 | 1,512888E+23                           | 1,355006E+23                           | 2,867894E+23  |
| 251               | 7,564657E+22                              | 7,564669E+22 | 6,774965E+22 | 6,775012E+22 | 1,512933E+23                           | 1,354998E+23                           | 2,867930E+23  |
| 252               | 7,564291E+22                              | 7,564330E+22 | 6,774988E+22 | 6,774952E+22 | 1,512862E+23                           | 1,354994E+23                           | 2,867856E+23  |
| 253               | 7,564416E+22                              | 7,564487E+22 | 6,774957E+22 | 6,774913E+22 | 1,512890E+23                           | 1,354987E+23                           | 2,867877E+23  |
| 254               | 7,564653E+22                              | 7,564417E+22 | 6,774898E+22 | 6,774841E+22 | 1,512907E+23                           | 1,354974E+23                           | 2,867881E+23  |
| 255               | 7,564265E+22                              | 7,564292E+22 | 6,774840E+22 | 6,774841E+22 | 1,512856E+23                           | 1,354968E+23                           | 2,867824E+23  |
| 256               | 7,564557E+22                              | 7,564608E+22 | 6,774771E+22 | 6,774909E+22 | 1,512917E+23                           | 1,354968E+23                           | 2,867885E+23  |
| 257               | 7,564463E+22                              | 7,564422E+22 | 6,774874E+22 | 6,774840E+22 | 1,512888E+23                           | 1,354971E+23                           | 2,867860E+23  |
| 258               | 7,564211E+22                              | 7,564452E+22 | 6,774932E+22 | 6,774842E+22 | 1,512866E+23                           | 1,354977E+23                           | 2,867844E+23  |
| 259               | 7,564648E+22                              | 7,564617E+22 | 6,774950E+22 | 6,774922E+22 | 1,512926E+23                           | 1,354987E+23                           | 2,867914E+23  |
| 260               | 7,564386E+22                              | 7,564311E+22 | 6,775052E+22 | 6,774962E+22 | 1,512870E+23                           | 1,355001E+23                           | 2,867871E+23  |
| 261               | 7,564379E+22                              | 7,564509E+22 | 6,775093E+22 | 6,775049E+22 | 1,512889E+23                           | 1,355014E+23                           | 2,867903E+23  |
| 262               | 7,564674E+22                              | 7,564603E+22 | 6,775071E+22 | 6,775129E+22 | 1,512928E+23                           | 1,355020E+23                           | 2,867948E+23  |
| 263               | 7,564321E+22                              | 7,564399E+22 | 6,775096E+22 | 6,775146E+22 | 1,512872E+23                           | 1,355024E+23                           | 2,867896E+23  |
| 264               | 7,564596E+22                              | 7,564677E+22 | 6,775110E+22 | 6,775198E+22 | 1,512927E+23                           | 1,355031E+23                           | 2,867958E+23  |
| 265               | 7,564684E+22                              | 7,564533E+22 | 6,775204E+22 | 6,775128E+22 | 1,512922E+23                           | 1,355033E+23                           | 2,867955E+23  |
| 266               | 7,564387E+22                              | 7,564485E+22 | 6,775208E+22 | 6,775094E+22 | 1,512887E+23                           | 1,355030E+23                           | 2,867917E+23  |
| 267               | 7,564732E+22                              | 7,564743E+22 | 6,775145E+22 | 6,775171E+22 | 1,512947E+23                           | 1,355032E+23                           | 2,867979E+23  |
| 268               | 7,564483E+22                              | 7,564469E+22 | 6,775157E+22 | 6,775132E+22 | 1,512895E+23                           | 1,355029E+23                           | 2,867924E+23  |
| 269               | 7,564325E+22                              | 7,564540E+22 | 6,775147E+22 | 6,775086E+22 | 1,512886E+23                           | 1,355023E+23                           | 2,867910E+23  |
| 270               | 7,564670E+22                              | 7,564625E+22 | 6,775070E+22 | 6,775076E+22 | 1,512930E+23                           | 1,355015E+23                           | 2,867944E+23  |
| 271               | 7,564366E+22                              | 7,564279E+22 | 6,775029E+22 | 6,774977E+22 | 1,512865E+23                           | 1,355001E+23                           | 2,867865E+23  |
| 272               | 7,564499E+22                              | 7,564514E+22 | 6,774978E+22 | 6,774992E+22 | 1,512901E+23                           | 1,354997E+23                           | 2,867898E+23  |
| 273               | 7,564631E+22                              | 7,564495E+22 | 6,774961E+22 | 6,774958E+22 | 1,512913E+23                           | 1,354992E+23                           | 2,867904E+23  |
| 274               | 7,564246E+22                              | 7,564395E+22 | 6,774923E+22 | 6,774910E+22 | 1,512864E+23                           | 1,354983E+23                           | 2,867848E+23  |
| 275               | 7,564541E+22                              | 7,564683E+22 | 6,774927E+22 | 6,774984E+22 | 1,512922E+23                           | 1,354991E+23                           | 2,867913E+23  |
| 276               | 7,564466E+22                              | 7,564413E+22 | 6,775017E+22 | 6,774948E+22 | 1,512888E+23                           | 1,354997E+23                           | 2,867884E+23  |
| 277               | 7,564277E+22                              | 7,564400E+22 | 6,775106E+22 | 6,774942E+22 | 1,512868E+23                           | 1,355005E+23                           | 2,867873E+23  |
| 278               | 7,564657E+22                              | 7,564618E+22 | 6,775091E+22 | 6,775080E+22 | 1,512928E+23                           | 1,355017E+23                           | 2,867945E+23  |
| 279               | 7,564405E+22                              | 7,564326E+22 | 6,775093E+22 | 6,775115E+22 | 1,512873E+23                           | 1,355021E+23                           | 2,867894E+23  |
| 280               | 7,564413E+22                              | 7,564570E+22 | 6,775127E+22 | 6,775214E+22 | 1,512898E+23                           | 1,355034E+23                           | 2,867932E+23  |
| 281               | 7,564686E+22                              | 7,564637E+22 | 6,775175E+22 | 6,775249E+22 | 1,512932E+23                           | 1,355042E+23                           | 2,867975E+23  |
| 282               | 7,564395E+22                              | 7,564423E+22 | 6,775215E+22 | 6,775165E+22 | 1,512882E+23                           | 1,355038E+23                           | 2,867920E+23  |
| 283               | 7,564673E+22                              | 7,564720E+22 | 6,775259E+22 | 6,775235E+22 | 1,512939E+23                           | 1,355049E+23                           | 2,867989E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 284               | 7,564709E+22                              | 7,564554E+22 | 6,775294E+22 | 6,775224E+22 | 1,512926E+23                           | 1,355052E+23                           | 2,867978E+23  |
| 285               | 7,564387E+22                              | 7,564512E+22 | 6,775321E+22 | 6,775197E+22 | 1,512890E+23                           | 1,355052E+23                           | 2,867942E+23  |
| 286               | 7,564661E+22                              | 7,564793E+22 | 6,775257E+22 | 6,775296E+22 | 1,512945E+23                           | 1,355055E+23                           | 2,868001E+23  |
| 287               | 7,564473E+22                              | 7,564440E+22 | 6,775222E+22 | 6,775214E+22 | 1,512891E+23                           | 1,355044E+23                           | 2,867935E+23  |
| 288               | 7,564384E+22                              | 7,564516E+22 | 6,775209E+22 | 6,775174E+22 | 1,512890E+23                           | 1,355038E+23                           | 2,867928E+23  |
| 289               | 7,564707E+22                              | 7,564594E+22 | 6,775159E+22 | 6,775169E+22 | 1,512930E+23                           | 1,355033E+23                           | 2,867963E+23  |
| 290               | 7,564418E+22                              | 7,564312E+22 | 6,775083E+22 | 6,775031E+22 | 1,512873E+23                           | 1,355011E+23                           | 2,867884E+23  |
| 291               | 7,564509E+22                              | 7,564614E+22 | 6,775039E+22 | 6,775080E+22 | 1,512912E+23                           | 1,355012E+23                           | 2,867924E+23  |
| 292               | 7,564600E+22                              | 7,564553E+22 | 6,775019E+22 | 6,775070E+22 | 1,512915E+23                           | 1,355009E+23                           | 2,867924E+23  |
| 293               | 7,564275E+22                              | 7,564393E+22 | 6,775071E+22 | 6,774977E+22 | 1,512867E+23                           | 1,355005E+23                           | 2,867872E+23  |
| 294               | 7,564538E+22                              | 7,564673E+22 | 6,775099E+22 | 6,775059E+22 | 1,512921E+23                           | 1,355016E+23                           | 2,867937E+23  |
| 295               | 7,564513E+22                              | 7,564370E+22 | 6,775121E+22 | 6,775039E+22 | 1,512888E+23                           | 1,355016E+23                           | 2,867904E+23  |
| 296               | 7,564337E+22                              | 7,564417E+22 | 6,775171E+22 | 6,775097E+22 | 1,512875E+23                           | 1,355027E+23                           | 2,867902E+23  |
| 297               | 7,564636E+22                              | 7,564664E+22 | 6,775179E+22 | 6,775261E+22 | 1,512930E+23                           | 1,355044E+23                           | 2,867974E+23  |
| 298               | 7,564429E+22                              | 7,564403E+22 | 6,775175E+22 | 6,775215E+22 | 1,512883E+23                           | 1,355039E+23                           | 2,867922E+23  |
| 299               | 7,564468E+22                              | 7,564632E+22 | 6,775248E+22 | 6,775287E+22 | 1,512910E+23                           | 1,355054E+23                           | 2,867963E+23  |
| 300               | 7,564736E+22                              | 7,564643E+22 | 6,775300E+22 | 6,775329E+22 | 1,512938E+23                           | 1,355063E+23                           | 2,868001E+23  |
| 301               | 7,564490E+22                              | 7,564411E+22 | 6,775376E+22 | 6,775225E+22 | 1,512890E+23                           | 1,355060E+23                           | 2,867950E+23  |
| 302               | 7,564652E+22                              | 7,564758E+22 | 6,775400E+22 | 6,775342E+22 | 1,512941E+23                           | 1,355074E+23                           | 2,868015E+23  |
| 303               | 7,564679E+22                              | 7,564587E+22 | 6,775346E+22 | 6,775356E+22 | 1,512927E+23                           | 1,355070E+23                           | 2,867997E+23  |
| 304               | 7,564380E+22                              | 7,564540E+22 | 6,775362E+22 | 6,775341E+22 | 1,512892E+23                           | 1,355070E+23                           | 2,867962E+23  |
| 305               | 7,564636E+22                              | 7,564770E+22 | 6,775356E+22 | 6,775407E+22 | 1,512941E+23                           | 1,355076E+23                           | 2,868017E+23  |
| 306               | 7,564536E+22                              | 7,564419E+22 | 6,775296E+22 | 6,775239E+22 | 1,512896E+23                           | 1,355053E+23                           | 2,867949E+23  |
| 307               | 7,564465E+22                              | 7,564532E+22 | 6,775280E+22 | 6,775218E+22 | 1,512900E+23                           | 1,355050E+23                           | 2,867950E+23  |
| 308               | 7,564734E+22                              | 7,564627E+22 | 6,775200E+22 | 6,775260E+22 | 1,512936E+23                           | 1,355046E+23                           | 2,867982E+23  |
| 309               | 7,564445E+22                              | 7,564370E+22 | 6,775169E+22 | 6,775104E+22 | 1,512881E+23                           | 1,355027E+23                           | 2,867909E+23  |
| 310               | 7,564455E+22                              | 7,564695E+22 | 6,775170E+22 | 6,775157E+22 | 1,512915E+23                           | 1,355033E+23                           | 2,867948E+23  |
| 311               | 7,564601E+22                              | 7,564558E+22 | 6,775126E+22 | 6,775139E+22 | 1,512916E+23                           | 1,355027E+23                           | 2,867942E+23  |
| 312               | 7,564324E+22                              | 7,564379E+22 | 6,775194E+22 | 6,775087E+22 | 1,512870E+23                           | 1,355028E+23                           | 2,867898E+23  |
| 313               | 7,564547E+22                              | 7,564642E+22 | 6,775247E+22 | 6,775208E+22 | 1,512919E+23                           | 1,355045E+23                           | 2,867964E+23  |
| 314               | 7,564544E+22                              | 7,564384E+22 | 6,775202E+22 | 6,775165E+22 | 1,512893E+23                           | 1,355037E+23                           | 2,867929E+23  |
| 315               | 7,564360E+22                              | 7,564494E+22 | 6,775231E+22 | 6,775248E+22 | 1,512885E+23                           | 1,355048E+23                           | 2,867933E+23  |
| 316               | 7,564653E+22                              | 7,564689E+22 | 6,775233E+22 | 6,775392E+22 | 1,512934E+23                           | 1,355063E+23                           | 2,867997E+23  |
| 317               | 7,564516E+22                              | 7,564397E+22 | 6,775305E+22 | 6,775262E+22 | 1,512891E+23                           | 1,355057E+23                           | 2,867948E+23  |
| 318               | 7,564513E+22                              | 7,564664E+22 | 6,775407E+22 | 6,775322E+22 | 1,512918E+23                           | 1,355073E+23                           | 2,867991E+23  |
| 319               | 7,564793E+22                              | 7,564650E+22 | 6,775396E+22 | 6,775393E+22 | 1,512944E+23                           | 1,355079E+23                           | 2,868023E+23  |
| 320               | 7,564513E+22                              | 7,564473E+22 | 6,775461E+22 | 6,775362E+22 | 1,512899E+23                           | 1,355082E+23                           | 2,867981E+23  |
| 321               | 7,564575E+22                              | 7,564815E+22 | 6,775511E+22 | 6,775508E+22 | 1,512939E+23                           | 1,355102E+23                           | 2,868041E+23  |
| 322               | 7,564646E+22                              | 7,564626E+22 | 6,775438E+22 | 6,775457E+22 | 1,512927E+23                           | 1,355089E+23                           | 2,868017E+23  |
| 323               | 7,564407E+22                              | 7,564557E+22 | 6,775460E+22 | 6,775429E+22 | 1,512896E+23                           | 1,355089E+23                           | 2,867985E+23  |
| 324               | 7,564685E+22                              | 7,564718E+22 | 6,775437E+22 | 6,775492E+22 | 1,512940E+23                           | 1,355093E+23                           | 2,868033E+23  |
| 325               | 7,564645E+22                              | 7,564385E+22 | 6,775394E+22 | 6,775291E+22 | 1,512903E+23                           | 1,355068E+23                           | 2,867971E+23  |
| 326               | 7,564475E+22                              | 7,564589E+22 | 6,775359E+22 | 6,775292E+22 | 1,512906E+23                           | 1,355065E+23                           | 2,867971E+23  |
| 327               | 7,564726E+22                              | 7,564682E+22 | 6,775223E+22 | 6,775350E+22 | 1,512941E+23                           | 1,355057E+23                           | 2,867998E+23  |
| 328               | 7,564457E+22                              | 7,564421E+22 | 6,775235E+22 | 6,775202E+22 | 1,512888E+23                           | 1,355044E+23                           | 2,867932E+23  |
| 329               | 7,564421E+22                              | 7,564685E+22 | 6,775318E+22 | 6,775244E+22 | 1,512911E+23                           | 1,355056E+23                           | 2,867967E+23  |
| 330               | 7,564638E+22                              | 7,564546E+22 | 6,775251E+22 | 6,775189E+22 | 1,512918E+23                           | 1,355044E+23                           | 2,867962E+23  |
| 331               | 7,564384E+22                              | 7,564388E+22 | 6,775287E+22 | 6,775189E+22 | 1,512877E+23                           | 1,355048E+23                           | 2,867925E+23  |
| 332               | 7,564550E+22                              | 7,564647E+22 | 6,775310E+22 | 6,775364E+22 | 1,512920E+23                           | 1,355067E+23                           | 2,867987E+23  |



| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 333               | 7,564587E+22                              | 7,564425E+22 | 6,775286E+22 | 6,775286E+22 | 1,512901E+23                           | 1,355057E+23                           | 2,867958E+23  |
| 334               | 7,564353E+22                              | 7,564562E+22 | 6,775347E+22 | 6,775339E+22 | 1,512891E+23                           | 1,355069E+23                           | 2,867960E+23  |
| 335               | 7,564704E+22                              | 7,564707E+22 | 6,775332E+22 | 6,775463E+22 | 1,512941E+23                           | 1,355079E+23                           | 2,868021E+23  |
| 336               | 7,564606E+22                              | 7,564423E+22 | 6,775428E+22 | 6,775348E+22 | 1,512903E+23                           | 1,355078E+23                           | 2,867980E+23  |
| 337               | 7,564514E+22                              | 7,564685E+22 | 6,775570E+22 | 6,775446E+22 | 1,512920E+23                           | 1,355102E+23                           | 2,868022E+23  |
| 338               | 7,564783E+22                              | 7,564716E+22 | 6,775495E+22 | 6,775513E+22 | 1,512950E+23                           | 1,355101E+23                           | 2,868051E+23  |
| 339               | 7,564491E+22                              | 7,564551E+22 | 6,775540E+22 | 6,775520E+22 | 1,512904E+23                           | 1,355106E+23                           | 2,868010E+23  |
| 340               | 7,564548E+22                              | 7,564800E+22 | 6,775597E+22 | 6,775650E+22 | 1,512935E+23                           | 1,355125E+23                           | 2,868059E+23  |
| 341               | 7,564725E+22                              | 7,564570E+22 | 6,775555E+22 | 6,775514E+22 | 1,512930E+23                           | 1,355107E+23                           | 2,868036E+23  |
| 342               | 7,564468E+22                              | 7,564545E+22 | 6,775568E+22 | 6,775462E+22 | 1,512901E+23                           | 1,355103E+23                           | 2,868004E+23  |
| 343               | 7,564767E+22                              | 7,564707E+22 | 6,775467E+22 | 6,775546E+22 | 1,512947E+23                           | 1,355101E+23                           | 2,868049E+23  |
| 344               | 7,564688E+22                              | 7,564459E+22 | 6,775428E+22 | 6,775381E+22 | 1,512915E+23                           | 1,355081E+23                           | 2,867995E+23  |
| 345               | 7,564419E+22                              | 7,564672E+22 | 6,775456E+22 | 6,775397E+22 | 1,512909E+23                           | 1,355085E+23                           | 2,867994E+23  |
| 346               | 7,564695E+22                              | 7,564738E+22 | 6,775321E+22 | 6,775399E+22 | 1,512943E+23                           | 1,355072E+23                           | 2,868015E+23  |
| 347               | 7,564466E+22                              | 7,564454E+22 | 6,775360E+22 | 6,775285E+22 | 1,512892E+23                           | 1,355065E+23                           | 2,867956E+23  |
| 348               | 7,564432E+22                              | 7,564628E+22 | 6,775439E+22 | 6,775357E+22 | 1,512906E+23                           | 1,355080E+23                           | 2,867986E+23  |
| 349               | 7,564696E+22                              | 7,564495E+22 | 6,775369E+22 | 6,775298E+22 | 1,512919E+23                           | 1,355067E+23                           | 2,867986E+23  |
| 350               | 7,564377E+22                              | 7,564437E+22 | 6,775366E+22 | 6,775320E+22 | 1,512881E+23                           | 1,355069E+23                           | 2,867950E+23  |
| 351               | 7,564571E+22                              | 7,564672E+22 | 6,775324E+22 | 6,775498E+22 | 1,512924E+23                           | 1,355082E+23                           | 2,868007E+23  |
| 352               | 7,564646E+22                              | 7,564467E+22 | 6,775352E+22 | 6,775388E+22 | 1,512911E+23                           | 1,355074E+23                           | 2,867985E+23  |
| 353               | 7,564383E+22                              | 7,564579E+22 | 6,775494E+22 | 6,775410E+22 | 1,512896E+23                           | 1,355090E+23                           | 2,867987E+23  |
| 354               | 7,564761E+22                              | 7,564737E+22 | 6,775462E+22 | 6,775498E+22 | 1,512950E+23                           | 1,355096E+23                           | 2,868046E+23  |
| 355               | 7,564650E+22                              | 7,564499E+22 | 6,775548E+22 | 6,775458E+22 | 1,512915E+23                           | 1,355101E+23                           | 2,868015E+23  |
| 356               | 7,564477E+22                              | 7,564722E+22 | 6,775681E+22 | 6,775610E+22 | 1,512920E+23                           | 1,355129E+23                           | 2,868049E+23  |
| 357               | 7,564780E+22                              | 7,564745E+22 | 6,775624E+22 | 6,775646E+22 | 1,512952E+23                           | 1,355127E+23                           | 2,868079E+23  |
| 358               | 7,564474E+22                              | 7,564579E+22 | 6,775673E+22 | 6,775621E+22 | 1,512905E+23                           | 1,355129E+23                           | 2,868035E+23  |
| 359               | 7,564606E+22                              | 7,564749E+22 | 6,775676E+22 | 6,775736E+22 | 1,512936E+23                           | 1,355141E+23                           | 2,868077E+23  |
| 360               | 7,564835E+22                              | 7,564552E+22 | 6,775632E+22 | 6,775595E+22 | 1,512939E+23                           | 1,355123E+23                           | 2,868061E+23  |
| 361               | 7,564496E+22                              | 7,564555E+22 | 6,775659E+22 | 6,775557E+22 | 1,512905E+23                           | 1,355122E+23                           | 2,868027E+23  |
| 362               | 7,564766E+22                              | 7,564791E+22 | 6,775504E+22 | 6,775619E+22 | 1,512956E+23                           | 1,355112E+23                           | 2,868068E+23  |
| 363               | 7,564675E+22                              | 7,564566E+22 | 6,775467E+22 | 6,775476E+22 | 1,512924E+23                           | 1,355094E+23                           | 2,868018E+23  |
| 364               | 7,564374E+22                              | 7,564668E+22 | 6,775556E+22 | 6,775485E+22 | 1,512904E+23                           | 1,355104E+23                           | 2,868008E+23  |
| 365               | 7,564731E+22                              | 7,564702E+22 | 6,775463E+22 | 6,775439E+22 | 1,512943E+23                           | 1,355090E+23                           | 2,868034E+23  |
| 366               | 7,564484E+22                              | 7,564438E+22 | 6,775491E+22 | 6,775346E+22 | 1,512892E+23                           | 1,355084E+23                           | 2,867976E+23  |
| 367               | 7,564473E+22                              | 7,564593E+22 | 6,775490E+22 | 6,775476E+22 | 1,512907E+23                           | 1,355097E+23                           | 2,868003E+23  |
| 368               | 7,564734E+22                              | 7,564537E+22 | 6,775411E+22 | 6,775440E+22 | 1,512927E+23                           | 1,355085E+23                           | 2,868012E+23  |
| 369               | 7,564353E+22                              | 7,564495E+22 | 6,775458E+22 | 6,775450E+22 | 1,512885E+23                           | 1,355091E+23                           | 2,867976E+23  |
| 370               | 7,564594E+22                              | 7,564730E+22 | 6,775416E+22 | 6,775556E+22 | 1,512932E+23                           | 1,355097E+23                           | 2,868030E+23  |
| 371               | 7,564710E+22                              | 7,564534E+22 | 6,775474E+22 | 6,775463E+22 | 1,512924E+23                           | 1,355094E+23                           | 2,868018E+23  |
| 372               | 7,564419E+22                              | 7,564570E+22 | 6,775657E+22 | 6,775517E+22 | 1,512899E+23                           | 1,355117E+23                           | 2,868016E+23  |
| 373               | 7,564805E+22                              | 7,564749E+22 | 6,775623E+22 | 6,775609E+22 | 1,512955E+23                           | 1,355123E+23                           | 2,868079E+23  |
| 374               | 7,564613E+22                              | 7,564576E+22 | 6,775681E+22 | 6,775608E+22 | 1,512919E+23                           | 1,355129E+23                           | 2,868048E+23  |
| 375               | 7,564470E+22                              | 7,564723E+22 | 6,775744E+22 | 6,775775E+22 | 1,512919E+23                           | 1,355152E+23                           | 2,868071E+23  |
| 376               | 7,564823E+22                              | 7,564731E+22 | 6,775715E+22 | 6,775765E+22 | 1,512955E+23                           | 1,355148E+23                           | 2,868103E+23  |
| 377               | 7,564521E+22                              | 7,564555E+22 | 6,775792E+22 | 6,775704E+22 | 1,512908E+23                           | 1,355150E+23                           | 2,868057E+23  |
| 378               | 7,564689E+22                              | 7,564744E+22 | 6,775732E+22 | 6,775766E+22 | 1,512943E+23                           | 1,355150E+23                           | 2,868093E+23  |
| 379               | 7,564889E+22                              | 7,564638E+22 | 6,775669E+22 | 6,775676E+22 | 1,512953E+23                           | 1,355135E+23                           | 2,868087E+23  |
| 380               | 7,564468E+22                              | 7,564619E+22 | 6,775721E+22 | 6,775661E+22 | 1,512909E+23                           | 1,355138E+23                           | 2,868047E+23  |
| 381               | 7,564743E+22                              | 7,564839E+22 | 6,775612E+22 | 6,775678E+22 | 1,512958E+23                           | 1,355129E+23                           | 2,868087E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 382               | 7,564632E+22                              | 7,564615E+22 | 6,775616E+22 | 6,775529E+22 | 1,512925E+23                           | 1,355114E+23                           | 2,868039E+23  |
| 383               | 7,564397E+22                              | 7,564606E+22 | 6,775656E+22 | 6,775568E+22 | 1,512900E+23                           | 1,355122E+23                           | 2,868023E+23  |
| 384               | 7,564787E+22                              | 7,564653E+22 | 6,775569E+22 | 6,775543E+22 | 1,512944E+23                           | 1,355111E+23                           | 2,868055E+23  |
| 385               | 7,564487E+22                              | 7,564429E+22 | 6,775584E+22 | 6,775488E+22 | 1,512892E+23                           | 1,355107E+23                           | 2,867999E+23  |
| 386               | 7,564476E+22                              | 7,564634E+22 | 6,775510E+22 | 6,775591E+22 | 1,512911E+23                           | 1,355110E+23                           | 2,868021E+23  |
| 387               | 7,564760E+22                              | 7,564625E+22 | 6,775444E+22 | 6,775560E+22 | 1,512938E+23                           | 1,355100E+23                           | 2,868039E+23  |
| 388               | 7,564378E+22                              | 7,564498E+22 | 6,775569E+22 | 6,775532E+22 | 1,512888E+23                           | 1,355110E+23                           | 2,867998E+23  |
| 389               | 7,564676E+22                              | 7,564732E+22 | 6,775576E+22 | 6,775582E+22 | 1,512941E+23                           | 1,355116E+23                           | 2,868057E+23  |
| 390               | 7,564750E+22                              | 7,564589E+22 | 6,775642E+22 | 6,775522E+22 | 1,512934E+23                           | 1,355116E+23                           | 2,868050E+23  |
| 391               | 7,564440E+22                              | 7,564586E+22 | 6,775760E+22 | 6,775662E+22 | 1,512903E+23                           | 1,355142E+23                           | 2,868045E+23  |
| 392               | 7,564800E+22                              | 7,564808E+22 | 6,775730E+22 | 6,775779E+22 | 1,512961E+23                           | 1,355151E+23                           | 2,868112E+23  |
| 393               | 7,564568E+22                              | 7,564606E+22 | 6,775814E+22 | 6,775773E+22 | 1,512917E+23                           | 1,355159E+23                           | 2,868076E+23  |
| 394               | 7,564487E+22                              | 7,564727E+22 | 6,775837E+22 | 6,775870E+22 | 1,512921E+23                           | 1,355171E+23                           | 2,868092E+23  |
| 395               | 7,564906E+22                              | 7,564753E+22 | 6,775788E+22 | 6,775857E+22 | 1,512966E+23                           | 1,355164E+23                           | 2,868130E+23  |
| 396               | 7,564578E+22                              | 7,564525E+22 | 6,775888E+22 | 6,775795E+22 | 1,512910E+23                           | 1,355168E+23                           | 2,868079E+23  |
| 397               | 7,564743E+22                              | 7,564782E+22 | 6,775816E+22 | 6,775831E+22 | 1,512953E+23                           | 1,355165E+23                           | 2,868117E+23  |
| 398               | 7,564858E+22                              | 7,564748E+22 | 6,775749E+22 | 6,775751E+22 | 1,512961E+23                           | 1,355150E+23                           | 2,868111E+23  |
| 399               | 7,564453E+22                              | 7,564632E+22 | 6,775783E+22 | 6,775758E+22 | 1,512908E+23                           | 1,355154E+23                           | 2,868063E+23  |
| 400               | 7,564757E+22                              | 7,564822E+22 | 6,775728E+22 | 6,775737E+22 | 1,512958E+23                           | 1,355147E+23                           | 2,868104E+23  |
| 401               | 7,564636E+22                              | 7,564573E+22 | 6,775758E+22 | 6,775601E+22 | 1,512921E+23                           | 1,355136E+23                           | 2,868057E+23  |
| 402               | 7,564436E+22                              | 7,564573E+22 | 6,775722E+22 | 6,775635E+22 | 1,512901E+23                           | 1,355136E+23                           | 2,868037E+23  |
| 403               | 7,564819E+22                              | 7,564705E+22 | 6,775595E+22 | 6,775673E+22 | 1,512952E+23                           | 1,355127E+23                           | 2,868079E+23  |
| 404               | 7,564475E+22                              | 7,564464E+22 | 6,775643E+22 | 6,775625E+22 | 1,512894E+23                           | 1,355127E+23                           | 2,868021E+23  |
| 405               | 7,564507E+22                              | 7,564680E+22 | 6,775603E+22 | 6,775660E+22 | 1,512919E+23                           | 1,355126E+23                           | 2,868045E+23  |
| 406               | 7,564778E+22                              | 7,564700E+22 | 6,775591E+22 | 6,775607E+22 | 1,512948E+23                           | 1,355120E+23                           | 2,868068E+23  |
| 407               | 7,564449E+22                              | 7,564482E+22 | 6,775697E+22 | 6,775619E+22 | 1,512893E+23                           | 1,355132E+23                           | 2,868025E+23  |
| 408               | 7,564730E+22                              | 7,564731E+22 | 6,775732E+22 | 6,775687E+22 | 1,512946E+23                           | 1,355142E+23                           | 2,868088E+23  |
| 409               | 7,564727E+22                              | 7,564635E+22 | 6,775789E+22 | 6,775694E+22 | 1,512936E+23                           | 1,355148E+23                           | 2,868085E+23  |
| 410               | 7,564415E+22                              | 7,564627E+22 | 6,775820E+22 | 6,775817E+22 | 1,512904E+23                           | 1,355164E+23                           | 2,868068E+23  |
| 411               | 7,564798E+22                              | 7,564859E+22 | 6,775790E+22 | 6,775936E+22 | 1,512966E+23                           | 1,355173E+23                           | 2,868138E+23  |
| 412               | 7,564602E+22                              | 7,564569E+22 | 6,775924E+22 | 6,775881E+22 | 1,512917E+23                           | 1,355181E+23                           | 2,868098E+23  |
| 413               | 7,564592E+22                              | 7,564694E+22 | 6,775944E+22 | 6,775905E+22 | 1,512929E+23                           | 1,355185E+23                           | 2,868114E+23  |
| 414               | 7,564968E+22                              | 7,564806E+22 | 6,775897E+22 | 6,775897E+22 | 1,512977E+23                           | 1,355179E+23                           | 2,868157E+23  |
| 415               | 7,564623E+22                              | 7,564559E+22 | 6,775936E+22 | 6,775889E+22 | 1,512918E+23                           | 1,355183E+23                           | 2,868101E+23  |
| 416               | 7,564738E+22                              | 7,564851E+22 | 6,775907E+22 | 6,775914E+22 | 1,512959E+23                           | 1,355182E+23                           | 2,868141E+23  |
| 417               | 7,564803E+22                              | 7,564802E+22 | 6,775886E+22 | 6,775844E+22 | 1,512961E+23                           | 1,355173E+23                           | 2,868133E+23  |
| 418               | 7,564441E+22                              | 7,564623E+22 | 6,775884E+22 | 6,775818E+22 | 1,512906E+23                           | 1,355170E+23                           | 2,868077E+23  |
| 419               | 7,564787E+22                              | 7,564821E+22 | 6,775815E+22 | 6,775837E+22 | 1,512961E+23                           | 1,355165E+23                           | 2,868126E+23  |
| 420               | 7,564659E+22                              | 7,564514E+22 | 6,775859E+22 | 6,775730E+22 | 1,512917E+23                           | 1,355159E+23                           | 2,868076E+23  |
| 421               | 7,564472E+22                              | 7,564584E+22 | 6,775777E+22 | 6,775744E+22 | 1,512906E+23                           | 1,355152E+23                           | 2,868058E+23  |
| 422               | 7,564814E+22                              | 7,564794E+22 | 6,775652E+22 | 6,775771E+22 | 1,512961E+23                           | 1,355142E+23                           | 2,868103E+23  |
| 423               | 7,564512E+22                              | 7,564474E+22 | 6,775692E+22 | 6,775721E+22 | 1,512899E+23                           | 1,355141E+23                           | 2,868040E+23  |
| 424               | 7,564579E+22                              | 7,564690E+22 | 6,775729E+22 | 6,775699E+22 | 1,512927E+23                           | 1,355143E+23                           | 2,868070E+23  |
| 425               | 7,564815E+22                              | 7,564712E+22 | 6,775748E+22 | 6,775670E+22 | 1,512953E+23                           | 1,355142E+23                           | 2,868095E+23  |
| 426               | 7,564476E+22                              | 7,564504E+22 | 6,775800E+22 | 6,775709E+22 | 1,512898E+23                           | 1,355151E+23                           | 2,868049E+23  |
| 427               | 7,564722E+22                              | 7,564821E+22 | 6,775803E+22 | 6,775847E+22 | 1,512954E+23                           | 1,355165E+23                           | 2,868119E+23  |
| 428               | 7,564678E+22                              | 7,564655E+22 | 6,775907E+22 | 6,775871E+22 | 1,512933E+23                           | 1,355178E+23                           | 2,868111E+23  |
| 429               | 7,564433E+22                              | 7,564642E+22 | 6,775941E+22 | 6,775926E+22 | 1,512908E+23                           | 1,355187E+23                           | 2,868094E+23  |
| 430               | 7,564839E+22                              | 7,564885E+22 | 6,775931E+22 | 6,776005E+22 | 1,512972E+23                           | 1,355194E+23                           | 2,868166E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 431                    | 7,564708E+22                              | 7,564524E+22 | 6,776018E+22 | 6,775973E+22 | 1,512923E+23                           | 1,355199E+23                           | 2,868122E+23  |
| 432                    | 7,564686E+22                              | 7,564699E+22 | 6,776049E+22 | 6,775981E+22 | 1,512939E+23                           | 1,355203E+23                           | 2,868142E+23  |
| 433                    | 7,564958E+22                              | 7,564882E+22 | 6,775996E+22 | 6,776015E+22 | 1,512984E+23                           | 1,355201E+23                           | 2,868185E+23  |
| 434                    | 7,564595E+22                              | 7,564633E+22 | 6,775984E+22 | 6,775988E+22 | 1,512923E+23                           | 1,355197E+23                           | 2,868120E+23  |
| 435                    | 7,564716E+22                              | 7,564912E+22 | 6,775977E+22 | 6,776011E+22 | 1,512963E+23                           | 1,355199E+23                           | 2,868162E+23  |
| 436                    | 7,564798E+22                              | 7,564756E+22 | 6,776023E+22 | 6,775928E+22 | 1,512955E+23                           | 1,355195E+23                           | 2,868151E+23  |
| 437                    | 7,564501E+22                              | 7,564578E+22 | 6,775990E+22 | 6,775867E+22 | 1,512908E+23                           | 1,355186E+23                           | 2,868094E+23  |
| 438                    | 7,564809E+22                              | 7,564845E+22 | 6,775905E+22 | 6,775913E+22 | 1,512965E+23                           | 1,355182E+23                           | 2,868147E+23  |
| 439                    | 7,564694E+22                              | 7,564522E+22 | 6,775878E+22 | 6,775864E+22 | 1,512922E+23                           | 1,355174E+23                           | 2,868096E+23  |
| 440                    | 7,564496E+22                              | 7,564622E+22 | 6,775835E+22 | 6,775834E+22 | 1,512912E+23                           | 1,355167E+23                           | 2,868079E+23  |
| 441                    | 7,564806E+22                              | 7,564849E+22 | 6,775769E+22 | 6,775851E+22 | 1,512966E+23                           | 1,355162E+23                           | 2,868128E+23  |
| 442                    | 7,564555E+22                              | 7,564490E+22 | 6,775779E+22 | 6,775759E+22 | 1,512904E+23                           | 1,355154E+23                           | 2,868058E+23  |
| 443                    | 7,564621E+22                              | 7,564724E+22 | 6,775834E+22 | 6,775778E+22 | 1,512934E+23                           | 1,355161E+23                           | 2,868096E+23  |
| 444                    | 7,564818E+22                              | 7,564708E+22 | 6,775894E+22 | 6,775808E+22 | 1,512953E+23                           | 1,355170E+23                           | 2,868123E+23  |
| 445                    | 7,564475E+22                              | 7,564539E+22 | 6,775900E+22 | 6,775849E+22 | 1,512901E+23                           | 1,355175E+23                           | 2,868076E+23  |
| 446                    | 7,564687E+22                              | 7,564890E+22 | 6,775915E+22 | 6,775985E+22 | 1,512958E+23                           | 1,355190E+23                           | 2,868148E+23  |
| 447                    | 7,564722E+22                              | 7,564619E+22 | 6,775989E+22 | 6,776008E+22 | 1,512934E+23                           | 1,355200E+23                           | 2,868134E+23  |
| 448                    | 7,564534E+22                              | 7,564603E+22 | 6,776063E+22 | 6,775988E+22 | 1,512914E+23                           | 1,355205E+23                           | 2,868119E+23  |
| 449                    | 7,564912E+22                              | 7,564892E+22 | 6,776061E+22 | 6,776079E+22 | 1,512980E+23                           | 1,355214E+23                           | 2,868194E+23  |
| 450                    | 7,564766E+22                              | 7,564572E+22 | 6,776073E+22 | 6,776048E+22 | 1,512934E+23                           | 1,355212E+23                           | 2,868146E+23  |
| 451                    | 7,564690E+22                              | 7,564828E+22 | 6,776098E+22 | 6,776100E+22 | 1,512952E+23                           | 1,355220E+23                           | 2,868171E+23  |
| 452                    | 7,564909E+22                              | 7,564939E+22 | 6,776119E+22 | 6,776143E+22 | 1,512985E+23                           | 1,355226E+23                           | 2,868211E+23  |
| 453                    | 7,564582E+22                              | 7,564667E+22 | 6,776116E+22 | 6,776065E+22 | 1,512925E+23                           | 1,355218E+23                           | 2,868143E+23  |
| 454                    | 7,564712E+22                              | 7,564931E+22 | 6,776129E+22 | 6,776073E+22 | 1,512964E+23                           | 1,355220E+23                           | 2,868185E+23  |
| 455                    | 7,564852E+22                              | 7,564676E+22 | 6,776115E+22 | 6,776045E+22 | 1,512953E+23                           | 1,355216E+23                           | 2,868169E+23  |
| 456                    | 7,564569E+22                              | 7,564546E+22 | 6,776069E+22 | 6,775969E+22 | 1,512911E+23                           | 1,355204E+23                           | 2,868115E+23  |
| 457                    | 7,564806E+22                              | 7,564879E+22 | 6,775954E+22 | 6,776038E+22 | 1,512969E+23                           | 1,355199E+23                           | 2,868168E+23  |
| 458                    | 7,564697E+22                              | 7,564567E+22 | 6,775877E+22 | 6,775947E+22 | 1,512926E+23                           | 1,355182E+23                           | 2,868109E+23  |
| 459                    | 7,564531E+22                              | 7,564686E+22 | 6,775873E+22 | 6,775888E+22 | 1,512922E+23                           | 1,355176E+23                           | 2,868098E+23  |
| 460                    | 7,564834E+22                              | 7,564827E+22 | 6,775905E+22 | 6,775897E+22 | 1,512966E+23                           | 1,355180E+23                           | 2,868146E+23  |
| 461                    | 7,564610E+22                              | 7,564505E+22 | 6,775910E+22 | 6,775800E+22 | 1,512911E+23                           | 1,355171E+23                           | 2,868083E+23  |
| 462                    | 7,564613E+22                              | 7,564792E+22 | 6,775971E+22 | 6,775869E+22 | 1,512941E+23                           | 1,355184E+23                           | 2,868125E+23  |
| 463                    | 7,564805E+22                              | 7,564725E+22 | 6,775981E+22 | 6,775983E+22 | 1,512953E+23                           | 1,355196E+23                           | 2,868149E+23  |
| 464                    | 7,564485E+22                              | 7,564555E+22 | 6,776018E+22 | 6,775984E+22 | 1,512904E+23                           | 1,355200E+23                           | 2,868104E+23  |
| 465                    | 7,564690E+22                              | 7,564900E+22 | 6,776058E+22 | 6,776112E+22 | 1,512959E+23                           | 1,355217E+23                           | 2,868176E+23  |
| 466                    | 7,564792E+22                              | 7,564612E+22 | 6,776072E+22 | 6,776096E+22 | 1,512940E+23                           | 1,355217E+23                           | 2,868157E+23  |
| 467                    | 7,564626E+22                              | 7,564643E+22 | 6,776135E+22 | 6,776091E+22 | 1,512927E+23                           | 1,355223E+23                           | 2,868150E+23  |
| 468                    | 7,564941E+22                              | 7,564922E+22 | 6,776180E+22 | 6,776211E+22 | 1,512986E+23                           | 1,355239E+23                           | 2,868225E+23  |
| 469                    | 7,564770E+22                              | 7,564672E+22 | 6,776154E+22 | 6,776156E+22 | 1,512944E+23                           | 1,355231E+23                           | 2,868175E+23  |
| 470                    | 7,564645E+22                              | 7,564930E+22 | 6,776221E+22 | 6,776191E+22 | 1,512957E+23                           | 1,355241E+23                           | 2,868199E+23  |
| 471                    | 7,564921E+22                              | 7,564909E+22 | 6,776230E+22 | 6,776250E+22 | 1,512983E+23                           | 1,355248E+23                           | 2,868231E+23  |
| 472                    | 7,564648E+22                              | 7,564597E+22 | 6,776250E+22 | 6,776118E+22 | 1,512924E+23                           | 1,355237E+23                           | 2,868161E+23  |
| 473                    | 7,564740E+22                              | 7,564896E+22 | 6,776244E+22 | 6,776162E+22 | 1,512964E+23                           | 1,355241E+23                           | 2,868204E+23  |
| 474                    | 7,564886E+22                              | 7,564677E+22 | 6,776119E+22 | 6,776136E+22 | 1,512956E+23                           | 1,355225E+23                           | 2,868182E+23  |
| 475                    | 7,564578E+22                              | 7,564624E+22 | 6,776055E+22 | 6,776075E+22 | 1,512920E+23                           | 1,355213E+23                           | 2,868133E+23  |
| 476                    | 7,564788E+22                              | 7,564912E+22 | 6,776034E+22 | 6,776131E+22 | 1,512970E+23                           | 1,355217E+23                           | 2,868187E+23  |
| 477                    | 7,564721E+22                              | 7,564615E+22 | 6,775973E+22 | 6,775971E+22 | 1,512934E+23                           | 1,355194E+23                           | 2,868128E+23  |
| 478                    | 7,564552E+22                              | 7,564734E+22 | 6,776029E+22 | 6,775911E+22 | 1,512929E+23                           | 1,355194E+23                           | 2,868123E+23  |
| 479                    | 7,564876E+22                              | 7,564791E+22 | 6,776029E+22 | 6,776002E+22 | 1,512967E+23                           | 1,355203E+23                           | 2,868170E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 480                    | 7,564635E+22                              | 7,564504E+22 | 6,776040E+22 | 6,775928E+22 | 1,512914E+23                           | 1,355197E+23                           | 2,868111E+23  |
| 481                    | 7,564562E+22                              | 7,564839E+22 | 6,776080E+22 | 6,776048E+22 | 1,512940E+23                           | 1,355213E+23                           | 2,868153E+23  |
| 482                    | 7,564791E+22                              | 7,564739E+22 | 6,776028E+22 | 6,776129E+22 | 1,512953E+23                           | 1,355216E+23                           | 2,868169E+23  |
| 483                    | 7,564542E+22                              | 7,564580E+22 | 6,776080E+22 | 6,776095E+22 | 1,512912E+23                           | 1,355218E+23                           | 2,868130E+23  |
| 484                    | 7,564765E+22                              | 7,564864E+22 | 6,776190E+22 | 6,776205E+22 | 1,512963E+23                           | 1,355240E+23                           | 2,868202E+23  |
| 485                    | 7,564879E+22                              | 7,564659E+22 | 6,776171E+22 | 6,776158E+22 | 1,512954E+23                           | 1,355233E+23                           | 2,868187E+23  |
| 486                    | 7,564655E+22                              | 7,564762E+22 | 6,776253E+22 | 6,776173E+22 | 1,512942E+23                           | 1,355243E+23                           | 2,868184E+23  |
| 487                    | 7,564933E+22                              | 7,564972E+22 | 6,776278E+22 | 6,776352E+22 | 1,512991E+23                           | 1,355263E+23                           | 2,868254E+23  |
| 488                    | 7,564773E+22                              | 7,564711E+22 | 6,776309E+22 | 6,776253E+22 | 1,512948E+23                           | 1,355256E+23                           | 2,868205E+23  |
| 489                    | 7,564624E+22                              | 7,564932E+22 | 6,776384E+22 | 6,776286E+22 | 1,512956E+23                           | 1,355267E+23                           | 2,868223E+23  |
| 490                    | 7,564943E+22                              | 7,564860E+22 | 6,776314E+22 | 6,776334E+22 | 1,512980E+23                           | 1,355265E+23                           | 2,868245E+23  |
| 491                    | 7,564710E+22                              | 7,564590E+22 | 6,776294E+22 | 6,776226E+22 | 1,512930E+23                           | 1,355252E+23                           | 2,868182E+23  |
| 492                    | 7,564751E+22                              | 7,564871E+22 | 6,776308E+22 | 6,776297E+22 | 1,512962E+23                           | 1,355261E+23                           | 2,868223E+23  |
| 493                    | 7,564887E+22                              | 7,564751E+22 | 6,776135E+22 | 6,776225E+22 | 1,512964E+23                           | 1,355236E+23                           | 2,868200E+23  |
| 494                    | 7,564578E+22                              | 7,564711E+22 | 6,776126E+22 | 6,776117E+22 | 1,512929E+23                           | 1,355224E+23                           | 2,868153E+23  |
| 495                    | 7,564825E+22                              | 7,564889E+22 | 6,776128E+22 | 6,776181E+22 | 1,512971E+23                           | 1,355231E+23                           | 2,868202E+23  |
| 496                    | 7,564794E+22                              | 7,564597E+22 | 6,776117E+22 | 6,775990E+22 | 1,512939E+23                           | 1,355211E+23                           | 2,868150E+23  |
| 497                    | 7,564553E+22                              | 7,564748E+22 | 6,776176E+22 | 6,776001E+22 | 1,512930E+23                           | 1,355218E+23                           | 2,868148E+23  |
| 498                    | 7,564850E+22                              | 7,564823E+22 | 6,776088E+22 | 6,776138E+22 | 1,512967E+23                           | 1,355223E+23                           | 2,868190E+23  |
| 499                    | 7,564618E+22                              | 7,564576E+22 | 6,776087E+22 | 6,776096E+22 | 1,512919E+23                           | 1,355218E+23                           | 2,868138E+23  |
| 500                    | 7,564543E+22                              | 7,564829E+22 | 6,776209E+22 | 6,776208E+22 | 1,512937E+23                           | 1,355242E+23                           | 2,868179E+23  |
| 501                    | 7,564839E+22                              | 7,564762E+22 | 6,776134E+22 | 6,776213E+22 | 1,512960E+23                           | 1,355235E+23                           | 2,868195E+23  |
| 502                    | 7,564620E+22                              | 7,564618E+22 | 6,776220E+22 | 6,776156E+22 | 1,512924E+23                           | 1,355238E+23                           | 2,868161E+23  |
| 503                    | 7,564855E+22                              | 7,564850E+22 | 6,776302E+22 | 6,776324E+22 | 1,512971E+23                           | 1,355263E+23                           | 2,868233E+23  |
| 504                    | 7,564938E+22                              | 7,564703E+22 | 6,776290E+22 | 6,776260E+22 | 1,512964E+23                           | 1,355255E+23                           | 2,868219E+23  |
| 505                    | 7,564614E+22                              | 7,564848E+22 | 6,776380E+22 | 6,776311E+22 | 1,512946E+23                           | 1,355269E+23                           | 2,868215E+23  |
| 506                    | 7,564907E+22                              | 7,564997E+22 | 6,776354E+22 | 6,776455E+22 | 1,512990E+23                           | 1,355281E+23                           | 2,868271E+23  |
| 507                    | 7,564802E+22                              | 7,564709E+22 | 6,776398E+22 | 6,776341E+22 | 1,512951E+23                           | 1,355274E+23                           | 2,868225E+23  |
| 508                    | 7,564656E+22                              | 7,564861E+22 | 6,776521E+22 | 6,776387E+22 | 1,512952E+23                           | 1,355291E+23                           | 2,868243E+23  |
| 509                    | 7,564985E+22                              | 7,564871E+22 | 6,776372E+22 | 6,776410E+22 | 1,512986E+23                           | 1,355278E+23                           | 2,868264E+23  |
| 510                    | 7,564725E+22                              | 7,564674E+22 | 6,776349E+22 | 6,776310E+22 | 1,512940E+23                           | 1,355266E+23                           | 2,868206E+23  |
| 511                    | 7,564759E+22                              | 7,564896E+22 | 6,776345E+22 | 6,776412E+22 | 1,512965E+23                           | 1,355276E+23                           | 2,868241E+23  |
| 512                    | 7,564915E+22                              | 7,564785E+22 | 6,776240E+22 | 6,776267E+22 | 1,512970E+23                           | 1,355251E+23                           | 2,868221E+23  |
| 513                    | 7,564579E+22                              | 7,564744E+22 | 6,776273E+22 | 6,776166E+22 | 1,512932E+23                           | 1,355244E+23                           | 2,868176E+23  |
| 514                    | 7,564844E+22                              | 7,564873E+22 | 6,776223E+22 | 6,776237E+22 | 1,512972E+23                           | 1,355246E+23                           | 2,868218E+23  |
| 515                    | 7,564825E+22                              | 7,564621E+22 | 6,776203E+22 | 6,776106E+22 | 1,512945E+23                           | 1,355231E+23                           | 2,868176E+23  |
| 516                    | 7,564523E+22                              | 7,564742E+22 | 6,776287E+22 | 6,776180E+22 | 1,512926E+23                           | 1,355247E+23                           | 2,868173E+23  |
| 517                    | 7,564813E+22                              | 7,564881E+22 | 6,776146E+22 | 6,776280E+22 | 1,512969E+23                           | 1,355243E+23                           | 2,868212E+23  |
| 518                    | 7,564638E+22                              | 7,564624E+22 | 6,776187E+22 | 6,776194E+22 | 1,512926E+23                           | 1,355238E+23                           | 2,868164E+23  |
| 519                    | 7,564627E+22                              | 7,564761E+22 | 6,776309E+22 | 6,776302E+22 | 1,512939E+23                           | 1,355261E+23                           | 2,868200E+23  |
| 520                    | 7,564963E+22                              | 7,564745E+22 | 6,776269E+22 | 6,776257E+22 | 1,512971E+23                           | 1,355253E+23                           | 2,868223E+23  |
| 521                    | 7,564674E+22                              | 7,564672E+22 | 6,776347E+22 | 6,776238E+22 | 1,512935E+23                           | 1,355259E+23                           | 2,868193E+23  |
| 522                    | 7,564847E+22                              | 7,564920E+22 | 6,776364E+22 | 6,776433E+22 | 1,512977E+23                           | 1,355280E+23                           | 2,868256E+23  |
| 523                    | 7,564924E+22                              | 7,564814E+22 | 6,776373E+22 | 6,776392E+22 | 1,512974E+23                           | 1,355277E+23                           | 2,868250E+23  |
| 524                    | 7,564576E+22                              | 7,564849E+22 | 6,776546E+22 | 6,776452E+22 | 1,512943E+23                           | 1,355300E+23                           | 2,868242E+23  |
| 525                    | 7,564902E+22                              | 7,565014E+22 | 6,776483E+22 | 6,776541E+22 | 1,512992E+23                           | 1,355302E+23                           | 2,868294E+23  |
| 526                    | 7,564852E+22                              | 7,564715E+22 | 6,776528E+22 | 6,776428E+22 | 1,512957E+23                           | 1,355296E+23                           | 2,868252E+23  |
| 527                    | 7,564712E+22                              | 7,564800E+22 | 6,776595E+22 | 6,776527E+22 | 1,512951E+23                           | 1,355312E+23                           | 2,868263E+23  |
| 528                    | 7,565032E+22                              | 7,564894E+22 | 6,776433E+22 | 6,776511E+22 | 1,512993E+23                           | 1,355294E+23                           | 2,868287E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 529                    | 7,564710E+22                              | 7,564745E+22 | 6,776414E+22 | 6,776403E+22 | 1,512946E+23                           | 1,355282E+23                           | 2,868227E+23  |
| 530                    | 7,564768E+22                              | 7,564914E+22 | 6,776384E+22 | 6,776456E+22 | 1,512968E+23                           | 1,355284E+23                           | 2,868252E+23  |
| 531                    | 7,564973E+22                              | 7,564807E+22 | 6,776318E+22 | 6,776296E+22 | 1,512978E+23                           | 1,355261E+23                           | 2,868239E+23  |
| 532                    | 7,564604E+22                              | 7,564708E+22 | 6,776420E+22 | 6,776245E+22 | 1,512931E+23                           | 1,355266E+23                           | 2,868198E+23  |
| 533                    | 7,564832E+22                              | 7,564918E+22 | 6,776308E+22 | 6,776318E+22 | 1,512975E+23                           | 1,355263E+23                           | 2,868238E+23  |
| 534                    | 7,564802E+22                              | 7,564698E+22 | 6,776298E+22 | 6,776230E+22 | 1,512950E+23                           | 1,355253E+23                           | 2,868203E+23  |
| 535                    | 7,564516E+22                              | 7,564728E+22 | 6,776370E+22 | 6,776343E+22 | 1,512924E+23                           | 1,355271E+23                           | 2,868196E+23  |
| 536                    | 7,564865E+22                              | 7,564862E+22 | 6,776267E+22 | 6,776361E+22 | 1,512973E+23                           | 1,355263E+23                           | 2,868236E+23  |
| 537                    | 7,564685E+22                              | 7,564632E+22 | 6,776324E+22 | 6,776267E+22 | 1,512932E+23                           | 1,355259E+23                           | 2,868191E+23  |
| 538                    | 7,564707E+22                              | 7,564752E+22 | 6,776378E+22 | 6,776374E+22 | 1,512946E+23                           | 1,355275E+23                           | 2,868221E+23  |
| 539                    | 7,565030E+22                              | 7,564805E+22 | 6,776341E+22 | 6,776366E+22 | 1,512983E+23                           | 1,355271E+23                           | 2,868254E+23  |
| 540                    | 7,564654E+22                              | 7,564731E+22 | 6,776473E+22 | 6,776406E+22 | 1,512939E+23                           | 1,355288E+23                           | 2,868226E+23  |
| 541                    | 7,564792E+22                              | 7,565022E+22 | 6,776457E+22 | 6,776548E+22 | 1,512981E+23                           | 1,355300E+23                           | 2,868282E+23  |
| 542                    | 7,564922E+22                              | 7,564869E+22 | 6,776522E+22 | 6,776487E+22 | 1,512979E+23                           | 1,355301E+23                           | 2,868280E+23  |
| 543                    | 7,564626E+22                              | 7,564771E+22 | 6,776680E+22 | 6,776567E+22 | 1,512940E+23                           | 1,355325E+23                           | 2,868264E+23  |
| 544                    | 7,564988E+22                              | 7,564965E+22 | 6,776612E+22 | 6,776613E+22 | 1,512995E+23                           | 1,355322E+23                           | 2,868318E+23  |
| 545                    | 7,564885E+22                              | 7,564749E+22 | 6,776620E+22 | 6,776535E+22 | 1,512963E+23                           | 1,355315E+23                           | 2,868279E+23  |
| 546                    | 7,564726E+22                              | 7,564839E+22 | 6,776598E+22 | 6,776634E+22 | 1,512957E+23                           | 1,355323E+23                           | 2,868280E+23  |
| 547                    | 7,565054E+22                              | 7,564975E+22 | 6,776473E+22 | 6,776596E+22 | 1,513003E+23                           | 1,355307E+23                           | 2,868310E+23  |
| 548                    | 7,564712E+22                              | 7,564761E+22 | 6,776545E+22 | 6,776480E+22 | 1,512947E+23                           | 1,355302E+23                           | 2,868250E+23  |
| 549                    | 7,564767E+22                              | 7,564954E+22 | 6,776495E+22 | 6,776477E+22 | 1,512972E+23                           | 1,355297E+23                           | 2,868269E+23  |
| 550                    | 7,565011E+22                              | 7,564841E+22 | 6,776454E+22 | 6,776356E+22 | 1,512985E+23                           | 1,355281E+23                           | 2,868266E+23  |
| 551                    | 7,564618E+22                              | 7,564654E+22 | 6,776515E+22 | 6,776393E+22 | 1,512927E+23                           | 1,355291E+23                           | 2,868218E+23  |
| 552                    | 7,564826E+22                              | 7,564931E+22 | 6,776394E+22 | 6,776448E+22 | 1,512976E+23                           | 1,355284E+23                           | 2,868260E+23  |
| 553                    | 7,564778E+22                              | 7,564734E+22 | 6,776378E+22 | 6,776354E+22 | 1,512951E+23                           | 1,355273E+23                           | 2,868224E+23  |
| 554                    | 7,564549E+22                              | 7,564691E+22 | 6,776406E+22 | 6,776420E+22 | 1,512924E+23                           | 1,355283E+23                           | 2,868207E+23  |
| 555                    | 7,564966E+22                              | 7,564864E+22 | 6,776339E+22 | 6,776414E+22 | 1,512983E+23                           | 1,355275E+23                           | 2,868258E+23  |
| 556                    | 7,564752E+22                              | 7,564629E+22 | 6,776448E+22 | 6,776356E+22 | 1,512938E+23                           | 1,355280E+23                           | 2,868219E+23  |
| 557                    | 7,564712E+22                              | 7,564857E+22 | 6,776457E+22 | 6,776451E+22 | 1,512957E+23                           | 1,355291E+23                           | 2,868248E+23  |
| 558                    | 7,565020E+22                              | 7,564943E+22 | 6,776455E+22 | 6,776483E+22 | 1,512996E+23                           | 1,355294E+23                           | 2,868290E+23  |
| 559                    | 7,564630E+22                              | 7,564745E+22 | 6,776614E+22 | 6,776567E+22 | 1,512938E+23                           | 1,355318E+23                           | 2,868256E+23  |
| 560                    | 7,564806E+22                              | 7,565020E+22 | 6,776635E+22 | 6,776644E+22 | 1,512983E+23                           | 1,355328E+23                           | 2,868310E+23  |
| 561                    | 7,564947E+22                              | 7,564859E+22 | 6,776694E+22 | 6,776593E+22 | 1,512981E+23                           | 1,355329E+23                           | 2,868309E+23  |
| 562                    | 7,564696E+22                              | 7,564715E+22 | 6,776752E+22 | 6,776682E+22 | 1,512941E+23                           | 1,355343E+23                           | 2,868284E+23  |
| 563                    | 7,565061E+22                              | 7,564985E+22 | 6,776654E+22 | 6,776738E+22 | 1,513005E+23                           | 1,355339E+23                           | 2,868344E+23  |
| 564                    | 7,564886E+22                              | 7,564793E+22 | 6,776685E+22 | 6,776682E+22 | 1,512968E+23                           | 1,355337E+23                           | 2,868305E+23  |
| 565                    | 7,564713E+22                              | 7,564934E+22 | 6,776634E+22 | 6,776690E+22 | 1,512965E+23                           | 1,355332E+23                           | 2,868297E+23  |
| 566                    | 7,565088E+22                              | 7,565032E+22 | 6,776579E+22 | 6,776622E+22 | 1,513012E+23                           | 1,355320E+23                           | 2,868332E+23  |
| 567                    | 7,564762E+22                              | 7,564713E+22 | 6,776672E+22 | 6,776542E+22 | 1,512947E+23                           | 1,355321E+23                           | 2,868269E+23  |
| 568                    | 7,564812E+22                              | 7,564935E+22 | 6,776620E+22 | 6,776516E+22 | 1,512975E+23                           | 1,355314E+23                           | 2,868288E+23  |
| 569                    | 7,564977E+22                              | 7,564884E+22 | 6,776559E+22 | 6,776464E+22 | 1,512986E+23                           | 1,355302E+23                           | 2,868288E+23  |
| 570                    | 7,564591E+22                              | 7,564669E+22 | 6,776533E+22 | 6,776528E+22 | 1,512926E+23                           | 1,355306E+23                           | 2,868232E+23  |
| 571                    | 7,564837E+22                              | 7,564950E+22 | 6,776445E+22 | 6,776560E+22 | 1,512979E+23                           | 1,355301E+23                           | 2,868279E+23  |
| 572                    | 7,564797E+22                              | 7,564722E+22 | 6,776496E+22 | 6,776466E+22 | 1,512952E+23                           | 1,355296E+23                           | 2,868248E+23  |
| 573                    | 7,564596E+22                              | 7,564727E+22 | 6,776482E+22 | 6,776461E+22 | 1,512932E+23                           | 1,355294E+23                           | 2,868227E+23  |
| 574                    | 7,565044E+22                              | 7,564921E+22 | 6,776454E+22 | 6,776486E+22 | 1,512996E+23                           | 1,355294E+23                           | 2,868290E+23  |
| 575                    | 7,564784E+22                              | 7,564649E+22 | 6,776557E+22 | 6,776503E+22 | 1,512943E+23                           | 1,355306E+23                           | 2,868249E+23  |
| 576                    | 7,564703E+22                              | 7,564926E+22 | 6,776584E+22 | 6,776566E+22 | 1,512963E+23                           | 1,355315E+23                           | 2,868278E+23  |
| 577                    | 7,564983E+22                              | 7,565007E+22 | 6,776611E+22 | 6,776607E+22 | 1,512999E+23                           | 1,355322E+23                           | 2,868321E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 578                    | 7,564661E+22                              | 7,564700E+22 | 6,776720E+22 | 6,776674E+22 | 1,512936E+23                           | 1,355339E+23                           | 2,868275E+23  |
| 579                    | 7,564892E+22                              | 7,564985E+22 | 6,776750E+22 | 6,776738E+22 | 1,512988E+23                           | 1,355349E+23                           | 2,868336E+23  |
| 580                    | 7,565003E+22                              | 7,564838E+22 | 6,776811E+22 | 6,776732E+22 | 1,512984E+23                           | 1,355354E+23                           | 2,868338E+23  |
| 581                    | 7,564707E+22                              | 7,564798E+22 | 6,776783E+22 | 6,776782E+22 | 1,512950E+23                           | 1,355356E+23                           | 2,868307E+23  |
| 582                    | 7,565086E+22                              | 7,565101E+22 | 6,776719E+22 | 6,776842E+22 | 1,513019E+23                           | 1,355356E+23                           | 2,868375E+23  |
| 583                    | 7,564899E+22                              | 7,564809E+22 | 6,776779E+22 | 6,776782E+22 | 1,512971E+23                           | 1,355356E+23                           | 2,868327E+23  |
| 584                    | 7,564740E+22                              | 7,564954E+22 | 6,776776E+22 | 6,776711E+22 | 1,512969E+23                           | 1,355349E+23                           | 2,868318E+23  |
| 585                    | 7,565101E+22                              | 7,565054E+22 | 6,776730E+22 | 6,776666E+22 | 1,513015E+23                           | 1,355340E+23                           | 2,868355E+23  |
| 586                    | 7,564781E+22                              | 7,564664E+22 | 6,776740E+22 | 6,776638E+22 | 1,512945E+23                           | 1,355338E+23                           | 2,868282E+23  |
| 587                    | 7,564812E+22                              | 7,564949E+22 | 6,776676E+22 | 6,776648E+22 | 1,512976E+23                           | 1,355332E+23                           | 2,868309E+23  |
| 588                    | 7,564928E+22                              | 7,564898E+22 | 6,776626E+22 | 6,776635E+22 | 1,512983E+23                           | 1,355326E+23                           | 2,868309E+23  |
| 589                    | 7,564570E+22                              | 7,564709E+22 | 6,776560E+22 | 6,776604E+22 | 1,512928E+23                           | 1,355316E+23                           | 2,868244E+23  |
| 590                    | 7,564912E+22                              | 7,564964E+22 | 6,776528E+22 | 6,776607E+22 | 1,512988E+23                           | 1,355314E+23                           | 2,868301E+23  |
| 591                    | 7,564885E+22                              | 7,564675E+22 | 6,776596E+22 | 6,776535E+22 | 1,512956E+23                           | 1,355313E+23                           | 2,868269E+23  |
| 592                    | 7,564672E+22                              | 7,564760E+22 | 6,776599E+22 | 6,776502E+22 | 1,512943E+23                           | 1,355310E+23                           | 2,868253E+23  |
| 593                    | 7,565033E+22                              | 7,565024E+22 | 6,776583E+22 | 6,776584E+22 | 1,513006E+23                           | 1,355317E+23                           | 2,868322E+23  |
| 594                    | 7,564763E+22                              | 7,564700E+22 | 6,776645E+22 | 6,776643E+22 | 1,512946E+23                           | 1,355329E+23                           | 2,868275E+23  |
| 595                    | 7,564704E+22                              | 7,564959E+22 | 6,776720E+22 | 6,776692E+22 | 1,512966E+23                           | 1,355341E+23                           | 2,868308E+23  |
| 596                    | 7,564976E+22                              | 7,564992E+22 | 6,776789E+22 | 6,776761E+22 | 1,512997E+23                           | 1,355355E+23                           | 2,868352E+23  |
| 597                    | 7,564701E+22                              | 7,564708E+22 | 6,776819E+22 | 6,776773E+22 | 1,512941E+23                           | 1,355359E+23                           | 2,868300E+23  |
| 598                    | 7,564977E+22                              | 7,564998E+22 | 6,776845E+22 | 6,776864E+22 | 1,512997E+23                           | 1,355371E+23                           | 2,868368E+23  |
| 599                    | 7,565040E+22                              | 7,564852E+22 | 6,776875E+22 | 6,776901E+22 | 1,512989E+23                           | 1,355378E+23                           | 2,868367E+23  |
| 600                    | 7,564735E+22                              | 7,564873E+22 | 6,776844E+22 | 6,776865E+22 | 1,512961E+23                           | 1,355371E+23                           | 2,868332E+23  |
| 601                    | 7,565076E+22                              | 7,565168E+22 | 6,776835E+22 | 6,776894E+22 | 1,513024E+23                           | 1,355373E+23                           | 2,868397E+23  |
| 602                    | 7,564938E+22                              | 7,564792E+22 | 6,776865E+22 | 6,776821E+22 | 1,512973E+23                           | 1,355369E+23                           | 2,868342E+23  |
| 603                    | 7,564796E+22                              | 7,564936E+22 | 6,776888E+22 | 6,776750E+22 | 1,512973E+23                           | 1,355364E+23                           | 2,868337E+23  |
| 604                    | 7,565082E+22                              | 7,565052E+22 | 6,776848E+22 | 6,776787E+22 | 1,513013E+23                           | 1,355364E+23                           | 2,868377E+23  |
| 605                    | 7,564735E+22                              | 7,564727E+22 | 6,776769E+22 | 6,776743E+22 | 1,512946E+23                           | 1,355351E+23                           | 2,868297E+23  |
| 606                    | 7,564805E+22                              | 7,564998E+22 | 6,776736E+22 | 6,776770E+22 | 1,512980E+23                           | 1,355351E+23                           | 2,868331E+23  |
| 607                    | 7,564937E+22                              | 7,564868E+22 | 6,776714E+22 | 6,776755E+22 | 1,512981E+23                           | 1,355347E+23                           | 2,868327E+23  |
| 608                    | 7,564636E+22                              | 7,564707E+22 | 6,776668E+22 | 6,776633E+22 | 1,512934E+23                           | 1,355330E+23                           | 2,868264E+23  |
| 609                    | 7,564972E+22                              | 7,564987E+22 | 6,776664E+22 | 6,776651E+22 | 1,512996E+23                           | 1,355331E+23                           | 2,868327E+23  |
| 610                    | 7,564946E+22                              | 7,564676E+22 | 6,776666E+22 | 6,776631E+22 | 1,512962E+23                           | 1,355330E+23                           | 2,868292E+23  |
| 611                    | 7,564686E+22                              | 7,564827E+22 | 6,776693E+22 | 6,776627E+22 | 1,512951E+23                           | 1,355332E+23                           | 2,868283E+23  |
| 612                    | 7,564972E+22                              | 7,565087E+22 | 6,776711E+22 | 6,776758E+22 | 1,513006E+23                           | 1,355347E+23                           | 2,868353E+23  |
| 613                    | 7,564729E+22                              | 7,564744E+22 | 6,776745E+22 | 6,776750E+22 | 1,512947E+23                           | 1,355349E+23                           | 2,868297E+23  |
| 614                    | 7,564768E+22                              | 7,564955E+22 | 6,776859E+22 | 6,776800E+22 | 1,512972E+23                           | 1,355366E+23                           | 2,868338E+23  |
| 615                    | 7,565047E+22                              | 7,564924E+22 | 6,776908E+22 | 6,776893E+22 | 1,512997E+23                           | 1,355380E+23                           | 2,868377E+23  |
| 616                    | 7,564771E+22                              | 7,564731E+22 | 6,776907E+22 | 6,776862E+22 | 1,512950E+23                           | 1,355377E+23                           | 2,868327E+23  |
| 617                    | 7,564992E+22                              | 7,565093E+22 | 6,776930E+22 | 6,776970E+22 | 1,513009E+23                           | 1,355390E+23                           | 2,868398E+23  |
| 618                    | 7,565054E+22                              | 7,564897E+22 | 6,776921E+22 | 6,777004E+22 | 1,512995E+23                           | 1,355393E+23                           | 2,868388E+23  |
| 619                    | 7,564765E+22                              | 7,564918E+22 | 6,776964E+22 | 6,776923E+22 | 1,512968E+23                           | 1,355389E+23                           | 2,868357E+23  |
| 620                    | 7,565070E+22                              | 7,565175E+22 | 6,776997E+22 | 6,776976E+22 | 1,513025E+23                           | 1,355397E+23                           | 2,868422E+23  |
| 621                    | 7,564943E+22                              | 7,564806E+22 | 6,776967E+22 | 6,776876E+22 | 1,512975E+23                           | 1,355384E+23                           | 2,868359E+23  |
| 622                    | 7,564825E+22                              | 7,564946E+22 | 6,776981E+22 | 6,776869E+22 | 1,512977E+23                           | 1,355385E+23                           | 2,868362E+23  |
| 623                    | 7,565049E+22                              | 7,565038E+22 | 6,776910E+22 | 6,776960E+22 | 1,513009E+23                           | 1,355387E+23                           | 2,868396E+23  |
| 624                    | 7,564735E+22                              | 7,564755E+22 | 6,776821E+22 | 6,776838E+22 | 1,512949E+23                           | 1,355366E+23                           | 2,868315E+23  |
| 625                    | 7,564827E+22                              | 7,565006E+22 | 6,776830E+22 | 6,776825E+22 | 1,512983E+23                           | 1,355366E+23                           | 2,868349E+23  |
| 626                    | 7,565022E+22                              | 7,564821E+22 | 6,776772E+22 | 6,776797E+22 | 1,512984E+23                           | 1,355357E+23                           | 2,868341E+23  |



| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 627               | 7,564739E+22                              | 7,564712E+22 | 6,776762E+22 | 6,776665E+22 | 1,512945E+23                           | 1,355343E+23                           | 2,868288E+23  |
| 628               | 7,564965E+22                              | 7,565043E+22 | 6,776781E+22 | 6,776764E+22 | 1,513001E+23                           | 1,355355E+23                           | 2,868355E+23  |
| 629               | 7,564902E+22                              | 7,564798E+22 | 6,776732E+22 | 6,776737E+22 | 1,512970E+23                           | 1,355347E+23                           | 2,868317E+23  |
| 630               | 7,564673E+22                              | 7,564896E+22 | 6,776810E+22 | 6,776768E+22 | 1,512957E+23                           | 1,355358E+23                           | 2,868315E+23  |
| 631               | 7,564944E+22                              | 7,565069E+22 | 6,776866E+22 | 6,776916E+22 | 1,513001E+23                           | 1,355378E+23                           | 2,868379E+23  |
| 632               | 7,564783E+22                              | 7,564732E+22 | 6,776886E+22 | 6,776835E+22 | 1,512952E+23                           | 1,355372E+23                           | 2,868324E+23  |
| 633               | 7,564826E+22                              | 7,564935E+22 | 6,777003E+22 | 6,776901E+22 | 1,512976E+23                           | 1,355390E+23                           | 2,868367E+23  |
| 634               | 7,565116E+22                              | 7,564909E+22 | 6,776964E+22 | 6,777032E+22 | 1,513002E+23                           | 1,355400E+23                           | 2,868402E+23  |
| 635               | 7,564824E+22                              | 7,564792E+22 | 6,776969E+22 | 6,776979E+22 | 1,512962E+23                           | 1,355395E+23                           | 2,868356E+23  |
| 636               | 7,564969E+22                              | 7,565163E+22 | 6,777033E+22 | 6,777096E+22 | 1,513013E+23                           | 1,355413E+23                           | 2,868426E+23  |
| 637               | 7,565056E+22                              | 7,564959E+22 | 6,777007E+22 | 6,777041E+22 | 1,513002E+23                           | 1,355405E+23                           | 2,868406E+23  |
| 638               | 7,564830E+22                              | 7,564928E+22 | 6,777096E+22 | 6,776977E+22 | 1,512976E+23                           | 1,355407E+23                           | 2,868383E+23  |
| 639               | 7,565082E+22                              | 7,565139E+22 | 6,777128E+22 | 6,777081E+22 | 1,513022E+23                           | 1,355421E+23                           | 2,868443E+23  |
| 640               | 7,564951E+22                              | 7,564836E+22 | 6,777057E+22 | 6,776966E+22 | 1,512979E+23                           | 1,355402E+23                           | 2,868381E+23  |
| 641               | 7,564794E+22                              | 7,564995E+22 | 6,777072E+22 | 6,776988E+22 | 1,512979E+23                           | 1,355406E+23                           | 2,868385E+23  |
| 642               | 7,565051E+22                              | 7,565024E+22 | 6,776947E+22 | 6,777079E+22 | 1,513007E+23                           | 1,355403E+23                           | 2,868410E+23  |
| 643               | 7,564790E+22                              | 7,564753E+22 | 6,776909E+22 | 6,776895E+22 | 1,512954E+23                           | 1,355380E+23                           | 2,868335E+23  |
| 644               | 7,564863E+22                              | 7,565006E+22 | 6,776943E+22 | 6,776902E+22 | 1,512987E+23                           | 1,355384E+23                           | 2,868371E+23  |
| 645               | 7,565061E+22                              | 7,564855E+22 | 6,776836E+22 | 6,776839E+22 | 1,512992E+23                           | 1,355368E+23                           | 2,868359E+23  |
| 646               | 7,564785E+22                              | 7,564777E+22 | 6,776848E+22 | 6,776780E+22 | 1,512956E+23                           | 1,355363E+23                           | 2,868319E+23  |
| 647               | 7,564915E+22                              | 7,565083E+22 | 6,776873E+22 | 6,776922E+22 | 1,513000E+23                           | 1,355380E+23                           | 2,868379E+23  |
| 648               | 7,564875E+22                              | 7,564847E+22 | 6,776843E+22 | 6,776837E+22 | 1,512972E+23                           | 1,355368E+23                           | 2,868340E+23  |
| 649               | 7,564683E+22                              | 7,564892E+22 | 6,776969E+22 | 6,776853E+22 | 1,512958E+23                           | 1,355382E+23                           | 2,868340E+23  |
| 650               | 7,565015E+22                              | 7,564986E+22 | 6,776964E+22 | 6,777013E+22 | 1,513000E+23                           | 1,355398E+23                           | 2,868398E+23  |
| 651               | 7,564887E+22                              | 7,564711E+22 | 6,776993E+22 | 6,776922E+22 | 1,512960E+23                           | 1,355391E+23                           | 2,868351E+23  |
| 652               | 7,564850E+22                              | 7,564982E+22 | 6,777092E+22 | 6,777047E+22 | 1,512983E+23                           | 1,355414E+23                           | 2,868397E+23  |
| 653               | 7,565110E+22                              | 7,565018E+22 | 6,777008E+22 | 6,777129E+22 | 1,513013E+23                           | 1,355414E+23                           | 2,868426E+23  |
| 654               | 7,564859E+22                              | 7,564882E+22 | 6,777074E+22 | 6,777083E+22 | 1,512974E+23                           | 1,355416E+23                           | 2,868390E+23  |
| 655               | 7,564959E+22                              | 7,565176E+22 | 6,777191E+22 | 6,777196E+22 | 1,513013E+23                           | 1,355439E+23                           | 2,868452E+23  |
| 656               | 7,565096E+22                              | 7,564984E+22 | 6,777162E+22 | 6,777093E+22 | 1,513008E+23                           | 1,355426E+23                           | 2,868433E+23  |
| 657               | 7,564857E+22                              | 7,564926E+22 | 6,777254E+22 | 6,777070E+22 | 1,512978E+23                           | 1,355432E+23                           | 2,868411E+23  |
| 658               | 7,565086E+22                              | 7,565115E+22 | 6,777185E+22 | 6,777235E+22 | 1,513020E+23                           | 1,355442E+23                           | 2,868462E+23  |
| 659               | 7,564963E+22                              | 7,564860E+22 | 6,777109E+22 | 6,777099E+22 | 1,512982E+23                           | 1,355421E+23                           | 2,868403E+23  |
| 660               | 7,564769E+22                              | 7,565007E+22 | 6,777140E+22 | 6,777118E+22 | 1,512978E+23                           | 1,355426E+23                           | 2,868403E+23  |
| 661               | 7,565086E+22                              | 7,565035E+22 | 6,776991E+22 | 6,777106E+22 | 1,513012E+23                           | 1,355410E+23                           | 2,868422E+23  |
| 662               | 7,564903E+22                              | 7,564753E+22 | 6,776978E+22 | 6,776925E+22 | 1,512966E+23                           | 1,355390E+23                           | 2,868356E+23  |
| 663               | 7,564889E+22                              | 7,565008E+22 | 6,777037E+22 | 6,776974E+22 | 1,512990E+23                           | 1,355401E+23                           | 2,868391E+23  |
| 664               | 7,565070E+22                              | 7,564947E+22 | 6,776913E+22 | 6,776897E+22 | 1,513002E+23                           | 1,355381E+23                           | 2,868383E+23  |
| 665               | 7,564744E+22                              | 7,564850E+22 | 6,776975E+22 | 6,776881E+22 | 1,512959E+23                           | 1,355386E+23                           | 2,868345E+23  |
| 666               | 7,564884E+22                              | 7,565075E+22 | 6,776980E+22 | 6,777050E+22 | 1,512996E+23                           | 1,355403E+23                           | 2,868399E+23  |
| 667               | 7,564915E+22                              | 7,564823E+22 | 6,776993E+22 | 6,776931E+22 | 1,512974E+23                           | 1,355392E+23                           | 2,868366E+23  |
| 668               | 7,564713E+22                              | 7,564857E+22 | 6,777114E+22 | 6,776985E+22 | 1,512957E+23                           | 1,355410E+23                           | 2,868367E+23  |
| 669               | 7,565072E+22                              | 7,564987E+22 | 6,777032E+22 | 6,777112E+22 | 1,513006E+23                           | 1,355414E+23                           | 2,868420E+23  |
| 670               | 7,564963E+22                              | 7,564773E+22 | 6,777048E+22 | 6,777069E+22 | 1,512974E+23                           | 1,355412E+23                           | 2,868385E+23  |
| 671               | 7,564838E+22                              | 7,565050E+22 | 6,777168E+22 | 6,777205E+22 | 1,512989E+23                           | 1,355437E+23                           | 2,868426E+23  |
| 672               | 7,565127E+22                              | 7,565105E+22 | 6,777114E+22 | 6,777196E+22 | 1,513023E+23                           | 1,355431E+23                           | 2,868454E+23  |
| 673               | 7,564895E+22                              | 7,564915E+22 | 6,777253E+22 | 6,777134E+22 | 1,512981E+23                           | 1,355439E+23                           | 2,868420E+23  |
| 674               | 7,565005E+22                              | 7,565133E+22 | 6,777316E+22 | 6,777277E+22 | 1,513014E+23                           | 1,355459E+23                           | 2,868473E+23  |
| 675               | 7,565146E+22                              | 7,564978E+22 | 6,777291E+22 | 6,777189E+22 | 1,513012E+23                           | 1,355448E+23                           | 2,868460E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 676                    | 7,564827E+22                              | 7,564959E+22 | 6,777344E+22 | 6,777236E+22 | 1,512979E+23                           | 1,355458E+23                           | 2,868437E+23  |
| 677                    | 7,565053E+22                              | 7,565153E+22 | 6,777207E+22 | 6,777343E+22 | 1,513021E+23                           | 1,355455E+23                           | 2,868476E+23  |
| 678                    | 7,565007E+22                              | 7,564893E+22 | 6,777163E+22 | 6,777199E+22 | 1,512990E+23                           | 1,355436E+23                           | 2,868426E+23  |
| 679                    | 7,564796E+22                              | 7,564989E+22 | 6,777223E+22 | 6,777188E+22 | 1,512979E+23                           | 1,355441E+23                           | 2,868420E+23  |
| 680                    | 7,565152E+22                              | 7,565050E+22 | 6,777081E+22 | 6,777112E+22 | 1,513020E+23                           | 1,355419E+23                           | 2,868440E+23  |
| 681                    | 7,564950E+22                              | 7,564787E+22 | 6,777104E+22 | 6,776971E+22 | 1,512974E+23                           | 1,355407E+23                           | 2,868381E+23  |
| 682                    | 7,564879E+22                              | 7,565023E+22 | 6,777097E+22 | 6,777085E+22 | 1,512990E+23                           | 1,355418E+23                           | 2,868408E+23  |
| 683                    | 7,565055E+22                              | 7,564993E+22 | 6,777013E+22 | 6,777009E+22 | 1,513005E+23                           | 1,355402E+23                           | 2,868407E+23  |
| 684                    | 7,564703E+22                              | 7,564857E+22 | 6,777099E+22 | 6,777019E+22 | 1,512956E+23                           | 1,355412E+23                           | 2,868368E+23  |
| 685                    | 7,564899E+22                              | 7,565046E+22 | 6,777069E+22 | 6,777118E+22 | 1,512994E+23                           | 1,355419E+23                           | 2,868413E+23  |
| 686                    | 7,565020E+22                              | 7,564808E+22 | 6,777081E+22 | 6,777036E+22 | 1,512983E+23                           | 1,355412E+23                           | 2,868394E+23  |
| 687                    | 7,564753E+22                              | 7,564859E+22 | 6,777199E+22 | 6,777124E+22 | 1,512961E+23                           | 1,355432E+23                           | 2,868393E+23  |
| 688                    | 7,565106E+22                              | 7,565089E+22 | 6,777100E+22 | 6,777213E+22 | 1,513020E+23                           | 1,355431E+23                           | 2,868451E+23  |
| 689                    | 7,564977E+22                              | 7,564880E+22 | 6,777175E+22 | 6,777169E+22 | 1,512986E+23                           | 1,355434E+23                           | 2,868420E+23  |
| 690                    | 7,564845E+22                              | 7,565081E+22 | 6,777290E+22 | 6,777308E+22 | 1,512993E+23                           | 1,355460E+23                           | 2,868452E+23  |
| 691                    | 7,565184E+22                              | 7,565122E+22 | 6,777292E+22 | 6,777268E+22 | 1,513031E+23                           | 1,355456E+23                           | 2,868487E+23  |
| 692                    | 7,564908E+22                              | 7,564905E+22 | 6,777427E+22 | 6,777265E+22 | 1,512981E+23                           | 1,355469E+23                           | 2,868450E+23  |
| 693                    | 7,565012E+22                              | 7,565133E+22 | 6,777405E+22 | 6,777392E+22 | 1,513014E+23                           | 1,355480E+23                           | 2,868494E+23  |
| 694                    | 7,565178E+22                              | 7,565011E+22 | 6,777332E+22 | 6,777354E+22 | 1,513019E+23                           | 1,355469E+23                           | 2,868487E+23  |
| 695                    | 7,564792E+22                              | 7,564969E+22 | 6,777389E+22 | 6,777391E+22 | 1,512976E+23                           | 1,355478E+23                           | 2,868454E+23  |
| 696                    | 7,565090E+22                              | 7,565180E+22 | 6,777261E+22 | 6,777381E+22 | 1,513027E+23                           | 1,355464E+23                           | 2,868491E+23  |
| 697                    | 7,565081E+22                              | 7,564892E+22 | 6,777271E+22 | 6,777200E+22 | 1,512997E+23                           | 1,355447E+23                           | 2,868444E+23  |
| 698                    | 7,564867E+22                              | 7,564959E+22 | 6,777292E+22 | 6,777217E+22 | 1,512983E+23                           | 1,355451E+23                           | 2,868433E+23  |
| 699                    | 7,565206E+22                              | 7,565084E+22 | 6,777178E+22 | 6,777155E+22 | 1,513029E+23                           | 1,355433E+23                           | 2,868462E+23  |
| 700                    | 7,564895E+22                              | 7,564862E+22 | 6,777205E+22 | 6,777102E+22 | 1,512976E+23                           | 1,355431E+23                           | 2,868406E+23  |
| 701                    | 7,564810E+22                              | 7,565075E+22 | 6,777168E+22 | 6,777185E+22 | 1,512988E+23                           | 1,355435E+23                           | 2,868424E+23  |
| 702                    | 7,565060E+22                              | 7,565014E+22 | 6,777115E+22 | 6,777138E+22 | 1,513007E+23                           | 1,355425E+23                           | 2,868433E+23  |
| 703                    | 7,564707E+22                              | 7,564820E+22 | 6,777224E+22 | 6,777151E+22 | 1,512953E+23                           | 1,355438E+23                           | 2,868390E+23  |
| 704                    | 7,564974E+22                              | 7,565034E+22 | 6,777172E+22 | 6,777197E+22 | 1,513001E+23                           | 1,355437E+23                           | 2,868438E+23  |
| 705                    | 7,565092E+22                              | 7,564841E+22 | 6,777193E+22 | 6,777145E+22 | 1,512993E+23                           | 1,355434E+23                           | 2,868427E+23  |
| 706                    | 7,564784E+22                              | 7,564902E+22 | 6,777242E+22 | 6,777269E+22 | 1,512969E+23                           | 1,355451E+23                           | 2,868420E+23  |
| 707                    | 7,565136E+22                              | 7,565160E+22 | 6,777209E+22 | 6,777317E+22 | 1,513030E+23                           | 1,355453E+23                           | 2,868482E+23  |
| 708                    | 7,564979E+22                              | 7,564930E+22 | 6,777332E+22 | 6,777279E+22 | 1,512991E+23                           | 1,355461E+23                           | 2,868452E+23  |
| 709                    | 7,564875E+22                              | 7,565071E+22 | 6,777415E+22 | 6,777353E+22 | 1,512995E+23                           | 1,355477E+23                           | 2,868471E+23  |
| 710                    | 7,565255E+22                              | 7,565128E+22 | 6,777409E+22 | 6,777376E+22 | 1,513038E+23                           | 1,355479E+23                           | 2,868517E+23  |
| 711                    | 7,564903E+22                              | 7,564910E+22 | 6,777522E+22 | 6,777419E+22 | 1,512981E+23                           | 1,355494E+23                           | 2,868475E+23  |
| 712                    | 7,565001E+22                              | 7,565185E+22 | 6,777464E+22 | 6,777501E+22 | 1,513019E+23                           | 1,355497E+23                           | 2,868515E+23  |
| 713                    | 7,565181E+22                              | 7,565065E+22 | 6,777430E+22 | 6,777452E+22 | 1,513025E+23                           | 1,355488E+23                           | 2,868513E+23  |
| 714                    | 7,564823E+22                              | 7,564953E+22 | 6,777451E+22 | 6,777468E+22 | 1,512978E+23                           | 1,355492E+23                           | 2,868470E+23  |
| 715                    | 7,565172E+22                              | 7,565170E+22 | 6,777378E+22 | 6,777407E+22 | 1,513034E+23                           | 1,355479E+23                           | 2,868513E+23  |
| 716                    | 7,565114E+22                              | 7,564907E+22 | 6,777389E+22 | 6,777272E+22 | 1,513002E+23                           | 1,355466E+23                           | 2,868468E+23  |
| 717                    | 7,564864E+22                              | 7,564989E+22 | 6,777350E+22 | 6,777281E+22 | 1,512985E+23                           | 1,355463E+23                           | 2,868448E+23  |
| 718                    | 7,565193E+22                              | 7,565165E+22 | 6,777225E+22 | 6,777294E+22 | 1,513036E+23                           | 1,355452E+23                           | 2,868488E+23  |
| 719                    | 7,564823E+22                              | 7,564888E+22 | 6,777292E+22 | 6,777258E+22 | 1,512971E+23                           | 1,355455E+23                           | 2,868426E+23  |
| 720                    | 7,564809E+22                              | 7,565075E+22 | 6,777274E+22 | 6,777256E+22 | 1,512988E+23                           | 1,355453E+23                           | 2,868442E+23  |
| 721                    | 7,565123E+22                              | 7,564986E+22 | 6,777255E+22 | 6,777202E+22 | 1,513011E+23                           | 1,355446E+23                           | 2,868457E+23  |
| 722                    | 7,564784E+22                              | 7,564775E+22 | 6,777293E+22 | 6,777250E+22 | 1,512956E+23                           | 1,355454E+23                           | 2,868410E+23  |
| 723                    | 7,565060E+22                              | 7,565063E+22 | 6,777260E+22 | 6,777292E+22 | 1,513012E+23                           | 1,355455E+23                           | 2,868468E+23  |
| 724                    | 7,565086E+22                              | 7,564931E+22 | 6,777287E+22 | 6,777284E+22 | 1,513002E+23                           | 1,355457E+23                           | 2,868459E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 725               | 7,564776E+22                              | 7,564976E+22 | 6,777333E+22 | 6,777351E+22 | 1,512975E+23                           | 1,355468E+23                           | 2,868444E+23  |
| 726               | 7,565178E+22                              | 7,565216E+22 | 6,777335E+22 | 6,777415E+22 | 1,513039E+23                           | 1,355475E+23                           | 2,868514E+23  |
| 727               | 7,564976E+22                              | 7,564924E+22 | 6,777502E+22 | 6,777401E+22 | 1,512990E+23                           | 1,355490E+23                           | 2,868480E+23  |
| 728               | 7,564909E+22                              | 7,565078E+22 | 6,777555E+22 | 6,777446E+22 | 1,512999E+23                           | 1,355500E+23                           | 2,868499E+23  |
| 729               | 7,565272E+22                              | 7,565151E+22 | 6,777534E+22 | 6,777513E+22 | 1,513042E+23                           | 1,355505E+23                           | 2,868547E+23  |
| 730               | 7,564898E+22                              | 7,564920E+22 | 6,777559E+22 | 6,777588E+22 | 1,512982E+23                           | 1,355515E+23                           | 2,868497E+23  |
| 731               | 7,565042E+22                              | 7,565194E+22 | 6,777542E+22 | 6,777600E+22 | 1,513024E+23                           | 1,355514E+23                           | 2,868538E+23  |
| 732               | 7,565206E+22                              | 7,565077E+22 | 6,777531E+22 | 6,777526E+22 | 1,513028E+23                           | 1,355506E+23                           | 2,868534E+23  |
| 733               | 7,564887E+22                              | 7,564943E+22 | 6,777516E+22 | 6,777472E+22 | 1,512983E+23                           | 1,355499E+23                           | 2,868482E+23  |
| 734               | 7,565245E+22                              | 7,565205E+22 | 6,777444E+22 | 6,777467E+22 | 1,513045E+23                           | 1,355491E+23                           | 2,868536E+23  |
| 735               | 7,565079E+22                              | 7,564964E+22 | 6,777476E+22 | 6,777388E+22 | 1,513004E+23                           | 1,355486E+23                           | 2,868491E+23  |
| 736               | 7,564816E+22                              | 7,565068E+22 | 6,777430E+22 | 6,777369E+22 | 1,512988E+23                           | 1,355480E+23                           | 2,868468E+23  |
| 737               | 7,565152E+22                              | 7,565211E+22 | 6,777360E+22 | 6,777393E+22 | 1,513036E+23                           | 1,355475E+23                           | 2,868512E+23  |
| 738               | 7,564831E+22                              | 7,564845E+22 | 6,777390E+22 | 6,777371E+22 | 1,512968E+23                           | 1,355476E+23                           | 2,868444E+23  |
| 739               | 7,564893E+22                              | 7,565011E+22 | 6,777409E+22 | 6,777334E+22 | 1,512990E+23                           | 1,355474E+23                           | 2,868465E+23  |
| 740               | 7,565179E+22                              | 7,564976E+22 | 6,777371E+22 | 6,777324E+22 | 1,513015E+23                           | 1,355469E+23                           | 2,868485E+23  |
| 741               | 7,564829E+22                              | 7,564796E+22 | 6,777323E+22 | 6,777343E+22 | 1,512962E+23                           | 1,355467E+23                           | 2,868429E+23  |
| 742               | 7,565090E+22                              | 7,565158E+22 | 6,777295E+22 | 6,777428E+22 | 1,513025E+23                           | 1,355472E+23                           | 2,868497E+23  |
| 743               | 7,565060E+22                              | 7,565000E+22 | 6,777390E+22 | 6,777408E+22 | 1,513006E+23                           | 1,355480E+23                           | 2,868486E+23  |
| 744               | 7,564796E+22                              | 7,565006E+22 | 6,777475E+22 | 6,777395E+22 | 1,512980E+23                           | 1,355487E+23                           | 2,868467E+23  |
| 745               | 7,565218E+22                              | 7,565230E+22 | 6,777521E+22 | 6,777482E+22 | 1,513045E+23                           | 1,355500E+23                           | 2,868545E+23  |
| 746               | 7,565011E+22                              | 7,564901E+22 | 6,777614E+22 | 6,777536E+22 | 1,512991E+23                           | 1,355515E+23                           | 2,868506E+23  |
| 747               | 7,564943E+22                              | 7,565088E+22 | 6,777670E+22 | 6,777586E+22 | 1,513003E+23                           | 1,355526E+23                           | 2,868529E+23  |
| 748               | 7,565242E+22                              | 7,565210E+22 | 6,777628E+22 | 6,777679E+22 | 1,513045E+23                           | 1,355531E+23                           | 2,868576E+23  |
| 749               | 7,564907E+22                              | 7,564942E+22 | 6,777612E+22 | 6,777674E+22 | 1,512985E+23                           | 1,355529E+23                           | 2,868514E+23  |
| 750               | 7,565114E+22                              | 7,565225E+22 | 6,777614E+22 | 6,777679E+22 | 1,513034E+23                           | 1,355529E+23                           | 2,868563E+23  |
| 751               | 7,565239E+22                              | 7,565084E+22 | 6,777646E+22 | 6,777603E+22 | 1,513032E+23                           | 1,355525E+23                           | 2,868557E+23  |
| 752               | 7,564929E+22                              | 7,564978E+22 | 6,777620E+22 | 6,777513E+22 | 1,512991E+23                           | 1,355513E+23                           | 2,868504E+23  |
| 753               | 7,565238E+22                              | 7,565272E+22 | 6,777556E+22 | 6,777556E+22 | 1,513051E+23                           | 1,355511E+23                           | 2,868562E+23  |
| 754               | 7,565032E+22                              | 7,564989E+22 | 6,777538E+22 | 6,777532E+22 | 1,513002E+23                           | 1,355507E+23                           | 2,868509E+23  |
| 755               | 7,564827E+22                              | 7,565047E+22 | 6,777547E+22 | 6,777465E+22 | 1,512987E+23                           | 1,355501E+23                           | 2,868489E+23  |
| 756               | 7,565158E+22                              | 7,565170E+22 | 6,777484E+22 | 6,777483E+22 | 1,513033E+23                           | 1,355497E+23                           | 2,868530E+23  |
| 757               | 7,564901E+22                              | 7,564790E+22 | 6,777448E+22 | 6,777418E+22 | 1,512969E+23                           | 1,355487E+23                           | 2,868456E+23  |
| 758               | 7,564991E+22                              | 7,565025E+22 | 6,777437E+22 | 6,777428E+22 | 1,513002E+23                           | 1,355487E+23                           | 2,868488E+23  |
| 759               | 7,565168E+22                              | 7,565038E+22 | 6,777430E+22 | 6,777453E+22 | 1,513021E+23                           | 1,355488E+23                           | 2,868509E+23  |
| 760               | 7,564820E+22                              | 7,564907E+22 | 6,777404E+22 | 6,777418E+22 | 1,512973E+23                           | 1,355482E+23                           | 2,868455E+23  |
| 761               | 7,565081E+22                              | 7,565240E+22 | 6,777452E+22 | 6,777502E+22 | 1,513032E+23                           | 1,355495E+23                           | 2,868528E+23  |
| 762               | 7,565069E+22                              | 7,565003E+22 | 6,777541E+22 | 6,777516E+22 | 1,513007E+23                           | 1,355506E+23                           | 2,868513E+23  |
| 763               | 7,564864E+22                              | 7,564970E+22 | 6,777662E+22 | 6,777495E+22 | 1,512983E+23                           | 1,355516E+23                           | 2,868499E+23  |
| 764               | 7,565220E+22                              | 7,565230E+22 | 6,777676E+22 | 6,777640E+22 | 1,513045E+23                           | 1,355532E+23                           | 2,868577E+23  |
| 765               | 7,565021E+22                              | 7,564913E+22 | 6,777665E+22 | 6,777688E+22 | 1,512993E+23                           | 1,355535E+23                           | 2,868529E+23  |
| 766               | 7,564973E+22                              | 7,565138E+22 | 6,777699E+22 | 6,777755E+22 | 1,513011E+23                           | 1,355545E+23                           | 2,868557E+23  |
| 767               | 7,565243E+22                              | 7,565231E+22 | 6,777717E+22 | 6,777803E+22 | 1,513047E+23                           | 1,355552E+23                           | 2,868599E+23  |
| 768               | 7,564980E+22                              | 7,564959E+22 | 6,777710E+22 | 6,777685E+22 | 1,512994E+23                           | 1,355540E+23                           | 2,868533E+23  |
| 769               | 7,565190E+22                              | 7,565254E+22 | 6,777746E+22 | 6,777697E+22 | 1,513044E+23                           | 1,355544E+23                           | 2,868589E+23  |
| 770               | 7,565273E+22                              | 7,565106E+22 | 6,777727E+22 | 6,777685E+22 | 1,513038E+23                           | 1,355541E+23                           | 2,868579E+23  |
| 771               | 7,564939E+22                              | 7,565011E+22 | 6,777731E+22 | 6,777607E+22 | 1,512995E+23                           | 1,355534E+23                           | 2,868529E+23  |
| 772               | 7,565162E+22                              | 7,565332E+22 | 6,777675E+22 | 6,777684E+22 | 1,513049E+23                           | 1,355536E+23                           | 2,868585E+23  |
| 773               | 7,565015E+22                              | 7,564970E+22 | 6,777607E+22 | 6,777614E+22 | 1,512998E+23                           | 1,355522E+23                           | 2,868521E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 774               | 7,564875E+22                              | 7,565018E+22 | 6,777617E+22 | 6,777565E+22 | 1,512989E+23                           | 1,355518E+23                           | 2,868507E+23  |
| 775               | 7,565189E+22                              | 7,565135E+22 | 6,777579E+22 | 6,777590E+22 | 1,513032E+23                           | 1,355517E+23                           | 2,868549E+23  |
| 776               | 7,564957E+22                              | 7,564808E+22 | 6,777505E+22 | 6,777480E+22 | 1,512977E+23                           | 1,355498E+23                           | 2,868475E+23  |
| 777               | 7,565012E+22                              | 7,565117E+22 | 6,777507E+22 | 6,777525E+22 | 1,513013E+23                           | 1,355503E+23                           | 2,868516E+23  |
| 778               | 7,565157E+22                              | 7,565105E+22 | 6,777487E+22 | 6,777578E+22 | 1,513026E+23                           | 1,355506E+23                           | 2,868533E+23  |
| 779               | 7,564858E+22                              | 7,564923E+22 | 6,777560E+22 | 6,777492E+22 | 1,512978E+23                           | 1,355505E+23                           | 2,868483E+23  |
| 780               | 7,565082E+22                              | 7,565248E+22 | 6,777640E+22 | 6,777582E+22 | 1,513033E+23                           | 1,355522E+23                           | 2,868555E+23  |
| 781               | 7,565116E+22                              | 7,564970E+22 | 6,777660E+22 | 6,777601E+22 | 1,513009E+23                           | 1,355526E+23                           | 2,868535E+23  |
| 782               | 7,564922E+22                              | 7,564987E+22 | 6,777745E+22 | 6,777653E+22 | 1,512991E+23                           | 1,355540E+23                           | 2,868531E+23  |
| 783               | 7,565193E+22                              | 7,565270E+22 | 6,777767E+22 | 6,777826E+22 | 1,513046E+23                           | 1,355559E+23                           | 2,868606E+23  |
| 784               | 7,565030E+22                              | 7,564981E+22 | 6,777743E+22 | 6,777794E+22 | 1,513001E+23                           | 1,355554E+23                           | 2,868555E+23  |
| 785               | 7,565019E+22                              | 7,565195E+22 | 6,777818E+22 | 6,777834E+22 | 1,513021E+23                           | 1,355565E+23                           | 2,868587E+23  |
| 786               | 7,565297E+22                              | 7,565231E+22 | 6,777829E+22 | 6,777884E+22 | 1,513053E+23                           | 1,355571E+23                           | 2,868624E+23  |
| 787               | 7,565083E+22                              | 7,564950E+22 | 6,777865E+22 | 6,777738E+22 | 1,513003E+23                           | 1,355560E+23                           | 2,868564E+23  |
| 788               | 7,565186E+22                              | 7,565287E+22 | 6,777878E+22 | 6,777789E+22 | 1,513047E+23                           | 1,355567E+23                           | 2,868614E+23  |
| 789               | 7,565245E+22                              | 7,565143E+22 | 6,777772E+22 | 6,777796E+22 | 1,513039E+23                           | 1,355557E+23                           | 2,868596E+23  |
| 790               | 7,564928E+22                              | 7,565050E+22 | 6,777765E+22 | 6,777744E+22 | 1,512998E+23                           | 1,355551E+23                           | 2,868549E+23  |
| 791               | 7,565114E+22                              | 7,565305E+22 | 6,777768E+22 | 6,777796E+22 | 1,513042E+23                           | 1,355556E+23                           | 2,868598E+23  |
| 792               | 7,565058E+22                              | 7,564944E+22 | 6,777689E+22 | 6,777644E+22 | 1,513000E+23                           | 1,355533E+23                           | 2,868534E+23  |
| 793               | 7,564954E+22                              | 7,565016E+22 | 6,777695E+22 | 6,777614E+22 | 1,512997E+23                           | 1,355531E+23                           | 2,868528E+23  |
| 794               | 7,565228E+22                              | 7,565148E+22 | 6,777623E+22 | 6,777692E+22 | 1,513038E+23                           | 1,355531E+23                           | 2,868569E+23  |
| 795               | 7,565002E+22                              | 7,564867E+22 | 6,777591E+22 | 6,777562E+22 | 1,512987E+23                           | 1,355515E+23                           | 2,868502E+23  |
| 796               | 7,564969E+22                              | 7,565204E+22 | 6,777636E+22 | 6,777613E+22 | 1,513017E+23                           | 1,355525E+23                           | 2,868542E+23  |
| 797               | 7,565162E+22                              | 7,565129E+22 | 6,777600E+22 | 6,777647E+22 | 1,513029E+23                           | 1,355525E+23                           | 2,868554E+23  |
| 798               | 7,564912E+22                              | 7,564924E+22 | 6,777694E+22 | 6,777604E+22 | 1,512984E+23                           | 1,355530E+23                           | 2,868513E+23  |
| 799               | 7,565081E+22                              | 7,565225E+22 | 6,777805E+22 | 6,777733E+22 | 1,513031E+23                           | 1,355554E+23                           | 2,868584E+23  |
| 800               | 7,565142E+22                              | 7,564988E+22 | 6,777764E+22 | 6,777732E+22 | 1,513013E+23                           | 1,355550E+23                           | 2,868563E+23  |
| 801               | 7,564938E+22                              | 7,565054E+22 | 6,777823E+22 | 6,777815E+22 | 1,512999E+23                           | 1,355564E+23                           | 2,868563E+23  |
| 802               | 7,565209E+22                              | 7,565296E+22 | 6,777829E+22 | 6,777981E+22 | 1,513050E+23                           | 1,355581E+23                           | 2,868632E+23  |
| 803               | 7,565125E+22                              | 7,564974E+22 | 6,777869E+22 | 6,777856E+22 | 1,513010E+23                           | 1,355572E+23                           | 2,868582E+23  |
| 804               | 7,565074E+22                              | 7,565221E+22 | 6,777965E+22 | 6,777873E+22 | 1,513029E+23                           | 1,355584E+23                           | 2,868613E+23  |
| 805               | 7,565369E+22                              | 7,565237E+22 | 6,777904E+22 | 6,777925E+22 | 1,513061E+23                           | 1,355583E+23                           | 2,868643E+23  |
| 806               | 7,565110E+22                              | 7,565008E+22 | 6,777930E+22 | 6,777849E+22 | 1,513012E+23                           | 1,355578E+23                           | 2,868590E+23  |
| 807               | 7,565099E+22                              | 7,565353E+22 | 6,777976E+22 | 6,777933E+22 | 1,513045E+23                           | 1,355591E+23                           | 2,868636E+23  |
| 808               | 7,565195E+22                              | 7,565186E+22 | 6,777857E+22 | 6,777882E+22 | 1,513038E+23                           | 1,355574E+23                           | 2,868612E+23  |
| 809               | 7,564934E+22                              | 7,565060E+22 | 6,777873E+22 | 6,777828E+22 | 1,512999E+23                           | 1,355570E+23                           | 2,868570E+23  |
| 810               | 7,565155E+22                              | 7,565247E+22 | 6,777853E+22 | 6,777889E+22 | 1,513040E+23                           | 1,355574E+23                           | 2,868614E+23  |
| 811               | 7,565166E+22                              | 7,564897E+22 | 6,777794E+22 | 6,777705E+22 | 1,513006E+23                           | 1,355550E+23                           | 2,868556E+23  |
| 812               | 7,564974E+22                              | 7,565062E+22 | 6,777777E+22 | 6,777699E+22 | 1,513004E+23                           | 1,355548E+23                           | 2,868551E+23  |
| 813               | 7,565235E+22                              | 7,565204E+22 | 6,777643E+22 | 6,777784E+22 | 1,513044E+23                           | 1,355543E+23                           | 2,868587E+23  |
| 814               | 7,565021E+22                              | 7,564936E+22 | 6,777656E+22 | 6,777669E+22 | 1,512996E+23                           | 1,355532E+23                           | 2,868528E+23  |
| 815               | 7,564941E+22                              | 7,565213E+22 | 6,777789E+22 | 6,777704E+22 | 1,513015E+23                           | 1,355549E+23                           | 2,868565E+23  |
| 816               | 7,565193E+22                              | 7,565130E+22 | 6,777742E+22 | 6,777699E+22 | 1,513032E+23                           | 1,355544E+23                           | 2,868576E+23  |
| 817               | 7,564967E+22                              | 7,564942E+22 | 6,777822E+22 | 6,777718E+22 | 1,512991E+23                           | 1,355554E+23                           | 2,868545E+23  |
| 818               | 7,565086E+22                              | 7,565229E+22 | 6,777892E+22 | 6,777910E+22 | 1,513032E+23                           | 1,355580E+23                           | 2,868612E+23  |
| 819               | 7,565186E+22                              | 7,565028E+22 | 6,777870E+22 | 6,777878E+22 | 1,513021E+23                           | 1,355575E+23                           | 2,868596E+23  |
| 820               | 7,564941E+22                              | 7,565113E+22 | 6,777937E+22 | 6,777925E+22 | 1,513005E+23                           | 1,355586E+23                           | 2,868592E+23  |
| 821               | 7,565262E+22                              | 7,565304E+22 | 6,777916E+22 | 6,778053E+22 | 1,513057E+23                           | 1,355597E+23                           | 2,868653E+23  |
| 822               | 7,565221E+22                              | 7,565004E+22 | 6,777969E+22 | 6,777932E+22 | 1,513022E+23                           | 1,355590E+23                           | 2,868613E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 823                    | 7,565079E+22                              | 7,565234E+22 | 6,778104E+22 | 6,777973E+22 | 1,513031E+23                           | 1,355608E+23                           | 2,868639E+23  |
| 824                    | 7,565358E+22                              | 7,565300E+22 | 6,777995E+22 | 6,778015E+22 | 1,513066E+23                           | 1,355601E+23                           | 2,868667E+23  |
| 825                    | 7,565082E+22                              | 7,565088E+22 | 6,778005E+22 | 6,777986E+22 | 1,513017E+23                           | 1,355599E+23                           | 2,868616E+23  |
| 826                    | 7,565055E+22                              | 7,565340E+22 | 6,778058E+22 | 6,778070E+22 | 1,513040E+23                           | 1,355613E+23                           | 2,868652E+23  |
| 827                    | 7,565256E+22                              | 7,565128E+22 | 6,777979E+22 | 6,777940E+22 | 1,513038E+23                           | 1,355592E+23                           | 2,868630E+23  |
| 828                    | 7,564984E+22                              | 7,565030E+22 | 6,777979E+22 | 6,777866E+22 | 1,513001E+23                           | 1,355585E+23                           | 2,868586E+23  |
| 829                    | 7,565237E+22                              | 7,565218E+22 | 6,777880E+22 | 6,777943E+22 | 1,513046E+23                           | 1,355582E+23                           | 2,868628E+23  |
| 830                    | 7,565222E+22                              | 7,564962E+22 | 6,777814E+22 | 6,777799E+22 | 1,513018E+23                           | 1,355561E+23                           | 2,868580E+23  |
| 831                    | 7,564923E+22                              | 7,565148E+22 | 6,777862E+22 | 6,777808E+22 | 1,513007E+23                           | 1,355567E+23                           | 2,868574E+23  |
| 832                    | 7,565209E+22                              | 7,565282E+22 | 6,777747E+22 | 6,777838E+22 | 1,513049E+23                           | 1,355559E+23                           | 2,868608E+23  |
| 833                    | 7,565031E+22                              | 7,564986E+22 | 6,777803E+22 | 6,777759E+22 | 1,513002E+23                           | 1,355556E+23                           | 2,868558E+23  |
| 834                    | 7,564954E+22                              | 7,565178E+22 | 6,777941E+22 | 6,777835E+22 | 1,513013E+23                           | 1,355578E+23                           | 2,868591E+23  |
| 835                    | 7,565261E+22                              | 7,565087E+22 | 6,777894E+22 | 6,777824E+22 | 1,513035E+23                           | 1,355572E+23                           | 2,868607E+23  |
| 836                    | 7,564966E+22                              | 7,564983E+22 | 6,777927E+22 | 6,777871E+22 | 1,512995E+23                           | 1,355580E+23                           | 2,868575E+23  |
| 837                    | 7,565114E+22                              | 7,565252E+22 | 6,777911E+22 | 6,778057E+22 | 1,513037E+23                           | 1,355597E+23                           | 2,868633E+23  |
| 838                    | 7,565241E+22                              | 7,565068E+22 | 6,777926E+22 | 6,777995E+22 | 1,513031E+23                           | 1,355592E+23                           | 2,868623E+23  |
| 839                    | 7,564969E+22                              | 7,565131E+22 | 6,778071E+22 | 6,778002E+22 | 1,513010E+23                           | 1,355607E+23                           | 2,868617E+23  |
| 840                    | 7,565327E+22                              | 7,565330E+22 | 6,778033E+22 | 6,778073E+22 | 1,513066E+23                           | 1,355611E+23                           | 2,868676E+23  |
| 841                    | 7,565270E+22                              | 7,565075E+22 | 6,778086E+22 | 6,778017E+22 | 1,513035E+23                           | 1,355610E+23                           | 2,868645E+23  |
| 842                    | 7,565047E+22                              | 7,565276E+22 | 6,778206E+22 | 6,778115E+22 | 1,513032E+23                           | 1,355632E+23                           | 2,868664E+23  |
| 843                    | 7,565345E+22                              | 7,565334E+22 | 6,778120E+22 | 6,778131E+22 | 1,513068E+23                           | 1,355625E+23                           | 2,868693E+23  |
| 844                    | 7,565046E+22                              | 7,565116E+22 | 6,778138E+22 | 6,778084E+22 | 1,513016E+23                           | 1,355622E+23                           | 2,868638E+23  |
| 845                    | 7,565095E+22                              | 7,565281E+22 | 6,778131E+22 | 6,778151E+22 | 1,513038E+23                           | 1,355628E+23                           | 2,868666E+23  |
| 846                    | 7,565348E+22                              | 7,565099E+22 | 6,778049E+22 | 6,778025E+22 | 1,513045E+23                           | 1,355607E+23                           | 2,868652E+23  |
| 847                    | 7,565012E+22                              | 7,565028E+22 | 6,778059E+22 | 6,777965E+22 | 1,513004E+23                           | 1,355602E+23                           | 2,868606E+23  |
| 848                    | 7,565243E+22                              | 7,565290E+22 | 6,777913E+22 | 6,778016E+22 | 1,513053E+23                           | 1,355593E+23                           | 2,868646E+23  |
| 849                    | 7,565219E+22                              | 7,565080E+22 | 6,777861E+22 | 6,777904E+22 | 1,513030E+23                           | 1,355577E+23                           | 2,868606E+23  |
| 850                    | 7,564893E+22                              | 7,565162E+22 | 6,777971E+22 | 6,777909E+22 | 1,513005E+23                           | 1,355588E+23                           | 2,868593E+23  |
| 851                    | 7,565254E+22                              | 7,565262E+22 | 6,777914E+22 | 6,777889E+22 | 1,513052E+23                           | 1,355580E+23                           | 2,868632E+23  |
| 852                    | 7,565059E+22                              | 7,564977E+22 | 6,777955E+22 | 6,777830E+22 | 1,513004E+23                           | 1,355578E+23                           | 2,868582E+23  |
| 853                    | 7,564993E+22                              | 7,565138E+22 | 6,778010E+22 | 6,777961E+22 | 1,513013E+23                           | 1,355597E+23                           | 2,868610E+23  |
| 854                    | 7,565294E+22                              | 7,565132E+22 | 6,777945E+22 | 6,777983E+22 | 1,513043E+23                           | 1,355593E+23                           | 2,868635E+23  |
| 855                    | 7,564937E+22                              | 7,565033E+22 | 6,778014E+22 | 6,778019E+22 | 1,512997E+23                           | 1,355603E+23                           | 2,868600E+23  |
| 856                    | 7,565135E+22                              | 7,565303E+22 | 6,778004E+22 | 6,778126E+22 | 1,513044E+23                           | 1,355613E+23                           | 2,868657E+23  |
| 857                    | 7,565313E+22                              | 7,565132E+22 | 6,778045E+22 | 6,778071E+22 | 1,513045E+23                           | 1,355612E+23                           | 2,868656E+23  |
| 858                    | 7,565016E+22                              | 7,565126E+22 | 6,778223E+22 | 6,778100E+22 | 1,513014E+23                           | 1,355632E+23                           | 2,868646E+23  |
| 859                    | 7,565384E+22                              | 7,565344E+22 | 6,778195E+22 | 6,778164E+22 | 1,513073E+23                           | 1,355636E+23                           | 2,868709E+23  |
| 860                    | 7,565236E+22                              | 7,565151E+22 | 6,778215E+22 | 6,778148E+22 | 1,513039E+23                           | 1,355636E+23                           | 2,868675E+23  |
| 861                    | 7,565026E+22                              | 7,565284E+22 | 6,778264E+22 | 6,778264E+22 | 1,513031E+23                           | 1,355653E+23                           | 2,868684E+23  |
| 862                    | 7,565368E+22                              | 7,565326E+22 | 6,778199E+22 | 6,778247E+22 | 1,513069E+23                           | 1,355645E+23                           | 2,868714E+23  |
| 863                    | 7,565067E+22                              | 7,565079E+22 | 6,778247E+22 | 6,778168E+22 | 1,513015E+23                           | 1,355642E+23                           | 2,868656E+23  |
| 864                    | 7,565168E+22                              | 7,565264E+22 | 6,778187E+22 | 6,778183E+22 | 1,513043E+23                           | 1,355637E+23                           | 2,868680E+23  |
| 865                    | 7,565407E+22                              | 7,565168E+22 | 6,778087E+22 | 6,778110E+22 | 1,513057E+23                           | 1,355620E+23                           | 2,868677E+23  |
| 866                    | 7,565001E+22                              | 7,565092E+22 | 6,778119E+22 | 6,778078E+22 | 1,513009E+23                           | 1,355620E+23                           | 2,868629E+23  |
| 867                    | 7,565244E+22                              | 7,565345E+22 | 6,778019E+22 | 6,778077E+22 | 1,513059E+23                           | 1,355610E+23                           | 2,868669E+23  |
| 868                    | 7,565184E+22                              | 7,565140E+22 | 6,778014E+22 | 6,777960E+22 | 1,513032E+23                           | 1,355597E+23                           | 2,868630E+23  |
| 869                    | 7,564920E+22                              | 7,565118E+22 | 6,778080E+22 | 6,777989E+22 | 1,513004E+23                           | 1,355607E+23                           | 2,868611E+23  |
| 870                    | 7,565301E+22                              | 7,565222E+22 | 6,778031E+22 | 6,777998E+22 | 1,513052E+23                           | 1,355603E+23                           | 2,868655E+23  |
| 871                    | 7,565054E+22                              | 7,564967E+22 | 6,778069E+22 | 6,777985E+22 | 1,513002E+23                           | 1,355605E+23                           | 2,868607E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 872               | 7,564997E+22                              | 7,565172E+22 | 6,778049E+22 | 6,778091E+22 | 1,513017E+23                           | 1,355614E+23                           | 2,868631E+23  |
| 873               | 7,565317E+22                              | 7,565215E+22 | 6,777992E+22 | 6,778126E+22 | 1,513053E+23                           | 1,355612E+23                           | 2,868665E+23  |
| 874               | 7,564970E+22                              | 7,565041E+22 | 6,778123E+22 | 6,778119E+22 | 1,513001E+23                           | 1,355624E+23                           | 2,868625E+23  |
| 875               | 7,565232E+22                              | 7,565302E+22 | 6,778161E+22 | 6,778156E+22 | 1,513053E+23                           | 1,355632E+23                           | 2,868685E+23  |
| 876               | 7,565364E+22                              | 7,565188E+22 | 6,778209E+22 | 6,778122E+22 | 1,513055E+23                           | 1,355633E+23                           | 2,868688E+23  |
| 877               | 7,565048E+22                              | 7,565144E+22 | 6,778319E+22 | 6,778222E+22 | 1,513019E+23                           | 1,355654E+23                           | 2,868673E+23  |
| 878               | 7,565368E+22                              | 7,565410E+22 | 6,778295E+22 | 6,778318E+22 | 1,513078E+23                           | 1,355661E+23                           | 2,868739E+23  |
| 879               | 7,565172E+22                              | 7,565190E+22 | 6,778344E+22 | 6,778308E+22 | 1,513036E+23                           | 1,355665E+23                           | 2,868701E+23  |
| 880               | 7,565019E+22                              | 7,565281E+22 | 6,778359E+22 | 6,778356E+22 | 1,513030E+23                           | 1,355672E+23                           | 2,868702E+23  |
| 881               | 7,565432E+22                              | 7,565339E+22 | 6,778280E+22 | 6,778348E+22 | 1,513077E+23                           | 1,355663E+23                           | 2,868740E+23  |
| 882               | 7,565128E+22                              | 7,565034E+22 | 6,778335E+22 | 6,778265E+22 | 1,513016E+23                           | 1,355660E+23                           | 2,868676E+23  |
| 883               | 7,565242E+22                              | 7,565280E+22 | 6,778267E+22 | 6,778248E+22 | 1,513052E+23                           | 1,355652E+23                           | 2,868704E+23  |
| 884               | 7,565396E+22                              | 7,565271E+22 | 6,778151E+22 | 6,778177E+22 | 1,513067E+23                           | 1,355633E+23                           | 2,868699E+23  |
| 885               | 7,564990E+22                              | 7,565111E+22 | 6,778165E+22 | 6,778163E+22 | 1,513010E+23                           | 1,355633E+23                           | 2,868643E+23  |
| 886               | 7,565252E+22                              | 7,565349E+22 | 6,778133E+22 | 6,778133E+22 | 1,513060E+23                           | 1,355627E+23                           | 2,868687E+23  |
| 887               | 7,565180E+22                              | 7,565105E+22 | 6,778163E+22 | 6,778032E+22 | 1,513029E+23                           | 1,355620E+23                           | 2,868648E+23  |
| 888               | 7,564951E+22                              | 7,565086E+22 | 6,778169E+22 | 6,778061E+22 | 1,513004E+23                           | 1,355623E+23                           | 2,868627E+23  |
| 889               | 7,565331E+22                              | 7,565271E+22 | 6,778081E+22 | 6,778142E+22 | 1,513060E+23                           | 1,355622E+23                           | 2,868682E+23  |
| 890               | 7,565042E+22                              | 7,564999E+22 | 6,778139E+22 | 6,778143E+22 | 1,513004E+23                           | 1,355628E+23                           | 2,868632E+23  |
| 891               | 7,565036E+22                              | 7,565215E+22 | 6,778152E+22 | 6,778183E+22 | 1,513025E+23                           | 1,355634E+23                           | 2,868659E+23  |
| 892               | 7,565343E+22                              | 7,565285E+22 | 6,778139E+22 | 6,778186E+22 | 1,513063E+23                           | 1,355633E+23                           | 2,868695E+23  |
| 893               | 7,565048E+22                              | 7,565033E+22 | 6,778247E+22 | 6,778205E+22 | 1,513008E+23                           | 1,355645E+23                           | 2,868653E+23  |
| 894               | 7,565297E+22                              | 7,565317E+22 | 6,778311E+22 | 6,778255E+22 | 1,513061E+23                           | 1,355657E+23                           | 2,868718E+23  |
| 895               | 7,565342E+22                              | 7,565236E+22 | 6,778358E+22 | 6,778281E+22 | 1,513058E+23                           | 1,355664E+23                           | 2,868722E+23  |
| 896               | 7,565017E+22                              | 7,565201E+22 | 6,778392E+22 | 6,778373E+22 | 1,513022E+23                           | 1,355676E+23                           | 2,868698E+23  |
| 897               | 7,565353E+22                              | 7,565471E+22 | 6,778366E+22 | 6,778481E+22 | 1,513082E+23                           | 1,355685E+23                           | 2,868767E+23  |
| 898               | 7,565194E+22                              | 7,565154E+22 | 6,778461E+22 | 6,778428E+22 | 1,513035E+23                           | 1,355689E+23                           | 2,868724E+23  |
| 899               | 7,565129E+22                              | 7,565229E+22 | 6,778465E+22 | 6,778392E+22 | 1,513036E+23                           | 1,355686E+23                           | 2,868721E+23  |
| 900               | 7,565495E+22                              | 7,565365E+22 | 6,778376E+22 | 6,778382E+22 | 1,513086E+23                           | 1,355676E+23                           | 2,868762E+23  |
| 901               | 7,565183E+22                              | 7,565059E+22 | 6,778359E+22 | 6,778342E+22 | 1,513024E+23                           | 1,355670E+23                           | 2,868694E+23  |
| 902               | 7,565240E+22                              | 7,565349E+22 | 6,778327E+22 | 6,778318E+22 | 1,513059E+23                           | 1,355665E+23                           | 2,868723E+23  |
| 903               | 7,565336E+22                              | 7,565332E+22 | 6,778275E+22 | 6,778260E+22 | 1,513067E+23                           | 1,355653E+23                           | 2,868720E+23  |
| 904               | 7,564976E+22                              | 7,565115E+22 | 6,778271E+22 | 6,778216E+22 | 1,513009E+23                           | 1,355649E+23                           | 2,868658E+23  |
| 905               | 7,565269E+22                              | 7,565358E+22 | 6,778238E+22 | 6,778235E+22 | 1,513063E+23                           | 1,355647E+23                           | 2,868710E+23  |
| 906               | 7,565198E+22                              | 7,565053E+22 | 6,778284E+22 | 6,778171E+22 | 1,513025E+23                           | 1,355646E+23                           | 2,868671E+23  |
| 907               | 7,564993E+22                              | 7,565081E+22 | 6,778249E+22 | 6,778183E+22 | 1,513007E+23                           | 1,355643E+23                           | 2,868651E+23  |
| 908               | 7,565326E+22                              | 7,565350E+22 | 6,778152E+22 | 6,778262E+22 | 1,513068E+23                           | 1,355641E+23                           | 2,868709E+23  |
| 909               | 7,565086E+22                              | 7,565010E+22 | 6,778185E+22 | 6,778256E+22 | 1,513010E+23                           | 1,355644E+23                           | 2,868654E+23  |
| 910               | 7,565110E+22                              | 7,565229E+22 | 6,778271E+22 | 6,778238E+22 | 1,513034E+23                           | 1,355651E+23                           | 2,868685E+23  |
| 911               | 7,565387E+22                              | 7,565306E+22 | 6,778299E+22 | 6,778256E+22 | 1,513069E+23                           | 1,355656E+23                           | 2,868725E+23  |
| 912               | 7,565086E+22                              | 7,565062E+22 | 6,778363E+22 | 6,778289E+22 | 1,513015E+23                           | 1,355665E+23                           | 2,868680E+23  |
| 913               | 7,565295E+22                              | 7,565418E+22 | 6,778403E+22 | 6,778416E+22 | 1,513071E+23                           | 1,355682E+23                           | 2,868753E+23  |
| 914               | 7,565299E+22                              | 7,565267E+22 | 6,778482E+22 | 6,778460E+22 | 1,513057E+23                           | 1,355694E+23                           | 2,868751E+23  |
| 915               | 7,565031E+22                              | 7,565210E+22 | 6,778522E+22 | 6,778485E+22 | 1,513024E+23                           | 1,355701E+23                           | 2,868725E+23  |
| 916               | 7,565383E+22                              | 7,565487E+22 | 6,778499E+22 | 6,778548E+22 | 1,513087E+23                           | 1,355705E+23                           | 2,868792E+23  |
| 917               | 7,565287E+22                              | 7,565092E+22 | 6,778535E+22 | 6,778511E+22 | 1,513038E+23                           | 1,355705E+23                           | 2,868742E+23  |
| 918               | 7,565219E+22                              | 7,565221E+22 | 6,778549E+22 | 6,778460E+22 | 1,513044E+23                           | 1,355701E+23                           | 2,868745E+23  |
| 919               | 7,565492E+22                              | 7,565421E+22 | 6,778453E+22 | 6,778485E+22 | 1,513091E+23                           | 1,355694E+23                           | 2,868785E+23  |
| 920               | 7,565157E+22                              | 7,565134E+22 | 6,778392E+22 | 6,778423E+22 | 1,513029E+23                           | 1,355682E+23                           | 2,868711E+23  |



| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 921                    | 7,565217E+22                              | 7,565425E+22 | 6,778389E+22 | 6,778407E+22 | 1,513064E+23                           | 1,355680E+23                           | 2,868744E+23  |
| 922                    | 7,565325E+22                              | 7,565300E+22 | 6,778411E+22 | 6,778338E+22 | 1,513062E+23                           | 1,355675E+23                           | 2,868737E+23  |
| 923                    | 7,565033E+22                              | 7,565073E+22 | 6,778395E+22 | 6,778266E+22 | 1,513011E+23                           | 1,355666E+23                           | 2,868677E+23  |
| 924                    | 7,565286E+22                              | 7,565374E+22 | 6,778346E+22 | 6,778316E+22 | 1,513066E+23                           | 1,355666E+23                           | 2,868732E+23  |
| 925                    | 7,565226E+22                              | 7,565055E+22 | 6,778318E+22 | 6,778317E+22 | 1,513028E+23                           | 1,355664E+23                           | 2,868692E+23  |
| 926                    | 7,565017E+22                              | 7,565125E+22 | 6,778311E+22 | 6,778297E+22 | 1,513014E+23                           | 1,355661E+23                           | 2,868675E+23  |
| 927                    | 7,565319E+22                              | 7,565399E+22 | 6,778273E+22 | 6,778365E+22 | 1,513072E+23                           | 1,355664E+23                           | 2,868736E+23  |
| 928                    | 7,565135E+22                              | 7,565040E+22 | 6,778288E+22 | 6,778312E+22 | 1,513017E+23                           | 1,355660E+23                           | 2,868677E+23  |
| 929                    | 7,565171E+22                              | 7,565277E+22 | 6,778389E+22 | 6,778330E+22 | 1,513045E+23                           | 1,355672E+23                           | 2,868717E+23  |
| 930                    | 7,565411E+22                              | 7,565315E+22 | 6,778461E+22 | 6,778397E+22 | 1,513073E+23                           | 1,355686E+23                           | 2,868759E+23  |
| 931                    | 7,565107E+22                              | 7,565102E+22 | 6,778479E+22 | 6,778425E+22 | 1,513021E+23                           | 1,355690E+23                           | 2,868711E+23  |
| 932                    | 7,565250E+22                              | 7,565491E+22 | 6,778521E+22 | 6,778552E+22 | 1,513074E+23                           | 1,355707E+23                           | 2,868781E+23  |
| 933                    | 7,565324E+22                              | 7,565241E+22 | 6,778564E+22 | 6,778598E+22 | 1,513057E+23                           | 1,355716E+23                           | 2,868773E+23  |
| 934                    | 7,565115E+22                              | 7,565162E+22 | 6,778632E+22 | 6,778551E+22 | 1,513028E+23                           | 1,355718E+23                           | 2,868746E+23  |
| 935                    | 7,565445E+22                              | 7,565471E+22 | 6,778619E+22 | 6,778619E+22 | 1,513092E+23                           | 1,355724E+23                           | 2,868815E+23  |
| 936                    | 7,565348E+22                              | 7,565125E+22 | 6,778573E+22 | 6,778570E+22 | 1,513047E+23                           | 1,355714E+23                           | 2,868762E+23  |
| 937                    | 7,565228E+22                              | 7,565340E+22 | 6,778575E+22 | 6,778565E+22 | 1,513057E+23                           | 1,355714E+23                           | 2,868771E+23  |
| 938                    | 7,565445E+22                              | 7,565486E+22 | 6,778555E+22 | 6,778596E+22 | 1,513093E+23                           | 1,355715E+23                           | 2,868808E+23  |
| 939                    | 7,565147E+22                              | 7,565169E+22 | 6,778518E+22 | 6,778483E+22 | 1,513032E+23                           | 1,355700E+23                           | 2,868732E+23  |
| 940                    | 7,565199E+22                              | 7,565449E+22 | 6,778545E+22 | 6,778458E+22 | 1,513065E+23                           | 1,355700E+23                           | 2,868765E+23  |
| 941                    | 7,565370E+22                              | 7,565227E+22 | 6,778509E+22 | 6,778449E+22 | 1,513060E+23                           | 1,355696E+23                           | 2,868755E+23  |
| 942                    | 7,565090E+22                              | 7,565033E+22 | 6,778485E+22 | 6,778377E+22 | 1,513012E+23                           | 1,355686E+23                           | 2,868698E+23  |
| 943                    | 7,565280E+22                              | 7,565401E+22 | 6,778413E+22 | 6,778462E+22 | 1,513068E+23                           | 1,355687E+23                           | 2,868756E+23  |
| 944                    | 7,565232E+22                              | 7,565101E+22 | 6,778330E+22 | 6,778426E+22 | 1,513033E+23                           | 1,355676E+23                           | 2,868709E+23  |
| 945                    | 7,565061E+22                              | 7,565196E+22 | 6,778361E+22 | 6,778385E+22 | 1,513026E+23                           | 1,355675E+23                           | 2,868700E+23  |
| 946                    | 7,565371E+22                              | 7,565383E+22 | 6,778413E+22 | 6,778426E+22 | 1,513075E+23                           | 1,355684E+23                           | 2,868759E+23  |
| 947                    | 7,565213E+22                              | 7,565055E+22 | 6,778430E+22 | 6,778354E+22 | 1,513027E+23                           | 1,355678E+23                           | 2,868705E+23  |
| 948                    | 7,565179E+22                              | 7,565354E+22 | 6,778532E+22 | 6,778410E+22 | 1,513053E+23                           | 1,355694E+23                           | 2,868748E+23  |
| 949                    | 7,565398E+22                              | 7,565340E+22 | 6,778550E+22 | 6,778562E+22 | 1,513074E+23                           | 1,355711E+23                           | 2,868785E+23  |
| 950                    | 7,565103E+22                              | 7,565130E+22 | 6,778604E+22 | 6,778566E+22 | 1,513023E+23                           | 1,355717E+23                           | 2,868740E+23  |
| 951                    | 7,565235E+22                              | 7,565497E+22 | 6,778668E+22 | 6,778686E+22 | 1,513073E+23                           | 1,355735E+23                           | 2,868809E+23  |
| 952                    | 7,565376E+22                              | 7,565227E+22 | 6,778650E+22 | 6,778689E+22 | 1,513060E+23                           | 1,355734E+23                           | 2,868794E+23  |
| 953                    | 7,565203E+22                              | 7,565193E+22 | 6,778694E+22 | 6,778656E+22 | 1,513040E+23                           | 1,355735E+23                           | 2,868775E+23  |
| 954                    | 7,565483E+22                              | 7,565482E+22 | 6,778721E+22 | 6,778739E+22 | 1,513096E+23                           | 1,355746E+23                           | 2,868842E+23  |
| 955                    | 7,565366E+22                              | 7,565214E+22 | 6,778639E+22 | 6,778659E+22 | 1,513058E+23                           | 1,355730E+23                           | 2,868788E+23  |
| 956                    | 7,565187E+22                              | 7,565445E+22 | 6,778677E+22 | 6,778634E+22 | 1,513063E+23                           | 1,355731E+23                           | 2,868794E+23  |
| 957                    | 7,565446E+22                              | 7,565468E+22 | 6,778655E+22 | 6,778683E+22 | 1,513091E+23                           | 1,355734E+23                           | 2,868825E+23  |
| 958                    | 7,565199E+22                              | 7,565115E+22 | 6,778656E+22 | 6,778532E+22 | 1,513031E+23                           | 1,355719E+23                           | 2,868750E+23  |
| 959                    | 7,565212E+22                              | 7,565408E+22 | 6,778674E+22 | 6,778550E+22 | 1,513062E+23                           | 1,355722E+23                           | 2,868784E+23  |
| 960                    | 7,565394E+22                              | 7,565225E+22 | 6,778539E+22 | 6,778555E+22 | 1,513062E+23                           | 1,355709E+23                           | 2,868771E+23  |
| 961                    | 7,565105E+22                              | 7,565107E+22 | 6,778483E+22 | 6,778509E+22 | 1,513021E+23                           | 1,355699E+23                           | 2,868720E+23  |
| 962                    | 7,565274E+22                              | 7,565430E+22 | 6,778498E+22 | 6,778580E+22 | 1,513070E+23                           | 1,355708E+23                           | 2,868778E+23  |
| 963                    | 7,565278E+22                              | 7,565149E+22 | 6,778425E+22 | 6,778465E+22 | 1,513043E+23                           | 1,355689E+23                           | 2,868732E+23  |
| 964                    | 7,565090E+22                              | 7,565248E+22 | 6,778514E+22 | 6,778411E+22 | 1,513034E+23                           | 1,355692E+23                           | 2,868726E+23  |
| 965                    | 7,565421E+22                              | 7,565365E+22 | 6,778543E+22 | 6,778529E+22 | 1,513079E+23                           | 1,355707E+23                           | 2,868786E+23  |
| 966                    | 7,565247E+22                              | 7,565062E+22 | 6,778571E+22 | 6,778478E+22 | 1,513031E+23                           | 1,355705E+23                           | 2,868736E+23  |
| 967                    | 7,565125E+22                              | 7,565404E+22 | 6,778660E+22 | 6,778592E+22 | 1,513053E+23                           | 1,355725E+23                           | 2,868778E+23  |
| 968                    | 7,565372E+22                              | 7,565368E+22 | 6,778610E+22 | 6,778716E+22 | 1,513074E+23                           | 1,355733E+23                           | 2,868807E+23  |
| 969                    | 7,565146E+22                              | 7,565155E+22 | 6,778672E+22 | 6,778693E+22 | 1,513030E+23                           | 1,355737E+23                           | 2,868767E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 970                    | 7,565306E+22                              | 7,565449E+22 | 6,778800E+22 | 6,778786E+22 | 1,513076E+23                           | 1,355759E+23                           | 2,868834E+23  |
| 971                    | 7,565473E+22                              | 7,565249E+22 | 6,778741E+22 | 6,778744E+22 | 1,513072E+23                           | 1,355748E+23                           | 2,868821E+23  |
| 972                    | 7,565236E+22                              | 7,565296E+22 | 6,778794E+22 | 6,778721E+22 | 1,513053E+23                           | 1,355751E+23                           | 2,868805E+23  |
| 973                    | 7,565484E+22                              | 7,565535E+22 | 6,778791E+22 | 6,778859E+22 | 1,513102E+23                           | 1,355765E+23                           | 2,868867E+23  |
| 974                    | 7,565361E+22                              | 7,565259E+22 | 6,778773E+22 | 6,778738E+22 | 1,513062E+23                           | 1,355751E+23                           | 2,868813E+23  |
| 975                    | 7,565153E+22                              | 7,565458E+22 | 6,778841E+22 | 6,778721E+22 | 1,513061E+23                           | 1,355756E+23                           | 2,868817E+23  |
| 976                    | 7,565455E+22                              | 7,565429E+22 | 6,778749E+22 | 6,778763E+22 | 1,513088E+23                           | 1,355751E+23                           | 2,868840E+23  |
| 977                    | 7,565253E+22                              | 7,565108E+22 | 6,778716E+22 | 6,778652E+22 | 1,513036E+23                           | 1,355737E+23                           | 2,868773E+23  |
| 978                    | 7,565232E+22                              | 7,565369E+22 | 6,778747E+22 | 6,778694E+22 | 1,513060E+23                           | 1,355744E+23                           | 2,868804E+23  |
| 979                    | 7,565402E+22                              | 7,565280E+22 | 6,778561E+22 | 6,778657E+22 | 1,513068E+23                           | 1,355722E+23                           | 2,868790E+23  |
| 980                    | 7,565107E+22                              | 7,565198E+22 | 6,778544E+22 | 6,778564E+22 | 1,513031E+23                           | 1,355711E+23                           | 2,868741E+23  |
| 981                    | 7,565318E+22                              | 7,565410E+22 | 6,778579E+22 | 6,778638E+22 | 1,513073E+23                           | 1,355722E+23                           | 2,868794E+23  |
| 982                    | 7,565358E+22                              | 7,565141E+22 | 6,778573E+22 | 6,778488E+22 | 1,513050E+23                           | 1,355706E+23                           | 2,868756E+23  |
| 983                    | 7,565104E+22                              | 7,565269E+22 | 6,778671E+22 | 6,778499E+22 | 1,513037E+23                           | 1,355717E+23                           | 2,868754E+23  |
| 984                    | 7,565398E+22                              | 7,565408E+22 | 6,778622E+22 | 6,778660E+22 | 1,513081E+23                           | 1,355728E+23                           | 2,868809E+23  |
| 985                    | 7,565226E+22                              | 7,565151E+22 | 6,778637E+22 | 6,778658E+22 | 1,513038E+23                           | 1,355729E+23                           | 2,868767E+23  |
| 986                    | 7,565098E+22                              | 7,565398E+22 | 6,778801E+22 | 6,778766E+22 | 1,513050E+23                           | 1,355757E+23                           | 2,868806E+23  |
| 987                    | 7,565412E+22                              | 7,565384E+22 | 6,778730E+22 | 6,778813E+22 | 1,513080E+23                           | 1,355754E+23                           | 2,868834E+23  |
| 988                    | 7,565220E+22                              | 7,565185E+22 | 6,778807E+22 | 6,778758E+22 | 1,513041E+23                           | 1,355757E+23                           | 2,868797E+23  |
| 989                    | 7,565400E+22                              | 7,565422E+22 | 6,778901E+22 | 6,778899E+22 | 1,513082E+23                           | 1,355780E+23                           | 2,868862E+23  |
| 990                    | 7,565542E+22                              | 7,565291E+22 | 6,778850E+22 | 6,778839E+22 | 1,513083E+23                           | 1,355769E+23                           | 2,868852E+23  |
| 991                    | 7,565201E+22                              | 7,565383E+22 | 6,778908E+22 | 6,778849E+22 | 1,513058E+23                           | 1,355776E+23                           | 2,868834E+23  |
| 992                    | 7,565454E+22                              | 7,565577E+22 | 6,778866E+22 | 6,778955E+22 | 1,513103E+23                           | 1,355782E+23                           | 2,868885E+23  |
| 993                    | 7,565386E+22                              | 7,565270E+22 | 6,778859E+22 | 6,778823E+22 | 1,513066E+23                           | 1,355768E+23                           | 2,868834E+23  |
| 994                    | 7,565177E+22                              | 7,565383E+22 | 6,778981E+22 | 6,778815E+22 | 1,513056E+23                           | 1,355780E+23                           | 2,868836E+23  |
| 995                    | 7,565495E+22                              | 7,565426E+22 | 6,778808E+22 | 6,778830E+22 | 1,513092E+23                           | 1,355764E+23                           | 2,868856E+23  |
| 996                    | 7,565257E+22                              | 7,565171E+22 | 6,778765E+22 | 6,778733E+22 | 1,513043E+23                           | 1,355750E+23                           | 2,868793E+23  |
| 997                    | 7,565236E+22                              | 7,565385E+22 | 6,778776E+22 | 6,778816E+22 | 1,513062E+23                           | 1,355759E+23                           | 2,868821E+23  |
| 998                    | 7,565434E+22                              | 7,565307E+22 | 6,778656E+22 | 6,778710E+22 | 1,513074E+23                           | 1,355737E+23                           | 2,868811E+23  |
| 999                    | 7,565113E+22                              | 7,565230E+22 | 6,778691E+22 | 6,778620E+22 | 1,513034E+23                           | 1,355731E+23                           | 2,868765E+23  |
| 1000                   | 7,565346E+22                              | 7,565408E+22 | 6,778680E+22 | 6,778693E+22 | 1,513075E+23                           | 1,355737E+23                           | 2,868813E+23  |
| 1001                   | 7,565400E+22                              | 7,565176E+22 | 6,778669E+22 | 6,778606E+22 | 1,513058E+23                           | 1,355728E+23                           | 2,868785E+23  |
| 1002                   | 7,565084E+22                              | 7,565270E+22 | 6,778805E+22 | 6,778678E+22 | 1,513035E+23                           | 1,355748E+23                           | 2,868784E+23  |
| 1003                   | 7,565364E+22                              | 7,565471E+22 | 6,778699E+22 | 6,778810E+22 | 1,513083E+23                           | 1,355751E+23                           | 2,868834E+23  |
| 1004                   | 7,565228E+22                              | 7,565205E+22 | 6,778751E+22 | 6,778771E+22 | 1,513043E+23                           | 1,355752E+23                           | 2,868796E+23  |
| 1005                   | 7,565176E+22                              | 7,565331E+22 | 6,778910E+22 | 6,778878E+22 | 1,513051E+23                           | 1,355779E+23                           | 2,868829E+23  |
| 1006                   | 7,565534E+22                              | 7,565351E+22 | 6,778869E+22 | 6,778869E+22 | 1,513089E+23                           | 1,355774E+23                           | 2,868862E+23  |
| 1007                   | 7,565283E+22                              | 7,565230E+22 | 6,778935E+22 | 6,778848E+22 | 1,513051E+23                           | 1,355778E+23                           | 2,868830E+23  |
| 1008                   | 7,565410E+22                              | 7,565492E+22 | 6,778953E+22 | 6,779003E+22 | 1,513090E+23                           | 1,355796E+23                           | 2,868886E+23  |
| 1009                   | 7,565538E+22                              | 7,565414E+22 | 6,778919E+22 | 6,778967E+22 | 1,513095E+23                           | 1,355789E+23                           | 2,868884E+23  |
| 1010                   | 7,565170E+22                              | 7,565395E+22 | 6,779060E+22 | 6,778972E+22 | 1,513056E+23                           | 1,355803E+23                           | 2,868860E+23  |
| 1011                   | 7,565436E+22                              | 7,565592E+22 | 6,778989E+22 | 6,779021E+22 | 1,513103E+23                           | 1,355801E+23                           | 2,868904E+23  |
| 1012                   | 7,565413E+22                              | 7,565280E+22 | 6,778987E+22 | 6,778895E+22 | 1,513069E+23                           | 1,355788E+23                           | 2,868857E+23  |
| 1013                   | 7,565223E+22                              | 7,565305E+22 | 6,779051E+22 | 6,778947E+22 | 1,513053E+23                           | 1,355800E+23                           | 2,868853E+23  |
| 1014                   | 7,565536E+22                              | 7,565428E+22 | 6,778872E+22 | 6,778935E+22 | 1,513096E+23                           | 1,355781E+23                           | 2,868877E+23  |
| 1015                   | 7,565244E+22                              | 7,565234E+22 | 6,778821E+22 | 6,778835E+22 | 1,513048E+23                           | 1,355766E+23                           | 2,868813E+23  |
| 1016                   | 7,565246E+22                              | 7,565406E+22 | 6,778807E+22 | 6,778869E+22 | 1,513065E+23                           | 1,355768E+23                           | 2,868833E+23  |
| 1017                   | 7,565498E+22                              | 7,565342E+22 | 6,778732E+22 | 6,778748E+22 | 1,513084E+23                           | 1,355748E+23                           | 2,868832E+23  |
| 1018                   | 7,565152E+22                              | 7,565198E+22 | 6,778845E+22 | 6,778693E+22 | 1,513035E+23                           | 1,355754E+23                           | 2,868789E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 1019                   | 7,565345E+22                              | 7,565457E+22 | 6,778786E+22 | 6,778770E+22 | 1,513080E+23                           | 1,355756E+23                           | 2,868836E+23  |
| 1020                   | 7,565377E+22                              | 7,565267E+22 | 6,778780E+22 | 6,778731E+22 | 1,513064E+23                           | 1,355751E+23                           | 2,868815E+23  |
| 1021                   | 7,565067E+22                              | 7,565263E+22 | 6,778904E+22 | 6,778856E+22 | 1,513033E+23                           | 1,355776E+23                           | 2,868809E+23  |
| 1022                   | 7,565403E+22                              | 7,565461E+22 | 6,778842E+22 | 6,778919E+22 | 1,513086E+23                           | 1,355776E+23                           | 2,868863E+23  |
| 1023                   | 7,565271E+22                              | 7,565210E+22 | 6,778905E+22 | 6,778874E+22 | 1,513048E+23                           | 1,355778E+23                           | 2,868826E+23  |
| 1024                   | 7,565262E+22                              | 7,565320E+22 | 6,778990E+22 | 6,778972E+22 | 1,513058E+23                           | 1,355796E+23                           | 2,868854E+23  |
| 1025                   | 7,565624E+22                              | 7,565405E+22 | 6,778937E+22 | 6,778985E+22 | 1,513103E+23                           | 1,355792E+23                           | 2,868895E+23  |
| 1026                   | 7,565283E+22                              | 7,565282E+22 | 6,779051E+22 | 6,779003E+22 | 1,513057E+23                           | 1,355805E+23                           | 2,868862E+23  |
| 1027                   | 7,565368E+22                              | 7,565602E+22 | 6,779029E+22 | 6,779100E+22 | 1,513097E+23                           | 1,355813E+23                           | 2,868910E+23  |
| 1028                   | 7,565521E+22                              | 7,565477E+22 | 6,779049E+22 | 6,779039E+22 | 1,513100E+23                           | 1,355809E+23                           | 2,868909E+23  |
| 1029                   | 7,565204E+22                              | 7,565320E+22 | 6,779190E+22 | 6,779070E+22 | 1,513052E+23                           | 1,355826E+23                           | 2,868878E+23  |
| 1030                   | 7,565507E+22                              | 7,565532E+22 | 6,779116E+22 | 6,779081E+22 | 1,513104E+23                           | 1,355820E+23                           | 2,868924E+23  |
| 1031                   | 7,565432E+22                              | 7,565290E+22 | 6,779079E+22 | 6,778997E+22 | 1,513072E+23                           | 1,355808E+23                           | 2,868880E+23  |
| 1032                   | 7,565232E+22                              | 7,565331E+22 | 6,779046E+22 | 6,779054E+22 | 1,513056E+23                           | 1,355810E+23                           | 2,868866E+23  |
| 1033                   | 7,565556E+22                              | 7,565500E+22 | 6,778894E+22 | 6,779027E+22 | 1,513106E+23                           | 1,355792E+23                           | 2,868898E+23  |
| 1034                   | 7,565250E+22                              | 7,565246E+22 | 6,778941E+22 | 6,778911E+22 | 1,513050E+23                           | 1,355785E+23                           | 2,868835E+23  |
| 1035                   | 7,565260E+22                              | 7,565449E+22 | 6,778910E+22 | 6,778883E+22 | 1,513071E+23                           | 1,355779E+23                           | 2,868850E+23  |
| 1036                   | 7,565535E+22                              | 7,565388E+22 | 6,778872E+22 | 6,778799E+22 | 1,513092E+23                           | 1,355767E+23                           | 2,868859E+23  |
| 1037                   | 7,565175E+22                              | 7,565161E+22 | 6,778960E+22 | 6,778843E+22 | 1,513034E+23                           | 1,355780E+23                           | 2,868814E+23  |
| 1038                   | 7,565337E+22                              | 7,565476E+22 | 6,778899E+22 | 6,778913E+22 | 1,513081E+23                           | 1,355781E+23                           | 2,868863E+23  |
| 1039                   | 7,565344E+22                              | 7,565317E+22 | 6,778891E+22 | 6,778888E+22 | 1,513066E+23                           | 1,355778E+23                           | 2,868844E+23  |
| 1040                   | 7,565100E+22                              | 7,565233E+22 | 6,778961E+22 | 6,778966E+22 | 1,513033E+23                           | 1,355793E+23                           | 2,868826E+23  |
| 1041                   | 7,565508E+22                              | 7,565460E+22 | 6,778925E+22 | 6,779001E+22 | 1,513097E+23                           | 1,355793E+23                           | 2,868890E+23  |
| 1042                   | 7,565358E+22                              | 7,565199E+22 | 6,779027E+22 | 6,778967E+22 | 1,513056E+23                           | 1,355799E+23                           | 2,868855E+23  |
| 1043                   | 7,565285E+22                              | 7,565411E+22 | 6,779059E+22 | 6,779043E+22 | 1,513070E+23                           | 1,355810E+23                           | 2,868880E+23  |
| 1044                   | 7,565617E+22                              | 7,565551E+22 | 6,779041E+22 | 6,779087E+22 | 1,513117E+23                           | 1,355813E+23                           | 2,868930E+23  |
| 1045                   | 7,565262E+22                              | 7,565307E+22 | 6,779179E+22 | 6,779148E+22 | 1,513057E+23                           | 1,355833E+23                           | 2,868890E+23  |
| 1046                   | 7,565370E+22                              | 7,565604E+22 | 6,779208E+22 | 6,779180E+22 | 1,513097E+23                           | 1,355839E+23                           | 2,868936E+23  |
| 1047                   | 7,565531E+22                              | 7,565471E+22 | 6,779221E+22 | 6,779133E+22 | 1,513100E+23                           | 1,355835E+23                           | 2,868936E+23  |
| 1048                   | 7,565255E+22                              | 7,565256E+22 | 6,779260E+22 | 6,779175E+22 | 1,513051E+23                           | 1,355844E+23                           | 2,868895E+23  |
| 1049                   | 7,565571E+22                              | 7,565538E+22 | 6,779155E+22 | 6,779205E+22 | 1,513111E+23                           | 1,355836E+23                           | 2,868947E+23  |
| 1050                   | 7,565434E+22                              | 7,565314E+22 | 6,779133E+22 | 6,779140E+22 | 1,513075E+23                           | 1,355827E+23                           | 2,868902E+23  |
| 1051                   | 7,565216E+22                              | 7,565418E+22 | 6,779065E+22 | 6,779113E+22 | 1,513063E+23                           | 1,355818E+23                           | 2,868881E+23  |
| 1052                   | 7,565587E+22                              | 7,565564E+22 | 6,778986E+22 | 6,779050E+22 | 1,513115E+23                           | 1,355804E+23                           | 2,868919E+23  |
| 1053                   | 7,565304E+22                              | 7,565202E+22 | 6,779063E+22 | 6,778968E+22 | 1,513051E+23                           | 1,355803E+23                           | 2,868854E+23  |
| 1054                   | 7,565311E+22                              | 7,565440E+22 | 6,779054E+22 | 6,778923E+22 | 1,513075E+23                           | 1,355798E+23                           | 2,868873E+23  |
| 1055                   | 7,565510E+22                              | 7,565437E+22 | 6,779000E+22 | 6,778915E+22 | 1,513095E+23                           | 1,355791E+23                           | 2,868886E+23  |
| 1056                   | 7,565149E+22                              | 7,565188E+22 | 6,779006E+22 | 6,778998E+22 | 1,513034E+23                           | 1,355800E+23                           | 2,868834E+23  |
| 1057                   | 7,565348E+22                              | 7,565505E+22 | 6,778964E+22 | 6,779051E+22 | 1,513085E+23                           | 1,355802E+23                           | 2,868887E+23  |
| 1058                   | 7,565357E+22                              | 7,565296E+22 | 6,779022E+22 | 6,779020E+22 | 1,513065E+23                           | 1,355804E+23                           | 2,868870E+23  |
| 1059                   | 7,565150E+22                              | 7,565265E+22 | 6,779040E+22 | 6,779023E+22 | 1,513042E+23                           | 1,355806E+23                           | 2,868848E+23  |
| 1060                   | 7,565592E+22                              | 7,565506E+22 | 6,779037E+22 | 6,779075E+22 | 1,513110E+23                           | 1,355811E+23                           | 2,868921E+23  |
| 1061                   | 7,565406E+22                              | 7,565213E+22 | 6,779136E+22 | 6,779109E+22 | 1,513062E+23                           | 1,355824E+23                           | 2,868886E+23  |
| 1062                   | 7,565295E+22                              | 7,565485E+22 | 6,779181E+22 | 6,779149E+22 | 1,513078E+23                           | 1,355833E+23                           | 2,868911E+23  |
| 1063                   | 7,565579E+22                              | 7,565628E+22 | 6,779193E+22 | 6,779204E+22 | 1,513121E+23                           | 1,355840E+23                           | 2,868960E+23  |
| 1064                   | 7,565281E+22                              | 7,565279E+22 | 6,779284E+22 | 6,779248E+22 | 1,513056E+23                           | 1,355853E+23                           | 2,868909E+23  |
| 1065                   | 7,565438E+22                              | 7,565570E+22 | 6,779320E+22 | 6,779267E+22 | 1,513101E+23                           | 1,355859E+23                           | 2,868960E+23  |
| 1066                   | 7,565572E+22                              | 7,565433E+22 | 6,779339E+22 | 6,779261E+22 | 1,513100E+23                           | 1,355860E+23                           | 2,868960E+23  |
| 1067                   | 7,565264E+22                              | 7,565318E+22 | 6,779279E+22 | 6,779266E+22 | 1,513058E+23                           | 1,355855E+23                           | 2,868913E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 1068              | 7,565583E+22                              | 7,565639E+22 | 6,779201E+22 | 6,779301E+22 | 1,513122E+23                           | 1,355850E+23                           | 2,868972E+23  |
| 1069              | 7,565445E+22                              | 7,565333E+22 | 6,779211E+22 | 6,779241E+22 | 1,513078E+23                           | 1,355845E+23                           | 2,868923E+23  |
| 1070              | 7,565249E+22                              | 7,565439E+22 | 6,779199E+22 | 6,779136E+22 | 1,513069E+23                           | 1,355833E+23                           | 2,868902E+23  |
| 1071              | 7,565604E+22                              | 7,565598E+22 | 6,779144E+22 | 6,779098E+22 | 1,513120E+23                           | 1,355824E+23                           | 2,868944E+23  |
| 1072              | 7,565338E+22                              | 7,565166E+22 | 6,779144E+22 | 6,779064E+22 | 1,513050E+23                           | 1,355821E+23                           | 2,868871E+23  |
| 1073              | 7,565319E+22                              | 7,565460E+22 | 6,779128E+22 | 6,779060E+22 | 1,513078E+23                           | 1,355819E+23                           | 2,868897E+23  |
| 1074              | 7,565464E+22                              | 7,565460E+22 | 6,779082E+22 | 6,779092E+22 | 1,513092E+23                           | 1,355817E+23                           | 2,868910E+23  |
| 1075              | 7,565118E+22                              | 7,565227E+22 | 6,779041E+22 | 6,779093E+22 | 1,513035E+23                           | 1,355813E+23                           | 2,868848E+23  |
| 1076              | 7,565410E+22                              | 7,565519E+22 | 6,779062E+22 | 6,779117E+22 | 1,513093E+23                           | 1,355818E+23                           | 2,868911E+23  |
| 1077              | 7,565453E+22                              | 7,565241E+22 | 6,779130E+22 | 6,779104E+22 | 1,513069E+23                           | 1,355823E+23                           | 2,868893E+23  |
| 1078              | 7,565242E+22                              | 7,565287E+22 | 6,779163E+22 | 6,779072E+22 | 1,513053E+23                           | 1,355824E+23                           | 2,868877E+23  |
| 1079              | 7,565598E+22                              | 7,565611E+22 | 6,779166E+22 | 6,779176E+22 | 1,513121E+23                           | 1,355834E+23                           | 2,868955E+23  |
| 1080              | 7,565393E+22                              | 7,565278E+22 | 6,779218E+22 | 6,779243E+22 | 1,513067E+23                           | 1,355846E+23                           | 2,868913E+23  |
| 1081              | 7,565292E+22                              | 7,565539E+22 | 6,779315E+22 | 6,779270E+22 | 1,513083E+23                           | 1,355858E+23                           | 2,868942E+23  |
| 1082              | 7,565563E+22                              | 7,565618E+22 | 6,779372E+22 | 6,779345E+22 | 1,513118E+23                           | 1,355872E+23                           | 2,868990E+23  |
| 1083              | 7,565299E+22                              | 7,565284E+22 | 6,779387E+22 | 6,779341E+22 | 1,513058E+23                           | 1,355873E+23                           | 2,868931E+23  |
| 1084              | 7,565505E+22                              | 7,565574E+22 | 6,779418E+22 | 6,779386E+22 | 1,513108E+23                           | 1,355880E+23                           | 2,868988E+23  |
| 1085              | 7,565604E+22                              | 7,565422E+22 | 6,779401E+22 | 6,779427E+22 | 1,513103E+23                           | 1,355883E+23                           | 2,868985E+23  |
| 1086              | 7,565293E+22                              | 7,565381E+22 | 6,779333E+22 | 6,779357E+22 | 1,513067E+23                           | 1,355869E+23                           | 2,868936E+23  |
| 1087              | 7,565581E+22                              | 7,565702E+22 | 6,779299E+22 | 6,779360E+22 | 1,513128E+23                           | 1,355866E+23                           | 2,868994E+23  |
| 1088              | 7,565492E+22                              | 7,565321E+22 | 6,779285E+22 | 6,779277E+22 | 1,513081E+23                           | 1,355856E+23                           | 2,868937E+23  |
| 1089              | 7,565319E+22                              | 7,565430E+22 | 6,779300E+22 | 6,779162E+22 | 1,513075E+23                           | 1,355846E+23                           | 2,868921E+23  |
| 1090              | 7,565589E+22                              | 7,565590E+22 | 6,779265E+22 | 6,779200E+22 | 1,513118E+23                           | 1,355847E+23                           | 2,868964E+23  |
| 1091              | 7,565289E+22                              | 7,565236E+22 | 6,779184E+22 | 6,779166E+22 | 1,513052E+23                           | 1,355835E+23                           | 2,868887E+23  |
| 1092              | 7,565296E+22                              | 7,565512E+22 | 6,779197E+22 | 6,779190E+22 | 1,513081E+23                           | 1,355839E+23                           | 2,868919E+23  |
| 1093              | 7,565462E+22                              | 7,565427E+22 | 6,779185E+22 | 6,779232E+22 | 1,513089E+23                           | 1,355842E+23                           | 2,868931E+23  |
| 1094              | 7,565187E+22                              | 7,565220E+22 | 6,779159E+22 | 6,779144E+22 | 1,513041E+23                           | 1,355830E+23                           | 2,868871E+23  |
| 1095              | 7,565477E+22                              | 7,565536E+22 | 6,779203E+22 | 6,779180E+22 | 1,513101E+23                           | 1,355838E+23                           | 2,868939E+23  |
| 1096              | 7,565530E+22                              | 7,565245E+22 | 6,779205E+22 | 6,779207E+22 | 1,513078E+23                           | 1,355841E+23                           | 2,868919E+23  |
| 1097              | 7,565279E+22                              | 7,565359E+22 | 6,779257E+22 | 6,779197E+22 | 1,513064E+23                           | 1,355845E+23                           | 2,868909E+23  |
| 1098              | 7,565544E+22                              | 7,565686E+22 | 6,779298E+22 | 6,779346E+22 | 1,513123E+23                           | 1,355864E+23                           | 2,868987E+23  |
| 1099              | 7,565355E+22                              | 7,565344E+22 | 6,779319E+22 | 6,779347E+22 | 1,513070E+23                           | 1,355867E+23                           | 2,868937E+23  |
| 1100              | 7,565333E+22                              | 7,565543E+22 | 6,779462E+22 | 6,779373E+22 | 1,513088E+23                           | 1,355883E+23                           | 2,868971E+23  |
| 1101              | 7,565621E+22                              | 7,565552E+22 | 6,779505E+22 | 6,779479E+22 | 1,513117E+23                           | 1,355898E+23                           | 2,869016E+23  |
| 1102              | 7,565370E+22                              | 7,565289E+22 | 6,779483E+22 | 6,779435E+22 | 1,513066E+23                           | 1,355892E+23                           | 2,868958E+23  |
| 1103              | 7,565522E+22                              | 7,565652E+22 | 6,779504E+22 | 6,779500E+22 | 1,513117E+23                           | 1,355900E+23                           | 2,869018E+23  |
| 1104              | 7,565627E+22                              | 7,565460E+22 | 6,779426E+22 | 6,779530E+22 | 1,513109E+23                           | 1,355896E+23                           | 2,869004E+23  |
| 1105              | 7,565327E+22                              | 7,565424E+22 | 6,779426E+22 | 6,779408E+22 | 1,513075E+23                           | 1,355883E+23                           | 2,868958E+23  |
| 1106              | 7,565579E+22                              | 7,565713E+22 | 6,779441E+22 | 6,779422E+22 | 1,513129E+23                           | 1,355886E+23                           | 2,869016E+23  |
| 1107              | 7,565492E+22                              | 7,565340E+22 | 6,779373E+22 | 6,779311E+22 | 1,513083E+23                           | 1,355868E+23                           | 2,868952E+23  |
| 1108              | 7,565339E+22                              | 7,565443E+22 | 6,779404E+22 | 6,779265E+22 | 1,513078E+23                           | 1,355867E+23                           | 2,868945E+23  |
| 1109              | 7,565555E+22                              | 7,565576E+22 | 6,779341E+22 | 6,779371E+22 | 1,513113E+23                           | 1,355871E+23                           | 2,868984E+23  |
| 1110              | 7,565279E+22                              | 7,565264E+22 | 6,779251E+22 | 6,779279E+22 | 1,513054E+23                           | 1,355853E+23                           | 2,868907E+23  |
| 1111              | 7,565308E+22                              | 7,565522E+22 | 6,779303E+22 | 6,779272E+22 | 1,513083E+23                           | 1,355858E+23                           | 2,868940E+23  |
| 1112              | 7,565544E+22                              | 7,565374E+22 | 6,779250E+22 | 6,779296E+22 | 1,513092E+23                           | 1,355855E+23                           | 2,868946E+23  |
| 1113              | 7,565299E+22                              | 7,565223E+22 | 6,779255E+22 | 6,779189E+22 | 1,513052E+23                           | 1,355844E+23                           | 2,868897E+23  |
| 1114              | 7,565495E+22                              | 7,565584E+22 | 6,779319E+22 | 6,779293E+22 | 1,513108E+23                           | 1,355861E+23                           | 2,868969E+23  |
| 1115              | 7,565494E+22                              | 7,565374E+22 | 6,779271E+22 | 6,779311E+22 | 1,513087E+23                           | 1,355858E+23                           | 2,868945E+23  |
| 1116              | 7,565264E+22                              | 7,565454E+22 | 6,779382E+22 | 6,779337E+22 | 1,513072E+23                           | 1,355872E+23                           | 2,868944E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 1117              | 7,565512E+22                              | 7,565680E+22 | 6,779468E+22 | 6,779506E+22 | 1,513119E+23                           | 1,355897E+23                           | 2,869017E+23  |
| 1118              | 7,565402E+22                              | 7,565339E+22 | 6,779486E+22 | 6,779446E+22 | 1,513074E+23                           | 1,355893E+23                           | 2,868967E+23  |
| 1119              | 7,565390E+22                              | 7,565518E+22 | 6,779619E+22 | 6,779484E+22 | 1,513091E+23                           | 1,355910E+23                           | 2,869001E+23  |
| 1120              | 7,565692E+22                              | 7,565519E+22 | 6,779564E+22 | 6,779622E+22 | 1,513121E+23                           | 1,355919E+23                           | 2,869040E+23  |
| 1121              | 7,565433E+22                              | 7,565338E+22 | 6,779523E+22 | 6,779547E+22 | 1,513077E+23                           | 1,355907E+23                           | 2,868984E+23  |
| 1122              | 7,565501E+22                              | 7,565704E+22 | 6,779576E+22 | 6,779617E+22 | 1,513121E+23                           | 1,355919E+23                           | 2,869040E+23  |
| 1123              | 7,565621E+22                              | 7,565527E+22 | 6,779484E+22 | 6,779554E+22 | 1,513115E+23                           | 1,355904E+23                           | 2,869019E+23  |
| 1124              | 7,565387E+22                              | 7,565435E+22 | 6,779541E+22 | 6,779438E+22 | 1,513082E+23                           | 1,355898E+23                           | 2,868980E+23  |
| 1125              | 7,565592E+22                              | 7,565673E+22 | 6,779571E+22 | 6,779505E+22 | 1,513126E+23                           | 1,355908E+23                           | 2,869034E+23  |
| 1126              | 7,565505E+22                              | 7,565367E+22 | 6,779470E+22 | 6,779388E+22 | 1,513087E+23                           | 1,355886E+23                           | 2,868973E+23  |
| 1127              | 7,565300E+22                              | 7,565492E+22 | 6,779501E+22 | 6,779385E+22 | 1,513079E+23                           | 1,355889E+23                           | 2,868968E+23  |
| 1128              | 7,565543E+22                              | 7,565568E+22 | 6,779387E+22 | 6,779504E+22 | 1,513111E+23                           | 1,355889E+23                           | 2,869000E+23  |
| 1129              | 7,565327E+22                              | 7,565261E+22 | 6,779340E+22 | 6,779355E+22 | 1,513059E+23                           | 1,355869E+23                           | 2,868928E+23  |
| 1130              | 7,565341E+22                              | 7,565513E+22 | 6,779421E+22 | 6,779366E+22 | 1,513085E+23                           | 1,355879E+23                           | 2,868964E+23  |
| 1131              | 7,565592E+22                              | 7,565411E+22 | 6,779317E+22 | 6,779350E+22 | 1,513100E+23                           | 1,355867E+23                           | 2,868967E+23  |
| 1132              | 7,565357E+22                              | 7,565286E+22 | 6,779353E+22 | 6,779305E+22 | 1,513064E+23                           | 1,355866E+23                           | 2,868930E+23  |
| 1133              | 7,565465E+22                              | 7,565637E+22 | 6,779431E+22 | 6,779459E+22 | 1,513110E+23                           | 1,355889E+23                           | 2,868999E+23  |
| 1134              | 7,565483E+22                              | 7,565443E+22 | 6,779398E+22 | 6,779425E+22 | 1,513093E+23                           | 1,355882E+23                           | 2,868975E+23  |
| 1135              | 7,565273E+22                              | 7,565470E+22 | 6,779564E+22 | 6,779440E+22 | 1,513074E+23                           | 1,355900E+23                           | 2,868975E+23  |
| 1136              | 7,565581E+22                              | 7,565607E+22 | 6,779578E+22 | 6,779610E+22 | 1,513119E+23                           | 1,355919E+23                           | 2,869038E+23  |
| 1137              | 7,565501E+22                              | 7,565308E+22 | 6,779596E+22 | 6,779538E+22 | 1,513081E+23                           | 1,355913E+23                           | 2,868994E+23  |
| 1138              | 7,565413E+22                              | 7,565546E+22 | 6,779704E+22 | 6,779630E+22 | 1,513096E+23                           | 1,355933E+23                           | 2,869029E+23  |
| 1139              | 7,565680E+22                              | 7,565613E+22 | 6,779585E+22 | 6,779715E+22 | 1,513129E+23                           | 1,355930E+23                           | 2,869059E+23  |
| 1140              | 7,565460E+22                              | 7,565425E+22 | 6,779606E+22 | 6,779639E+22 | 1,513088E+23                           | 1,355925E+23                           | 2,869013E+23  |
| 1141              | 7,565497E+22                              | 7,565716E+22 | 6,779710E+22 | 6,779700E+22 | 1,513121E+23                           | 1,355941E+23                           | 2,869062E+23  |
| 1142              | 7,565660E+22                              | 7,565552E+22 | 6,779627E+22 | 6,779585E+22 | 1,513121E+23                           | 1,355921E+23                           | 2,869042E+23  |
| 1143              | 7,565409E+22                              | 7,565439E+22 | 6,779698E+22 | 6,779513E+22 | 1,513085E+23                           | 1,355921E+23                           | 2,869006E+23  |
| 1144              | 7,565590E+22                              | 7,565643E+22 | 6,779633E+22 | 6,779643E+22 | 1,513123E+23                           | 1,355928E+23                           | 2,869051E+23  |
| 1145              | 7,565505E+22                              | 7,565391E+22 | 6,779527E+22 | 6,779521E+22 | 1,513090E+23                           | 1,355905E+23                           | 2,868994E+23  |
| 1146              | 7,565265E+22                              | 7,565499E+22 | 6,779569E+22 | 6,779528E+22 | 1,513076E+23                           | 1,355910E+23                           | 2,868986E+23  |
| 1147              | 7,565560E+22                              | 7,565574E+22 | 6,779430E+22 | 6,779548E+22 | 1,513113E+23                           | 1,355898E+23                           | 2,869011E+23  |
| 1148              | 7,565437E+22                              | 7,565264E+22 | 6,779419E+22 | 6,779400E+22 | 1,513070E+23                           | 1,355882E+23                           | 2,868952E+23  |
| 1149              | 7,565390E+22                              | 7,565507E+22 | 6,779525E+22 | 6,779451E+22 | 1,513090E+23                           | 1,355898E+23                           | 2,868987E+23  |
| 1150              | 7,565629E+22                              | 7,565504E+22 | 6,779413E+22 | 6,779423E+22 | 1,513113E+23                           | 1,355884E+23                           | 2,868997E+23  |
| 1151              | 7,565338E+22                              | 7,565376E+22 | 6,779490E+22 | 6,779415E+22 | 1,513071E+23                           | 1,355891E+23                           | 2,868962E+23  |
| 1152              | 7,565438E+22                              | 7,565648E+22 | 6,779548E+22 | 6,779593E+22 | 1,513109E+23                           | 1,355914E+23                           | 2,869023E+23  |
| 1153              | 7,565521E+22                              | 7,565439E+22 | 6,779556E+22 | 6,779522E+22 | 1,513096E+23                           | 1,355908E+23                           | 2,869004E+23  |
| 1154              | 7,565292E+22                              | 7,565429E+22 | 6,779717E+22 | 6,779577E+22 | 1,513072E+23                           | 1,355929E+23                           | 2,869001E+23  |
| 1155              | 7,565622E+22                              | 7,565603E+22 | 6,779655E+22 | 6,779714E+22 | 1,513123E+23                           | 1,355937E+23                           | 2,869059E+23  |
| 1156              | 7,565576E+22                              | 7,565354E+22 | 6,779653E+22 | 6,779684E+22 | 1,513093E+23                           | 1,355934E+23                           | 2,869027E+23  |
| 1157              | 7,565408E+22                              | 7,565599E+22 | 6,779768E+22 | 6,779789E+22 | 1,513101E+23                           | 1,355956E+23                           | 2,869056E+23  |
| 1158              | 7,565704E+22                              | 7,565699E+22 | 6,779672E+22 | 6,779779E+22 | 1,513140E+23                           | 1,355945E+23                           | 2,869085E+23  |
| 1159              | 7,565493E+22                              | 7,565462E+22 | 6,779765E+22 | 6,779675E+22 | 1,513095E+23                           | 1,355944E+23                           | 2,869039E+23  |
| 1160              | 7,565542E+22                              | 7,565679E+22 | 6,779824E+22 | 6,779755E+22 | 1,513122E+23                           | 1,355958E+23                           | 2,869080E+23  |
| 1161              | 7,565711E+22                              | 7,565548E+22 | 6,779746E+22 | 6,779654E+22 | 1,513126E+23                           | 1,355940E+23                           | 2,869066E+23  |
| 1162              | 7,565368E+22                              | 7,565463E+22 | 6,779789E+22 | 6,779665E+22 | 1,513083E+23                           | 1,355945E+23                           | 2,869028E+23  |
| 1163              | 7,565536E+22                              | 7,565690E+22 | 6,779656E+22 | 6,779754E+22 | 1,513123E+23                           | 1,355941E+23                           | 2,869064E+23  |
| 1164              | 7,565528E+22                              | 7,565420E+22 | 6,779589E+22 | 6,779635E+22 | 1,513095E+23                           | 1,355922E+23                           | 2,869017E+23  |
| 1165              | 7,565291E+22                              | 7,565475E+22 | 6,779665E+22 | 6,779622E+22 | 1,513077E+23                           | 1,355929E+23                           | 2,869005E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 1166              | 7,565645E+22                              | 7,565581E+22 | 6,779530E+22 | 6,779575E+22 | 1,513123E+23                           | 1,355910E+23                           | 2,869033E+23  |
| 1167              | 7,565506E+22                              | 7,565298E+22 | 6,779555E+22 | 6,779457E+22 | 1,513080E+23                           | 1,355901E+23                           | 2,868982E+23  |
| 1168              | 7,565412E+22                              | 7,565529E+22 | 6,779588E+22 | 6,779561E+22 | 1,513094E+23                           | 1,355915E+23                           | 2,869009E+23  |
| 1169              | 7,565623E+22                              | 7,565566E+22 | 6,779512E+22 | 6,779536E+22 | 1,513119E+23                           | 1,355905E+23                           | 2,869024E+23  |
| 1170              | 7,565291E+22                              | 7,565405E+22 | 6,779626E+22 | 6,779563E+22 | 1,513070E+23                           | 1,355919E+23                           | 2,868988E+23  |
| 1171              | 7,565434E+22                              | 7,565631E+22 | 6,779650E+22 | 6,779672E+22 | 1,513107E+23                           | 1,355932E+23                           | 2,869039E+23  |
| 1172              | 7,565609E+22                              | 7,565421E+22 | 6,779668E+22 | 6,779635E+22 | 1,513103E+23                           | 1,355930E+23                           | 2,869033E+23  |
| 1173              | 7,565338E+22                              | 7,565414E+22 | 6,779812E+22 | 6,779724E+22 | 1,513075E+23                           | 1,355954E+23                           | 2,869029E+23  |
| 1174              | 7,565666E+22                              | 7,565683E+22 | 6,779724E+22 | 6,779819E+22 | 1,513135E+23                           | 1,355954E+23                           | 2,869089E+23  |
| 1175              | 7,565592E+22                              | 7,565460E+22 | 6,779766E+22 | 6,779783E+22 | 1,513105E+23                           | 1,355955E+23                           | 2,869060E+23  |
| 1176              | 7,565423E+22                              | 7,565629E+22 | 6,779865E+22 | 6,779881E+22 | 1,513105E+23                           | 1,355975E+23                           | 2,869080E+23  |
| 1177              | 7,565757E+22                              | 7,565722E+22 | 6,779830E+22 | 6,779831E+22 | 1,513148E+23                           | 1,355966E+23                           | 2,869114E+23  |
| 1178              | 7,565502E+22                              | 7,565457E+22 | 6,779925E+22 | 6,779782E+22 | 1,513096E+23                           | 1,355971E+23                           | 2,869067E+23  |
| 1179              | 7,565531E+22                              | 7,565677E+22 | 6,779909E+22 | 6,779847E+22 | 1,513121E+23                           | 1,355976E+23                           | 2,869096E+23  |
| 1180              | 7,565729E+22                              | 7,565582E+22 | 6,779800E+22 | 6,779810E+22 | 1,513131E+23                           | 1,355961E+23                           | 2,869092E+23  |
| 1181              | 7,565329E+22                              | 7,565467E+22 | 6,779841E+22 | 6,779831E+22 | 1,513080E+23                           | 1,355967E+23                           | 2,869047E+23  |
| 1182              | 7,565568E+22                              | 7,565711E+22 | 6,779718E+22 | 6,779816E+22 | 1,513128E+23                           | 1,355953E+23                           | 2,869081E+23  |
| 1183              | 7,565606E+22                              | 7,565413E+22 | 6,779696E+22 | 6,779651E+22 | 1,513102E+23                           | 1,355935E+23                           | 2,869037E+23  |
| 1184              | 7,565375E+22                              | 7,565436E+22 | 6,779727E+22 | 6,779658E+22 | 1,513081E+23                           | 1,355938E+23                           | 2,869020E+23  |
| 1185              | 7,565719E+22                              | 7,565618E+22 | 6,779619E+22 | 6,779614E+22 | 1,513134E+23                           | 1,355923E+23                           | 2,869057E+23  |
| 1186              | 7,565463E+22                              | 7,565374E+22 | 6,779651E+22 | 6,779583E+22 | 1,513084E+23                           | 1,355923E+23                           | 2,869007E+23  |
| 1187              | 7,565337E+22                              | 7,565604E+22 | 6,779667E+22 | 6,779661E+22 | 1,513094E+23                           | 1,355933E+23                           | 2,869027E+23  |
| 1188              | 7,565621E+22                              | 7,565607E+22 | 6,779632E+22 | 6,779670E+22 | 1,513123E+23                           | 1,355930E+23                           | 2,869053E+23  |
| 1189              | 7,565287E+22                              | 7,565374E+22 | 6,779776E+22 | 6,779710E+22 | 1,513066E+23                           | 1,355949E+23                           | 2,869015E+23  |
| 1190              | 7,565504E+22                              | 7,565620E+22 | 6,779775E+22 | 6,779767E+22 | 1,513112E+23                           | 1,355954E+23                           | 2,869067E+23  |
| 1191              | 7,565681E+22                              | 7,565440E+22 | 6,779796E+22 | 6,779754E+22 | 1,513112E+23                           | 1,355955E+23                           | 2,869067E+23  |
| 1192              | 7,565382E+22                              | 7,565444E+22 | 6,779857E+22 | 6,779875E+22 | 1,513083E+23                           | 1,355973E+23                           | 2,869056E+23  |
| 1193              | 7,565709E+22                              | 7,565754E+22 | 6,779815E+22 | 6,779924E+22 | 1,513146E+23                           | 1,355974E+23                           | 2,869120E+23  |
| 1194              | 7,565589E+22                              | 7,565514E+22 | 6,779903E+22 | 6,779887E+22 | 1,513110E+23                           | 1,355979E+23                           | 2,869089E+23  |
| 1195              | 7,565444E+22                              | 7,565638E+22 | 6,779980E+22 | 6,779911E+22 | 1,513108E+23                           | 1,355989E+23                           | 2,869097E+23  |
| 1196              | 7,565823E+22                              | 7,565731E+22 | 6,779949E+22 | 6,779920E+22 | 1,513155E+23                           | 1,355987E+23                           | 2,869142E+23  |
| 1197              | 7,565496E+22                              | 7,565458E+22 | 6,780033E+22 | 6,779929E+22 | 1,513095E+23                           | 1,355996E+23                           | 2,869092E+23  |
| 1198              | 7,565521E+22                              | 7,565722E+22 | 6,779973E+22 | 6,779957E+22 | 1,513124E+23                           | 1,355993E+23                           | 2,869117E+23  |
| 1199              | 7,565717E+22                              | 7,565630E+22 | 6,779897E+22 | 6,779914E+22 | 1,513135E+23                           | 1,355981E+23                           | 2,869116E+23  |
| 1200              | 7,565358E+22                              | 7,565444E+22 | 6,779888E+22 | 6,779912E+22 | 1,513080E+23                           | 1,355980E+23                           | 2,869060E+23  |
| 1201              | 7,565647E+22                              | 7,565687E+22 | 6,779818E+22 | 6,779844E+22 | 1,513133E+23                           | 1,355966E+23                           | 2,869100E+23  |
| 1202              | 7,565641E+22                              | 7,565424E+22 | 6,779804E+22 | 6,779724E+22 | 1,513106E+23                           | 1,355953E+23                           | 2,869059E+23  |
| 1203              | 7,565381E+22                              | 7,565465E+22 | 6,779781E+22 | 6,779715E+22 | 1,513085E+23                           | 1,355950E+23                           | 2,869034E+23  |
| 1204              | 7,565716E+22                              | 7,565702E+22 | 6,779679E+22 | 6,779748E+22 | 1,513142E+23                           | 1,355943E+23                           | 2,869085E+23  |
| 1205              | 7,565400E+22                              | 7,565418E+22 | 6,779750E+22 | 6,779747E+22 | 1,513082E+23                           | 1,355950E+23                           | 2,869032E+23  |
| 1206              | 7,565332E+22                              | 7,565618E+22 | 6,779790E+22 | 6,779745E+22 | 1,513095E+23                           | 1,355954E+23                           | 2,869049E+23  |
| 1207              | 7,565671E+22                              | 7,565589E+22 | 6,779796E+22 | 6,779746E+22 | 1,513126E+23                           | 1,355954E+23                           | 2,869080E+23  |
| 1208              | 7,565368E+22                              | 7,565317E+22 | 6,779860E+22 | 6,779819E+22 | 1,513068E+23                           | 1,355968E+23                           | 2,869036E+23  |
| 1209              | 7,565596E+22                              | 7,565631E+22 | 6,779872E+22 | 6,779872E+22 | 1,513123E+23                           | 1,355974E+23                           | 2,869097E+23  |
| 1210              | 7,565682E+22                              | 7,565525E+22 | 6,779883E+22 | 6,779904E+22 | 1,513121E+23                           | 1,355979E+23                           | 2,869100E+23  |
| 1211              | 7,565370E+22                              | 7,565523E+22 | 6,779931E+22 | 6,779962E+22 | 1,513089E+23                           | 1,355989E+23                           | 2,869079E+23  |
| 1212              | 7,565752E+22                              | 7,565822E+22 | 6,779939E+22 | 6,780022E+22 | 1,513157E+23                           | 1,355996E+23                           | 2,869154E+23  |
| 1213              | 7,565597E+22                              | 7,565517E+22 | 6,780072E+22 | 6,780002E+22 | 1,513111E+23                           | 1,356007E+23                           | 2,869119E+23  |
| 1214              | 7,565483E+22                              | 7,565650E+22 | 6,780127E+22 | 6,779993E+22 | 1,513113E+23                           | 1,356012E+23                           | 2,869125E+23  |



| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 1215                   | 7,565842E+22                              | 7,565752E+22 | 6,780077E+22 | 6,780037E+22 | 1,513159E+23                           | 1,356011E+23                           | 2,869171E+23  |
| 1216                   | 7,565484E+22                              | 7,565456E+22 | 6,780064E+22 | 6,780091E+22 | 1,513094E+23                           | 1,356015E+23                           | 2,869110E+23  |
| 1217                   | 7,565545E+22                              | 7,565730E+22 | 6,780036E+22 | 6,780058E+22 | 1,513128E+23                           | 1,356009E+23                           | 2,869137E+23  |
| 1218                   | 7,565724E+22                              | 7,565627E+22 | 6,779980E+22 | 6,779995E+22 | 1,513135E+23                           | 1,355998E+23                           | 2,869133E+23  |
| 1219                   | 7,565410E+22                              | 7,565426E+22 | 6,779940E+22 | 6,779915E+22 | 1,513084E+23                           | 1,355985E+23                           | 2,869069E+23  |
| 1220                   | 7,565733E+22                              | 7,565715E+22 | 6,779876E+22 | 6,779895E+22 | 1,513145E+23                           | 1,355977E+23                           | 2,869122E+23  |
| 1221                   | 7,565625E+22                              | 7,565476E+22 | 6,779890E+22 | 6,779832E+22 | 1,513110E+23                           | 1,355972E+23                           | 2,869082E+23  |
| 1222                   | 7,565347E+22                              | 7,565558E+22 | 6,779868E+22 | 6,779800E+22 | 1,513090E+23                           | 1,355967E+23                           | 2,869057E+23  |
| 1223                   | 7,565673E+22                              | 7,565764E+22 | 6,779827E+22 | 6,779847E+22 | 1,513144E+23                           | 1,355967E+23                           | 2,869111E+23  |
| 1224                   | 7,565400E+22                              | 7,565388E+22 | 6,779869E+22 | 6,779872E+22 | 1,513079E+23                           | 1,355974E+23                           | 2,869053E+23  |
| 1225                   | 7,565408E+22                              | 7,565560E+22 | 6,779942E+22 | 6,779838E+22 | 1,513097E+23                           | 1,355978E+23                           | 2,869075E+23  |
| 1226                   | 7,565715E+22                              | 7,565569E+22 | 6,779928E+22 | 6,779887E+22 | 1,513128E+23                           | 1,355982E+23                           | 2,869110E+23  |
| 1227                   | 7,565413E+22                              | 7,565337E+22 | 6,779904E+22 | 6,779931E+22 | 1,513075E+23                           | 1,355984E+23                           | 2,869059E+23  |
| 1228                   | 7,565641E+22                              | 7,565723E+22 | 6,779914E+22 | 6,780028E+22 | 1,513136E+23                           | 1,355994E+23                           | 2,869131E+23  |
| 1229                   | 7,565670E+22                              | 7,565603E+22 | 6,779989E+22 | 6,780049E+22 | 1,513127E+23                           | 1,356004E+23                           | 2,869131E+23  |
| 1230                   | 7,565408E+22                              | 7,565567E+22 | 6,780068E+22 | 6,780009E+22 | 1,513097E+23                           | 1,356008E+23                           | 2,869105E+23  |
| 1231                   | 7,565795E+22                              | 7,565841E+22 | 6,780126E+22 | 6,780073E+22 | 1,513164E+23                           | 1,356020E+23                           | 2,869183E+23  |
| 1232                   | 7,565639E+22                              | 7,565495E+22 | 6,780178E+22 | 6,780113E+22 | 1,513113E+23                           | 1,356029E+23                           | 2,869142E+23  |
| 1233                   | 7,565509E+22                              | 7,565648E+22 | 6,780233E+22 | 6,780111E+22 | 1,513116E+23                           | 1,356034E+23                           | 2,869150E+23  |
| 1234                   | 7,565788E+22                              | 7,565802E+22 | 6,780162E+22 | 6,780197E+22 | 1,513159E+23                           | 1,356036E+23                           | 2,869195E+23  |
| 1235                   | 7,565471E+22                              | 7,565470E+22 | 6,780099E+22 | 6,780175E+22 | 1,513094E+23                           | 1,356027E+23                           | 2,869121E+23  |
| 1236                   | 7,565606E+22                              | 7,565743E+22 | 6,780097E+22 | 6,780138E+22 | 1,513135E+23                           | 1,356024E+23                           | 2,869158E+23  |
| 1237                   | 7,565760E+22                              | 7,565623E+22 | 6,780081E+22 | 6,780070E+22 | 1,513138E+23                           | 1,356015E+23                           | 2,869153E+23  |
| 1238                   | 7,565465E+22                              | 7,565452E+22 | 6,780033E+22 | 6,779945E+22 | 1,513092E+23                           | 1,355998E+23                           | 2,869090E+23  |
| 1239                   | 7,565739E+22                              | 7,565780E+22 | 6,779992E+22 | 6,779968E+22 | 1,513152E+23                           | 1,355996E+23                           | 2,869148E+23  |
| 1240                   | 7,565592E+22                              | 7,565511E+22 | 6,779951E+22 | 6,779968E+22 | 1,513110E+23                           | 1,355992E+23                           | 2,869102E+23  |
| 1241                   | 7,565348E+22                              | 7,565555E+22 | 6,779993E+22 | 6,779903E+22 | 1,513090E+23                           | 1,355990E+23                           | 2,869080E+23  |
| 1242                   | 7,565659E+22                              | 7,565742E+22 | 6,779970E+22 | 6,779957E+22 | 1,513140E+23                           | 1,355993E+23                           | 2,869133E+23  |
| 1243                   | 7,565452E+22                              | 7,565335E+22 | 6,779949E+22 | 6,779940E+22 | 1,513079E+23                           | 1,355989E+23                           | 2,869068E+23  |
| 1244                   | 7,565510E+22                              | 7,565566E+22 | 6,780001E+22 | 6,779961E+22 | 1,513108E+23                           | 1,355996E+23                           | 2,869104E+23  |
| 1245                   | 7,565728E+22                              | 7,565618E+22 | 6,780001E+22 | 6,780043E+22 | 1,513135E+23                           | 1,356004E+23                           | 2,869139E+23  |
| 1246                   | 7,565426E+22                              | 7,565451E+22 | 6,779985E+22 | 6,780025E+22 | 1,513088E+23                           | 1,356001E+23                           | 2,869089E+23  |
| 1247                   | 7,565650E+22                              | 7,565818E+22 | 6,780062E+22 | 6,780102E+22 | 1,513147E+23                           | 1,356016E+23                           | 2,869163E+23  |
| 1248                   | 7,565687E+22                              | 7,565614E+22 | 6,780129E+22 | 6,780147E+22 | 1,513130E+23                           | 1,356028E+23                           | 2,869158E+23  |
| 1249                   | 7,565473E+22                              | 7,565548E+22 | 6,780254E+22 | 6,780093E+22 | 1,513102E+23                           | 1,356035E+23                           | 2,869137E+23  |
| 1250                   | 7,565787E+22                              | 7,565838E+22 | 6,780283E+22 | 6,780216E+22 | 1,513163E+23                           | 1,356050E+23                           | 2,869212E+23  |
| 1251                   | 7,565633E+22                              | 7,565500E+22 | 6,780236E+22 | 6,780253E+22 | 1,513113E+23                           | 1,356049E+23                           | 2,869162E+23  |
| 1252                   | 7,565530E+22                              | 7,565690E+22 | 6,780259E+22 | 6,780279E+22 | 1,513122E+23                           | 1,356054E+23                           | 2,869176E+23  |
| 1253                   | 7,565776E+22                              | 7,565812E+22 | 6,780237E+22 | 6,780327E+22 | 1,513159E+23                           | 1,356056E+23                           | 2,869215E+23  |
| 1254                   | 7,565537E+22                              | 7,565481E+22 | 6,780182E+22 | 6,780184E+22 | 1,513102E+23                           | 1,356037E+23                           | 2,869138E+23  |
| 1255                   | 7,565687E+22                              | 7,565757E+22 | 6,780214E+22 | 6,780141E+22 | 1,513144E+23                           | 1,356036E+23                           | 2,869180E+23  |
| 1256                   | 7,565806E+22                              | 7,565635E+22 | 6,780151E+22 | 6,780135E+22 | 1,513144E+23                           | 1,356029E+23                           | 2,869173E+23  |
| 1257                   | 7,565487E+22                              | 7,565492E+22 | 6,780137E+22 | 6,780025E+22 | 1,513098E+23                           | 1,356016E+23                           | 2,869114E+23  |
| 1258                   | 7,565652E+22                              | 7,565850E+22 | 6,780111E+22 | 6,780095E+22 | 1,513150E+23                           | 1,356021E+23                           | 2,869171E+23  |
| 1259                   | 7,565557E+22                              | 7,565516E+22 | 6,780039E+22 | 6,780063E+22 | 1,513107E+23                           | 1,356010E+23                           | 2,869117E+23  |
| 1260                   | 7,565390E+22                              | 7,565534E+22 | 6,780091E+22 | 6,780026E+22 | 1,513092E+23                           | 1,356012E+23                           | 2,869104E+23  |
| 1261                   | 7,565689E+22                              | 7,565706E+22 | 6,780092E+22 | 6,780095E+22 | 1,513140E+23                           | 1,356019E+23                           | 2,869158E+23  |
| 1262                   | 7,565526E+22                              | 7,565345E+22 | 6,780022E+22 | 6,780022E+22 | 1,513087E+23                           | 1,356004E+23                           | 2,869091E+23  |
| 1263                   | 7,565549E+22                              | 7,565640E+22 | 6,780081E+22 | 6,780071E+22 | 1,513119E+23                           | 1,356015E+23                           | 2,869134E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 1264              | 7,565737E+22                              | 7,565689E+22 | 6,780051E+22 | 6,780177E+22 | 1,513143E+23                           | 1,356023E+23                           | 2,869165E+23  |
| 1265              | 7,565471E+22                              | 7,565477E+22 | 6,780128E+22 | 6,780099E+22 | 1,513095E+23                           | 1,356023E+23                           | 2,869117E+23  |
| 1266              | 7,565647E+22                              | 7,565836E+22 | 6,780249E+22 | 6,780179E+22 | 1,513148E+23                           | 1,356043E+23                           | 2,869191E+23  |
| 1267              | 7,565731E+22                              | 7,565591E+22 | 6,780251E+22 | 6,780216E+22 | 1,513132E+23                           | 1,356047E+23                           | 2,869179E+23  |
| 1268              | 7,565528E+22                              | 7,565560E+22 | 6,780347E+22 | 6,780239E+22 | 1,513109E+23                           | 1,356059E+23                           | 2,869167E+23  |
| 1269              | 7,565752E+22                              | 7,565873E+22 | 6,780375E+22 | 6,780397E+22 | 1,513162E+23                           | 1,356077E+23                           | 2,869240E+23  |
| 1270              | 7,565628E+22                              | 7,565560E+22 | 6,780303E+22 | 6,780358E+22 | 1,513119E+23                           | 1,356066E+23                           | 2,869185E+23  |
| 1271              | 7,565560E+22                              | 7,565733E+22 | 6,780368E+22 | 6,780354E+22 | 1,513129E+23                           | 1,356072E+23                           | 2,869201E+23  |
| 1272              | 7,565832E+22                              | 7,565797E+22 | 6,780325E+22 | 6,780399E+22 | 1,513163E+23                           | 1,356072E+23                           | 2,869235E+23  |
| 1273              | 7,565637E+22                              | 7,565464E+22 | 6,780315E+22 | 6,780220E+22 | 1,513110E+23                           | 1,356054E+23                           | 2,869164E+23  |
| 1274              | 7,565689E+22                              | 7,565792E+22 | 6,780336E+22 | 6,780221E+22 | 1,513148E+23                           | 1,356056E+23                           | 2,869204E+23  |
| 1275              | 7,565782E+22                              | 7,565680E+22 | 6,780195E+22 | 6,780235E+22 | 1,513146E+23                           | 1,356043E+23                           | 2,869189E+23  |
| 1276              | 7,565476E+22                              | 7,565551E+22 | 6,780186E+22 | 6,780174E+22 | 1,513103E+23                           | 1,356036E+23                           | 2,869139E+23  |
| 1277              | 7,565601E+22                              | 7,565838E+22 | 6,780219E+22 | 6,780227E+22 | 1,513144E+23                           | 1,356045E+23                           | 2,869188E+23  |
| 1278              | 7,565593E+22                              | 7,565495E+22 | 6,780141E+22 | 6,780112E+22 | 1,513109E+23                           | 1,356025E+23                           | 2,869134E+23  |
| 1279              | 7,565473E+22                              | 7,565524E+22 | 6,780187E+22 | 6,780083E+22 | 1,513100E+23                           | 1,356027E+23                           | 2,869127E+23  |
| 1280              | 7,565741E+22                              | 7,565696E+22 | 6,780142E+22 | 6,780206E+22 | 1,513144E+23                           | 1,356035E+23                           | 2,869179E+23  |
| 1281              | 7,565581E+22                              | 7,565401E+22 | 6,780110E+22 | 6,780114E+22 | 1,513098E+23                           | 1,356022E+23                           | 2,869121E+23  |
| 1282              | 7,565516E+22                              | 7,565732E+22 | 6,780200E+22 | 6,780171E+22 | 1,513125E+23                           | 1,356037E+23                           | 2,869162E+23  |
| 1283              | 7,565742E+22                              | 7,565727E+22 | 6,780166E+22 | 6,780249E+22 | 1,513147E+23                           | 1,356041E+23                           | 2,869188E+23  |
| 1284              | 7,565530E+22                              | 7,565498E+22 | 6,780271E+22 | 6,780210E+22 | 1,513103E+23                           | 1,356048E+23                           | 2,869151E+23  |
| 1285              | 7,565644E+22                              | 7,565822E+22 | 6,780423E+22 | 6,780323E+22 | 1,513147E+23                           | 1,356075E+23                           | 2,869221E+23  |
| 1286              | 7,565755E+22                              | 7,565611E+22 | 6,780371E+22 | 6,780339E+22 | 1,513137E+23                           | 1,356071E+23                           | 2,869208E+23  |
| 1287              | 7,565541E+22                              | 7,565613E+22 | 6,780433E+22 | 6,780395E+22 | 1,513115E+23                           | 1,356083E+23                           | 2,869198E+23  |
| 1288              | 7,565754E+22                              | 7,565890E+22 | 6,780428E+22 | 6,780557E+22 | 1,513164E+23                           | 1,356098E+23                           | 2,869263E+23  |
| 1289              | 7,565709E+22                              | 7,565552E+22 | 6,780412E+22 | 6,780423E+22 | 1,513126E+23                           | 1,356084E+23                           | 2,869210E+23  |
| 1290              | 7,565604E+22                              | 7,565743E+22 | 6,780494E+22 | 6,780393E+22 | 1,513135E+23                           | 1,356089E+23                           | 2,869223E+23  |
| 1291              | 7,565904E+22                              | 7,565797E+22 | 6,780391E+22 | 6,780428E+22 | 1,513170E+23                           | 1,356082E+23                           | 2,869252E+23  |
| 1292              | 7,565685E+22                              | 7,565518E+22 | 6,780374E+22 | 6,780318E+22 | 1,513120E+23                           | 1,356069E+23                           | 2,869190E+23  |
| 1293              | 7,565613E+22                              | 7,565863E+22 | 6,780431E+22 | 6,780358E+22 | 1,513148E+23                           | 1,356079E+23                           | 2,869226E+23  |
| 1294              | 7,565734E+22                              | 7,565738E+22 | 6,780277E+22 | 6,780313E+22 | 1,513147E+23                           | 1,356059E+23                           | 2,869206E+23  |
| 1295              | 7,565468E+22                              | 7,565560E+22 | 6,780304E+22 | 6,780258E+22 | 1,513103E+23                           | 1,356056E+23                           | 2,869159E+23  |
| 1296              | 7,565630E+22                              | 7,565781E+22 | 6,780313E+22 | 6,780328E+22 | 1,513141E+23                           | 1,356064E+23                           | 2,869205E+23  |
| 1297              | 7,565695E+22                              | 7,565437E+22 | 6,780253E+22 | 6,780184E+22 | 1,513113E+23                           | 1,356044E+23                           | 2,869157E+23  |
| 1298              | 7,565498E+22                              | 7,565551E+22 | 6,780278E+22 | 6,780185E+22 | 1,513105E+23                           | 1,356046E+23                           | 2,869151E+23  |
| 1299              | 7,565764E+22                              | 7,565749E+22 | 6,780164E+22 | 6,780310E+22 | 1,513151E+23                           | 1,356047E+23                           | 2,869199E+23  |
| 1300              | 7,565613E+22                              | 7,565483E+22 | 6,780173E+22 | 6,780234E+22 | 1,513110E+23                           | 1,356041E+23                           | 2,869150E+23  |
| 1301              | 7,565496E+22                              | 7,565763E+22 | 6,780354E+22 | 6,780271E+22 | 1,513126E+23                           | 1,356063E+23                           | 2,869188E+23  |
| 1302              | 7,565778E+22                              | 7,565742E+22 | 6,780317E+22 | 6,780295E+22 | 1,513152E+23                           | 1,356061E+23                           | 2,869213E+23  |
| 1303              | 7,565582E+22                              | 7,565519E+22 | 6,780421E+22 | 6,780315E+22 | 1,513110E+23                           | 1,356074E+23                           | 2,869184E+23  |
| 1304              | 7,565651E+22                              | 7,565825E+22 | 6,780519E+22 | 6,780496E+22 | 1,513148E+23                           | 1,356101E+23                           | 2,869249E+23  |
| 1305              | 7,565782E+22                              | 7,565646E+22 | 6,780479E+22 | 6,780487E+22 | 1,513143E+23                           | 1,356097E+23                           | 2,869239E+23  |
| 1306              | 7,565526E+22                              | 7,565672E+22 | 6,780544E+22 | 6,780522E+22 | 1,513120E+23                           | 1,356107E+23                           | 2,869226E+23  |
| 1307              | 7,565800E+22                              | 7,565889E+22 | 6,780506E+22 | 6,780634E+22 | 1,513169E+23                           | 1,356114E+23                           | 2,869283E+23  |
| 1308              | 7,565810E+22                              | 7,565579E+22 | 6,780504E+22 | 6,780503E+22 | 1,513139E+23                           | 1,356101E+23                           | 2,869240E+23  |
| 1309              | 7,565628E+22                              | 7,565752E+22 | 6,780615E+22 | 6,780480E+22 | 1,513138E+23                           | 1,356109E+23                           | 2,869248E+23  |
| 1310              | 7,565906E+22                              | 7,565856E+22 | 6,780473E+22 | 6,780495E+22 | 1,513176E+23                           | 1,356097E+23                           | 2,869273E+23  |
| 1311              | 7,565662E+22                              | 7,565604E+22 | 6,780445E+22 | 6,780432E+22 | 1,513127E+23                           | 1,356088E+23                           | 2,869214E+23  |
| 1312              | 7,565557E+22                              | 7,565856E+22 | 6,780503E+22 | 6,780487E+22 | 1,513141E+23                           | 1,356099E+23                           | 2,869240E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 1313                   | 7,565770E+22                              | 7,565688E+22 | 6,780408E+22 | 6,780374E+22 | 1,513146E+23                           | 1,356078E+23                           | 2,869224E+23  |
| 1314                   | 7,565505E+22                              | 7,565522E+22 | 6,780419E+22 | 6,780309E+22 | 1,513103E+23                           | 1,356073E+23                           | 2,869176E+23  |
| 1315                   | 7,565710E+22                              | 7,565735E+22 | 6,780354E+22 | 6,780392E+22 | 1,513144E+23                           | 1,356075E+23                           | 2,869219E+23  |
| 1316                   | 7,565765E+22                              | 7,565494E+22 | 6,780279E+22 | 6,780294E+22 | 1,513126E+23                           | 1,356057E+23                           | 2,869183E+23  |
| 1317                   | 7,565460E+22                              | 7,565638E+22 | 6,780356E+22 | 6,780310E+22 | 1,513110E+23                           | 1,356067E+23                           | 2,869176E+23  |
| 1318                   | 7,565746E+22                              | 7,565841E+22 | 6,780268E+22 | 6,780371E+22 | 1,513159E+23                           | 1,356064E+23                           | 2,869223E+23  |
| 1319                   | 7,565630E+22                              | 7,565546E+22 | 6,780329E+22 | 6,780320E+22 | 1,513118E+23                           | 1,356065E+23                           | 2,869183E+23  |
| 1320                   | 7,565507E+22                              | 7,565741E+22 | 6,780518E+22 | 6,780398E+22 | 1,513125E+23                           | 1,356092E+23                           | 2,869216E+23  |
| 1321                   | 7,565842E+22                              | 7,565714E+22 | 6,780489E+22 | 6,780420E+22 | 1,513156E+23                           | 1,356091E+23                           | 2,869246E+23  |
| 1322                   | 7,565576E+22                              | 7,565550E+22 | 6,780547E+22 | 6,780480E+22 | 1,513113E+23                           | 1,356103E+23                           | 2,869215E+23  |
| 1323                   | 7,565670E+22                              | 7,565845E+22 | 6,780556E+22 | 6,780661E+22 | 1,513151E+23                           | 1,356122E+23                           | 2,869273E+23  |
| 1324                   | 7,565840E+22                              | 7,565683E+22 | 6,780531E+22 | 6,780627E+22 | 1,513152E+23                           | 1,356116E+23                           | 2,869268E+23  |
| 1325                   | 7,565556E+22                              | 7,565683E+22 | 6,780661E+22 | 6,780609E+22 | 1,513124E+23                           | 1,356127E+23                           | 2,869251E+23  |
| 1326                   | 7,565878E+22                              | 7,565907E+22 | 6,780601E+22 | 6,780637E+22 | 1,513178E+23                           | 1,356124E+23                           | 2,869302E+23  |
| 1327                   | 7,565867E+22                              | 7,565634E+22 | 6,780602E+22 | 6,780555E+22 | 1,513150E+23                           | 1,356116E+23                           | 2,869266E+23  |
| 1328                   | 7,565604E+22                              | 7,565794E+22 | 6,780699E+22 | 6,780593E+22 | 1,513140E+23                           | 1,356129E+23                           | 2,869269E+23  |
| 1329                   | 7,565886E+22                              | 7,565894E+22 | 6,780584E+22 | 6,780588E+22 | 1,513178E+23                           | 1,356117E+23                           | 2,869295E+23  |
| 1330                   | 7,565603E+22                              | 7,565635E+22 | 6,780576E+22 | 6,780527E+22 | 1,513124E+23                           | 1,356110E+23                           | 2,869234E+23  |
| 1331                   | 7,565578E+22                              | 7,565799E+22 | 6,780582E+22 | 6,780569E+22 | 1,513138E+23                           | 1,356115E+23                           | 2,869253E+23  |
| 1332                   | 7,565850E+22                              | 7,565655E+22 | 6,780484E+22 | 6,780472E+22 | 1,513150E+23                           | 1,356096E+23                           | 2,869246E+23  |
| 1333                   | 7,565533E+22                              | 7,565510E+22 | 6,780503E+22 | 6,780421E+22 | 1,513104E+23                           | 1,356092E+23                           | 2,869197E+23  |
| 1334                   | 7,565733E+22                              | 7,565793E+22 | 6,780389E+22 | 6,780470E+22 | 1,513153E+23                           | 1,356086E+23                           | 2,869238E+23  |
| 1335                   | 7,565772E+22                              | 7,565614E+22 | 6,780329E+22 | 6,780407E+22 | 1,513139E+23                           | 1,356074E+23                           | 2,869212E+23  |
| 1336                   | 7,565442E+22                              | 7,565674E+22 | 6,780459E+22 | 6,780420E+22 | 1,513112E+23                           | 1,356088E+23                           | 2,869199E+23  |
| 1337                   | 7,565791E+22                              | 7,565836E+22 | 6,780447E+22 | 6,780426E+22 | 1,513163E+23                           | 1,356087E+23                           | 2,869250E+23  |
| 1338                   | 7,565656E+22                              | 7,565553E+22 | 6,780510E+22 | 6,780402E+22 | 1,513121E+23                           | 1,356091E+23                           | 2,869212E+23  |
| 1339                   | 7,565552E+22                              | 7,565705E+22 | 6,780616E+22 | 6,780532E+22 | 1,513126E+23                           | 1,356115E+23                           | 2,869240E+23  |
| 1340                   | 7,565879E+22                              | 7,565761E+22 | 6,780565E+22 | 6,780598E+22 | 1,513164E+23                           | 1,356116E+23                           | 2,869280E+23  |
| 1341                   | 7,565552E+22                              | 7,565599E+22 | 6,780634E+22 | 6,780645E+22 | 1,513115E+23                           | 1,356128E+23                           | 2,869243E+23  |
| 1342                   | 7,565688E+22                              | 7,565886E+22 | 6,780642E+22 | 6,780738E+22 | 1,513157E+23                           | 1,356138E+23                           | 2,869295E+23  |
| 1343                   | 7,565910E+22                              | 7,565743E+22 | 6,780639E+22 | 6,780697E+22 | 1,513165E+23                           | 1,356134E+23                           | 2,869299E+23  |
| 1344                   | 7,565607E+22                              | 7,565671E+22 | 6,780785E+22 | 6,780689E+22 | 1,513128E+23                           | 1,356147E+23                           | 2,869275E+23  |
| 1345                   | 7,565940E+22                              | 7,565914E+22 | 6,780751E+22 | 6,780703E+22 | 1,513185E+23                           | 1,356145E+23                           | 2,869331E+23  |
| 1346                   | 7,565836E+22                              | 7,565707E+22 | 6,780720E+22 | 6,780663E+22 | 1,513154E+23                           | 1,356138E+23                           | 2,869293E+23  |
| 1347                   | 7,565571E+22                              | 7,565808E+22 | 6,780750E+22 | 6,780725E+22 | 1,513138E+23                           | 1,356148E+23                           | 2,869285E+23  |
| 1348                   | 7,565888E+22                              | 7,565901E+22 | 6,780658E+22 | 6,780706E+22 | 1,513179E+23                           | 1,356136E+23                           | 2,869315E+23  |
| 1349                   | 7,565604E+22                              | 7,565592E+22 | 6,780684E+22 | 6,780618E+22 | 1,513120E+23                           | 1,356130E+23                           | 2,869250E+23  |
| 1350                   | 7,565640E+22                              | 7,565766E+22 | 6,780645E+22 | 6,780604E+22 | 1,513141E+23                           | 1,356125E+23                           | 2,869266E+23  |
| 1351                   | 7,565916E+22                              | 7,565700E+22 | 6,780526E+22 | 6,780556E+22 | 1,513162E+23                           | 1,356108E+23                           | 2,869270E+23  |
| 1352                   | 7,565531E+22                              | 7,565564E+22 | 6,780553E+22 | 6,780537E+22 | 1,513109E+23                           | 1,356109E+23                           | 2,869218E+23  |
| 1353                   | 7,565744E+22                              | 7,565861E+22 | 6,780494E+22 | 6,780543E+22 | 1,513160E+23                           | 1,356104E+23                           | 2,869264E+23  |
| 1354                   | 7,565743E+22                              | 7,565686E+22 | 6,780488E+22 | 6,780476E+22 | 1,513143E+23                           | 1,356096E+23                           | 2,869239E+23  |
| 1355                   | 7,565475E+22                              | 7,565651E+22 | 6,780594E+22 | 6,780511E+22 | 1,513113E+23                           | 1,356111E+23                           | 2,869223E+23  |
| 1356                   | 7,565848E+22                              | 7,565815E+22 | 6,780585E+22 | 6,780547E+22 | 1,513166E+23                           | 1,356113E+23                           | 2,869280E+23  |
| 1357                   | 7,565656E+22                              | 7,565543E+22 | 6,780647E+22 | 6,780570E+22 | 1,513120E+23                           | 1,356122E+23                           | 2,869242E+23  |
| 1358                   | 7,565562E+22                              | 7,565736E+22 | 6,780670E+22 | 6,780669E+22 | 1,513130E+23                           | 1,356134E+23                           | 2,869264E+23  |
| 1359                   | 7,565894E+22                              | 7,565834E+22 | 6,780612E+22 | 6,780752E+22 | 1,513173E+23                           | 1,356136E+23                           | 2,869309E+23  |
| 1360                   | 7,565578E+22                              | 7,565608E+22 | 6,780729E+22 | 6,780758E+22 | 1,513119E+23                           | 1,356149E+23                           | 2,869267E+23  |
| 1361                   | 7,565789E+22                              | 7,565876E+22 | 6,780784E+22 | 6,780767E+22 | 1,513166E+23                           | 1,356155E+23                           | 2,869322E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 1362                   | 7,565964E+22                              | 7,565788E+22 | 6,780791E+22 | 6,780734E+22 | 1,513175E+23                           | 1,356152E+23                           | 2,869328E+23  |
| 1363                   | 7,565651E+22                              | 7,565689E+22 | 6,780868E+22 | 6,780784E+22 | 1,513134E+23                           | 1,356165E+23                           | 2,869299E+23  |
| 1364                   | 7,565926E+22                              | 7,565987E+22 | 6,780837E+22 | 6,780835E+22 | 1,513191E+23                           | 1,356167E+23                           | 2,869358E+23  |
| 1365                   | 7,565757E+22                              | 7,565757E+22 | 6,780838E+22 | 6,780810E+22 | 1,513151E+23                           | 1,356165E+23                           | 2,869316E+23  |
| 1366                   | 7,565547E+22                              | 7,565804E+22 | 6,780842E+22 | 6,780807E+22 | 1,513135E+23                           | 1,356165E+23                           | 2,869300E+23  |
| 1367                   | 7,565927E+22                              | 7,565904E+22 | 6,780744E+22 | 6,780804E+22 | 1,513183E+23                           | 1,356155E+23                           | 2,869338E+23  |
| 1368                   | 7,565656E+22                              | 7,565543E+22 | 6,780768E+22 | 6,780719E+22 | 1,513120E+23                           | 1,356149E+23                           | 2,869269E+23  |
| 1369                   | 7,565719E+22                              | 7,565760E+22 | 6,780728E+22 | 6,780675E+22 | 1,513148E+23                           | 1,356140E+23                           | 2,869288E+23  |
| 1370                   | 7,565918E+22                              | 7,565794E+22 | 6,780599E+22 | 6,780639E+22 | 1,513171E+23                           | 1,356124E+23                           | 2,869295E+23  |
| 1371                   | 7,565542E+22                              | 7,565596E+22 | 6,780601E+22 | 6,780635E+22 | 1,513114E+23                           | 1,356124E+23                           | 2,869237E+23  |
| 1372                   | 7,565766E+22                              | 7,565890E+22 | 6,780615E+22 | 6,780615E+22 | 1,513166E+23                           | 1,356123E+23                           | 2,869289E+23  |
| 1373                   | 7,565750E+22                              | 7,565671E+22 | 6,780646E+22 | 6,780555E+22 | 1,513142E+23                           | 1,356120E+23                           | 2,869262E+23  |
| 1374                   | 7,565505E+22                              | 7,565621E+22 | 6,780703E+22 | 6,780582E+22 | 1,513113E+23                           | 1,356129E+23                           | 2,869241E+23  |
| 1375                   | 7,565872E+22                              | 7,565865E+22 | 6,780658E+22 | 6,780696E+22 | 1,513174E+23                           | 1,356135E+23                           | 2,869309E+23  |
| 1376                   | 7,565638E+22                              | 7,565571E+22 | 6,780721E+22 | 6,780743E+22 | 1,513121E+23                           | 1,356146E+23                           | 2,869267E+23  |
| 1377                   | 7,565595E+22                              | 7,565770E+22 | 6,780779E+22 | 6,780780E+22 | 1,513136E+23                           | 1,356156E+23                           | 2,869292E+23  |
| 1378                   | 7,565919E+22                              | 7,565895E+22 | 6,780758E+22 | 6,780825E+22 | 1,513181E+23                           | 1,356158E+23                           | 2,869340E+23  |
| 1379                   | 7,565661E+22                              | 7,565597E+22 | 6,780844E+22 | 6,780838E+22 | 1,513126E+23                           | 1,356168E+23                           | 2,869294E+23  |
| 1380                   | 7,565866E+22                              | 7,565897E+22 | 6,780920E+22 | 6,780853E+22 | 1,513176E+23                           | 1,356177E+23                           | 2,869354E+23  |
| 1381                   | 7,565953E+22                              | 7,565831E+22 | 6,780928E+22 | 6,780870E+22 | 1,513178E+23                           | 1,356180E+23                           | 2,869358E+23  |
| 1382                   | 7,565617E+22                              | 7,565748E+22 | 6,780938E+22 | 6,780910E+22 | 1,513136E+23                           | 1,356185E+23                           | 2,869321E+23  |
| 1383                   | 7,565894E+22                              | 7,566054E+22 | 6,780899E+22 | 6,780984E+22 | 1,513195E+23                           | 1,356188E+23                           | 2,869383E+23  |
| 1384                   | 7,565750E+22                              | 7,565719E+22 | 6,780946E+22 | 6,780927E+22 | 1,513147E+23                           | 1,356187E+23                           | 2,869334E+23  |
| 1385                   | 7,565639E+22                              | 7,565741E+22 | 6,780955E+22 | 6,780847E+22 | 1,513138E+23                           | 1,356180E+23                           | 2,869318E+23  |
| 1386                   | 7,565989E+22                              | 7,565905E+22 | 6,780845E+22 | 6,780845E+22 | 1,513189E+23                           | 1,356169E+23                           | 2,869358E+23  |
| 1387                   | 7,565726E+22                              | 7,565553E+22 | 6,780794E+22 | 6,780802E+22 | 1,513128E+23                           | 1,356160E+23                           | 2,869287E+23  |
| 1388                   | 7,565743E+22                              | 7,565833E+22 | 6,780773E+22 | 6,780754E+22 | 1,513158E+23                           | 1,356153E+23                           | 2,869310E+23  |
| 1389                   | 7,565867E+22                              | 7,565865E+22 | 6,780710E+22 | 6,780728E+22 | 1,513173E+23                           | 1,356144E+23                           | 2,869317E+23  |
| 1390                   | 7,565532E+22                              | 7,565622E+22 | 6,780709E+22 | 6,780682E+22 | 1,513115E+23                           | 1,356139E+23                           | 2,869254E+23  |
| 1391                   | 7,565775E+22                              | 7,565908E+22 | 6,780733E+22 | 6,780712E+22 | 1,513168E+23                           | 1,356144E+23                           | 2,869313E+23  |
| 1392                   | 7,565759E+22                              | 7,565630E+22 | 6,780788E+22 | 6,780698E+22 | 1,513139E+23                           | 1,356149E+23                           | 2,869288E+23  |
| 1393                   | 7,565552E+22                              | 7,565608E+22 | 6,780810E+22 | 6,780715E+22 | 1,513116E+23                           | 1,356153E+23                           | 2,869268E+23  |
| 1394                   | 7,565864E+22                              | 7,565934E+22 | 6,780748E+22 | 6,780837E+22 | 1,513180E+23                           | 1,356158E+23                           | 2,869338E+23  |
| 1395                   | 7,565682E+22                              | 7,565588E+22 | 6,780770E+22 | 6,780877E+22 | 1,513127E+23                           | 1,356165E+23                           | 2,869292E+23  |
| 1396                   | 7,565674E+22                              | 7,565787E+22 | 6,780889E+22 | 6,780853E+22 | 1,513146E+23                           | 1,356174E+23                           | 2,869320E+23  |
| 1397                   | 7,565969E+22                              | 7,565915E+22 | 6,780912E+22 | 6,780895E+22 | 1,513188E+23                           | 1,356181E+23                           | 2,869369E+23  |
| 1398                   | 7,565714E+22                              | 7,565626E+22 | 6,780952E+22 | 6,780899E+22 | 1,513134E+23                           | 1,356185E+23                           | 2,869319E+23  |
| 1399                   | 7,565866E+22                              | 7,565996E+22 | 6,781010E+22 | 6,780988E+22 | 1,513186E+23                           | 1,356200E+23                           | 2,869386E+23  |
| 1400                   | 7,565902E+22                              | 7,565880E+22 | 6,781043E+22 | 6,781033E+22 | 1,513178E+23                           | 1,356208E+23                           | 2,869386E+23  |
| 1401                   | 7,565614E+22                              | 7,565758E+22 | 6,781070E+22 | 6,781019E+22 | 1,513137E+23                           | 1,356209E+23                           | 2,869346E+23  |
| 1402                   | 7,565900E+22                              | 7,566068E+22 | 6,781044E+22 | 6,781060E+22 | 1,513197E+23                           | 1,356210E+23                           | 2,869407E+23  |
| 1403                   | 7,565837E+22                              | 7,565649E+22 | 6,781021E+22 | 6,781016E+22 | 1,513149E+23                           | 1,356204E+23                           | 2,869352E+23  |
| 1404                   | 7,565734E+22                              | 7,565721E+22 | 6,781031E+22 | 6,780923E+22 | 1,513145E+23                           | 1,356195E+23                           | 2,869341E+23  |
| 1405                   | 7,566002E+22                              | 7,565945E+22 | 6,780907E+22 | 6,780943E+22 | 1,513195E+23                           | 1,356185E+23                           | 2,869380E+23  |
| 1406                   | 7,565707E+22                              | 7,565622E+22 | 6,780810E+22 | 6,780873E+22 | 1,513133E+23                           | 1,356168E+23                           | 2,869301E+23  |
| 1407                   | 7,565719E+22                              | 7,565925E+22 | 6,780826E+22 | 6,780840E+22 | 1,513164E+23                           | 1,356167E+23                           | 2,869331E+23  |
| 1408                   | 7,565854E+22                              | 7,565850E+22 | 6,780843E+22 | 6,780804E+22 | 1,513170E+23                           | 1,356165E+23                           | 2,869335E+23  |
| 1409                   | 7,565588E+22                              | 7,565582E+22 | 6,780857E+22 | 6,780735E+22 | 1,513117E+23                           | 1,356159E+23                           | 2,869276E+23  |
| 1410                   | 7,565791E+22                              | 7,565923E+22 | 6,780866E+22 | 6,780798E+22 | 1,513171E+23                           | 1,356166E+23                           | 2,869338E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 1411              | 7,565788E+22                              | 7,565627E+22 | 6,780842E+22 | 6,780855E+22 | 1,513142E+23                           | 1,356170E+23                           | 2,869311E+23  |
| 1412              | 7,565576E+22                              | 7,565655E+22 | 6,780880E+22 | 6,780853E+22 | 1,513123E+23                           | 1,356173E+23                           | 2,869296E+23  |
| 1413              | 7,565859E+22                              | 7,565976E+22 | 6,780867E+22 | 6,780959E+22 | 1,513183E+23                           | 1,356183E+23                           | 2,869366E+23  |
| 1414              | 7,565730E+22                              | 7,565617E+22 | 6,780873E+22 | 6,780937E+22 | 1,513135E+23                           | 1,356181E+23                           | 2,869316E+23  |
| 1415              | 7,565744E+22                              | 7,565843E+22 | 6,781000E+22 | 6,780943E+22 | 1,513159E+23                           | 1,356194E+23                           | 2,869353E+23  |
| 1416              | 7,566000E+22                              | 7,565925E+22 | 6,781068E+22 | 6,781023E+22 | 1,513192E+23                           | 1,356209E+23                           | 2,869402E+23  |
| 1417              | 7,565744E+22                              | 7,565670E+22 | 6,781083E+22 | 6,781025E+22 | 1,513141E+23                           | 1,356211E+23                           | 2,869352E+23  |
| 1418              | 7,565819E+22                              | 7,566076E+22 | 6,781135E+22 | 6,781121E+22 | 1,513189E+23                           | 1,356226E+23                           | 2,869415E+23  |
| 1419              | 7,565916E+22                              | 7,565864E+22 | 6,781128E+22 | 6,781176E+22 | 1,513178E+23                           | 1,356230E+23                           | 2,869408E+23  |
| 1420              | 7,565690E+22                              | 7,565710E+22 | 6,781171E+22 | 6,781089E+22 | 1,513140E+23                           | 1,356226E+23                           | 2,869366E+23  |
| 1421              | 7,565950E+22                              | 7,566027E+22 | 6,781150E+22 | 6,781128E+22 | 1,513198E+23                           | 1,356228E+23                           | 2,869426E+23  |
| 1422              | 7,565897E+22                              | 7,565666E+22 | 6,781044E+22 | 6,781061E+22 | 1,513156E+23                           | 1,356210E+23                           | 2,869367E+23  |
| 1423              | 7,565748E+22                              | 7,565823E+22 | 6,781033E+22 | 6,781017E+22 | 1,513157E+23                           | 1,356205E+23                           | 2,869362E+23  |
| 1424              | 7,565956E+22                              | 7,566013E+22 | 6,780989E+22 | 6,781047E+22 | 1,513197E+23                           | 1,356204E+23                           | 2,869400E+23  |
| 1425              | 7,565705E+22                              | 7,565667E+22 | 6,780932E+22 | 6,780926E+22 | 1,513137E+23                           | 1,356186E+23                           | 2,869323E+23  |
| 1426              | 7,565697E+22                              | 7,565959E+22 | 6,780994E+22 | 6,780885E+22 | 1,513166E+23                           | 1,356188E+23                           | 2,869353E+23  |
| 1427              | 7,565896E+22                              | 7,565794E+22 | 6,780960E+22 | 6,780913E+22 | 1,513169E+23                           | 1,356187E+23                           | 2,869356E+23  |
| 1428              | 7,565644E+22                              | 7,565545E+22 | 6,780967E+22 | 6,780856E+22 | 1,513119E+23                           | 1,356182E+23                           | 2,869301E+23  |
| 1429              | 7,565781E+22                              | 7,565938E+22 | 6,780956E+22 | 6,780961E+22 | 1,513172E+23                           | 1,356192E+23                           | 2,869364E+23  |
| 1430              | 7,565793E+22                              | 7,565673E+22 | 6,780864E+22 | 6,780982E+22 | 1,513147E+23                           | 1,356185E+23                           | 2,869331E+23  |
| 1431              | 7,565614E+22                              | 7,565727E+22 | 6,780929E+22 | 6,780965E+22 | 1,513134E+23                           | 1,356189E+23                           | 2,869323E+23  |
| 1432              | 7,565914E+22                              | 7,565971E+22 | 6,781009E+22 | 6,781039E+22 | 1,513188E+23                           | 1,356205E+23                           | 2,869393E+23  |
| 1433              | 7,565826E+22                              | 7,565631E+22 | 6,781025E+22 | 6,780983E+22 | 1,513146E+23                           | 1,356201E+23                           | 2,869346E+23  |
| 1434              | 7,565769E+22                              | 7,565924E+22 | 6,781158E+22 | 6,781021E+22 | 1,513169E+23                           | 1,356218E+23                           | 2,869387E+23  |
| 1435              | 7,566005E+22                              | 7,565961E+22 | 6,781160E+22 | 6,781180E+22 | 1,513197E+23                           | 1,356234E+23                           | 2,869431E+23  |
| 1436              | 7,565736E+22                              | 7,565712E+22 | 6,781205E+22 | 6,781168E+22 | 1,513145E+23                           | 1,356237E+23                           | 2,869382E+23  |
| 1437              | 7,565787E+22                              | 7,566084E+22 | 6,781273E+22 | 6,781251E+22 | 1,513187E+23                           | 1,356252E+23                           | 2,869439E+23  |
| 1438              | 7,565942E+22                              | 7,565836E+22 | 6,781205E+22 | 6,781256E+22 | 1,513178E+23                           | 1,356246E+23                           | 2,869424E+23  |
| 1439              | 7,565761E+22                              | 7,565726E+22 | 6,781222E+22 | 6,781188E+22 | 1,513149E+23                           | 1,356241E+23                           | 2,869390E+23  |
| 1440              | 7,565992E+22                              | 7,566015E+22 | 6,781232E+22 | 6,781236E+22 | 1,513201E+23                           | 1,356247E+23                           | 2,869448E+23  |
| 1441              | 7,565927E+22                              | 7,565733E+22 | 6,781099E+22 | 6,781136E+22 | 1,513166E+23                           | 1,356224E+23                           | 2,869390E+23  |
| 1442              | 7,565714E+22                              | 7,565932E+22 | 6,781119E+22 | 6,781076E+22 | 1,513165E+23                           | 1,356219E+23                           | 2,869384E+23  |
| 1443              | 7,565958E+22                              | 7,566010E+22 | 6,781078E+22 | 6,781125E+22 | 1,513197E+23                           | 1,356220E+23                           | 2,869417E+23  |
| 1444              | 7,565752E+22                              | 7,565630E+22 | 6,781075E+22 | 6,780973E+22 | 1,513138E+23                           | 1,356205E+23                           | 2,869343E+23  |
| 1445              | 7,565705E+22                              | 7,565916E+22 | 6,781136E+22 | 6,780975E+22 | 1,513162E+23                           | 1,356211E+23                           | 2,869373E+23  |
| 1446              | 7,565909E+22                              | 7,565787E+22 | 6,781011E+22 | 6,781021E+22 | 1,513170E+23                           | 1,356203E+23                           | 2,869373E+23  |
| 1447              | 7,565655E+22                              | 7,565621E+22 | 6,780978E+22 | 6,781008E+22 | 1,513128E+23                           | 1,356199E+23                           | 2,869326E+23  |
| 1448              | 7,565772E+22                              | 7,565964E+22 | 6,781045E+22 | 6,781106E+22 | 1,513174E+23                           | 1,356215E+23                           | 2,869389E+23  |
| 1449              | 7,565847E+22                              | 7,565721E+22 | 6,780975E+22 | 6,781049E+22 | 1,513157E+23                           | 1,356202E+23                           | 2,869359E+23  |
| 1450              | 7,565661E+22                              | 7,565784E+22 | 6,781090E+22 | 6,781009E+22 | 1,513144E+23                           | 1,356210E+23                           | 2,869354E+23  |
| 1451              | 7,565988E+22                              | 7,565964E+22 | 6,781146E+22 | 6,781146E+22 | 1,513195E+23                           | 1,356229E+23                           | 2,869424E+23  |
| 1452              | 7,565884E+22                              | 7,565652E+22 | 6,781169E+22 | 6,781099E+22 | 1,513154E+23                           | 1,356227E+23                           | 2,869380E+23  |
| 1453              | 7,565717E+22                              | 7,565975E+22 | 6,781288E+22 | 6,781193E+22 | 1,513169E+23                           | 1,356248E+23                           | 2,869417E+23  |
| 1454              | 7,565962E+22                              | 7,566006E+22 | 6,781221E+22 | 6,781326E+22 | 1,513197E+23                           | 1,356255E+23                           | 2,869452E+23  |
| 1455              | 7,565755E+22                              | 7,565737E+22 | 6,781266E+22 | 6,781298E+22 | 1,513149E+23                           | 1,356256E+23                           | 2,869406E+23  |
| 1456              | 7,565838E+22                              | 7,566021E+22 | 6,781404E+22 | 6,781349E+22 | 1,513186E+23                           | 1,356275E+23                           | 2,869461E+23  |
| 1457              | 7,566042E+22                              | 7,565832E+22 | 6,781291E+22 | 6,781303E+22 | 1,513187E+23                           | 1,356259E+23                           | 2,869447E+23  |
| 1458              | 7,565799E+22                              | 7,565805E+22 | 6,781305E+22 | 6,781239E+22 | 1,513160E+23                           | 1,356254E+23                           | 2,869415E+23  |
| 1459              | 7,566006E+22                              | 7,566065E+22 | 6,781280E+22 | 6,781341E+22 | 1,513207E+23                           | 1,356262E+23                           | 2,869469E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 1460              | 7,565927E+22                              | 7,565787E+22 | 6,781208E+22 | 6,781202E+22 | 1,513171E+23                           | 1,356241E+23                           | 2,869412E+23  |
| 1461              | 7,565672E+22                              | 7,565952E+22 | 6,781276E+22 | 6,781151E+22 | 1,513162E+23                           | 1,356243E+23                           | 2,869405E+23  |
| 1462              | 7,565954E+22                              | 7,565986E+22 | 6,781177E+22 | 6,781190E+22 | 1,513194E+23                           | 1,356237E+23                           | 2,869431E+23  |
| 1463              | 7,565789E+22                              | 7,565628E+22 | 6,781149E+22 | 6,781098E+22 | 1,513142E+23                           | 1,356225E+23                           | 2,869366E+23  |
| 1464              | 7,565718E+22                              | 7,565875E+22 | 6,781236E+22 | 6,781136E+22 | 1,513159E+23                           | 1,356237E+23                           | 2,869396E+23  |
| 1465              | 7,565925E+22                              | 7,565829E+22 | 6,781058E+22 | 6,781151E+22 | 1,513175E+23                           | 1,356221E+23                           | 2,869396E+23  |
| 1466              | 7,565663E+22                              | 7,565713E+22 | 6,781053E+22 | 6,781099E+22 | 1,513138E+23                           | 1,356215E+23                           | 2,869353E+23  |
| 1467              | 7,565839E+22                              | 7,565950E+22 | 6,781126E+22 | 6,781188E+22 | 1,513179E+23                           | 1,356231E+23                           | 2,869410E+23  |
| 1468              | 7,565943E+22                              | 7,565718E+22 | 6,781121E+22 | 6,781084E+22 | 1,513166E+23                           | 1,356220E+23                           | 2,869387E+23  |
| 1469              | 7,565692E+22                              | 7,565811E+22 | 6,781247E+22 | 6,781088E+22 | 1,513150E+23                           | 1,356234E+23                           | 2,869384E+23  |
| 1470              | 7,565972E+22                              | 7,566009E+22 | 6,781228E+22 | 6,781259E+22 | 1,513198E+23                           | 1,356249E+23                           | 2,869447E+23  |
| 1471              | 7,565856E+22                              | 7,565752E+22 | 6,781241E+22 | 6,781275E+22 | 1,513161E+23                           | 1,356252E+23                           | 2,869412E+23  |
| 1472              | 7,565677E+22                              | 7,565975E+22 | 6,781430E+22 | 6,781366E+22 | 1,513165E+23                           | 1,356280E+23                           | 2,869445E+23  |
| 1473              | 7,565987E+22                              | 7,566010E+22 | 6,781349E+22 | 6,781424E+22 | 1,513200E+23                           | 1,356277E+23                           | 2,869477E+23  |
| 1474              | 7,565817E+22                              | 7,565758E+22 | 6,781397E+22 | 6,781363E+22 | 1,513157E+23                           | 1,356276E+23                           | 2,869433E+23  |
| 1475              | 7,565935E+22                              | 7,565975E+22 | 6,781488E+22 | 6,781455E+22 | 1,513191E+23                           | 1,356294E+23                           | 2,869485E+23  |
| 1476              | 7,566118E+22                              | 7,565859E+22 | 6,781383E+22 | 6,781385E+22 | 1,513198E+23                           | 1,356277E+23                           | 2,869474E+23  |
| 1477              | 7,565774E+22                              | 7,565883E+22 | 6,781393E+22 | 6,781347E+22 | 1,513166E+23                           | 1,356274E+23                           | 2,869440E+23  |
| 1478              | 7,565965E+22                              | 7,566116E+22 | 6,781334E+22 | 6,781417E+22 | 1,513208E+23                           | 1,356275E+23                           | 2,869483E+23  |
| 1479              | 7,565937E+22                              | 7,565821E+22 | 6,781288E+22 | 6,781281E+22 | 1,513176E+23                           | 1,356257E+23                           | 2,869433E+23  |
| 1480              | 7,565685E+22                              | 7,565883E+22 | 6,781425E+22 | 6,781243E+22 | 1,513157E+23                           | 1,356267E+23                           | 2,869423E+23  |
| 1481              | 7,565992E+22                              | 7,565979E+22 | 6,781267E+22 | 6,781268E+22 | 1,513197E+23                           | 1,356254E+23                           | 2,869451E+23  |
| 1482              | 7,565799E+22                              | 7,565683E+22 | 6,781217E+22 | 6,781196E+22 | 1,513148E+23                           | 1,356241E+23                           | 2,869389E+23  |
| 1483              | 7,565732E+22                              | 7,565887E+22 | 6,781273E+22 | 6,781283E+22 | 1,513162E+23                           | 1,356256E+23                           | 2,869418E+23  |
| 1484              | 7,565968E+22                              | 7,565860E+22 | 6,781150E+22 | 6,781226E+22 | 1,513183E+23                           | 1,356238E+23                           | 2,869420E+23  |
| 1485              | 7,565672E+22                              | 7,565739E+22 | 6,781194E+22 | 6,781164E+22 | 1,513141E+23                           | 1,356236E+23                           | 2,869377E+23  |
| 1486              | 7,565873E+22                              | 7,565961E+22 | 6,781229E+22 | 6,781243E+22 | 1,513183E+23                           | 1,356247E+23                           | 2,869431E+23  |
| 1487              | 7,565995E+22                              | 7,565765E+22 | 6,781221E+22 | 6,781199E+22 | 1,513176E+23                           | 1,356242E+23                           | 2,869418E+23  |
| 1488              | 7,565681E+22                              | 7,565816E+22 | 6,781399E+22 | 6,781261E+22 | 1,513150E+23                           | 1,356266E+23                           | 2,869416E+23  |
| 1489              | 7,565942E+22                              | 7,566080E+22 | 6,781324E+22 | 6,781408E+22 | 1,513202E+23                           | 1,356273E+23                           | 2,869475E+23  |
| 1490              | 7,565844E+22                              | 7,565814E+22 | 6,781365E+22 | 6,781397E+22 | 1,513166E+23                           | 1,356276E+23                           | 2,869442E+23  |
| 1491              | 7,565743E+22                              | 7,565911E+22 | 6,781543E+22 | 6,781488E+22 | 1,513165E+23                           | 1,356303E+23                           | 2,869469E+23  |
| 1492              | 7,566104E+22                              | 7,565963E+22 | 6,781482E+22 | 6,781483E+22 | 1,513207E+23                           | 1,356296E+23                           | 2,869503E+23  |
| 1493              | 7,565877E+22                              | 7,565780E+22 | 6,781510E+22 | 6,781444E+22 | 1,513166E+23                           | 1,356295E+23                           | 2,869461E+23  |
| 1494              | 7,565952E+22                              | 7,566036E+22 | 6,781516E+22 | 6,781541E+22 | 1,513199E+23                           | 1,356306E+23                           | 2,869505E+23  |
| 1495              | 7,566109E+22                              | 7,565982E+22 | 6,781425E+22 | 6,781499E+22 | 1,513209E+23                           | 1,356292E+23                           | 2,869502E+23  |
| 1496              | 7,565737E+22                              | 7,565908E+22 | 6,781536E+22 | 6,781460E+22 | 1,513164E+23                           | 1,356300E+23                           | 2,869464E+23  |
| 1497              | 7,565948E+22                              | 7,566134E+22 | 6,781464E+22 | 6,781475E+22 | 1,513208E+23                           | 1,356294E+23                           | 2,869502E+23  |
| 1498              | 7,565957E+22                              | 7,565835E+22 | 6,781430E+22 | 6,781352E+22 | 1,513179E+23                           | 1,356278E+23                           | 2,869457E+23  |
| 1499              | 7,565739E+22                              | 7,565801E+22 | 6,781503E+22 | 6,781376E+22 | 1,513154E+23                           | 1,356288E+23                           | 2,869442E+23  |
| 1500              | 7,566032E+22                              | 7,565962E+22 | 6,781338E+22 | 6,781381E+22 | 1,513199E+23                           | 1,356272E+23                           | 2,869471E+23  |
| 1501              | 7,565784E+22                              | 7,565740E+22 | 6,781270E+22 | 6,781313E+22 | 1,513152E+23                           | 1,356258E+23                           | 2,869411E+23  |
| 1502              | 7,565740E+22                              | 7,565907E+22 | 6,781292E+22 | 6,781350E+22 | 1,513165E+23                           | 1,356264E+23                           | 2,869429E+23  |
| 1503              | 7,566032E+22                              | 7,565899E+22 | 6,781224E+22 | 6,781279E+22 | 1,513193E+23                           | 1,356250E+23                           | 2,869443E+23  |
| 1504              | 7,565727E+22                              | 7,565713E+22 | 6,781354E+22 | 6,781236E+22 | 1,513144E+23                           | 1,356259E+23                           | 2,869403E+23  |
| 1505              | 7,565891E+22                              | 7,566009E+22 | 6,781351E+22 | 6,781313E+22 | 1,513190E+23                           | 1,356266E+23                           | 2,869456E+23  |
| 1506              | 7,565979E+22                              | 7,565868E+22 | 6,781347E+22 | 6,781320E+22 | 1,513185E+23                           | 1,356267E+23                           | 2,869451E+23  |
| 1507              | 7,565666E+22                              | 7,565822E+22 | 6,781506E+22 | 6,781444E+22 | 1,513149E+23                           | 1,356295E+23                           | 2,869444E+23  |
| 1508              | 7,565964E+22                              | 7,566078E+22 | 6,781476E+22 | 6,781529E+22 | 1,513204E+23                           | 1,356301E+23                           | 2,869505E+23  |



| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 1509                   | 7,565873E+22                              | 7,565814E+22 | 6,781519E+22 | 6,781508E+22 | 1,513169E+23                           | 1,356303E+23                           | 2,869471E+23  |
| 1510                   | 7,565814E+22                              | 7,565888E+22 | 6,781618E+22 | 6,781583E+22 | 1,513170E+23                           | 1,356320E+23                           | 2,869490E+23  |
| 1511                   | 7,566193E+22                              | 7,566010E+22 | 6,781543E+22 | 6,781601E+22 | 1,513220E+23                           | 1,356314E+23                           | 2,869535E+23  |
| 1512                   | 7,565890E+22                              | 7,565821E+22 | 6,781615E+22 | 6,781588E+22 | 1,513171E+23                           | 1,356320E+23                           | 2,869491E+23  |
| 1513                   | 7,565925E+22                              | 7,566149E+22 | 6,781585E+22 | 6,781631E+22 | 1,513207E+23                           | 1,356322E+23                           | 2,869529E+23  |
| 1514                   | 7,566098E+22                              | 7,566061E+22 | 6,781541E+22 | 6,781560E+22 | 1,513216E+23                           | 1,356310E+23                           | 2,869526E+23  |
| 1515                   | 7,565769E+22                              | 7,565842E+22 | 6,781662E+22 | 6,781547E+22 | 1,513161E+23                           | 1,356321E+23                           | 2,869482E+23  |
| 1516                   | 7,566011E+22                              | 7,566077E+22 | 6,781592E+22 | 6,781522E+22 | 1,513209E+23                           | 1,356311E+23                           | 2,869520E+23  |
| 1517                   | 7,565963E+22                              | 7,565826E+22 | 6,781524E+22 | 6,781447E+22 | 1,513179E+23                           | 1,356297E+23                           | 2,869476E+23  |
| 1518                   | 7,565734E+22                              | 7,565816E+22 | 6,781502E+22 | 6,781486E+22 | 1,513155E+23                           | 1,356299E+23                           | 2,869454E+23  |
| 1519                   | 7,566048E+22                              | 7,566029E+22 | 6,781353E+22 | 6,781489E+22 | 1,513208E+23                           | 1,356284E+23                           | 2,869492E+23  |
| 1520                   | 7,565791E+22                              | 7,565748E+22 | 6,781389E+22 | 6,781401E+22 | 1,513154E+23                           | 1,356279E+23                           | 2,869433E+23  |
| 1521                   | 7,565768E+22                              | 7,565954E+22 | 6,781399E+22 | 6,781372E+22 | 1,513172E+23                           | 1,356277E+23                           | 2,869449E+23  |
| 1522                   | 7,566079E+22                              | 7,565956E+22 | 6,781370E+22 | 6,781329E+22 | 1,513203E+23                           | 1,356270E+23                           | 2,869473E+23  |
| 1523                   | 7,565765E+22                              | 7,565689E+22 | 6,781486E+22 | 6,781383E+22 | 1,513145E+23                           | 1,356287E+23                           | 2,869432E+23  |
| 1524                   | 7,565892E+22                              | 7,566035E+22 | 6,781483E+22 | 6,781456E+22 | 1,513193E+23                           | 1,356294E+23                           | 2,869487E+23  |
| 1525                   | 7,565931E+22                              | 7,565926E+22 | 6,781473E+22 | 6,781488E+22 | 1,513186E+23                           | 1,356296E+23                           | 2,869482E+23  |
| 1526                   | 7,565680E+22                              | 7,565804E+22 | 6,781574E+22 | 6,781572E+22 | 1,513148E+23                           | 1,356315E+23                           | 2,869463E+23  |
| 1527                   | 7,566053E+22                              | 7,566071E+22 | 6,781565E+22 | 6,781632E+22 | 1,513212E+23                           | 1,356320E+23                           | 2,869532E+23  |
| 1528                   | 7,565961E+22                              | 7,565791E+22 | 6,781650E+22 | 6,781613E+22 | 1,513175E+23                           | 1,356326E+23                           | 2,869502E+23  |
| 1529                   | 7,565865E+22                              | 7,565960E+22 | 6,781683E+22 | 6,781655E+22 | 1,513183E+23                           | 1,356334E+23                           | 2,869516E+23  |
| 1530                   | 7,566202E+22                              | 7,566151E+22 | 6,781634E+22 | 6,781694E+22 | 1,513235E+23                           | 1,356333E+23                           | 2,869568E+23  |
| 1531                   | 7,565885E+22                              | 7,565857E+22 | 6,781716E+22 | 6,781713E+22 | 1,513174E+23                           | 1,356343E+23                           | 2,869517E+23  |
| 1532                   | 7,565920E+22                              | 7,566153E+22 | 6,781746E+22 | 6,781688E+22 | 1,513207E+23                           | 1,356343E+23                           | 2,869551E+23  |
| 1533                   | 7,566088E+22                              | 7,566061E+22 | 6,781705E+22 | 6,781634E+22 | 1,513215E+23                           | 1,356334E+23                           | 2,869549E+23  |
| 1534                   | 7,565801E+22                              | 7,565774E+22 | 6,781728E+22 | 6,781637E+22 | 1,513157E+23                           | 1,356336E+23                           | 2,869494E+23  |
| 1535                   | 7,566059E+22                              | 7,566069E+22 | 6,781635E+22 | 6,781646E+22 | 1,513213E+23                           | 1,356328E+23                           | 2,869541E+23  |
| 1536                   | 7,565963E+22                              | 7,565835E+22 | 6,781580E+22 | 6,781594E+22 | 1,513180E+23                           | 1,356317E+23                           | 2,869497E+23  |
| 1537                   | 7,565723E+22                              | 7,565893E+22 | 6,781515E+22 | 6,781559E+22 | 1,513162E+23                           | 1,356307E+23                           | 2,869469E+23  |
| 1538                   | 7,566081E+22                              | 7,566098E+22 | 6,781441E+22 | 6,781523E+22 | 1,513218E+23                           | 1,356296E+23                           | 2,869514E+23  |
| 1539                   | 7,565861E+22                              | 7,565710E+22 | 6,781507E+22 | 6,781459E+22 | 1,513157E+23                           | 1,356297E+23                           | 2,869454E+23  |
| 1540                   | 7,565833E+22                              | 7,565950E+22 | 6,781551E+22 | 6,781408E+22 | 1,513178E+23                           | 1,356296E+23                           | 2,869474E+23  |
| 1541                   | 7,566065E+22                              | 7,566016E+22 | 6,781508E+22 | 6,781441E+22 | 1,513208E+23                           | 1,356295E+23                           | 2,869503E+23  |
| 1542                   | 7,565731E+22                              | 7,565729E+22 | 6,781548E+22 | 6,781543E+22 | 1,513146E+23                           | 1,356309E+23                           | 2,869455E+23  |
| 1543                   | 7,565885E+22                              | 7,566086E+22 | 6,781569E+22 | 6,781620E+22 | 1,513197E+23                           | 1,356319E+23                           | 2,869516E+23  |
| 1544                   | 7,565937E+22                              | 7,565906E+22 | 6,781629E+22 | 6,781644E+22 | 1,513184E+23                           | 1,356327E+23                           | 2,869512E+23  |
| 1545                   | 7,565736E+22                              | 7,565829E+22 | 6,781674E+22 | 6,781654E+22 | 1,513157E+23                           | 1,356333E+23                           | 2,869489E+23  |
| 1546                   | 7,566152E+22                              | 7,566109E+22 | 6,781679E+22 | 6,781712E+22 | 1,513226E+23                           | 1,356339E+23                           | 2,869565E+23  |
| 1547                   | 7,566031E+22                              | 7,565793E+22 | 6,781749E+22 | 6,781748E+22 | 1,513182E+23                           | 1,356350E+23                           | 2,869532E+23  |
| 1548                   | 7,565892E+22                              | 7,566036E+22 | 6,781786E+22 | 6,781745E+22 | 1,513193E+23                           | 1,356353E+23                           | 2,869546E+23  |
| 1549                   | 7,566160E+22                              | 7,566233E+22 | 6,781760E+22 | 6,781792E+22 | 1,513239E+23                           | 1,356355E+23                           | 2,869594E+23  |
| 1550                   | 7,565883E+22                              | 7,565842E+22 | 6,781811E+22 | 6,781795E+22 | 1,513172E+23                           | 1,356361E+23                           | 2,869533E+23  |
| 1551                   | 7,565968E+22                              | 7,566124E+22 | 6,781852E+22 | 6,781762E+22 | 1,513209E+23                           | 1,356361E+23                           | 2,869571E+23  |
| 1552                   | 7,566112E+22                              | 7,566009E+22 | 6,781828E+22 | 6,781748E+22 | 1,513212E+23                           | 1,356358E+23                           | 2,869570E+23  |
| 1553                   | 7,565806E+22                              | 7,565818E+22 | 6,781749E+22 | 6,781724E+22 | 1,513162E+23                           | 1,356347E+23                           | 2,869510E+23  |
| 1554                   | 7,566065E+22                              | 7,566155E+22 | 6,781673E+22 | 6,781744E+22 | 1,513222E+23                           | 1,356342E+23                           | 2,869564E+23  |
| 1555                   | 7,565975E+22                              | 7,565849E+22 | 6,781646E+22 | 6,781702E+22 | 1,513182E+23                           | 1,356335E+23                           | 2,869517E+23  |
| 1556                   | 7,565765E+22                              | 7,565913E+22 | 6,781638E+22 | 6,781584E+22 | 1,513168E+23                           | 1,356322E+23                           | 2,869490E+23  |
| 1557                   | 7,566098E+22                              | 7,566134E+22 | 6,781596E+22 | 6,781569E+22 | 1,513223E+23                           | 1,356317E+23                           | 2,869540E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 1558                   | 7,565898E+22                              | 7,565694E+22 | 6,781599E+22 | 6,781554E+22 | 1,513159E+23                           | 1,356315E+23                           | 2,869475E+23  |
| 1559                   | 7,565846E+22                              | 7,565981E+22 | 6,781646E+22 | 6,781551E+22 | 1,513183E+23                           | 1,356320E+23                           | 2,869502E+23  |
| 1560                   | 7,566022E+22                              | 7,566049E+22 | 6,781623E+22 | 6,781635E+22 | 1,513207E+23                           | 1,356326E+23                           | 2,869533E+23  |
| 1561                   | 7,565706E+22                              | 7,565777E+22 | 6,781606E+22 | 6,781666E+22 | 1,513148E+23                           | 1,356327E+23                           | 2,869476E+23  |
| 1562                   | 7,565941E+22                              | 7,566102E+22 | 6,781685E+22 | 6,781710E+22 | 1,513204E+23                           | 1,356340E+23                           | 2,869544E+23  |
| 1563                   | 7,566043E+22                              | 7,565847E+22 | 6,781740E+22 | 6,781740E+22 | 1,513189E+23                           | 1,356348E+23                           | 2,869537E+23  |
| 1564                   | 7,565839E+22                              | 7,565830E+22 | 6,781789E+22 | 6,781705E+22 | 1,513167E+23                           | 1,356349E+23                           | 2,869516E+23  |
| 1565                   | 7,566168E+22                              | 7,566203E+22 | 6,781796E+22 | 6,781806E+22 | 1,513237E+23                           | 1,356360E+23                           | 2,869597E+23  |
| 1566                   | 7,566022E+22                              | 7,565864E+22 | 6,781809E+22 | 6,781865E+22 | 1,513189E+23                           | 1,356367E+23                           | 2,869556E+23  |
| 1567                   | 7,565881E+22                              | 7,566103E+22 | 6,781903E+22 | 6,781851E+22 | 1,513198E+23                           | 1,356375E+23                           | 2,869574E+23  |
| 1568                   | 7,566136E+22                              | 7,566231E+22 | 6,781935E+22 | 6,781912E+22 | 1,513237E+23                           | 1,356385E+23                           | 2,869621E+23  |
| 1569                   | 7,565887E+22                              | 7,565848E+22 | 6,781914E+22 | 6,781875E+22 | 1,513173E+23                           | 1,356379E+23                           | 2,869552E+23  |
| 1570                   | 7,566016E+22                              | 7,566122E+22 | 6,781954E+22 | 6,781870E+22 | 1,513214E+23                           | 1,356382E+23                           | 2,869596E+23  |
| 1571                   | 7,566142E+22                              | 7,565977E+22 | 6,781887E+22 | 6,781908E+22 | 1,513212E+23                           | 1,356379E+23                           | 2,869591E+23  |
| 1572                   | 7,565830E+22                              | 7,565863E+22 | 6,781793E+22 | 6,781818E+22 | 1,513169E+23                           | 1,356361E+23                           | 2,869530E+23  |
| 1573                   | 7,566061E+22                              | 7,566218E+22 | 6,781752E+22 | 6,781811E+22 | 1,513228E+23                           | 1,356356E+23                           | 2,869584E+23  |
| 1574                   | 7,566019E+22                              | 7,565841E+22 | 6,781710E+22 | 6,781741E+22 | 1,513186E+23                           | 1,356345E+23                           | 2,869531E+23  |
| 1575                   | 7,565840E+22                              | 7,565918E+22 | 6,781746E+22 | 6,781617E+22 | 1,513176E+23                           | 1,356336E+23                           | 2,869512E+23  |
| 1576                   | 7,566103E+22                              | 7,566130E+22 | 6,781738E+22 | 6,781672E+22 | 1,513223E+23                           | 1,356341E+23                           | 2,869564E+23  |
| 1577                   | 7,565864E+22                              | 7,565773E+22 | 6,781666E+22 | 6,781666E+22 | 1,513164E+23                           | 1,356333E+23                           | 2,869497E+23  |
| 1578                   | 7,565827E+22                              | 7,566048E+22 | 6,781733E+22 | 6,781691E+22 | 1,513188E+23                           | 1,356342E+23                           | 2,869530E+23  |
| 1579                   | 7,566012E+22                              | 7,566021E+22 | 6,781739E+22 | 6,781793E+22 | 1,513203E+23                           | 1,356353E+23                           | 2,869556E+23  |
| 1580                   | 7,565769E+22                              | 7,565769E+22 | 6,781735E+22 | 6,781735E+22 | 1,513154E+23                           | 1,356347E+23                           | 2,869501E+23  |
| 1581                   | 7,566006E+22                              | 7,566106E+22 | 6,781825E+22 | 6,781786E+22 | 1,513211E+23                           | 1,356361E+23                           | 2,869572E+23  |
| 1582                   | 7,566123E+22                              | 7,565843E+22 | 6,781816E+22 | 6,781847E+22 | 1,513197E+23                           | 1,356366E+23                           | 2,869563E+23  |
| 1583                   | 7,565892E+22                              | 7,565903E+22 | 6,781873E+22 | 6,781827E+22 | 1,513179E+23                           | 1,356370E+23                           | 2,869549E+23  |
| 1584                   | 7,566126E+22                              | 7,566281E+22 | 6,781921E+22 | 6,781964E+22 | 1,513241E+23                           | 1,356389E+23                           | 2,869629E+23  |
| 1585                   | 7,565983E+22                              | 7,565948E+22 | 6,781903E+22 | 6,781959E+22 | 1,513193E+23                           | 1,356386E+23                           | 2,869579E+23  |
| 1586                   | 7,565909E+22                              | 7,566114E+22 | 6,782048E+22 | 6,781936E+22 | 1,513202E+23                           | 1,356398E+23                           | 2,869601E+23  |
| 1587                   | 7,566179E+22                              | 7,566160E+22 | 6,782068E+22 | 6,782030E+22 | 1,513234E+23                           | 1,356410E+23                           | 2,869644E+23  |
| 1588                   | 7,565951E+22                              | 7,565833E+22 | 6,782006E+22 | 6,781957E+22 | 1,513178E+23                           | 1,356396E+23                           | 2,869575E+23  |
| 1589                   | 7,566018E+22                              | 7,566173E+22 | 6,782029E+22 | 6,781980E+22 | 1,513219E+23                           | 1,356401E+23                           | 2,869620E+23  |
| 1590                   | 7,566153E+22                              | 7,566010E+22 | 6,781900E+22 | 6,782016E+22 | 1,513216E+23                           | 1,356392E+23                           | 2,869608E+23  |
| 1591                   | 7,565864E+22                              | 7,565904E+22 | 6,781868E+22 | 6,781878E+22 | 1,513177E+23                           | 1,356375E+23                           | 2,869551E+23  |
| 1592                   | 7,566070E+22                              | 7,566228E+22 | 6,781894E+22 | 6,781878E+22 | 1,513230E+23                           | 1,356377E+23                           | 2,869607E+23  |
| 1593                   | 7,566039E+22                              | 7,565871E+22 | 6,781797E+22 | 6,781773E+22 | 1,513191E+23                           | 1,356357E+23                           | 2,869548E+23  |
| 1594                   | 7,565871E+22                              | 7,565940E+22 | 6,781862E+22 | 6,781713E+22 | 1,513181E+23                           | 1,356358E+23                           | 2,869539E+23  |
| 1595                   | 7,566079E+22                              | 7,566127E+22 | 6,781828E+22 | 6,781838E+22 | 1,513221E+23                           | 1,356367E+23                           | 2,869587E+23  |
| 1596                   | 7,565849E+22                              | 7,565802E+22 | 6,781745E+22 | 6,781790E+22 | 1,513165E+23                           | 1,356353E+23                           | 2,869519E+23  |
| 1597                   | 7,565820E+22                              | 7,566061E+22 | 6,781854E+22 | 6,781798E+22 | 1,513188E+23                           | 1,356365E+23                           | 2,869553E+23  |
| 1598                   | 7,566085E+22                              | 7,565966E+22 | 6,781813E+22 | 6,781879E+22 | 1,513205E+23                           | 1,356369E+23                           | 2,869574E+23  |
| 1599                   | 7,565884E+22                              | 7,565765E+22 | 6,781833E+22 | 6,781798E+22 | 1,513165E+23                           | 1,356363E+23                           | 2,869528E+23  |
| 1600                   | 7,566046E+22                              | 7,566145E+22 | 6,781941E+22 | 6,781904E+22 | 1,513219E+23                           | 1,356385E+23                           | 2,869604E+23  |
| 1601                   | 7,566105E+22                              | 7,565974E+22 | 6,781875E+22 | 6,781947E+22 | 1,513208E+23                           | 1,356382E+23                           | 2,869590E+23  |
| 1602                   | 7,565881E+22                              | 7,566016E+22 | 6,781994E+22 | 6,781955E+22 | 1,513190E+23                           | 1,356395E+23                           | 2,869585E+23  |
| 1603                   | 7,566095E+22                              | 7,566285E+22 | 6,782087E+22 | 6,782108E+22 | 1,513238E+23                           | 1,356420E+23                           | 2,869658E+23  |
| 1604                   | 7,566015E+22                              | 7,565942E+22 | 6,782074E+22 | 6,782044E+22 | 1,513196E+23                           | 1,356412E+23                           | 2,869608E+23  |
| 1605                   | 7,565946E+22                              | 7,566091E+22 | 6,782207E+22 | 6,782040E+22 | 1,513204E+23                           | 1,356425E+23                           | 2,869628E+23  |
| 1606                   | 7,566233E+22                              | 7,566112E+22 | 6,782127E+22 | 6,782169E+22 | 1,513235E+23                           | 1,356430E+23                           | 2,869664E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 1607              | 7,566008E+22                              | 7,565871E+22 | 6,782044E+22 | 6,782078E+22 | 1,513188E+23                           | 1,356412E+23                           | 2,869600E+23  |
| 1608              | 7,566008E+22                              | 7,566213E+22 | 6,782088E+22 | 6,782106E+22 | 1,513222E+23                           | 1,356419E+23                           | 2,869642E+23  |
| 1609              | 7,566153E+22                              | 7,566077E+22 | 6,781944E+22 | 6,782046E+22 | 1,513223E+23                           | 1,356399E+23                           | 2,869622E+23  |
| 1610              | 7,565933E+22                              | 7,565925E+22 | 6,781970E+22 | 6,781896E+22 | 1,513186E+23                           | 1,356387E+23                           | 2,869572E+23  |
| 1611              | 7,566091E+22                              | 7,566185E+22 | 6,782019E+22 | 6,781943E+22 | 1,513228E+23                           | 1,356396E+23                           | 2,869624E+23  |
| 1612              | 7,566056E+22                              | 7,565901E+22 | 6,781902E+22 | 6,781839E+22 | 1,513196E+23                           | 1,356374E+23                           | 2,869570E+23  |
| 1613              | 7,565826E+22                              | 7,565991E+22 | 6,781967E+22 | 6,781834E+22 | 1,513182E+23                           | 1,356380E+23                           | 2,869562E+23  |
| 1614              | 7,566049E+22                              | 7,566126E+22 | 6,781887E+22 | 6,781985E+22 | 1,513218E+23                           | 1,356387E+23                           | 2,869605E+23  |
| 1615              | 7,565887E+22                              | 7,565806E+22 | 6,781845E+22 | 6,781890E+22 | 1,513169E+23                           | 1,356373E+23                           | 2,869543E+23  |
| 1616              | 7,565854E+22                              | 7,566041E+22 | 6,781986E+22 | 6,781912E+22 | 1,513189E+23                           | 1,356390E+23                           | 2,869579E+23  |
| 1617              | 7,566141E+22                              | 7,565999E+22 | 6,781888E+22 | 6,781948E+22 | 1,513214E+23                           | 1,356384E+23                           | 2,869598E+23  |
| 1618              | 7,565960E+22                              | 7,565824E+22 | 6,781933E+22 | 6,781911E+22 | 1,513178E+23                           | 1,356384E+23                           | 2,869563E+23  |
| 1619              | 7,566035E+22                              | 7,566198E+22 | 6,782052E+22 | 6,782065E+22 | 1,513223E+23                           | 1,356412E+23                           | 2,869635E+23  |
| 1620              | 7,566103E+22                              | 7,566059E+22 | 6,781997E+22 | 6,782054E+22 | 1,513216E+23                           | 1,356405E+23                           | 2,869621E+23  |
| 1621              | 7,565875E+22                              | 7,566044E+22 | 6,782175E+22 | 6,782053E+22 | 1,513192E+23                           | 1,356423E+23                           | 2,869615E+23  |
| 1622              | 7,566144E+22                              | 7,566224E+22 | 6,782210E+22 | 6,782212E+22 | 1,513237E+23                           | 1,356442E+23                           | 2,869679E+23  |
| 1623              | 7,566105E+22                              | 7,565907E+22 | 6,782191E+22 | 6,782139E+22 | 1,513201E+23                           | 1,356433E+23                           | 2,869634E+23  |
| 1624              | 7,565970E+22                              | 7,566096E+22 | 6,782299E+22 | 6,782190E+22 | 1,513207E+23                           | 1,356449E+23                           | 2,869655E+23  |
| 1625              | 7,566228E+22                              | 7,566192E+22 | 6,782132E+22 | 6,782262E+22 | 1,513242E+23                           | 1,356439E+23                           | 2,869681E+23  |
| 1626              | 7,566032E+22                              | 7,565949E+22 | 6,782101E+22 | 6,782162E+22 | 1,513198E+23                           | 1,356426E+23                           | 2,869624E+23  |
| 1627              | 7,566011E+22                              | 7,566224E+22 | 6,782195E+22 | 6,782174E+22 | 1,513224E+23                           | 1,356437E+23                           | 2,869660E+23  |
| 1628              | 7,566194E+22                              | 7,566098E+22 | 6,782066E+22 | 6,782058E+22 | 1,513229E+23                           | 1,356412E+23                           | 2,869642E+23  |
| 1629              | 7,565950E+22                              | 7,565933E+22 | 6,782126E+22 | 6,781956E+22 | 1,513188E+23                           | 1,356408E+23                           | 2,869597E+23  |
| 1630              | 7,566089E+22                              | 7,566161E+22 | 6,782091E+22 | 6,782070E+22 | 1,513225E+23                           | 1,356416E+23                           | 2,869641E+23  |
| 1631              | 7,566051E+22                              | 7,565932E+22 | 6,781973E+22 | 6,781978E+22 | 1,513198E+23                           | 1,356395E+23                           | 2,869593E+23  |
| 1632              | 7,565785E+22                              | 7,566003E+22 | 6,782051E+22 | 6,781996E+22 | 1,513179E+23                           | 1,356405E+23                           | 2,869583E+23  |
| 1633              | 7,566058E+22                              | 7,566133E+22 | 6,781942E+22 | 6,782053E+22 | 1,513219E+23                           | 1,356399E+23                           | 2,869619E+23  |
| 1634              | 7,565992E+22                              | 7,565806E+22 | 6,781938E+22 | 6,781951E+22 | 1,513180E+23                           | 1,356389E+23                           | 2,869569E+23  |
| 1635              | 7,565924E+22                              | 7,566024E+22 | 6,782091E+22 | 6,782006E+22 | 1,513195E+23                           | 1,356410E+23                           | 2,869605E+23  |
| 1636              | 7,566193E+22                              | 7,566081E+22 | 6,781988E+22 | 6,782024E+22 | 1,513227E+23                           | 1,356401E+23                           | 2,869629E+23  |
| 1637              | 7,565949E+22                              | 7,565931E+22 | 6,782075E+22 | 6,782024E+22 | 1,513188E+23                           | 1,356410E+23                           | 2,869598E+23  |
| 1638              | 7,566010E+22                              | 7,566228E+22 | 6,782175E+22 | 6,782201E+22 | 1,513224E+23                           | 1,356438E+23                           | 2,869661E+23  |
| 1639              | 7,566137E+22                              | 7,566075E+22 | 6,782169E+22 | 6,782160E+22 | 1,513221E+23                           | 1,356433E+23                           | 2,869654E+23  |
| 1640              | 7,565895E+22                              | 7,566007E+22 | 6,782340E+22 | 6,782197E+22 | 1,513190E+23                           | 1,356454E+23                           | 2,869644E+23  |
| 1641              | 7,566174E+22                              | 7,566218E+22 | 6,782292E+22 | 6,782318E+22 | 1,513239E+23                           | 1,356461E+23                           | 2,869700E+23  |
| 1642              | 7,566177E+22                              | 7,565942E+22 | 6,782244E+22 | 6,782278E+22 | 1,513212E+23                           | 1,356452E+23                           | 2,869664E+23  |
| 1643              | 7,565965E+22                              | 7,566123E+22 | 6,782342E+22 | 6,782341E+22 | 1,513209E+23                           | 1,356468E+23                           | 2,869677E+23  |
| 1644              | 7,566248E+22                              | 7,566265E+22 | 6,782196E+22 | 6,782320E+22 | 1,513251E+23                           | 1,356452E+23                           | 2,869703E+23  |
| 1645              | 7,566061E+22                              | 7,565983E+22 | 6,782234E+22 | 6,782182E+22 | 1,513204E+23                           | 1,356442E+23                           | 2,869646E+23  |
| 1646              | 7,566056E+22                              | 7,566186E+22 | 6,782295E+22 | 6,782209E+22 | 1,513224E+23                           | 1,356450E+23                           | 2,869675E+23  |
| 1647              | 7,566250E+22                              | 7,566102E+22 | 6,782179E+22 | 6,782108E+22 | 1,513235E+23                           | 1,356429E+23                           | 2,869664E+23  |
| 1648              | 7,565911E+22                              | 7,565954E+22 | 6,782224E+22 | 6,782099E+22 | 1,513186E+23                           | 1,356432E+23                           | 2,869619E+23  |
| 1649              | 7,566020E+22                              | 7,566218E+22 | 6,782124E+22 | 6,782185E+22 | 1,513224E+23                           | 1,356431E+23                           | 2,869655E+23  |
| 1650              | 7,566059E+22                              | 7,565962E+22 | 6,782046E+22 | 6,782103E+22 | 1,513202E+23                           | 1,356415E+23                           | 2,869617E+23  |
| 1651              | 7,565802E+22                              | 7,565968E+22 | 6,782158E+22 | 6,782107E+22 | 1,513177E+23                           | 1,356427E+23                           | 2,869604E+23  |
| 1652              | 7,566148E+22                              | 7,566133E+22 | 6,782049E+22 | 6,782097E+22 | 1,513228E+23                           | 1,356415E+23                           | 2,869643E+23  |
| 1653              | 7,566067E+22                              | 7,565835E+22 | 6,782078E+22 | 6,782018E+22 | 1,513190E+23                           | 1,356410E+23                           | 2,869600E+23  |
| 1654              | 7,565965E+22                              | 7,566054E+22 | 6,782167E+22 | 6,782127E+22 | 1,513202E+23                           | 1,356429E+23                           | 2,869631E+23  |
| 1655              | 7,566210E+22                              | 7,566162E+22 | 6,782094E+22 | 6,782148E+22 | 1,513237E+23                           | 1,356424E+23                           | 2,869661E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 1656              | 7,565911E+22                              | 7,565980E+22 | 6,782224E+22 | 6,782185E+22 | 1,513189E+23                           | 1,356441E+23                           | 2,869630E+23  |
| 1657              | 7,566003E+22                              | 7,566234E+22 | 6,782284E+22 | 6,782281E+22 | 1,513224E+23                           | 1,356457E+23                           | 2,869680E+23  |
| 1658              | 7,566211E+22                              | 7,566057E+22 | 6,782291E+22 | 6,782269E+22 | 1,513227E+23                           | 1,356456E+23                           | 2,869683E+23  |
| 1659              | 7,565936E+22                              | 7,565980E+22 | 6,782439E+22 | 6,782339E+22 | 1,513192E+23                           | 1,356478E+23                           | 2,869669E+23  |
| 1660              | 7,566216E+22                              | 7,566271E+22 | 6,782351E+22 | 6,782417E+22 | 1,513249E+23                           | 1,356477E+23                           | 2,869726E+23  |
| 1661              | 7,566183E+22                              | 7,566035E+22 | 6,782339E+22 | 6,782372E+22 | 1,513222E+23                           | 1,356471E+23                           | 2,869693E+23  |
| 1662              | 7,565981E+22                              | 7,566150E+22 | 6,782412E+22 | 6,782424E+22 | 1,513213E+23                           | 1,356484E+23                           | 2,869697E+23  |
| 1663              | 7,566302E+22                              | 7,566289E+22 | 6,782332E+22 | 6,782356E+22 | 1,513259E+23                           | 1,356469E+23                           | 2,869728E+23  |
| 1664              | 7,566071E+22                              | 7,565983E+22 | 6,782384E+22 | 6,782270E+22 | 1,513205E+23                           | 1,356465E+23                           | 2,869671E+23  |
| 1665              | 7,566042E+22                              | 7,566190E+22 | 6,782376E+22 | 6,782279E+22 | 1,513223E+23                           | 1,356466E+23                           | 2,869689E+23  |
| 1666              | 7,566258E+22                              | 7,566138E+22 | 6,782245E+22 | 6,782249E+22 | 1,513240E+23                           | 1,356449E+23                           | 2,869689E+23  |
| 1667              | 7,565867E+22                              | 7,565960E+22 | 6,782282E+22 | 6,782268E+22 | 1,513183E+23                           | 1,356455E+23                           | 2,869638E+23  |
| 1668              | 7,566035E+22                              | 7,566231E+22 | 6,782195E+22 | 6,782264E+22 | 1,513227E+23                           | 1,356446E+23                           | 2,869673E+23  |
| 1669              | 7,566123E+22                              | 7,565957E+22 | 6,782168E+22 | 6,782145E+22 | 1,513208E+23                           | 1,356431E+23                           | 2,869639E+23  |
| 1670              | 7,565896E+22                              | 7,565923E+22 | 6,782229E+22 | 6,782167E+22 | 1,513182E+23                           | 1,356440E+23                           | 2,869621E+23  |
| 1671              | 7,566245E+22                              | 7,566168E+22 | 6,782151E+22 | 6,782157E+22 | 1,513241E+23                           | 1,356431E+23                           | 2,869672E+23  |
| 1672              | 7,566057E+22                              | 7,565916E+22 | 6,782179E+22 | 6,782153E+22 | 1,513197E+23                           | 1,356433E+23                           | 2,869631E+23  |
| 1673              | 7,565901E+22                              | 7,566148E+22 | 6,782247E+22 | 6,782229E+22 | 1,513205E+23                           | 1,356448E+23                           | 2,869652E+23  |
| 1674              | 7,566209E+22                              | 7,566227E+22 | 6,782221E+22 | 6,782275E+22 | 1,513244E+23                           | 1,356450E+23                           | 2,869693E+23  |
| 1675              | 7,565899E+22                              | 7,565949E+22 | 6,782384E+22 | 6,782330E+22 | 1,513185E+23                           | 1,356471E+23                           | 2,869656E+23  |
| 1676              | 7,566057E+22                              | 7,566218E+22 | 6,782424E+22 | 6,782379E+22 | 1,513227E+23                           | 1,356480E+23                           | 2,869708E+23  |
| 1677              | 7,566272E+22                              | 7,566062E+22 | 6,782426E+22 | 6,782388E+22 | 1,513233E+23                           | 1,356481E+23                           | 2,869715E+23  |
| 1678              | 7,565982E+22                              | 7,565988E+22 | 6,782479E+22 | 6,782491E+22 | 1,513197E+23                           | 1,356497E+23                           | 2,869694E+23  |
| 1679              | 7,566266E+22                              | 7,566335E+22 | 6,782420E+22 | 6,782520E+22 | 1,513260E+23                           | 1,356494E+23                           | 2,869754E+23  |
| 1680              | 7,566182E+22                              | 7,566084E+22 | 6,782449E+22 | 6,782467E+22 | 1,513227E+23                           | 1,356492E+23                           | 2,869718E+23  |
| 1681              | 7,565998E+22                              | 7,566166E+22 | 6,782506E+22 | 6,782435E+22 | 1,513216E+23                           | 1,356494E+23                           | 2,869710E+23  |
| 1682              | 7,566367E+22                              | 7,566299E+22 | 6,782438E+22 | 6,782414E+22 | 1,513267E+23                           | 1,356485E+23                           | 2,869752E+23  |
| 1683              | 7,566060E+22                              | 7,565978E+22 | 6,782489E+22 | 6,782395E+22 | 1,513204E+23                           | 1,356488E+23                           | 2,869692E+23  |
| 1684              | 7,566021E+22                              | 7,566236E+22 | 6,782445E+22 | 6,782383E+22 | 1,513226E+23                           | 1,356483E+23                           | 2,869708E+23  |
| 1685              | 7,566224E+22                              | 7,566186E+22 | 6,782349E+22 | 6,782360E+22 | 1,513241E+23                           | 1,356471E+23                           | 2,869712E+23  |
| 1686              | 7,565886E+22                              | 7,565936E+22 | 6,782343E+22 | 6,782374E+22 | 1,513182E+23                           | 1,356472E+23                           | 2,869654E+23  |
| 1687              | 7,566125E+22                              | 7,566205E+22 | 6,782302E+22 | 6,782317E+22 | 1,513233E+23                           | 1,356462E+23                           | 2,869695E+23  |
| 1688              | 7,566173E+22                              | 7,565964E+22 | 6,782282E+22 | 6,782240E+22 | 1,513214E+23                           | 1,356452E+23                           | 2,869666E+23  |
| 1689              | 7,565924E+22                              | 7,565961E+22 | 6,782280E+22 | 6,782228E+22 | 1,513189E+23                           | 1,356451E+23                           | 2,869639E+23  |
| 1690              | 7,566258E+22                              | 7,566256E+22 | 6,782214E+22 | 6,782288E+22 | 1,513251E+23                           | 1,356450E+23                           | 2,869702E+23  |
| 1691              | 7,566001E+22                              | 7,565979E+22 | 6,782286E+22 | 6,782318E+22 | 1,513198E+23                           | 1,356460E+23                           | 2,869658E+23  |
| 1692              | 7,565894E+22                              | 7,566176E+22 | 6,782380E+22 | 6,782316E+22 | 1,513207E+23                           | 1,356470E+23                           | 2,869677E+23  |
| 1693              | 7,566243E+22                              | 7,566218E+22 | 6,782407E+22 | 6,782355E+22 | 1,513246E+23                           | 1,356476E+23                           | 2,869722E+23  |
| 1694              | 7,565978E+22                              | 7,565891E+22 | 6,782484E+22 | 6,782446E+22 | 1,513187E+23                           | 1,356493E+23                           | 2,869680E+23  |
| 1695              | 7,566149E+22                              | 7,566215E+22 | 6,782528E+22 | 6,782491E+22 | 1,513236E+23                           | 1,356502E+23                           | 2,869738E+23  |
| 1696              | 7,566275E+22                              | 7,566134E+22 | 6,782509E+22 | 6,782545E+22 | 1,513241E+23                           | 1,356505E+23                           | 2,869746E+23  |
| 1697              | 7,565969E+22                              | 7,566066E+22 | 6,782527E+22 | 6,782574E+22 | 1,513204E+23                           | 1,356510E+23                           | 2,869714E+23  |
| 1698              | 7,566305E+22                              | 7,566400E+22 | 6,782525E+22 | 6,782605E+22 | 1,513271E+23                           | 1,356513E+23                           | 2,869784E+23  |
| 1699              | 7,566192E+22                              | 7,566093E+22 | 6,782597E+22 | 6,782559E+22 | 1,513228E+23                           | 1,356516E+23                           | 2,869744E+23  |
| 1700              | 7,566030E+22                              | 7,566177E+22 | 6,782642E+22 | 6,782491E+22 | 1,513221E+23                           | 1,356513E+23                           | 2,869734E+23  |
| 1701              | 7,566373E+22                              | 7,566324E+22 | 6,782577E+22 | 6,782516E+22 | 1,513270E+23                           | 1,356509E+23                           | 2,869779E+23  |
| 1702              | 7,566047E+22                              | 7,565972E+22 | 6,782531E+22 | 6,782558E+22 | 1,513202E+23                           | 1,356509E+23                           | 2,869711E+23  |
| 1703              | 7,566040E+22                              | 7,566244E+22 | 6,782517E+22 | 6,782502E+22 | 1,513228E+23                           | 1,356502E+23                           | 2,869730E+23  |
| 1704              | 7,566231E+22                              | 7,566177E+22 | 6,782432E+22 | 6,782462E+22 | 1,513241E+23                           | 1,356489E+23                           | 2,869730E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 1705              | 7,565934E+22                              | 7,565912E+22 | 6,782386E+22 | 6,782388E+22 | 1,513185E+23                           | 1,356477E+23                           | 2,869662E+23  |
| 1706              | 7,566223E+22                              | 7,566228E+22 | 6,782356E+22 | 6,782369E+22 | 1,513245E+23                           | 1,356472E+23                           | 2,869718E+23  |
| 1707              | 7,566175E+22                              | 7,566007E+22 | 6,782361E+22 | 6,782344E+22 | 1,513218E+23                           | 1,356470E+23                           | 2,869689E+23  |
| 1708              | 7,565901E+22                              | 7,566059E+22 | 6,782372E+22 | 6,782310E+22 | 1,513196E+23                           | 1,356468E+23                           | 2,869664E+23  |
| 1709              | 7,566216E+22                              | 7,566335E+22 | 6,782372E+22 | 6,782385E+22 | 1,513255E+23                           | 1,356476E+23                           | 2,869731E+23  |
| 1710              | 7,566000E+22                              | 7,565960E+22 | 6,782423E+22 | 6,782448E+22 | 1,513196E+23                           | 1,356487E+23                           | 2,869683E+23  |
| 1711              | 7,565964E+22                              | 7,566130E+22 | 6,782551E+22 | 6,782419E+22 | 1,513209E+23                           | 1,356497E+23                           | 2,869706E+23  |
| 1712              | 7,566279E+22                              | 7,566192E+22 | 6,782551E+22 | 6,782508E+22 | 1,513247E+23                           | 1,356506E+23                           | 2,869753E+23  |
| 1713              | 7,566018E+22                              | 7,565903E+22 | 6,782534E+22 | 6,782565E+22 | 1,513192E+23                           | 1,356510E+23                           | 2,869702E+23  |
| 1714              | 7,566203E+22                              | 7,566293E+22 | 6,782563E+22 | 6,782648E+22 | 1,513250E+23                           | 1,356521E+23                           | 2,869771E+23  |
| 1715              | 7,566263E+22                              | 7,566204E+22 | 6,782596E+22 | 6,782688E+22 | 1,513247E+23                           | 1,356528E+23                           | 2,869775E+23  |
| 1716              | 7,566007E+22                              | 7,566119E+22 | 6,782648E+22 | 6,782614E+22 | 1,513213E+23                           | 1,356526E+23                           | 2,869739E+23  |
| 1717              | 7,566347E+22                              | 7,566422E+22 | 6,782705E+22 | 6,782638E+22 | 1,513277E+23                           | 1,356534E+23                           | 2,869811E+23  |
| 1718              | 7,566238E+22                              | 7,566074E+22 | 6,782706E+22 | 6,782657E+22 | 1,513231E+23                           | 1,356536E+23                           | 2,869768E+23  |
| 1719              | 7,566064E+22                              | 7,566176E+22 | 6,782749E+22 | 6,782598E+22 | 1,513224E+23                           | 1,356535E+23                           | 2,869759E+23  |
| 1720              | 7,566309E+22                              | 7,566372E+22 | 6,782660E+22 | 6,782676E+22 | 1,513268E+23                           | 1,356534E+23                           | 2,869802E+23  |
| 1721              | 7,566017E+22                              | 7,565991E+22 | 6,782556E+22 | 6,782642E+22 | 1,513201E+23                           | 1,356520E+23                           | 2,869721E+23  |
| 1722              | 7,566087E+22                              | 7,566240E+22 | 6,782572E+22 | 6,782586E+22 | 1,513233E+23                           | 1,356516E+23                           | 2,869748E+23  |
| 1723              | 7,566263E+22                              | 7,566159E+22 | 6,782531E+22 | 6,782543E+22 | 1,513242E+23                           | 1,356507E+23                           | 2,869750E+23  |
| 1724              | 7,566001E+22                              | 7,565930E+22 | 6,782474E+22 | 6,782418E+22 | 1,513193E+23                           | 1,356489E+23                           | 2,869682E+23  |
| 1725              | 7,566242E+22                              | 7,566290E+22 | 6,782478E+22 | 6,782437E+22 | 1,513253E+23                           | 1,356492E+23                           | 2,869745E+23  |
| 1726              | 7,566163E+22                              | 7,566058E+22 | 6,782428E+22 | 6,782480E+22 | 1,513222E+23                           | 1,356491E+23                           | 2,869713E+23  |
| 1727              | 7,565907E+22                              | 7,566079E+22 | 6,782508E+22 | 6,782420E+22 | 1,513199E+23                           | 1,356493E+23                           | 2,869691E+23  |
| 1728              | 7,566192E+22                              | 7,566331E+22 | 6,782535E+22 | 6,782509E+22 | 1,513252E+23                           | 1,356504E+23                           | 2,869757E+23  |
| 1729              | 7,566039E+22                              | 7,565915E+22 | 6,782520E+22 | 6,782527E+22 | 1,513195E+23                           | 1,356505E+23                           | 2,869700E+23  |
| 1730              | 7,566058E+22                              | 7,566123E+22 | 6,782628E+22 | 6,782555E+22 | 1,513218E+23                           | 1,356518E+23                           | 2,869736E+23  |
| 1731              | 7,566295E+22                              | 7,566229E+22 | 6,782630E+22 | 6,782677E+22 | 1,513252E+23                           | 1,356531E+23                           | 2,869783E+23  |
| 1732              | 7,566034E+22                              | 7,566006E+22 | 6,782606E+22 | 6,782667E+22 | 1,513204E+23                           | 1,356527E+23                           | 2,869731E+23  |
| 1733              | 7,566216E+22                              | 7,566391E+22 | 6,782707E+22 | 6,782728E+22 | 1,513261E+23                           | 1,356543E+23                           | 2,869804E+23  |
| 1734              | 7,566297E+22                              | 7,566220E+22 | 6,782727E+22 | 6,782782E+22 | 1,513252E+23                           | 1,356551E+23                           | 2,869803E+23  |
| 1735              | 7,566081E+22                              | 7,566110E+22 | 6,782830E+22 | 6,782686E+22 | 1,513219E+23                           | 1,356552E+23                           | 2,869771E+23  |
| 1736              | 7,566343E+22                              | 7,566423E+22 | 6,782854E+22 | 6,782761E+22 | 1,513277E+23                           | 1,356561E+23                           | 2,869838E+23  |
| 1737              | 7,566219E+22                              | 7,566073E+22 | 6,782757E+22 | 6,782776E+22 | 1,513229E+23                           | 1,356553E+23                           | 2,869782E+23  |
| 1738              | 7,566070E+22                              | 7,566213E+22 | 6,782771E+22 | 6,782756E+22 | 1,513228E+23                           | 1,356553E+23                           | 2,869781E+23  |
| 1739              | 7,566280E+22                              | 7,566368E+22 | 6,782720E+22 | 6,782807E+22 | 1,513265E+23                           | 1,356553E+23                           | 2,869818E+23  |
| 1740              | 7,566069E+22                              | 7,565988E+22 | 6,782630E+22 | 6,782657E+22 | 1,513206E+23                           | 1,356529E+23                           | 2,869734E+23  |
| 1741              | 7,566171E+22                              | 7,566242E+22 | 6,782682E+22 | 6,782589E+22 | 1,513241E+23                           | 1,356527E+23                           | 2,869768E+23  |
| 1742              | 7,566326E+22                              | 7,566160E+22 | 6,782594E+22 | 6,782606E+22 | 1,513249E+23                           | 1,356520E+23                           | 2,869769E+23  |
| 1743              | 7,566042E+22                              | 7,565978E+22 | 6,782578E+22 | 6,782493E+22 | 1,513202E+23                           | 1,356507E+23                           | 2,869709E+23  |
| 1744              | 7,566164E+22                              | 7,566371E+22 | 6,782599E+22 | 6,782564E+22 | 1,513254E+23                           | 1,356516E+23                           | 2,869770E+23  |
| 1745              | 7,566117E+22                              | 7,566085E+22 | 6,782525E+22 | 6,782577E+22 | 1,513220E+23                           | 1,356510E+23                           | 2,869730E+23  |
| 1746              | 7,565942E+22                              | 7,566072E+22 | 6,782624E+22 | 6,782552E+22 | 1,513201E+23                           | 1,356518E+23                           | 2,869719E+23  |
| 1747              | 7,566205E+22                              | 7,566295E+22 | 6,782675E+22 | 6,782663E+22 | 1,513250E+23                           | 1,356534E+23                           | 2,869784E+23  |
| 1748              | 7,566107E+22                              | 7,565924E+22 | 6,782617E+22 | 6,782632E+22 | 1,513203E+23                           | 1,356525E+23                           | 2,869728E+23  |
| 1749              | 7,566107E+22                              | 7,566183E+22 | 6,782726E+22 | 6,782685E+22 | 1,513229E+23                           | 1,356541E+23                           | 2,869770E+23  |
| 1750              | 7,566325E+22                              | 7,566295E+22 | 6,782687E+22 | 6,782833E+22 | 1,513262E+23                           | 1,356552E+23                           | 2,869814E+23  |
| 1751              | 7,566102E+22                              | 7,566044E+22 | 6,782737E+22 | 6,782746E+22 | 1,513215E+23                           | 1,356548E+23                           | 2,869763E+23  |
| 1752              | 7,566222E+22                              | 7,566416E+22 | 6,782881E+22 | 6,782796E+22 | 1,513264E+23                           | 1,356568E+23                           | 2,869832E+23  |
| 1753              | 7,566340E+22                              | 7,566212E+22 | 6,782836E+22 | 6,782825E+22 | 1,513255E+23                           | 1,356566E+23                           | 2,869821E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 1754                   | 7,566130E+22                              | 7,566117E+22 | 6,782915E+22 | 6,782807E+22 | 1,513225E+23                           | 1,356572E+23                           | 2,869797E+23  |
| 1755                   | 7,566289E+22                              | 7,566450E+22 | 6,782944E+22 | 6,782928E+22 | 1,513274E+23                           | 1,356587E+23                           | 2,869861E+23  |
| 1756                   | 7,566196E+22                              | 7,566126E+22 | 6,782816E+22 | 6,782875E+22 | 1,513232E+23                           | 1,356569E+23                           | 2,869801E+23  |
| 1757                   | 7,566081E+22                              | 7,566240E+22 | 6,782875E+22 | 6,782830E+22 | 1,513232E+23                           | 1,356570E+23                           | 2,869802E+23  |
| 1758                   | 7,566334E+22                              | 7,566339E+22 | 6,782799E+22 | 6,782881E+22 | 1,513267E+23                           | 1,356568E+23                           | 2,869835E+23  |
| 1759                   | 7,566175E+22                              | 7,565964E+22 | 6,782750E+22 | 6,782689E+22 | 1,513214E+23                           | 1,356544E+23                           | 2,869758E+23  |
| 1760                   | 7,566182E+22                              | 7,566274E+22 | 6,782795E+22 | 6,782665E+22 | 1,513246E+23                           | 1,356546E+23                           | 2,869792E+23  |
| 1761                   | 7,566314E+22                              | 7,566210E+22 | 6,782634E+22 | 6,782694E+22 | 1,513252E+23                           | 1,356533E+23                           | 2,869785E+23  |
| 1762                   | 7,566031E+22                              | 7,566048E+22 | 6,782633E+22 | 6,782642E+22 | 1,513208E+23                           | 1,356528E+23                           | 2,869735E+23  |
| 1763                   | 7,566102E+22                              | 7,566381E+22 | 6,782721E+22 | 6,782707E+22 | 1,513248E+23                           | 1,356543E+23                           | 2,869791E+23  |
| 1764                   | 7,566141E+22                              | 7,566071E+22 | 6,782652E+22 | 6,782643E+22 | 1,513221E+23                           | 1,356529E+23                           | 2,869751E+23  |
| 1765                   | 7,566021E+22                              | 7,566058E+22 | 6,782757E+22 | 6,782632E+22 | 1,513208E+23                           | 1,356539E+23                           | 2,869747E+23  |
| 1766                   | 7,566277E+22                              | 7,566273E+22 | 6,782744E+22 | 6,782798E+22 | 1,513255E+23                           | 1,356554E+23                           | 2,869809E+23  |
| 1767                   | 7,566179E+22                              | 7,565974E+22 | 6,782711E+22 | 6,782744E+22 | 1,513215E+23                           | 1,356546E+23                           | 2,869761E+23  |
| 1768                   | 7,566091E+22                              | 7,566279E+22 | 6,782831E+22 | 6,782798E+22 | 1,513237E+23                           | 1,356563E+23                           | 2,869800E+23  |
| 1769                   | 7,566330E+22                              | 7,566334E+22 | 6,782785E+22 | 6,782898E+22 | 1,513266E+23                           | 1,356568E+23                           | 2,869835E+23  |
| 1770                   | 7,566161E+22                              | 7,566077E+22 | 6,782872E+22 | 6,782842E+22 | 1,513224E+23                           | 1,356571E+23                           | 2,869795E+23  |
| 1771                   | 7,566216E+22                              | 7,566406E+22 | 6,783045E+22 | 6,782921E+22 | 1,513262E+23                           | 1,356597E+23                           | 2,869859E+23  |
| 1772                   | 7,566355E+22                              | 7,566230E+22 | 6,782957E+22 | 6,782927E+22 | 1,513259E+23                           | 1,356588E+23                           | 2,869847E+23  |
| 1773                   | 7,566133E+22                              | 7,566163E+22 | 6,783007E+22 | 6,782947E+22 | 1,513230E+23                           | 1,356595E+23                           | 2,869825E+23  |
| 1774                   | 7,566280E+22                              | 7,566458E+22 | 6,782988E+22 | 6,783086E+22 | 1,513274E+23                           | 1,356607E+23                           | 2,869881E+23  |
| 1775                   | 7,566262E+22                              | 7,566114E+22 | 6,782914E+22 | 6,782944E+22 | 1,513238E+23                           | 1,356586E+23                           | 2,869823E+23  |
| 1776                   | 7,566120E+22                              | 7,566235E+22 | 6,782982E+22 | 6,782872E+22 | 1,513235E+23                           | 1,356585E+23                           | 2,869821E+23  |
| 1777                   | 7,566403E+22                              | 7,566329E+22 | 6,782850E+22 | 6,782900E+22 | 1,513273E+23                           | 1,356575E+23                           | 2,869848E+23  |
| 1778                   | 7,566235E+22                              | 7,566019E+22 | 6,782796E+22 | 6,782774E+22 | 1,513225E+23                           | 1,356557E+23                           | 2,869782E+23  |
| 1779                   | 7,566111E+22                              | 7,566348E+22 | 6,782885E+22 | 6,782792E+22 | 1,513246E+23                           | 1,356568E+23                           | 2,869814E+23  |
| 1780                   | 7,566262E+22                              | 7,566292E+22 | 6,782730E+22 | 6,782775E+22 | 1,513255E+23                           | 1,356551E+23                           | 2,869806E+23  |
| 1781                   | 7,566021E+22                              | 7,566070E+22 | 6,782781E+22 | 6,782739E+22 | 1,513209E+23                           | 1,356552E+23                           | 2,869761E+23  |
| 1782                   | 7,566132E+22                              | 7,566330E+22 | 6,782847E+22 | 6,782833E+22 | 1,513246E+23                           | 1,356568E+23                           | 2,869814E+23  |
| 1783                   | 7,566249E+22                              | 7,566017E+22 | 6,782785E+22 | 6,782736E+22 | 1,513227E+23                           | 1,356552E+23                           | 2,869779E+23  |
| 1784                   | 7,566052E+22                              | 7,566070E+22 | 6,782858E+22 | 6,782755E+22 | 1,513212E+23                           | 1,356561E+23                           | 2,869774E+23  |
| 1785                   | 7,566310E+22                              | 7,566322E+22 | 6,782768E+22 | 6,782911E+22 | 1,513263E+23                           | 1,356568E+23                           | 2,869831E+23  |
| 1786                   | 7,566220E+22                              | 7,566059E+22 | 6,782762E+22 | 6,782870E+22 | 1,513228E+23                           | 1,356563E+23                           | 2,869791E+23  |
| 1787                   | 7,566074E+22                              | 7,566318E+22 | 6,782977E+22 | 6,782899E+22 | 1,513239E+23                           | 1,356588E+23                           | 2,869827E+23  |
| 1788                   | 7,566370E+22                              | 7,566362E+22 | 6,782934E+22 | 6,782933E+22 | 1,513273E+23                           | 1,356587E+23                           | 2,869860E+23  |
| 1789                   | 7,566211E+22                              | 7,566099E+22 | 6,783032E+22 | 6,782930E+22 | 1,513231E+23                           | 1,356596E+23                           | 2,869827E+23  |
| 1790                   | 7,566221E+22                              | 7,566408E+22 | 6,783145E+22 | 6,783080E+22 | 1,513263E+23                           | 1,356623E+23                           | 2,869885E+23  |
| 1791                   | 7,566372E+22                              | 7,566259E+22 | 6,783062E+22 | 6,783065E+22 | 1,513263E+23                           | 1,356613E+23                           | 2,869876E+23  |
| 1792                   | 7,566099E+22                              | 7,566211E+22 | 6,783107E+22 | 6,783073E+22 | 1,513231E+23                           | 1,356618E+23                           | 2,869849E+23  |
| 1793                   | 7,566313E+22                              | 7,566443E+22 | 6,783047E+22 | 6,783155E+22 | 1,513276E+23                           | 1,356620E+23                           | 2,869896E+23  |
| 1794                   | 7,566352E+22                              | 7,566126E+22 | 6,782986E+22 | 6,783016E+22 | 1,513248E+23                           | 1,356600E+23                           | 2,869848E+23  |
| 1795                   | 7,566144E+22                              | 7,566240E+22 | 6,783086E+22 | 6,782954E+22 | 1,513238E+23                           | 1,356604E+23                           | 2,869842E+23  |
| 1796                   | 7,566417E+22                              | 7,566383E+22 | 6,782927E+22 | 6,782956E+22 | 1,513280E+23                           | 1,356588E+23                           | 2,869868E+23  |
| 1797                   | 7,566225E+22                              | 7,566111E+22 | 6,782882E+22 | 6,782884E+22 | 1,513234E+23                           | 1,356577E+23                           | 2,869810E+23  |
| 1798                   | 7,566070E+22                              | 7,566358E+22 | 6,782964E+22 | 6,782926E+22 | 1,513243E+23                           | 1,356589E+23                           | 2,869832E+23  |
| 1799                   | 7,566295E+22                              | 7,566257E+22 | 6,782875E+22 | 6,782847E+22 | 1,513255E+23                           | 1,356572E+23                           | 2,869827E+23  |
| 1800                   | 7,566051E+22                              | 7,566038E+22 | 6,782909E+22 | 6,782805E+22 | 1,513209E+23                           | 1,356571E+23                           | 2,869780E+23  |
| 1801                   | 7,566203E+22                              | 7,566270E+22 | 6,782897E+22 | 6,782906E+22 | 1,513247E+23                           | 1,356580E+23                           | 2,869828E+23  |
| 1802                   | 7,566321E+22                              | 7,566064E+22 | 6,782820E+22 | 6,782863E+22 | 1,513239E+23                           | 1,356568E+23                           | 2,869807E+23  |



| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 1803              | 7,566024E+22                              | 7,566152E+22 | 6,782927E+22 | 6,782895E+22 | 1,513218E+23                           | 1,356582E+23                           | 2,869800E+23  |
| 1804              | 7,566300E+22                              | 7,566418E+22 | 6,782867E+22 | 6,782980E+22 | 1,513272E+23                           | 1,356585E+23                           | 2,869856E+23  |
| 1805              | 7,566247E+22                              | 7,566134E+22 | 6,782924E+22 | 6,782950E+22 | 1,513238E+23                           | 1,356587E+23                           | 2,869826E+23  |
| 1806              | 7,566094E+22                              | 7,566310E+22 | 6,783141E+22 | 6,783017E+22 | 1,513240E+23                           | 1,356616E+23                           | 2,869856E+23  |
| 1807              | 7,566433E+22                              | 7,566346E+22 | 6,783116E+22 | 6,783045E+22 | 1,513278E+23                           | 1,356616E+23                           | 2,869894E+23  |
| 1808              | 7,566200E+22                              | 7,566126E+22 | 6,783165E+22 | 6,783088E+22 | 1,513233E+23                           | 1,356625E+23                           | 2,869858E+23  |
| 1809              | 7,566219E+22                              | 7,566419E+22 | 6,783185E+22 | 6,783238E+22 | 1,513264E+23                           | 1,356642E+23                           | 2,869906E+23  |
| 1810              | 7,566412E+22                              | 7,566297E+22 | 6,783105E+22 | 6,783210E+22 | 1,513271E+23                           | 1,356632E+23                           | 2,869902E+23  |
| 1811              | 7,566114E+22                              | 7,566208E+22 | 6,783205E+22 | 6,783165E+22 | 1,513232E+23                           | 1,356637E+23                           | 2,869869E+23  |
| 1812              | 7,566390E+22                              | 7,566451E+22 | 6,783135E+22 | 6,783158E+22 | 1,513284E+23                           | 1,356629E+23                           | 2,869913E+23  |
| 1813              | 7,566426E+22                              | 7,566170E+22 | 6,783078E+22 | 6,783058E+22 | 1,513260E+23                           | 1,356614E+23                           | 2,869873E+23  |
| 1814              | 7,566142E+22                              | 7,566282E+22 | 6,783163E+22 | 6,783056E+22 | 1,513242E+23                           | 1,356622E+23                           | 2,869864E+23  |
| 1815              | 7,566409E+22                              | 7,566436E+22 | 6,783031E+22 | 6,783036E+22 | 1,513284E+23                           | 1,356607E+23                           | 2,869891E+23  |
| 1816              | 7,566156E+22                              | 7,566149E+22 | 6,783011E+22 | 6,782979E+22 | 1,513231E+23                           | 1,356599E+23                           | 2,869830E+23  |
| 1817              | 7,566072E+22                              | 7,566311E+22 | 6,783054E+22 | 6,783010E+22 | 1,513238E+23                           | 1,356606E+23                           | 2,869845E+23  |
| 1818              | 7,566360E+22                              | 7,566223E+22 | 6,782961E+22 | 6,782956E+22 | 1,513258E+23                           | 1,356592E+23                           | 2,869850E+23  |
| 1819              | 7,566072E+22                              | 7,566016E+22 | 6,783005E+22 | 6,782934E+22 | 1,513209E+23                           | 1,356594E+23                           | 2,869803E+23  |
| 1820              | 7,566239E+22                              | 7,566315E+22 | 6,782944E+22 | 6,782998E+22 | 1,513255E+23                           | 1,356594E+23                           | 2,869850E+23  |
| 1821              | 7,566342E+22                              | 7,566176E+22 | 6,782877E+22 | 6,782987E+22 | 1,513252E+23                           | 1,356586E+23                           | 2,869838E+23  |
| 1822              | 7,566022E+22                              | 7,566202E+22 | 6,783027E+22 | 6,783016E+22 | 1,513222E+23                           | 1,356604E+23                           | 2,869827E+23  |
| 1823              | 7,566357E+22                              | 7,566425E+22 | 6,783047E+22 | 6,783034E+22 | 1,513278E+23                           | 1,356608E+23                           | 2,869886E+23  |
| 1824              | 7,566272E+22                              | 7,566150E+22 | 6,783113E+22 | 6,783027E+22 | 1,513242E+23                           | 1,356614E+23                           | 2,869856E+23  |
| 1825              | 7,566137E+22                              | 7,566281E+22 | 6,783246E+22 | 6,783135E+22 | 1,513242E+23                           | 1,356638E+23                           | 2,869880E+23  |
| 1826              | 7,566456E+22                              | 7,566391E+22 | 6,783196E+22 | 6,783218E+22 | 1,513285E+23                           | 1,356641E+23                           | 2,869926E+23  |
| 1827              | 7,566158E+22                              | 7,566174E+22 | 6,783253E+22 | 6,783265E+22 | 1,513233E+23                           | 1,356652E+23                           | 2,869885E+23  |
| 1828              | 7,566228E+22                              | 7,566449E+22 | 6,783268E+22 | 6,783324E+22 | 1,513268E+23                           | 1,356659E+23                           | 2,869927E+23  |
| 1829              | 7,566482E+22                              | 7,566340E+22 | 6,783212E+22 | 6,783286E+22 | 1,513282E+23                           | 1,356650E+23                           | 2,869932E+23  |
| 1830              | 7,566183E+22                              | 7,566189E+22 | 6,783305E+22 | 6,783238E+22 | 1,513237E+23                           | 1,356654E+23                           | 2,869892E+23  |
| 1831              | 7,566466E+22                              | 7,566450E+22 | 6,783264E+22 | 6,783206E+22 | 1,513292E+23                           | 1,356647E+23                           | 2,869939E+23  |
| 1832              | 7,566404E+22                              | 7,566246E+22 | 6,783180E+22 | 6,783142E+22 | 1,513265E+23                           | 1,356632E+23                           | 2,869897E+23  |
| 1833              | 7,566104E+22                              | 7,566300E+22 | 6,783201E+22 | 6,783167E+22 | 1,513240E+23                           | 1,356637E+23                           | 2,869877E+23  |
| 1834              | 7,566392E+22                              | 7,566457E+22 | 6,783107E+22 | 6,783151E+22 | 1,513285E+23                           | 1,356626E+23                           | 2,869911E+23  |
| 1835              | 7,566139E+22                              | 7,566111E+22 | 6,783126E+22 | 6,783079E+22 | 1,513225E+23                           | 1,356621E+23                           | 2,869846E+23  |
| 1836              | 7,566123E+22                              | 7,566269E+22 | 6,783134E+22 | 6,783057E+22 | 1,513239E+23                           | 1,356619E+23                           | 2,869858E+23  |
| 1837              | 7,566430E+22                              | 7,566255E+22 | 6,783021E+22 | 6,783054E+22 | 1,513268E+23                           | 1,356608E+23                           | 2,869876E+23  |
| 1838              | 7,566086E+22                              | 7,566060E+22 | 6,783053E+22 | 6,783064E+22 | 1,513215E+23                           | 1,356612E+23                           | 2,869826E+23  |
| 1839              | 7,566266E+22                              | 7,566387E+22 | 6,783049E+22 | 6,783082E+22 | 1,513265E+23                           | 1,356613E+23                           | 2,869878E+23  |
| 1840              | 7,566324E+22                              | 7,566259E+22 | 6,783033E+22 | 6,783062E+22 | 1,513258E+23                           | 1,356610E+23                           | 2,869868E+23  |
| 1841              | 7,566055E+22                              | 7,566191E+22 | 6,783168E+22 | 6,783101E+22 | 1,513225E+23                           | 1,356627E+23                           | 2,869852E+23  |
| 1842              | 7,566412E+22                              | 7,566427E+22 | 6,783199E+22 | 6,783155E+22 | 1,513284E+23                           | 1,356635E+23                           | 2,869919E+23  |
| 1843              | 7,566267E+22                              | 7,566144E+22 | 6,783267E+22 | 6,783199E+22 | 1,513241E+23                           | 1,356647E+23                           | 2,869888E+23  |
| 1844              | 7,566144E+22                              | 7,566311E+22 | 6,783326E+22 | 6,783283E+22 | 1,513246E+23                           | 1,356661E+23                           | 2,869907E+23  |
| 1845              | 7,566473E+22                              | 7,566459E+22 | 6,783254E+22 | 6,783385E+22 | 1,513293E+23                           | 1,356664E+23                           | 2,869957E+23  |
| 1846              | 7,566184E+22                              | 7,566179E+22 | 6,783338E+22 | 6,783391E+22 | 1,513236E+23                           | 1,356673E+23                           | 2,869909E+23  |
| 1847              | 7,566336E+22                              | 7,566431E+22 | 6,783391E+22 | 6,783349E+22 | 1,513277E+23                           | 1,356674E+23                           | 2,869951E+23  |
| 1848              | 7,566535E+22                              | 7,566365E+22 | 6,783338E+22 | 6,783307E+22 | 1,513290E+23                           | 1,356665E+23                           | 2,869955E+23  |
| 1849              | 7,566229E+22                              | 7,566201E+22 | 6,783368E+22 | 6,783304E+22 | 1,513243E+23                           | 1,356667E+23                           | 2,869910E+23  |
| 1850              | 7,566455E+22                              | 7,566524E+22 | 6,783329E+22 | 6,783312E+22 | 1,513298E+23                           | 1,356664E+23                           | 2,869962E+23  |
| 1851              | 7,566313E+22                              | 7,566302E+22 | 6,783288E+22 | 6,783275E+22 | 1,513261E+23                           | 1,356656E+23                           | 2,869918E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 1852              | 7,566067E+22                              | 7,566305E+22 | 6,783298E+22 | 6,783241E+22 | 1,513237E+23                           | 1,356654E+23                           | 2,869891E+23  |
| 1853              | 7,566414E+22                              | 7,566456E+22 | 6,783208E+22 | 6,783251E+22 | 1,513287E+23                           | 1,356646E+23                           | 2,869933E+23  |
| 1854              | 7,566184E+22                              | 7,566058E+22 | 6,783218E+22 | 6,783193E+22 | 1,513224E+23                           | 1,356641E+23                           | 2,869865E+23  |
| 1855              | 7,566211E+22                              | 7,566244E+22 | 6,783225E+22 | 6,783140E+22 | 1,513245E+23                           | 1,356636E+23                           | 2,869882E+23  |
| 1856              | 7,566439E+22                              | 7,566333E+22 | 6,783099E+22 | 6,783152E+22 | 1,513277E+23                           | 1,356625E+23                           | 2,869902E+23  |
| 1857              | 7,566109E+22                              | 7,566104E+22 | 6,783096E+22 | 6,783169E+22 | 1,513221E+23                           | 1,356626E+23                           | 2,869848E+23  |
| 1858              | 7,566293E+22                              | 7,566433E+22 | 6,783165E+22 | 6,783165E+22 | 1,513273E+23                           | 1,356633E+23                           | 2,869906E+23  |
| 1859              | 7,566332E+22                              | 7,566265E+22 | 6,783207E+22 | 6,783151E+22 | 1,513260E+23                           | 1,356636E+23                           | 2,869895E+23  |
| 1860              | 7,566095E+22                              | 7,566174E+22 | 6,783303E+22 | 6,783178E+22 | 1,513227E+23                           | 1,356648E+23                           | 2,869875E+23  |
| 1861              | 7,566440E+22                              | 7,566480E+22 | 6,783303E+22 | 6,783313E+22 | 1,513292E+23                           | 1,356662E+23                           | 2,869954E+23  |
| 1862              | 7,566257E+22                              | 7,566175E+22 | 6,783346E+22 | 6,783383E+22 | 1,513243E+23                           | 1,356673E+23                           | 2,869916E+23  |
| 1863              | 7,566172E+22                              | 7,566335E+22 | 6,783433E+22 | 6,783404E+22 | 1,513251E+23                           | 1,356684E+23                           | 2,869934E+23  |
| 1864              | 7,566489E+22                              | 7,566511E+22 | 6,783388E+22 | 6,783461E+22 | 1,513300E+23                           | 1,356685E+23                           | 2,869985E+23  |
| 1865              | 7,566263E+22                              | 7,566158E+22 | 6,783427E+22 | 6,783457E+22 | 1,513242E+23                           | 1,356688E+23                           | 2,869930E+23  |
| 1866              | 7,566414E+22                              | 7,566449E+22 | 6,783503E+22 | 6,783420E+22 | 1,513286E+23                           | 1,356692E+23                           | 2,869979E+23  |
| 1867              | 7,566529E+22                              | 7,566406E+22 | 6,783456E+22 | 6,783419E+22 | 1,513293E+23                           | 1,356688E+23                           | 2,869981E+23  |
| 1868              | 7,566197E+22                              | 7,566259E+22 | 6,783432E+22 | 6,783404E+22 | 1,513246E+23                           | 1,356684E+23                           | 2,869929E+23  |
| 1869              | 7,566413E+22                              | 7,566602E+22 | 6,783393E+22 | 6,783447E+22 | 1,513302E+23                           | 1,356684E+23                           | 2,869985E+23  |
| 1870              | 7,566292E+22                              | 7,566270E+22 | 6,783394E+22 | 6,783389E+22 | 1,513256E+23                           | 1,356678E+23                           | 2,869934E+23  |
| 1871              | 7,566145E+22                              | 7,566234E+22 | 6,783422E+22 | 6,783285E+22 | 1,513238E+23                           | 1,356671E+23                           | 2,869909E+23  |
| 1872              | 7,566470E+22                              | 7,566441E+22 | 6,783313E+22 | 6,783299E+22 | 1,513291E+23                           | 1,356661E+23                           | 2,869952E+23  |
| 1873              | 7,566251E+22                              | 7,566053E+22 | 6,783245E+22 | 6,783283E+22 | 1,513230E+23                           | 1,356653E+23                           | 2,869883E+23  |
| 1874              | 7,566242E+22                              | 7,566323E+22 | 6,783267E+22 | 6,783238E+22 | 1,513257E+23                           | 1,356651E+23                           | 2,869907E+23  |
| 1875              | 7,566398E+22                              | 7,566410E+22 | 6,783210E+22 | 6,783259E+22 | 1,513281E+23                           | 1,356647E+23                           | 2,869928E+23  |
| 1876              | 7,566111E+22                              | 7,566146E+22 | 6,783223E+22 | 6,783229E+22 | 1,513226E+23                           | 1,356645E+23                           | 2,869871E+23  |
| 1877              | 7,566320E+22                              | 7,566468E+22 | 6,783304E+22 | 6,783266E+22 | 1,513279E+23                           | 1,356657E+23                           | 2,869936E+23  |
| 1878              | 7,566349E+22                              | 7,566239E+22 | 6,783363E+22 | 6,783300E+22 | 1,513259E+23                           | 1,356666E+23                           | 2,869925E+23  |
| 1879              | 7,566148E+22                              | 7,566163E+22 | 6,783430E+22 | 6,783312E+22 | 1,513231E+23                           | 1,356674E+23                           | 2,869905E+23  |
| 1880              | 7,566421E+22                              | 7,566536E+22 | 6,783400E+22 | 6,783460E+22 | 1,513296E+23                           | 1,356686E+23                           | 2,869982E+23  |
| 1881              | 7,566288E+22                              | 7,566188E+22 | 6,783395E+22 | 6,783526E+22 | 1,513248E+23                           | 1,356692E+23                           | 2,869940E+23  |
| 1882              | 7,566247E+22                              | 7,566347E+22 | 6,783525E+22 | 6,783487E+22 | 1,513259E+23                           | 1,356701E+23                           | 2,869961E+23  |
| 1883              | 7,566538E+22                              | 7,566515E+22 | 6,783527E+22 | 6,783527E+22 | 1,513305E+23                           | 1,356705E+23                           | 2,870011E+23  |
| 1884              | 7,566325E+22                              | 7,566183E+22 | 6,783520E+22 | 6,783494E+22 | 1,513251E+23                           | 1,356701E+23                           | 2,869952E+23  |
| 1885              | 7,566424E+22                              | 7,566541E+22 | 6,783578E+22 | 6,783526E+22 | 1,513297E+23                           | 1,356710E+23                           | 2,870007E+23  |
| 1886              | 7,566477E+22                              | 7,566463E+22 | 6,783554E+22 | 6,783560E+22 | 1,513294E+23                           | 1,356711E+23                           | 2,870005E+23  |
| 1887              | 7,566185E+22                              | 7,566272E+22 | 6,783556E+22 | 6,783497E+22 | 1,513246E+23                           | 1,356705E+23                           | 2,869951E+23  |
| 1888              | 7,566390E+22                              | 7,566608E+22 | 6,783537E+22 | 6,783517E+22 | 1,513300E+23                           | 1,356705E+23                           | 2,870005E+23  |
| 1889              | 7,566358E+22                              | 7,566200E+22 | 6,783471E+22 | 6,783478E+22 | 1,513256E+23                           | 1,356695E+23                           | 2,869951E+23  |
| 1890              | 7,566231E+22                              | 7,566203E+22 | 6,783496E+22 | 6,783373E+22 | 1,513243E+23                           | 1,356687E+23                           | 2,869930E+23  |
| 1891              | 7,566488E+22                              | 7,566466E+22 | 6,783386E+22 | 6,783416E+22 | 1,513295E+23                           | 1,356680E+23                           | 2,869976E+23  |
| 1892              | 7,566256E+22                              | 7,566122E+22 | 6,783266E+22 | 6,783366E+22 | 1,513238E+23                           | 1,356663E+23                           | 2,869901E+23  |
| 1893              | 7,566238E+22                              | 7,566430E+22 | 6,783325E+22 | 6,783339E+22 | 1,513267E+23                           | 1,356666E+23                           | 2,869933E+23  |
| 1894              | 7,566402E+22                              | 7,566420E+22 | 6,783340E+22 | 6,783341E+22 | 1,513282E+23                           | 1,356668E+23                           | 2,869950E+23  |
| 1895              | 7,566172E+22                              | 7,566114E+22 | 6,783385E+22 | 6,783281E+22 | 1,513229E+23                           | 1,356667E+23                           | 2,869895E+23  |
| 1896              | 7,566329E+22                              | 7,566490E+22 | 6,783459E+22 | 6,783353E+22 | 1,513282E+23                           | 1,356681E+23                           | 2,869963E+23  |
| 1897              | 7,566373E+22                              | 7,566235E+22 | 6,783432E+22 | 6,783457E+22 | 1,513261E+23                           | 1,356689E+23                           | 2,869950E+23  |
| 1898              | 7,566164E+22                              | 7,566209E+22 | 6,783509E+22 | 6,783466E+22 | 1,513237E+23                           | 1,356697E+23                           | 2,869935E+23  |
| 1899              | 7,566410E+22                              | 7,566573E+22 | 6,783520E+22 | 6,783597E+22 | 1,513298E+23                           | 1,356712E+23                           | 2,870010E+23  |
| 1900              | 7,566334E+22                              | 7,566210E+22 | 6,783496E+22 | 6,783589E+22 | 1,513254E+23                           | 1,356708E+23                           | 2,869963E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 1901              | 7,566323E+22                              | 7,566402E+22 | 6,783627E+22 | 6,783573E+22 | 1,513273E+23                           | 1,356720E+23                           | 2,869992E+23  |
| 1902              | 7,566580E+22                              | 7,566523E+22 | 6,783664E+22 | 6,783638E+22 | 1,513310E+23                           | 1,356730E+23                           | 2,870040E+23  |
| 1903              | 7,566362E+22                              | 7,566222E+22 | 6,783644E+22 | 6,783595E+22 | 1,513258E+23                           | 1,356724E+23                           | 2,869982E+23  |
| 1904              | 7,566371E+22                              | 7,566626E+22 | 6,783693E+22 | 6,783636E+22 | 1,513300E+23                           | 1,356733E+23                           | 2,870033E+23  |
| 1905              | 7,566468E+22                              | 7,566455E+22 | 6,783630E+22 | 6,783688E+22 | 1,513292E+23                           | 1,356732E+23                           | 2,870024E+23  |
| 1906              | 7,566236E+22                              | 7,566233E+22 | 6,783661E+22 | 6,783574E+22 | 1,513247E+23                           | 1,356724E+23                           | 2,869970E+23  |
| 1907              | 7,566428E+22                              | 7,566553E+22 | 6,783650E+22 | 6,783597E+22 | 1,513298E+23                           | 1,356725E+23                           | 2,870023E+23  |
| 1908              | 7,566421E+22                              | 7,566200E+22 | 6,783505E+22 | 6,783535E+22 | 1,513262E+23                           | 1,356704E+23                           | 2,869966E+23  |
| 1909              | 7,566266E+22                              | 7,566295E+22 | 6,783492E+22 | 6,783476E+22 | 1,513256E+23                           | 1,356697E+23                           | 2,869953E+23  |
| 1910              | 7,566458E+22                              | 7,566533E+22 | 6,783452E+22 | 6,783525E+22 | 1,513299E+23                           | 1,356698E+23                           | 2,869997E+23  |
| 1911              | 7,566267E+22                              | 7,566179E+22 | 6,783383E+22 | 6,783414E+22 | 1,513245E+23                           | 1,356680E+23                           | 2,869924E+23  |
| 1912              | 7,566216E+22                              | 7,566469E+22 | 6,783494E+22 | 6,783377E+22 | 1,513269E+23                           | 1,356687E+23                           | 2,869956E+23  |
| 1913              | 7,566440E+22                              | 7,566379E+22 | 6,783472E+22 | 6,783446E+22 | 1,513282E+23                           | 1,356692E+23                           | 2,869974E+23  |
| 1914              | 7,566226E+22                              | 7,566088E+22 | 6,783514E+22 | 6,783410E+22 | 1,513231E+23                           | 1,356692E+23                           | 2,869924E+23  |
| 1915              | 7,566313E+22                              | 7,566497E+22 | 6,783571E+22 | 6,783530E+22 | 1,513281E+23                           | 1,356710E+23                           | 2,869991E+23  |
| 1916              | 7,566374E+22                              | 7,566281E+22 | 6,783470E+22 | 6,783599E+22 | 1,513266E+23                           | 1,356707E+23                           | 2,869972E+23  |
| 1917              | 7,566202E+22                              | 7,566278E+22 | 6,783556E+22 | 6,783597E+22 | 1,513248E+23                           | 1,356715E+23                           | 2,869963E+23  |
| 1918              | 7,566468E+22                              | 7,566564E+22 | 6,783654E+22 | 6,783685E+22 | 1,513303E+23                           | 1,356734E+23                           | 2,870037E+23  |
| 1919              | 7,566443E+22                              | 7,566218E+22 | 6,783637E+22 | 6,783622E+22 | 1,513266E+23                           | 1,356726E+23                           | 2,869992E+23  |
| 1920              | 7,566351E+22                              | 7,566475E+22 | 6,783773E+22 | 6,783629E+22 | 1,513283E+23                           | 1,356740E+23                           | 2,870023E+23  |
| 1921              | 7,566587E+22                              | 7,566570E+22 | 6,783746E+22 | 6,783773E+22 | 1,513316E+23                           | 1,356752E+23                           | 2,870068E+23  |
| 1922              | 7,566343E+22                              | 7,566275E+22 | 6,783756E+22 | 6,783729E+22 | 1,513262E+23                           | 1,356748E+23                           | 2,870010E+23  |
| 1923              | 7,566320E+22                              | 7,566638E+22 | 6,783837E+22 | 6,783768E+22 | 1,513296E+23                           | 1,356760E+23                           | 2,870056E+23  |
| 1924              | 7,566483E+22                              | 7,566425E+22 | 6,783713E+22 | 6,783767E+22 | 1,513291E+23                           | 1,356748E+23                           | 2,870039E+23  |
| 1925              | 7,566300E+22                              | 7,566238E+22 | 6,783711E+22 | 6,783679E+22 | 1,513254E+23                           | 1,356739E+23                           | 2,869993E+23  |
| 1926              | 7,566478E+22                              | 7,566528E+22 | 6,783719E+22 | 6,783703E+22 | 1,513301E+23                           | 1,356742E+23                           | 2,870043E+23  |
| 1927              | 7,566462E+22                              | 7,566243E+22 | 6,783550E+22 | 6,783605E+22 | 1,513270E+23                           | 1,356715E+23                           | 2,869986E+23  |
| 1928              | 7,566238E+22                              | 7,566404E+22 | 6,783568E+22 | 6,783533E+22 | 1,513264E+23                           | 1,356710E+23                           | 2,869974E+23  |
| 1929              | 7,566467E+22                              | 7,566545E+22 | 6,783532E+22 | 6,783599E+22 | 1,513301E+23                           | 1,356713E+23                           | 2,870014E+23  |
| 1930              | 7,566315E+22                              | 7,566160E+22 | 6,783533E+22 | 6,783464E+22 | 1,513248E+23                           | 1,356700E+23                           | 2,869947E+23  |
| 1931              | 7,566225E+22                              | 7,566437E+22 | 6,783656E+22 | 6,783469E+22 | 1,513266E+23                           | 1,356712E+23                           | 2,869979E+23  |
| 1932              | 7,566449E+22                              | 7,566376E+22 | 6,783549E+22 | 6,783557E+22 | 1,513283E+23                           | 1,356711E+23                           | 2,869993E+23  |
| 1933              | 7,566233E+22                              | 7,566165E+22 | 6,783547E+22 | 6,783580E+22 | 1,513240E+23                           | 1,356713E+23                           | 2,869953E+23  |
| 1934              | 7,566303E+22                              | 7,566519E+22 | 6,783665E+22 | 6,783694E+22 | 1,513282E+23                           | 1,356736E+23                           | 2,870018E+23  |
| 1935              | 7,566426E+22                              | 7,566317E+22 | 6,783588E+22 | 6,783683E+22 | 1,513274E+23                           | 1,356727E+23                           | 2,870001E+23  |
| 1936              | 7,566252E+22                              | 7,566335E+22 | 6,783710E+22 | 6,783647E+22 | 1,513259E+23                           | 1,356736E+23                           | 2,869994E+23  |
| 1937              | 7,566549E+22                              | 7,566558E+22 | 6,783780E+22 | 6,783786E+22 | 1,513311E+23                           | 1,356757E+23                           | 2,870067E+23  |
| 1938              | 7,566510E+22                              | 7,566249E+22 | 6,783782E+22 | 6,783733E+22 | 1,513276E+23                           | 1,356751E+23                           | 2,870027E+23  |
| 1939              | 7,566311E+22                              | 7,566527E+22 | 6,783906E+22 | 6,783789E+22 | 1,513284E+23                           | 1,356770E+23                           | 2,870053E+23  |
| 1940              | 7,566542E+22                              | 7,566625E+22 | 6,783812E+22 | 6,783910E+22 | 1,513317E+23                           | 1,356772E+23                           | 2,870089E+23  |
| 1941              | 7,566354E+22                              | 7,566310E+22 | 6,783811E+22 | 6,783857E+22 | 1,513266E+23                           | 1,356767E+23                           | 2,870033E+23  |
| 1942              | 7,566352E+22                              | 7,566562E+22 | 6,783956E+22 | 6,783862E+22 | 1,513291E+23                           | 1,356782E+23                           | 2,870073E+23  |
| 1943              | 7,566574E+22                              | 7,566400E+22 | 6,783794E+22 | 6,783805E+22 | 1,513297E+23                           | 1,356760E+23                           | 2,870057E+23  |
| 1944              | 7,566337E+22                              | 7,566290E+22 | 6,783774E+22 | 6,783719E+22 | 1,513263E+23                           | 1,356749E+23                           | 2,870012E+23  |
| 1945              | 7,566497E+22                              | 7,566566E+22 | 6,783749E+22 | 6,783801E+22 | 1,513306E+23                           | 1,356755E+23                           | 2,870061E+23  |
| 1946              | 7,566470E+22                              | 7,566307E+22 | 6,783640E+22 | 6,783668E+22 | 1,513278E+23                           | 1,356731E+23                           | 2,870008E+23  |
| 1947              | 7,566197E+22                              | 7,566431E+22 | 6,783722E+22 | 6,783605E+22 | 1,513263E+23                           | 1,356733E+23                           | 2,869995E+23  |
| 1948              | 7,566462E+22                              | 7,566539E+22 | 6,783645E+22 | 6,783658E+22 | 1,513300E+23                           | 1,356730E+23                           | 2,870030E+23  |
| 1949              | 7,566349E+22                              | 7,566170E+22 | 6,783624E+22 | 6,783594E+22 | 1,513252E+23                           | 1,356722E+23                           | 2,869974E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 1950              | 7,566232E+22                              | 7,566397E+22 | 6,783778E+22 | 6,783638E+22 | 1,513263E+23                           | 1,356742E+23                           | 2,870004E+23  |
| 1951              | 7,566468E+22                              | 7,566411E+22 | 6,783617E+22 | 6,783700E+22 | 1,513288E+23                           | 1,356732E+23                           | 2,870020E+23  |
| 1952              | 7,566232E+22                              | 7,566252E+22 | 6,783627E+22 | 6,783692E+22 | 1,513248E+23                           | 1,356732E+23                           | 2,869980E+23  |
| 1953              | 7,566371E+22                              | 7,566512E+22 | 6,783749E+22 | 6,783802E+22 | 1,513288E+23                           | 1,356755E+23                           | 2,870043E+23  |
| 1954              | 7,566532E+22                              | 7,566318E+22 | 6,783735E+22 | 6,783736E+22 | 1,513285E+23                           | 1,356747E+23                           | 2,870032E+23  |
| 1955              | 7,566301E+22                              | 7,566363E+22 | 6,783875E+22 | 6,783733E+22 | 1,513266E+23                           | 1,356761E+23                           | 2,870027E+23  |
| 1956              | 7,566558E+22                              | 7,566610E+22 | 6,783865E+22 | 6,783886E+22 | 1,513317E+23                           | 1,356775E+23                           | 2,870092E+23  |
| 1957              | 7,566488E+22                              | 7,566360E+22 | 6,783850E+22 | 6,783897E+22 | 1,513285E+23                           | 1,356775E+23                           | 2,870060E+23  |
| 1958              | 7,566263E+22                              | 7,566542E+22 | 6,784038E+22 | 6,783947E+22 | 1,513281E+23                           | 1,356798E+23                           | 2,870079E+23  |
| 1959              | 7,566546E+22                              | 7,566619E+22 | 6,783934E+22 | 6,783995E+22 | 1,513316E+23                           | 1,356793E+23                           | 2,870109E+23  |
| 1960              | 7,566389E+22                              | 7,566316E+22 | 6,783939E+22 | 6,783916E+22 | 1,513271E+23                           | 1,356785E+23                           | 2,870056E+23  |
| 1961              | 7,566442E+22                              | 7,566498E+22 | 6,784027E+22 | 6,783961E+22 | 1,513294E+23                           | 1,356799E+23                           | 2,870093E+23  |
| 1962              | 7,566652E+22                              | 7,566405E+22 | 6,783873E+22 | 6,783884E+22 | 1,513306E+23                           | 1,356776E+23                           | 2,870081E+23  |
| 1963              | 7,566322E+22                              | 7,566359E+22 | 6,783846E+22 | 6,783820E+22 | 1,513268E+23                           | 1,356767E+23                           | 2,870035E+23  |
| 1964              | 7,566463E+22                              | 7,566626E+22 | 6,783786E+22 | 6,783868E+22 | 1,513309E+23                           | 1,356765E+23                           | 2,870074E+23  |
| 1965              | 7,566478E+22                              | 7,566360E+22 | 6,783716E+22 | 6,783744E+22 | 1,513284E+23                           | 1,356746E+23                           | 2,870030E+23  |
| 1966              | 7,566209E+22                              | 7,566373E+22 | 6,783876E+22 | 6,783691E+22 | 1,513258E+23                           | 1,356757E+23                           | 2,870015E+23  |
| 1967              | 7,566492E+22                              | 7,566527E+22 | 6,783758E+22 | 6,783734E+22 | 1,513302E+23                           | 1,356749E+23                           | 2,870051E+23  |
| 1968              | 7,566351E+22                              | 7,566226E+22 | 6,783713E+22 | 6,783704E+22 | 1,513258E+23                           | 1,356742E+23                           | 2,869999E+23  |
| 1969              | 7,566244E+22                              | 7,566404E+22 | 6,783829E+22 | 6,783807E+22 | 1,513265E+23                           | 1,356764E+23                           | 2,870028E+23  |
| 1970              | 7,566510E+22                              | 7,566443E+22 | 6,783724E+22 | 6,783810E+22 | 1,513295E+23                           | 1,356753E+23                           | 2,870049E+23  |
| 1971              | 7,566256E+22                              | 7,566275E+22 | 6,783774E+22 | 6,783781E+22 | 1,513253E+23                           | 1,356756E+23                           | 2,870009E+23  |
| 1972              | 7,566423E+22                              | 7,566528E+22 | 6,783855E+22 | 6,783867E+22 | 1,513295E+23                           | 1,356772E+23                           | 2,870067E+23  |
| 1973              | 7,566604E+22                              | 7,566379E+22 | 6,783828E+22 | 6,783846E+22 | 1,513298E+23                           | 1,356767E+23                           | 2,870066E+23  |
| 1974              | 7,566300E+22                              | 7,566369E+22 | 6,784022E+22 | 6,783888E+22 | 1,513267E+23                           | 1,356791E+23                           | 2,870058E+23  |
| 1975              | 7,566529E+22                              | 7,566684E+22 | 6,783965E+22 | 6,784017E+22 | 1,513321E+23                           | 1,356798E+23                           | 2,870119E+23  |
| 1976              | 7,566460E+22                              | 7,566426E+22 | 6,783967E+22 | 6,784009E+22 | 1,513289E+23                           | 1,356798E+23                           | 2,870086E+23  |
| 1977              | 7,566309E+22                              | 7,566475E+22 | 6,784148E+22 | 6,784065E+22 | 1,513278E+23                           | 1,356821E+23                           | 2,870100E+23  |
| 1978              | 7,566649E+22                              | 7,566562E+22 | 6,784060E+22 | 6,784051E+22 | 1,513321E+23                           | 1,356811E+23                           | 2,870132E+23  |
| 1979              | 7,566444E+22                              | 7,566313E+22 | 6,784038E+22 | 6,783990E+22 | 1,513276E+23                           | 1,356803E+23                           | 2,870078E+23  |
| 1980              | 7,566464E+22                              | 7,566546E+22 | 6,784037E+22 | 6,784037E+22 | 1,513301E+23                           | 1,356807E+23                           | 2,870108E+23  |
| 1981              | 7,566649E+22                              | 7,566525E+22 | 6,783888E+22 | 6,783989E+22 | 1,513317E+23                           | 1,356788E+23                           | 2,870105E+23  |
| 1982              | 7,566283E+22                              | 7,566390E+22 | 6,783972E+22 | 6,783919E+22 | 1,513267E+23                           | 1,356789E+23                           | 2,870056E+23  |
| 1983              | 7,566447E+22                              | 7,566653E+22 | 6,783917E+22 | 6,783910E+22 | 1,513310E+23                           | 1,356783E+23                           | 2,870093E+23  |
| 1984              | 7,566483E+22                              | 7,566383E+22 | 6,783868E+22 | 6,783808E+22 | 1,513287E+23                           | 1,356768E+23                           | 2,870054E+23  |
| 1985              | 7,566257E+22                              | 7,566301E+22 | 6,783981E+22 | 6,783834E+22 | 1,513256E+23                           | 1,356781E+23                           | 2,870037E+23  |
| 1986              | 7,566534E+22                              | 7,566507E+22 | 6,783857E+22 | 6,783870E+22 | 1,513304E+23                           | 1,356773E+23                           | 2,870077E+23  |
| 1987              | 7,566341E+22                              | 7,566277E+22 | 6,783790E+22 | 6,783854E+22 | 1,513262E+23                           | 1,356764E+23                           | 2,870026E+23  |
| 1988              | 7,566266E+22                              | 7,566429E+22 | 6,783853E+22 | 6,783902E+22 | 1,513269E+23                           | 1,356775E+23                           | 2,870045E+23  |
| 1989              | 7,566582E+22                              | 7,566485E+22 | 6,783796E+22 | 6,783884E+22 | 1,513307E+23                           | 1,356768E+23                           | 2,870075E+23  |
| 1990              | 7,566325E+22                              | 7,566258E+22 | 6,783931E+22 | 6,783850E+22 | 1,513258E+23                           | 1,356778E+23                           | 2,870036E+23  |
| 1991              | 7,566460E+22                              | 7,566572E+22 | 6,783977E+22 | 6,783923E+22 | 1,513303E+23                           | 1,356790E+23                           | 2,870093E+23  |
| 1992              | 7,566590E+22                              | 7,566487E+22 | 6,783961E+22 | 6,783954E+22 | 1,513308E+23                           | 1,356791E+23                           | 2,870099E+23  |
| 1993              | 7,566284E+22                              | 7,566388E+22 | 6,784129E+22 | 6,784065E+22 | 1,513267E+23                           | 1,356819E+23                           | 2,870087E+23  |
| 1994              | 7,566532E+22                              | 7,566687E+22 | 6,784120E+22 | 6,784139E+22 | 1,513322E+23                           | 1,356826E+23                           | 2,870148E+23  |
| 1995              | 7,566470E+22                              | 7,566421E+22 | 6,784124E+22 | 6,784122E+22 | 1,513289E+23                           | 1,356825E+23                           | 2,870114E+23  |
| 1996              | 7,566367E+22                              | 7,566438E+22 | 6,784215E+22 | 6,784156E+22 | 1,513281E+23                           | 1,356837E+23                           | 2,870118E+23  |
| 1997              | 7,566732E+22                              | 7,566591E+22 | 6,784108E+22 | 6,784165E+22 | 1,513332E+23                           | 1,356827E+23                           | 2,870159E+23  |
| 1998              | 7,566465E+22                              | 7,566337E+22 | 6,784121E+22 | 6,784114E+22 | 1,513280E+23                           | 1,356823E+23                           | 2,870104E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 1999              | 7,566444E+22                              | 7,566645E+22 | 6,784085E+22 | 6,784109E+22 | 1,513309E+23                           | 1,356819E+23                           | 2,870128E+23  |
| 2000              | 7,566631E+22                              | 7,566620E+22 | 6,783990E+22 | 6,784038E+22 | 1,513325E+23                           | 1,356803E+23                           | 2,870128E+23  |
| 2001              | 7,566313E+22                              | 7,566336E+22 | 6,784097E+22 | 6,784002E+22 | 1,513265E+23                           | 1,356810E+23                           | 2,870075E+23  |
| 2002              | 7,566505E+22                              | 7,566603E+22 | 6,784067E+22 | 6,783963E+22 | 1,513311E+23                           | 1,356803E+23                           | 2,870114E+23  |
| 2003              | 7,566495E+22                              | 7,566370E+22 | 6,783982E+22 | 6,783913E+22 | 1,513286E+23                           | 1,356790E+23                           | 2,870076E+23  |
| 2004              | 7,566255E+22                              | 7,566312E+22 | 6,783995E+22 | 6,783960E+22 | 1,513257E+23                           | 1,356795E+23                           | 2,870052E+23  |
| 2005              | 7,566552E+22                              | 7,566578E+22 | 6,783871E+22 | 6,783998E+22 | 1,513313E+23                           | 1,356787E+23                           | 2,870100E+23  |
| 2006              | 7,566347E+22                              | 7,566279E+22 | 6,783902E+22 | 6,783956E+22 | 1,513263E+23                           | 1,356786E+23                           | 2,870048E+23  |
| 2007              | 7,566303E+22                              | 7,566472E+22 | 6,783962E+22 | 6,783934E+22 | 1,513277E+23                           | 1,356790E+23                           | 2,870067E+23  |
| 2008              | 7,566638E+22                              | 7,566546E+22 | 6,783941E+22 | 6,783934E+22 | 1,513318E+23                           | 1,356787E+23                           | 2,870106E+23  |
| 2009              | 7,566378E+22                              | 7,566242E+22 | 6,784071E+22 | 6,783992E+22 | 1,513262E+23                           | 1,356806E+23                           | 2,870068E+23  |
| 2010              | 7,566471E+22                              | 7,566609E+22 | 6,784122E+22 | 6,784060E+22 | 1,513308E+23                           | 1,356818E+23                           | 2,870126E+23  |
| 2011              | 7,566539E+22                              | 7,566554E+22 | 6,784093E+22 | 6,784122E+22 | 1,513309E+23                           | 1,356822E+23                           | 2,870131E+23  |
| 2012              | 7,566280E+22                              | 7,566383E+22 | 6,784203E+22 | 6,784198E+22 | 1,513266E+23                           | 1,356840E+23                           | 2,870106E+23  |
| 2013              | 7,566603E+22                              | 7,566679E+22 | 6,784206E+22 | 6,784247E+22 | 1,513328E+23                           | 1,356845E+23                           | 2,870174E+23  |
| 2014              | 7,566544E+22                              | 7,566378E+22 | 6,784249E+22 | 6,784223E+22 | 1,513292E+23                           | 1,356847E+23                           | 2,870139E+23  |
| 2015              | 7,566423E+22                              | 7,566490E+22 | 6,784266E+22 | 6,784218E+22 | 1,513291E+23                           | 1,356848E+23                           | 2,870140E+23  |
| 2016              | 7,566742E+22                              | 7,566715E+22 | 6,784178E+22 | 6,784243E+22 | 1,513346E+23                           | 1,356842E+23                           | 2,870188E+23  |
| 2017              | 7,566465E+22                              | 7,566381E+22 | 6,784207E+22 | 6,784230E+22 | 1,513285E+23                           | 1,356844E+23                           | 2,870128E+23  |
| 2018              | 7,566446E+22                              | 7,566659E+22 | 6,784238E+22 | 6,784158E+22 | 1,513311E+23                           | 1,356840E+23                           | 2,870150E+23  |
| 2019              | 7,566620E+22                              | 7,566629E+22 | 6,784160E+22 | 6,784107E+22 | 1,513325E+23                           | 1,356827E+23                           | 2,870152E+23  |
| 2020              | 7,566343E+22                              | 7,566282E+22 | 6,784169E+22 | 6,784088E+22 | 1,513263E+23                           | 1,356826E+23                           | 2,870088E+23  |
| 2021              | 7,566541E+22                              | 7,566592E+22 | 6,784118E+22 | 6,784093E+22 | 1,513313E+23                           | 1,356821E+23                           | 2,870134E+23  |
| 2022              | 7,566489E+22                              | 7,566371E+22 | 6,784051E+22 | 6,784068E+22 | 1,513286E+23                           | 1,356812E+23                           | 2,870098E+23  |
| 2023              | 7,566245E+22                              | 7,566377E+22 | 6,784008E+22 | 6,784049E+22 | 1,513262E+23                           | 1,356806E+23                           | 2,870068E+23  |
| 2024              | 7,566582E+22                              | 7,566644E+22 | 6,783962E+22 | 6,784052E+22 | 1,513323E+23                           | 1,356801E+23                           | 2,870124E+23  |
| 2025              | 7,566429E+22                              | 7,566248E+22 | 6,784021E+22 | 6,784023E+22 | 1,513268E+23                           | 1,356804E+23                           | 2,870072E+23  |
| 2026              | 7,566384E+22                              | 7,566471E+22 | 6,784121E+22 | 6,783971E+22 | 1,513285E+23                           | 1,356809E+23                           | 2,870095E+23  |
| 2027              | 7,566639E+22                              | 7,566613E+22 | 6,784090E+22 | 6,784042E+22 | 1,513325E+23                           | 1,356813E+23                           | 2,870138E+23  |
| 2028              | 7,566349E+22                              | 7,566293E+22 | 6,784142E+22 | 6,784147E+22 | 1,513264E+23                           | 1,356829E+23                           | 2,870093E+23  |
| 2029              | 7,566449E+22                              | 7,566675E+22 | 6,784214E+22 | 6,784229E+22 | 1,513312E+23                           | 1,356844E+23                           | 2,870157E+23  |
| 2030              | 7,566529E+22                              | 7,566537E+22 | 6,784255E+22 | 6,784278E+22 | 1,513307E+23                           | 1,356853E+23                           | 2,870160E+23  |
| 2031              | 7,566321E+22                              | 7,566392E+22 | 6,784306E+22 | 6,784283E+22 | 1,513271E+23                           | 1,356859E+23                           | 2,870130E+23  |
| 2032              | 7,566690E+22                              | 7,566705E+22 | 6,784320E+22 | 6,784330E+22 | 1,513340E+23                           | 1,356865E+23                           | 2,870205E+23  |
| 2033              | 7,566625E+22                              | 7,566364E+22 | 6,784338E+22 | 6,784355E+22 | 1,513299E+23                           | 1,356869E+23                           | 2,870168E+23  |
| 2034              | 7,566468E+22                              | 7,566554E+22 | 6,784359E+22 | 6,784305E+22 | 1,513302E+23                           | 1,356866E+23                           | 2,870169E+23  |
| 2035              | 7,566716E+22                              | 7,566802E+22 | 6,784280E+22 | 6,784331E+22 | 1,513352E+23                           | 1,356861E+23                           | 2,870213E+23  |
| 2036              | 7,566460E+22                              | 7,566381E+22 | 6,784284E+22 | 6,784297E+22 | 1,513284E+23                           | 1,356858E+23                           | 2,870142E+23  |
| 2037              | 7,566483E+22                              | 7,566647E+22 | 6,784334E+22 | 6,784216E+22 | 1,513313E+23                           | 1,356855E+23                           | 2,870168E+23  |
| 2038              | 7,566629E+22                              | 7,566568E+22 | 6,784283E+22 | 6,784203E+22 | 1,513320E+23                           | 1,356849E+23                           | 2,870168E+23  |
| 2039              | 7,566339E+22                              | 7,566310E+22 | 6,784203E+22 | 6,784173E+22 | 1,513265E+23                           | 1,356838E+23                           | 2,870103E+23  |
| 2040              | 7,566539E+22                              | 7,566666E+22 | 6,784160E+22 | 6,784199E+22 | 1,513321E+23                           | 1,356836E+23                           | 2,870156E+23  |
| 2041              | 7,566501E+22                              | 7,566380E+22 | 6,784116E+22 | 6,784194E+22 | 1,513288E+23                           | 1,356831E+23                           | 2,870119E+23  |
| 2042              | 7,566295E+22                              | 7,566398E+22 | 6,784131E+22 | 6,784090E+22 | 1,513269E+23                           | 1,356822E+23                           | 2,870091E+23  |
| 2043              | 7,566611E+22                              | 7,566680E+22 | 6,784117E+22 | 6,784107E+22 | 1,513329E+23                           | 1,356822E+23                           | 2,870151E+23  |
| 2044              | 7,566476E+22                              | 7,566248E+22 | 6,784121E+22 | 6,784116E+22 | 1,513272E+23                           | 1,356824E+23                           | 2,870096E+23  |
| 2045              | 7,566410E+22                              | 7,566514E+22 | 6,784224E+22 | 6,784109E+22 | 1,513292E+23                           | 1,356833E+23                           | 2,870126E+23  |
| 2046              | 7,566595E+22                              | 7,566651E+22 | 6,784222E+22 | 6,784232E+22 | 1,513325E+23                           | 1,356845E+23                           | 2,870170E+23  |
| 2047              | 7,566316E+22                              | 7,566357E+22 | 6,784217E+22 | 6,784282E+22 | 1,513267E+23                           | 1,356850E+23                           | 2,870117E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 2048                   | 7,566485E+22                              | 7,566694E+22 | 6,784344E+22 | 6,784334E+22 | 1,513318E+23                           | 1,356868E+23                           | 2,870186E+23  |
| 2049                   | 7,566629E+22                              | 7,566472E+22 | 6,784384E+22 | 6,784393E+22 | 1,513310E+23                           | 1,356878E+23                           | 2,870188E+23  |
| 2050                   | 7,566440E+22                              | 7,566376E+22 | 6,784422E+22 | 6,784343E+22 | 1,513282E+23                           | 1,356877E+23                           | 2,870158E+23  |
| 2051                   | 7,566724E+22                              | 7,566781E+22 | 6,784426E+22 | 6,784423E+22 | 1,513351E+23                           | 1,356885E+23                           | 2,870235E+23  |
| 2052                   | 7,566629E+22                              | 7,566441E+22 | 6,784368E+22 | 6,784455E+22 | 1,513307E+23                           | 1,356882E+23                           | 2,870189E+23  |
| 2053                   | 7,566453E+22                              | 7,566628E+22 | 6,784443E+22 | 6,784391E+22 | 1,513308E+23                           | 1,356883E+23                           | 2,870192E+23  |
| 2054                   | 7,566679E+22                              | 7,566806E+22 | 6,784443E+22 | 6,784424E+22 | 1,513348E+23                           | 1,356887E+23                           | 2,870235E+23  |
| 2055                   | 7,566451E+22                              | 7,566386E+22 | 6,784382E+22 | 6,784357E+22 | 1,513284E+23                           | 1,356874E+23                           | 2,870158E+23  |
| 2056                   | 7,566510E+22                              | 7,566639E+22 | 6,784444E+22 | 6,784313E+22 | 1,513315E+23                           | 1,356876E+23                           | 2,870191E+23  |
| 2057                   | 7,566654E+22                              | 7,566525E+22 | 6,784352E+22 | 6,784362E+22 | 1,513318E+23                           | 1,356871E+23                           | 2,870189E+23  |
| 2058                   | 7,566364E+22                              | 7,566338E+22 | 6,784250E+22 | 6,784278E+22 | 1,513270E+23                           | 1,356853E+23                           | 2,870123E+23  |
| 2059                   | 7,566537E+22                              | 7,566724E+22 | 6,784235E+22 | 6,784284E+22 | 1,513326E+23                           | 1,356852E+23                           | 2,870178E+23  |
| 2060                   | 7,566549E+22                              | 7,566375E+22 | 6,784169E+22 | 6,784245E+22 | 1,513292E+23                           | 1,356841E+23                           | 2,870134E+23  |
| 2061                   | 7,566376E+22                              | 7,566411E+22 | 6,784235E+22 | 6,784128E+22 | 1,513279E+23                           | 1,356836E+23                           | 2,870115E+23  |
| 2062                   | 7,566631E+22                              | 7,566684E+22 | 6,784265E+22 | 6,784201E+22 | 1,513331E+23                           | 1,356847E+23                           | 2,870178E+23  |
| 2063                   | 7,566450E+22                              | 7,566330E+22 | 6,784203E+22 | 6,784224E+22 | 1,513278E+23                           | 1,356843E+23                           | 2,870121E+23  |
| 2064                   | 7,566383E+22                              | 7,566600E+22 | 6,784336E+22 | 6,784259E+22 | 1,513298E+23                           | 1,356860E+23                           | 2,870158E+23  |
| 2065                   | 7,566582E+22                              | 7,566636E+22 | 6,784357E+22 | 6,784409E+22 | 1,513322E+23                           | 1,356877E+23                           | 2,870198E+23  |
| 2066                   | 7,566377E+22                              | 7,566347E+22 | 6,784369E+22 | 6,784378E+22 | 1,513272E+23                           | 1,356875E+23                           | 2,870147E+23  |
| 2067                   | 7,566556E+22                              | 7,566691E+22 | 6,784487E+22 | 6,784426E+22 | 1,513325E+23                           | 1,356891E+23                           | 2,870216E+23  |
| 2068                   | 7,566713E+22                              | 7,566458E+22 | 6,784449E+22 | 6,784502E+22 | 1,513317E+23                           | 1,356895E+23                           | 2,870212E+23  |
| 2069                   | 7,566504E+22                              | 7,566446E+22 | 6,784484E+22 | 6,784454E+22 | 1,513295E+23                           | 1,356894E+23                           | 2,870189E+23  |
| 2070                   | 7,566690E+22                              | 7,566850E+22 | 6,784524E+22 | 6,784560E+22 | 1,513354E+23                           | 1,356908E+23                           | 2,870262E+23  |
| 2071                   | 7,566583E+22                              | 7,566533E+22 | 6,784444E+22 | 6,784529E+22 | 1,513312E+23                           | 1,356897E+23                           | 2,870209E+23  |
| 2072                   | 7,566466E+22                              | 7,566652E+22 | 6,784577E+22 | 6,784454E+22 | 1,513312E+23                           | 1,356903E+23                           | 2,870215E+23  |
| 2073                   | 7,566710E+22                              | 7,566734E+22 | 6,784577E+22 | 6,784524E+22 | 1,513344E+23                           | 1,356910E+23                           | 2,870254E+23  |
| 2074                   | 7,566508E+22                              | 7,566360E+22 | 6,784482E+22 | 6,784431E+22 | 1,513287E+23                           | 1,356891E+23                           | 2,870178E+23  |
| 2075                   | 7,566507E+22                              | 7,566669E+22 | 6,784520E+22 | 6,784424E+22 | 1,513318E+23                           | 1,356894E+23                           | 2,870212E+23  |
| 2076                   | 7,566655E+22                              | 7,566549E+22 | 6,784361E+22 | 6,784479E+22 | 1,513320E+23                           | 1,356884E+23                           | 2,870204E+23  |
| 2077                   | 7,566396E+22                              | 7,566381E+22 | 6,784308E+22 | 6,784348E+22 | 1,513278E+23                           | 1,356866E+23                           | 2,870143E+23  |
| 2078                   | 7,566547E+22                              | 7,566728E+22 | 6,784370E+22 | 6,784354E+22 | 1,513328E+23                           | 1,356872E+23                           | 2,870200E+23  |
| 2079                   | 7,566577E+22                              | 7,566419E+22 | 6,784263E+22 | 6,784281E+22 | 1,513300E+23                           | 1,356854E+23                           | 2,870154E+23  |
| 2080                   | 7,566416E+22                              | 7,566445E+22 | 6,784370E+22 | 6,784225E+22 | 1,513286E+23                           | 1,356859E+23                           | 2,870145E+23  |
| 2081                   | 7,566624E+22                              | 7,566690E+22 | 6,784389E+22 | 6,784377E+22 | 1,513331E+23                           | 1,356877E+23                           | 2,870208E+23  |
| 2082                   | 7,566450E+22                              | 7,566371E+22 | 6,784308E+22 | 6,784367E+22 | 1,513282E+23                           | 1,356867E+23                           | 2,870150E+23  |
| 2083                   | 7,566372E+22                              | 7,566623E+22 | 6,784472E+22 | 6,784392E+22 | 1,513299E+23                           | 1,356886E+23                           | 2,870186E+23  |
| 2084                   | 7,566646E+22                              | 7,566590E+22 | 6,784437E+22 | 6,784511E+22 | 1,513324E+23                           | 1,356895E+23                           | 2,870218E+23  |
| 2085                   | 7,566486E+22                              | 7,566331E+22 | 6,784459E+22 | 6,784449E+22 | 1,513282E+23                           | 1,356891E+23                           | 2,870172E+23  |
| 2086                   | 7,566603E+22                              | 7,566708E+22 | 6,784599E+22 | 6,784540E+22 | 1,513331E+23                           | 1,356914E+23                           | 2,870245E+23  |
| 2087                   | 7,566708E+22                              | 7,566577E+22 | 6,784491E+22 | 6,784589E+22 | 1,513329E+23                           | 1,356908E+23                           | 2,870236E+23  |
| 2088                   | 7,566493E+22                              | 7,566563E+22 | 6,784587E+22 | 6,784563E+22 | 1,513306E+23                           | 1,356915E+23                           | 2,870221E+23  |
| 2089                   | 7,566661E+22                              | 7,566864E+22 | 6,784676E+22 | 6,784682E+22 | 1,513353E+23                           | 1,356936E+23                           | 2,870288E+23  |
| 2090                   | 7,566609E+22                              | 7,566529E+22 | 6,784609E+22 | 6,784594E+22 | 1,513314E+23                           | 1,356920E+23                           | 2,870234E+23  |
| 2091                   | 7,566486E+22                              | 7,566628E+22 | 6,784737E+22 | 6,784543E+22 | 1,513311E+23                           | 1,356928E+23                           | 2,870239E+23  |
| 2092                   | 7,566749E+22                              | 7,566676E+22 | 6,784633E+22 | 6,784652E+22 | 1,513343E+23                           | 1,356928E+23                           | 2,870271E+23  |
| 2093                   | 7,566551E+22                              | 7,566380E+22 | 6,784514E+22 | 6,784552E+22 | 1,513293E+23                           | 1,356907E+23                           | 2,870200E+23  |
| 2094                   | 7,566494E+22                              | 7,566698E+22 | 6,784568E+22 | 6,784557E+22 | 1,513319E+23                           | 1,356912E+23                           | 2,870232E+23  |
| 2095                   | 7,566652E+22                              | 7,566611E+22 | 6,784393E+22 | 6,784521E+22 | 1,513326E+23                           | 1,356891E+23                           | 2,870218E+23  |
| 2096                   | 7,566466E+22                              | 7,566411E+22 | 6,784415E+22 | 6,784376E+22 | 1,513288E+23                           | 1,356879E+23                           | 2,870167E+23  |



| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 2097              | 7,566594E+22                              | 7,566691E+22 | 6,784505E+22 | 6,784423E+22 | 1,513329E+23                           | 1,356893E+23                           | 2,870221E+23  |
| 2098              | 7,566619E+22                              | 7,566456E+22 | 6,784387E+22 | 6,784352E+22 | 1,513307E+23                           | 1,356874E+23                           | 2,870181E+23  |
| 2099              | 7,566386E+22                              | 7,566511E+22 | 6,784488E+22 | 6,784351E+22 | 1,513290E+23                           | 1,356884E+23                           | 2,870173E+23  |
| 2100              | 7,566583E+22                              | 7,566704E+22 | 6,784455E+22 | 6,784534E+22 | 1,513329E+23                           | 1,356899E+23                           | 2,870228E+23  |
| 2101              | 7,566471E+22                              | 7,566389E+22 | 6,784417E+22 | 6,784484E+22 | 1,513286E+23                           | 1,356890E+23                           | 2,870176E+23  |
| 2102              | 7,566397E+22                              | 7,566590E+22 | 6,784612E+22 | 6,784519E+22 | 1,513299E+23                           | 1,356913E+23                           | 2,870212E+23  |
| 2103              | 7,566698E+22                              | 7,566611E+22 | 6,784520E+22 | 6,784592E+22 | 1,513331E+23                           | 1,356911E+23                           | 2,870242E+23  |
| 2104              | 7,566572E+22                              | 7,566383E+22 | 6,784559E+22 | 6,784559E+22 | 1,513295E+23                           | 1,356912E+23                           | 2,870207E+23  |
| 2105              | 7,566615E+22                              | 7,566752E+22 | 6,784702E+22 | 6,784692E+22 | 1,513337E+23                           | 1,356939E+23                           | 2,870276E+23  |
| 2106              | 7,566719E+22                              | 7,566670E+22 | 6,784602E+22 | 6,784685E+22 | 1,513339E+23                           | 1,356929E+23                           | 2,870268E+23  |
| 2107              | 7,566484E+22                              | 7,566605E+22 | 6,784752E+22 | 6,784648E+22 | 1,513309E+23                           | 1,356940E+23                           | 2,870249E+23  |
| 2108              | 7,566691E+22                              | 7,566812E+22 | 6,784795E+22 | 6,784767E+22 | 1,513350E+23                           | 1,356956E+23                           | 2,870306E+23  |
| 2109              | 7,566682E+22                              | 7,566494E+22 | 6,784720E+22 | 6,784674E+22 | 1,513318E+23                           | 1,356939E+23                           | 2,870257E+23  |
| 2110              | 7,566494E+22                              | 7,566607E+22 | 6,784827E+22 | 6,784683E+22 | 1,513310E+23                           | 1,356951E+23                           | 2,870261E+23  |
| 2111              | 7,566730E+22                              | 7,566745E+22 | 6,784636E+22 | 6,784751E+22 | 1,513347E+23                           | 1,356939E+23                           | 2,870286E+23  |
| 2112              | 7,566568E+22                              | 7,566453E+22 | 6,784562E+22 | 6,784647E+22 | 1,513302E+23                           | 1,356921E+23                           | 2,870223E+23  |
| 2113              | 7,566507E+22                              | 7,566705E+22 | 6,784671E+22 | 6,784640E+22 | 1,513321E+23                           | 1,356931E+23                           | 2,870252E+23  |
| 2114              | 7,566716E+22                              | 7,566633E+22 | 6,784511E+22 | 6,784536E+22 | 1,513335E+23                           | 1,356905E+23                           | 2,870240E+23  |
| 2115              | 7,566497E+22                              | 7,566428E+22 | 6,784571E+22 | 6,784433E+22 | 1,513292E+23                           | 1,356900E+23                           | 2,870193E+23  |
| 2116              | 7,566602E+22                              | 7,566681E+22 | 6,784585E+22 | 6,784539E+22 | 1,513328E+23                           | 1,356912E+23                           | 2,870241E+23  |
| 2117              | 7,566613E+22                              | 7,566492E+22 | 6,784466E+22 | 6,784490E+22 | 1,513311E+23                           | 1,356896E+23                           | 2,870206E+23  |
| 2118              | 7,566334E+22                              | 7,566525E+22 | 6,784589E+22 | 6,784525E+22 | 1,513286E+23                           | 1,356911E+23                           | 2,870197E+23  |
| 2119              | 7,566577E+22                              | 7,566717E+22 | 6,784521E+22 | 6,784623E+22 | 1,513329E+23                           | 1,356914E+23                           | 2,870244E+23  |
| 2120              | 7,566566E+22                              | 7,566384E+22 | 6,784525E+22 | 6,784563E+22 | 1,513295E+23                           | 1,356909E+23                           | 2,870204E+23  |
| 2121              | 7,566482E+22                              | 7,566561E+22 | 6,784724E+22 | 6,784624E+22 | 1,513304E+23                           | 1,356935E+23                           | 2,870239E+23  |
| 2122              | 7,566772E+22                              | 7,566675E+22 | 6,784619E+22 | 6,784668E+22 | 1,513345E+23                           | 1,356929E+23                           | 2,870273E+23  |
| 2123              | 7,566572E+22                              | 7,566493E+22 | 6,784690E+22 | 6,784664E+22 | 1,513307E+23                           | 1,356935E+23                           | 2,870242E+23  |
| 2124              | 7,566595E+22                              | 7,566797E+22 | 6,784804E+22 | 6,784811E+22 | 1,513339E+23                           | 1,356962E+23                           | 2,870301E+23  |
| 2125              | 7,566738E+22                              | 7,566698E+22 | 6,784761E+22 | 6,784775E+22 | 1,513344E+23                           | 1,356954E+23                           | 2,870297E+23  |
| 2126              | 7,566486E+22                              | 7,566575E+22 | 6,784919E+22 | 6,784777E+22 | 1,513306E+23                           | 1,356970E+23                           | 2,870276E+23  |
| 2127              | 7,566699E+22                              | 7,566803E+22 | 6,784877E+22 | 6,784866E+22 | 1,513350E+23                           | 1,356974E+23                           | 2,870325E+23  |
| 2128              | 7,566740E+22                              | 7,566516E+22 | 6,784786E+22 | 6,784814E+22 | 1,513326E+23                           | 1,356960E+23                           | 2,870286E+23  |
| 2129              | 7,566501E+22                              | 7,566615E+22 | 6,784867E+22 | 6,784841E+22 | 1,513312E+23                           | 1,356971E+23                           | 2,870282E+23  |
| 2130              | 7,566759E+22                              | 7,566806E+22 | 6,784687E+22 | 6,784820E+22 | 1,513357E+23                           | 1,356951E+23                           | 2,870307E+23  |
| 2131              | 7,566603E+22                              | 7,566494E+22 | 6,784672E+22 | 6,784664E+22 | 1,513310E+23                           | 1,356934E+23                           | 2,870243E+23  |
| 2132              | 7,566557E+22                              | 7,566668E+22 | 6,784753E+22 | 6,784662E+22 | 1,513323E+23                           | 1,356941E+23                           | 2,870264E+23  |
| 2133              | 7,566777E+22                              | 7,566646E+22 | 6,784621E+22 | 6,784572E+22 | 1,513342E+23                           | 1,356919E+23                           | 2,870262E+23  |
| 2134              | 7,566465E+22                              | 7,566449E+22 | 6,784677E+22 | 6,784566E+22 | 1,513291E+23                           | 1,356924E+23                           | 2,870216E+23  |
| 2135              | 7,566523E+22                              | 7,566747E+22 | 6,784636E+22 | 6,784658E+22 | 1,513327E+23                           | 1,356929E+23                           | 2,870256E+23  |
| 2136              | 7,566607E+22                              | 7,566537E+22 | 6,784559E+22 | 6,784628E+22 | 1,513314E+23                           | 1,356919E+23                           | 2,870233E+23  |
| 2137              | 7,566347E+22                              | 7,566486E+22 | 6,784714E+22 | 6,784658E+22 | 1,513283E+23                           | 1,356937E+23                           | 2,870221E+23  |
| 2138              | 7,566669E+22                              | 7,566709E+22 | 6,784645E+22 | 6,784687E+22 | 1,513338E+23                           | 1,356933E+23                           | 2,870271E+23  |
| 2139              | 7,566649E+22                              | 7,566407E+22 | 6,784667E+22 | 6,784641E+22 | 1,513306E+23                           | 1,356931E+23                           | 2,870236E+23  |
| 2140              | 7,566538E+22                              | 7,566585E+22 | 6,784798E+22 | 6,784747E+22 | 1,513312E+23                           | 1,356955E+23                           | 2,870267E+23  |
| 2141              | 7,566804E+22                              | 7,566768E+22 | 6,784716E+22 | 6,784788E+22 | 1,513357E+23                           | 1,356950E+23                           | 2,870308E+23  |
| 2142              | 7,566532E+22                              | 7,566554E+22 | 6,784831E+22 | 6,784820E+22 | 1,513309E+23                           | 1,356965E+23                           | 2,870274E+23  |
| 2143              | 7,566570E+22                              | 7,566824E+22 | 6,784921E+22 | 6,784890E+22 | 1,513339E+23                           | 1,356981E+23                           | 2,870321E+23  |
| 2144              | 7,566802E+22                              | 7,566685E+22 | 6,784895E+22 | 6,784878E+22 | 1,513349E+23                           | 1,356977E+23                           | 2,870326E+23  |
| 2145              | 7,566528E+22                              | 7,566533E+22 | 6,785030E+22 | 6,784918E+22 | 1,513306E+23                           | 1,356995E+23                           | 2,870301E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 2146                   | 7,566749E+22                              | 7,566835E+22 | 6,784931E+22 | 6,784961E+22 | 1,513358E+23                           | 1,356989E+23                           | 2,870348E+23  |
| 2147                   | 7,566739E+22                              | 7,566593E+22 | 6,784859E+22 | 6,784905E+22 | 1,513333E+23                           | 1,356976E+23                           | 2,870310E+23  |
| 2148                   | 7,566514E+22                              | 7,566639E+22 | 6,784907E+22 | 6,784917E+22 | 1,513315E+23                           | 1,356982E+23                           | 2,870298E+23  |
| 2149                   | 7,566810E+22                              | 7,566823E+22 | 6,784794E+22 | 6,784842E+22 | 1,513363E+23                           | 1,356964E+23                           | 2,870327E+23  |
| 2150                   | 7,566613E+22                              | 7,566491E+22 | 6,784812E+22 | 6,784736E+22 | 1,513310E+23                           | 1,356955E+23                           | 2,870265E+23  |
| 2151                   | 7,566545E+22                              | 7,566682E+22 | 6,784833E+22 | 6,784716E+22 | 1,513323E+23                           | 1,356955E+23                           | 2,870278E+23  |
| 2152                   | 7,566785E+22                              | 7,566686E+22 | 6,784703E+22 | 6,784703E+22 | 1,513347E+23                           | 1,356941E+23                           | 2,870288E+23  |
| 2153                   | 7,566423E+22                              | 7,566461E+22 | 6,784754E+22 | 6,784742E+22 | 1,513288E+23                           | 1,356950E+23                           | 2,870238E+23  |
| 2154                   | 7,566531E+22                              | 7,566764E+22 | 6,784720E+22 | 6,784758E+22 | 1,513330E+23                           | 1,356948E+23                           | 2,870277E+23  |
| 2155                   | 7,566655E+22                              | 7,566535E+22 | 6,784696E+22 | 6,784694E+22 | 1,513319E+23                           | 1,356939E+23                           | 2,870258E+23  |
| 2156                   | 7,566444E+22                              | 7,566437E+22 | 6,784789E+22 | 6,784732E+22 | 1,513288E+23                           | 1,356952E+23                           | 2,870240E+23  |
| 2157                   | 7,566775E+22                              | 7,566732E+22 | 6,784746E+22 | 6,784757E+22 | 1,513351E+23                           | 1,356950E+23                           | 2,870301E+23  |
| 2158                   | 7,566653E+22                              | 7,566489E+22 | 6,784771E+22 | 6,784781E+22 | 1,513314E+23                           | 1,356955E+23                           | 2,870269E+23  |
| 2159                   | 7,566484E+22                              | 7,566696E+22 | 6,784873E+22 | 6,784852E+22 | 1,513318E+23                           | 1,356973E+23                           | 2,870291E+23  |
| 2160                   | 7,566804E+22                              | 7,566855E+22 | 6,784853E+22 | 6,784919E+22 | 1,513366E+23                           | 1,356977E+23                           | 2,870343E+23  |
| 2161                   | 7,566529E+22                              | 7,566536E+22 | 6,785001E+22 | 6,784963E+22 | 1,513307E+23                           | 1,356996E+23                           | 2,870303E+23  |
| 2162                   | 7,566619E+22                              | 7,566808E+22 | 6,785070E+22 | 6,784984E+22 | 1,513343E+23                           | 1,357005E+23                           | 2,870348E+23  |
| 2163                   | 7,566852E+22                              | 7,566686E+22 | 6,785030E+22 | 6,784986E+22 | 1,513354E+23                           | 1,357002E+23                           | 2,870355E+23  |
| 2164                   | 7,566566E+22                              | 7,566515E+22 | 6,785057E+22 | 6,785059E+22 | 1,513308E+23                           | 1,357012E+23                           | 2,870320E+23  |
| 2165                   | 7,566792E+22                              | 7,566882E+22 | 6,784981E+22 | 6,785059E+22 | 1,513367E+23                           | 1,357004E+23                           | 2,870371E+23  |
| 2166                   | 7,566735E+22                              | 7,566634E+22 | 6,784939E+22 | 6,784994E+22 | 1,513337E+23                           | 1,356993E+23                           | 2,870330E+23  |
| 2167                   | 7,566524E+22                              | 7,566658E+22 | 6,784978E+22 | 6,784917E+22 | 1,513318E+23                           | 1,356990E+23                           | 2,870308E+23  |
| 2168                   | 7,566878E+22                              | 7,566840E+22 | 6,784896E+22 | 6,784881E+22 | 1,513372E+23                           | 1,356978E+23                           | 2,870349E+23  |
| 2169                   | 7,566613E+22                              | 7,566483E+22 | 6,784921E+22 | 6,784845E+22 | 1,513310E+23                           | 1,356977E+23                           | 2,870286E+23  |
| 2170                   | 7,566526E+22                              | 7,566731E+22 | 6,784914E+22 | 6,784814E+22 | 1,513326E+23                           | 1,356973E+23                           | 2,870298E+23  |
| 2171                   | 7,566739E+22                              | 7,566743E+22 | 6,784815E+22 | 6,784819E+22 | 1,513348E+23                           | 1,356963E+23                           | 2,870312E+23  |
| 2172                   | 7,566424E+22                              | 7,566440E+22 | 6,784825E+22 | 6,784865E+22 | 1,513286E+23                           | 1,356969E+23                           | 2,870255E+23  |
| 2173                   | 7,566612E+22                              | 7,566738E+22 | 6,784838E+22 | 6,784830E+22 | 1,513335E+23                           | 1,356967E+23                           | 2,870302E+23  |
| 2174                   | 7,566705E+22                              | 7,566530E+22 | 6,784818E+22 | 6,784809E+22 | 1,513324E+23                           | 1,356963E+23                           | 2,870286E+23  |
| 2175                   | 7,566483E+22                              | 7,566476E+22 | 6,784852E+22 | 6,784813E+22 | 1,513296E+23                           | 1,356966E+23                           | 2,870262E+23  |
| 2176                   | 7,566818E+22                              | 7,566819E+22 | 6,784822E+22 | 6,784897E+22 | 1,513364E+23                           | 1,356972E+23                           | 2,870336E+23  |
| 2177                   | 7,566624E+22                              | 7,566563E+22 | 6,784885E+22 | 6,784952E+22 | 1,513319E+23                           | 1,356984E+23                           | 2,870302E+23  |
| 2178                   | 7,566490E+22                              | 7,566746E+22 | 6,785005E+22 | 6,784938E+22 | 1,513324E+23                           | 1,356994E+23                           | 2,870318E+23  |
| 2179                   | 7,566825E+22                              | 7,566854E+22 | 6,785041E+22 | 6,784989E+22 | 1,513368E+23                           | 1,357003E+23                           | 2,870371E+23  |
| 2180                   | 7,566597E+22                              | 7,566477E+22 | 6,785107E+22 | 6,785070E+22 | 1,513307E+23                           | 1,357018E+23                           | 2,870325E+23  |
| 2181                   | 7,566702E+22                              | 7,566786E+22 | 6,785169E+22 | 6,785086E+22 | 1,513349E+23                           | 1,357026E+23                           | 2,870374E+23  |
| 2182                   | 7,566844E+22                              | 7,566733E+22 | 6,785104E+22 | 6,785140E+22 | 1,513358E+23                           | 1,357024E+23                           | 2,870382E+23  |
| 2183                   | 7,566546E+22                              | 7,566588E+22 | 6,785078E+22 | 6,785139E+22 | 1,513313E+23                           | 1,357022E+23                           | 2,870335E+23  |
| 2184                   | 7,566828E+22                              | 7,566940E+22 | 6,785061E+22 | 6,785135E+22 | 1,513377E+23                           | 1,357020E+23                           | 2,870396E+23  |
| 2185                   | 7,566748E+22                              | 7,566642E+22 | 6,785070E+22 | 6,785069E+22 | 1,513339E+23                           | 1,357014E+23                           | 2,870353E+23  |
| 2186                   | 7,566563E+22                              | 7,566670E+22 | 6,785102E+22 | 6,784952E+22 | 1,513323E+23                           | 1,357005E+23                           | 2,870329E+23  |
| 2187                   | 7,566879E+22                              | 7,566868E+22 | 6,785038E+22 | 6,784962E+22 | 1,513375E+23                           | 1,357000E+23                           | 2,870375E+23  |
| 2188                   | 7,566600E+22                              | 7,566483E+22 | 6,784970E+22 | 6,785000E+22 | 1,513308E+23                           | 1,356997E+23                           | 2,870305E+23  |
| 2189                   | 7,566528E+22                              | 7,566741E+22 | 6,784992E+22 | 6,784945E+22 | 1,513327E+23                           | 1,356994E+23                           | 2,870321E+23  |
| 2190                   | 7,566725E+22                              | 7,566740E+22 | 6,784915E+22 | 6,784950E+22 | 1,513347E+23                           | 1,356987E+23                           | 2,870333E+23  |
| 2191                   | 7,566466E+22                              | 7,566417E+22 | 6,784881E+22 | 6,784908E+22 | 1,513288E+23                           | 1,356979E+23                           | 2,870267E+23  |
| 2192                   | 7,566727E+22                              | 7,566752E+22 | 6,784912E+22 | 6,784907E+22 | 1,513348E+23                           | 1,356982E+23                           | 2,870330E+23  |
| 2193                   | 7,566745E+22                              | 7,566567E+22 | 6,784903E+22 | 6,784924E+22 | 1,513331E+23                           | 1,356983E+23                           | 2,870314E+23  |
| 2194                   | 7,566488E+22                              | 7,566578E+22 | 6,784944E+22 | 6,784898E+22 | 1,513307E+23                           | 1,356984E+23                           | 2,870291E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 2195              | 7,566784E+22                              | 7,566922E+22 | 6,784979E+22 | 6,784988E+22 | 1,513371E+23                           | 1,356997E+23                           | 2,870367E+23  |
| 2196              | 7,566618E+22                              | 7,566557E+22 | 6,785022E+22 | 6,785075E+22 | 1,513317E+23                           | 1,357010E+23                           | 2,870327E+23  |
| 2197              | 7,566544E+22                              | 7,566710E+22 | 6,785187E+22 | 6,785038E+22 | 1,513325E+23                           | 1,357023E+23                           | 2,870348E+23  |
| 2198              | 7,566846E+22                              | 7,566827E+22 | 6,785192E+22 | 6,785143E+22 | 1,513367E+23                           | 1,357033E+23                           | 2,870401E+23  |
| 2199              | 7,566623E+22                              | 7,566477E+22 | 6,785160E+22 | 6,785190E+22 | 1,513310E+23                           | 1,357035E+23                           | 2,870345E+23  |
| 2200              | 7,566755E+22                              | 7,566847E+22 | 6,785202E+22 | 6,785242E+22 | 1,513360E+23                           | 1,357044E+23                           | 2,870405E+23  |
| 2201              | 7,566837E+22                              | 7,566790E+22 | 6,785168E+22 | 6,785282E+22 | 1,513363E+23                           | 1,357045E+23                           | 2,870408E+23  |
| 2202              | 7,566582E+22                              | 7,566639E+22 | 6,785174E+22 | 6,785169E+22 | 1,513322E+23                           | 1,357034E+23                           | 2,870356E+23  |
| 2203              | 7,566870E+22                              | 7,566961E+22 | 6,785220E+22 | 6,785144E+22 | 1,513383E+23                           | 1,357036E+23                           | 2,870419E+23  |
| 2204              | 7,566794E+22                              | 7,566619E+22 | 6,785167E+22 | 6,785140E+22 | 1,513341E+23                           | 1,357031E+23                           | 2,870372E+23  |
| 2205              | 7,566596E+22                              | 7,566674E+22 | 6,785210E+22 | 6,785041E+22 | 1,513327E+23                           | 1,357025E+23                           | 2,870352E+23  |
| 2206              | 7,566804E+22                              | 7,566913E+22 | 6,785127E+22 | 6,785121E+22 | 1,513372E+23                           | 1,357025E+23                           | 2,870397E+23  |
| 2207              | 7,566552E+22                              | 7,566512E+22 | 6,785008E+22 | 6,785106E+22 | 1,513306E+23                           | 1,357011E+23                           | 2,870318E+23  |
| 2208              | 7,566575E+22                              | 7,566733E+22 | 6,785063E+22 | 6,785052E+22 | 1,513331E+23                           | 1,357011E+23                           | 2,870342E+23  |
| 2209              | 7,566767E+22                              | 7,566711E+22 | 6,785024E+22 | 6,785055E+22 | 1,513348E+23                           | 1,357008E+23                           | 2,870356E+23  |
| 2210              | 7,566553E+22                              | 7,566433E+22 | 6,784965E+22 | 6,784946E+22 | 1,513299E+23                           | 1,356991E+23                           | 2,870290E+23  |
| 2211              | 7,566763E+22                              | 7,566805E+22 | 6,785031E+22 | 6,784973E+22 | 1,513357E+23                           | 1,357000E+23                           | 2,870357E+23  |
| 2212              | 7,566750E+22                              | 7,566625E+22 | 6,784972E+22 | 6,785057E+22 | 1,513338E+23                           | 1,357003E+23                           | 2,870340E+23  |
| 2213              | 7,566500E+22                              | 7,566618E+22 | 6,785078E+22 | 6,785007E+22 | 1,513312E+23                           | 1,357008E+23                           | 2,870320E+23  |
| 2214              | 7,566748E+22                              | 7,566933E+22 | 6,785153E+22 | 6,785117E+22 | 1,513368E+23                           | 1,357027E+23                           | 2,870395E+23  |
| 2215              | 7,566643E+22                              | 7,566527E+22 | 6,785134E+22 | 6,785157E+22 | 1,513317E+23                           | 1,357029E+23                           | 2,870346E+23  |
| 2216              | 7,566632E+22                              | 7,566693E+22 | 6,785280E+22 | 6,785176E+22 | 1,513333E+23                           | 1,357046E+23                           | 2,870378E+23  |
| 2217              | 7,566862E+22                              | 7,566846E+22 | 6,785276E+22 | 6,785314E+22 | 1,513371E+23                           | 1,357059E+23                           | 2,870430E+23  |
| 2218              | 7,566642E+22                              | 7,566566E+22 | 6,785213E+22 | 6,785291E+22 | 1,513321E+23                           | 1,357050E+23                           | 2,870371E+23  |
| 2219              | 7,566762E+22                              | 7,566937E+22 | 6,785321E+22 | 6,785315E+22 | 1,513370E+23                           | 1,357064E+23                           | 2,870434E+23  |
| 2220              | 7,566872E+22                              | 7,566807E+22 | 6,785274E+22 | 6,785360E+22 | 1,513368E+23                           | 1,357063E+23                           | 2,870431E+23  |
| 2221              | 7,566653E+22                              | 7,566632E+22 | 6,785337E+22 | 6,785218E+22 | 1,513328E+23                           | 1,357055E+23                           | 2,870384E+23  |
| 2222              | 7,566861E+22                              | 7,566966E+22 | 6,785370E+22 | 6,785252E+22 | 1,513383E+23                           | 1,357062E+23                           | 2,870445E+23  |
| 2223              | 7,566774E+22                              | 7,566621E+22 | 6,785227E+22 | 6,785248E+22 | 1,513340E+23                           | 1,357047E+23                           | 2,870387E+23  |
| 2224              | 7,566602E+22                              | 7,566710E+22 | 6,785248E+22 | 6,785204E+22 | 1,513331E+23                           | 1,357045E+23                           | 2,870376E+23  |
| 2225              | 7,566773E+22                              | 7,566915E+22 | 6,785187E+22 | 6,785267E+22 | 1,513369E+23                           | 1,357045E+23                           | 2,870414E+23  |
| 2226              | 7,566594E+22                              | 7,566504E+22 | 6,785080E+22 | 6,785138E+22 | 1,513310E+23                           | 1,357022E+23                           | 2,870332E+23  |
| 2227              | 7,566657E+22                              | 7,566730E+22 | 6,785176E+22 | 6,785063E+22 | 1,513339E+23                           | 1,357024E+23                           | 2,870363E+23  |
| 2228              | 7,566845E+22                              | 7,566696E+22 | 6,785084E+22 | 6,785121E+22 | 1,513354E+23                           | 1,357020E+23                           | 2,870375E+23  |
| 2229              | 7,566609E+22                              | 7,566478E+22 | 6,785071E+22 | 6,785021E+22 | 1,513309E+23                           | 1,357009E+23                           | 2,870318E+23  |
| 2230              | 7,566698E+22                              | 7,566900E+22 | 6,785151E+22 | 6,785103E+22 | 1,513360E+23                           | 1,357025E+23                           | 2,870385E+23  |
| 2231              | 7,566699E+22                              | 7,566677E+22 | 6,785074E+22 | 6,785158E+22 | 1,513338E+23                           | 1,357023E+23                           | 2,870361E+23  |
| 2232              | 7,566529E+22                              | 7,566629E+22 | 6,785214E+22 | 6,785143E+22 | 1,513316E+23                           | 1,357036E+23                           | 2,870351E+23  |
| 2233              | 7,566754E+22                              | 7,566901E+22 | 6,785308E+22 | 6,785277E+22 | 1,513365E+23                           | 1,357059E+23                           | 2,870424E+23  |
| 2234              | 7,566702E+22                              | 7,566529E+22 | 6,785246E+22 | 6,785269E+22 | 1,513323E+23                           | 1,357052E+23                           | 2,870375E+23  |
| 2235              | 7,566681E+22                              | 7,566734E+22 | 6,785383E+22 | 6,785305E+22 | 1,513341E+23                           | 1,357069E+23                           | 2,870410E+23  |
| 2236              | 7,566893E+22                              | 7,566890E+22 | 6,785321E+22 | 6,785471E+22 | 1,513378E+23                           | 1,357079E+23                           | 2,870458E+23  |
| 2237              | 7,566708E+22                              | 7,566610E+22 | 6,785324E+22 | 6,785371E+22 | 1,513332E+23                           | 1,357069E+23                           | 2,870401E+23  |
| 2238              | 7,566771E+22                              | 7,566963E+22 | 6,785474E+22 | 6,785380E+22 | 1,513373E+23                           | 1,357085E+23                           | 2,870459E+23  |
| 2239              | 7,566916E+22                              | 7,566807E+22 | 6,785376E+22 | 6,785388E+22 | 1,513372E+23                           | 1,357076E+23                           | 2,870449E+23  |
| 2240              | 7,566716E+22                              | 7,566640E+22 | 6,785419E+22 | 6,785318E+22 | 1,513336E+23                           | 1,357074E+23                           | 2,870409E+23  |
| 2241              | 7,566808E+22                              | 7,566989E+22 | 6,785457E+22 | 6,785404E+22 | 1,513380E+23                           | 1,357086E+23                           | 2,870466E+23  |
| 2242              | 7,566740E+22                              | 7,566679E+22 | 6,785278E+22 | 6,785340E+22 | 1,513342E+23                           | 1,357062E+23                           | 2,870404E+23  |
| 2243              | 7,566591E+22                              | 7,566726E+22 | 6,785344E+22 | 6,785278E+22 | 1,513332E+23                           | 1,357062E+23                           | 2,870394E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 2244              | 7,566815E+22                              | 7,566872E+22 | 6,785266E+22 | 6,785348E+22 | 1,513369E+23                           | 1,357061E+23                           | 2,870430E+23  |
| 2245              | 7,566700E+22                              | 7,566475E+22 | 6,785193E+22 | 6,785175E+22 | 1,513318E+23                           | 1,357037E+23                           | 2,870354E+23  |
| 2246              | 7,566679E+22                              | 7,566755E+22 | 6,785286E+22 | 6,785147E+22 | 1,513343E+23                           | 1,357043E+23                           | 2,870387E+23  |
| 2247              | 7,566848E+22                              | 7,566753E+22 | 6,785128E+22 | 6,785208E+22 | 1,513360E+23                           | 1,357034E+23                           | 2,870394E+23  |
| 2248              | 7,566613E+22                              | 7,566563E+22 | 6,785135E+22 | 6,785173E+22 | 1,513318E+23                           | 1,357031E+23                           | 2,870348E+23  |
| 2249              | 7,566636E+22                              | 7,566932E+22 | 6,785285E+22 | 6,785254E+22 | 1,513357E+23                           | 1,357054E+23                           | 2,870411E+23  |
| 2250              | 7,566717E+22                              | 7,566679E+22 | 6,785215E+22 | 6,785229E+22 | 1,513340E+23                           | 1,357044E+23                           | 2,870384E+23  |
| 2251              | 7,566594E+22                              | 7,566611E+22 | 6,785371E+22 | 6,785228E+22 | 1,513320E+23                           | 1,357060E+23                           | 2,870380E+23  |
| 2252              | 7,566825E+22                              | 7,566871E+22 | 6,785393E+22 | 6,785420E+22 | 1,513370E+23                           | 1,357081E+23                           | 2,870451E+23  |
| 2253              | 7,566775E+22                              | 7,566565E+22 | 6,785343E+22 | 6,785391E+22 | 1,513334E+23                           | 1,357073E+23                           | 2,870407E+23  |
| 2254              | 7,566668E+22                              | 7,566825E+22 | 6,785484E+22 | 6,785439E+22 | 1,513349E+23                           | 1,357092E+23                           | 2,870442E+23  |
| 2255              | 7,566907E+22                              | 7,566934E+22 | 6,785406E+22 | 6,785541E+22 | 1,513384E+23                           | 1,357095E+23                           | 2,870479E+23  |
| 2256              | 7,566777E+22                              | 7,566649E+22 | 6,785449E+22 | 6,785459E+22 | 1,513343E+23                           | 1,357091E+23                           | 2,870433E+23  |
| 2257              | 7,566775E+22                              | 7,566963E+22 | 6,785621E+22 | 6,785479E+22 | 1,513374E+23                           | 1,357110E+23                           | 2,870484E+23  |
| 2258              | 7,566927E+22                              | 7,566824E+22 | 6,785485E+22 | 6,785462E+22 | 1,513375E+23                           | 1,357095E+23                           | 2,870470E+23  |
| 2259              | 7,566706E+22                              | 7,566682E+22 | 6,785515E+22 | 6,785436E+22 | 1,513339E+23                           | 1,357095E+23                           | 2,870434E+23  |
| 2260              | 7,566783E+22                              | 7,566989E+22 | 6,785493E+22 | 6,785557E+22 | 1,513377E+23                           | 1,357105E+23                           | 2,870482E+23  |
| 2261              | 7,566783E+22                              | 7,566662E+22 | 6,785372E+22 | 6,785417E+22 | 1,513344E+23                           | 1,357079E+23                           | 2,870423E+23  |
| 2262              | 7,566620E+22                              | 7,566711E+22 | 6,785445E+22 | 6,785333E+22 | 1,513333E+23                           | 1,357078E+23                           | 2,870411E+23  |
| 2263              | 7,566886E+22                              | 7,566847E+22 | 6,785314E+22 | 6,785370E+22 | 1,513373E+23                           | 1,357068E+23                           | 2,870442E+23  |
| 2264              | 7,566780E+22                              | 7,566524E+22 | 6,785240E+22 | 6,785257E+22 | 1,513330E+23                           | 1,357050E+23                           | 2,870380E+23  |
| 2265              | 7,566630E+22                              | 7,566830E+22 | 6,785369E+22 | 6,785271E+22 | 1,513346E+23                           | 1,357064E+23                           | 2,870410E+23  |
| 2266              | 7,566802E+22                              | 7,566852E+22 | 6,785225E+22 | 6,785288E+22 | 1,513365E+23                           | 1,357051E+23                           | 2,870417E+23  |
| 2267              | 7,566597E+22                              | 7,566606E+22 | 6,785297E+22 | 6,785270E+22 | 1,513320E+23                           | 1,357057E+23                           | 2,870377E+23  |
| 2268              | 7,566652E+22                              | 7,566886E+22 | 6,785430E+22 | 6,785388E+22 | 1,513354E+23                           | 1,357082E+23                           | 2,870436E+23  |
| 2269              | 7,566812E+22                              | 7,566632E+22 | 6,785376E+22 | 6,785339E+22 | 1,513344E+23                           | 1,357072E+23                           | 2,870416E+23  |
| 2270              | 7,566629E+22                              | 7,566610E+22 | 6,785492E+22 | 6,785376E+22 | 1,513324E+23                           | 1,357087E+23                           | 2,870411E+23  |
| 2271              | 7,566868E+22                              | 7,566907E+22 | 6,785430E+22 | 6,785552E+22 | 1,513378E+23                           | 1,357098E+23                           | 2,870476E+23  |
| 2272              | 7,566838E+22                              | 7,566654E+22 | 6,785382E+22 | 6,785528E+22 | 1,513349E+23                           | 1,357091E+23                           | 2,870440E+23  |
| 2273              | 7,566660E+22                              | 7,566871E+22 | 6,785604E+22 | 6,785542E+22 | 1,513353E+23                           | 1,357115E+23                           | 2,870468E+23  |
| 2274              | 7,566950E+22                              | 7,566973E+22 | 6,785536E+22 | 6,785556E+22 | 1,513392E+23                           | 1,357109E+23                           | 2,870502E+23  |
| 2275              | 7,566823E+22                              | 7,566667E+22 | 6,785597E+22 | 6,785514E+22 | 1,513349E+23                           | 1,357111E+23                           | 2,870460E+23  |
| 2276              | 7,566774E+22                              | 7,566957E+22 | 6,785718E+22 | 6,785611E+22 | 1,513373E+23                           | 1,357133E+23                           | 2,870506E+23  |
| 2277              | 7,566932E+22                              | 7,566850E+22 | 6,785583E+22 | 6,785582E+22 | 1,513378E+23                           | 1,357117E+23                           | 2,870495E+23  |
| 2278              | 7,566650E+22                              | 7,566723E+22 | 6,785606E+22 | 6,785564E+22 | 1,513337E+23                           | 1,357117E+23                           | 2,870454E+23  |
| 2279              | 7,566796E+22                              | 7,566969E+22 | 6,785547E+22 | 6,785627E+22 | 1,513377E+23                           | 1,357117E+23                           | 2,870494E+23  |
| 2280              | 7,566869E+22                              | 7,566661E+22 | 6,785437E+22 | 6,785493E+22 | 1,513353E+23                           | 1,357093E+23                           | 2,870446E+23  |
| 2281              | 7,566649E+22                              | 7,566709E+22 | 6,785539E+22 | 6,785417E+22 | 1,513336E+23                           | 1,357096E+23                           | 2,870431E+23  |
| 2282              | 7,566916E+22                              | 7,566896E+22 | 6,785385E+22 | 6,785417E+22 | 1,513381E+23                           | 1,357080E+23                           | 2,870461E+23  |
| 2283              | 7,566778E+22                              | 7,566615E+22 | 6,785331E+22 | 6,785357E+22 | 1,513339E+23                           | 1,357069E+23                           | 2,870408E+23  |
| 2284              | 7,566595E+22                              | 7,566864E+22 | 6,785457E+22 | 6,785408E+22 | 1,513346E+23                           | 1,357086E+23                           | 2,870432E+23  |
| 2285              | 7,566828E+22                              | 7,566840E+22 | 6,785387E+22 | 6,785374E+22 | 1,513367E+23                           | 1,357076E+23                           | 2,870443E+23  |
| 2286              | 7,566618E+22                              | 7,566584E+22 | 6,785459E+22 | 6,785365E+22 | 1,513320E+23                           | 1,357082E+23                           | 2,870403E+23  |
| 2287              | 7,566727E+22                              | 7,566825E+22 | 6,785508E+22 | 6,785481E+22 | 1,513355E+23                           | 1,357099E+23                           | 2,870454E+23  |
| 2288              | 7,566896E+22                              | 7,566667E+22 | 6,785429E+22 | 6,785488E+22 | 1,513356E+23                           | 1,357092E+23                           | 2,870448E+23  |
| 2289              | 7,566616E+22                              | 7,566688E+22 | 6,785552E+22 | 6,785529E+22 | 1,513330E+23                           | 1,357108E+23                           | 2,870439E+23  |
| 2290              | 7,566863E+22                              | 7,566999E+22 | 6,785510E+22 | 6,785624E+22 | 1,513386E+23                           | 1,357113E+23                           | 2,870500E+23  |
| 2291              | 7,566863E+22                              | 7,566732E+22 | 6,785536E+22 | 6,785595E+22 | 1,513360E+23                           | 1,357113E+23                           | 2,870473E+23  |
| 2292              | 7,566687E+22                              | 7,566867E+22 | 6,785753E+22 | 6,785637E+22 | 1,513355E+23                           | 1,357139E+23                           | 2,870494E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 2293                   | 7,567011E+22                              | 7,566960E+22 | 6,785715E+22 | 6,785644E+22 | 1,513397E+23                           | 1,357136E+23                           | 2,870533E+23  |
| 2294                   | 7,566806E+22                              | 7,566690E+22 | 6,785733E+22 | 6,785655E+22 | 1,513350E+23                           | 1,357139E+23                           | 2,870488E+23  |
| 2295                   | 7,566758E+22                              | 7,566959E+22 | 6,785756E+22 | 6,785756E+22 | 1,513372E+23                           | 1,357151E+23                           | 2,870523E+23  |
| 2296                   | 7,566953E+22                              | 7,566885E+22 | 6,785618E+22 | 6,785729E+22 | 1,513384E+23                           | 1,357135E+23                           | 2,870519E+23  |
| 2297                   | 7,566652E+22                              | 7,566709E+22 | 6,785684E+22 | 6,785659E+22 | 1,513336E+23                           | 1,357134E+23                           | 2,870470E+23  |
| 2298                   | 7,566866E+22                              | 7,566959E+22 | 6,785621E+22 | 6,785627E+22 | 1,513383E+23                           | 1,357125E+23                           | 2,870507E+23  |
| 2299                   | 7,566950E+22                              | 7,566695E+22 | 6,785522E+22 | 6,785521E+22 | 1,513365E+23                           | 1,357104E+23                           | 2,870469E+23  |
| 2300                   | 7,566662E+22                              | 7,566741E+22 | 6,785606E+22 | 6,785510E+22 | 1,513340E+23                           | 1,357112E+23                           | 2,870452E+23  |
| 2301                   | 7,566918E+22                              | 7,566962E+22 | 6,785496E+22 | 6,785500E+22 | 1,513388E+23                           | 1,357100E+23                           | 2,870488E+23  |
| 2302                   | 7,566715E+22                              | 7,566673E+22 | 6,785472E+22 | 6,785468E+22 | 1,513339E+23                           | 1,357094E+23                           | 2,870433E+23  |
| 2303                   | 7,566591E+22                              | 7,566834E+22 | 6,785571E+22 | 6,785507E+22 | 1,513343E+23                           | 1,357108E+23                           | 2,870450E+23  |
| 2304                   | 7,566893E+22                              | 7,566822E+22 | 6,785490E+22 | 6,785497E+22 | 1,513372E+23                           | 1,357099E+23                           | 2,870470E+23  |
| 2305                   | 7,566636E+22                              | 7,566557E+22 | 6,785565E+22 | 6,785510E+22 | 1,513319E+23                           | 1,357108E+23                           | 2,870427E+23  |
| 2306                   | 7,566769E+22                              | 7,566860E+22 | 6,785567E+22 | 6,785584E+22 | 1,513363E+23                           | 1,357115E+23                           | 2,870478E+23  |
| 2307                   | 7,566924E+22                              | 7,566766E+22 | 6,785489E+22 | 6,785618E+22 | 1,513369E+23                           | 1,357111E+23                           | 2,870480E+23  |
| 2308                   | 7,566623E+22                              | 7,566741E+22 | 6,785640E+22 | 6,785659E+22 | 1,513336E+23                           | 1,357130E+23                           | 2,870466E+23  |
| 2309                   | 7,566928E+22                              | 7,567018E+22 | 6,785681E+22 | 6,785675E+22 | 1,513395E+23                           | 1,357136E+23                           | 2,870530E+23  |
| 2310                   | 7,566890E+22                              | 7,566753E+22 | 6,785722E+22 | 6,785660E+22 | 1,513364E+23                           | 1,357138E+23                           | 2,870502E+23  |
| 2311                   | 7,566730E+22                              | 7,566845E+22 | 6,785861E+22 | 6,785730E+22 | 1,513357E+23                           | 1,357159E+23                           | 2,870517E+23  |
| 2312                   | 7,567031E+22                              | 7,567003E+22 | 6,785792E+22 | 6,785798E+22 | 1,513403E+23                           | 1,357159E+23                           | 2,870563E+23  |
| 2313                   | 7,566746E+22                              | 7,566734E+22 | 6,785814E+22 | 6,785825E+22 | 1,513348E+23                           | 1,357164E+23                           | 2,870512E+23  |
| 2314                   | 7,566747E+22                              | 7,566982E+22 | 6,785825E+22 | 6,785838E+22 | 1,513373E+23                           | 1,357166E+23                           | 2,870539E+23  |
| 2315                   | 7,567000E+22                              | 7,566907E+22 | 6,785718E+22 | 6,785800E+22 | 1,513391E+23                           | 1,357152E+23                           | 2,870543E+23  |
| 2316                   | 7,566716E+22                              | 7,566683E+22 | 6,785772E+22 | 6,785734E+22 | 1,513340E+23                           | 1,357151E+23                           | 2,870490E+23  |
| 2317                   | 7,566955E+22                              | 7,566950E+22 | 6,785740E+22 | 6,785673E+22 | 1,513390E+23                           | 1,357141E+23                           | 2,870532E+23  |
| 2318                   | 7,566945E+22                              | 7,566768E+22 | 6,785628E+22 | 6,785609E+22 | 1,513371E+23                           | 1,357124E+23                           | 2,870495E+23  |
| 2319                   | 7,566645E+22                              | 7,566775E+22 | 6,785647E+22 | 6,785617E+22 | 1,513342E+23                           | 1,357126E+23                           | 2,870468E+23  |
| 2320                   | 7,566902E+22                              | 7,567007E+22 | 6,785576E+22 | 6,785622E+22 | 1,513391E+23                           | 1,357120E+23                           | 2,870511E+23  |
| 2321                   | 7,566689E+22                              | 7,566654E+22 | 6,785596E+22 | 6,785577E+22 | 1,513334E+23                           | 1,357117E+23                           | 2,870452E+23  |
| 2322                   | 7,566630E+22                              | 7,566785E+22 | 6,785667E+22 | 6,785560E+22 | 1,513342E+23                           | 1,357123E+23                           | 2,870464E+23  |
| 2323                   | 7,566956E+22                              | 7,566836E+22 | 6,785576E+22 | 6,785604E+22 | 1,513379E+23                           | 1,357118E+23                           | 2,870497E+23  |
| 2324                   | 7,566662E+22                              | 7,566587E+22 | 6,785616E+22 | 6,785653E+22 | 1,513325E+23                           | 1,357127E+23                           | 2,870452E+23  |
| 2325                   | 7,566807E+22                              | 7,566925E+22 | 6,785668E+22 | 6,785683E+22 | 1,513373E+23                           | 1,357135E+23                           | 2,870508E+23  |
| 2326                   | 7,566914E+22                              | 7,566856E+22 | 6,785638E+22 | 6,785703E+22 | 1,513377E+23                           | 1,357134E+23                           | 2,870511E+23  |
| 2327                   | 7,566662E+22                              | 7,566740E+22 | 6,785775E+22 | 6,785736E+22 | 1,513340E+23                           | 1,357151E+23                           | 2,870491E+23  |
| 2328                   | 7,566986E+22                              | 7,567034E+22 | 6,785832E+22 | 6,785783E+22 | 1,513402E+23                           | 1,357162E+23                           | 2,870564E+23  |
| 2329                   | 7,566884E+22                              | 7,566751E+22 | 6,785873E+22 | 6,785815E+22 | 1,513363E+23                           | 1,357169E+23                           | 2,870532E+23  |
| 2330                   | 7,566724E+22                              | 7,566866E+22 | 6,785946E+22 | 6,785861E+22 | 1,513359E+23                           | 1,357181E+23                           | 2,870540E+23  |
| 2331                   | 7,567029E+22                              | 7,567070E+22 | 6,785852E+22 | 6,785958E+22 | 1,513410E+23                           | 1,357181E+23                           | 2,870591E+23  |
| 2332                   | 7,566754E+22                              | 7,566733E+22 | 6,785882E+22 | 6,785959E+22 | 1,513349E+23                           | 1,357184E+23                           | 2,870533E+23  |
| 2333                   | 7,566846E+22                              | 7,566952E+22 | 6,785945E+22 | 6,785874E+22 | 1,513380E+23                           | 1,357182E+23                           | 2,870562E+23  |
| 2334                   | 7,567064E+22                              | 7,566916E+22 | 6,785835E+22 | 6,785825E+22 | 1,513398E+23                           | 1,357166E+23                           | 2,870564E+23  |
| 2335                   | 7,566781E+22                              | 7,566686E+22 | 6,785823E+22 | 6,785788E+22 | 1,513347E+23                           | 1,357161E+23                           | 2,870508E+23  |
| 2336                   | 7,566966E+22                              | 7,567033E+22 | 6,785787E+22 | 6,785765E+22 | 1,513400E+23                           | 1,357155E+23                           | 2,870555E+23  |
| 2337                   | 7,566854E+22                              | 7,566835E+22 | 6,785719E+22 | 6,785731E+22 | 1,513369E+23                           | 1,357145E+23                           | 2,870514E+23  |
| 2338                   | 7,566595E+22                              | 7,566797E+22 | 6,785750E+22 | 6,785685E+22 | 1,513339E+23                           | 1,357144E+23                           | 2,870483E+23  |
| 2339                   | 7,566907E+22                              | 7,567009E+22 | 6,785696E+22 | 6,785720E+22 | 1,513392E+23                           | 1,357142E+23                           | 2,870533E+23  |
| 2340                   | 7,566722E+22                              | 7,566599E+22 | 6,785707E+22 | 6,785705E+22 | 1,513332E+23                           | 1,357141E+23                           | 2,870473E+23  |
| 2341                   | 7,566723E+22                              | 7,566748E+22 | 6,785779E+22 | 6,785660E+22 | 1,513347E+23                           | 1,357144E+23                           | 2,870491E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 2342                   | 7,566976E+22                              | 7,566895E+22 | 6,785668E+22 | 6,785722E+22 | 1,513387E+23                           | 1,357139E+23                           | 2,870526E+23  |
| 2343                   | 7,566697E+22                              | 7,566635E+22 | 6,785658E+22 | 6,785769E+22 | 1,513333E+23                           | 1,357143E+23                           | 2,870476E+23  |
| 2344                   | 7,566849E+22                              | 7,566988E+22 | 6,785770E+22 | 6,785776E+22 | 1,513384E+23                           | 1,357155E+23                           | 2,870538E+23  |
| 2345                   | 7,566922E+22                              | 7,566876E+22 | 6,785807E+22 | 6,785790E+22 | 1,513380E+23                           | 1,357160E+23                           | 2,870539E+23  |
| 2346                   | 7,566703E+22                              | 7,566738E+22 | 6,785916E+22 | 6,785796E+22 | 1,513344E+23                           | 1,357171E+23                           | 2,870515E+23  |
| 2347                   | 7,567005E+22                              | 7,567082E+22 | 6,785950E+22 | 6,785924E+22 | 1,513409E+23                           | 1,357187E+23                           | 2,870596E+23  |
| 2348                   | 7,566865E+22                              | 7,566782E+22 | 6,785962E+22 | 6,786000E+22 | 1,513365E+23                           | 1,357196E+23                           | 2,870561E+23  |
| 2349                   | 7,566744E+22                              | 7,566882E+22 | 6,786054E+22 | 6,785992E+22 | 1,513363E+23                           | 1,357205E+23                           | 2,870567E+23  |
| 2350                   | 7,567035E+22                              | 7,567109E+22 | 6,785983E+22 | 6,786048E+22 | 1,513414E+23                           | 1,357203E+23                           | 2,870617E+23  |
| 2351                   | 7,566837E+22                              | 7,566704E+22 | 6,785952E+22 | 6,786018E+22 | 1,513354E+23                           | 1,357197E+23                           | 2,870551E+23  |
| 2352                   | 7,566932E+22                              | 7,566962E+22 | 6,786028E+22 | 6,785935E+22 | 1,513389E+23                           | 1,357196E+23                           | 2,870586E+23  |
| 2353                   | 7,567066E+22                              | 7,566952E+22 | 6,785929E+22 | 6,785915E+22 | 1,513402E+23                           | 1,357184E+23                           | 2,870586E+23  |
| 2354                   | 7,566755E+22                              | 7,566738E+22 | 6,785874E+22 | 6,785861E+22 | 1,513349E+23                           | 1,357173E+23                           | 2,870523E+23  |
| 2355                   | 7,566917E+22                              | 7,567115E+22 | 6,785854E+22 | 6,785884E+22 | 1,513403E+23                           | 1,357174E+23                           | 2,870577E+23  |
| 2356                   | 7,566823E+22                              | 7,566819E+22 | 6,785824E+22 | 6,785846E+22 | 1,513364E+23                           | 1,357167E+23                           | 2,870531E+23  |
| 2357                   | 7,566660E+22                              | 7,566726E+22 | 6,785891E+22 | 6,785739E+22 | 1,513339E+23                           | 1,357163E+23                           | 2,870502E+23  |
| 2358                   | 7,566955E+22                              | 7,566986E+22 | 6,785821E+22 | 6,785783E+22 | 1,513394E+23                           | 1,357160E+23                           | 2,870555E+23  |
| 2359                   | 7,566795E+22                              | 7,566580E+22 | 6,785743E+22 | 6,785806E+22 | 1,513337E+23                           | 1,357155E+23                           | 2,870492E+23  |
| 2360                   | 7,566765E+22                              | 7,566823E+22 | 6,785819E+22 | 6,785778E+22 | 1,513359E+23                           | 1,357160E+23                           | 2,870519E+23  |
| 2361                   | 7,566944E+22                              | 7,566976E+22 | 6,785766E+22 | 6,785844E+22 | 1,513392E+23                           | 1,357161E+23                           | 2,870553E+23  |
| 2362                   | 7,566699E+22                              | 7,566687E+22 | 6,785782E+22 | 6,785828E+22 | 1,513339E+23                           | 1,357161E+23                           | 2,870500E+23  |
| 2363                   | 7,566877E+22                              | 7,567040E+22 | 6,785921E+22 | 6,785872E+22 | 1,513392E+23                           | 1,357179E+23                           | 2,870571E+23  |
| 2364                   | 7,566943E+22                              | 7,566863E+22 | 6,785972E+22 | 6,785937E+22 | 1,513381E+23                           | 1,357191E+23                           | 2,870571E+23  |
| 2365                   | 7,566761E+22                              | 7,566729E+22 | 6,786070E+22 | 6,785936E+22 | 1,513349E+23                           | 1,357201E+23                           | 2,870550E+23  |
| 2366                   | 7,566988E+22                              | 7,567135E+22 | 6,786061E+22 | 6,786079E+22 | 1,513412E+23                           | 1,357214E+23                           | 2,870626E+23  |
| 2367                   | 7,566888E+22                              | 7,566795E+22 | 6,786007E+22 | 6,786153E+22 | 1,513368E+23                           | 1,357216E+23                           | 2,870584E+23  |
| 2368                   | 7,566813E+22                              | 7,566897E+22 | 6,786124E+22 | 6,786080E+22 | 1,513371E+23                           | 1,357220E+23                           | 2,870591E+23  |
| 2369                   | 7,567075E+22                              | 7,567091E+22 | 6,786096E+22 | 6,786106E+22 | 1,513417E+23                           | 1,357220E+23                           | 2,870637E+23  |
| 2370                   | 7,566899E+22                              | 7,566715E+22 | 6,786027E+22 | 6,786029E+22 | 1,513361E+23                           | 1,357206E+23                           | 2,870567E+23  |
| 2371                   | 7,566953E+22                              | 7,567043E+22 | 6,786085E+22 | 6,786011E+22 | 1,513400E+23                           | 1,357210E+23                           | 2,870609E+23  |
| 2372                   | 7,567018E+22                              | 7,567013E+22 | 6,786011E+22 | 6,786034E+22 | 1,513403E+23                           | 1,357205E+23                           | 2,870608E+23  |
| 2373                   | 7,566739E+22                              | 7,566764E+22 | 6,785996E+22 | 6,785944E+22 | 1,513350E+23                           | 1,357194E+23                           | 2,870544E+23  |
| 2374                   | 7,566875E+22                              | 7,567126E+22 | 6,786007E+22 | 6,785955E+22 | 1,513400E+23                           | 1,357196E+23                           | 2,870596E+23  |
| 2375                   | 7,566872E+22                              | 7,566753E+22 | 6,785917E+22 | 6,785940E+22 | 1,513362E+23                           | 1,357186E+23                           | 2,870548E+23  |
| 2376                   | 7,566743E+22                              | 7,566691E+22 | 6,785971E+22 | 6,785841E+22 | 1,513343E+23                           | 1,357181E+23                           | 2,870525E+23  |
| 2377                   | 7,566974E+22                              | 7,566992E+22 | 6,785903E+22 | 6,785915E+22 | 1,513397E+23                           | 1,357182E+23                           | 2,870578E+23  |
| 2378                   | 7,566809E+22                              | 7,566649E+22 | 6,785768E+22 | 6,785899E+22 | 1,513346E+23                           | 1,357167E+23                           | 2,870513E+23  |
| 2379                   | 7,566769E+22                              | 7,566935E+22 | 6,785875E+22 | 6,785893E+22 | 1,513370E+23                           | 1,357177E+23                           | 2,870547E+23  |
| 2380                   | 7,566956E+22                              | 7,567005E+22 | 6,785904E+22 | 6,785943E+22 | 1,513396E+23                           | 1,357185E+23                           | 2,870581E+23  |
| 2381                   | 7,566778E+22                              | 7,566666E+22 | 6,785965E+22 | 6,785888E+22 | 1,513344E+23                           | 1,357185E+23                           | 2,870530E+23  |
| 2382                   | 7,566897E+22                              | 7,567066E+22 | 6,786100E+22 | 6,785963E+22 | 1,513396E+23                           | 1,357206E+23                           | 2,870603E+23  |
| 2383                   | 7,566979E+22                              | 7,566866E+22 | 6,786051E+22 | 6,786087E+22 | 1,513384E+23                           | 1,357214E+23                           | 2,870598E+23  |
| 2384                   | 7,566771E+22                              | 7,566774E+22 | 6,786143E+22 | 6,786094E+22 | 1,513355E+23                           | 1,357224E+23                           | 2,870578E+23  |
| 2385                   | 7,566959E+22                              | 7,567167E+22 | 6,786170E+22 | 6,786219E+22 | 1,513413E+23                           | 1,357239E+23                           | 2,870652E+23  |
| 2386                   | 7,566920E+22                              | 7,566803E+22 | 6,786091E+22 | 6,786208E+22 | 1,513372E+23                           | 1,357230E+23                           | 2,870602E+23  |
| 2387                   | 7,566882E+22                              | 7,566934E+22 | 6,786211E+22 | 6,786155E+22 | 1,513382E+23                           | 1,357237E+23                           | 2,870618E+23  |
| 2388                   | 7,567124E+22                              | 7,567091E+22 | 6,786208E+22 | 6,786198E+22 | 1,513422E+23                           | 1,357241E+23                           | 2,870662E+23  |
| 2389                   | 7,566947E+22                              | 7,566743E+22 | 6,786139E+22 | 6,786105E+22 | 1,513369E+23                           | 1,357224E+23                           | 2,870594E+23  |
| 2390                   | 7,566903E+22                              | 7,567131E+22 | 6,786191E+22 | 6,786100E+22 | 1,513403E+23                           | 1,357229E+23                           | 2,870632E+23  |



| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 2391              | 7,567000E+22                              | 7,567020E+22 | 6,786076E+22 | 6,786148E+22 | 1,513402E+23                           | 1,357222E+23                           | 2,870624E+23  |
| 2392              | 7,566769E+22                              | 7,566739E+22 | 6,786101E+22 | 6,786025E+22 | 1,513351E+23                           | 1,357213E+23                           | 2,870563E+23  |
| 2393              | 7,566894E+22                              | 7,567068E+22 | 6,786125E+22 | 6,786041E+22 | 1,513396E+23                           | 1,357217E+23                           | 2,870613E+23  |
| 2394              | 7,566921E+22                              | 7,566735E+22 | 6,785963E+22 | 6,786003E+22 | 1,513366E+23                           | 1,357197E+23                           | 2,870562E+23  |
| 2395              | 7,566781E+22                              | 7,566773E+22 | 6,785980E+22 | 6,785961E+22 | 1,513355E+23                           | 1,357194E+23                           | 2,870549E+23  |
| 2396              | 7,566961E+22                              | 7,567056E+22 | 6,785967E+22 | 6,786046E+22 | 1,513402E+23                           | 1,357201E+23                           | 2,870603E+23  |
| 2397              | 7,566840E+22                              | 7,566715E+22 | 6,785895E+22 | 6,785967E+22 | 1,513355E+23                           | 1,357186E+23                           | 2,870542E+23  |
| 2398              | 7,566769E+22                              | 7,566991E+22 | 6,786052E+22 | 6,785937E+22 | 1,513376E+23                           | 1,357199E+23                           | 2,870575E+23  |
| 2399              | 7,567005E+22                              | 7,566983E+22 | 6,786045E+22 | 6,786045E+22 | 1,513399E+23                           | 1,357209E+23                           | 2,870608E+23  |
| 2400              | 7,566837E+22                              | 7,566661E+22 | 6,786105E+22 | 6,786014E+22 | 1,513350E+23                           | 1,357212E+23                           | 2,870562E+23  |
| 2401              | 7,566871E+22                              | 7,567066E+22 | 6,786223E+22 | 6,786138E+22 | 1,513394E+23                           | 1,357236E+23                           | 2,870630E+23  |
| 2402              | 7,566963E+22                              | 7,566907E+22 | 6,786103E+22 | 6,786231E+22 | 1,513387E+23                           | 1,357233E+23                           | 2,870620E+23  |
| 2403              | 7,566798E+22                              | 7,566839E+22 | 6,786186E+22 | 6,786234E+22 | 1,513364E+23                           | 1,357242E+23                           | 2,870606E+23  |
| 2404              | 7,567010E+22                              | 7,567148E+22 | 6,786290E+22 | 6,786313E+22 | 1,513416E+23                           | 1,357260E+23                           | 2,870676E+23  |
| 2405              | 7,567035E+22                              | 7,566800E+22 | 6,786221E+22 | 6,786231E+22 | 1,513384E+23                           | 1,357245E+23                           | 2,870629E+23  |
| 2406              | 7,566921E+22                              | 7,566994E+22 | 6,786338E+22 | 6,786191E+22 | 1,513392E+23                           | 1,357253E+23                           | 2,870644E+23  |
| 2407              | 7,567139E+22                              | 7,567136E+22 | 6,786273E+22 | 6,786306E+22 | 1,513428E+23                           | 1,357258E+23                           | 2,870685E+23  |
| 2408              | 7,566926E+22                              | 7,566809E+22 | 6,786229E+22 | 6,786219E+22 | 1,513374E+23                           | 1,357245E+23                           | 2,870618E+23  |
| 2409              | 7,566826E+22                              | 7,567146E+22 | 6,786325E+22 | 6,786219E+22 | 1,513397E+23                           | 1,357254E+23                           | 2,870652E+23  |
| 2410              | 7,566988E+22                              | 7,566998E+22 | 6,786167E+22 | 6,786218E+22 | 1,513399E+23                           | 1,357239E+23                           | 2,870637E+23  |
| 2411              | 7,566817E+22                              | 7,566735E+22 | 6,786161E+22 | 6,786136E+22 | 1,513355E+23                           | 1,357230E+23                           | 2,870585E+23  |
| 2412              | 7,566944E+22                              | 7,567029E+22 | 6,786210E+22 | 6,786166E+22 | 1,513397E+23                           | 1,357238E+23                           | 2,870635E+23  |
| 2413              | 7,566988E+22                              | 7,566760E+22 | 6,786022E+22 | 6,786092E+22 | 1,513375E+23                           | 1,357211E+23                           | 2,870586E+23  |
| 2414              | 7,566774E+22                              | 7,566880E+22 | 6,786055E+22 | 6,786037E+22 | 1,513365E+23                           | 1,357209E+23                           | 2,870575E+23  |
| 2415              | 7,566991E+22                              | 7,567088E+22 | 6,786035E+22 | 6,786127E+22 | 1,513408E+23                           | 1,357216E+23                           | 2,870624E+23  |
| 2416              | 7,566893E+22                              | 7,566715E+22 | 6,786040E+22 | 6,786018E+22 | 1,513361E+23                           | 1,357206E+23                           | 2,870567E+23  |
| 2417              | 7,566776E+22                              | 7,566970E+22 | 6,786228E+22 | 6,786022E+22 | 1,513375E+23                           | 1,357225E+23                           | 2,870600E+23  |
| 2418              | 7,567012E+22                              | 7,566985E+22 | 6,786139E+22 | 6,786145E+22 | 1,513400E+23                           | 1,357228E+23                           | 2,870628E+23  |
| 2419              | 7,566837E+22                              | 7,566735E+22 | 6,786158E+22 | 6,786191E+22 | 1,513357E+23                           | 1,357235E+23                           | 2,870592E+23  |
| 2420              | 7,566853E+22                              | 7,567088E+22 | 6,786320E+22 | 6,786315E+22 | 1,513394E+23                           | 1,357264E+23                           | 2,870658E+23  |
| 2421              | 7,567010E+22                              | 7,566932E+22 | 6,786222E+22 | 6,786328E+22 | 1,513394E+23                           | 1,357255E+23                           | 2,870649E+23  |
| 2422              | 7,566845E+22                              | 7,566888E+22 | 6,786330E+22 | 6,786288E+22 | 1,513373E+23                           | 1,357262E+23                           | 2,870635E+23  |
| 2423              | 7,567101E+22                              | 7,567135E+22 | 6,786394E+22 | 6,786401E+22 | 1,513424E+23                           | 1,357280E+23                           | 2,870703E+23  |
| 2424              | 7,567106E+22                              | 7,566832E+22 | 6,786346E+22 | 6,786321E+22 | 1,513394E+23                           | 1,357267E+23                           | 2,870660E+23  |
| 2425              | 7,566884E+22                              | 7,567047E+22 | 6,786455E+22 | 6,786323E+22 | 1,513393E+23                           | 1,357278E+23                           | 2,870671E+23  |
| 2426              | 7,567080E+22                              | 7,567197E+22 | 6,786329E+22 | 6,786419E+22 | 1,513428E+23                           | 1,357275E+23                           | 2,870703E+23  |
| 2427              | 7,566914E+22                              | 7,566856E+22 | 6,786290E+22 | 6,786348E+22 | 1,513377E+23                           | 1,357264E+23                           | 2,870641E+23  |
| 2428              | 7,566845E+22                              | 7,567068E+22 | 6,786451E+22 | 6,786322E+22 | 1,513391E+23                           | 1,357277E+23                           | 2,870669E+23  |
| 2429              | 7,567079E+22                              | 7,566954E+22 | 6,786267E+22 | 6,786269E+22 | 1,513403E+23                           | 1,357254E+23                           | 2,870657E+23  |
| 2430              | 7,566868E+22                              | 7,566771E+22 | 6,786225E+22 | 6,786184E+22 | 1,513364E+23                           | 1,357241E+23                           | 2,870605E+23  |
| 2431              | 7,566980E+22                              | 7,567056E+22 | 6,786228E+22 | 6,786269E+22 | 1,513404E+23                           | 1,357250E+23                           | 2,870653E+23  |
| 2432              | 7,567006E+22                              | 7,566837E+22 | 6,786096E+22 | 6,786161E+22 | 1,513384E+23                           | 1,357226E+23                           | 2,870610E+23  |
| 2433              | 7,566735E+22                              | 7,566913E+22 | 6,786198E+22 | 6,786108E+22 | 1,513365E+23                           | 1,357231E+23                           | 2,870596E+23  |
| 2434              | 7,566981E+22                              | 7,567096E+22 | 6,786162E+22 | 6,786180E+22 | 1,513408E+23                           | 1,357234E+23                           | 2,870642E+23  |
| 2435              | 7,566927E+22                              | 7,566741E+22 | 6,786148E+22 | 6,786148E+22 | 1,513367E+23                           | 1,357230E+23                           | 2,870596E+23  |
| 2436              | 7,566781E+22                              | 7,566933E+22 | 6,786370E+22 | 6,786197E+22 | 1,513371E+23                           | 1,357257E+23                           | 2,870628E+23  |
| 2437              | 7,567032E+22                              | 7,567016E+22 | 6,786234E+22 | 6,786297E+22 | 1,513405E+23                           | 1,357253E+23                           | 2,870658E+23  |
| 2438              | 7,566831E+22                              | 7,566817E+22 | 6,786245E+22 | 6,786320E+22 | 1,513365E+23                           | 1,357256E+23                           | 2,870621E+23  |
| 2439              | 7,566917E+22                              | 7,567079E+22 | 6,786401E+22 | 6,786438E+22 | 1,513400E+23                           | 1,357284E+23                           | 2,870683E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 2440              | 7,567118E+22                              | 7,566929E+22 | 6,786354E+22 | 6,786384E+22 | 1,513405E+23                           | 1,357274E+23                           | 2,870678E+23  |
| 2441              | 7,566896E+22                              | 7,566900E+22 | 6,786477E+22 | 6,786360E+22 | 1,513380E+23                           | 1,357284E+23                           | 2,870663E+23  |
| 2442              | 7,567117E+22                              | 7,567186E+22 | 6,786470E+22 | 6,786476E+22 | 1,513430E+23                           | 1,357295E+23                           | 2,870725E+23  |
| 2443              | 7,567089E+22                              | 7,566945E+22 | 6,786403E+22 | 6,786467E+22 | 1,513403E+23                           | 1,357287E+23                           | 2,870690E+23  |
| 2444              | 7,566830E+22                              | 7,567073E+22 | 6,786583E+22 | 6,786472E+22 | 1,513390E+23                           | 1,357306E+23                           | 2,870696E+23  |
| 2445              | 7,567080E+22                              | 7,567192E+22 | 6,786454E+22 | 6,786498E+22 | 1,513427E+23                           | 1,357295E+23                           | 2,870722E+23  |
| 2446              | 7,566935E+22                              | 7,566855E+22 | 6,786418E+22 | 6,786407E+22 | 1,513379E+23                           | 1,357283E+23                           | 2,870662E+23  |
| 2447              | 7,566932E+22                              | 7,566996E+22 | 6,786513E+22 | 6,786419E+22 | 1,513393E+23                           | 1,357293E+23                           | 2,870686E+23  |
| 2448              | 7,567155E+22                              | 7,566937E+22 | 6,786334E+22 | 6,786349E+22 | 1,513409E+23                           | 1,357268E+23                           | 2,870677E+23  |
| 2449              | 7,566856E+22                              | 7,566825E+22 | 6,786287E+22 | 6,786285E+22 | 1,513368E+23                           | 1,357257E+23                           | 2,870625E+23  |
| 2450              | 7,566954E+22                              | 7,567123E+22 | 6,786251E+22 | 6,786334E+22 | 1,513408E+23                           | 1,357259E+23                           | 2,870666E+23  |
| 2451              | 7,567016E+22                              | 7,566908E+22 | 6,786169E+22 | 6,786243E+22 | 1,513392E+23                           | 1,357241E+23                           | 2,870634E+23  |
| 2452              | 7,566752E+22                              | 7,566874E+22 | 6,786365E+22 | 6,786194E+22 | 1,513363E+23                           | 1,357256E+23                           | 2,870618E+23  |
| 2453              | 7,567018E+22                              | 7,567086E+22 | 6,786300E+22 | 6,786255E+22 | 1,513410E+23                           | 1,357255E+23                           | 2,870666E+23  |
| 2454              | 7,566927E+22                              | 7,566798E+22 | 6,786264E+22 | 6,786265E+22 | 1,513373E+23                           | 1,357253E+23                           | 2,870625E+23  |
| 2455              | 7,566795E+22                              | 7,566940E+22 | 6,786432E+22 | 6,786379E+22 | 1,513373E+23                           | 1,357281E+23                           | 2,870655E+23  |
| 2456              | 7,567062E+22                              | 7,567048E+22 | 6,786343E+22 | 6,786428E+22 | 1,513411E+23                           | 1,357277E+23                           | 2,870688E+23  |
| 2457              | 7,566848E+22                              | 7,566839E+22 | 6,786389E+22 | 6,786423E+22 | 1,513369E+23                           | 1,357281E+23                           | 2,870650E+23  |
| 2458              | 7,566970E+22                              | 7,567090E+22 | 6,786501E+22 | 6,786504E+22 | 1,513406E+23                           | 1,357301E+23                           | 2,870707E+23  |
| 2459              | 7,567197E+22                              | 7,566992E+22 | 6,786448E+22 | 6,786496E+22 | 1,513419E+23                           | 1,357294E+23                           | 2,870713E+23  |
| 2460              | 7,566916E+22                              | 7,566907E+22 | 6,786621E+22 | 6,786504E+22 | 1,513382E+23                           | 1,357313E+23                           | 2,870695E+23  |
| 2461              | 7,567105E+22                              | 7,567260E+22 | 6,786575E+22 | 6,786594E+22 | 1,513436E+23                           | 1,357317E+23                           | 2,870753E+23  |
| 2462              | 7,567058E+22                              | 7,567026E+22 | 6,786508E+22 | 6,786565E+22 | 1,513408E+23                           | 1,357307E+23                           | 2,870716E+23  |
| 2463              | 7,566857E+22                              | 7,567008E+22 | 6,786679E+22 | 6,786582E+22 | 1,513387E+23                           | 1,357326E+23                           | 2,870713E+23  |
| 2464              | 7,567160E+22                              | 7,567133E+22 | 6,786574E+22 | 6,786549E+22 | 1,513429E+23                           | 1,357312E+23                           | 2,870742E+23  |
| 2465              | 7,566976E+22                              | 7,566827E+22 | 6,786506E+22 | 6,786476E+22 | 1,513380E+23                           | 1,357298E+23                           | 2,870679E+23  |
| 2466              | 7,566951E+22                              | 7,567021E+22 | 6,786517E+22 | 6,786490E+22 | 1,513397E+23                           | 1,357301E+23                           | 2,870698E+23  |
| 2467              | 7,567160E+22                              | 7,567052E+22 | 6,786335E+22 | 6,786456E+22 | 1,513421E+23                           | 1,357279E+23                           | 2,870700E+23  |
| 2468              | 7,566824E+22                              | 7,566862E+22 | 6,786399E+22 | 6,786383E+22 | 1,513369E+23                           | 1,357278E+23                           | 2,870647E+23  |
| 2469              | 7,566950E+22                              | 7,567159E+22 | 6,786388E+22 | 6,786370E+22 | 1,513411E+23                           | 1,357276E+23                           | 2,870687E+23  |
| 2470              | 7,567026E+22                              | 7,566944E+22 | 6,786330E+22 | 6,786299E+22 | 1,513397E+23                           | 1,357263E+23                           | 2,870660E+23  |
| 2471              | 7,566798E+22                              | 7,566814E+22 | 6,786488E+22 | 6,786338E+22 | 1,513361E+23                           | 1,357283E+23                           | 2,870644E+23  |
| 2472              | 7,567056E+22                              | 7,567071E+22 | 6,786419E+22 | 6,786399E+22 | 1,513413E+23                           | 1,357282E+23                           | 2,870694E+23  |
| 2473              | 7,566905E+22                              | 7,566839E+22 | 6,786356E+22 | 6,786435E+22 | 1,513374E+23                           | 1,357279E+23                           | 2,870653E+23  |
| 2474              | 7,566807E+22                              | 7,566967E+22 | 6,786468E+22 | 6,786500E+22 | 1,513377E+23                           | 1,357297E+23                           | 2,870674E+23  |
| 2475              | 7,567138E+22                              | 7,567087E+22 | 6,786419E+22 | 6,786530E+22 | 1,513422E+23                           | 1,357295E+23                           | 2,870717E+23  |
| 2476              | 7,566932E+22                              | 7,566820E+22 | 6,786548E+22 | 6,786503E+22 | 1,513375E+23                           | 1,357305E+23                           | 2,870680E+23  |
| 2477              | 7,567042E+22                              | 7,567130E+22 | 6,786619E+22 | 6,786551E+22 | 1,513417E+23                           | 1,357317E+23                           | 2,870734E+23  |
| 2478              | 7,567198E+22                              | 7,567104E+22 | 6,786570E+22 | 6,786583E+22 | 1,513430E+23                           | 1,357315E+23                           | 2,870745E+23  |
| 2479              | 7,566903E+22                              | 7,566945E+22 | 6,786712E+22 | 6,786658E+22 | 1,513385E+23                           | 1,357337E+23                           | 2,870722E+23  |
| 2480              | 7,567086E+22                              | 7,567269E+22 | 6,786712E+22 | 6,786699E+22 | 1,513435E+23                           | 1,357341E+23                           | 2,870777E+23  |
| 2481              | 7,567037E+22                              | 7,567013E+22 | 6,786661E+22 | 6,786669E+22 | 1,513405E+23                           | 1,357333E+23                           | 2,870738E+23  |
| 2482              | 7,566895E+22                              | 7,566960E+22 | 6,786740E+22 | 6,786662E+22 | 1,513386E+23                           | 1,357340E+23                           | 2,870726E+23  |
| 2483              | 7,567232E+22                              | 7,567143E+22 | 6,786612E+22 | 6,786662E+22 | 1,513437E+23                           | 1,357327E+23                           | 2,870765E+23  |
| 2484              | 7,567003E+22                              | 7,566835E+22 | 6,786578E+22 | 6,786594E+22 | 1,513384E+23                           | 1,357317E+23                           | 2,870701E+23  |
| 2485              | 7,566947E+22                              | 7,567109E+22 | 6,786550E+22 | 6,786558E+22 | 1,513406E+23                           | 1,357311E+23                           | 2,870716E+23  |
| 2486              | 7,567144E+22                              | 7,567157E+22 | 6,786426E+22 | 6,786501E+22 | 1,513430E+23                           | 1,357293E+23                           | 2,870723E+23  |
| 2487              | 7,566861E+22                              | 7,566825E+22 | 6,786519E+22 | 6,786459E+22 | 1,513369E+23                           | 1,357298E+23                           | 2,870666E+23  |
| 2488              | 7,567001E+22                              | 7,567117E+22 | 6,786551E+22 | 6,786419E+22 | 1,513412E+23                           | 1,357297E+23                           | 2,870709E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 2489              | 7,567030E+22                              | 7,566938E+22 | 6,786467E+22 | 6,786409E+22 | 1,513397E+23                           | 1,357288E+23                           | 2,870684E+23  |
| 2490              | 7,566792E+22                              | 7,566822E+22 | 6,786526E+22 | 6,786476E+22 | 1,513361E+23                           | 1,357300E+23                           | 2,870662E+23  |
| 2491              | 7,567069E+22                              | 7,567145E+22 | 6,786455E+22 | 6,786563E+22 | 1,513421E+23                           | 1,357302E+23                           | 2,870723E+23  |
| 2492              | 7,566918E+22                              | 7,566842E+22 | 6,786477E+22 | 6,786566E+22 | 1,513376E+23                           | 1,357304E+23                           | 2,870680E+23  |
| 2493              | 7,566862E+22                              | 7,567005E+22 | 6,786584E+22 | 6,786555E+22 | 1,513387E+23                           | 1,357314E+23                           | 2,870701E+23  |
| 2494              | 7,567209E+22                              | 7,567154E+22 | 6,786558E+22 | 6,786580E+22 | 1,513436E+23                           | 1,357314E+23                           | 2,870750E+23  |
| 2495              | 7,567000E+22                              | 7,566806E+22 | 6,786675E+22 | 6,786629E+22 | 1,513381E+23                           | 1,357330E+23                           | 2,870711E+23  |
| 2496              | 7,567059E+22                              | 7,567172E+22 | 6,786762E+22 | 6,786666E+22 | 1,513423E+23                           | 1,357343E+23                           | 2,870766E+23  |
| 2497              | 7,567142E+22                              | 7,567175E+22 | 6,786694E+22 | 6,786734E+22 | 1,513432E+23                           | 1,357343E+23                           | 2,870774E+23  |
| 2498              | 7,566877E+22                              | 7,566948E+22 | 6,786784E+22 | 6,786782E+22 | 1,513382E+23                           | 1,357357E+23                           | 2,870739E+23  |
| 2499              | 7,567132E+22                              | 7,567261E+22 | 6,786794E+22 | 6,786806E+22 | 1,513439E+23                           | 1,357360E+23                           | 2,870799E+23  |
| 2500              | 7,567097E+22                              | 7,566950E+22 | 6,786781E+22 | 6,786764E+22 | 1,513405E+23                           | 1,357354E+23                           | 2,870759E+23  |
| 2501              | 7,566955E+22                              | 7,566984E+22 | 6,786784E+22 | 6,786716E+22 | 1,513394E+23                           | 1,357350E+23                           | 2,870744E+23  |
| 2502              | 7,567249E+22                              | 7,567245E+22 | 6,786662E+22 | 6,786727E+22 | 1,513449E+23                           | 1,357339E+23                           | 2,870788E+23  |
| 2503              | 7,567008E+22                              | 7,566878E+22 | 6,786639E+22 | 6,786697E+22 | 1,513389E+23                           | 1,357334E+23                           | 2,870722E+23  |
| 2504              | 7,566952E+22                              | 7,567138E+22 | 6,786685E+22 | 6,786595E+22 | 1,513409E+23                           | 1,357328E+23                           | 2,870737E+23  |
| 2505              | 7,567125E+22                              | 7,567172E+22 | 6,786593E+22 | 6,786562E+22 | 1,513430E+23                           | 1,357316E+23                           | 2,870745E+23  |
| 2506              | 7,566881E+22                              | 7,566787E+22 | 6,786613E+22 | 6,786549E+22 | 1,513367E+23                           | 1,357316E+23                           | 2,870683E+23  |
| 2507              | 7,567035E+22                              | 7,567112E+22 | 6,786627E+22 | 6,786566E+22 | 1,513415E+23                           | 1,357319E+23                           | 2,870734E+23  |
| 2508              | 7,567029E+22                              | 7,566934E+22 | 6,786566E+22 | 6,786587E+22 | 1,513396E+23                           | 1,357315E+23                           | 2,870712E+23  |
| 2509              | 7,566798E+22                              | 7,566887E+22 | 6,786551E+22 | 6,786589E+22 | 1,513368E+23                           | 1,357314E+23                           | 2,870682E+23  |
| 2510              | 7,567099E+22                              | 7,567210E+22 | 6,786545E+22 | 6,786637E+22 | 1,513431E+23                           | 1,357318E+23                           | 2,870749E+23  |
| 2511              | 7,567009E+22                              | 7,566819E+22 | 6,786592E+22 | 6,786641E+22 | 1,513383E+23                           | 1,357323E+23                           | 2,870706E+23  |
| 2512              | 7,566956E+22                              | 7,567002E+22 | 6,786733E+22 | 6,786589E+22 | 1,513396E+23                           | 1,357332E+23                           | 2,870728E+23  |
| 2513              | 7,567218E+22                              | 7,567217E+22 | 6,786707E+22 | 6,786678E+22 | 1,513443E+23                           | 1,357339E+23                           | 2,870782E+23  |
| 2514              | 7,566976E+22                              | 7,566869E+22 | 6,786745E+22 | 6,786768E+22 | 1,513385E+23                           | 1,357351E+23                           | 2,870736E+23  |
| 2515              | 7,567026E+22                              | 7,567252E+22 | 6,786850E+22 | 6,786829E+22 | 1,513428E+23                           | 1,357368E+23                           | 2,870796E+23  |
| 2516              | 7,567114E+22                              | 7,567164E+22 | 6,786858E+22 | 6,786881E+22 | 1,513428E+23                           | 1,357374E+23                           | 2,870802E+23  |
| 2517              | 7,566905E+22                              | 7,566943E+22 | 6,786888E+22 | 6,786860E+22 | 1,513385E+23                           | 1,357375E+23                           | 2,870760E+23  |
| 2518              | 7,567202E+22                              | 7,567270E+22 | 6,786904E+22 | 6,786880E+22 | 1,513447E+23                           | 1,357378E+23                           | 2,870826E+23  |
| 2519              | 7,567179E+22                              | 7,566918E+22 | 6,786852E+22 | 6,786884E+22 | 1,513410E+23                           | 1,357374E+23                           | 2,870783E+23  |
| 2520              | 7,567002E+22                              | 7,567028E+22 | 6,786855E+22 | 6,786793E+22 | 1,513403E+23                           | 1,357365E+23                           | 2,870768E+23  |
| 2521              | 7,567223E+22                              | 7,567334E+22 | 6,786747E+22 | 6,786811E+22 | 1,513456E+23                           | 1,357356E+23                           | 2,870811E+23  |
| 2522              | 7,567002E+22                              | 7,566894E+22 | 6,786706E+22 | 6,786759E+22 | 1,513390E+23                           | 1,357346E+23                           | 2,870736E+23  |
| 2523              | 7,566988E+22                              | 7,567143E+22 | 6,786792E+22 | 6,786658E+22 | 1,513413E+23                           | 1,357345E+23                           | 2,870758E+23  |
| 2524              | 7,567143E+22                              | 7,567120E+22 | 6,786734E+22 | 6,786658E+22 | 1,513426E+23                           | 1,357339E+23                           | 2,870765E+23  |
| 2525              | 7,566884E+22                              | 7,566812E+22 | 6,786669E+22 | 6,786644E+22 | 1,513370E+23                           | 1,357331E+23                           | 2,870701E+23  |
| 2526              | 7,567030E+22                              | 7,567187E+22 | 6,786681E+22 | 6,786682E+22 | 1,513422E+23                           | 1,357336E+23                           | 2,870758E+23  |
| 2527              | 7,567036E+22                              | 7,566937E+22 | 6,786629E+22 | 6,786729E+22 | 1,513397E+23                           | 1,357336E+23                           | 2,870733E+23  |
| 2528              | 7,566845E+22                              | 7,566902E+22 | 6,786675E+22 | 6,786648E+22 | 1,513375E+23                           | 1,357332E+23                           | 2,870707E+23  |
| 2529              | 7,567137E+22                              | 7,567240E+22 | 6,786697E+22 | 6,786700E+22 | 1,513438E+23                           | 1,357340E+23                           | 2,870777E+23  |
| 2530              | 7,567065E+22                              | 7,566825E+22 | 6,786693E+22 | 6,786730E+22 | 1,513389E+23                           | 1,357342E+23                           | 2,870731E+23  |
| 2531              | 7,566996E+22                              | 7,567057E+22 | 6,786840E+22 | 6,786720E+22 | 1,513405E+23                           | 1,357356E+23                           | 2,870761E+23  |
| 2532              | 7,567183E+22                              | 7,567259E+22 | 6,786845E+22 | 6,786855E+22 | 1,513444E+23                           | 1,357370E+23                           | 2,870814E+23  |
| 2533              | 7,566940E+22                              | 7,566943E+22 | 6,786828E+22 | 6,786901E+22 | 1,513388E+23                           | 1,357373E+23                           | 2,870761E+23  |
| 2534              | 7,567042E+22                              | 7,567276E+22 | 6,786979E+22 | 6,786931E+22 | 1,513432E+23                           | 1,357391E+23                           | 2,870823E+23  |
| 2535              | 7,567194E+22                              | 7,567089E+22 | 6,786983E+22 | 6,786992E+22 | 1,513428E+23                           | 1,357397E+23                           | 2,870826E+23  |
| 2536              | 7,567016E+22                              | 7,566912E+22 | 6,786994E+22 | 6,786915E+22 | 1,513393E+23                           | 1,357391E+23                           | 2,870784E+23  |
| 2537              | 7,567236E+22                              | 7,567318E+22 | 6,786992E+22 | 6,786968E+22 | 1,513455E+23                           | 1,357396E+23                           | 2,870851E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 2538              | 7,567185E+22                              | 7,566990E+22 | 6,786867E+22 | 6,786979E+22 | 1,513417E+23                           | 1,357385E+23                           | 2,870802E+23  |
| 2539              | 7,566997E+22                              | 7,567111E+22 | 6,786916E+22 | 6,786878E+22 | 1,513411E+23                           | 1,357379E+23                           | 2,870790E+23  |
| 2540              | 7,567193E+22                              | 7,567346E+22 | 6,786902E+22 | 6,786894E+22 | 1,513454E+23                           | 1,357380E+23                           | 2,870834E+23  |
| 2541              | 7,567002E+22                              | 7,566912E+22 | 6,786804E+22 | 6,786805E+22 | 1,513391E+23                           | 1,357361E+23                           | 2,870752E+23  |
| 2542              | 7,567003E+22                              | 7,567139E+22 | 6,786908E+22 | 6,786745E+22 | 1,513414E+23                           | 1,357365E+23                           | 2,870780E+23  |
| 2543              | 7,567160E+22                              | 7,567077E+22 | 6,786820E+22 | 6,786815E+22 | 1,513424E+23                           | 1,357363E+23                           | 2,870787E+23  |
| 2544              | 7,566905E+22                              | 7,566829E+22 | 6,786726E+22 | 6,786759E+22 | 1,513373E+23                           | 1,357349E+23                           | 2,870722E+23  |
| 2545              | 7,567022E+22                              | 7,567235E+22 | 6,786763E+22 | 6,786791E+22 | 1,513426E+23                           | 1,357355E+23                           | 2,870781E+23  |
| 2546              | 7,567087E+22                              | 7,566937E+22 | 6,786685E+22 | 6,786799E+22 | 1,513402E+23                           | 1,357348E+23                           | 2,870751E+23  |
| 2547              | 7,566937E+22                              | 7,566919E+22 | 6,786778E+22 | 6,786699E+22 | 1,513386E+23                           | 1,357348E+23                           | 2,870733E+23  |
| 2548              | 7,567177E+22                              | 7,567247E+22 | 6,786852E+22 | 6,786792E+22 | 1,513442E+23                           | 1,357364E+23                           | 2,870807E+23  |
| 2549              | 7,567059E+22                              | 7,566913E+22 | 6,786782E+22 | 6,786828E+22 | 1,513397E+23                           | 1,357361E+23                           | 2,870758E+23  |
| 2550              | 7,566965E+22                              | 7,567157E+22 | 6,786960E+22 | 6,786860E+22 | 1,513412E+23                           | 1,357382E+23                           | 2,870794E+23  |
| 2551              | 7,567161E+22                              | 7,567261E+22 | 6,786983E+22 | 6,787027E+22 | 1,513442E+23                           | 1,357401E+23                           | 2,870843E+23  |
| 2552              | 7,566979E+22                              | 7,566927E+22 | 6,786986E+22 | 6,787000E+22 | 1,513391E+23                           | 1,357399E+23                           | 2,870789E+23  |
| 2553              | 7,567092E+22                              | 7,567261E+22 | 6,787131E+22 | 6,787032E+22 | 1,513435E+23                           | 1,357416E+23                           | 2,870852E+23  |
| 2554              | 7,567275E+22                              | 7,567060E+22 | 6,787044E+22 | 6,787106E+22 | 1,513433E+23                           | 1,357415E+23                           | 2,870849E+23  |
| 2555              | 7,567090E+22                              | 7,566968E+22 | 6,787044E+22 | 6,787030E+22 | 1,513406E+23                           | 1,357407E+23                           | 2,870813E+23  |
| 2556              | 7,567226E+22                              | 7,567378E+22 | 6,787066E+22 | 6,787092E+22 | 1,513460E+23                           | 1,357416E+23                           | 2,870876E+23  |
| 2557              | 7,567148E+22                              | 7,567087E+22 | 6,786917E+22 | 6,787038E+22 | 1,513424E+23                           | 1,357395E+23                           | 2,870819E+23  |
| 2558              | 7,567004E+22                              | 7,567151E+22 | 6,787036E+22 | 6,786915E+22 | 1,513416E+23                           | 1,357395E+23                           | 2,870811E+23  |
| 2559              | 7,567215E+22                              | 7,567274E+22 | 6,787031E+22 | 6,786972E+22 | 1,513449E+23                           | 1,357400E+23                           | 2,870849E+23  |
| 2560              | 7,567048E+22                              | 7,566878E+22 | 6,786917E+22 | 6,786872E+22 | 1,513393E+23                           | 1,357379E+23                           | 2,870771E+23  |
| 2561              | 7,566993E+22                              | 7,567155E+22 | 6,786993E+22 | 6,786861E+22 | 1,513415E+23                           | 1,357385E+23                           | 2,870800E+23  |
| 2562              | 7,567152E+22                              | 7,567094E+22 | 6,786833E+22 | 6,786947E+22 | 1,513425E+23                           | 1,357378E+23                           | 2,870803E+23  |
| 2563              | 7,566934E+22                              | 7,566876E+22 | 6,786780E+22 | 6,786851E+22 | 1,513381E+23                           | 1,357363E+23                           | 2,870744E+23  |
| 2564              | 7,567043E+22                              | 7,567231E+22 | 6,786897E+22 | 6,786874E+22 | 1,513427E+23                           | 1,357377E+23                           | 2,870804E+23  |
| 2565              | 7,567126E+22                              | 7,566984E+22 | 6,786781E+22 | 6,786841E+22 | 1,513411E+23                           | 1,357362E+23                           | 2,870773E+23  |
| 2566              | 7,566989E+22                              | 7,566964E+22 | 6,786916E+22 | 6,786788E+22 | 1,513395E+23                           | 1,357370E+23                           | 2,870766E+23  |
| 2567              | 7,567179E+22                              | 7,567257E+22 | 6,786986E+22 | 6,786958E+22 | 1,513444E+23                           | 1,357394E+23                           | 2,870838E+23  |
| 2568              | 7,567060E+22                              | 7,566969E+22 | 6,786903E+22 | 6,786972E+22 | 1,513403E+23                           | 1,357387E+23                           | 2,870790E+23  |
| 2569              | 7,566941E+22                              | 7,567189E+22 | 6,787106E+22 | 6,787007E+22 | 1,513413E+23                           | 1,357411E+23                           | 2,870824E+23  |
| 2570              | 7,567207E+22                              | 7,567222E+22 | 6,787080E+22 | 6,787148E+22 | 1,513443E+23                           | 1,357423E+23                           | 2,870866E+23  |
| 2571              | 7,567088E+22                              | 7,566907E+22 | 6,787077E+22 | 6,787088E+22 | 1,513400E+23                           | 1,357417E+23                           | 2,870816E+23  |
| 2572              | 7,567151E+22                              | 7,567256E+22 | 6,787237E+22 | 6,787148E+22 | 1,513441E+23                           | 1,357438E+23                           | 2,870879E+23  |
| 2573              | 7,567287E+22                              | 7,567167E+22 | 6,787064E+22 | 6,787181E+22 | 1,513445E+23                           | 1,357424E+23                           | 2,870870E+23  |
| 2574              | 7,567080E+22                              | 7,567080E+22 | 6,787114E+22 | 6,787115E+22 | 1,513416E+23                           | 1,357423E+23                           | 2,870839E+23  |
| 2575              | 7,567197E+22                              | 7,567398E+22 | 6,787196E+22 | 6,787188E+22 | 1,513459E+23                           | 1,357438E+23                           | 2,870898E+23  |
| 2576              | 7,567167E+22                              | 7,567086E+22 | 6,787072E+22 | 6,787076E+22 | 1,513425E+23                           | 1,357415E+23                           | 2,870840E+23  |
| 2577              | 7,567009E+22                              | 7,567127E+22 | 6,787198E+22 | 6,786991E+22 | 1,513414E+23                           | 1,357419E+23                           | 2,870832E+23  |
| 2578              | 7,567239E+22                              | 7,567220E+22 | 6,787096E+22 | 6,787093E+22 | 1,513446E+23                           | 1,357419E+23                           | 2,870865E+23  |
| 2579              | 7,567081E+22                              | 7,566889E+22 | 6,786956E+22 | 6,787004E+22 | 1,513397E+23                           | 1,357396E+23                           | 2,870793E+23  |
| 2580              | 7,566978E+22                              | 7,567173E+22 | 6,787048E+22 | 6,787009E+22 | 1,513415E+23                           | 1,357406E+23                           | 2,870821E+23  |
| 2581              | 7,567153E+22                              | 7,567151E+22 | 6,786861E+22 | 6,787009E+22 | 1,513430E+23                           | 1,357387E+23                           | 2,870817E+23  |
| 2582              | 7,567002E+22                              | 7,566909E+22 | 6,786886E+22 | 6,786887E+22 | 1,513391E+23                           | 1,357377E+23                           | 2,870768E+23  |
| 2583              | 7,567107E+22                              | 7,567203E+22 | 6,787031E+22 | 6,786943E+22 | 1,513431E+23                           | 1,357397E+23                           | 2,870828E+23  |
| 2584              | 7,567181E+22                              | 7,567021E+22 | 6,786915E+22 | 6,786910E+22 | 1,513420E+23                           | 1,357383E+23                           | 2,870803E+23  |
| 2585              | 7,566965E+22                              | 7,567040E+22 | 6,787056E+22 | 6,786921E+22 | 1,513400E+23                           | 1,357398E+23                           | 2,870798E+23  |
| 2586              | 7,567140E+22                              | 7,567289E+22 | 6,787070E+22 | 6,787127E+22 | 1,513443E+23                           | 1,357420E+23                           | 2,870863E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 2587                   | 7,567076E+22                              | 7,567000E+22 | 6,787028E+22 | 6,787112E+22 | 1,513408E+23                           | 1,357414E+23                           | 2,870822E+23  |
| 2588                   | 7,566969E+22                              | 7,567153E+22 | 6,787254E+22 | 6,787143E+22 | 1,513412E+23                           | 1,357440E+23                           | 2,870852E+23  |
| 2589                   | 7,567255E+22                              | 7,567229E+22 | 6,787160E+22 | 6,787232E+22 | 1,513448E+23                           | 1,357439E+23                           | 2,870888E+23  |
| 2590                   | 7,567172E+22                              | 7,566950E+22 | 6,787165E+22 | 6,787187E+22 | 1,513412E+23                           | 1,357435E+23                           | 2,870847E+23  |
| 2591                   | 7,567176E+22                              | 7,567281E+22 | 6,787314E+22 | 6,787282E+22 | 1,513446E+23                           | 1,357460E+23                           | 2,870905E+23  |
| 2592                   | 7,567301E+22                              | 7,567251E+22 | 6,787154E+22 | 6,787259E+22 | 1,513455E+23                           | 1,357441E+23                           | 2,870897E+23  |
| 2593                   | 7,567067E+22                              | 7,567130E+22 | 6,787257E+22 | 6,787179E+22 | 1,513420E+23                           | 1,357444E+23                           | 2,870863E+23  |
| 2594                   | 7,567214E+22                              | 7,567353E+22 | 6,787305E+22 | 6,787251E+22 | 1,513457E+23                           | 1,357456E+23                           | 2,870912E+23  |
| 2595                   | 7,567229E+22                              | 7,567058E+22 | 6,787180E+22 | 6,787142E+22 | 1,513429E+23                           | 1,357432E+23                           | 2,870861E+23  |
| 2596                   | 7,567011E+22                              | 7,567092E+22 | 6,787291E+22 | 6,787121E+22 | 1,513410E+23                           | 1,357441E+23                           | 2,870852E+23  |
| 2597                   | 7,567207E+22                              | 7,567276E+22 | 6,787102E+22 | 6,787196E+22 | 1,513448E+23                           | 1,357430E+23                           | 2,870878E+23  |
| 2598                   | 7,567087E+22                              | 7,566960E+22 | 6,786997E+22 | 6,787105E+22 | 1,513405E+23                           | 1,357410E+23                           | 2,870815E+23  |
| 2599                   | 7,566989E+22                              | 7,567170E+22 | 6,787142E+22 | 6,787104E+22 | 1,513416E+23                           | 1,357425E+23                           | 2,870840E+23  |
| 2600                   | 7,567222E+22                              | 7,567172E+22 | 6,786986E+22 | 6,787036E+22 | 1,513439E+23                           | 1,357402E+23                           | 2,870842E+23  |
| 2601                   | 7,567047E+22                              | 7,566932E+22 | 6,787048E+22 | 6,786952E+22 | 1,513398E+23                           | 1,357400E+23                           | 2,870798E+23  |
| 2602                   | 7,567132E+22                              | 7,567207E+22 | 6,787133E+22 | 6,787066E+22 | 1,513434E+23                           | 1,357420E+23                           | 2,870854E+23  |
| 2603                   | 7,567197E+22                              | 7,567078E+22 | 6,787009E+22 | 6,787056E+22 | 1,513428E+23                           | 1,357407E+23                           | 2,870834E+23  |
| 2604                   | 7,566918E+22                              | 7,567067E+22 | 6,787173E+22 | 6,787109E+22 | 1,513399E+23                           | 1,357428E+23                           | 2,870827E+23  |
| 2605                   | 7,567122E+22                              | 7,567319E+22 | 6,787146E+22 | 6,787229E+22 | 1,513444E+23                           | 1,357437E+23                           | 2,870882E+23  |
| 2606                   | 7,567152E+22                              | 7,566988E+22 | 6,787142E+22 | 6,787197E+22 | 1,513414E+23                           | 1,357434E+23                           | 2,870848E+23  |
| 2607                   | 7,567052E+22                              | 7,567105E+22 | 6,787369E+22 | 6,787252E+22 | 1,513416E+23                           | 1,357462E+23                           | 2,870878E+23  |
| 2608                   | 7,567341E+22                              | 7,567270E+22 | 6,787251E+22 | 6,787303E+22 | 1,513461E+23                           | 1,357455E+23                           | 2,870917E+23  |
| 2609                   | 7,567178E+22                              | 7,567052E+22 | 6,787278E+22 | 6,787280E+22 | 1,513423E+23                           | 1,357456E+23                           | 2,870879E+23  |
| 2610                   | 7,567159E+22                              | 7,567337E+22 | 6,787393E+22 | 6,787383E+22 | 1,513450E+23                           | 1,357478E+23                           | 2,870927E+23  |
| 2611                   | 7,567316E+22                              | 7,567292E+22 | 6,787291E+22 | 6,787330E+22 | 1,513461E+23                           | 1,357462E+23                           | 2,870923E+23  |
| 2612                   | 7,567057E+22                              | 7,567105E+22 | 6,787420E+22 | 6,787289E+22 | 1,513416E+23                           | 1,357471E+23                           | 2,870887E+23  |
| 2613                   | 7,567205E+22                              | 7,567345E+22 | 6,787383E+22 | 6,787335E+22 | 1,513455E+23                           | 1,357472E+23                           | 2,870927E+23  |
| 2614                   | 7,567262E+22                              | 7,567068E+22 | 6,787251E+22 | 6,787271E+22 | 1,513433E+23                           | 1,357452E+23                           | 2,870885E+23  |
| 2615                   | 7,567012E+22                              | 7,567086E+22 | 6,787333E+22 | 6,787281E+22 | 1,513410E+23                           | 1,357461E+23                           | 2,870871E+23  |
| 2616                   | 7,567234E+22                              | 7,567320E+22 | 6,787150E+22 | 6,787278E+22 | 1,513455E+23                           | 1,357443E+23                           | 2,870898E+23  |
| 2617                   | 7,567121E+22                              | 7,567000E+22 | 6,787108E+22 | 6,787144E+22 | 1,513412E+23                           | 1,357425E+23                           | 2,870837E+23  |
| 2618                   | 7,567059E+22                              | 7,567139E+22 | 6,787224E+22 | 6,787139E+22 | 1,513420E+23                           | 1,357436E+23                           | 2,870856E+23  |
| 2619                   | 7,567307E+22                              | 7,567196E+22 | 6,787099E+22 | 6,787080E+22 | 1,513450E+23                           | 1,357418E+23                           | 2,870868E+23  |
| 2620                   | 7,567040E+22                              | 7,566964E+22 | 6,787162E+22 | 6,787080E+22 | 1,513400E+23                           | 1,357424E+23                           | 2,870825E+23  |
| 2621                   | 7,567054E+22                              | 7,567284E+22 | 6,787191E+22 | 6,787182E+22 | 1,513434E+23                           | 1,357437E+23                           | 2,870871E+23  |
| 2622                   | 7,567174E+22                              | 7,567141E+22 | 6,787117E+22 | 6,787197E+22 | 1,513431E+23                           | 1,357431E+23                           | 2,870863E+23  |
| 2623                   | 7,566921E+22                              | 7,567026E+22 | 6,787310E+22 | 6,787250E+22 | 1,513395E+23                           | 1,357456E+23                           | 2,870851E+23  |
| 2624                   | 7,567205E+22                              | 7,567296E+22 | 6,787284E+22 | 6,787306E+22 | 1,513450E+23                           | 1,357459E+23                           | 2,870909E+23  |
| 2625                   | 7,567234E+22                              | 7,567003E+22 | 6,787285E+22 | 6,787284E+22 | 1,513424E+23                           | 1,357457E+23                           | 2,870880E+23  |
| 2626                   | 7,567119E+22                              | 7,567118E+22 | 6,787432E+22 | 6,787376E+22 | 1,513424E+23                           | 1,357481E+23                           | 2,870905E+23  |
| 2627                   | 7,567385E+22                              | 7,567364E+22 | 6,787331E+22 | 6,787416E+22 | 1,513475E+23                           | 1,357475E+23                           | 2,870949E+23  |
| 2628                   | 7,567146E+22                              | 7,567119E+22 | 6,787395E+22 | 6,787418E+22 | 1,513426E+23                           | 1,357481E+23                           | 2,870908E+23  |
| 2629                   | 7,567123E+22                              | 7,567378E+22 | 6,787495E+22 | 6,787441E+22 | 1,513450E+23                           | 1,357494E+23                           | 2,870944E+23  |
| 2630                   | 7,567361E+22                              | 7,567290E+22 | 6,787420E+22 | 6,787407E+22 | 1,513465E+23                           | 1,357483E+23                           | 2,870948E+23  |
| 2631                   | 7,567083E+22                              | 7,567050E+22 | 6,787531E+22 | 6,787414E+22 | 1,513413E+23                           | 1,357494E+23                           | 2,870908E+23  |
| 2632                   | 7,567241E+22                              | 7,567360E+22 | 6,787447E+22 | 6,787431E+22 | 1,513460E+23                           | 1,357488E+23                           | 2,870948E+23  |
| 2633                   | 7,567255E+22                              | 7,567130E+22 | 6,787324E+22 | 6,787374E+22 | 1,513439E+23                           | 1,357470E+23                           | 2,870908E+23  |
| 2634                   | 7,567028E+22                              | 7,567106E+22 | 6,787367E+22 | 6,787375E+22 | 1,513413E+23                           | 1,357474E+23                           | 2,870888E+23  |
| 2635                   | 7,567302E+22                              | 7,567341E+22 | 6,787245E+22 | 6,787309E+22 | 1,513464E+23                           | 1,357455E+23                           | 2,870920E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 2636              | 7,567146E+22                              | 7,566999E+22 | 6,787242E+22 | 6,787214E+22 | 1,513415E+23                           | 1,357446E+23                           | 2,870860E+23  |
| 2637              | 7,567058E+22                              | 7,567170E+22 | 6,787303E+22 | 6,787182E+22 | 1,513423E+23                           | 1,357449E+23                           | 2,870871E+23  |
| 2638              | 7,567317E+22                              | 7,567243E+22 | 6,787190E+22 | 6,787199E+22 | 1,513456E+23                           | 1,357439E+23                           | 2,870895E+23  |
| 2639              | 7,566997E+22                              | 7,566982E+22 | 6,787261E+22 | 6,787260E+22 | 1,513398E+23                           | 1,357452E+23                           | 2,870850E+23  |
| 2640              | 7,567054E+22                              | 7,567309E+22 | 6,787293E+22 | 6,787298E+22 | 1,513436E+23                           | 1,357459E+23                           | 2,870895E+23  |
| 2641              | 7,567205E+22                              | 7,567141E+22 | 6,787273E+22 | 6,787283E+22 | 1,513435E+23                           | 1,357456E+23                           | 2,870890E+23  |
| 2642              | 7,567016E+22                              | 7,566973E+22 | 6,787397E+22 | 6,787341E+22 | 1,513399E+23                           | 1,357474E+23                           | 2,870873E+23  |
| 2643              | 7,567322E+22                              | 7,567306E+22 | 6,787384E+22 | 6,787386E+22 | 1,513463E+23                           | 1,357477E+23                           | 2,870940E+23  |
| 2644              | 7,567251E+22                              | 7,567074E+22 | 6,787383E+22 | 6,787422E+22 | 1,513432E+23                           | 1,357480E+23                           | 2,870913E+23  |
| 2645              | 7,567076E+22                              | 7,567236E+22 | 6,787485E+22 | 6,787470E+22 | 1,513431E+23                           | 1,357495E+23                           | 2,870927E+23  |
| 2646              | 7,567378E+22                              | 7,567456E+22 | 6,787452E+22 | 6,787527E+22 | 1,513483E+23                           | 1,357498E+23                           | 2,870981E+23  |
| 2647              | 7,567136E+22                              | 7,567111E+22 | 6,787561E+22 | 6,787542E+22 | 1,513425E+23                           | 1,357510E+23                           | 2,870935E+23  |
| 2648              | 7,567160E+22                              | 7,567358E+22 | 6,787646E+22 | 6,787520E+22 | 1,513452E+23                           | 1,357517E+23                           | 2,870968E+23  |
| 2649              | 7,567395E+22                              | 7,567286E+22 | 6,787566E+22 | 6,787512E+22 | 1,513468E+23                           | 1,357508E+23                           | 2,870976E+23  |
| 2650              | 7,567123E+22                              | 7,567019E+22 | 6,787559E+22 | 6,787556E+22 | 1,513414E+23                           | 1,357512E+23                           | 2,870926E+23  |
| 2651              | 7,567286E+22                              | 7,567394E+22 | 6,787486E+22 | 6,787537E+22 | 1,513468E+23                           | 1,357502E+23                           | 2,870970E+23  |
| 2652              | 7,567256E+22                              | 7,567167E+22 | 6,787382E+22 | 6,787467E+22 | 1,513442E+23                           | 1,357485E+23                           | 2,870927E+23  |
| 2653              | 7,567036E+22                              | 7,567123E+22 | 6,787413E+22 | 6,787372E+22 | 1,513416E+23                           | 1,357479E+23                           | 2,870894E+23  |
| 2654              | 7,567371E+22                              | 7,567360E+22 | 6,787343E+22 | 6,787336E+22 | 1,513473E+23                           | 1,357468E+23                           | 2,870941E+23  |
| 2655              | 7,567161E+22                              | 7,566993E+22 | 6,787351E+22 | 6,787309E+22 | 1,513415E+23                           | 1,357466E+23                           | 2,870881E+23  |
| 2656              | 7,567044E+22                              | 7,567221E+22 | 6,787400E+22 | 6,787275E+22 | 1,513427E+23                           | 1,357467E+23                           | 2,870894E+23  |
| 2657              | 7,567265E+22                              | 7,567316E+22 | 6,787318E+22 | 6,787320E+22 | 1,513458E+23                           | 1,357464E+23                           | 2,870922E+23  |
| 2658              | 7,566989E+22                              | 7,566970E+22 | 6,787347E+22 | 6,787400E+22 | 1,513396E+23                           | 1,357475E+23                           | 2,870871E+23  |
| 2659              | 7,567125E+22                              | 7,567285E+22 | 6,787427E+22 | 6,787391E+22 | 1,513441E+23                           | 1,357482E+23                           | 2,870923E+23  |
| 2660              | 7,567257E+22                              | 7,567126E+22 | 6,787402E+22 | 6,787414E+22 | 1,513438E+23                           | 1,357482E+23                           | 2,870920E+23  |
| 2661              | 7,567057E+22                              | 7,567007E+22 | 6,787458E+22 | 6,787431E+22 | 1,513406E+23                           | 1,357489E+23                           | 2,870895E+23  |
| 2662              | 7,567376E+22                              | 7,567392E+22 | 6,787458E+22 | 6,787522E+22 | 1,513477E+23                           | 1,357498E+23                           | 2,870975E+23  |
| 2663              | 7,567232E+22                              | 7,567148E+22 | 6,787487E+22 | 6,787584E+22 | 1,513438E+23                           | 1,357507E+23                           | 2,870945E+23  |
| 2664              | 7,567083E+22                              | 7,567300E+22 | 6,787619E+22 | 6,787551E+22 | 1,513438E+23                           | 1,357517E+23                           | 2,870955E+23  |
| 2665              | 7,567397E+22                              | 7,567467E+22 | 6,787645E+22 | 6,787590E+22 | 1,513486E+23                           | 1,357523E+23                           | 2,871010E+23  |
| 2666              | 7,567201E+22                              | 7,567054E+22 | 6,787676E+22 | 6,787645E+22 | 1,513426E+23                           | 1,357532E+23                           | 2,870958E+23  |
| 2667              | 7,567242E+22                              | 7,567332E+22 | 6,787740E+22 | 6,787613E+22 | 1,513457E+23                           | 1,357535E+23                           | 2,870993E+23  |
| 2668              | 7,567377E+22                              | 7,567312E+22 | 6,787628E+22 | 6,787660E+22 | 1,513469E+23                           | 1,357529E+23                           | 2,870998E+23  |
| 2669              | 7,567088E+22                              | 7,567087E+22 | 6,787558E+22 | 6,787630E+22 | 1,513418E+23                           | 1,357519E+23                           | 2,870936E+23  |
| 2670              | 7,567314E+22                              | 7,567439E+22 | 6,787542E+22 | 6,787605E+22 | 1,513475E+23                           | 1,357515E+23                           | 2,870990E+23  |
| 2671              | 7,567270E+22                              | 7,567165E+22 | 6,787500E+22 | 6,787533E+22 | 1,513443E+23                           | 1,357503E+23                           | 2,870947E+23  |
| 2672              | 7,567085E+22                              | 7,567137E+22 | 6,787531E+22 | 6,787396E+22 | 1,513422E+23                           | 1,357493E+23                           | 2,870915E+23  |
| 2673              | 7,567377E+22                              | 7,567392E+22 | 6,787491E+22 | 6,787405E+22 | 1,513477E+23                           | 1,357490E+23                           | 2,870967E+23  |
| 2674              | 7,567155E+22                              | 7,567003E+22 | 6,787417E+22 | 6,787460E+22 | 1,513416E+23                           | 1,357488E+23                           | 2,870903E+23  |
| 2675              | 7,567045E+22                              | 7,567243E+22 | 6,787489E+22 | 6,787414E+22 | 1,513429E+23                           | 1,357490E+23                           | 2,870919E+23  |
| 2676              | 7,567235E+22                              | 7,567319E+22 | 6,787434E+22 | 6,787470E+22 | 1,513455E+23                           | 1,357490E+23                           | 2,870946E+23  |
| 2677              | 7,567018E+22                              | 7,566952E+22 | 6,787412E+22 | 6,787461E+22 | 1,513397E+23                           | 1,357487E+23                           | 2,870884E+23  |
| 2678              | 7,567237E+22                              | 7,567283E+22 | 6,787511E+22 | 6,787481E+22 | 1,513452E+23                           | 1,357499E+23                           | 2,870951E+23  |
| 2679              | 7,567310E+22                              | 7,567152E+22 | 6,787495E+22 | 6,787542E+22 | 1,513446E+23                           | 1,357504E+23                           | 2,870950E+23  |
| 2680              | 7,567085E+22                              | 7,567103E+22 | 6,787547E+22 | 6,787523E+22 | 1,513419E+23                           | 1,357507E+23                           | 2,870926E+23  |
| 2681              | 7,567357E+22                              | 7,567507E+22 | 6,787616E+22 | 6,787617E+22 | 1,513486E+23                           | 1,357523E+23                           | 2,871010E+23  |
| 2682              | 7,567242E+22                              | 7,567161E+22 | 6,787620E+22 | 6,787700E+22 | 1,513440E+23                           | 1,357532E+23                           | 2,870972E+23  |
| 2683              | 7,567136E+22                              | 7,567276E+22 | 6,787798E+22 | 6,787638E+22 | 1,513441E+23                           | 1,357544E+23                           | 2,870985E+23  |
| 2684              | 7,567406E+22                              | 7,567445E+22 | 6,787792E+22 | 6,787727E+22 | 1,513485E+23                           | 1,357552E+23                           | 2,871037E+23  |



| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 2685                   | 7,567205E+22                              | 7,567042E+22 | 6,787718E+22 | 6,787753E+22 | 1,513425E+23                           | 1,357547E+23                           | 2,870972E+23  |
| 2686                   | 7,567279E+22                              | 7,567369E+22 | 6,787770E+22 | 6,787760E+22 | 1,513465E+23                           | 1,357553E+23                           | 2,871018E+23  |
| 2687                   | 7,567367E+22                              | 7,567350E+22 | 6,787671E+22 | 6,787799E+22 | 1,513472E+23                           | 1,357547E+23                           | 2,871019E+23  |
| 2688                   | 7,567123E+22                              | 7,567128E+22 | 6,787630E+22 | 6,787658E+22 | 1,513425E+23                           | 1,357529E+23                           | 2,870954E+23  |
| 2689                   | 7,567359E+22                              | 7,567462E+22 | 6,787685E+22 | 6,787603E+22 | 1,513482E+23                           | 1,357529E+23                           | 2,871011E+23  |
| 2690                   | 7,567326E+22                              | 7,567144E+22 | 6,787589E+22 | 6,787589E+22 | 1,513447E+23                           | 1,357518E+23                           | 2,870965E+23  |
| 2691                   | 7,567124E+22                              | 7,567149E+22 | 6,787642E+22 | 6,787473E+22 | 1,513427E+23                           | 1,357511E+23                           | 2,870939E+23  |
| 2692                   | 7,567302E+22                              | 7,567444E+22 | 6,787588E+22 | 6,787560E+22 | 1,513475E+23                           | 1,357515E+23                           | 2,870989E+23  |
| 2693                   | 7,567086E+22                              | 7,567043E+22 | 6,787465E+22 | 6,787575E+22 | 1,513413E+23                           | 1,357504E+23                           | 2,870917E+23  |
| 2694                   | 7,567075E+22                              | 7,567241E+22 | 6,787580E+22 | 6,787538E+22 | 1,513432E+23                           | 1,357512E+23                           | 2,870943E+23  |
| 2695                   | 7,567272E+22                              | 7,567278E+22 | 6,787560E+22 | 6,787598E+22 | 1,513455E+23                           | 1,357516E+23                           | 2,870971E+23  |
| 2696                   | 7,567112E+22                              | 7,566961E+22 | 6,787515E+22 | 6,787526E+22 | 1,513407E+23                           | 1,357504E+23                           | 2,870911E+23  |
| 2697                   | 7,567300E+22                              | 7,567331E+22 | 6,787639E+22 | 6,787566E+22 | 1,513463E+23                           | 1,357521E+23                           | 2,870984E+23  |
| 2698                   | 7,567344E+22                              | 7,567214E+22 | 6,787567E+22 | 6,787685E+22 | 1,513456E+23                           | 1,357525E+23                           | 2,870981E+23  |
| 2699                   | 7,567118E+22                              | 7,567169E+22 | 6,787670E+22 | 6,787627E+22 | 1,513429E+23                           | 1,357530E+23                           | 2,870959E+23  |
| 2700                   | 7,567317E+22                              | 7,567530E+22 | 6,787782E+22 | 6,787737E+22 | 1,513485E+23                           | 1,357552E+23                           | 2,871037E+23  |
| 2701                   | 7,567249E+22                              | 7,567146E+22 | 6,787737E+22 | 6,787768E+22 | 1,513440E+23                           | 1,357550E+23                           | 2,870990E+23  |
| 2702                   | 7,567208E+22                              | 7,567252E+22 | 6,787894E+22 | 6,787762E+22 | 1,513446E+23                           | 1,357566E+23                           | 2,871012E+23  |
| 2703                   | 7,567409E+22                              | 7,567442E+22 | 6,787875E+22 | 6,787892E+22 | 1,513485E+23                           | 1,357577E+23                           | 2,871062E+23  |
| 2704                   | 7,567219E+22                              | 7,567113E+22 | 6,787758E+22 | 6,787850E+22 | 1,513433E+23                           | 1,357561E+23                           | 2,870994E+23  |
| 2705                   | 7,567281E+22                              | 7,567443E+22 | 6,787866E+22 | 6,787829E+22 | 1,513472E+23                           | 1,357570E+23                           | 2,871042E+23  |
| 2706                   | 7,567405E+22                              | 7,567359E+22 | 6,787756E+22 | 6,787866E+22 | 1,513476E+23                           | 1,357562E+23                           | 2,871039E+23  |
| 2707                   | 7,567202E+22                              | 7,567120E+22 | 6,787770E+22 | 6,787687E+22 | 1,513432E+23                           | 1,357546E+23                           | 2,870978E+23  |
| 2708                   | 7,567351E+22                              | 7,567468E+22 | 6,787826E+22 | 6,787692E+22 | 1,513482E+23                           | 1,357552E+23                           | 2,871034E+23  |
| 2709                   | 7,567302E+22                              | 7,567160E+22 | 6,787647E+22 | 6,787679E+22 | 1,513446E+23                           | 1,357533E+23                           | 2,870979E+23  |
| 2710                   | 7,567120E+22                              | 7,567185E+22 | 6,787692E+22 | 6,787633E+22 | 1,513431E+23                           | 1,357532E+23                           | 2,870963E+23  |
| 2711                   | 7,567256E+22                              | 7,567452E+22 | 6,787667E+22 | 6,787725E+22 | 1,513471E+23                           | 1,357539E+23                           | 2,871010E+23  |
| 2712                   | 7,567123E+22                              | 7,567036E+22 | 6,787554E+22 | 6,787637E+22 | 1,513416E+23                           | 1,357519E+23                           | 2,870935E+23  |
| 2713                   | 7,567162E+22                              | 7,567231E+22 | 6,787715E+22 | 6,787579E+22 | 1,513439E+23                           | 1,357529E+23                           | 2,870969E+23  |
| 2714                   | 7,567378E+22                              | 7,567257E+22 | 6,787626E+22 | 6,787682E+22 | 1,513463E+23                           | 1,357531E+23                           | 2,870994E+23  |
| 2715                   | 7,567191E+22                              | 7,567006E+22 | 6,787615E+22 | 6,787606E+22 | 1,513420E+23                           | 1,357522E+23                           | 2,870942E+23  |
| 2716                   | 7,567252E+22                              | 7,567438E+22 | 6,787749E+22 | 6,787694E+22 | 1,513469E+23                           | 1,357544E+23                           | 2,871013E+23  |
| 2717                   | 7,567290E+22                              | 7,567285E+22 | 6,787657E+22 | 6,787775E+22 | 1,513458E+23                           | 1,357543E+23                           | 2,871001E+23  |
| 2718                   | 7,567137E+22                              | 7,567192E+22 | 6,787816E+22 | 6,787755E+22 | 1,513433E+23                           | 1,357557E+23                           | 2,870990E+23  |
| 2719                   | 7,567313E+22                              | 7,567503E+22 | 6,787945E+22 | 6,787887E+22 | 1,513482E+23                           | 1,357583E+23                           | 2,871065E+23  |
| 2720                   | 7,567296E+22                              | 7,567140E+22 | 6,787855E+22 | 6,787878E+22 | 1,513444E+23                           | 1,357573E+23                           | 2,871017E+23  |
| 2721                   | 7,567249E+22                              | 7,567277E+22 | 6,788003E+22 | 6,787887E+22 | 1,513453E+23                           | 1,357589E+23                           | 2,871042E+23  |
| 2722                   | 7,567442E+22                              | 7,567466E+22 | 6,787909E+22 | 6,788046E+22 | 1,513491E+23                           | 1,357595E+23                           | 2,871086E+23  |
| 2723                   | 7,567280E+22                              | 7,567153E+22 | 6,787843E+22 | 6,787924E+22 | 1,513443E+23                           | 1,357577E+23                           | 2,871020E+23  |
| 2724                   | 7,567290E+22                              | 7,567466E+22 | 6,787988E+22 | 6,787884E+22 | 1,513476E+23                           | 1,357587E+23                           | 2,871063E+23  |
| 2725                   | 7,567440E+22                              | 7,567358E+22 | 6,787838E+22 | 6,787872E+22 | 1,513480E+23                           | 1,357571E+23                           | 2,871051E+23  |
| 2726                   | 7,567264E+22                              | 7,567134E+22 | 6,787853E+22 | 6,787768E+22 | 1,513440E+23                           | 1,357562E+23                           | 2,871002E+23  |
| 2727                   | 7,567298E+22                              | 7,567489E+22 | 6,787918E+22 | 6,787835E+22 | 1,513479E+23                           | 1,357575E+23                           | 2,871054E+23  |
| 2728                   | 7,567263E+22                              | 7,567224E+22 | 6,787716E+22 | 6,787782E+22 | 1,513449E+23                           | 1,357550E+23                           | 2,870999E+23  |
| 2729                   | 7,567107E+22                              | 7,567207E+22 | 6,787804E+22 | 6,787725E+22 | 1,513431E+23                           | 1,357553E+23                           | 2,870984E+23  |
| 2730                   | 7,567298E+22                              | 7,567406E+22 | 6,787759E+22 | 6,787830E+22 | 1,513470E+23                           | 1,357559E+23                           | 2,871029E+23  |
| 2731                   | 7,567235E+22                              | 7,567009E+22 | 6,787668E+22 | 6,787689E+22 | 1,513424E+23                           | 1,357536E+23                           | 2,870960E+23  |
| 2732                   | 7,567192E+22                              | 7,567243E+22 | 6,787818E+22 | 6,787676E+22 | 1,513444E+23                           | 1,357549E+23                           | 2,870993E+23  |
| 2733                   | 7,567389E+22                              | 7,567313E+22 | 6,787673E+22 | 6,787771E+22 | 1,513470E+23                           | 1,357544E+23                           | 2,871015E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 2734                   | 7,567210E+22                              | 7,567098E+22 | 6,787679E+22 | 6,787753E+22 | 1,513431E+23                           | 1,357543E+23                           | 2,870974E+23  |
| 2735                   | 7,567195E+22                              | 7,567484E+22 | 6,787886E+22 | 6,787844E+22 | 1,513468E+23                           | 1,357573E+23                           | 2,871041E+23  |
| 2736                   | 7,567306E+22                              | 7,567304E+22 | 6,787809E+22 | 6,787844E+22 | 1,513461E+23                           | 1,357565E+23                           | 2,871026E+23  |
| 2737                   | 7,567192E+22                              | 7,567175E+22 | 6,787989E+22 | 6,787837E+22 | 1,513437E+23                           | 1,357583E+23                           | 2,871019E+23  |
| 2738                   | 7,567377E+22                              | 7,567465E+22 | 6,788039E+22 | 6,788030E+22 | 1,513484E+23                           | 1,357607E+23                           | 2,871091E+23  |
| 2739                   | 7,567366E+22                              | 7,567163E+22 | 6,787945E+22 | 6,787998E+22 | 1,513453E+23                           | 1,357594E+23                           | 2,871047E+23  |
| 2740                   | 7,567226E+22                              | 7,567350E+22 | 6,788083E+22 | 6,788021E+22 | 1,513458E+23                           | 1,357610E+23                           | 2,871068E+23  |
| 2741                   | 7,567445E+22                              | 7,567508E+22 | 6,787966E+22 | 6,788107E+22 | 1,513495E+23                           | 1,357607E+23                           | 2,871103E+23  |
| 2742                   | 7,567345E+22                              | 7,567184E+22 | 6,787946E+22 | 6,787994E+22 | 1,513453E+23                           | 1,357594E+23                           | 2,871047E+23  |
| 2743                   | 7,567297E+22                              | 7,567466E+22 | 6,788124E+22 | 6,787968E+22 | 1,513476E+23                           | 1,357609E+23                           | 2,871086E+23  |
| 2744                   | 7,567461E+22                              | 7,567379E+22 | 6,787942E+22 | 6,787932E+22 | 1,513484E+23                           | 1,357587E+23                           | 2,871071E+23  |
| 2745                   | 7,567259E+22                              | 7,567178E+22 | 6,787961E+22 | 6,787879E+22 | 1,513444E+23                           | 1,357584E+23                           | 2,871028E+23  |
| 2746                   | 7,567278E+22                              | 7,567499E+22 | 6,787957E+22 | 6,787988E+22 | 1,513478E+23                           | 1,357594E+23                           | 2,871072E+23  |
| 2747                   | 7,567292E+22                              | 7,567210E+22 | 6,787810E+22 | 6,787869E+22 | 1,513450E+23                           | 1,357568E+23                           | 2,871018E+23  |
| 2748                   | 7,567123E+22                              | 7,567190E+22 | 6,787909E+22 | 6,787795E+22 | 1,513431E+23                           | 1,357570E+23                           | 2,871002E+23  |
| 2749                   | 7,567365E+22                              | 7,567369E+22 | 6,787806E+22 | 6,787859E+22 | 1,513473E+23                           | 1,357567E+23                           | 2,871040E+23  |
| 2750                   | 7,567324E+22                              | 7,567049E+22 | 6,787721E+22 | 6,787777E+22 | 1,513437E+23                           | 1,357550E+23                           | 2,870987E+23  |
| 2751                   | 7,567165E+22                              | 7,567320E+22 | 6,787900E+22 | 6,787802E+22 | 1,513448E+23                           | 1,357570E+23                           | 2,871019E+23  |
| 2752                   | 7,567357E+22                              | 7,567424E+22 | 6,787770E+22 | 6,787853E+22 | 1,513478E+23                           | 1,357562E+23                           | 2,871040E+23  |
| 2753                   | 7,567196E+22                              | 7,567162E+22 | 6,787856E+22 | 6,787847E+22 | 1,513436E+23                           | 1,357570E+23                           | 2,871006E+23  |
| 2754                   | 7,567210E+22                              | 7,567450E+22 | 6,788045E+22 | 6,787976E+22 | 1,513466E+23                           | 1,357602E+23                           | 2,871068E+23  |
| 2755                   | 7,567388E+22                              | 7,567263E+22 | 6,787986E+22 | 6,787955E+22 | 1,513465E+23                           | 1,357594E+23                           | 2,871059E+23  |
| 2756                   | 7,567218E+22                              | 7,567168E+22 | 6,788116E+22 | 6,787991E+22 | 1,513439E+23                           | 1,357611E+23                           | 2,871049E+23  |
| 2757                   | 7,567406E+22                              | 7,567482E+22 | 6,788076E+22 | 6,788163E+22 | 1,513489E+23                           | 1,357624E+23                           | 2,871113E+23  |
| 2758                   | 7,567423E+22                              | 7,567245E+22 | 6,787977E+22 | 6,788142E+22 | 1,513467E+23                           | 1,357612E+23                           | 2,871079E+23  |
| 2759                   | 7,567224E+22                              | 7,567392E+22 | 6,788180E+22 | 6,788129E+22 | 1,513462E+23                           | 1,357631E+23                           | 2,871092E+23  |
| 2760                   | 7,567497E+22                              | 7,567546E+22 | 6,788085E+22 | 6,788117E+22 | 1,513504E+23                           | 1,357620E+23                           | 2,871125E+23  |
| 2761                   | 7,567406E+22                              | 7,567207E+22 | 6,788086E+22 | 6,788026E+22 | 1,513461E+23                           | 1,357611E+23                           | 2,871072E+23  |
| 2762                   | 7,567305E+22                              | 7,567460E+22 | 6,788213E+22 | 6,788077E+22 | 1,513477E+23                           | 1,357629E+23                           | 2,871106E+23  |
| 2763                   | 7,567462E+22                              | 7,567415E+22 | 6,788035E+22 | 6,788031E+22 | 1,513488E+23                           | 1,357607E+23                           | 2,871094E+23  |
| 2764                   | 7,567183E+22                              | 7,567214E+22 | 6,788043E+22 | 6,788004E+22 | 1,513440E+23                           | 1,357605E+23                           | 2,871044E+23  |
| 2765                   | 7,567263E+22                              | 7,567472E+22 | 6,788013E+22 | 6,788062E+22 | 1,513474E+23                           | 1,357608E+23                           | 2,871081E+23  |
| 2766                   | 7,567369E+22                              | 7,567199E+22 | 6,787878E+22 | 6,787954E+22 | 1,513457E+23                           | 1,357583E+23                           | 2,871040E+23  |
| 2767                   | 7,567156E+22                              | 7,567175E+22 | 6,788000E+22 | 6,787892E+22 | 1,513433E+23                           | 1,357589E+23                           | 2,871022E+23  |
| 2768                   | 7,567413E+22                              | 7,567413E+22 | 6,787879E+22 | 6,787913E+22 | 1,513483E+23                           | 1,357579E+23                           | 2,871062E+23  |
| 2769                   | 7,567341E+22                              | 7,567140E+22 | 6,787818E+22 | 6,787874E+22 | 1,513448E+23                           | 1,357569E+23                           | 2,871017E+23  |
| 2770                   | 7,567145E+22                              | 7,567370E+22 | 6,787991E+22 | 6,787940E+22 | 1,513451E+23                           | 1,357593E+23                           | 2,871045E+23  |
| 2771                   | 7,567385E+22                              | 7,567435E+22 | 6,787936E+22 | 6,787938E+22 | 1,513482E+23                           | 1,357587E+23                           | 2,871069E+23  |
| 2772                   | 7,567203E+22                              | 7,567148E+22 | 6,788034E+22 | 6,787950E+22 | 1,513435E+23                           | 1,357598E+23                           | 2,871033E+23  |
| 2773                   | 7,567267E+22                              | 7,567397E+22 | 6,788141E+22 | 6,788074E+22 | 1,513466E+23                           | 1,357622E+23                           | 2,871088E+23  |
| 2774                   | 7,567464E+22                              | 7,567286E+22 | 6,788052E+22 | 6,788114E+22 | 1,513475E+23                           | 1,357617E+23                           | 2,871092E+23  |
| 2775                   | 7,567206E+22                              | 7,567232E+22 | 6,788180E+22 | 6,788163E+22 | 1,513444E+23                           | 1,357634E+23                           | 2,871078E+23  |
| 2776                   | 7,567414E+22                              | 7,567567E+22 | 6,788143E+22 | 6,788245E+22 | 1,513498E+23                           | 1,357639E+23                           | 2,871137E+23  |
| 2777                   | 7,567458E+22                              | 7,567322E+22 | 6,788116E+22 | 6,788204E+22 | 1,513478E+23                           | 1,357632E+23                           | 2,871110E+23  |
| 2778                   | 7,567267E+22                              | 7,567395E+22 | 6,788303E+22 | 6,788202E+22 | 1,513466E+23                           | 1,357651E+23                           | 2,871117E+23  |
| 2779                   | 7,567558E+22                              | 7,567535E+22 | 6,788242E+22 | 6,788175E+22 | 1,513509E+23                           | 1,357642E+23                           | 2,871151E+23  |
| 2780                   | 7,567379E+22                              | 7,567231E+22 | 6,788216E+22 | 6,788143E+22 | 1,513461E+23                           | 1,357636E+23                           | 2,871097E+23  |
| 2781                   | 7,567273E+22                              | 7,567459E+22 | 6,788247E+22 | 6,788201E+22 | 1,513473E+23                           | 1,357645E+23                           | 2,871118E+23  |
| 2782                   | 7,567462E+22                              | 7,567447E+22 | 6,788072E+22 | 6,788177E+22 | 1,513491E+23                           | 1,357625E+23                           | 2,871116E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 2783                   | 7,567170E+22                              | 7,567197E+22 | 6,788119E+22 | 6,788110E+22 | 1,513437E+23                           | 1,357623E+23                           | 2,871060E+23  |
| 2784                   | 7,567330E+22                              | 7,567448E+22 | 6,788089E+22 | 6,788073E+22 | 1,513478E+23                           | 1,357616E+23                           | 2,871094E+23  |
| 2785                   | 7,567459E+22                              | 7,567222E+22 | 6,787969E+22 | 6,787987E+22 | 1,513468E+23                           | 1,357596E+23                           | 2,871064E+23  |
| 2786                   | 7,567193E+22                              | 7,567204E+22 | 6,788059E+22 | 6,787986E+22 | 1,513440E+23                           | 1,357605E+23                           | 2,871044E+23  |
| 2787                   | 7,567427E+22                              | 7,567486E+22 | 6,787989E+22 | 6,787995E+22 | 1,513491E+23                           | 1,357598E+23                           | 2,871090E+23  |
| 2788                   | 7,567280E+22                              | 7,567220E+22 | 6,787961E+22 | 6,787988E+22 | 1,513450E+23                           | 1,357595E+23                           | 2,871045E+23  |
| 2789                   | 7,567128E+22                              | 7,567355E+22 | 6,788118E+22 | 6,788038E+22 | 1,513448E+23                           | 1,357616E+23                           | 2,871064E+23  |
| 2790                   | 7,567438E+22                              | 7,567431E+22 | 6,788069E+22 | 6,788075E+22 | 1,513487E+23                           | 1,357614E+23                           | 2,871101E+23  |
| 2791                   | 7,567220E+22                              | 7,567120E+22 | 6,788162E+22 | 6,788117E+22 | 1,513434E+23                           | 1,357628E+23                           | 2,871062E+23  |
| 2792                   | 7,567316E+22                              | 7,567418E+22 | 6,788223E+22 | 6,788197E+22 | 1,513473E+23                           | 1,357642E+23                           | 2,871115E+23  |
| 2793                   | 7,567510E+22                              | 7,567374E+22 | 6,788117E+22 | 6,788252E+22 | 1,513488E+23                           | 1,357637E+23                           | 2,871125E+23  |
| 2794                   | 7,567227E+22                              | 7,567280E+22 | 6,788244E+22 | 6,788297E+22 | 1,513451E+23                           | 1,357654E+23                           | 2,871105E+23  |
| 2795                   | 7,567485E+22                              | 7,567591E+22 | 6,788290E+22 | 6,788285E+22 | 1,513508E+23                           | 1,357658E+23                           | 2,871165E+23  |
| 2796                   | 7,567482E+22                              | 7,567339E+22 | 6,788277E+22 | 6,788245E+22 | 1,513482E+23                           | 1,357652E+23                           | 2,871134E+23  |
| 2797                   | 7,567301E+22                              | 7,567371E+22 | 6,788401E+22 | 6,788262E+22 | 1,513467E+23                           | 1,357666E+23                           | 2,871134E+23  |
| 2798                   | 7,567575E+22                              | 7,567577E+22 | 6,788311E+22 | 6,788303E+22 | 1,513515E+23                           | 1,357661E+23                           | 2,871177E+23  |
| 2799                   | 7,567304E+22                              | 7,567269E+22 | 6,788289E+22 | 6,788303E+22 | 1,513457E+23                           | 1,357659E+23                           | 2,871117E+23  |
| 2800                   | 7,567244E+22                              | 7,567479E+22 | 6,788314E+22 | 6,788281E+22 | 1,513472E+23                           | 1,357660E+23                           | 2,871132E+23  |
| 2801                   | 7,567493E+22                              | 7,567454E+22 | 6,788173E+22 | 6,788248E+22 | 1,513495E+23                           | 1,357642E+23                           | 2,871137E+23  |
| 2802                   | 7,567231E+22                              | 7,567159E+22 | 6,788198E+22 | 6,788189E+22 | 1,513439E+23                           | 1,357639E+23                           | 2,871078E+23  |
| 2803                   | 7,567429E+22                              | 7,567432E+22 | 6,788196E+22 | 6,788119E+22 | 1,513486E+23                           | 1,357632E+23                           | 2,871118E+23  |
| 2804                   | 7,567461E+22                              | 7,567286E+22 | 6,788070E+22 | 6,788076E+22 | 1,513475E+23                           | 1,357615E+23                           | 2,871089E+23  |
| 2805                   | 7,567182E+22                              | 7,567253E+22 | 6,788106E+22 | 6,788091E+22 | 1,513444E+23                           | 1,357620E+23                           | 2,871063E+23  |
| 2806                   | 7,567419E+22                              | 7,567552E+22 | 6,788079E+22 | 6,788126E+22 | 1,513497E+23                           | 1,357621E+23                           | 2,871118E+23  |
| 2807                   | 7,567253E+22                              | 7,567222E+22 | 6,788110E+22 | 6,788118E+22 | 1,513447E+23                           | 1,357623E+23                           | 2,871070E+23  |
| 2808                   | 7,567173E+22                              | 7,567317E+22 | 6,788241E+22 | 6,788108E+22 | 1,513449E+23                           | 1,357635E+23                           | 2,871084E+23  |
| 2809                   | 7,567502E+22                              | 7,567441E+22 | 6,788180E+22 | 6,788195E+22 | 1,513494E+23                           | 1,357637E+23                           | 2,871132E+23  |
| 2810                   | 7,567257E+22                              | 7,567146E+22 | 6,788215E+22 | 6,788269E+22 | 1,513440E+23                           | 1,357648E+23                           | 2,871089E+23  |
| 2811                   | 7,567359E+22                              | 7,567469E+22 | 6,788311E+22 | 6,788302E+22 | 1,513483E+23                           | 1,357661E+23                           | 2,871144E+23  |
| 2812                   | 7,567497E+22                              | 7,567459E+22 | 6,788253E+22 | 6,788339E+22 | 1,513496E+23                           | 1,357659E+23                           | 2,871155E+23  |
| 2813                   | 7,567266E+22                              | 7,567283E+22 | 6,788361E+22 | 6,788355E+22 | 1,513455E+23                           | 1,357672E+23                           | 2,871127E+23  |
| 2814                   | 7,567545E+22                              | 7,567611E+22 | 6,788429E+22 | 6,788373E+22 | 1,513516E+23                           | 1,357680E+23                           | 2,871196E+23  |
| 2815                   | 7,567475E+22                              | 7,567344E+22 | 6,788420E+22 | 6,788377E+22 | 1,513482E+23                           | 1,357680E+23                           | 2,871162E+23  |
| 2816                   | 7,567289E+22                              | 7,567388E+22 | 6,788485E+22 | 6,788372E+22 | 1,513468E+23                           | 1,357686E+23                           | 2,871153E+23  |
| 2817                   | 7,567555E+22                              | 7,567640E+22 | 6,788375E+22 | 6,788449E+22 | 1,513520E+23                           | 1,357682E+23                           | 2,871202E+23  |
| 2818                   | 7,567298E+22                              | 7,567264E+22 | 6,788343E+22 | 6,788438E+22 | 1,513456E+23                           | 1,357678E+23                           | 2,871134E+23  |
| 2819                   | 7,567325E+22                              | 7,567434E+22 | 6,788424E+22 | 6,788323E+22 | 1,513476E+23                           | 1,357675E+23                           | 2,871151E+23  |
| 2820                   | 7,567550E+22                              | 7,567448E+22 | 6,788282E+22 | 6,788279E+22 | 1,513500E+23                           | 1,357656E+23                           | 2,871156E+23  |
| 2821                   | 7,567300E+22                              | 7,567149E+22 | 6,788240E+22 | 6,788239E+22 | 1,513445E+23                           | 1,357648E+23                           | 2,871093E+23  |
| 2822                   | 7,567457E+22                              | 7,567517E+22 | 6,788244E+22 | 6,788216E+22 | 1,513497E+23                           | 1,357646E+23                           | 2,871143E+23  |
| 2823                   | 7,567389E+22                              | 7,567366E+22 | 6,788161E+22 | 6,788206E+22 | 1,513476E+23                           | 1,357637E+23                           | 2,871112E+23  |
| 2824                   | 7,567142E+22                              | 7,567295E+22 | 6,788224E+22 | 6,788168E+22 | 1,513444E+23                           | 1,357639E+23                           | 2,871083E+23  |
| 2825                   | 7,567426E+22                              | 7,567572E+22 | 6,788220E+22 | 6,788225E+22 | 1,513500E+23                           | 1,357644E+23                           | 2,871144E+23  |
| 2826                   | 7,567282E+22                              | 7,567169E+22 | 6,788234E+22 | 6,788257E+22 | 1,513445E+23                           | 1,357649E+23                           | 2,871094E+23  |
| 2827                   | 7,567260E+22                              | 7,567275E+22 | 6,788370E+22 | 6,788220E+22 | 1,513454E+23                           | 1,357659E+23                           | 2,871113E+23  |
| 2828                   | 7,567520E+22                              | 7,567479E+22 | 6,788278E+22 | 6,788326E+22 | 1,513500E+23                           | 1,357660E+23                           | 2,871160E+23  |
| 2829                   | 7,567292E+22                              | 7,567185E+22 | 6,788253E+22 | 6,788393E+22 | 1,513448E+23                           | 1,357665E+23                           | 2,871112E+23  |
| 2830                   | 7,567412E+22                              | 7,567539E+22 | 6,788396E+22 | 6,788402E+22 | 1,513495E+23                           | 1,357680E+23                           | 2,871175E+23  |
| 2831                   | 7,567510E+22                              | 7,567483E+22 | 6,788406E+22 | 6,788421E+22 | 1,513499E+23                           | 1,357683E+23                           | 2,871182E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 2832              | 7,567313E+22                              | 7,567290E+22 | 6,788497E+22 | 6,788394E+22 | 1,513460E+23                           | 1,357689E+23                           | 2,871149E+23  |
| 2833              | 7,567566E+22                              | 7,567657E+22 | 6,788547E+22 | 6,788484E+22 | 1,513522E+23                           | 1,357703E+23                           | 2,871225E+23  |
| 2834              | 7,567446E+22                              | 7,567373E+22 | 6,788503E+22 | 6,788544E+22 | 1,513482E+23                           | 1,357705E+23                           | 2,871187E+23  |
| 2835              | 7,567292E+22                              | 7,567403E+22 | 6,788583E+22 | 6,788492E+22 | 1,513470E+23                           | 1,357707E+23                           | 2,871177E+23  |
| 2836              | 7,567531E+22                              | 7,567663E+22 | 6,788494E+22 | 6,788541E+22 | 1,513519E+23                           | 1,357704E+23                           | 2,871223E+23  |
| 2837              | 7,567361E+22                              | 7,567225E+22 | 6,788409E+22 | 6,788500E+22 | 1,513459E+23                           | 1,357691E+23                           | 2,871149E+23  |
| 2838              | 7,567418E+22                              | 7,567434E+22 | 6,788495E+22 | 6,788393E+22 | 1,513485E+23                           | 1,357689E+23                           | 2,871174E+23  |
| 2839              | 7,567568E+22                              | 7,567476E+22 | 6,788374E+22 | 6,788376E+22 | 1,513504E+23                           | 1,357675E+23                           | 2,871180E+23  |
| 2840              | 7,567303E+22                              | 7,567207E+22 | 6,788290E+22 | 6,788305E+22 | 1,513451E+23                           | 1,357660E+23                           | 2,871111E+23  |
| 2841              | 7,567421E+22                              | 7,567611E+22 | 6,788317E+22 | 6,788328E+22 | 1,513503E+23                           | 1,357664E+23                           | 2,871168E+23  |
| 2842              | 7,567362E+22                              | 7,567378E+22 | 6,788267E+22 | 6,788320E+22 | 1,513474E+23                           | 1,357659E+23                           | 2,871133E+23  |
| 2843              | 7,567197E+22                              | 7,567230E+22 | 6,788379E+22 | 6,788226E+22 | 1,513443E+23                           | 1,357660E+23                           | 2,871103E+23  |
| 2844              | 7,567457E+22                              | 7,567543E+22 | 6,788370E+22 | 6,788302E+22 | 1,513500E+23                           | 1,357667E+23                           | 2,871167E+23  |
| 2845              | 7,567350E+22                              | 7,567143E+22 | 6,788284E+22 | 6,788369E+22 | 1,513449E+23                           | 1,357665E+23                           | 2,871115E+23  |
| 2846              | 7,567308E+22                              | 7,567340E+22 | 6,788415E+22 | 6,788359E+22 | 1,513465E+23                           | 1,357677E+23                           | 2,871142E+23  |
| 2847              | 7,567495E+22                              | 7,567559E+22 | 6,788371E+22 | 6,788464E+22 | 1,513505E+23                           | 1,357684E+23                           | 2,871189E+23  |
| 2848              | 7,567302E+22                              | 7,567241E+22 | 6,788368E+22 | 6,788451E+22 | 1,513454E+23                           | 1,357682E+23                           | 2,871136E+23  |
| 2849              | 7,567446E+22                              | 7,567599E+22 | 6,788546E+22 | 6,788485E+22 | 1,513504E+23                           | 1,357703E+23                           | 2,871208E+23  |
| 2850              | 7,567538E+22                              | 7,567482E+22 | 6,788559E+22 | 6,788548E+22 | 1,513502E+23                           | 1,357711E+23                           | 2,871213E+23  |
| 2851              | 7,567362E+22                              | 7,567280E+22 | 6,788652E+22 | 6,788514E+22 | 1,513464E+23                           | 1,357717E+23                           | 2,871181E+23  |
| 2852              | 7,567532E+22                              | 7,567707E+22 | 6,788663E+22 | 6,788628E+22 | 1,513524E+23                           | 1,357729E+23                           | 2,871253E+23  |
| 2853              | 7,567450E+22                              | 7,567379E+22 | 6,788543E+22 | 6,788694E+22 | 1,513483E+23                           | 1,357724E+23                           | 2,871207E+23  |
| 2854              | 7,567347E+22                              | 7,567412E+22 | 6,788649E+22 | 6,788595E+22 | 1,513476E+23                           | 1,357724E+23                           | 2,871200E+23  |
| 2855              | 7,567573E+22                              | 7,567630E+22 | 6,788595E+22 | 6,788608E+22 | 1,513520E+23                           | 1,357720E+23                           | 2,871241E+23  |
| 2856              | 7,567434E+22                              | 7,567225E+22 | 6,788472E+22 | 6,788506E+22 | 1,513466E+23                           | 1,357698E+23                           | 2,871164E+23  |
| 2857              | 7,567460E+22                              | 7,567512E+22 | 6,788536E+22 | 6,788451E+22 | 1,513497E+23                           | 1,357699E+23                           | 2,871196E+23  |
| 2858              | 7,567532E+22                              | 7,567537E+22 | 6,788434E+22 | 6,788479E+22 | 1,513507E+23                           | 1,357691E+23                           | 2,871198E+23  |
| 2859              | 7,567287E+22                              | 7,567247E+22 | 6,788412E+22 | 6,788379E+22 | 1,513453E+23                           | 1,357679E+23                           | 2,871132E+23  |
| 2860              | 7,567367E+22                              | 7,567631E+22 | 6,788477E+22 | 6,788397E+22 | 1,513500E+23                           | 1,357687E+23                           | 2,871187E+23  |
| 2861              | 7,567393E+22                              | 7,567318E+22 | 6,788380E+22 | 6,788418E+22 | 1,513471E+23                           | 1,357680E+23                           | 2,871151E+23  |
| 2862              | 7,567273E+22                              | 7,567200E+22 | 6,788475E+22 | 6,788345E+22 | 1,513447E+23                           | 1,357682E+23                           | 2,871129E+23  |
| 2863              | 7,567475E+22                              | 7,567536E+22 | 6,788464E+22 | 6,788454E+22 | 1,513501E+23                           | 1,357692E+23                           | 2,871193E+23  |
| 2864              | 7,567371E+22                              | 7,567206E+22 | 6,788321E+22 | 6,788475E+22 | 1,513458E+23                           | 1,357680E+23                           | 2,871137E+23  |
| 2865              | 7,567327E+22                              | 7,567453E+22 | 6,788465E+22 | 6,788485E+22 | 1,513478E+23                           | 1,357695E+23                           | 2,871173E+23  |
| 2866              | 7,567513E+22                              | 7,567596E+22 | 6,788499E+22 | 6,788569E+22 | 1,513511E+23                           | 1,357707E+23                           | 2,871218E+23  |
| 2867              | 7,567388E+22                              | 7,567235E+22 | 6,788550E+22 | 6,788500E+22 | 1,513462E+23                           | 1,357705E+23                           | 2,871167E+23  |
| 2868              | 7,567462E+22                              | 7,567625E+22 | 6,788727E+22 | 6,788560E+22 | 1,513509E+23                           | 1,357729E+23                           | 2,871237E+23  |
| 2869              | 7,567567E+22                              | 7,567489E+22 | 6,788650E+22 | 6,788687E+22 | 1,513506E+23                           | 1,357734E+23                           | 2,871239E+23  |
| 2870              | 7,567371E+22                              | 7,567327E+22 | 6,788727E+22 | 6,788675E+22 | 1,513470E+23                           | 1,357740E+23                           | 2,871210E+23  |
| 2871              | 7,567490E+22                              | 7,567735E+22 | 6,788769E+22 | 6,788779E+22 | 1,513523E+23                           | 1,357755E+23                           | 2,871277E+23  |
| 2872              | 7,567476E+22                              | 7,567383E+22 | 6,788617E+22 | 6,788747E+22 | 1,513486E+23                           | 1,357736E+23                           | 2,871222E+23  |
| 2873              | 7,567413E+22                              | 7,567432E+22 | 6,788719E+22 | 6,788662E+22 | 1,513484E+23                           | 1,357738E+23                           | 2,871223E+23  |
| 2874              | 7,567627E+22                              | 7,567622E+22 | 6,788684E+22 | 6,788685E+22 | 1,513525E+23                           | 1,357737E+23                           | 2,871262E+23  |
| 2875              | 7,567491E+22                              | 7,567240E+22 | 6,788566E+22 | 6,788559E+22 | 1,513473E+23                           | 1,357713E+23                           | 2,871186E+23  |
| 2876              | 7,567412E+22                              | 7,567597E+22 | 6,788637E+22 | 6,788524E+22 | 1,513501E+23                           | 1,357716E+23                           | 2,871217E+23  |
| 2877              | 7,567513E+22                              | 7,567563E+22 | 6,788494E+22 | 6,788583E+22 | 1,513508E+23                           | 1,357708E+23                           | 2,871215E+23  |
| 2878              | 7,567306E+22                              | 7,567240E+22 | 6,788523E+22 | 6,788469E+22 | 1,513455E+23                           | 1,357699E+23                           | 2,871154E+23  |
| 2879              | 7,567371E+22                              | 7,567578E+22 | 6,788615E+22 | 6,788494E+22 | 1,513495E+23                           | 1,357711E+23                           | 2,871206E+23  |
| 2880              | 7,567437E+22                              | 7,567292E+22 | 6,788447E+22 | 6,788491E+22 | 1,513473E+23                           | 1,357694E+23                           | 2,871167E+23  |

| 1                 | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------------|---|--------------|--------------|--------------|--|--|---------------|
|                   | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                   | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude $\odot$ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years             |   |              |              |              |  |  |               |
| 2881              | 7,567313E+22                              | 7,567267E+22 | 6,788501E+22 | 6,788478E+22 | 1,513458E+23                           | 1,357698E+23                           | 2,871156E+23  |
| 2882              | 7,567475E+22                              | 7,567594E+22 | 6,788523E+22 | 6,788599E+22 | 1,513507E+23                           | 1,357712E+23                           | 2,871219E+23  |
| 2883              | 7,567408E+22                              | 7,567268E+22 | 6,788443E+22 | 6,788552E+22 | 1,513468E+23                           | 1,357699E+23                           | 2,871167E+23  |
| 2884              | 7,567332E+22                              | 7,567518E+22 | 6,788644E+22 | 6,788535E+22 | 1,513485E+23                           | 1,357718E+23                           | 2,871203E+23  |
| 2885              | 7,567572E+22                              | 7,567585E+22 | 6,788644E+22 | 6,788666E+22 | 1,513516E+23                           | 1,357731E+23                           | 2,871247E+23  |
| 2886              | 7,567454E+22                              | 7,567245E+22 | 6,788703E+22 | 6,788631E+22 | 1,513470E+23                           | 1,357733E+23                           | 2,871203E+23  |
| 2887              | 7,567443E+22                              | 7,567628E+22 | 6,788860E+22 | 6,788732E+22 | 1,513507E+23                           | 1,357759E+23                           | 2,871266E+23  |
| 2888              | 7,567547E+22                              | 7,567529E+22 | 6,788707E+22 | 6,788826E+22 | 1,513508E+23                           | 1,357753E+23                           | 2,871261E+23  |
| 2889              | 7,567387E+22                              | 7,567392E+22 | 6,788760E+22 | 6,788812E+22 | 1,513478E+23                           | 1,357757E+23                           | 2,871235E+23  |
| 2890              | 7,567527E+22                              | 7,567699E+22 | 6,788863E+22 | 6,788867E+22 | 1,513523E+23                           | 1,357773E+23                           | 2,871296E+23  |
| 2891              | 7,567584E+22                              | 7,567359E+22 | 6,788733E+22 | 6,788758E+22 | 1,513494E+23                           | 1,357749E+23                           | 2,871243E+23  |
| 2892              | 7,567456E+22                              | 7,567474E+22 | 6,788822E+22 | 6,788680E+22 | 1,513493E+23                           | 1,357750E+23                           | 2,871243E+23  |
| 2893              | 7,567649E+22                              | 7,567660E+22 | 6,788729E+22 | 6,788771E+22 | 1,513531E+23                           | 1,357750E+23                           | 2,871281E+23  |
| 2894              | 7,567475E+22                              | 7,567321E+22 | 6,788641E+22 | 6,788659E+22 | 1,513480E+23                           | 1,357730E+23                           | 2,871210E+23  |
| 2895              | 7,567326E+22                              | 7,567623E+22 | 6,788765E+22 | 6,788636E+22 | 1,513495E+23                           | 1,357740E+23                           | 2,871235E+23  |
| 2896              | 7,567484E+22                              | 7,567554E+22 | 6,788600E+22 | 6,788648E+22 | 1,513504E+23                           | 1,357725E+23                           | 2,871229E+23  |
| 2897              | 7,567343E+22                              | 7,567238E+22 | 6,788599E+22 | 6,788584E+22 | 1,513458E+23                           | 1,357718E+23                           | 2,871176E+23  |
| 2898              | 7,567411E+22                              | 7,567529E+22 | 6,788712E+22 | 6,788633E+22 | 1,513494E+23                           | 1,357734E+23                           | 2,871228E+23  |
| 2899              | 7,567509E+22                              | 7,567305E+22 | 6,788524E+22 | 6,788596E+22 | 1,513481E+23                           | 1,357712E+23                           | 2,871193E+23  |
| 2900              | 7,567315E+22                              | 7,567363E+22 | 6,788579E+22 | 6,788575E+22 | 1,513468E+23                           | 1,357715E+23                           | 2,871183E+23  |
| 2901              | 7,567517E+22                              | 7,567635E+22 | 6,788596E+22 | 6,788702E+22 | 1,513515E+23                           | 1,357730E+23                           | 2,871245E+23  |
| 2902              | 7,567480E+22                              | 7,567290E+22 | 6,788590E+22 | 6,788617E+22 | 1,513477E+23                           | 1,357721E+23                           | 2,871198E+23  |
| 2903              | 7,567354E+22                              | 7,567512E+22 | 6,788830E+22 | 6,788622E+22 | 1,513487E+23                           | 1,357745E+23                           | 2,871232E+23  |
| 2904              | 7,567592E+22                              | 7,567604E+22 | 6,788748E+22 | 6,788751E+22 | 1,513520E+23                           | 1,357750E+23                           | 2,871269E+23  |
| 2905              | 7,567451E+22                              | 7,567317E+22 | 6,788764E+22 | 6,788800E+22 | 1,513477E+23                           | 1,357756E+23                           | 2,871233E+23  |
| 2906              | 7,567408E+22                              | 7,567652E+22 | 6,788955E+22 | 6,788908E+22 | 1,513506E+23                           | 1,357786E+23                           | 2,871292E+23  |
| 2907              | 7,567575E+22                              | 7,567539E+22 | 6,788818E+22 | 6,788921E+22 | 1,513511E+23                           | 1,357774E+23                           | 2,871285E+23  |
| 2908              | 7,567417E+22                              | 7,567420E+22 | 6,788892E+22 | 6,788863E+22 | 1,513484E+23                           | 1,357776E+23                           | 2,871259E+23  |
| 2909              | 7,567620E+22                              | 7,567673E+22 | 6,788946E+22 | 6,788943E+22 | 1,513529E+23                           | 1,357789E+23                           | 2,871318E+23  |
| 2910              | 7,567662E+22                              | 7,567383E+22 | 6,788831E+22 | 6,788832E+22 | 1,513505E+23                           | 1,357766E+23                           | 2,871271E+23  |
| 2911              | 7,567427E+22                              | 7,567523E+22 | 6,788924E+22 | 6,788789E+22 | 1,513495E+23                           | 1,357771E+23                           | 2,871266E+23  |
| 2912              | 7,567594E+22                              | 7,567727E+22 | 6,788775E+22 | 6,788860E+22 | 1,513532E+23                           | 1,357764E+23                           | 2,871296E+23  |
| 2913              | 7,567450E+22                              | 7,567380E+22 | 6,788700E+22 | 6,788781E+22 | 1,513483E+23                           | 1,357748E+23                           | 2,871231E+23  |
| 2914              | 7,567328E+22                              | 7,567556E+22 | 6,788893E+22 | 6,788738E+22 | 1,513488E+23                           | 1,357763E+23                           | 2,871251E+23  |
| 2915              | 7,567559E+22                              | 7,567495E+22 | 6,788717E+22 | 6,788703E+22 | 1,513505E+23                           | 1,357742E+23                           | 2,871247E+23  |
| 2916              | 7,567387E+22                              | 7,567261E+22 | 6,788682E+22 | 6,788649E+22 | 1,513465E+23                           | 1,357733E+23                           | 2,871198E+23  |
| 2917              | 7,567464E+22                              | 7,567542E+22 | 6,788738E+22 | 6,788757E+22 | 1,513501E+23                           | 1,357749E+23                           | 2,871250E+23  |
| 2918              | 7,567546E+22                              | 7,567387E+22 | 6,788599E+22 | 6,788695E+22 | 1,513493E+23                           | 1,357729E+23                           | 2,871223E+23  |
| 2919              | 7,567298E+22                              | 7,567411E+22 | 6,788715E+22 | 6,788660E+22 | 1,513471E+23                           | 1,357738E+23                           | 2,871208E+23  |
| 2920              | 7,567521E+22                              | 7,567657E+22 | 6,788725E+22 | 6,788752E+22 | 1,513518E+23                           | 1,357748E+23                           | 2,871266E+23  |
| 2921              | 7,567521E+22                              | 7,567337E+22 | 6,788706E+22 | 6,788737E+22 | 1,513486E+23                           | 1,357744E+23                           | 2,871230E+23  |
| 2922              | 7,567356E+22                              | 7,567480E+22 | 6,788976E+22 | 6,788786E+22 | 1,513484E+23                           | 1,357776E+23                           | 2,871260E+23  |
| 2923              | 7,567603E+22                              | 7,567627E+22 | 6,788862E+22 | 6,788898E+22 | 1,513523E+23                           | 1,357776E+23                           | 2,871299E+23  |
| 2924              | 7,567433E+22                              | 7,567395E+22 | 6,788853E+22 | 6,788933E+22 | 1,513483E+23                           | 1,357779E+23                           | 2,871261E+23  |
| 2925              | 7,567459E+22                              | 7,567635E+22 | 6,789027E+22 | 6,789038E+22 | 1,513509E+23                           | 1,357807E+23                           | 2,871316E+23  |
| 2926              | 7,567678E+22                              | 7,567531E+22 | 6,788937E+22 | 6,788981E+22 | 1,513521E+23                           | 1,357792E+23                           | 2,871313E+23  |
| 2927              | 7,567472E+22                              | 7,567417E+22 | 6,789016E+22 | 6,788924E+22 | 1,513489E+23                           | 1,357794E+23                           | 2,871283E+23  |
| 2928              | 7,567643E+22                              | 7,567715E+22 | 6,789003E+22 | 6,788994E+22 | 1,513536E+23                           | 1,357800E+23                           | 2,871336E+23  |
| 2929              | 7,567651E+22                              | 7,567499E+22 | 6,788867E+22 | 6,788950E+22 | 1,513515E+23                           | 1,357782E+23                           | 2,871297E+23  |

| 1                      | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|------------------------|---|--------------|--------------|--------------|--|--|---------------|
|                        | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|                        | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude <sup>⊙</sup> | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years                  |   |              |              |              |  |  |               |
| 2930                   | 7,567363E+22                              | 7,567555E+22 | 6,789034E+22 | 6,788917E+22 | 1,513492E+23                           | 1,357795E+23                           | 2,871287E+23  |
| 2931                   | 7,567577E+22                              | 7,567731E+22 | 6,788907E+22 | 6,788927E+22 | 1,513531E+23                           | 1,357783E+23                           | 2,871314E+23  |
| 2932                   | 7,567452E+22                              | 7,567375E+22 | 6,788842E+22 | 6,788843E+22 | 1,513483E+23                           | 1,357768E+23                           | 2,871251E+23  |
| 2933                   | 7,567407E+22                              | 7,567477E+22 | 6,788975E+22 | 6,788853E+22 | 1,513488E+23                           | 1,357783E+23                           | 2,871271E+23  |
| 2934                   | 7,567646E+22                              | 7,567471E+22 | 6,788795E+22 | 6,788808E+22 | 1,513512E+23                           | 1,357760E+23                           | 2,871272E+23  |
| 2935                   | 7,567390E+22                              | 7,567304E+22 | 6,788747E+22 | 6,788772E+22 | 1,513469E+23                           | 1,357752E+23                           | 2,871221E+23  |
| 2936                   | 7,567458E+22                              | 7,567620E+22 | 6,788753E+22 | 6,788831E+22 | 1,513508E+23                           | 1,357758E+23                           | 2,871266E+23  |
| 2937                   | 7,567563E+22                              | 7,567470E+22 | 6,788662E+22 | 6,788783E+22 | 1,513503E+23                           | 1,357744E+23                           | 2,871248E+23  |
| 2938                   | 7,567317E+22                              | 7,567387E+22 | 6,788887E+22 | 6,788741E+22 | 1,513470E+23                           | 1,357763E+23                           | 2,871233E+23  |
| 2939                   | 7,567565E+22                              | 7,567650E+22 | 6,788880E+22 | 6,788816E+22 | 1,513522E+23                           | 1,357770E+23                           | 2,871291E+23  |
| 2940                   | 7,567519E+22                              | 7,567392E+22 | 6,788843E+22 | 6,788851E+22 | 1,513491E+23                           | 1,357769E+23                           | 2,871260E+23  |
| 2941                   | 7,567368E+22                              | 7,567488E+22 | 6,789048E+22 | 6,788971E+22 | 1,513486E+23                           | 1,357802E+23                           | 2,871288E+23  |
| 2942                   | 7,567621E+22                              | 7,567659E+22 | 6,788969E+22 | 6,789041E+22 | 1,513528E+23                           | 1,357801E+23                           | 2,871329E+23  |
| 2943                   | 7,567437E+22                              | 7,567409E+22 | 6,788989E+22 | 6,789044E+22 | 1,513485E+23                           | 1,357803E+23                           | 2,871288E+23  |
| 2944                   | 7,567512E+22                              | 7,567633E+22 | 6,789113E+22 | 6,789096E+22 | 1,513515E+23                           | 1,357821E+23                           | 2,871335E+23  |
| 2945                   | 7,567757E+22                              | 7,567583E+22 | 6,789011E+22 | 6,789080E+22 | 1,513534E+23                           | 1,357809E+23                           | 2,871343E+23  |
| 2946                   | 7,567497E+22                              | 7,567422E+22 | 6,789136E+22 | 6,789042E+22 | 1,513492E+23                           | 1,357818E+23                           | 2,871310E+23  |
| 2947                   | 7,567636E+22                              | 7,567777E+22 | 6,789096E+22 | 6,789083E+22 | 1,513541E+23                           | 1,357818E+23                           | 2,871359E+23  |
| 2948                   | 7,567610E+22                              | 7,567589E+22 | 6,788970E+22 | 6,789038E+22 | 1,513520E+23                           | 1,357801E+23                           | 2,871321E+23  |
| 2949                   | 7,567384E+22                              | 7,567501E+22 | 6,789129E+22 | 6,789027E+22 | 1,513489E+23                           | 1,357816E+23                           | 2,871304E+23  |
| 2950                   | 7,567646E+22                              | 7,567676E+22 | 6,789036E+22 | 6,788990E+22 | 1,513532E+23                           | 1,357803E+23                           | 2,871335E+23  |
| 2951                   | 7,567492E+22                              | 7,567341E+22 | 6,788933E+22 | 6,788921E+22 | 1,513483E+23                           | 1,357785E+23                           | 2,871269E+23  |
| 2952                   | 7,567430E+22                              | 7,567486E+22 | 6,788977E+22 | 6,788931E+22 | 1,513492E+23                           | 1,357791E+23                           | 2,871282E+23  |
| 2953                   | 7,567657E+22                              | 7,567580E+22 | 6,788790E+22 | 6,788925E+22 | 1,513524E+23                           | 1,357772E+23                           | 2,871295E+23  |
| 2954                   | 7,567364E+22                              | 7,567343E+22 | 6,788841E+22 | 6,788872E+22 | 1,513471E+23                           | 1,357771E+23                           | 2,871242E+23  |
| 2955                   | 7,567462E+22                              | 7,567660E+22 | 6,788893E+22 | 6,788867E+22 | 1,513512E+23                           | 1,357776E+23                           | 2,871288E+23  |
| 2956                   | 7,567578E+22                              | 7,567521E+22 | 6,788832E+22 | 6,788834E+22 | 1,513510E+23                           | 1,357767E+23                           | 2,871276E+23  |
| 2957                   | 7,567369E+22                              | 7,567341E+22 | 6,789026E+22 | 6,788883E+22 | 1,513471E+23                           | 1,357791E+23                           | 2,871262E+23  |
| 2958                   | 7,567601E+22                              | 7,567647E+22 | 6,789021E+22 | 6,788964E+22 | 1,513525E+23                           | 1,357799E+23                           | 2,871323E+23  |
| 2959                   | 7,567492E+22                              | 7,567427E+22 | 6,788950E+22 | 6,789031E+22 | 1,513492E+23                           | 1,357798E+23                           | 2,871290E+23  |
| 2960                   | 7,567369E+22                              | 7,567515E+22 | 6,789091E+22 | 6,789106E+22 | 1,513488E+23                           | 1,357820E+23                           | 2,871308E+23  |
| 2961                   | 7,567688E+22                              | 7,567697E+22 | 6,789036E+22 | 6,789155E+22 | 1,513538E+23                           | 1,357819E+23                           | 2,871358E+23  |
| 2962                   | 7,567514E+22                              | 7,567378E+22 | 6,789132E+22 | 6,789120E+22 | 1,513489E+23                           | 1,357825E+23                           | 2,871314E+23  |
| 2963                   | 7,567595E+22                              | 7,567662E+22 | 6,789222E+22 | 6,789131E+22 | 1,513526E+23                           | 1,357835E+23                           | 2,871361E+23  |
| 2964                   | 7,567769E+22                              | 7,567687E+22 | 6,789120E+22 | 6,789149E+22 | 1,513546E+23                           | 1,357827E+23                           | 2,871373E+23  |
| 2965                   | 7,567493E+22                              | 7,567468E+22 | 6,789220E+22 | 6,789184E+22 | 1,513496E+23                           | 1,357840E+23                           | 2,871336E+23  |
| 2966                   | 7,567617E+22                              | 7,567804E+22 | 6,789223E+22 | 6,789180E+22 | 1,513542E+23                           | 1,357840E+23                           | 2,871382E+23  |
| 2967                   | 7,567573E+22                              | 7,567578E+22 | 6,789119E+22 | 6,789135E+22 | 1,513515E+23                           | 1,357825E+23                           | 2,871341E+23  |
| 2968                   | 7,567407E+22                              | 7,567454E+22 | 6,789189E+22 | 6,789097E+22 | 1,513486E+23                           | 1,357829E+23                           | 2,871315E+23  |
| 2969                   | 7,567703E+22                              | 7,567669E+22 | 6,789067E+22 | 6,789102E+22 | 1,513537E+23                           | 1,357817E+23                           | 2,871354E+23  |
| 2970                   | 7,567514E+22                              | 7,567329E+22 | 6,789003E+22 | 6,789039E+22 | 1,513484E+23                           | 1,357804E+23                           | 2,871289E+23  |
| 2971                   | 7,567442E+22                              | 7,567558E+22 | 6,789006E+22 | 6,789001E+22 | 1,513500E+23                           | 1,357801E+23                           | 2,871301E+23  |
| 2972                   | 7,567648E+22                              | 7,567686E+22 | 6,788875E+22 | 6,788978E+22 | 1,513533E+23                           | 1,357785E+23                           | 2,871319E+23  |
| 2973                   | 7,567412E+22                              | 7,567326E+22 | 6,788961E+22 | 6,788951E+22 | 1,513474E+23                           | 1,357791E+23                           | 2,871265E+23  |
| 2974                   | 7,567521E+22                              | 7,567632E+22 | 6,789066E+22 | 6,788915E+22 | 1,513515E+23                           | 1,357798E+23                           | 2,871313E+23  |
| 2975                   | 7,567584E+22                              | 7,567522E+22 | 6,788988E+22 | 6,788943E+22 | 1,513511E+23                           | 1,357793E+23                           | 2,871304E+23  |
| 2976                   | 7,567362E+22                              | 7,567354E+22 | 6,789081E+22 | 6,789022E+22 | 1,513472E+23                           | 1,357810E+23                           | 2,871282E+23  |
| 2977                   | 7,567598E+22                              | 7,567721E+22 | 6,789066E+22 | 6,789144E+22 | 1,513532E+23                           | 1,357821E+23                           | 2,871353E+23  |
| 2978                   | 7,567490E+22                              | 7,567434E+22 | 6,789073E+22 | 6,789178E+22 | 1,513492E+23                           | 1,357825E+23                           | 2,871317E+23  |



| 1           | 14  | 15           | 16           | 17           | 18                                     | 19                                     | 20            |
|-------------|---|--------------|--------------|--------------|--|--|---------------|
|             | Astronomical season (northern hemisphere) |              |              |              | Summer half year (northern hemisphere) | Winter half year (northern hemisphere) | Tropical year |
|             | Spring                                    | Summer       | Autumn       | Winter       |  |  |               |
| Longitude ☉ | 0° - 90°                                  | 90° - 180°   | 180° - 270°  | 270° - 360°  | 0° - 180°                              | 180° - 360°                            | 0° - 360°     |
| Years       |   |              |              |              |  |  |               |
| 2979        | 7,567422E+22                              | 7,567535E+22 | 6,789207E+22 | 6,789172E+22 | 1,513496E+23                           | 1,357838E+23                           | 2,871334E+23  |
| 2980        | 7,567762E+22                              | 7,567753E+22 | 6,789178E+22 | 6,789211E+22 | 1,513551E+23                           | 1,357839E+23                           | 2,871390E+23  |
| 2981        | 7,567606E+22                              | 7,567366E+22 | 6,789247E+22 | 6,789240E+22 | 1,513497E+23                           | 1,357849E+23                           | 2,871346E+23  |
| 2982        | 7,567633E+22                              | 7,567708E+22 | 6,789353E+22 | 6,789232E+22 | 1,513534E+23                           | 1,357859E+23                           | 2,871393E+23  |
| 2983        | 7,567722E+22                              | 7,567770E+22 | 6,789226E+22 | 6,789277E+22 | 1,513549E+23                           | 1,357850E+23                           | 2,871400E+23  |
| 2984        | 7,567450E+22                              | 7,567483E+22 | 6,789274E+22 | 6,789289E+22 | 1,513493E+23                           | 1,357856E+23                           | 2,871350E+23  |
| 2985        | 7,567634E+22                              | 7,567803E+22 | 6,789300E+22 | 6,789278E+22 | 1,513544E+23                           | 1,357858E+23                           | 2,871402E+23  |
| 2986        | 7,567609E+22                              | 7,567500E+22 | 6,789235E+22 | 6,789220E+22 | 1,513511E+23                           | 1,357846E+23                           | 2,871357E+23  |
| 2987        | 7,567462E+22                              | 7,567449E+22 | 6,789236E+22 | 6,789149E+22 | 1,513491E+23                           | 1,357839E+23                           | 2,871330E+23  |
| 2988        | 7,567726E+22                              | 7,567751E+22 | 6,789113E+22 | 6,789167E+22 | 1,513548E+23                           | 1,357828E+23                           | 2,871376E+23  |
| 2989        | 7,567533E+22                              | 7,567370E+22 | 6,789049E+22 | 6,789144E+22 | 1,513490E+23                           | 1,357819E+23                           | 2,871310E+23  |
| 2990        | 7,567457E+22                              | 7,567601E+22 | 6,789131E+22 | 6,789042E+22 | 1,513506E+23                           | 1,357817E+23                           | 2,871323E+23  |
| 2991        | 7,567636E+22                              | 7,567712E+22 | 6,789042E+22 | 6,789036E+22 | 1,513535E+23                           | 1,357808E+23                           | 2,871343E+23  |
| 2992        | 7,567429E+22                              | 7,567306E+22 | 6,789071E+22 | 6,789037E+22 | 1,513474E+23                           | 1,357811E+23                           | 2,871284E+23  |
| 2993        | 7,567548E+22                              | 7,567643E+22 | 6,789159E+22 | 6,789065E+22 | 1,513519E+23                           | 1,357822E+23                           | 2,871342E+23  |
| 2994        | 7,567571E+22                              | 7,567514E+22 | 6,789108E+22 | 6,789129E+22 | 1,513508E+23                           | 1,357824E+23                           | 2,871332E+23  |
| 2995        | 7,567365E+22                              | 7,567413E+22 | 6,789133E+22 | 6,789158E+22 | 1,513478E+23                           | 1,357829E+23                           | 2,871307E+23  |
| 2996        | 7,567628E+22                              | 7,567783E+22 | 6,789165E+22 | 6,789245E+22 | 1,513541E+23                           | 1,357841E+23                           | 2,871382E+23  |
| 2997        | 7,567591E+22                              | 7,567412E+22 | 6,789192E+22 | 6,789276E+22 | 1,513500E+23                           | 1,357847E+23                           | 2,871347E+23  |
| 2998        | 7,567541E+22                              | 7,567534E+22 | 6,789346E+22 | 6,789211E+22 | 1,513507E+23                           | 1,357856E+23                           | 2,871363E+23  |
| 2999        | 7,567789E+22                              | 7,567807E+22 | 6,789313E+22 | 6,789297E+22 | 1,513560E+23                           | 1,357861E+23                           | 2,871421E+23  |