GEOLOGICAL SURVEY CIRCULAR 873

International Geomagnetic Reference Field 1980— Charts and Grid Values (IAGA Bulletin No. 47)

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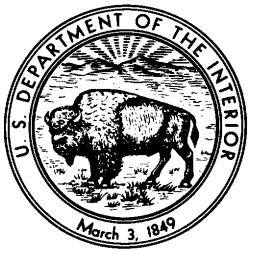
United States Department of the Interior
JAMES G. WATT, *Secretary*



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Dallas L. Peck, *Director*

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INTERNATIONAL GEOMAGNETIC REFERENCE FIELD 1980—CHARTS AND GRID VALUES (IAGA BULLETIN NO. 47)

By E. B. Fabiano, N. W. Peddie, D. R. Barraclough[1], and A. K. Zunde

EXPLANATION

To satisfy the continuing needs for an accurate International Geomagnetic Reference Field, IAGA, at its Fourth Scientific Assembly, held in Edinburgh in August 1981, adopted a completely revised IGRF [IAGA Division I Working Group 1, 1981]. The new IGRF has the following form:

1. An International Geomagnetic Reference Field for the interval 1980.0 to 1985.0 (IGRF 1980), consisting of a model of the main field at 1980.0 and a model of the secular variation for use in extending the main-field model up to 1985.0.
2. A definitive International Geomagnetic Reference Field (DGRF) for the interval 1965.0 to 1975.0, consisting of models of the main field at 1965.0 (DGRF 1965), 1970.0 (DGRF 1970) and 1975.0 (DGRF 1975), with linear interpolation of the model coefficients for intervening dates.
3. A provisional International Geomagnetic Reference Field for the interval 1975.0 to 1980.0 (PGRF 1975), defined to be the linear interpolation of DGRF 1975 and IGRF 1980 (main field).

DGRF models result from retrospective analysis and are definitive in the sense that further revision is not anticipated. PGRF 1975 now supersedes IGRF 1975 and will itself be superseded if and when a definitive model of the main field at 1980.0., different from IGRF 1980, is adopted.

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DGRF 1965, DGRF 1970, DGRF 1975 and IGRF 1980 (including the forecast secular variation model) are series of spherical harmonics that describe the geomagnetic potential (V) and the field components by means of the expressions

$$V=a\sum_{n=1}^{10}\sum_{m=0}^{n}(a/r)^{n+1}(g_n^m\cos m\lambda+h_n^m\sin m\lambda)P_n^m(\cos\theta);$$

$$X'=(1/r)(\delta V/\delta\theta);$$

$$Y'=(-1/r\sin\theta)(\delta V/\delta\lambda);$$

$$Z'=\delta V/\delta r,$$

where X', Y', and Z' are the northward, eastward, and radially downward components, respectively, of the geomagnetic field; a is the mean radius (6371.2 km) of the Earth; r is the distance from the center of the Earth; θ is the (geocentric) colatitude; λ is the east longitude; $P^m{}_n$ (cos θ) is the associated Legendre function of degree n and order m, in the Schmidt quasi-normalized form (Chapman and Bartels, 1940); $g^m{}_n$ and $h^m{}_n$ are spherical harmonic coefficients, of which there are 120, up to and including $m=n=10$ for the main field at 1965.0, 1970.0, 1975.0 and 1980.0; and 80, up to and including $m=n=8$, for the secular variation for the interval 1980 to 1985. For computational purposes, the secular variation model can be regarded as having 120 coefficients, the last 40 being zero.

It is usual to work in geodetic rather than geocentric coordinates and to use field components (X, Y, Z) referred to this coordinate system. These, and the other commonly used geomagnetic elements, declination (D), inclination (I), horizontal intensity (H) and total intensity (F) can be computed from the geocentric components (X', Y', Z'). (See Malin and Barraclough, 1981).

The coefficients of the revised IGRF are given in the Appendix.

The table of contents may be used to locate the following tables and charts:

(1) Grid values of D, I, H, Z and F at 1980.0 at five-degree intervals of geographic latitude and longitude. The annual change during the interval 1980 to 1985 is given as the second entry for each point. The D and I values are given to the nearest tenth of a degree and their annual change to the nearest tenth of a minute. The other components are given to the nearest nanotesla (1 nanotesla = 1 gamma) and their annual change to the nearest tenth of a nanotesla. To adjust a 1980 value to a different date d between 1980 and 1985, multiply the associated value of annual change by the difference d–1980 and add (algebraically) the result to the 1980 value.

(2) Contour charts of D, I, H, Z, and F and corresponding charts of annual change (D, I, H, Z, and F) *at 1980.0. The map projection is Mercator. The* +'s and their associated numbers indicate the positions and values of extrema, that is, points where the magnetic element attains either a maximum or a minimum value.

(3) Values of F on a 2° by 2° grid.

The tables and charts give values at the Earth's surface, using the International Ellipsoid of equatorial radius 6378.160 km and flattening 1/298.25 (International Astronomical Union, 1966). Here, *east* declination and *downward* inclination are indicated by *positive* values, and *west* declination and *upward* inclination are indicated by *negative* values.

The annual change values are the differences between main-field values for 1980.0 and 1981.0.

To derive values for positions between grid points, second-difference interpolation should be used for greater accuracies. If f_{-1}, f_0, f_1 are successive grid values, then f_p, the value at a point intermediate between f_0 and f_1, is given by $f_p = f_0 + p(f_1 - f_0) + Gd$, where $G = 0.5p(p-1)$; $d = f_1 - 2f_0 + f_{-1}$ and p = fractional distance between the grid points associated with f_0 and f_1, respectively.

For some requirements, however, linear interpolation may be satisfactory. This is true particularly for F because of the closer tabular grid spacing. Fabiano and Peddie (1969) have shown that, for the corresponding F tables of IGRF 1965 (also 2° by 2° grid), the maximum error due to using linear interpolation is about 20 nanotesla. As a guide to where the second difference, d, is important, note that the maximum numerical value of G is 0.125, corresponding to $p = 0.5$.

The first International Geomagnetic Reference Field, IGRF 1965, was adopted by the International Association of Geomagnetism and Aeronomy (IAGA) in 1968 (IAGA Commission 2 Working Group 4, 1969). It consists of a model of the main geomagnetic field at 1965.0, with a model of the secular variation for use in extending the main-field model in time, both backward (not earlier than 1955.0) and forward (not later than 1975.0). An updated version, IGRF 1975, adopted later, consists of IGRF 1965 extended to 1975.0, along with a revised model of the secular variation for use in extending the main-field model up to 1980.0 (IAGA Division I Study Group, 1975).

IGRF 1965 and IGRF 1975 are no longer acceptably accurate representations of the geomagnetic field because of the cumulative effect of the uncertainties in the secular variation models.

For information regarding the availability of the coefficients in computer-readable form, and computer programs for synthesizing field values, write to World Data Center A for Rockets and Satellites, Code 601, NASA/Goddard Space Flight Center, Greenbelt, MD 20771, USA; or World Digital Data Center C1, Geomagnetism Unit, Institute of Geological Sciences, Murchison House, West Mains Road, Edinburgh EH9 3LA, United Kingdom; or World Data Center A, National Oceanic and Atmospheric Administration, EDIS/NGSDC (D62), 325 Broadway, Boulder, CO 80303, USA.

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GRID VALUES OF THE MAGNETIC FIELD (5°×5°)

IGRF 1980 DECLINATION (D)

LONG / LAT	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
90	-35.1	-30.1	-25.1	-20.1	-15.1	-10.1	-5.1	-0.1	4.9	9.9	14.9	19.9	24.9	29.9	34.9	39.9	44.9	49.9	54.9
	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
85	-18.2	-13.6	-9.1	-4.6	-0.2	4.1	8.3	12.4	16.4	20.3	24.1	27.8	31.2	34.5	37.5	40.3	42.8	44.9	46.6
	16.5	16.1	15.7	15.4	15.0	14.7	14.3	14.0	13.7	13.3	13.0	12.6	12.2	11.7	11.2	10.5	9.7	8.6	7.3
80	-13.9	-9.6	-5.4	-1.2	2.9	6.9	10.8	14.5	18.2	21.6	24.8	27.9	30.6	33.0	34.9	36.3	37.1	37.0	35.8
	14.5	13.9	13.4	12.9	12.3	11.8	11.2	10.6	10.0	9.5	8.8	8.2	7.4	6.6	5.7	4.5	3.0	1.0	-1.7
75	-12.0	-8.0	-4.1	-0.3	3.5	7.1	10.6	14.0	17.2	20.1	22.9	25.3	27.4	29.0	30.1	30.5	30.0	28.4	25.5
	13.4	12.7	12.1	11.4	10.7	9.9	9.2	8.4	7.6	6.8	5.9	5.0	4.1	3.1	2.0	0.6	-1.0	-2.9	-5.3
70	-10.6	-7.0	-3.5	0.0	3.3	6.5	9.5	12.4	15.1	17.6	19.8	21.8	23.3	24.3	24.8	24.5	23.3	21.1	17.7
	12.5	11.8	11.1	10.3	9.5	8.6	7.7	6.8	5.8	4.8	3.8	2.9	1.9	0.9	-0.1	-1.2	-2.4	-3.7	-5.1
65	-9.2	-6.1	-3.0	0.0	2.8	5.6	8.1	10.5	12.8	14.8	16.5	18.0	19.1	19.7	19.8	19.1	17.7	15.5	12.3
	11.5	10.9	10.2	9.4	8.5	7.6	6.6	5.5	4.5	3.5	2.5	1.6	0.7	-0.1	-0.9	-1.6	-2.3	-3.0	-3.7
60	-7.9	-5.1	-2.5	0.1	2.4	4.7	6.8	8.7	10.5	12.0	13.4	14.5	15.2	15.5	15.4	14.6	13.3	11.3	8.6
	10.6	10.0	9.3	8.5	7.7	6.7	5.7	4.6	3.6	2.6	1.7	0.8	0.1	-0.5	-1.0	-1.4	-1.7	-2.0	-2.3
55	-6.6	-4.2	-2.0	0.2	2.1	3.9	5.5	7.0	8.4	9.5	10.5	11.3	11.8	11.9	11.7	11.0	9.8	8.1	5.9
	9.7	9.2	8.5	7.8	7.0	6.0	5.0	4.0	3.0	2.0	1.2	0.5	-0.1	-0.5	-0.9	-1.0	-1.1	-1.2	-1.2
50	-5.6	-3.5	-1.5	0.2	1.8	3.3	4.5	5.6	6.6	7.4	8.1	8.6	8.8	8.8	8.5	7.9	7.0	5.6	3.9
	9.0	8.5	7.9	7.3	6.5	5.5	4.5	3.5	2.6	1.7	1.0	0.4	-0.1	-0.4	-0.6	-0.7	-0.7	-0.7	-0.6
45	-4.9	-3.0	-1.3	0.2	1.5	2.7	3.7	4.5	5.2	5.7	6.1	6.3	6.4	6.3	6.0	5.4	4.7	3.7	2.4
	8.4	8.0	7.5	6.9	6.1	5.2	4.3	3.3	2.4	1.6	0.9	0.4	0.0	-0.3	-0.5	-0.5	-0.5	-0.4	-0.3
40	-4.4	-2.7	-1.2	0.1	1.2	2.2	3.0	3.6	4.1	4.4	4.5	4.6	4.5	4.2	3.9	3.4	2.9	2.2	1.3
	8.0	7.7	7.2	6.7	5.9	5.1	4.1	3.2	2.4	1.7	1.1	0.6	0.2	-0.2	-0.4	-0.5	-0.5	-0.4	-0.3
35	-4.2	-2.6	-1.3	-0.1	0.9	1.7	2.4	2.9	3.2	3.4	3.3	3.2	2.9	2.6	2.2	1.8	1.4	1.0	0.4
	7.7	7.4	7.1	6.6	5.9	5.1	4.2	3.3	2.6	1.9	1.3	0.9	0.4	0.0	-0.3	-0.5	-0.6	-0.6	-0.5
30	-4.1	-2.7	-1.4	-0.4	0.5	1.2	1.8	2.3	2.5	2.6	2.4	2.1	1.7	1.3	0.9	0.5	0.3	0.1	-0.2
	7.4	7.3	7.0	6.6	6.0	5.2	4.4	3.6	2.8	2.2	1.7	1.2	0.7	0.2	-0.2	-0.6	-0.8	-0.8	-0.8
25	-4.3	-2.9	-1.8	-0.8	0.0	0.8	1.4	1.8	2.0	2.0	1.7	1.2	0.7	0.2	-0.2	-0.5	-0.6	-0.6	-0.6
	7.2	7.2	7.1	6.8	6.2	5.5	4.7	3.9	3.2	2.7	2.2	1.7	1.1	0.5	-0.2	-0.7	-1.0	-1.1	-1.1
20	-4.8	-3.4	-2.2	-1.3	-0.5	0.3	0.9	1.3	1.5	1.4	1.1	0.5	-0.1	-0.7	-1.1	-1.4	-1.4	-1.2	-1.0
	7.1	7.2	7.2	7.0	6.5	5.9	5.1	4.3	3.7	3.1	2.6	2.1	1.4	0.7	-0.1	-0.8	-1.3	-1.5	-1.5
15	-5.4	-4.0	-2.9	-1.9	-1.1	-0.3	0.4	0.9	1.1	1.0	0.5	-0.2	-0.9	-1.5	-2.0	-2.1	-2.0	-1.7	-1.2
	7.0	7.2	7.4	7.3	7.0	6.3	5.6	4.8	4.1	3.5	3.0	2.4	1.7	0.8	-0.1	-1.0	-1.6	-1.9	-2.0
10	-6.4	-5.0	-3.8	-2.8	-1.8	-0.9	-0.1	0.4	0.6	0.4	-0.1	-0.9	-1.7	-2.4	-2.8	-2.9	-2.7	-2.2	-1.5
	6.9	7.3	7.7	7.8	7.5	7.0	6.2	5.3	4.6	3.9	3.3	2.6	1.8	0.8	-0.3	-1.2	-1.9	-2.4	-2.5
5	-7.9	-6.3	-5.0	-3.8	-2.7	-1.7	-0.7	-0.1	0.0	-0.3	-0.9	-1.8	-2.7	-3.5	-3.9	-3.9	-3.5	-2.8	-2.0
	6.7	7.4	8.0	8.4	8.3	7.7	6.9	5.9	5.0	4.1	3.4	2.6	1.7	0.6	-0.5	-1.5	-2.4	-2.9	-3.1
0	-9.8	-8.1	-6.6	-5.3	-3.9	-2.6	-1.6	-0.9	-0.8	-1.2	-2.1	-3.1	-4.1	-4.9	-5.2	-5.1	-4.6	-3.7	-2.6
	6.6	7.5	8.5	9.1	9.2	8.7	7.7	6.5	5.2	4.1	3.2	2.3	1.4	0.3	-0.9	-2.0	-2.8	-3.4	-3.6

IGRF 1980 DECLINATION (D)

LONG / LAT	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180
90	54.9	59.9	64.9	69.9	74.9	79.9	84.9	89.9	94.9	99.9	104.9	109.9	114.9	119.9	124.9	129.9	134.9	139.9	144.9
	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
85	46.6	47.9	48.5	48.6	48.0	46.7	44.9	42.6	40.2	37.9	36.0	34.7	34.2	34.5	35.5	37.3	39.8	42.9	46.7
	7.3	5.5	3.3	0.3	-3.3	-7.7	-12.6	-17.7	-22.5	-26.6	-29.5	-31.4	-32.4	-32.7	-32.7	-32.4	-32.2	-32.1	-32.2
80	35.8	33.3	29.4	24.1	17.7	11.1	5.2	0.4	-2.8	-4.5	-5.0	-4.5	-3.1	-1.0	1.5	4.5	7.9	11.6	15.5
	-1.7	-5.2	-9.5	-14.4	-18.8	-21.8	-22.8	-22.0	-20.3	-18.2	-16.2	-14.5	-13.0	-11.7	-10.7	-10.0	-9.4	-9.1	-8.9
75	25.5	21.2	15.5	9.0	2.3	-3.7	-8.3	-11.5	-13.3	-13.8	-13.4	-12.1	-10.1	-7.6	-4.7	-1.5	2.0	5.7	9.6
	-5.3	-8.1	-10.9	-13.2	-14.5	-14.5	-13.6	-12.2	-10.7	-9.3	-8.0	-6.9	-6.0	-5.3	-4.7	-4.2	-3.8	-3.6	-3.4
70	17.7	13.2	7.9	2.1	-3.5	-8.3	-11.9	-14.4	-15.6	-15.8	-15.1	-13.8	-11.8	-9.3	-6.4	-3.2	0.3	3.9	7.7
	-5.1	-6.6	-7.8	-8.7	-9.0	-8.8	-8.2	-7.4	-6.6	-5.8	-5.0	-4.3	-3.7	-3.2	-2.7	-2.4	-2.0	-1.8	-1.7
65	12.3	8.3	3.8	-1.0	-5.5	-9.4	-12.4	-14.4	-15.5	-15.6	-15.0	-13.6	-11.7	-9.4	-6.6	-3.5	-0.2	3.3	6.9
	-3.7	-4.3	-4.8	-5.2	-5.4	-5.4	-5.2	-4.9	-4.5	-4.1	-3.6	-3.2	-2.8	-2.4	-2.1	-1.7	-1.5	-1.3	-1.1
60	8.6	5.3	1.6	-2.3	-5.9	-9.2	-11.7	-13.5	-14.4	-14.6	-14.0	-12.8	-11.0	-8.8	-6.1	-3.2	0.0	3.3	6.6
	-2.3	-2.5	-2.7	-3.0	-3.2	-3.3	-3.4	-3.3	-3.2	-3.1	-2.8	-2.6	-2.4	-2.1	-1.9	-1.6	-1.4	-1.2	-1.1
55	5.9	3.3	0.3	-2.8	-5.8	-8.5	-10.6	-12.2	-13.1	-13.2	-12.7	-11.6	-10.0	-7.9	-5.4	-2.6	0.4	3.5	6.7
	-1.2	-1.3	-1.4	-1.6	-1.8	-2.1	-2.2	-2.4	-2.4	-2.4	-2.3	-2.2	-2.1	-2.0	-1.8	-1.7	-1.5	-1.3	-1.2
50	3.9	1.9	-0.4	-2.9	-5.3	-7.5	-9.4	-10.8	-11.5	-11.7	-11.3	-10.2	-8.7	-6.7	-4.3	-1.7	1.1	4.0	6.9
	-0.6	-0.6	-0.7	-0.8	-1.1	-1.4	-1.6	-1.7	-1.8	-1.8	-1.8	-1.8	-1.8	-1.8	-1.8	-1.8	-1.7	-1.5	-1.4
45	2.4	0.9	-0.8	-2.7	-4.6	-6.4	-8.0	-9.2	-9.9	-10.1	-9.7	-8.7	-7.2	-5.3	-3.1	-0.6	2.0	4.7	7.3
	-0.3	-0.3	-0.3	-0.5	-0.8	-1.0	-1.3	-1.4	-1.5	-1.5	-1.5	-1.5	-1.5	-1.6	-1.7	-1.8	-1.8	-1.7	-1.5
40	1.3	0.2	-1.0	-2.4	-3.9	-5.3	-6.6	-7.7	-8.3	-8.4	-8.0	-7.0	-5.6	-3.8	-1.6	0.7	3.2	5.6	7.9
	-0.3	-0.3	-0.3	-0.5	-0.7	-1.0	-1.3	-1.4	-1.4	-1.3	-1.2	-1.1	-1.1	-1.3	-1.5	-1.7	-1.8	-1.7	-1.6
35	0.4	-0.2	-1.0	-2.0	-3.1	-4.2	-5.3	-6.1	-6.6	-6.7	-6.2	-5.3	-3.9	-2.1	-0.1	2.2	4.4	6.5	8.5
	-0.5	-0.4	-0.5	-0.7	-0.9	-1.3	-1.5	-1.6	-1.5	-1.3	-1.0	-0.8	-0.7	-0.8	-1.1	-1.3	-1.5	-1.6	-1.4
30	-0.2	-0.5	-0.9	-1.6	-2.3	-3.2	-4.0	-4.6	-5.0	-4.9	-4.4	-3.5	-2.1	-0.4	1.5	3.6	5.7	7.5	9.2
	-0.8	-0.7	-0.8	-1.0	-1.3	-1.6	-1.9	-2.0	-1.8	-1.4	-0.9	-0.5	-0.3	-0.3	-0.5	-0.8	-1.1	-1.1	-1.0
25	-0.6	-0.6	-0.8	-1.1	-1.6	-2.2	-2.8	-3.2	-3.4	-3.3	-2.7	-1.8	-0.4	1.3	3.1	5.0	6.9	8.5	9.7
	-1.1	-1.1	-1.1	-1.3	-1.7	-2.1	-2.4	-2.4	-2.2	-1.6	-0.9	-0.3	0.2	0.3	0.2	-0.1	-0.4	-0.5	-0.5
20	-1.0	-0.7	-0.6	-0.6	-0.9	-1.2	-1.6	-1.9	-2.0	-1.7	-1.1	-0.1	1.2	2.8	4.5	6.3	7.9	9.2	10.2
	-1.5	-1.5	-1.6	-1.7	-2.1	-2.5	-2.8	-2.8	-2.5	-1.9	-1.0	-0.1	0.5	0.9	0.9	0.7	0.4	0.2	0.1
15	-1.2	-0.8	-0.4	-0.2	-0.2	-0.4	-0.6	-0.7	-0.7	-0.3	0.4	1.4	2.7	4.2	5.7	7.3	8.7	9.8	10.5
	-2.0	-2.0	-2.0	-2.2	-2.5	-2.8	-3.1	-3.1	-2.8	-2.0	-1.0	0.0	0.9	1.4	1.5	1.4	1.2	0.9	0.8
10	-1.5	-0.8	-0.3	0.2	0.3	0.3	0.3	0.3	0.5	0.9	1.7	2.7	3.9	5.3	6.7	8.1	9.3	10.1	10.6
	-2.5	-2.5	-2.5	-2.5	-2.8	-3.1	-3.3	-3.2	-2.8	-2.0	-0.9	0.3	1.2	1.8	2.1	2.0	1.8	1.6	1.4
5	-2.0	-1.0	-0.2	0.4	0.7	0.9	1.0	1.1	1.4	2.0	2.8	3.8	4.9	6.2	7.5	8.7	9.7	10.4	10.7
	-3.1	-3.0	-2.9	-2.9	-3.0	-3.1	-3.2	-3.1	-2.6	-1.7	-0.6	0.5	1.5	2.2	2.5	2.5	2.4	2.2	1.9
0	-2.6	-1.5	-0.4	0.4	1.0	1.3	1.5	1.8	2.2	2.8	3.6	4.6	5.8	6.9	8.1	9.2	10.0	10.6	10.9
	-3.6	-3.5	-3.3	-3.2	-3.1	-3.0	-3.0	-2.7	-2.2	-1.3	-0.2	0.9	1.8	2.5	2.8	2.9	2.8	2.6	2.3

IGRF 1980 DECLINATION (D)

LONG / LAT	180	-175	-170	-165	-160	-155	-150	-145	-140	-135	-130	-125	-120	-115	-110	-105	-100	-95	-90
90	144.9	149.9	154.9	159.9	164.9	169.9	174.9	179.9	-175.1	-170.1	-165.1	-160.1	-155.1	-150.1	-145.1	-140.1	-135.1	-130.1	-125.1
	19.0	19.0	19.0	19.0	19.0	19.0	19.0	-999.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
85	46.7	51.1	56.1	61.7	68.1	75.5	83.9	93.7	105.2	118.7	134.3	151.3	168.7	-175.0	-160.5	-147.9	-137.0	-127.4	-118.9
	-32.2	-32.6	-33.1	-34.0	-35.0	-36.0	-36.9	-36.9	-35.1	-29.7	-19.3	-4.3	11.7	24.2	31.5	34.5	34.9	34.1	32.6
80	15.5	19.6	23.9	28.3	33.0	37.7	42.7	47.8	53.2	59.0	65.4	72.8	82.2	96.3	124.4	-178.9	-137.3	-118.6	-107.6
	-8.9	-8.9	-9.2	-9.6	-10.3	-11.3	-12.6	-14.5	-16.9	-20.3	-25.1	-32.1	-42.9	-59.2	-63.0	64.3	91.5	68.2	52.7
75	9.6	13.6	17.8	21.9	26.1	30.3	34.4	38.5	42.5	46.3	50.0	53.4	56.4	58.5	58.5	51.5	-3.6	-68.9	-77.6
	-3.4	-3.4	-3.6	-3.9	-4.4	-5.1	-6.0	-7.2	-8.9	-11.0	-14.0	-18.2	-24.6	-35.2	-55.6	-106.8	-98.6	95.6	64.3
70	7.7	11.5	15.4	19.3	23.1	26.8	30.3	33.7	36.8	39.5	41.8	43.6	44.3	43.6	40.3	31.9	14.3	-13.2	-37.0
	-1.7	-1.7	-1.8	-2.1	-2.6	-3.2	-4.1	-5.2	-6.6	-8.4	-10.8	-13.9	-18.1	-23.9	-32.1	-42.2	-44.4	-15.5	17.7
65	6.9	10.5	14.2	17.7	21.1	24.3	27.3	30.0	32.4	34.3	35.7	36.3	36.0	34.3	30.6	24.1	13.6	-0.6	-16.0
	-1.1	-1.1	-1.3	-1.5	-2.0	-2.6	-3.5	-4.5	-5.8	-7.4	-9.4	-11.8	-14.6	-18.1	-22.1	-25.5	-25.8	-18.9	-5.5
60	6.6	10.0	13.4	16.6	19.6	22.3	24.8	27.0	28.7	29.9	30.6	30.7	29.8	27.9	24.6	19.5	12.4	3.2	-7.1
	-1.1	-1.0	-1.1	-1.4	-1.8	-2.4	-3.3	-4.3	-5.5	-6.9	-8.4	-10.2	-12.2	-14.3	-16.3	-17.9	-18.0	-15.4	-9.7
55	6.7	9.8	12.8	15.6	18.2	20.6	22.6	24.2	25.5	26.3	26.5	26.2	25.2	23.4	20.6	16.6	11.3	4.8	-2.7
	-1.2	-1.1	-1.2	-1.4	-1.8	-2.3	-3.1	-4.1	-5.2	-6.3	-7.6	-8.8	-10.1	-11.4	-12.6	-13.5	-13.8	-12.7	-10.0
50	6.9	9.7	12.4	14.8	17.0	19.0	20.6	21.8	22.7	23.2	23.2	22.7	21.8	20.1	17.8	14.6	10.5	5.5	-0.3
	-1.4	-1.2	-1.2	-1.3	-1.7	-2.2	-3.0	-3.8	-4.8	-5.7	-6.6	-7.5	-8.3	-9.1	-9.9	-10.6	-11.1	-10.9	-9.7
45	7.3	9.8	12.1	14.1	16.0	17.5	18.8	19.7	20.3	20.6	20.4	20.0	19.0	17.7	15.7	13.2	9.9	5.9	1.3
	-1.5	-1.3	-1.2	-1.2	-1.5	-2.0	-2.7	-3.5	-4.4	-5.1	-5.7	-6.2	-6.7	-7.2	-7.8	-8.5	-9.1	-9.5	-9.3
40	7.9	10.0	11.9	13.5	15.0	16.2	17.1	17.8	18.2	18.3	18.1	17.6	16.8	15.7	14.1	12.0	9.4	6.1	2.2
	-1.6	-1.3	-1.1	-1.1	-1.3	-1.8	-2.5	-3.2	-3.9	-4.4	-4.7	-4.9	-5.1	-5.4	-5.9	-6.7	-7.6	-8.5	-8.9
35	8.5	10.2	11.7	12.9	14.0	14.8	15.5	16.0	16.2	16.2	16.0	15.6	14.9	14.0	12.7	11.0	8.9	6.2	2.9
	-1.4	-1.1	-0.9	-0.9	-1.2	-1.7	-2.3	-2.9	-3.4	-3.6	-3.6	-3.5	-3.5	-3.7	-4.3	-5.2	-6.4	-7.6	-8.5
30	9.2	10.5	11.5	12.3	13.0	13.5	13.9	14.2	14.4	14.4	14.2	13.8	13.3	12.5	11.5	10.2	8.4	6.2	3.5
	-1.0	-0.8	-0.7	-0.7	-1.0	-1.6	-2.2	-2.7	-2.9	-2.8	-2.5	-2.1	-1.9	-2.1	-2.8	-3.9	-5.4	-6.9	-8.1
25	9.7	10.7	11.3	11.7	12.0	12.2	12.5	12.6	12.7	12.7	12.5	12.2	11.8	11.2	10.5	9.5	8.1	6.3	4.0
	-0.5	-0.4	-0.4	-0.5	-0.9	-1.5	-2.1	-2.4	-2.3	-1.9	-1.3	-0.6	-0.3	-0.6	-1.4	-2.8	-4.5	-6.2	-7.8
20	10.2	10.8	11.0	11.1	11.0	11.1	11.2	11.3	11.3	11.2	11.1	10.9	10.6	10.2	9.6	8.9	7.9	6.4	4.4
	0.1	0.1	0.0	-0.4	-0.9	-1.5	-2.0	-2.1	-1.8	-1.0	0.0	0.8	1.1	0.8	-0.3	-1.9	-3.8	-5.7	-7.4
15	10.5	10.8	10.7	10.5	10.3	10.1	10.1	10.1	10.1	10.1	10.0	9.8	9.6	9.4	9.0	8.6	7.8	6.6	5.0
	0.8	0.6	0.3	-0.2	-0.8	-1.5	-1.9	-1.8	-1.2	-0.1	1.1	2.0	2.3	1.8	0.6	-1.2	-3.3	-5.3	-7.1
10	10.6	10.7	10.5	10.1	9.8	9.5	9.4	9.4	9.4	9.3	9.2	9.0	8.9	8.8	8.7	8.4	7.9	7.0	5.5
	1.4	1.1	0.6	0.0	-0.8	-1.4	-1.7	-1.4	-0.5	0.7	2.1	3.1	3.3	2.6	1.2	-0.8	-3.0	-5.1	-6.8
5	10.7	10.7	10.4	9.9	9.5	9.2	9.1	9.0	9.0	8.9	8.8	8.7	8.6	8.6	8.6	8.5	8.2	7.4	6.2
	1.9	1.5	1.0	0.2	-0.6	-1.2	-1.4	-1.0	0.1	1.5	2.9	3.8	3.9	3.1	1.4	-0.7	-3.0	-5.0	-6.7
0	10.9	10.8	10.5	10.0	9.6	9.3	9.2	9.1	9.0	8.9	8.8	8.7	8.6	8.7	8.8	8.8	8.6	8.0	6.9
	2.3	1.9	1.2	0.5	-0.3	-0.9	-1.1	-0.5	0.6	2.1	3.5	4.3	4.2	3.2	1.3	-0.9	-3.2	-5.1	-6.6

IGRF 1980 DECLINATION (D)

LAT \ LONG	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
90	-125.1	-120.1	-115.1	-110.1	-105.1	-100.1	-95.1	-90.1	-85.1	-80.1	-75.1	-70.1	-65.1	-60.1	-55.1	-50.1	-45.1	-40.1	-35.1
	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
85	-118.9	-111.1	-104.0	-97.3	-91.0	-84.9	-79.1	-73.4	-67.9	-62.6	-57.3	-52.2	-47.1	-42.1	-37.2	-32.3	-27.5	-22.8	-18.2
	32.6	31.0	29.4	27.9	26.5	25.3	24.2	23.2	22.3	21.5	20.7	20.1	19.4	18.9	18.3	17.8	17.4	16.9	16.5
80	-107.6	-99.4	-92.6	-86.5	-80.8	-75.4	-70.2	-65.2	-60.2	-55.4	-50.6	-45.8	-41.1	-36.4	-31.8	-27.3	-22.8	-18.3	-13.9
	52.7	43.1	36.8	32.4	29.1	26.6	24.7	23.1	21.8	20.7	19.7	18.9	18.1	17.4	16.8	16.2	15.6	15.0	14.5
75	-77.6	-77.9	-75.9	-73.0	-69.6	-65.9	-62.0	-58.0	-53.9	-49.7	-45.5	-41.3	-37.0	-32.8	-28.6	-24.4	-20.2	-16.1	-12.0
	64.3	47.8	38.6	32.8	28.9	26.1	23.9	22.2	20.9	19.7	18.8	17.9	17.2	16.5	15.8	15.2	14.6	14.0	13.4
70	-37.0	-49.8	-55.3	-57.1	-56.8	-55.4	-53.2	-50.4	-47.3	-44.0	-40.5	-36.8	-33.1	-29.3	-25.5	-21.8	-18.0	-14.3	-10.6
	17.7	28.1	28.7	27.0	25.0	23.2	21.7	20.4	19.3	18.4	17.5	16.8	16.1	15.5	14.9	14.3	13.7	13.1	12.5
65	-16.0	-28.8	-37.3	-42.2	-44.6	-45.1	-44.5	-43.0	-40.8	-38.3	-35.5	-32.4	-29.2	-25.9	-22.5	-19.2	-15.8	-12.5	-9.2
	-5.5	6.9	14.2	17.5	18.6	18.7	18.3	17.8	17.2	16.5	15.9	15.3	14.8	14.2	13.7	13.2	12.7	12.1	11.5
60	-7.1	-17.0	-25.1	-30.9	-34.6	-36.4	-36.9	-36.3	-35.0	-33.1	-30.8	-28.3	-25.5	-22.6	-19.6	-16.6	-13.7	-10.7	-7.9
	-9.7	-2.3	4.4	9.2	12.1	13.8	14.6	14.9	14.9	14.7	14.3	13.9	13.4	13.0	12.5	12.0	11.6	11.1	10.6
55	-2.7	-10.4	-17.4	-23.0	-27.1	-29.6	-30.8	-30.9	-30.2	-28.8	-26.9	-24.7	-22.3	-19.7	-17.1	-14.4	-11.7	-9.1	-6.6
	-10.0	-5.8	-1.0	3.5	7.0	9.6	11.2	12.2	12.8	12.9	12.9	12.6	12.3	11.9	11.4	11.0	10.6	10.1	9.7
50	-0.3	-6.4	-12.4	-17.6	-21.7	-24.6	-26.2	-26.7	-26.4	-25.4	-23.8	-21.9	-19.7	-17.4	-15.0	-12.6	-10.2	-7.8	-5.6
	-9.7	-7.3	-4.0	-0.3	3.1	6.1	8.3	9.8	10.9	11.4	11.6	11.6	11.3	11.0	10.5	10.1	9.7	9.3	9.0
45	1.3	-3.9	-9.0	-13.8	-17.8	-20.8	-22.7	-23.5	-23.5	-22.8	-21.4	-19.7	-17.8	-15.6	-13.4	-11.2	-9.0	-6.9	-4.9
	-9.3	-8.1	-5.9	-3.1	0.1	3.1	5.6	7.6	9.1	10.0	10.5	10.7	10.6	10.3	9.9	9.5	9.1	8.7	8.4
40	2.2	-2.1	-6.6	-11.0	-14.9	-18.0	-20.0	-21.2	-21.4	-20.9	-19.8	-18.2	-16.4	-14.4	-12.4	-10.3	-8.2	-6.2	-4.4
	-8.9	-8.6	-7.3	-5.1	-2.4	0.5	3.2	5.5	7.3	8.6	9.4	9.8	9.9	9.6	9.3	8.9	8.6	8.3	8.0
35	2.9	-0.8	-4.8	-8.9	-12.6	-15.7	-18.0	-19.4	-19.8	-19.6	-18.7	-17.3	-15.6	-13.8	-11.8	-9.8	-7.8	-5.9	-4.2
	-8.5	-8.8	-8.2	-6.8	-4.6	-2.0	0.7	3.2	5.3	7.0	8.2	8.9	9.2	9.1	8.8	8.5	8.1	7.9	7.7
30	3.5	0.2	-3.4	-7.1	-10.7	-13.9	-16.4	-18.0	-18.8	-18.8	-18.1	-16.9	-15.4	-13.6	-11.6	-9.6	-7.7	-5.8	-4.1
	-8.1	-8.9	-8.9	-8.0	-6.4	-4.3	-1.8	0.8	3.2	5.2	6.8	7.8	8.4	8.5	8.3	8.0	7.8	7.6	7.4
25	4.0	1.1	-2.1	-5.6	-9.2	-12.4	-15.0	-17.0	-18.0	-18.3	-18.0	-17.0	-15.6	-13.8	-11.9	-9.9	-7.9	-6.0	-4.3
	-7.8	-8.8	-9.3	-9.0	-8.0	-6.3	-4.2	-1.7	0.9	3.2	5.2	6.6	7.5	7.9	7.8	7.6	7.4	7.3	7.2
20	4.4	2.0	-1.0	-4.3	-7.8	-11.1	-14.0	-16.2	-17.6	-18.2	-18.2	-17.4	-16.1	-14.5	-12.5	-10.4	-8.4	-6.4	-4.8
	-7.4	-8.7	-9.4	-9.6	-9.2	-8.1	-6.4	-4.2	-1.6	1.1	3.4	5.3	6.6	7.2	7.4	7.3	7.1	7.0	7.1
15	5.0	2.8	0.0	-3.2	-6.6	-10.0	-13.0	-15.5	-17.3	-18.3	-18.6	-18.1	-17.0	-15.4	-13.5	-11.3	-9.1	-7.1	-5.4
	-7.1	-8.4	-9.4	-10.0	-10.1	-9.6	-8.4	-6.5	-3.9	-1.1	1.6	3.9	5.5	6.4	6.8	6.9	6.8	6.8	7.0
10	5.5	3.5	1.0	-2.1	-5.5	-9.0	-12.2	-15.0	-17.2	-18.6	-19.2	-19.0	-18.2	-16.7	-14.8	-12.5	-10.3	-8.2	-6.4
	-6.8	-8.2	-9.3	-10.1	-10.7	-10.7	-10.1	-8.5	-6.1	-3.3	-0.3	2.3	4.3	5.6	6.2	6.4	6.4	6.6	6.9
5	6.2	4.4	1.9	-1.1	-4.5	-8.0	-11.5	-14.6	-17.1	-18.8	-19.8	-20.0	-19.4	-18.2	-16.3	-14.1	-11.9	-9.7	-7.9
	-6.7	-8.0	-9.0	-10.1	-10.9	-11.5	-11.3	-10.1	-8.0	-5.2	-2.1	0.8	3.1	4.7	5.5	5.8	6.0	6.2	6.7
0	6.9	5.2	2.8	-0.1	-3.5	-7.2	-10.8	-14.2	-17.0	-19.1	-20.4	-21.0	-20.7	-19.8	-18.2	-16.1	-13.9	-11.7	-9.8
	-6.6	-7.8	-8.8	-9.9	-11.0	-11.8	-12.1	-11.3	-9.5	-6.8	-3.7	-0.7	1.8	3.6	4.6	5.1	5.4	5.8	6.6

IGRF 1980 DECLINATION (D)

LAT \ LONG	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	-9.8	-8.1	-6.6	-5.3	-3.9	-2.6	-1.6	-0.9	-0.8	-1.2	-2.1	-3.1	-4.1	-4.9	-5.2	-5.1	-4.6	-3.7	-2.6
	6.6	7.5	8.5	9.1	9.2	8.7	7.7	6.5	5.2	4.1	3.2	2.3	1.4	0.3	-0.9	-2.0	-2.8	-3.4	-3.6
-5	-12.2	-10.4	-8.7	-7.1	-5.4	-3.9	-2.7	-2.1	-2.1	-2.7	-3.8	-5.0	-6.1	-6.8	-7.1	-6.9	-6.1	-5.0	-3.7
	6.2	7.6	8.9	9.9	10.2	9.7	8.5	6.9	5.3	3.9	2.7	1.7	0.8	-0.3	-1.3	-2.4	-3.3	-3.9	-4.1
-10	-15.2	-13.3	-11.3	-9.4	-7.4	-5.7	-4.4	-3.8	-4.1	-5.0	-6.3	-7.7	-8.9	-9.6	-9.8	-9.3	-8.3	-6.9	-5.2
	5.7	7.5	9.3	10.7	11.3	10.7	9.2	7.1	5.0	3.1	1.7	0.7	-0.1	-0.9	-1.9	-2.8	-3.7	-4.3	-4.5
-15	-18.4	-16.5	-14.4	-12.2	-10.0	-8.1	-6.9	-6.6	-7.2	-8.4	-10.0	-11.6	-12.8	-13.4	-13.3	-12.6	-11.4	-9.6	-7.5
	5.0	7.2	9.5	11.3	12.1	11.4	9.4	6.7	4.0	1.8	0.3	-0.6	-1.1	-1.6	-2.3	-3.1	-3.9	-4.6	-4.8
-20	-21.6	-19.8	-17.7	-15.4	-13.2	-11.5	-10.5	-10.6	-11.6	-13.3	-15.1	-16.7	-17.8	-18.3	-18.0	-17.0	-15.4	-13.1	-10.6
	4.4	6.7	9.3	11.4	12.2	11.3	8.7	5.4	2.2	-0.2	-1.5	-2.0	-2.1	-2.2	-2.6	-3.2	-3.9	-4.6	-4.9
-25	-24.3	-22.8	-21.0	-18.9	-17.0	-15.6	-15.3	-15.9	-17.5	-19.4	-21.4	-23.0	-23.9	-24.2	-23.7	-22.4	-20.4	-17.8	-14.8
	4.3	6.5	8.9	10.8	11.3	9.8	6.7	3.0	-0.2	-2.3	-3.2	-3.3	-3.0	-2.7	-2.7	-3.1	-3.8	-4.4	-4.9
-30	-26.0	-24.9	-23.5	-22.0	-20.7	-20.2	-20.5	-21.8	-23.8	-25.9	-27.9	-29.5	-30.3	-30.5	-29.9	-28.5	-26.3	-23.5	-20.0
	4.9	6.6	8.3	9.5	9.1	6.9	3.6	0.0	-2.8	-4.4	-4.8	-4.5	-3.8	-3.3	-3.1	-3.2	-3.8	-4.4	-5.0
-35	-26.5	-25.9	-25.0	-24.3	-23.9	-24.2	-25.3	-27.1	-29.4	-31.7	-33.8	-35.4	-36.4	-36.7	-36.3	-35.0	-33.0	-30.1	-26.5
	6.1	7.1	7.8	7.7	6.3	3.6	0.3	-2.8	-5.1	-6.2	-6.3	-5.8	-5.1	-4.4	-4.0	-3.9	-4.3	-4.9	-5.5
-40	-25.8	-25.7	-25.6	-25.6	-26.1	-27.2	-29.0	-31.2	-33.7	-36.2	-38.5	-40.3	-41.6	-42.3	-42.3	-41.5	-39.9	-37.4	-34.0
	7.4	7.6	7.2	5.9	3.7	0.7	-2.4	-5.1	-6.9	-7.7	-7.8	-7.4	-6.8	-6.1	-5.6	-5.4	-5.6	-6.0	-6.6
-45	-24.4	-24.9	-25.4	-26.3	-27.6	-29.3	-31.6	-34.2	-36.9	-39.6	-42.1	-44.3	-46.0	-47.2	-47.8	-47.7	-46.9	-45.2	-42.4
	8.2	7.7	6.5	4.4	1.7	-1.3	-4.1	-6.5	-8.1	-9.0	-9.2	-9.0	-8.5	-8.0	-7.6	-7.3	-7.4	-7.7	-8.3
-50	-22.7	-23.8	-25.1	-26.7	-28.5	-30.8	-33.4	-36.3	-39.2	-42.2	-44.9	-47.5	-49.7	-51.5	-52.8	-53.6	-53.7	-53.1	-51.5
	8.2	7.3	5.6	3.3	0.6	-2.2	-4.8	-6.9	-8.5	-9.5	-9.9	-10.0	-9.8	-9.5	-9.2	-9.1	-9.2	-9.5	-10.2
-55	-21.3	-23.0	-24.8	-27.0	-29.3	-32.0	-34.9	-38.0	-41.2	-44.3	-47.4	-50.3	-53.0	-55.4	-57.4	-59.1	-60.3	-61.0	-60.9
	7.6	6.5	4.8	2.7	0.2	-2.2	-4.5	-6.4	-8.0	-9.0	-9.7	-10.0	-10.1	-10.1	-10.0	-10.0	-10.1	-10.5	-11.2
-60	-20.1	-22.3	-24.8	-27.3	-30.1	-33.1	-36.3	-39.6	-42.9	-46.3	-49.7	-52.9	-56.1	-59.1	-61.8	-64.4	-66.6	-68.6	-70.1
	6.6	5.6	4.2	2.4	0.4	-1.6	-3.5	-5.1	-6.5	-7.6	-8.4	-9.0	-9.3	-9.5	-9.6	-9.7	-9.9	-10.3	-10.9
-65	-19.4	-22.1	-25.0	-27.9	-31.0	-34.3	-37.7	-41.2	-44.8	-48.4	-52.0	-55.6	-59.2	-62.7	-66.1	-69.5	-72.7	-75.8	-78.8
	5.5	4.7	3.7	2.4	0.9	-0.6	-2.0	-3.4	-4.6	-5.6	-6.3	-6.9	-7.4	-7.7	-7.9	-8.1	-8.4	-8.7	-9.1
-70	-19.2	-22.4	-25.6	-28.9	-32.3	-35.8	-39.5	-43.2	-47.0	-50.8	-54.7	-58.7	-62.6	-66.6	-70.6	-74.6	-78.6	-82.7	-86.9
	4.4	3.9	3.2	2.4	1.4	0.4	-0.6	-1.5	-2.4	-3.2	-3.9	-4.5	-4.9	-5.3	-5.5	-5.8	-6.0	-6.2	-6.4
-75	-19.7	-23.2	-26.8	-30.4	-34.1	-37.9	-41.8	-45.8	-49.8	-53.9	-58.1	-62.4	-66.7	-71.0	-75.5	-80.0	-84.7	-89.4	-94.4
	3.4	3.2	2.8	2.3	1.7	1.2	0.6	0.0	-0.6	-1.1	-1.6	-2.0	-2.4	-2.7	-3.0	-3.2	-3.4	-3.5	-3.7
-80	-20.9	-24.8	-28.8	-32.8	-36.9	-41.0	-45.2	-49.5	-53.8	-58.2	-62.7	-67.2	-71.9	-76.6	-81.4	-86.3	-91.3	-96.5	-101.8
	2.5	2.4	2.2	2.0	1.7	1.5	1.2	0.9	0.6	0.3	0.0	-0.2	-0.4	-0.6	-0.8	-1.0	-1.1	-1.2	-1.3
-85	-23.3	-27.7	-32.2	-36.6	-41.1	-45.6	-50.2	-54.8	-59.5	-64.2	-69.0	-73.8	-78.7	-83.7	-88.7	-93.8	-98.9	-104.1	-109.4
	1.6	1.6	1.5	1.4	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.4	0.3	0.2	0.2
-90	-27.5	-32.5	-37.5	-42.5	-47.5	-52.5	-57.5	-62.5	-67.5	-72.5	-77.5	-82.5	-87.5	-92.5	-97.5	-102.5	-107.5	-112.5	-117.5
	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

IGRF 1980 DECLINATION (D)

LAT \ LONG	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180
0	-2.6	-1.5	-0.4	0.4	1.0	1.3	1.5	1.8	2.2	2.8	3.6	4.6	5.8	6.9	8.1	9.2	10.0	10.6	10.9
	-3.6	-3.5	-3.3	-3.2	-3.1	-3.0	-3.0	-2.7	-2.2	-1.3	-0.2	0.9	1.8	2.5	2.8	2.9	2.8	2.6	2.3
-5	-3.7	-2.2	-0.9	0.2	1.0	1.5	1.8	2.2	2.7	3.4	4.3	5.4	6.5	7.6	8.7	9.6	10.4	11.0	11.2
	-4.1	-4.0	-3.7	-3.4	-3.1	-2.8	-2.5	-2.1	-1.5	-0.7	0.3	1.3	2.1	2.7	3.0	3.1	3.0	2.8	2.6
-10	-5.2	-3.4	-1.8	-0.4	0.7	1.4	2.0	2.5	3.1	4.0	4.9	6.0	7.1	8.2	9.3	10.2	10.9	11.4	11.7
	-4.5	-4.4	-4.0	-3.5	-3.0	-2.5	-2.0	-1.5	-0.8	0.0	0.9	1.7	2.4	2.8	3.1	3.2	3.1	3.0	2.8
-15	-7.5	-5.3	-3.2	-1.4	0.0	1.0	1.8	2.6	3.4	4.4	5.5	6.6	7.8	8.9	10.0	10.9	11.6	12.1	12.4
	-4.8	-4.7	-4.2	-3.5	-2.8	-2.1	-1.4	-0.8	0.0	0.7	1.4	2.1	2.6	2.9	3.1	3.2	3.2	3.2	3.0
-20	-10.6	-7.9	-5.3	-3.1	-1.2	0.3	1.5	2.5	3.6	4.8	6.0	7.3	8.6	9.8	10.9	11.8	12.6	13.1	13.5
	-4.9	-4.8	-4.3	-3.6	-2.7	-1.8	-1.0	-0.1	0.6	1.3	2.0	2.5	2.8	3.1	3.2	3.3	3.4	3.3	3.1
-25	-14.8	-11.5	-8.3	-5.4	-3.0	-0.9	0.8	2.3	3.7	5.2	6.6	8.1	9.5	10.8	12.0	13.0	13.8	14.5	14.8
	-4.9	-4.9	-4.5	-3.8	-2.8	-1.7	-0.7	0.2	1.1	1.8	2.4	2.8	3.1	3.3	3.4	3.5	3.6	3.6	3.4
-30	-20.0	-16.3	-12.4	-8.8	-5.5	-2.7	-0.3	1.8	3.8	5.6	7.4	9.1	10.7	12.1	13.4	14.5	15.4	16.1	16.5
	-5.0	-5.2	-4.9	-4.2	-3.2	-2.0	-0.8	0.3	1.3	2.1	2.7	3.1	3.4	3.6	3.8	3.9	4.0	3.9	3.7
-35	-26.5	-22.3	-17.8	-13.3	-9.1	-5.3	-2.0	1.0	3.6	6.0	8.2	10.3	12.1	13.8	15.3	16.5	17.4	18.1	18.6
	-5.5	-5.8	-5.8	-5.2	-4.1	-2.8	-1.4	-0.1	1.1	2.1	2.8	3.4	3.8	4.1	4.4	4.5	4.6	4.5	4.3
-40	-34.0	-29.7	-24.8	-19.5	-14.2	-9.2	-4.6	-0.5	3.1	6.3	9.2	11.8	14.0	15.9	17.5	18.8	19.8	20.6	21.1
	-6.6	-7.1	-7.3	-6.9	-5.9	-4.5	-2.8	-1.1	0.4	1.8	2.9	3.8	4.4	4.9	5.3	5.5	5.5	5.4	5.0
-45	-42.4	-38.6	-33.8	-28.0	-21.7	-15.2	-8.9	-3.2	2.0	6.4	10.3	13.5	16.3	18.5	20.3	21.8	22.9	23.6	24.1
	-8.3	-9.0	-9.6	-9.6	-8.9	-7.5	-5.4	-3.1	-0.8	1.3	3.0	4.3	5.4	6.1	6.6	6.8	6.8	6.5	6.0
-50	-51.5	-48.8	-44.9	-39.5	-32.8	-24.9	-16.5	-8.2	-0.6	6.0	11.4	15.9	19.4	22.1	24.2	25.8	26.9	27.6	28.0
	-10.2	-11.1	-12.2	-13.1	-13.4	-12.5	-10.2	-6.9	-3.1	0.3	3.2	5.4	7.0	8.0	8.5	8.7	8.5	8.1	7.4
-55	-60.9	-59.9	-57.9	-54.3	-48.8	-41.0	-30.9	-19.0	-6.8	4.0	12.7	19.3	24.1	27.6	30.0	31.7	32.7	33.4	33.7
	-11.2	-12.3	-13.9	-15.9	-18.0	-19.6	-19.1	-15.4	-8.8	-1.7	4.1	7.9	10.1	11.3	11.6	11.5	10.9	10.1	9.1
-60	-70.1	-71.2	-71.6	-71.1	-69.3	-65.4	-58.3	-45.9	-26.7	-4.0	14.6	26.5	33.7	37.9	40.4	41.8	42.4	42.7	42.6
	-10.9	-11.9	-13.4	-15.7	-19.0	-23.8	-29.9	-35.0	-30.6	-11.1	7.4	15.9	18.3	18.2	17.2	15.8	14.3	12.7	11.1
-65	-78.8	-81.7	-84.5	-87.1	-89.5	-91.7	-93.6	-95.0	-95.0	-89.1	33.2	62.6	64.7	64.3	63.2	61.9	60.5	59.1	57.7
	-9.1	-9.8	-10.7	-12.2	-14.4	-17.7	-23.2	-33.0	-54.4	-131.4	183.9	80.2	47.8	34.3	26.7	21.8	18.1	15.2	12.8
-70	-86.9	-91.1	-95.6	-100.2	-105.3	-110.9	-117.4	-125.4	-135.5	-149.3	-168.5	167.2	142.7	123.4	109.7	99.9	92.6	86.9	82.2
	-6.4	-6.8	-7.2	-7.7	-8.4	-9.3	-10.3	-11.4	-12.1	-10.8	-4.4	8.5	19.7	22.7	21.1	18.3	15.5	13.1	11.1
-75	-94.4	-99.5	-104.8	-110.4	-116.5	-123.0	-130.1	-137.9	-146.6	-156.2	-166.8	-178.3	169.9	158.0	146.6	136.2	126.8	118.5	111.2
	-3.7	-3.8	-3.9	-4.0	-4.1	-4.2	-4.2	-4.1	-3.7	-3.1	-2.1	-0.7	0.9	2.4	3.7	4.5	4.8	4.9	4.7
-80	-101.8	-107.2	-112.8	-118.7	-124.7	-131.0	-137.6	-144.4	-151.5	-158.8	-166.4	-174.2	177.9	170.0	162.2	154.4	146.9	139.7	132.8
	-1.3	-1.4	-1.5	-1.5	-1.5	-1.5	-1.4	-1.4	-1.2	-1.1	-0.9	-0.7	-0.4	-0.1	0.1	0.3	0.5	0.7	0.8
-85	-109.4	-114.8	-120.3	-125.8	-131.5	-137.2	-143.0	-148.8	-154.7	-160.7	-166.7	-172.7	-178.8	175.2	169.1	163.1	157.1	151.2	145.3
	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2
-90	-117.5	-122.5	-127.5	-132.5	-137.5	-142.5	-147.5	-152.5	-157.5	-162.5	-167.5	-172.5	-177.5	177.5	172.5	167.5	162.5	157.5	152.5
	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

IGRF 1980 DECLINATION (D)

LONG / LAT	180	-175	-170	-165	-160	-155	-150	-145	-140	-135	-130	-125	-120	-115	-110	-105	-100	-95	-90
0	10.9	10.8	10.5	10.0	9.6	9.3	9.2	9.1	9.0	8.9	8.8	8.7	8.6	8.7	8.8	8.8	8.6	8.0	6.9
	2.3	1.9	1.2	0.5	-0.3	-0.9	-1.1	-0.5	0.6	2.1	3.5	4.3	4.2	3.2	1.3	-0.9	-3.2	-5.1	-6.6
-5	11.2	11.1	10.8	10.4	10.0	9.8	9.6	9.6	9.5	9.4	9.2	9.1	9.0	9.1	9.3	9.3	9.2	8.7	7.7
	2.6	2.1	1.5	0.7	0.0	-0.6	-0.6	-0.1	1.1	2.5	3.8	4.4	4.2	2.9	1.0	-1.3	-3.5	-5.3	-6.6
-10	11.7	11.6	11.4	11.1	10.8	10.6	10.5	10.4	10.3	10.1	10.0	9.8	9.8	9.8	10.0	10.1	10.0	9.6	8.7
	2.8	2.4	1.8	1.0	0.3	-0.2	-0.2	0.3	1.4	2.7	3.7	4.2	3.7	2.4	0.4	-1.9	-3.9	-5.5	-6.6
-15	12.4	12.5	12.3	12.1	11.9	11.7	11.6	11.5	11.4	11.3	11.1	10.9	10.8	10.9	11.0	11.1	11.1	10.8	9.9
	3.0	2.6	2.0	1.3	0.6	0.1	0.1	0.6	1.5	2.6	3.4	3.6	3.0	1.6	-0.3	-2.4	-4.3	-5.6	-6.5
-20	13.5	13.6	13.5	13.4	13.2	13.0	13.0	12.9	12.8	12.6	12.4	12.3	12.2	12.2	12.4	12.5	12.5	12.2	11.4
	3.1	2.8	2.2	1.5	0.9	0.4	0.3	0.7	1.5	2.3	2.8	2.9	2.2	0.8	-1.0	-2.8	-4.4	-5.5	-6.2
-25	14.8	15.0	15.0	14.9	14.8	14.6	14.5	14.5	14.4	14.2	14.1	14.0	13.9	14.0	14.1	14.3	14.3	14.0	13.2
	3.4	3.0	2.4	1.7	1.1	0.6	0.5	0.7	1.2	1.8	2.1	2.0	1.3	0.1	-1.4	-2.9	-4.1	-5.0	-5.6
-30	16.5	16.8	16.8	16.7	16.6	16.5	16.4	16.3	16.2	16.1	16.0	16.0	16.0	16.2	16.3	16.5	16.5	16.2	15.4
	3.7	3.3	2.7	2.0	1.3	0.8	0.6	0.6	0.9	1.3	1.5	1.3	0.7	-0.2	-1.4	-2.5	-3.5	-4.2	-4.7
-35	18.6	18.8	18.9	18.8	18.7	18.6	18.5	18.3	18.3	18.3	18.3	18.4	18.5	18.7	19.0	19.1	19.1	18.7	17.8
	4.3	3.8	3.1	2.3	1.6	1.0	0.7	0.6	0.7	0.9	1.0	0.9	0.5	-0.2	-1.0	-1.8	-2.4	-3.0	-3.5
-40	21.1	21.3	21.4	21.3	21.2	21.0	20.9	20.8	20.8	20.9	21.0	21.2	21.5	21.7	22.0	22.1	21.9	21.4	20.3
	5.0	4.4	3.7	2.8	2.0	1.4	1.0	0.8	0.8	0.9	1.0	1.0	0.7	0.3	-0.2	-0.7	-1.2	-1.6	-2.2
-45	24.1	24.3	24.3	24.3	24.1	24.0	23.9	23.9	24.0	24.1	24.3	24.6	24.9	25.1	25.3	25.2	24.8	24.1	22.8
	6.0	5.3	4.5	3.6	2.7	2.0	1.5	1.3	1.2	1.3	1.4	1.4	1.3	1.2	0.9	0.5	0.1	-0.4	-1.0
-50	28.0	28.2	28.2	28.1	28.0	27.9	27.8	27.8	27.9	28.1	28.3	28.5	28.7	28.8	28.7	28.4	27.7	26.6	25.0
	7.4	6.5	5.5	4.5	3.6	2.9	2.4	2.1	2.0	2.0	2.1	2.1	2.1	2.0	1.8	1.5	1.0	0.4	-0.3
-55	33.7	33.8	33.7	33.5	33.3	33.2	33.1	33.0	33.1	33.1	33.2	33.2	33.1	32.9	32.4	31.7	30.6	29.1	27.2
	9.1	8.0	6.8	5.7	4.8	4.0	3.5	3.1	2.9	2.9	2.9	2.8	2.8	2.6	2.3	1.9	1.4	0.8	0.1
-60	42.6	42.3	41.9	41.5	41.1	40.7	40.4	40.1	39.8	39.5	39.2	38.8	38.2	37.4	36.4	35.2	33.6	31.8	29.6
	11.1	9.6	8.3	7.0	6.0	5.1	4.5	4.0	3.7	3.5	3.3	3.2	3.0	2.7	2.3	1.9	1.4	0.8	0.1
-65	57.7	56.3	55.0	53.8	52.7	51.6	50.6	49.6	48.7	47.7	46.6	45.5	44.2	42.7	41.1	39.3	37.2	34.9	32.4
	12.8	10.9	9.2	7.8	6.6	5.7	5.0	4.4	3.9	3.6	3.2	2.9	2.6	2.3	1.9	1.4	1.0	0.5	0.0
-70	82.2	78.2	74.8	71.8	69.1	66.6	64.3	62.1	60.0	57.9	55.8	53.7	51.5	49.2	46.8	44.3	41.7	39.0	36.1
	11.1	9.4	7.9	6.7	5.7	4.9	4.2	3.7	3.2	2.8	2.5	2.1	1.8	1.5	1.1	0.8	0.5	0.2	-0.1
-75	111.2	104.8	99.1	93.9	89.2	84.9	81.0	77.2	73.7	70.3	66.9	63.7	60.4	57.2	54.0	50.8	47.5	44.3	40.9
	4.7	4.3	3.9	3.5	3.1	2.7	2.4	2.1	1.8	1.5	1.3	1.1	0.9	0.7	0.5	0.3	0.2	0.0	0.0
-80	132.8	126.2	119.9	113.9	108.3	103.0	97.9	93.0	88.3	83.7	79.3	75.1	70.9	66.8	62.8	58.8	54.9	51.0	47.1
	0.8	0.8	0.9	0.9	0.8	0.8	0.7	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.3
-85	145.3	139.5	133.9	128.2	122.7	117.3	112.0	106.8	101.7	96.6	91.7	86.8	82.0	77.3	72.6	68.0	63.4	58.9	54.4
	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7
-90	152.5	147.5	142.5	137.5	132.5	127.5	122.5	117.5	112.5	107.5	102.5	97.5	92.5	87.5	82.5	77.5	72.5	67.5	62.5
	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

IGRF 1980 DECLINATION (D)

LAT \ LONG	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
0	6.9	5.2	2.8	-0.1	-3.5	-7.2	-10.8	-14.2	-17.0	-19.1	-20.4	-21.0	-20.7	-19.8	-18.2	-16.1	-13.9	-11.7	-9.8
	-6.6	-7.8	-8.8	-9.9	-11.0	-11.8	-12.1	-11.3	-9.5	-6.8	-3.7	-0.7	1.8	3.6	4.6	5.1	5.4	5.8	6.6
-5	7.7	6.1	3.8	0.9	-2.6	-6.3	-10.1	-13.7	-16.8	-19.2	-20.9	-21.9	-22.0	-21.4	-20.1	-18.3	-16.3	-14.2	-12.2
	-6.6	-7.6	-8.5	-9.6	-10.8	-11.9	-12.5	-12.1	-10.6	-8.1	-5.1	-2.0	0.6	2.4	3.5	4.1	4.5	5.2	6.2
-10	8.7	7.2	4.9	2.0	-1.5	-5.4	-9.3	-13.1	-16.5	-19.2	-21.3	-22.6	-23.1	-23.0	-22.1	-20.7	-19.0	-17.1	-15.2
	-6.6	-7.4	-8.2	-9.2	-10.5	-11.8	-12.5	-12.4	-11.2	-8.9	-6.1	-3.1	-0.5	1.4	2.5	3.1	3.6	4.3	5.7
-15	9.9	8.4	6.2	3.3	-0.2	-4.2	-8.4	-12.4	-16.0	-19.0	-21.4	-23.1	-24.0	-24.3	-23.9	-23.0	-21.8	-20.2	-18.4
	-6.5	-7.1	-7.8	-8.8	-10.1	-11.4	-12.3	-12.4	-11.4	-9.3	-6.7	-3.8	-1.3	0.5	1.6	2.2	2.6	3.5	5.0
-20	11.4	10.0	7.8	4.9	1.3	-2.9	-7.2	-11.4	-15.3	-18.6	-21.2	-23.2	-24.5	-25.2	-25.3	-25.0	-24.2	-23.1	-21.6
	-6.2	-6.7	-7.4	-8.3	-9.6	-10.9	-11.9	-12.1	-11.2	-9.4	-6.9	-4.2	-1.7	0.1	1.2	1.7	2.1	2.9	4.4
-25	13.2	11.8	9.6	6.7	3.0	-1.2	-5.7	-10.1	-14.3	-17.8	-20.7	-22.9	-24.5	-25.6	-26.1	-26.3	-26.0	-25.4	-24.3
	-5.6	-6.1	-6.7	-7.7	-9.0	-10.3	-11.3	-11.5	-10.8	-9.1	-6.8	-4.2	-1.7	0.1	1.3	1.9	2.2	2.9	4.3
-30	15.4	14.0	11.8	8.8	5.0	0.7	-3.9	-8.5	-12.8	-16.5	-19.7	-22.1	-24.0	-25.3	-26.2	-26.7	-26.9	-26.6	-26.0
	-4.7	-5.2	-5.9	-6.9	-8.2	-9.5	-10.5	-10.8	-10.2	-8.7	-6.5	-3.9	-1.5	0.5	1.8	2.6	3.1	3.8	4.9
-35	17.8	16.3	14.0	11.0	7.2	2.9	-1.7	-6.3	-10.7	-14.6	-18.0	-20.6	-22.7	-24.3	-25.4	-26.2	-26.7	-26.7	-26.5
	-3.5	-4.1	-4.9	-6.0	-7.3	-8.6	-9.5	-9.8	-9.3	-8.0	-5.9	-3.5	-1.1	1.0	2.6	3.8	4.5	5.3	6.1
-40	20.3	18.7	16.3	13.2	9.5	5.3	0.8	-3.8	-8.1	-12.1	-15.5	-18.3	-20.6	-22.4	-23.7	-24.7	-25.3	-25.7	-25.8
	-2.2	-2.9	-3.8	-4.9	-6.2	-7.4	-8.3	-8.6	-8.2	-7.0	-5.2	-2.9	-0.5	1.7	3.6	5.0	6.1	6.9	7.4
-45	22.8	20.9	18.4	15.3	11.7	7.7	3.4	-1.0	-5.1	-9.0	-12.4	-15.3	-17.7	-19.6	-21.1	-22.3	-23.2	-23.9	-24.4
	-1.0	-1.8	-2.8	-3.9	-5.1	-6.2	-6.9	-7.2	-6.8	-5.7	-4.1	-2.0	0.3	2.5	4.5	6.2	7.4	8.1	8.2
-50	25.0	23.0	20.4	17.3	13.8	10.0	6.0	2.0	-1.9	-5.5	-8.8	-11.7	-14.1	-16.2	-17.9	-19.4	-20.6	-21.7	-22.7
	-0.3	-1.1	-2.0	-3.1	-4.1	-4.9	-5.4	-5.5	-5.1	-4.2	-2.7	-0.9	1.2	3.3	5.2	6.8	7.9	8.4	8.2
-55	27.2	25.0	22.3	19.2	15.9	12.4	8.7	5.0	1.4	-2.0	-5.1	-7.9	-10.5	-12.7	-14.7	-16.4	-18.1	-19.7	-21.3
	0.1	-0.7	-1.5	-2.4	-3.1	-3.7	-4.0	-3.9	-3.4	-2.5	-1.2	0.4	2.2	4.0	5.6	6.9	7.8	8.0	7.6
-60	29.6	27.1	24.3	21.3	18.1	14.8	11.4	8.0	4.7	1.5	-1.6	-4.4	-7.0	-9.4	-11.7	-13.8	-15.9	-18.0	-20.1
	0.1	-0.5	-1.2	-1.8	-2.2	-2.5	-2.6	-2.4	-1.8	-1.0	0.1	1.4	2.8	4.2	5.5	6.4	7.0	7.1	6.6
-65	32.4	29.7	26.8	23.8	20.7	17.5	14.2	11.0	7.8	4.7	1.7	-1.2	-4.0	-6.6	-9.2	-11.8	-14.3	-16.8	-19.4
	0.0	-0.5	-0.9	-1.2	-1.4	-1.5	-1.3	-1.0	-0.5	0.2	1.1	2.1	3.2	4.2	5.0	5.6	5.9	5.9	5.5
-70	36.1	33.1	30.0	26.9	23.7	20.5	17.2	14.0	10.8	7.6	4.5	1.5	-1.5	-4.4	-7.4	-10.3	-13.2	-16.2	-19.2
	-0.1	-0.4	-0.5	-0.6	-0.6	-0.5	-0.3	0.0	0.5	1.1	1.7	2.4	3.1	3.7	4.3	4.6	4.8	4.7	4.4
-75	40.9	37.6	34.2	30.8	27.4	24.0	20.6	17.2	13.8	10.4	7.1	3.8	0.4	-2.9	-6.2	-9.5	-12.9	-16.2	-19.7
	0.0	-0.1	-0.1	0.0	0.1	0.3	0.5	0.8	1.1	1.5	2.0	2.4	2.8	3.1	3.4	3.6	3.6	3.6	3.4
-80	47.1	43.3	39.4	35.6	31.8	28.0	24.3	20.5	16.8	13.0	9.3	5.6	1.8	-1.9	-5.7	-9.4	-13.2	-17.1	-20.9
	0.3	0.3	0.4	0.5	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.5	2.6	2.6	2.6	2.5
-85	54.4	50.0	45.6	41.2	36.9	32.6	28.3	24.0	19.7	15.4	11.1	6.9	2.6	-1.7	-6.0	-10.3	-14.6	-19.0	-23.3
	0.7	0.7	0.8	0.9	0.9	1.0	1.1	1.2	1.2	1.3	1.4	1.4	1.5	1.6	1.6	1.6	1.6	1.6	1.6
-90	62.5	57.5	52.5	47.5	42.5	37.5	32.5	27.5	22.5	17.5	12.5	7.5	2.5	-2.5	-7.5	-12.5	-17.5	-22.5	-27.5
	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

IGRF 1980 INCLINATION (I)

LAT \ LONG	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
90	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6
	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
85	85.0	85.0	85.0	85.0	85.1	85.1	85.2	85.3	85.4	85.6	85.7	85.9	86.0	86.2	86.4	86.6	86.8	87.0	87.2
	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3
80	82.5	82.5	82.5	82.5	82.6	82.7	82.8	83.0	83.2	83.4	83.6	83.9	84.2	84.6	84.9	85.3	85.7	86.0	86.4
	0.6	0.7	0.8	0.8	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4
75	80.2	80.1	80.1	80.1	80.2	80.3	80.4	80.6	80.9	81.1	81.5	81.8	82.2	82.7	83.1	83.6	84.1	84.6	85.0
	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.3	1.3
70	77.8	77.7	77.7	77.7	77.8	77.9	78.1	78.3	78.5	78.8	79.2	79.6	80.0	80.5	81.0	81.5	82.1	82.6	83.0
	0.0	0.1	0.3	0.4	0.6	0.7	0.8	0.9	1.0	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.0
65	75.2	75.2	75.2	75.2	75.3	75.4	75.6	75.8	76.1	76.3	76.7	77.1	77.5	78.0	78.5	79.0	79.5	80.0	80.4
	-0.3	-0.1	0.0	0.2	0.4	0.5	0.7	0.8	0.9	0.9	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8
60	72.4	72.3	72.4	72.4	72.6	72.7	72.9	73.1	73.4	73.6	73.9	74.3	74.7	75.1	75.5	76.0	76.4	76.9	77.2
	-0.6	-0.3	-0.1	0.1	0.3	0.5	0.6	0.7	0.8	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6
55	69.1	69.1	69.1	69.3	69.4	69.6	69.8	70.1	70.3	70.6	70.8	71.1	71.5	71.8	72.2	72.6	72.9	73.2	73.5
	-0.8	-0.5	-0.2	0.1	0.3	0.5	0.7	0.8	0.9	0.9	0.9	0.8	0.8	0.7	0.6	0.6	0.6	0.5	0.6
50	65.2	65.2	65.4	65.5	65.7	66.0	66.2	66.5	66.8	67.0	67.3	67.5	67.8	68.0	68.3	68.6	68.8	69.1	69.2
	-1.1	-0.7	-0.3	0.1	0.4	0.7	0.9	1.0	1.1	1.1	1.1	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.6
45	60.7	60.7	60.9	61.1	61.3	61.6	61.9	62.2	62.5	62.8	63.1	63.3	63.5	63.7	63.8	64.0	64.1	64.2	64.3
	-1.4	-0.9	-0.4	0.1	0.5	0.9	1.1	1.3	1.4	1.4	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.8	0.8
40	55.3	55.3	55.5	55.7	56.0	56.4	56.7	57.1	57.5	57.8	58.1	58.3	58.5	58.6	58.6	58.6	58.6	58.6	58.6
	-2.1	-1.4	-0.8	-0.1	0.4	0.9	1.3	1.5	1.7	1.7	1.8	1.7	1.7	1.6	1.5	1.4	1.3	1.2	1.1
35	48.8	48.9	49.1	49.3	49.7	50.1	50.5	50.9	51.4	51.8	52.2	52.4	52.5	52.6	52.5	52.4	52.2	52.1	52.0
	-3.0	-2.2	-1.4	-0.5	0.2	0.9	1.4	1.7	1.9	2.1	2.2	2.3	2.3	2.3	2.2	2.0	1.8	1.7	1.6
30	41.2	41.2	41.4	41.7	42.1	42.6	43.0	43.6	44.2	44.7	45.1	45.4	45.5	45.4	45.3	45.0	44.7	44.5	44.3
	-4.4	-3.4	-2.3	-1.2	-0.3	0.6	1.3	1.7	2.1	2.4	2.6	2.8	3.0	3.1	3.0	2.8	2.6	2.3	2.1
25	32.2	32.2	32.4	32.7	33.1	33.6	34.2	34.8	35.6	36.2	36.8	37.1	37.2	37.1	36.8	36.4	36.0	35.6	35.4
	-6.1	-4.9	-3.6	-2.3	-1.0	0.1	1.0	1.7	2.2	2.6	3.0	3.4	3.8	3.9	3.9	3.7	3.4	3.0	2.7
20	21.8	21.8	22.0	22.3	22.7	23.2	23.9	24.7	25.5	26.4	27.1	27.5	27.6	27.4	27.0	26.5	25.9	25.5	25.2
	-8.0	-6.7	-5.2	-3.5	-2.0	-0.6	0.6	1.5	2.2	2.8	3.4	4.0	4.6	4.9	5.0	4.7	4.3	3.7	3.2
15	10.2	10.1	10.3	10.6	10.9	11.5	12.2	13.2	14.2	15.3	16.1	16.6	16.7	16.5	16.0	15.3	14.6	14.1	13.8
	-10.1	-8.6	-6.9	-5.0	-3.1	-1.4	0.1	1.2	2.1	3.0	3.8	4.6	5.3	5.8	5.9	5.6	5.1	4.4	3.7
10	-2.1	-2.3	-2.2	-2.0	-1.7	-1.2	-0.4	0.7	1.9	3.2	4.1	4.7	4.9	4.6	4.0	3.3	2.5	2.0	1.7
	-11.9	-10.3	-8.5	-6.4	-4.2	-2.2	-0.5	0.9	2.0	3.1	4.1	5.1	5.9	6.5	6.6	6.3	5.6	4.8	3.9
5	-14.3	-14.7	-14.8	-14.8	-14.6	-14.1	-13.3	-12.1	-10.7	-9.4	-8.3	-7.6	-7.4	-7.7	-8.3	-9.0	-9.7	-10.2	-10.4
	-13.2	-11.6	-9.7	-7.5	-5.2	-3.0	-1.0	0.6	1.9	3.1	4.2	5.3	6.2	6.8	6.9	6.6	5.8	4.8	3.8
0	-25.8	-26.4	-26.8	-26.9	-26.8	-26.4	-25.6	-24.3	-22.9	-21.5	-20.3	-19.6	-19.4	-19.6	-20.2	-20.8	-21.5	-21.9	-22.0
	-13.9	-12.4	-10.6	-8.3	-5.9	-3.6	-1.5	0.3	1.8	3.1	4.3	5.3	6.2	6.7	6.8	6.4	5.6	4.5	3.4

IGRF 1980 INCLINATION (I)

LAT \ LONG	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180
90	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6
	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
85	87.2	87.4	87.6	87.8	87.9	88.1	88.2	88.3	88.3	88.3	88.4	88.3	88.3	88.3	88.3	88.3	88.3	88.3	88.3
	1.3	1.4	1.3	1.3	1.3	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.4
80	86.4	86.7	87.0	87.2	87.3	87.3	87.2	87.0	86.8	86.6	86.3	86.1	85.8	85.6	85.5	85.3	85.2	85.2	85.2
	1.4	1.4	1.3	1.1	0.9	0.7	0.5	0.3	0.1	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1
75	85.0	85.3	85.6	85.7	85.6	85.4	85.1	84.7	84.3	83.8	83.4	82.9	82.6	82.2	81.9	81.7	81.6	81.5	81.6
	1.3	1.2	1.0	0.8	0.6	0.4	0.2	0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	0.0
70	83.0	83.3	83.5	83.5	83.3	82.9	82.5	81.9	81.3	80.6	80.0	79.4	78.9	78.5	78.1	77.9	77.7	77.6	77.6
	1.0	0.9	0.8	0.6	0.5	0.3	0.2	0.1	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.1	0.1
65	80.4	80.6	80.7	80.6	80.4	79.9	79.3	78.6	77.9	77.1	76.4	75.7	75.0	74.5	74.1	73.8	73.6	73.5	73.6
	0.8	0.7	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
60	77.2	77.4	77.4	77.3	77.0	76.5	75.8	75.0	74.2	73.3	72.4	71.6	70.9	70.3	69.9	69.5	69.4	69.4	69.5
	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2
55	73.5	73.6	73.6	73.4	73.1	72.6	71.9	71.0	70.1	69.2	68.3	67.4	66.6	66.0	65.5	65.2	65.1	65.1	65.3
	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.4	0.3	0.2	0.2
50	69.2	69.3	69.3	69.1	68.7	68.2	67.5	66.6	65.7	64.8	63.8	62.9	62.1	61.5	61.0	60.8	60.7	60.9	61.2
	0.6	0.7	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.6	0.5	0.3	0.2	0.1
45	64.3	64.3	64.3	64.1	63.8	63.3	62.6	61.8	60.9	59.9	58.9	58.0	57.3	56.7	56.3	56.2	56.3	56.5	57.0
	0.8	0.9	0.9	1.0	1.1	1.1	1.1	1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.7	0.5	0.3	0.1	-0.1
40	58.6	58.6	58.5	58.4	58.1	57.7	57.1	56.3	55.4	54.5	53.6	52.7	52.0	51.5	51.3	51.3	51.6	52.1	52.7
	1.1	1.2	1.2	1.3	1.3	1.2	1.1	0.9	0.8	0.6	0.6	0.6	0.6	0.6	0.6	0.4	0.2	0.0	-0.2
35	52.0	52.0	51.9	51.8	51.6	51.3	50.8	50.1	49.3	48.4	47.5	46.7	46.1	45.8	45.7	46.0	46.5	47.3	48.3
	1.6	1.5	1.5	1.5	1.5	1.3	1.0	0.7	0.4	0.1	0.0	0.0	0.1	0.2	0.3	0.3	0.1	-0.1	-0.3
30	44.3	44.2	44.2	44.2	44.1	43.9	43.5	42.9	42.2	41.4	40.6	39.9	39.5	39.3	39.6	40.1	41.0	42.1	43.3
	2.1	2.0	1.9	1.8	1.6	1.3	0.9	0.3	-0.3	-0.7	-0.9	-0.9	-0.7	-0.4	-0.2	-0.1	-0.1	-0.2	-0.4
25	35.4	35.3	35.3	35.4	35.5	35.4	35.1	34.7	34.1	33.4	32.8	32.3	32.0	32.1	32.6	33.5	34.7	36.2	37.8
	2.7	2.4	2.2	2.1	1.8	1.3	0.6	-0.2	-1.0	-1.7	-2.1	-2.1	-1.8	-1.3	-0.9	-0.5	-0.4	-0.3	-0.3
20	25.2	25.1	25.2	25.5	25.7	25.7	25.6	25.3	24.9	24.4	23.9	23.7	23.6	24.0	24.8	26.0	27.6	29.4	31.3
	3.2	2.8	2.5	2.2	1.8	1.2	0.3	-0.8	-2.0	-2.9	-3.4	-3.4	-3.1	-2.4	-1.7	-1.1	-0.7	-0.4	-0.2
15	13.8	13.8	14.0	14.4	14.8	15.1	15.1	15.0	14.8	14.4	14.2	14.1	14.4	15.0	16.1	17.6	19.5	21.6	23.8
	3.7	3.1	2.7	2.2	1.7	0.9	-0.2	-1.5	-2.9	-4.0	-4.6	-4.7	-4.3	-3.5	-2.5	-1.7	-1.0	-0.5	-0.1
10	1.7	1.8	2.2	2.7	3.3	3.7	4.0	4.1	4.0	3.8	3.8	4.0	4.5	5.4	6.7	8.4	10.5	12.8	15.1
	3.9	3.1	2.5	2.0	1.3	0.4	-0.8	-2.2	-3.7	-4.9	-5.6	-5.7	-5.2	-4.2	-3.2	-2.1	-1.2	-0.5	0.1
5	-10.4	-10.3	-9.8	-9.1	-8.4	-7.8	-7.3	-7.1	-7.0	-6.9	-6.7	-6.3	-5.6	-4.6	-3.2	-1.4	0.7	3.1	5.5
	3.8	2.9	2.1	1.5	0.7	-0.2	-1.4	-2.8	-4.2	-5.3	-6.0	-6.1	-5.5	-4.6	-3.5	-2.4	-1.4	-0.5	0.3
0	-22.0	-21.8	-21.2	-20.5	-19.6	-18.8	-18.3	-17.9	-17.6	-17.4	-17.0	-16.5	-15.6	-14.5	-13.1	-11.3	-9.3	-7.0	-4.7
	3.4	2.4	1.5	0.8	0.0	-0.9	-2.0	-3.2	-4.4	-5.3	-5.9	-5.9	-5.4	-4.5	-3.5	-2.4	-1.4	-0.5	0.4

IGRF 1980 INCLINATION (I)

LONG / LAT	180	-175	-170	-165	-160	-155	-150	-145	-140	-135	-130	-125	-120	-115	-110	-105	-100	-95	-90
90	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6
	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
85	88.3	88.3	88.4	88.4	88.5	88.6	88.7	88.8	88.9	88.9	89.0	89.0	89.0	88.9	88.7	88.6	88.4	88.2	87.9
	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.2	1.2	1.1	1.0	0.9	0.9	0.8
80	85.2	85.3	85.4	85.5	85.7	85.9	86.2	86.5	86.9	87.3	87.7	88.1	88.6	89.0	89.4	89.5	89.2	88.7	88.3
	-0.1	-0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.8	1.2	1.3	0.7	0.4	0.3
75	81.6	81.6	81.8	82.1	82.4	82.8	83.2	83.7	84.3	84.9	85.5	86.2	86.9	87.6	88.4	89.1	89.6	89.2	88.4
	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	-0.2	-1.7	-1.3	-1.0
70	77.6	77.8	78.0	78.4	78.8	79.3	79.9	80.6	81.4	82.2	83.0	83.9	84.8	85.7	86.6	87.4	88.0	88.2	87.8
	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.0	-0.3	-0.8	-1.6	-2.3	-2.4
65	73.6	73.8	74.1	74.6	75.1	75.8	76.5	77.3	78.2	79.2	80.2	81.2	82.3	83.3	84.3	85.1	85.8	86.1	86.1
	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.1	-0.1	-0.3	-0.7	-1.2	-1.8	-2.5	-2.9
60	69.5	69.7	70.1	70.7	71.3	72.1	72.9	73.9	74.9	75.9	77.0	78.2	79.3	80.4	81.4	82.3	83.1	83.5	83.6
	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.1	-0.1	-0.3	-0.6	-1.0	-1.5	-2.1	-2.7	-3.3
55	65.3	65.7	66.1	66.8	67.5	68.3	69.3	70.3	71.3	72.5	73.6	74.8	75.9	77.0	78.1	79.1	79.8	80.4	80.6
	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.1	-0.1	-0.3	-0.6	-0.9	-1.3	-1.7	-2.3	-2.9	-3.5
50	61.2	61.6	62.2	62.9	63.7	64.6	65.6	66.6	67.7	68.8	69.9	71.1	72.3	73.4	74.4	75.4	76.3	76.9	77.3
	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	-0.1	-0.3	-0.5	-0.8	-1.1	-1.4	-1.8	-2.3	-2.9	-3.5
45	57.0	57.6	58.3	59.1	59.9	60.8	61.8	62.8	63.9	65.0	66.1	67.2	68.3	69.4	70.5	71.5	72.4	73.1	73.6
	-0.1	-0.2	-0.2	-0.2	-0.1	0.0	0.1	0.0	-0.1	-0.3	-0.5	-0.7	-0.9	-1.1	-1.3	-1.6	-2.0	-2.6	-3.3
40	52.7	53.5	54.3	55.2	56.1	57.0	58.0	59.0	60.0	61.0	62.1	63.1	64.2	65.3	66.3	67.3	68.3	69.1	69.6
	-0.2	-0.4	-0.4	-0.3	-0.2	-0.1	-0.1	-0.1	-0.3	-0.5	-0.6	-0.8	-0.9	-0.9	-1.0	-1.2	-1.5	-2.1	-2.8
35	48.3	49.3	50.3	51.2	52.2	53.1	54.0	54.9	55.8	56.8	57.8	58.8	59.8	60.8	61.8	62.8	63.8	64.7	65.3
	-0.3	-0.5	-0.5	-0.4	-0.3	-0.2	-0.2	-0.3	-0.5	-0.7	-0.8	-0.8	-0.7	-0.6	-0.5	-0.5	-0.8	-1.3	-2.1
30	43.3	44.6	45.8	46.9	47.9	48.8	49.6	50.4	51.3	52.2	53.1	54.0	54.9	55.9	56.9	57.9	58.9	59.9	60.7
	-0.4	-0.4	-0.4	-0.3	-0.2	-0.2	-0.3	-0.6	-0.8	-1.0	-1.0	-0.8	-0.5	0.0	0.3	0.5	0.3	-0.2	-1.0
25	37.8	39.4	40.8	42.0	42.9	43.8	44.6	45.3	46.1	46.9	47.8	48.6	49.5	50.4	51.4	52.4	53.5	54.6	55.5
	-0.3	-0.3	-0.2	-0.1	0.0	-0.1	-0.4	-0.8	-1.2	-1.3	-1.2	-0.7	0.0	0.8	1.4	1.8	1.7	1.2	0.2
20	31.3	33.2	34.8	36.1	37.1	37.9	38.7	39.4	40.1	40.8	41.6	42.4	43.2	44.1	45.1	46.2	47.4	48.6	49.8
	-0.2	0.0	0.2	0.3	0.3	0.0	-0.5	-1.1	-1.6	-1.7	-1.3	-0.5	0.6	1.8	2.7	3.3	3.3	2.7	1.7
15	23.8	25.9	27.6	29.0	30.1	30.9	31.6	32.3	33.0	33.8	34.5	35.3	36.1	37.0	38.0	39.2	40.5	41.9	43.3
	-0.1	0.3	0.6	0.8	0.6	0.2	-0.5	-1.3	-1.9	-1.9	-1.3	-0.2	1.4	3.0	4.3	5.0	5.0	4.4	3.2
10	15.1	17.3	19.2	20.7	21.8	22.7	23.4	24.1	24.8	25.6	26.4	27.1	27.9	28.8	29.9	31.3	32.8	34.4	36.1
	0.1	0.6	1.1	1.2	1.0	0.4	-0.5	-1.5	-2.1	-2.0	-1.1	0.5	2.5	4.5	6.0	6.8	6.7	6.0	4.7
5	5.5	7.8	9.7	11.3	12.4	13.3	14.1	14.9	15.7	16.5	17.3	18.0	18.9	19.8	21.0	22.4	24.2	26.0	28.0
	0.3	0.9	1.4	1.6	1.4	0.6	-0.4	-1.4	-2.0	-1.8	-0.6	1.3	3.7	6.0	7.7	8.5	8.3	7.4	5.9
0	-4.7	-2.5	-0.6	1.0	2.2	3.2	4.0	4.9	5.8	6.6	7.5	8.3	9.1	10.1	11.4	12.9	14.8	16.9	19.1
	0.4	1.1	1.7	1.9	1.6	0.9	-0.2	-1.2	-1.7	-1.3	0.1	2.4	5.0	7.5	9.2	9.9	9.5	8.4	6.8

IGRF 1980 INCLINATION (I)

LAT \ LONG	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
90	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6	87.6
	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
85	87.9	87.7	87.5	87.3	87.0	86.8	86.6	86.4	86.2	86.0	85.8	85.7	85.5	85.4	85.3	85.2	85.1	85.1	85.0
	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9
80	88.3	87.8	87.3	86.8	86.3	85.9	85.5	85.1	84.7	84.3	84.0	83.7	83.4	83.2	83.0	82.9	82.7	82.6	82.5
	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.6
75	88.4	87.7	87.0	86.3	85.6	84.9	84.3	83.7	83.2	82.6	82.2	81.8	81.4	81.1	80.8	80.6	80.4	80.3	80.2
	-1.0	-0.8	-0.8	-0.7	-0.7	-0.6	-0.6	-0.5	-0.5	-0.4	-0.4	-0.3	-0.2	-0.1	-0.1	0.0	0.1	0.2	0.3
70	87.8	87.1	86.3	85.4	84.6	83.7	82.9	82.2	81.5	80.8	80.2	79.7	79.3	78.9	78.6	78.3	78.1	77.9	77.8
	-2.4	-2.2	-1.9	-1.8	-1.6	-1.5	-1.4	-1.3	-1.2	-1.1	-1.0	-0.9	-0.8	-0.7	-0.5	-0.4	-0.3	-0.1	0.0
65	86.1	85.6	84.9	84.0	83.1	82.1	81.2	80.3	79.5	78.7	78.0	77.4	76.9	76.4	76.0	75.7	75.5	75.3	75.2
	-2.9	-3.1	-3.0	-2.9	-2.7	-2.5	-2.4	-2.2	-2.1	-1.9	-1.7	-1.6	-1.4	-1.2	-1.0	-0.9	-0.7	-0.5	-0.3
60	83.6	83.4	82.8	82.0	81.1	80.0	79.0	78.0	77.1	76.2	75.4	74.7	74.1	73.6	73.2	72.9	72.6	72.4	72.4
	-3.3	-3.6	-3.8	-3.8	-3.7	-3.6	-3.4	-3.2	-3.0	-2.7	-2.5	-2.2	-2.0	-1.8	-1.5	-1.3	-1.1	-0.8	-0.6
55	80.6	80.6	80.1	79.4	78.5	77.5	76.4	75.3	74.2	73.2	72.3	71.5	70.9	70.3	69.9	69.5	69.3	69.1	69.1
	-3.5	-4.0	-4.3	-4.6	-4.6	-4.5	-4.4	-4.2	-3.9	-3.6	-3.3	-3.0	-2.6	-2.3	-2.0	-1.7	-1.4	-1.1	-0.8
50	77.3	77.3	77.1	76.4	75.6	74.5	73.4	72.2	71.0	69.9	68.8	67.9	67.2	66.6	66.1	65.7	65.4	65.3	65.2
	-3.5	-4.1	-4.7	-5.1	-5.4	-5.4	-5.4	-5.2	-4.9	-4.6	-4.2	-3.8	-3.4	-3.0	-2.6	-2.2	-1.8	-1.4	-1.1
45	73.6	73.8	73.6	73.1	72.3	71.2	70.0	68.7	67.4	66.1	64.9	63.9	63.0	62.3	61.7	61.2	60.9	60.7	60.7
	-3.3	-4.1	-4.8	-5.5	-5.9	-6.2	-6.3	-6.2	-6.0	-5.7	-5.3	-4.8	-4.3	-3.8	-3.3	-2.9	-2.4	-1.9	-1.4
40	69.6	69.9	69.9	69.5	68.7	67.7	66.4	64.9	63.5	62.0	60.6	59.4	58.3	57.3	56.6	56.0	55.6	55.3	55.3
	-2.8	-3.7	-4.7	-5.6	-6.3	-6.9	-7.2	-7.3	-7.2	-7.0	-6.6	-6.1	-5.5	-5.0	-4.4	-3.8	-3.3	-2.7	-2.1
35	65.3	65.8	65.9	65.6	64.9	63.8	62.5	60.9	59.2	57.5	55.8	54.3	52.8	51.6	50.6	49.8	49.2	48.9	48.8
	-2.1	-3.1	-4.2	-5.4	-6.4	-7.3	-8.0	-8.4	-8.6	-8.5	-8.3	-7.8	-7.2	-6.5	-5.8	-5.1	-4.5	-3.8	-3.0
30	60.7	61.2	61.5	61.3	60.7	59.7	58.3	56.5	54.6	52.5	50.4	48.4	46.6	44.9	43.6	42.5	41.8	41.3	41.2
	-1.0	-2.2	-3.5	-4.8	-6.2	-7.5	-8.6	-9.5	-10.1	-10.3	-10.3	-9.9	-9.3	-8.5	-7.7	-6.9	-6.1	-5.3	-4.4
25	55.5	56.2	56.7	56.7	56.2	55.2	53.7	51.8	49.5	47.0	44.4	41.9	39.4	37.2	35.4	33.9	32.9	32.4	32.2
	0.2	-1.0	-2.4	-4.0	-5.7	-7.4	-9.0	-10.4	-11.6	-12.4	-12.7	-12.5	-11.9	-11.0	-10.1	-9.1	-8.1	-7.1	-6.1
20	49.8	50.7	51.3	51.5	51.2	50.2	48.6	46.5	43.9	40.9	37.7	34.5	31.3	28.5	26.0	24.1	22.8	22.0	21.8
	1.7	0.4	-1.2	-3.0	-4.9	-7.0	-9.2	-11.3	-13.2	-14.6	-15.4	-15.4	-14.9	-13.9	-12.7	-11.5	-10.4	-9.2	-8.0
15	43.3	44.5	45.4	45.8	45.6	44.7	43.0	40.7	37.7	34.2	30.3	26.3	22.3	18.7	15.6	13.2	11.5	10.6	10.2
	3.2	1.8	0.1	-1.8	-4.0	-6.5	-9.3	-12.1	-14.8	-16.9	-18.2	-18.5	-18.0	-16.9	-15.4	-14.0	-12.7	-11.4	-10.1
10	36.1	37.6	38.7	39.3	39.3	38.5	36.7	34.2	30.8	26.7	22.2	17.4	12.7	8.3	4.6	1.7	-0.3	-1.5	-2.1
	4.7	3.1	1.4	-0.6	-3.0	-5.9	-9.2	-12.8	-16.2	-19.1	-20.9	-21.5	-20.9	-19.6	-17.8	-16.1	-14.6	-13.3	-11.9
5	28.0	29.8	31.2	32.1	32.3	31.5	29.7	26.9	23.2	18.6	13.5	8.1	2.8	-2.2	-6.4	-9.8	-12.1	-13.5	-14.3
	5.9	4.3	2.4	0.4	-2.1	-5.3	-9.1	-13.3	-17.4	-20.8	-23.1	-23.8	-23.1	-21.5	-19.5	-17.6	-15.9	-14.5	-13.2
0	19.1	21.2	23.0	24.1	24.4	23.7	21.9	19.0	15.0	10.1	4.6	-1.2	-6.9	-12.2	-16.8	-20.4	-23.0	-24.7	-25.8
	6.8	5.0	3.1	1.1	-1.5	-4.8	-8.9	-13.5	-18.1	-21.9	-24.3	-25.1	-24.3	-22.4	-20.2	-18.2	-16.5	-15.1	-13.9

IGRF 1980 INCLINATION (I)

LONG / LAT	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	-25.8	-26.4	-26.8	-26.9	-26.8	-26.4	-25.6	-24.3	-22.9	-21.5	-20.3	-19.6	-19.4	-19.6	-20.2	-20.8	-21.5	-21.9	-22.0
	-13.9	-12.4	-10.6	-8.3	-5.9	-3.6	-1.5	0.3	1.8	3.1	4.3	5.3	6.2	6.7	6.8	6.4	5.6	4.5	3.4
-5	-35.9	-36.8	-37.4	-37.8	-37.9	-37.5	-36.7	-35.5	-34.0	-32.6	-31.4	-30.7	-30.4	-30.5	-31.0	-31.6	-32.1	-32.5	-32.5
	-14.0	-12.7	-10.9	-8.8	-6.4	-4.0	-1.7	0.2	1.8	3.1	4.2	5.2	5.9	6.3	6.3	5.9	5.1	4.0	2.8
-10	-44.3	-45.6	-46.5	-47.1	-47.3	-47.0	-46.2	-45.0	-43.6	-42.2	-41.0	-40.2	-39.9	-40.0	-40.4	-40.9	-41.3	-41.6	-41.7
	-13.7	-12.6	-11.0	-8.9	-6.6	-4.1	-1.8	0.2	1.9	3.2	4.2	5.0	5.5	5.8	5.7	5.2	4.3	3.3	2.1
-15	-51.1	-52.6	-53.8	-54.5	-54.8	-54.6	-53.9	-52.7	-51.3	-49.9	-48.8	-48.0	-47.7	-47.8	-48.1	-48.6	-49.1	-49.4	-49.4
	-13.1	-12.1	-10.7	-8.8	-6.5	-4.0	-1.6	0.4	2.1	3.4	4.3	4.8	5.1	5.1	4.9	4.3	3.5	2.5	1.4
-20	-56.2	-57.9	-59.3	-60.1	-60.5	-60.3	-59.6	-58.4	-57.0	-55.7	-54.6	-53.9	-53.7	-53.8	-54.2	-54.8	-55.3	-55.7	-55.9
	-12.3	-11.5	-10.2	-8.4	-6.1	-3.7	-1.2	0.9	2.6	3.8	4.4	4.7	4.6	4.4	4.0	3.4	2.6	1.7	0.7
-25	-59.8	-61.6	-63.0	-63.9	-64.2	-64.0	-63.2	-62.0	-60.7	-59.4	-58.5	-57.9	-57.9	-58.2	-58.8	-59.5	-60.2	-60.8	-61.1
	-11.2	-10.5	-9.3	-7.6	-5.4	-2.9	-0.5	1.6	3.2	4.2	4.5	4.4	4.0	3.5	2.9	2.3	1.6	0.8	-0.1
-30	-62.2	-63.8	-65.1	-65.8	-66.0	-65.6	-64.8	-63.6	-62.4	-61.3	-60.6	-60.4	-60.6	-61.2	-62.0	-62.9	-63.9	-64.7	-65.3
	-10.0	-9.3	-8.1	-6.3	-4.2	-1.8	0.6	2.5	3.8	4.4	4.3	3.8	3.1	2.4	1.8	1.2	0.6	0.0	-0.7
-35	-63.3	-64.7	-65.7	-66.1	-66.1	-65.6	-64.7	-63.7	-62.6	-61.9	-61.5	-61.6	-62.2	-63.0	-64.1	-65.4	-66.6	-67.7	-68.6
	-8.7	-7.7	-6.4	-4.6	-2.5	-0.3	1.8	3.3	4.2	4.3	3.8	3.0	2.1	1.2	0.6	0.1	-0.4	-0.8	-1.2
-40	-63.4	-64.4	-65.1	-65.3	-65.1	-64.5	-63.7	-62.8	-62.2	-61.8	-61.8	-62.3	-63.1	-64.3	-65.6	-67.0	-68.5	-69.9	-71.1
	-7.0	-5.8	-4.3	-2.6	-0.6	1.3	2.8	3.8	4.2	3.9	3.1	2.1	1.2	0.3	-0.3	-0.7	-1.0	-1.3	-1.5
-45	-62.6	-63.3	-63.7	-63.8	-63.5	-63.0	-62.4	-61.9	-61.6	-61.6	-62.0	-62.8	-63.8	-65.1	-66.6	-68.2	-69.9	-71.5	-73.0
	-5.1	-3.7	-2.2	-0.5	1.1	2.5	3.6	4.1	4.0	3.4	2.5	1.6	0.6	-0.1	-0.7	-1.0	-1.2	-1.3	-1.4
-50	-61.5	-62.0	-62.2	-62.2	-62.1	-61.8	-61.5	-61.4	-61.4	-61.8	-62.4	-63.3	-64.5	-65.9	-67.5	-69.1	-70.8	-72.6	-74.3
	-3.0	-1.6	-0.1	1.3	2.5	3.5	4.0	4.1	3.8	3.2	2.4	1.5	0.7	0.0	-0.4	-0.7	-0.9	-0.9	-0.9
-55	-60.6	-60.9	-61.1	-61.2	-61.2	-61.2	-61.2	-61.4	-61.7	-62.3	-63.1	-64.1	-65.3	-66.7	-68.2	-69.9	-71.6	-73.3	-75.1
	-1.0	0.3	1.5	2.6	3.4	4.0	4.3	4.2	3.8	3.3	2.6	1.9	1.2	0.7	0.3	0.0	-0.1	-0.1	-0.1
-60	-60.3	-60.6	-60.8	-61.0	-61.2	-61.4	-61.6	-62.0	-62.5	-63.2	-64.0	-65.1	-66.2	-67.6	-69.0	-70.5	-72.1	-73.8	-75.5
	0.6	1.6	2.5	3.3	3.9	4.3	4.4	4.3	4.0	3.5	3.0	2.5	2.0	1.6	1.2	1.0	0.9	0.9	0.9
-65	-60.8	-61.1	-61.4	-61.7	-61.9	-62.3	-62.7	-63.2	-63.8	-64.5	-65.3	-66.3	-67.3	-68.5	-69.8	-71.2	-72.6	-74.1	-75.6
	1.6	2.4	3.0	3.6	4.0	4.2	4.3	4.2	4.0	3.7	3.4	3.1	2.7	2.4	2.2	2.0	1.9	1.8	1.7
-70	-62.3	-62.5	-62.8	-63.1	-63.4	-63.8	-64.3	-64.8	-65.4	-66.1	-66.8	-67.7	-68.6	-69.6	-70.7	-71.8	-73.0	-74.3	-75.5
	2.2	2.7	3.1	3.5	3.7	3.9	4.0	4.0	3.9	3.8	3.6	3.4	3.2	3.0	2.8	2.7	2.5	2.4	2.4
-75	-64.5	-64.7	-64.9	-65.2	-65.5	-65.9	-66.3	-66.8	-67.3	-67.9	-68.5	-69.2	-70.0	-70.8	-71.6	-72.5	-73.4	-74.4	-75.3
	2.4	2.7	2.9	3.1	3.3	3.4	3.5	3.5	3.5	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.8	2.7
-80	-67.2	-67.4	-67.6	-67.8	-68.1	-68.4	-68.7	-69.1	-69.4	-69.9	-70.4	-70.9	-71.4	-71.9	-72.5	-73.1	-73.7	-74.4	-75.0
	2.3	2.5	2.6	2.7	2.8	2.9	2.9	3.0	3.0	3.0	3.0	3.0	3.0	2.9	2.9	2.8	2.8	2.7	2.7
-85	-70.4	-70.4	-70.6	-70.7	-70.8	-71.0	-71.2	-71.4	-71.6	-71.9	-72.1	-72.4	-72.7	-73.0	-73.3	-73.6	-73.9	-74.2	-74.5
	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4
-90	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7
	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

IGRF 1980 INCLINATION (I)

LAT \ LONG	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180
0	-22.0	-21.8	-21.2	-20.5	-19.6	-18.8	-18.3	-17.9	-17.6	-17.4	-17.0	-16.5	-15.6	-14.5	-13.1	-11.3	-9.3	-7.0	-4.7
	3.4	2.4	1.5	0.8	0.0	-0.9	-2.0	-3.2	-4.4	-5.3	-5.9	-5.9	-5.4	-4.5	-3.5	-2.4	-1.4	-0.5	0.4
-5	-32.5	-32.2	-31.6	-30.8	-29.9	-29.1	-28.4	-27.9	-27.5	-27.2	-26.7	-26.1	-25.2	-24.1	-22.7	-21.0	-19.2	-17.1	-14.9
	2.8	1.7	0.8	0.0	-0.8	-1.6	-2.4	-3.4	-4.3	-5.0	-5.3	-5.3	-4.8	-4.1	-3.2	-2.2	-1.3	-0.4	0.4
-10	-41.7	-41.4	-40.8	-40.0	-39.1	-38.2	-37.5	-37.0	-36.6	-36.1	-35.6	-34.9	-34.1	-33.0	-31.7	-30.2	-28.5	-26.7	-24.8
	2.1	1.0	0.0	-0.8	-1.5	-2.1	-2.8	-3.4	-4.0	-4.4	-4.6	-4.4	-4.0	-3.4	-2.7	-1.9	-1.2	-0.4	0.4
-15	-49.4	-49.2	-48.7	-47.9	-47.1	-46.3	-45.6	-45.0	-44.6	-44.1	-43.6	-42.9	-42.1	-41.1	-39.9	-38.6	-37.1	-35.5	-33.8
	1.4	0.3	-0.6	-1.4	-2.1	-2.6	-3.0	-3.4	-3.7	-3.8	-3.8	-3.6	-3.2	-2.7	-2.2	-1.6	-1.0	-0.3	0.4
-20	-55.9	-55.8	-55.4	-54.8	-54.1	-53.3	-52.7	-52.1	-51.6	-51.2	-50.6	-50.0	-49.2	-48.3	-47.2	-46.0	-44.7	-43.3	-41.8
	0.7	-0.3	-1.2	-2.0	-2.5	-2.9	-3.2	-3.3	-3.3	-3.3	-3.1	-2.9	-2.5	-2.1	-1.7	-1.3	-0.8	-0.3	0.3
-25	-61.1	-61.2	-61.0	-60.6	-60.1	-59.5	-58.9	-58.3	-57.9	-57.4	-56.8	-56.2	-55.5	-54.6	-53.7	-52.6	-51.4	-50.1	-48.8
	-0.1	-0.9	-1.7	-2.4	-2.8	-3.1	-3.2	-3.2	-3.1	-2.9	-2.6	-2.3	-2.0	-1.7	-1.3	-1.0	-0.6	-0.2	0.2
-30	-65.3	-65.7	-65.8	-65.6	-65.2	-64.8	-64.3	-63.8	-63.3	-62.8	-62.3	-61.7	-61.0	-60.2	-59.3	-58.3	-57.2	-56.0	-54.8
	-0.7	-1.4	-2.1	-2.6	-3.0	-3.2	-3.2	-3.1	-2.9	-2.7	-2.3	-2.0	-1.7	-1.4	-1.1	-0.8	-0.5	-0.2	0.2
-35	-68.6	-69.3	-69.7	-69.8	-69.7	-69.4	-69.1	-68.6	-68.2	-67.7	-67.1	-66.5	-65.8	-65.0	-64.1	-63.2	-62.1	-61.1	-59.9
	-1.2	-1.7	-2.2	-2.6	-3.0	-3.1	-3.2	-3.0	-2.8	-2.5	-2.2	-1.9	-1.6	-1.3	-1.0	-0.7	-0.5	-0.2	0.1
-40	-71.1	-72.1	-72.9	-73.4	-73.6	-73.5	-73.3	-72.9	-72.5	-72.0	-71.4	-70.8	-70.0	-69.2	-68.4	-67.4	-66.4	-65.4	-64.4
	-1.5	-1.8	-2.1	-2.5	-2.7	-2.9	-3.0	-2.9	-2.8	-2.5	-2.2	-1.9	-1.6	-1.3	-1.0	-0.7	-0.5	-0.2	0.1
-45	-73.0	-74.3	-75.4	-76.3	-76.8	-77.1	-77.1	-76.8	-76.5	-75.9	-75.3	-74.6	-73.9	-73.1	-72.2	-71.3	-70.3	-69.3	-68.3
	-1.4	-1.6	-1.8	-2.0	-2.3	-2.6	-2.7	-2.8	-2.7	-2.5	-2.3	-2.0	-1.7	-1.4	-1.1	-0.8	-0.5	-0.2	0.1
-50	-74.3	-75.9	-77.3	-78.5	-79.4	-80.1	-80.4	-80.4	-80.1	-79.7	-79.0	-78.3	-77.5	-76.6	-75.7	-74.8	-73.8	-72.8	-71.8
	-0.9	-1.0	-1.1	-1.3	-1.6	-2.0	-2.3	-2.5	-2.6	-2.5	-2.4	-2.1	-1.8	-1.4	-1.1	-0.7	-0.4	-0.1	0.1
-55	-75.1	-76.8	-78.4	-79.9	-81.3	-82.4	-83.2	-83.6	-83.6	-83.2	-82.6	-81.8	-81.0	-80.0	-79.1	-78.1	-77.1	-76.1	-75.1
	-0.1	-0.1	-0.2	-0.3	-0.6	-1.0	-1.6	-2.1	-2.4	-2.5	-2.4	-2.1	-1.8	-1.4	-1.0	-0.6	-0.3	0.0	0.3
-60	-75.5	-77.2	-78.9	-80.5	-82.1	-83.6	-84.9	-86.0	-86.6	-86.6	-86.1	-85.3	-84.3	-83.3	-82.3	-81.2	-80.2	-79.2	-78.2
	0.9	0.9	0.9	0.8	0.6	0.4	-0.1	-0.9	-1.8	-2.4	-2.4	-2.0	-1.6	-1.1	-0.7	-0.3	0.0	0.3	0.5
-65	-75.6	-77.1	-78.7	-80.3	-81.8	-83.3	-84.8	-86.2	-87.6	-89.0	-89.6	-88.4	-87.2	-86.1	-84.9	-83.9	-82.8	-81.8	-80.8
	1.7	1.7	1.7	1.7	1.7	1.6	1.5	1.3	1.0	0.5	-2.1	-0.9	-0.5	-0.2	0.1	0.4	0.7	0.9	1.0
-70	-75.5	-76.8	-78.1	-79.4	-80.7	-81.9	-83.1	-84.3	-85.4	-86.3	-86.9	-87.2	-87.0	-86.5	-85.8	-85.0	-84.1	-83.3	-82.4
	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.0	1.8	1.6	1.6	1.6	1.6	1.6
-75	-75.3	-76.3	-77.3	-78.2	-79.2	-80.1	-80.9	-81.7	-82.4	-83.0	-83.5	-83.9	-84.0	-84.0	-83.8	-83.5	-83.1	-82.6	-82.0
	2.7	2.6	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0
-80	-75.0	-75.6	-76.3	-76.9	-77.5	-78.1	-78.6	-79.1	-79.5	-79.9	-80.2	-80.4	-80.6	-80.7	-80.7	-80.6	-80.4	-80.2	-79.9
	2.7	2.6	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0
-85	-74.5	-74.8	-75.1	-75.4	-75.7	-75.9	-76.2	-76.4	-76.6	-76.8	-76.9	-77.0	-77.1	-77.2	-77.2	-77.2	-77.1	-77.1	-77.0
	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0
-90	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7
	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

IGRF 1980 INCLINATION (I)

LONG / LAT	180	-175	-170	-165	-160	-155	-150	-145	-140	-135	-130	-125	-120	-115	-110	-105	-100	-95	-90
0	-4.7	-2.5	-0.6	1.0	2.2	3.2	4.0	4.9	5.8	6.6	7.5	8.3	9.1	10.1	11.4	12.9	14.8	16.9	19.1
	0.4	1.1	1.7	1.9	1.6	0.9	-0.2	-1.2	-1.7	-1.3	0.1	2.4	5.0	7.5	9.2	9.9	9.5	8.4	6.8
-5	-14.9	-12.9	-11.1	-9.6	-8.4	-7.3	-6.4	-5.4	-4.4	-3.5	-2.6	-1.7	-0.8	0.2	1.4	3.0	5.0	7.2	9.6
	0.4	1.2	1.8	2.0	1.8	1.1	0.1	-0.7	-1.0	-0.5	1.1	3.4	6.1	8.5	10.1	10.6	10.0	8.7	7.0
-10	-24.8	-22.9	-21.3	-19.8	-18.6	-17.5	-16.5	-15.5	-14.4	-13.4	-12.4	-11.5	-10.6	-9.6	-8.4	-6.8	-4.9	-2.6	-0.2
	0.4	1.1	1.7	1.9	1.8	1.2	0.5	-0.2	-0.3	0.4	2.0	4.2	6.7	8.8	10.2	10.4	9.7	8.3	6.5
-15	-33.8	-32.2	-30.7	-29.3	-28.1	-27.0	-25.9	-24.9	-23.8	-22.7	-21.7	-20.8	-19.8	-18.9	-17.7	-16.2	-14.4	-12.2	-9.8
	0.4	1.0	1.5	1.8	1.7	1.3	0.7	0.3	0.4	1.1	2.6	4.6	6.7	8.4	9.4	9.4	8.6	7.1	5.5
-20	-41.8	-40.4	-39.0	-37.7	-36.6	-35.5	-34.4	-33.3	-32.2	-31.1	-30.1	-29.2	-28.3	-27.3	-26.2	-24.8	-23.1	-21.1	-18.8
	0.3	0.9	1.3	1.5	1.5	1.2	0.9	0.7	0.9	1.5	2.8	4.4	6.0	7.3	7.9	7.7	6.9	5.6	4.1
-25	-48.8	-47.5	-46.2	-45.1	-43.9	-42.8	-41.8	-40.7	-39.6	-38.6	-37.6	-36.7	-35.8	-34.8	-33.8	-32.5	-30.9	-29.0	-26.9
	0.2	0.7	1.0	1.2	1.3	1.1	0.9	0.8	1.0	1.5	2.5	3.7	4.9	5.7	6.0	5.7	4.9	3.8	2.6
-30	-54.8	-53.6	-52.4	-51.3	-50.2	-49.2	-48.2	-47.1	-46.1	-45.1	-44.2	-43.2	-42.3	-41.4	-40.3	-39.0	-37.5	-35.8	-33.8
	0.2	0.5	0.8	1.0	1.0	0.9	0.7	0.6	0.8	1.2	1.9	2.7	3.4	3.9	4.1	3.8	3.1	2.3	1.3
-35	-59.9	-58.8	-57.7	-56.7	-55.6	-54.6	-53.7	-52.7	-51.7	-50.8	-49.9	-48.9	-48.0	-47.0	-45.9	-44.6	-43.1	-41.4	-39.5
	0.1	0.4	0.6	0.7	0.7	0.6	0.4	0.3	0.4	0.6	1.0	1.5	2.0	2.3	2.3	2.1	1.7	1.1	0.4
-40	-64.4	-63.3	-62.3	-61.3	-60.3	-59.4	-58.4	-57.5	-56.6	-55.7	-54.8	-53.8	-52.8	-51.8	-50.6	-49.2	-47.7	-46.0	-44.1
	0.1	0.3	0.4	0.5	0.4	0.3	0.1	0.0	0.0	0.1	0.3	0.5	0.8	1.0	1.0	0.9	0.7	0.4	0.0
-45	-68.3	-67.3	-66.3	-65.4	-64.4	-63.5	-62.7	-61.8	-60.9	-60.0	-59.1	-58.1	-57.0	-55.8	-54.5	-53.1	-51.5	-49.8	-48.0
	0.1	0.2	0.3	0.3	0.3	0.1	-0.1	-0.2	-0.3	-0.3	-0.2	-0.1	0.1	0.2	0.3	0.3	0.3	0.1	0.0
-50	-71.8	-70.9	-69.9	-69.0	-68.1	-67.3	-66.4	-65.6	-64.7	-63.8	-62.8	-61.7	-60.6	-59.3	-57.9	-56.4	-54.9	-53.2	-51.5
	0.1	0.3	0.4	0.3	0.3	0.1	0.0	-0.2	-0.3	-0.4	-0.4	-0.3	-0.2	0.0	0.1	0.2	0.3	0.3	0.2
-55	-75.1	-74.2	-73.3	-72.4	-71.5	-70.7	-69.8	-68.9	-68.0	-67.0	-66.0	-64.9	-63.7	-62.4	-61.0	-59.5	-57.9	-56.4	-54.8
	0.3	0.4	0.5	0.5	0.4	0.3	0.2	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.2	0.3	0.4	0.5	0.6	0.5
-60	-78.2	-77.3	-76.4	-75.5	-74.6	-73.7	-72.8	-71.9	-70.9	-69.9	-68.8	-67.6	-66.4	-65.1	-63.8	-62.4	-60.9	-59.5	-58.2
	0.5	0.7	0.8	0.8	0.7	0.7	0.6	0.5	0.4	0.4	0.4	0.4	0.5	0.6	0.7	0.8	0.9	0.9	0.8
-65	-80.8	-79.9	-78.9	-78.0	-77.1	-76.2	-75.3	-74.3	-73.3	-72.3	-71.2	-70.1	-68.9	-67.6	-66.4	-65.1	-63.9	-62.7	-61.5
	1.0	1.1	1.2	1.2	1.2	1.1	1.1	1.0	1.0	0.9	0.9	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.0
-70	-82.4	-81.5	-80.6	-79.7	-78.8	-77.9	-77.0	-76.1	-75.1	-74.1	-73.1	-72.1	-71.0	-69.9	-68.8	-67.8	-66.7	-65.7	-64.8
	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.2
-75	-82.0	-81.4	-80.7	-80.0	-79.3	-78.5	-77.7	-76.9	-76.1	-75.3	-74.4	-73.5	-72.7	-71.8	-70.9	-70.1	-69.3	-68.5	-67.8
	2.0	1.9	1.9	1.9	1.9	1.8	1.8	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.5	1.5	1.4	1.3	1.3
-80	-79.9	-79.6	-79.2	-78.8	-78.3	-77.8	-77.3	-76.7	-76.1	-75.6	-75.0	-74.4	-73.7	-73.1	-72.5	-72.0	-71.4	-70.8	-70.3
	2.0	2.0	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.7	1.7	1.7	1.6	1.6	1.6	1.5	1.5	1.5	1.4
-85	-77.0	-76.8	-76.7	-76.5	-76.3	-76.1	-75.8	-75.5	-75.3	-75.0	-74.7	-74.4	-74.1	-73.8	-73.5	-73.2	-72.9	-72.6	-72.3
	2.0	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7
-90	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7
	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

IGRF 1980 INCLINATION (I)

LONG / LAT	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
0	19.1	21.2	23.0	24.1	24.4	23.7	21.9	19.0	15.0	10.1	4.6	-1.2	-6.9	-12.2	-16.8	-20.4	-23.0	-24.7	-25.8
	6.8	5.0	3.1	1.1	-1.5	-4.8	-8.9	-13.5	-18.1	-21.9	-24.3	-25.1	-24.3	-22.4	-20.2	-18.2	-16.5	-15.1	-13.9
-5	9.6	11.9	13.9	15.3	15.8	15.2	13.4	10.4	6.3	1.3	-4.3	-10.2	-16.0	-21.4	-26.0	-29.7	-32.5	-34.5	-35.9
	7.0	5.2	3.4	1.4	-1.1	-4.4	-8.7	-13.5	-18.2	-22.1	-24.5	-25.1	-24.2	-22.2	-20.0	-17.9	-16.4	-15.1	-14.0
-10	-0.2	2.3	4.4	6.0	6.6	6.2	4.5	1.6	-2.5	-7.4	-12.9	-18.6	-24.2	-29.3	-33.8	-37.5	-40.5	-42.7	-44.3
	6.5	4.8	3.1	1.3	-1.1	-4.3	-8.5	-13.2	-17.8	-21.5	-23.7	-24.1	-23.1	-21.2	-19.0	-17.1	-15.7	-14.7	-13.7
-15	-9.8	-7.4	-5.2	-3.5	-2.7	-2.9	-4.5	-7.2	-11.1	-15.7	-20.8	-26.1	-31.2	-36.0	-40.2	-43.8	-46.8	-49.2	-51.1
	5.5	3.9	2.4	0.7	-1.5	-4.4	-8.3	-12.7	-16.8	-20.1	-22.0	-22.2	-21.2	-19.5	-17.5	-15.9	-14.7	-13.9	-13.1
-20	-18.8	-16.5	-14.3	-12.6	-11.7	-11.8	-13.1	-15.6	-19.1	-23.3	-27.9	-32.6	-37.2	-41.5	-45.4	-48.8	-51.7	-54.1	-56.2
	4.1	2.7	1.4	-0.1	-2.0	-4.7	-8.1	-11.9	-15.6	-18.3	-19.8	-20.0	-19.1	-17.6	-15.9	-14.5	-13.5	-12.8	-12.3
-25	-26.9	-24.7	-22.6	-21.0	-20.0	-19.9	-21.0	-23.1	-26.2	-29.9	-33.9	-38.1	-42.2	-45.9	-49.4	-52.5	-55.3	-57.7	-59.8
	2.6	1.5	0.4	-0.9	-2.6	-4.9	-7.9	-11.1	-14.1	-16.4	-17.6	-17.8	-17.0	-15.7	-14.3	-13.1	-12.3	-11.7	-11.2
-30	-33.8	-31.7	-29.8	-28.2	-27.2	-27.0	-27.8	-29.6	-32.2	-35.4	-38.9	-42.6	-46.1	-49.4	-52.5	-55.3	-57.9	-60.2	-62.2
	1.3	0.4	-0.5	-1.6	-3.0	-5.0	-7.5	-10.2	-12.7	-14.6	-15.6	-15.7	-15.1	-14.1	-13.0	-12.0	-11.2	-10.6	-10.0
-35	-39.5	-37.6	-35.7	-34.2	-33.2	-32.9	-33.5	-34.9	-37.1	-39.9	-42.9	-46.0	-49.1	-52.1	-54.8	-57.3	-59.5	-61.6	-63.3
	0.4	-0.2	-1.0	-1.9	-3.2	-4.9	-7.0	-9.2	-11.3	-12.8	-13.7	-13.9	-13.5	-12.8	-11.8	-10.9	-10.1	-9.4	-8.7
-40	-44.1	-42.3	-40.6	-39.1	-38.2	-37.8	-38.2	-39.4	-41.1	-43.4	-46.0	-48.6	-51.3	-53.8	-56.2	-58.4	-60.3	-62.0	-63.4
	0.0	-0.5	-1.0	-1.8	-2.9	-4.4	-6.2	-8.0	-9.8	-11.1	-12.0	-12.3	-12.1	-11.5	-10.7	-9.8	-9.0	-8.1	-7.0
-45	-48.0	-46.3	-44.7	-43.4	-42.4	-42.1	-42.3	-43.1	-44.5	-46.3	-48.3	-50.6	-52.8	-54.9	-56.9	-58.7	-60.3	-61.6	-62.6
	0.0	-0.3	-0.8	-1.5	-2.4	-3.7	-5.1	-6.7	-8.2	-9.4	-10.2	-10.5	-10.4	-10.0	-9.3	-8.4	-7.4	-6.3	-5.1
-50	-51.5	-49.9	-48.4	-47.2	-46.4	-45.9	-46.0	-46.5	-47.5	-48.8	-50.4	-52.1	-53.9	-55.6	-57.2	-58.6	-59.8	-60.8	-61.5
	0.2	0.0	-0.4	-0.9	-1.8	-2.8	-4.0	-5.2	-6.4	-7.5	-8.2	-8.5	-8.5	-8.1	-7.5	-6.6	-5.5	-4.3	-3.0
-55	-54.8	-53.4	-52.1	-51.0	-50.2	-49.7	-49.6	-49.9	-50.5	-51.4	-52.5	-53.7	-55.0	-56.2	-57.4	-58.4	-59.3	-60.0	-60.6
	0.5	0.4	0.1	-0.4	-1.1	-1.9	-2.8	-3.8	-4.7	-5.5	-6.0	-6.3	-6.2	-5.9	-5.3	-4.5	-3.4	-2.3	-1.0
-60	-58.2	-56.9	-55.8	-54.8	-54.1	-53.6	-53.3	-53.4	-53.7	-54.2	-54.8	-55.6	-56.4	-57.2	-58.0	-58.7	-59.3	-59.8	-60.3
	0.8	0.7	0.4	0.0	-0.5	-1.1	-1.7	-2.4	-3.0	-3.5	-3.9	-4.0	-3.9	-3.6	-3.1	-2.3	-1.4	-0.4	0.6
-65	-61.5	-60.4	-59.5	-58.6	-58.0	-57.5	-57.2	-57.0	-57.1	-57.2	-57.5	-57.9	-58.3	-58.8	-59.3	-59.7	-60.1	-60.5	-60.8
	1.0	0.9	0.7	0.4	0.0	-0.4	-0.8	-1.2	-1.6	-1.8	-2.0	-2.0	-1.9	-1.6	-1.1	-0.5	0.2	0.9	1.6
-70	-64.8	-63.9	-63.1	-62.4	-61.8	-61.3	-60.9	-60.7	-60.5	-60.5	-60.6	-60.7	-60.8	-61.0	-61.3	-61.5	-61.8	-62.0	-62.3
	1.2	1.0	0.9	0.7	0.5	0.2	0.0	-0.2	-0.4	-0.5	-0.5	-0.4	-0.3	0.0	0.3	0.7	1.2	1.7	2.2
-75	-67.8	-67.1	-66.4	-65.9	-65.3	-64.9	-64.5	-64.3	-64.0	-63.9	-63.8	-63.7	-63.7	-63.8	-63.9	-64.0	-64.1	-64.3	-64.5
	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.6	0.6	0.6	0.7	0.8	1.0	1.3	1.5	1.8	2.1	2.4
-80	-70.3	-69.8	-69.4	-68.9	-68.6	-68.2	-67.9	-67.6	-67.4	-67.2	-67.1	-67.0	-66.9	-66.9	-66.9	-66.9	-67.0	-67.1	-67.2
	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.5	1.6	1.8	1.9	2.0	2.2	2.3
-85	-72.3	-72.0	-71.8	-71.5	-71.3	-71.1	-70.9	-70.8	-70.6	-70.5	-70.4	-70.3	-70.3	-70.2	-70.2	-70.2	-70.2	-70.3	-70.4
	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.2
-90	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7	-73.7
	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

IGRF 1980 HORIZONTAL INTENSITY (H)

LONG / LAT	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
90	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331
	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3
85	4820	4839	4841	4825	4792	4741	4674	4589	4488	4371	4239	4093	3933	3761	3579	3389	3193	2995	2797
	-13.0	-13.5	-14.1	-14.6	-15.2	-15.7	-16.3	-16.9	-17.5	-18.1	-18.7	-19.2	-19.8	-20.3	-20.8	-21.2	-21.6	-21.9	-22.1
80	7086	7127	7141	7128	7088	7019	6922	6795	6638	6451	6233	5985	5708	5404	5078	4733	4378	4021	3677
	-7.8	-8.7	-9.7	-10.7	-11.8	-12.9	-14.0	-15.1	-16.2	-17.3	-18.4	-19.4	-20.4	-21.3	-22.1	-22.7	-23.2	-23.4	-23.2
75	9126	9184	9213	9213	9183	9123	9031	8905	8741	8539	8295	8009	7680	7310	6905	6473	6028	5589	5183
	-1.7	-3.0	-4.3	-5.7	-7.2	-8.6	-10.1	-11.7	-13.2	-14.7	-16.1	-17.4	-18.7	-19.8	-20.7	-21.3	-21.7	-21.5	-20.8
70	11075	11134	11167	11175	11159	11117	11049	10949	10816	10644	10429	10166	9854	9494	9089	8653	8202	7766	7380
	4.3	2.7	1.1	-0.6	-2.3	-4.0	-5.7	-7.4	-9.0	-10.6	-12.1	-13.5	-14.7	-15.8	-16.6	-17.2	-17.4	-17.2	-16.4
65	13064	13109	13131	13136	13124	13096	13053	12990	12905	12790	12641	12451	12214	11930	11600	11237	10860	10499	10193
	9.1	7.3	5.4	3.5	1.6	-0.2	-2.0	-3.7	-5.2	-6.7	-7.9	-9.0	-10.0	-10.8	-11.4	-11.9	-12.1	-12.2	-12.0
60	15185	15206	15210	15201	15184	15163	15137	15108	15071	15023	14957	14864	14739	14576	14375	14144	13899	13665	13476
	12.6	10.4	8.2	6.0	3.8	1.8	-0.1	-1.7	-3.1	-4.3	-5.2	-5.9	-6.5	-6.9	-7.3	-7.6	-8.0	-8.4	-8.8
55	17472	17477	17466	17447	17424	17404	17390	17384	17388	17399	17412	17420	17417	17395	17351	17286	17206	17129	17077
	15.2	12.6	9.9	7.2	4.6	2.1	0.0	-1.7	-3.1	-4.2	-4.9	-5.4	-5.7	-5.9	-6.0	-6.2	-6.5	-7.1	-7.9
50	19920	19927	19918	19901	19883	19869	19866	19879	19911	19965	20042	20138	20248	20365	20481	20589	20684	20771	20856
	18.1	14.9	11.6	8.3	5.0	1.9	-0.8	-3.0	-4.7	-6.0	-7.0	-7.6	-8.0	-8.1	-8.1	-8.1	-8.2	-8.6	-9.3
45	22490	22522	22538	22545	22549	22555	22570	22599	22652	22735	22855	23018	23221	23459	23720	23988	24247	24483	24689
	22.5	18.8	14.9	10.7	6.5	2.6	-0.9	-4.0	-6.5	-8.6	-10.3	-11.6	-12.5	-13.0	-13.2	-13.1	-12.8	-12.6	-12.7
40	25114	25192	25253	25305	25351	25394	25438	25489	25559	25661	25811	26020	26295	26629	27008	27408	27800	28155	28451
	28.8	24.8	20.3	15.3	10.3	5.3	0.7	-3.4	-7.1	-10.4	-13.3	-15.8	-17.8	-19.2	-19.8	-19.6	-18.9	-17.9	-16.9
35	27683	27820	27940	28053	28158	28254	28340	28422	28512	28630	28801	29044	29370	29776	30242	30738	31222	31655	32001
	36.2	32.2	27.3	21.9	16.1	10.2	4.5	-0.8	-5.8	-10.5	-15.0	-19.0	-22.4	-24.8	-26.0	-25.9	-24.7	-22.8	-20.6
30	30027	30230	30421	30605	30782	30943	31082	31203	31320	31459	31650	31921	32286	32742	33265	33818	34351	34817	35174
	42.5	39.0	34.3	28.7	22.4	15.9	9.3	3.0	-3.2	-9.3	-15.2	-20.6	-25.3	-28.8	-30.5	-30.5	-28.8	-26.0	-22.5
25	31913	32190	32460	32728	32984	33217	33417	33584	33737	33904	34123	34424	34823	35315	35870	36447	36993	37456	37795
	45.1	42.5	38.5	33.2	26.9	20.0	13.0	5.9	-1.0	-7.9	-14.6	-21.0	-26.4	-30.4	-32.3	-32.1	-29.9	-26.1	-21.5
20	33084	33441	33800	34156	34496	34803	35064	35284	35481	35690	35949	36290	36727	37250	37826	38409	38947	39390	39700
	41.4	40.0	37.0	32.4	26.6	20.0	12.9	5.8	-1.2	-8.0	-14.7	-20.8	-26.0	-29.7	-31.2	-30.3	-27.4	-22.9	-17.3
15	33317	33754	34201	34644	35062	35435	35755	36029	36282	36548	36866	37266	37755	38317	38917	39508	40040	40470	40763
	29.9	29.8	28.1	24.6	19.6	13.7	7.4	1.0	-5.2	-11.0	-16.3	-21.0	-24.8	-27.0	-27.2	-25.3	-21.6	-16.3	-10.2
10	32497	32995	33513	34021	34494	34915	35283	35612	35931	36275	36678	37162	37728	38352	38997	39615	40164	40608	40922
	10.8	12.0	11.5	9.3	5.6	1.0	-3.9	-8.8	-13.1	-16.7	-19.6	-21.7	-22.7	-22.5	-20.8	-17.5	-12.9	-7.3	-1.1
5	30671	31184	31725	32253	32740	33178	33576	33959	34356	34799	35315	35915	36589	37306	38025	38703	39304	39803	40182
	-13.6	-11.7	-11.2	-12.0	-14.0	-16.6	-19.3	-21.8	-23.5	-24.0	-23.5	-22.0	-19.6	-16.4	-12.3	-7.6	-2.4	3.1	8.6
0	28051	28505	28995	29473	29918	30334	30743	31176	31662	32225	32881	33626	34437	35275	36096	36863	37548	38137	38624
	-40.0	-37.9	-36.7	-36.2	-36.0	-36.0	-35.8	-35.1	-33.5	-30.5	-26.1	-20.8	-14.8	-8.5	-2.3	3.5	8.7	13.3	17.4

IGRF 1980 HORIZONTAL INTENSITY (H)

LONG / LAT	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180
90	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331
	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3
85	2797	2602	2416	2241	2084	1948	1836	1753	1697	1668	1660	1669	1689	1713	1736	1752	1760	1755	1736
	-22.1	-22.3	-22.3	-22.1	-21.7	-21.1	-20.1	-18.8	-17.2	-15.5	-13.7	-12.0	-10.5	-9.3	-8.3	-7.5	-7.0	-6.8	-6.7
80	3677	3362	3096	2901	2796	2792	2881	3048	3266	3513	3768	4015	4242	4440	4603	4726	4805	4840	4828
	-23.2	-22.5	-21.2	-18.9	-15.9	-12.3	-8.6	-5.3	-2.7	-0.7	0.7	1.5	2.0	2.3	2.3	2.1	1.8	1.5	1.1
75	5183	4845	4611	4514	4570	4771	5090	5490	5934	6389	6830	7239	7600	7906	8149	8325	8432	8470	8439
	-20.8	-19.3	-16.9	-13.7	-10.1	-6.6	-3.6	-1.3	0.3	1.3	1.8	1.9	1.8	1.5	1.1	0.7	0.2	-0.4	-0.9
70	7380	7089	6935	6950	7142	7495	7973	8531	9124	9716	10275	10779	11213	11569	11840	12025	12126	12143	12079
	-16.4	-15.1	-13.1	-10.8	-8.3	-6.0	-4.1	-2.8	-1.9	-1.5	-1.4	-1.5	-1.8	-2.1	-2.5	-2.8	-3.2	-3.5	-3.8
65	10193	9986	9922	10027	10310	10751	11314	11951	12614	13262	13860	14385	14821	15161	15404	15553	15612	15588	15484
	-12.0	-11.5	-10.8	-9.8	-8.8	-7.8	-7.0	-6.4	-6.1	-6.0	-6.1	-6.2	-6.3	-6.3	-6.3	-6.2	-6.0	-5.8	-5.6
60	13476	13373	13393	13561	13885	14351	14923	15558	16207	16826	17381	17847	18213	18473	18633	18702	18689	18605	18458
	-8.8	-9.3	-9.8	-10.2	-10.4	-10.5	-10.4	-10.4	-10.3	-10.3	-10.3	-10.2	-10.1	-9.7	-9.1	-8.4	-7.6	-6.7	-5.9
55	17077	17082	17172	17370	17687	18114	18624	19179	19732	20244	20679	21017	21247	21373	21404	21355	21242	21083	20886
	-7.9	-9.0	-10.1	-11.3	-12.1	-12.7	-12.9	-12.9	-12.8	-12.6	-12.5	-12.2	-11.8	-11.1	-10.2	-9.0	-7.6	-6.2	-4.9
50	20856	20958	21097	21292	21557	21890	22274	22681	23072	23410	23664	23818	23866	23816	23684	23491	23258	23007	22751
	-9.3	-10.3	-11.5	-12.6	-13.3	-13.5	-13.3	-12.8	-12.1	-11.6	-11.2	-10.9	-10.6	-10.0	-9.2	-8.0	-6.5	-4.9	-3.4
45	24689	24868	25029	25189	25363	25559	25772	25983	26162	26280	26313	26248	26085	25836	25523	25171	24807	24453	24128
	-12.7	-13.0	-13.4	-13.7	-13.5	-12.6	-11.2	-9.5	-7.9	-6.7	-6.0	-5.9	-6.0	-6.1	-6.0	-5.5	-4.6	-3.5	-2.2
40	28451	28676	28832	28930	28990	29025	29042	29031	28975	28851	28644	28346	27963	27514	27022	26514	26019	25561	25161
	-16.9	-16.0	-15.1	-14.0	-12.3	-9.8	-6.6	-3.3	-0.3	1.7	2.6	2.5	1.6	0.3	-1.0	-2.0	-2.4	-2.4	-2.0
35	32001	32239	32363	32383	32318	32189	32009	31779	31490	31128	30687	30166	29580	28949	28300	27659	27052	26504	26033
	-20.6	-18.3	-15.8	-13.1	-9.6	-5.3	-0.3	4.7	9.1	12.1	13.3	12.8	10.9	8.1	5.0	2.1	-0.3	-1.9	-2.9
30	35174	35395	35470	35406	35224	34947	34593	34171	33677	33108	32465	31757	31005	30234	29470	28737	28056	27445	26923
	-22.5	-18.7	-14.7	-10.4	-5.4	0.3	6.7	13.1	18.5	22.2	23.6	22.7	20.0	15.9	11.1	6.1	1.6	-2.0	-4.6
25	37795	37980	38000	37861	37584	37193	36709	36143	35498	34776	33987	33150	32291	31439	30619	29850	29143	28510	27965
	-21.5	-16.4	-11.2	-5.8	0.1	6.6	13.5	20.2	25.9	29.7	31.0	30.0	26.7	21.8	15.7	9.3	3.0	-2.5	-6.8
20	39700	39848	39826	39638	39304	38848	38290	37644	36917	36115	35256	34364	33470	32605	31793	31046	30366	29757	29223
	-17.3	-11.3	-5.3	0.7	6.7	12.8	19.0	24.9	29.7	32.8	33.7	32.5	29.2	24.2	17.8	10.7	3.4	-3.3	-8.9
15	40763	40899	40867	40673	40333	39870	39304	38649	37916	37115	36265	35396	34541	33730	32985	32311	31706	31159	30669
	-10.2	-3.8	2.5	8.3	13.6	18.4	22.8	26.5	29.3	30.7	30.7	29.3	26.4	22.0	16.4	9.7	2.5	-4.6	-11.0
10	40922	41087	41096	40952	40667	40261	39753	39159	38492	37766	37000	36225	35471	34768	34133	33571	33069	32612	32187
	-1.1	5.2	11.1	16.1	20.0	22.7	24.3	25.0	24.8	23.9	22.6	20.8	18.5	15.4	11.3	6.1	-0.1	-6.6	-12.9
5	40182	40430	40539	40506	40338	40050	39661	39187	38644	38049	37423	36792	36183	35622	35124	34689	34305	33948	33599
	8.6	14.0	18.8	22.5	24.6	24.8	23.4	20.8	17.4	13.9	10.9	8.7	7.0	5.5	3.3	0.2	-4.1	-9.2	-14.6
0	38624	39000	39258	39390	39393	39274	39048	38735	38353	37923	37466	37005	36562	36157	35802	35497	35228	34969	34695
	17.4	21.0	24.1	26.0	26.1	24.0	20.0	14.4	8.3	2.5	-1.9	-4.5	-5.6	-5.8	-6.0	-7.0	-9.0	-12.2	-16.2

IGRF 1980 HORIZONTAL INTENSITY (H)

LONG / LAT	180	-175	-170	-165	-160	-155	-150	-145	-140	-135	-130	-125	-120	-115	-110	-105	-100	-95	-90
90	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331
	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3
85	1736	1703	1654	1590	1512	1424	1327	1227	1133	1053	1001	990	1029	1119	1252	1420	1612	1820	2039
	-6.7	-6.9	-7.3	-7.9	-8.7	-9.7	-11.1	-12.7	-14.6	-16.7	-18.5	-19.7	-20.0	-19.2	-17.9	-16.5	-15.1	-14.0	-13.0
80	4828	4770	4665	4514	4319	4080	3801	3483	3130	2745	2332	1897	1449	1005	622	519	823	1271	1750
	1.1	0.6	0.1	-0.5	-1.0	-1.6	-2.3	-3.0	-3.7	-4.6	-5.6	-7.1	-9.2	-12.8	-19.6	-21.8	-12.2	-7.0	-4.4
75	8439	8339	8172	7937	7637	7273	6847	6362	5820	5225	4582	3898	3178	2431	1670	919	381	840	1577
	-0.9	-1.5	-2.0	-2.5	-3.1	-3.6	-4.1	-4.5	-4.9	-5.2	-5.3	-5.3	-4.9	-4.0	-1.9	4.2	28.5	22.1	16.5
70	12079	11935	11713	11413	11036	10580	10047	9437	8753	7999	7181	6310	5398	4465	3544	2697	2064	1893	2280
	-3.8	-4.1	-4.5	-4.9	-5.3	-5.7	-6.1	-6.4	-6.5	-6.3	-5.7	-4.6	-2.7	0.3	5.4	13.9	27.3	39.6	40.8
65	15484	15305	15050	14719	14309	13816	13239	12574	11823	10989	10079	9107	8091	7061	6059	5155	4452	4085	4150
	-5.6	-5.6	-5.6	-5.8	-6.1	-6.5	-6.8	-7.0	-6.8	-6.2	-4.9	-2.8	0.3	4.9	11.4	20.3	31.7	43.2	50.8
60	18458	18253	17989	17664	17272	16804	16254	15616	14886	14067	13165	12193	11172	10133	9119	8194	7441	6955	6815
	-5.9	-5.4	-5.1	-5.1	-5.3	-5.7	-6.1	-6.3	-6.0	-5.1	-3.3	-0.5	3.4	8.7	15.6	24.3	34.7	45.5	54.9
55	20886	20660	20404	20114	19779	19388	18928	18388	17762	17047	16245	15368	14432	13464	12501	11597	10821	10252	9964
	-4.9	-3.9	-3.3	-3.2	-3.5	-4.1	-4.7	-5.1	-4.9	-4.0	-2.1	0.8	4.7	9.8	16.3	24.2	33.6	44.0	54.1
50	22751	22501	22257	22013	21757	21473	21143	20752	20286	19738	19107	18395	17613	16780	15924	15088	14329	13717	13324
	-3.4	-2.2	-1.5	-1.4	-1.8	-2.6	-3.5	-4.1	-4.2	-3.6	-2.1	0.1	3.2	7.1	12.1	18.6	26.7	36.5	47.0
45	24128	23844	23604	23404	23228	23059	22873	22649	22370	22020	21594	21087	20503	19850	19145	18421	17722	17110	16656
	-2.2	-1.2	-0.5	-0.5	-1.0	-2.0	-3.0	-3.9	-4.3	-4.3	-3.7	-2.8	-1.6	0.2	3.0	7.3	13.7	22.4	33.0
40	25161	24834	24586	24415	24307	24240	24189	24127	24028	23877	23659	23367	22995	22542	22016	21434	20832	20259	19782
	-2.0	-1.5	-1.2	-1.3	-1.8	-2.7	-3.7	-4.6	-5.3	-5.9	-6.7	-7.6	-8.9	-9.9	-10.1	-8.6	-4.5	2.8	12.8
35	26033	25659	25392	25234	25172	25185	25243	25314	25370	25391	25359	25264	25092	24836	24491	24063	23573	23063	22588
	-2.9	-3.3	-3.6	-3.8	-4.3	-4.8	-5.4	-6.1	-6.9	-8.3	-10.5	-13.7	-17.8	-22.1	-25.6	-27.1	-25.6	-20.3	-11.3
30	26923	26508	26217	26057	26018	26080	26210	26374	26543	26692	26805	26868	26863	26776	26590	26302	25921	25474	25011
	-4.6	-6.3	-7.3	-7.9	-8.1	-8.2	-8.2	-8.4	-9.3	-11.3	-14.9	-20.3	-27.2	-34.6	-41.3	-45.7	-46.7	-43.6	-36.3
25	27965	27526	27214	27039	27000	27075	27234	27443	27670	27894	28098	28265	28378	28413	28348	28167	27870	27473	27017
	-6.8	-9.8	-11.7	-12.7	-12.9	-12.6	-12.1	-11.9	-12.7	-15.3	-20.1	-27.4	-36.5	-46.3	-55.2	-61.8	-64.9	-63.8	-58.5
20	29223	28781	28453	28256	28191	28242	28382	28580	28808	29045	29278	29490	29661	29763	29769	29654	29408	29042	28586
	-8.9	-13.2	-16.2	-17.7	-18.1	-17.7	-16.9	-16.6	-17.5	-20.6	-26.3	-34.7	-44.9	-55.7	-65.7	-73.4	-77.8	-78.3	-74.9
15	30669	30245	29909	29679	29564	29554	29628	29761	29930	30120	30319	30513	30681	30795	30823	30734	30514	30162	29705
	-11.0	-16.2	-20.0	-22.3	-23.3	-23.2	-22.7	-22.7	-24.0	-27.4	-33.3	-41.7	-51.7	-62.1	-71.6	-79.1	-83.8	-85.2	-83.6
10	32187	31797	31458	31190	31005	30902	30870	30891	30951	31040	31150	31270	31383	31460	31469	31379	31166	30825	30373
	-12.9	-18.4	-22.9	-26.0	-27.8	-28.6	-29.0	-29.6	-31.4	-34.9	-40.3	-47.6	-56.0	-64.5	-72.2	-78.3	-82.4	-84.2	-83.9
5	33599	33250	32912	32602	32337	32125	31964	31847	31767	31720	31702	31708	31724	31730	31693	31583	31372	31044	30607
	-14.6	-19.9	-24.6	-28.5	-31.3	-33.2	-34.8	-36.4	-38.6	-41.7	-45.8	-51.0	-56.6	-62.2	-67.3	-71.4	-74.5	-76.3	-77.0
0	34695	34390	34058	33712	33373	33056	32768	32513	32289	32097	31937	31810	31711	31625	31527	31387	31173	30861	30448
	-16.2	-20.7	-25.3	-29.5	-33.2	-36.4	-39.1	-41.5	-43.7	-45.9	-48.2	-50.5	-52.9	-55.2	-57.4	-59.6	-61.7	-63.6	-65.1

IGRF 1980 HORIZONTAL INTENSITY (H)

LONG / LAT	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
90	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331	2331
	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3	-18.3
85	2039	2263	2489	2714	2935	3150	3357	3554	3740	3915	4076	4224	4357	4474	4576	4662	4732	4785	4820
	-13.0	-12.2	-11.6	-11.1	-10.7	-10.5	-10.3	-10.2	-10.2	-10.2	-10.4	-10.5	-10.8	-11.0	-11.4	-11.7	-12.1	-12.6	-13.0
80	1750	2234	2711	3174	3620	4044	4445	4820	5167	5487	5778	6040	6273	6477	6654	6802	6924	7018	7086
	-4.4	-3.0	-2.2	-1.6	-1.4	-1.3	-1.3	-1.4	-1.6	-1.9	-2.3	-2.8	-3.3	-3.9	-4.6	-5.3	-6.0	-6.9	-7.8
75	1577	2324	3053	3753	4417	5040	5619	6151	6635	7072	7462	7806	8107	8366	8587	8771	8921	9039	9126
	16.5	14.2	12.9	12.0	11.2	10.5	9.8	9.1	8.3	7.5	6.7	5.8	4.9	3.9	2.9	1.8	0.7	-0.5	-1.7
70	2280	2994	3824	4676	5506	6291	7018	7681	8276	8803	9264	9662	10001	10286	10522	10715	10869	10987	11075
	40.8	36.8	32.9	29.7	27.2	25.0	23.1	21.3	19.5	17.9	16.3	14.7	13.2	11.7	10.3	8.8	7.3	5.8	4.3
65	4150	4610	5332	6185	7078	7953	8777	9530	10202	10788	11290	11713	12064	12350	12578	12757	12894	12994	13064
	50.8	52.6	50.8	47.6	44.1	40.6	37.3	34.1	31.1	28.3	25.6	23.2	20.9	18.7	16.7	14.7	12.8	11.0	9.1
60	6815	7041	7578	8326	9185	10074	10934	11728	12436	13047	13562	13986	14326	14595	14802	14956	15066	15140	15185
	54.9	60.7	62.5	61.4	58.5	54.7	50.4	46.0	41.7	37.6	33.8	30.3	27.2	24.3	21.7	19.3	17.0	14.8	12.6
55	9964	10000	10348	10950	11716	12559	13403	14195	14902	15509	16012	16419	16739	16985	17169	17301	17391	17446	17472
	54.1	62.3	67.5	69.2	68.1	64.9	60.4	55.4	50.1	45.0	40.3	36.0	32.2	28.8	25.7	23.0	20.3	17.8	15.2
50	13324	13207	13385	13829	14472	15229	16018	16773	17453	18035	18516	18902	19206	19440	19617	19747	19836	19892	19920
	47.0	57.1	65.1	69.8	71.2	69.6	66.0	61.1	55.6	50.2	45.1	40.5	36.4	32.9	29.7	26.7	23.9	21.1	18.1
45	16656	16424	16453	16742	17245	17890	18596	19290	19926	20478	20940	21320	21629	21879	22079	22235	22352	22435	22490
	33.0	44.4	54.7	62.5	66.8	67.7	65.9	62.3	57.8	53.0	48.5	44.4	40.7	37.4	34.4	31.6	28.8	25.8	22.5
40	19782	19468	19370	19508	19862	20377	20979	21600	22188	22717	23180	23582	23930	24232	24490	24705	24878	25012	25114
	12.8	24.8	36.9	47.3	54.8	58.8	59.8	58.7	56.3	53.4	50.4	47.5	44.9	42.4	40.1	37.7	35.1	32.2	28.8
35	22588	22215	22007	22001	22203	22577	23066	23608	24155	24677	25166	25621	26043	26430	26776	27073	27321	27521	27683
	-11.3	0.4	13.4	25.8	36.1	43.6	48.2	50.5	51.2	51.0	50.3	49.3	48.2	46.9	45.5	43.8	41.8	39.3	36.2
30	25011	24593	24287	24147	24198	24432	24808	25275	25789	26319	26851	27378	27890	28374	28816	29202	29527	29798	30027
	-36.3	-25.6	-12.8	0.6	13.1	23.8	32.2	38.4	42.8	45.7	47.6	48.6	49.0	49.0	48.6	47.9	46.8	45.1	42.5
25	27017	26559	26168	25908	25823	25926	26196	26595	27081	27620	28192	28780	29364	29924	30438	30892	31281	31616	31913
	-58.5	-49.6	-37.9	-24.7	-11.1	2.1	13.9	23.8	31.6	37.4	41.3	43.8	45.3	46.3	46.9	47.2	47.2	46.6	45.1
20	28586	28094	27633	27274	27075	27065	27241	27573	28023	28553	29132	29735	30336	30911	31440	31914	32337	32721	33084
	-74.9	-68.2	-58.5	-46.6	-33.0	-18.6	-4.4	8.3	18.6	26.0	30.9	33.9	35.7	37.0	38.2	39.5	40.7	41.5	41.4
15	29705	29189	28679	28247	27960	27857	27947	28208	28600	29079	29607	30151	30684	31185	31648	32077	32488	32896	33317
	-83.6	-79.0	-71.8	-62.0	-49.7	-35.5	-20.5	-6.7	4.5	12.2	16.6	18.6	19.6	20.5	22.0	24.1	26.5	28.6	29.9
10	30373	29848	29311	28833	28481	28302	28309	28483	28782	29158	29565	29966	30339	30675	30987	31301	31647	32044	32497
	-83.9	-81.4	-76.8	-69.7	-59.6	-47.0	-33.0	-19.8	-9.5	-3.3	-0.9	-1.0	-1.8	-1.9	-0.6	2.0	5.2	8.4	10.8
5	30607	30091	29546	29041	28639	28389	28308	28375	28546	28769	28993	29183	29325	29427	29524	29665	29893	30231	30671
	-77.0	-76.3	-74.2	-69.8	-62.7	-52.7	-41.2	-30.3	-22.6	-19.2	-19.9	-23.0	-26.1	-27.6	-26.8	-24.1	-20.4	-16.7	-13.6
0	30448	29949	29408	28882	28434	28112	27932	27874	27892	27930	27937	27884	27764	27606	27461	27396	27464	27688	28051
	-65.1	-66.0	-66.0	-64.3	-60.3	-53.7	-45.6	-38.2	-34.0	-34.3	-38.4	-44.5	-49.9	-52.8	-52.7	-50.2	-46.6	-43.0	-40.0

IGRF 1980 HORIZONTAL INTENSITY (H)

LONG / LAT	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	28051	28505	28995	29473	29918	30334	30743	31176	31662	32225	32881	33626	34437	35275	36096	36863	37548	38137	38624
	-40.0	-37.9	-36.7	-36.2	-36.0	-36.0	-35.8	-35.1	-33.5	-30.5	-26.1	-20.8	-14.8	-8.5	-2.3	3.5	8.7	13.3	17.4
-5	24967	25278	25630	25983	26328	26684	27086	27566	28148	28845	29657	30564	31527	32499	33435	34300	35081	35775	36385
	-64.6	-62.9	-61.4	-59.4	-56.8	-53.5	-49.8	-45.5	-40.2	-33.5	-25.5	-16.7	-7.6	1.0	8.5	14.6	19.0	21.8	23.6
-10	21789	21885	22029	22197	22401	22676	23061	23587	24267	25100	26068	27133	28239	29331	30362	31307	32162	32939	33655
	-84.1	-83.3	-81.6	-78.2	-72.9	-66.2	-58.7	-50.6	-41.7	-31.6	-20.5	-9.1	1.8	11.4	19.1	24.3	27.0	27.3	26.1
-15	18838	18690	18597	18563	18622	18818	19193	19767	20541	21499	22603	23795	25005	26169	27243	28212	29084	29885	30647
	-96.9	-97.0	-95.1	-90.3	-82.4	-72.3	-61.1	-49.5	-37.4	-24.6	-11.5	1.0	12.2	21.2	27.5	30.9	31.1	28.6	24.2
-20	16337	15969	15671	15473	15423	15574	15959	16589	17452	18512	19712	20975	22220	23380	24418	25327	26129	26865	27582
	-103.0	-103.4	-101.2	-94.9	-84.7	-71.8	-57.7	-43.2	-28.5	-13.9	-0.2	11.7	21.3	28.0	31.8	32.5	30.1	24.9	17.7
-25	14398	13889	13470	13189	13105	13265	13695	14393	15332	16459	17698	18959	20155	21223	22134	22891	23527	24097	24661
	-103.7	-103.7	-100.4	-92.8	-80.9	-66.1	-50.0	-33.5	-17.4	-2.4	10.3	20.0	26.5	29.8	30.2	28.0	23.3	16.2	7.3
-30	13065	12516	12083	11821	11786	12014	12520	13289	14281	15427	16638	17820	18889	19789	20499	21029	21419	21732	22041
	-100.9	-99.5	-94.8	-85.8	-72.9	-57.2	-40.2	-23.1	-7.1	6.7	17.0	23.3	25.9	25.3	22.4	17.7	11.5	3.6	-5.5
-35	12348	11854	11501	11341	11414	11746	12336	13158	14159	15265	16383	17424	18313	19002	19473	19738	19839	19839	19818
	-96.0	-92.8	-86.3	-76.2	-62.9	-47.3	-30.8	-14.7	-0.3	11.0	18.1	20.8	19.6	15.7	10.2	3.8	-2.9	-10.2	-18.2
-40	12247	11869	11650	11626	11823	12252	12898	13727	14683	15689	16664	17526	18212	18679	18911	18917	18730	18408	18028
	-89.8	-84.7	-76.7	-66.1	-53.0	-38.6	-23.7	-9.8	1.9	10.1	14.0	13.7	9.9	3.9	-3.1	-9.9	-16.2	-22.1	-27.9
-45	12736	12492	12408	12506	12797	13277	13926	14703	15555	16414	17210	17876	18358	18617	18637	18418	17984	17377	16662
	-82.6	-75.9	-67.2	-56.6	-44.6	-31.9	-19.5	-8.4	0.3	5.6	7.1	5.0	0.0	-6.5	-13.4	-19.6	-24.6	-28.5	-31.7
-50	13735	13602	13616	13787	14113	14583	15170	15839	16540	17219	17819	18285	18574	18651	18496	18104	17485	16665	15690
	-74.2	-66.7	-57.8	-48.0	-37.5	-27.0	-17.2	-8.9	-2.9	0.2	0.3	-2.3	-6.9	-12.5	-18.1	-22.7	-25.8	-27.5	-28.3
-55	15092	15026	15085	15267	15565	15964	16438	16955	17476	17959	18359	18634	18747	18670	18382	17872	17140	16200	15076
	-64.5	-56.9	-48.6	-39.9	-31.1	-22.8	-15.4	-9.4	-5.3	-3.4	-3.6	-5.6	-8.9	-12.7	-16.2	-18.7	-19.9	-19.6	-18.4
-60	16589	16547	16600	16742	16964	17250	17578	17923	18255	18541	18750	18850	18811	18610	18228	17654	16881	15915	14766
	-53.6	-46.5	-39.2	-31.8	-24.7	-18.3	-12.7	-8.3	-5.3	-3.7	-3.5	-4.4	-5.9	-7.6	-9.0	-9.6	-9.1	-7.5	-5.0
-65	17974	17925	17940	18014	18135	18291	18465	18639	18791	18897	18936	18885	18722	18431	17995	17406	16657	15748	14686
	-41.9	-35.8	-29.6	-23.7	-18.1	-13.0	-8.7	-5.2	-2.6	-0.9	0.0	0.4	0.4	0.4	0.7	1.5	3.0	5.2	8.0
-70	18992	18926	18895	18894	18915	18949	18984	19008	19007	18965	18868	18702	18452	18109	17661	17103	16431	15645	14749
	-30.0	-25.2	-20.4	-15.8	-11.4	-7.5	-4.0	-1.0	1.4	3.4	5.0	6.2	7.3	8.4	9.6	11.1	12.9	15.0	17.3
-75	19428	19348	19280	19220	19163	19103	19034	18948	18838	18695	18511	18279	17991	17643	17229	16746	16195	15577	14895
	-18.9	-15.5	-12.0	-8.7	-5.4	-2.4	0.4	2.9	5.1	7.1	8.9	10.6	12.1	13.6	15.1	16.6	18.1	19.8	21.5
-80	19129	19051	18968	18878	18780	18672	18550	18412	18254	18074	17868	17634	17370	17074	16745	16384	15992	15570	15122
	-9.2	-7.1	-4.9	-2.8	-0.7	1.4	3.4	5.3	7.0	8.7	10.3	11.8	13.2	14.5	15.8	17.0	18.1	19.2	20.3
-85	18028	17972	17906	17831	17746	17652	17547	17432	17306	17170	17022	16864	16695	16516	16327	16130	15926	15717	15503
	-0.9	0.0	1.0	2.0	3.0	4.1	5.1	6.1	7.1	8.0	8.9	9.8	10.7	11.5	12.2	12.9	13.6	14.2	14.8
-90	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157
	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4

IGRF 1980 HORIZONTAL INTENSITY (H)

LONG / LAT	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180
0	38624	39000	39258	39390	39393	39274	39048	38735	38353	37923	37466	37005	36562	36157	35802	35497	35228	34969	34695
	17.4	21.0	24.1	26.0	26.1	24.0	20.0	14.4	8.3	2.5	-1.9	-4.5	-5.6	-5.8	-6.0	-7.0	-9.0	-12.2	-16.2
-5	36385	36912	37347	37673	37878	37957	37920	37786	37578	37322	37039	36750	36473	36221	36003	35818	35654	35484	35280
	23.6	24.8	25.4	25.2	23.5	19.7	13.9	6.6	-1.2	-8.3	-13.5	-16.3	-17.0	-16.1	-14.8	-13.9	-13.9	-15.1	-17.5
-10	33655	34317	34917	35434	35840	36119	36271	36314	36272	36176	36052	35921	35794	35682	35590	35515	35445	35356	35221
	26.1	24.2	22.1	19.6	16.3	11.6	5.3	-2.3	-10.2	-17.2	-22.3	-24.9	-25.1	-23.7	-21.4	-19.3	-17.9	-17.5	-18.4
-15	30647	31387	32103	32766	33338	33789	34107	34304	34406	34447	34457	34458	34462	34474	34495	34521	34540	34532	34469
	24.2	19.1	14.1	9.5	5.1	0.2	-5.5	-11.9	-18.3	-23.9	-27.7	-29.5	-29.3	-27.5	-25.0	-22.4	-20.3	-19.0	-18.7
-20	27582	28310	29053	29783	30455	31023	31466	31784	32001	32153	32272	32383	32497	32618	32743	32867	32977	33055	33078
	17.7	9.8	2.4	-3.9	-9.1	-13.5	-17.7	-21.8	-25.6	-28.7	-30.5	-30.8	-29.9	-28.0	-25.7	-23.2	-21.0	-19.4	-18.6
-25	24661	25265	25925	26619	27300	27915	28427	28828	29134	29376	29587	29792	30004	30224	30450	30673	30880	31055	31178
	7.3	-2.2	-11.2	-18.6	-24.0	-27.8	-30.2	-31.7	-32.4	-32.5	-31.8	-30.5	-28.7	-26.6	-24.5	-22.4	-20.6	-19.1	-18.2
-30	22041	22407	22866	23410	23998	24577	25100	25546	25919	26240	26537	26833	27139	27457	27784	28110	28423	28706	28941
	-5.5	-15.2	-24.4	-32.1	-37.5	-40.5	-41.4	-40.7	-38.8	-36.2	-33.2	-30.2	-27.4	-24.9	-22.9	-21.1	-19.7	-18.6	-17.9
-35	19818	19853	20001	20281	20671	21127	21597	22049	22469	22866	23254	23647	24055	24478	24912	25347	25771	26170	26526
	-18.2	-26.6	-34.9	-42.0	-47.2	-49.9	-50.1	-48.2	-44.8	-40.4	-35.8	-31.5	-27.7	-24.6	-22.2	-20.4	-19.0	-18.1	-17.7
-40	18028	17675	17430	17344	17431	17668	18012	18422	18867	19334	19820	20325	20849	21390	21941	22494	23036	23553	24030
	-27.9	-33.9	-40.3	-46.4	-51.4	-54.4	-55.0	-53.3	-49.8	-45.1	-39.8	-34.6	-30.0	-26.1	-23.0	-20.6	-18.9	-17.9	-17.6
-45	16662	15920	15244	14717	14397	14305	14427	14724	15151	15670	16253	16881	17538	18213	18897	19576	20241	20877	21471
	-31.7	-35.0	-39.0	-43.7	-48.7	-52.8	-55.2	-55.3	-53.2	-49.4	-44.5	-39.1	-33.8	-29.0	-24.8	-21.5	-19.0	-17.5	-17.1
-50	15690	14624	13549	12559	11750	11201	10958	11019	11342	11865	12528	13279	14080	14904	15731	16548	17340	18095	18804
	-28.3	-28.9	-30.4	-33.4	-38.2	-44.1	-49.6	-53.3	-54.2	-52.5	-48.6	-43.3	-37.5	-31.7	-26.4	-21.9	-18.4	-16.2	-15.3
-55	15076	13808	12454	11085	9793	8686	7882	7479	7512	7928	8620	9482	10432	11415	12397	13357	14281	15158	15982
	-18.4	-16.8	-15.8	-16.5	-19.9	-26.5	-35.7	-45.0	-51.5	-53.2	-50.7	-45.5	-39.0	-32.1	-25.7	-20.1	-15.7	-12.8	-11.4
-60	14766	13456	12014	10480	8903	7347	5900	4705	3985	3956	4560	5530	6651	7812	8960	10068	11124	12121	13058
	-5.0	-2.0	0.8	2.6	2.6	-0.5	-8.0	-21.3	-38.5	-50.2	-50.1	-43.4	-35.0	-26.9	-19.7	-13.7	-9.0	-5.8	-4.2
-65	14686	13480	12148	10710	9188	7610	5999	4381	2778	1221	467	1858	3264	4611	5891	7105	8251	9334	10355
	8.0	11.2	14.5	17.6	20.1	21.8	22.2	21.1	18.0	9.3	-41.2	-19.5	-12.3	-6.9	-2.3	1.5	4.4	6.2	6.9
-70	14749	13752	12664	11501	10281	9026	7764	6526	5361	4340	3587	3264	3458	4057	4881	5805	6765	7727	8676
	17.3	19.9	22.6	25.3	27.9	30.2	32.4	34.6	36.9	39.5	41.6	41.0	36.4	30.9	26.9	24.4	22.7	21.4	19.9
-75	14895	14156	13370	12546	11701	10851	10017	9222	8492	7859	7353	7004	6833	6846	7033	7370	7827	8374	8987
	21.5	23.2	24.9	26.5	28.1	29.6	30.9	32.0	33.0	33.7	34.2	34.4	34.1	33.3	32.2	30.7	29.0	27.2	25.3
-80	15122	14653	14168	13675	13181	12695	12227	11787	11387	11036	10744	10519	10368	10294	10299	10380	10535	10755	11036
	20.3	21.3	22.2	23.1	23.8	24.5	25.0	25.5	25.8	26.0	26.0	25.9	25.7	25.2	24.7	23.9	23.1	22.0	20.8
-85	15503	15287	15072	14860	14654	14455	14269	14096	13940	13803	13688	13596	13530	13490	13477	13491	13532	13600	13692
	14.8	15.3	15.7	16.1	16.4	16.6	16.8	16.9	17.0	17.0	16.9	16.7	16.5	16.2	15.8	15.4	14.8	14.3	13.6
-90	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157
	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4

IGRF 1980 HORIZONTAL INTENSITY (H)

LONG / LAT	180	-175	-170	-165	-160	-155	-150	-145	-140	-135	-130	-125	-120	-115	-110	-105	-100	-95	-90
0	34695	34390	34058	33712	33373	33056	32768	32513	32289	32097	31937	31810	31711	31625	31527	31387	31173	30861	30448
	-16.2	-20.7	-25.3	-29.5	-33.2	-36.4	-39.1	-41.5	-43.7	-45.9	-48.2	-50.5	-52.9	-55.2	-57.4	-59.6	-61.7	-63.6	-65.1
-5	35280	35022	34706	34343	33954	33560	33176	32812	32471	32155	31867	31615	31399	31216	31049	30870	30645	30345	29951
	-17.5	-20.8	-24.8	-29.1	-33.3	-37.3	-40.9	-43.6	-45.4	-46.1	-46.1	-45.5	-44.6	-44.0	-43.9	-44.8	-46.5	-48.8	-51.2
-10	35221	35015	34733	34381	33982	33560	33133	32713	32305	31910	31534	31184	30872	30600	30360	30131	29882	29576	29187
	-18.4	-20.5	-23.5	-27.4	-31.7	-35.9	-39.6	-42.1	-42.9	-41.9	-39.5	-36.2	-32.8	-30.2	-28.9	-29.5	-31.6	-34.8	-38.5
-15	34469	34331	34106	33804	33444	33049	32640	32228	31815	31400	30987	30584	30205	29861	29552	29265	28973	28639	28233
	-18.7	-19.7	-21.8	-25.0	-28.8	-32.7	-35.8	-37.4	-37.0	-34.3	-30.0	-24.7	-19.8	-16.3	-15.0	-16.3	-19.6	-24.2	-29.3
-20	33078	33024	32887	32672	32396	32082	31747	31400	31040	30661	30264	29854	29446	29054	28688	28342	27995	27618	27178
	-18.6	-18.8	-20.2	-22.5	-25.6	-28.6	-30.9	-31.4	-29.7	-25.7	-20.1	-13.9	-8.6	-5.4	-5.0	-7.5	-12.4	-18.6	-25.0
-25	31178	31230	31205	31106	30950	30754	30533	30291	30024	29723	29383	29008	28610	28204	27804	27414	27021	26602	26128
	-18.2	-18.1	-19.0	-20.7	-23.0	-25.3	-26.6	-26.2	-23.6	-19.0	-13.0	-6.9	-2.1	0.2	-0.7	-4.6	-10.9	-18.3	-25.8
-30	28941	29114	29217	29254	29235	29175	29084	28964	28808	28608	28354	28048	27697	27318	26925	26527	26118	25681	25194
	-17.9	-17.8	-18.6	-20.1	-22.0	-23.7	-24.5	-23.7	-21.0	-16.5	-11.0	-5.7	-1.9	-0.8	-2.8	-7.8	-14.8	-22.7	-30.5
-35	26526	26826	27063	27237	27357	27431	27469	27470	27429	27338	27188	26978	26714	26409	26076	25724	25350	24942	24480
	-17.7	-18.0	-18.9	-20.6	-22.5	-24.2	-25.1	-24.6	-22.5	-18.9	-14.6	-10.6	-8.0	-7.8	-10.4	-15.4	-22.2	-29.7	-37.2
-40	24030	24455	24820	25125	25373	25571	25727	25842	25913	25936	25905	25819	25681	25500	25285	25039	24758	24431	24041
	-17.6	-18.1	-19.5	-21.5	-23.9	-26.2	-27.7	-28.1	-27.1	-25.0	-22.2	-19.6	-18.0	-18.3	-20.7	-25.0	-30.7	-37.2	-43.7
-45	21471	22014	22498	22920	23285	23598	23864	24090	24277	24424	24530	24595	24620	24607	24557	24468	24331	24132	23855
	-17.1	-17.7	-19.4	-21.9	-24.9	-27.8	-30.3	-31.9	-32.3	-31.7	-30.5	-29.1	-28.3	-28.7	-30.4	-33.6	-37.9	-43.0	-48.4
-50	18804	19458	20053	20586	21062	21487	21869	22215	22531	22820	23085	23324	23536	23717	23860	23955	23988	23944	23807
	-15.3	-15.8	-17.5	-20.3	-23.7	-27.3	-30.6	-33.2	-34.9	-35.7	-35.7	-35.4	-35.2	-35.5	-36.7	-38.8	-41.9	-45.7	-50.2
-55	15982	16746	17450	18096	18689	19236	19747	20231	20695	21144	21581	22004	22406	22780	23111	23387	23589	23703	23714
	-11.4	-11.5	-13.0	-15.7	-19.1	-22.9	-26.6	-29.9	-32.4	-34.2	-35.2	-35.8	-36.2	-36.7	-37.7	-39.4	-41.8	-45.0	-48.7
-60	13058	13934	14751	15516	16234	16915	17568	18201	18822	19433	20035	20624	21191	21725	22212	22635	22980	23231	23378
	-4.2	-4.1	-5.3	-7.7	-10.8	-14.4	-18.0	-21.5	-24.4	-26.8	-28.6	-30.0	-31.2	-32.4	-33.8	-35.6	-38.0	-40.9	-44.4
-65	10355	11320	12234	13104	13936	14739	15520	16283	17034	17773	18497	19200	19875	20510	21093	21610	22049	22399	22653
	6.9	6.6	5.2	3.0	0.2	-3.1	-6.4	-9.8	-12.9	-15.7	-18.1	-20.3	-22.3	-24.3	-26.5	-28.8	-31.5	-34.5	-37.8
-70	8676	9606	10512	11396	12260	13105	13934	14748	15546	16327	17086	17819	18517	19172	19776	20320	20794	21192	21510
	19.9	18.1	16.0	13.5	10.7	7.7	4.6	1.4	-1.7	-4.6	-7.5	-10.2	-12.8	-15.5	-18.1	-20.9	-23.8	-26.8	-29.9
-75	8987	9645	10334	11041	11760	12483	13206	13923	14632	15326	16002	16653	17274	17859	18403	18899	19343	19732	20062
	25.3	23.2	21.0	18.6	16.1	13.5	10.8	8.1	5.3	2.6	-0.1	-2.8	-5.5	-8.1	-10.8	-13.4	-16.1	-18.7	-21.3
-80	11036	11367	11742	12153	12591	13051	13525	14009	14495	14979	15457	15922	16372	16802	17207	17586	17935	18251	18533
	20.8	19.5	18.0	16.4	14.7	13.0	11.1	9.2	7.2	5.2	3.2	1.2	-0.9	-2.9	-4.9	-6.8	-8.7	-10.6	-12.4
-85	13692	13808	13946	14103	14278	14467	14669	14880	15098	15322	15547	15772	15994	16212	16424	16628	16822	17005	17176
	13.6	12.9	12.1	11.3	10.4	9.5	8.6	7.6	6.6	5.6	4.6	3.5	2.5	1.5	0.5	-0.4	-1.3	-2.2	-3.0
-90	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157
	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4

IGRF 1980 HORIZONTAL INTENSITY (H)

LAT \ LONG	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
0	30448	29949	29408	28882	28434	28112	27932	27874	27892	27930	27937	27884	27764	27606	27461	27396	27464	27688	28051
	-65.1	-66.0	-66.0	-64.3	-60.3	-53.7	-45.6	-38.2	-34.0	-34.3	-38.4	-44.5	-49.9	-52.8	-52.7	-50.2	-46.6	-43.0	-40.0
-5	29951	29469	28928	28380	27882	27481	27194	27002	26859	26708	26501	26214	25852	25454	25082	24810	24695	24755	24967
	-51.2	-53.6	-55.4	-56.1	-54.9	-51.6	-47.2	-43.8	-43.4	-47.2	-54.5	-63.0	-70.1	-74.1	-74.6	-72.6	-69.6	-66.7	-64.6
-10	29187	28707	28157	27577	27022	26538	26144	25824	25532	25216	24830	24356	23806	23224	22673	22223	21922	21785	21789
	-38.5	-42.1	-45.5	-48.0	-49.1	-48.8	-47.7	-47.8	-50.7	-57.3	-66.7	-76.6	-84.6	-89.1	-90.0	-88.6	-86.6	-85.0	-84.1
-15	28233	27738	27164	26546	25932	25368	24876	24446	24035	23594	23082	22485	21817	21121	20452	19866	19401	19064	18838
	-29.3	-34.2	-38.7	-42.6	-45.4	-47.1	-48.5	-51.0	-56.0	-64.2	-74.4	-84.6	-92.6	-97.1	-98.3	-97.6	-96.6	-96.5	-96.9
-20	27178	26656	26052	25394	24727	24096	23525	23008	22512	21989	21404	20744	20022	19273	18541	17867	17274	16768	16337
	-25.0	-31.0	-36.5	-41.1	-44.8	-47.7	-50.4	-54.1	-60.0	-68.4	-78.3	-87.8	-95.1	-99.3	-100.7	-100.7	-100.7	-101.6	-103.0
-25	26128	25578	24950	24263	23558	22877	22247	21668	21113	20540	19919	19236	18502	17741	16986	16265	15591	14968	14398
	-25.8	-32.6	-38.5	-43.5	-47.6	-50.9	-54.0	-57.8	-63.4	-71.0	-79.6	-87.8	-94.1	-97.9	-99.6	-100.2	-100.9	-102.3	-103.7
-30	25194	24636	24002	23307	22585	21874	21204	20578	19977	19370	18728	18039	17309	16557	15803	15066	14358	13687	13065
	-30.5	-37.5	-43.6	-48.7	-52.8	-56.0	-58.9	-62.3	-66.9	-73.1	-80.0	-86.7	-92.0	-95.4	-97.2	-98.2	-99.2	-100.3	-100.9
-35	24480	23947	23336	22659	21943	21223	20526	19862	19219	18576	17911	17216	16491	15752	15013	14289	13593	12939	12348
	-37.2	-44.0	-50.0	-55.0	-58.9	-62.0	-64.6	-67.4	-70.9	-75.6	-80.9	-86.1	-90.4	-93.4	-95.2	-96.2	-96.9	-97.0	-96.0
-40	24041	23572	23018	22388	21704	20996	20288	19593	18910	18228	17534	16823	16100	15375	14661	13974	13330	12745	12247
	-43.7	-50.0	-55.6	-60.4	-64.4	-67.4	-70.0	-72.4	-75.3	-78.8	-82.9	-86.9	-90.2	-92.6	-94.0	-94.5	-94.2	-92.8	-89.8
-45	23855	23486	23022	22469	21844	21172	20475	19767	19055	18340	17619	16896	16176	15471	14796	14167	13599	13115	12736
	-48.4	-53.9	-59.1	-63.8	-67.8	-71.1	-73.9	-76.5	-79.1	-82.1	-85.3	-88.3	-90.7	-92.3	-92.8	-92.3	-90.5	-87.4	-82.6
-50	23807	23566	23218	22769	22232	21625	20969	20280	19571	18851	18127	17410	16710	16042	15421	14862	14383	14001	13735
	-50.2	-54.9	-59.7	-64.2	-68.4	-72.1	-75.4	-78.3	-81.2	-83.9	-86.5	-88.7	-90.2	-90.7	-90.1	-88.2	-84.9	-80.3	-74.2
-55	23714	23613	23399	23074	22651	22143	21568	20943	20284	19605	18922	18250	17602	16995	16445	15966	15572	15277	15092
	-48.7	-52.9	-57.3	-61.8	-66.0	-70.0	-73.7	-77.0	-80.0	-82.6	-84.7	-86.1	-86.6	-86.1	-84.3	-81.2	-76.8	-71.2	-64.5
-60	23378	23413	23335	23148	22858	22480	22026	21513	20957	20377	19788	19207	18650	18134	17671	17276	16958	16727	16589
	-44.4	-48.2	-52.3	-56.6	-60.7	-64.7	-68.5	-71.8	-74.6	-76.9	-78.5	-79.1	-78.8	-77.3	-74.7	-70.9	-66.0	-60.2	-53.6
-65	22653	22804	22853	22801	22655	22425	22122	21759	21353	20917	20468	20021	19590	19189	18830	18522	18274	18090	17974
	-37.8	-41.4	-45.2	-49.0	-52.8	-56.4	-59.8	-62.7	-65.0	-66.7	-67.6	-67.6	-66.6	-64.6	-61.7	-57.8	-53.1	-47.7	-41.9
-70	21510	21743	21893	21960	21949	21868	21724	21528	21290	21023	20739	20448	20162	19890	19642	19424	19241	19097	18992
	-29.9	-33.1	-36.4	-39.6	-42.7	-45.6	-48.1	-50.2	-51.8	-52.8	-53.1	-52.6	-51.3	-49.3	-46.5	-43.1	-39.1	-34.7	-30.0
-75	20062	20331	20541	20691	20785	20827	20822	20775	20695	20587	20459	20318	20171	20024	19882	19749	19628	19521	19428
	-21.3	-23.9	-26.4	-28.8	-30.9	-32.9	-34.5	-35.7	-36.5	-36.9	-36.7	-36.1	-34.9	-33.2	-31.0	-28.4	-25.5	-22.3	-18.9
-80	18533	18781	18993	19171	19314	19426	19507	19560	19588	19595	19583	19555	19515	19465	19407	19344	19276	19204	19129
	-12.4	-14.0	-15.6	-17.0	-18.2	-19.2	-20.0	-20.6	-20.8	-20.8	-20.5	-20.0	-19.1	-18.0	-16.6	-15.0	-13.2	-11.3	-9.2
-85	17176	17334	17478	17609	17725	17828	17916	17990	18051	18098	18134	18157	18169	18170	18161	18142	18113	18075	18028
	-3.0	-3.7	-4.4	-4.9	-5.4	-5.8	-6.0	-6.2	-6.2	-6.2	-6.0	-5.7	-5.3	-4.8	-4.1	-3.4	-2.7	-1.8	-0.9
-90	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157	16157
	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4

IGRF 1980 NORTH COMPONENT (X)

LONG / LAT	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
90	1906	2016	2110	2189	2250	2295	2322	2331	2323	2297	2253	2193	2115	2022	1913	1789	1652	1503	1342
	-7.6	-9.4	-11.1	-12.8	-14.3	-15.8	-17.1	-18.3	-19.3	-20.2	-21.0	-21.5	-22.0	-22.2	-22.3	-22.2	-22.0	-21.6	-21.0
85	4580	4704	4780	4809	4792	4729	4625	4482	4305	4099	3869	3622	3363	3100	2838	2584	2343	2120	1920
	-5.2	-7.9	-10.4	-12.9	-15.1	-17.2	-19.0	-20.6	-21.8	-22.9	-23.6	-24.0	-24.1	-23.9	-23.5	-22.8	-21.9	-20.8	-19.5
80	6877	7027	7110	7127	7079	6968	6800	6577	6308	5998	5656	5291	4913	4533	4163	3812	3492	3213	2983
	-0.4	-3.8	-7.1	-10.2	-13.1	-15.7	-18.0	-19.9	-21.5	-22.6	-23.4	-23.8	-23.9	-23.5	-22.9	-21.9	-20.8	-19.3	-17.8
75	8926	9094	9189	9213	9166	9053	8876	8641	8353	8017	7643	7240	6819	6393	5974	5579	5222	4918	4679
	5.7	1.7	-2.1	-5.6	-8.9	-11.9	-14.4	-16.6	-18.3	-19.5	-20.4	-20.8	-20.8	-20.5	-19.9	-19.0	-17.9	-16.7	-15.3
70	10886	11051	11147	11175	11141	11047	10896	10693	10441	10145	9809	9442	9052	8652	8255	7877	7535	7247	7031
	11.5	7.3	3.2	-0.6	-4.1	-7.1	-9.7	-11.9	-13.5	-14.6	-15.4	-15.7	-15.7	-15.4	-15.0	-14.4	-13.7	-13.0	-12.3
65	12895	13035	13114	13136	13108	13035	12921	12771	12585	12367	12117	11841	11543	11232	10918	10617	10344	10119	9958
	16.0	11.5	7.3	3.4	-0.1	-3.1	-5.5	-7.5	-8.9	-9.7	-10.2	-10.3	-10.2	-10.0	-9.7	-9.5	-9.3	-9.3	-9.4
60	15042	15146	15196	15201	15171	15112	15032	14934	14821	14693	14551	14394	14224	14044	13861	13684	13526	13401	13326
	18.8	14.2	9.9	5.9	2.3	-0.7	-3.0	-4.8	-5.9	-6.5	-6.7	-6.6	-6.4	-6.1	-5.9	-5.9	-6.2	-6.7	-7.4
55	17356	17430	17456	17447	17412	17363	17308	17254	17203	17159	17119	17084	17052	17021	16994	16970	16956	16959	16988
	20.7	15.9	11.3	7.0	3.2	0.0	-2.4	-4.2	-5.3	-5.8	-5.9	-5.8	-5.5	-5.2	-5.0	-5.1	-5.4	-6.1	-7.2
50	19825	19890	19911	19901	19873	19837	19805	19783	19779	19798	19843	19913	20008	20123	20253	20392	20532	20671	20808
	23.0	17.9	12.8	8.0	3.7	0.1	-2.8	-5.0	-6.4	-7.3	-7.7	-7.8	-7.8	-7.6	-7.5	-7.5	-7.7	-8.2	-9.1
45	22409	22491	22532	22545	22541	22530	22523	22530	22559	22622	22726	22877	23076	23318	23591	23880	24166	24432	24667
	27.0	21.5	15.9	10.5	5.4	1.0	-2.7	-5.7	-7.9	-9.6	-10.9	-11.8	-12.4	-12.7	-12.8	-12.7	-12.5	-12.4	-12.6
40	25041	25164	25248	25305	25345	25375	25404	25439	25495	25586	25729	25938	26215	26557	26946	27359	27765	28135	28444
	33.1	27.3	21.3	15.2	9.3	3.9	-0.9	-4.9	-8.3	-11.3	-13.9	-16.1	-17.9	-19.0	-19.5	-19.3	-18.7	-17.7	-16.8
35	27610	27791	27934	28053	28154	28241	28316	28386	28467	28581	28752	28999	29332	29746	30220	30722	31213	31650	32000
	40.5	34.8	28.5	21.9	15.3	8.9	3.1	-2.2	-7.0	-11.4	-15.6	-19.4	-22.6	-24.8	-25.9	-25.8	-24.6	-22.7	-20.6
30	29948	30196	30411	30605	30781	30936	31066	31178	31289	31427	31622	31899	32272	32734	33262	33816	34351	34817	35174
	47.0	41.9	35.8	29.1	21.9	14.8	8.0	1.7	-4.4	-10.2	-15.8	-21.1	-25.5	-28.8	-30.5	-30.4	-28.8	-26.0	-22.5
25	31821	32148	32445	32725	32984	33214	33407	33568	33716	33884	34108	34416	34821	35314	35870	36446	36991	37454	37793
	50.0	45.8	40.4	34.0	26.8	19.3	11.9	4.7	-2.1	-8.8	-15.3	-21.3	-26.6	-30.4	-32.3	-32.2	-30.0	-26.3	-21.6
20	32970	33383	33774	34147	34495	34802	35060	35274	35469	35679	35943	36289	36727	37247	37818	38398	38936	39382	39694
	46.8	43.9	39.6	33.9	27.1	19.6	12.1	4.8	-2.2	-8.8	-15.2	-21.0	-26.0	-29.6	-31.2	-30.6	-27.8	-23.2	-17.6
15	33167	33670	34158	34624	35055	35434	35754	36025	36275	36543	36865	37265	37750	38303	38894	39481	40015	40452	40754
	36.1	34.7	31.7	27.0	20.9	14.0	6.9	0.1	-6.0	-11.6	-16.6	-20.9	-24.5	-26.7	-27.2	-25.7	-22.2	-17.0	-10.7
10	32292	32870	33439	33982	34477	34911	35283	35611	35929	36274	36678	37157	37710	38318	38949	39563	40120	40579	40907
	18.0	18.0	16.3	12.9	7.9	2.1	-3.9	-9.3	-13.7	-17.1	-19.5	-21.2	-22.1	-22.1	-20.9	-18.2	-14.0	-8.4	-1.9
5	30383	30994	31603	32180	32703	33164	33574	33959	34356	34799	35310	35897	36547	37238	37938	38614	39230	39754	40159
	-5.3	-4.3	-4.7	-6.8	-10.3	-14.5	-18.5	-21.7	-23.5	-23.9	-23.0	-21.2	-18.8	-16.0	-12.7	-8.8	-4.1	1.4	7.4
0	27643	28219	28800	29350	29849	30302	30732	31172	31659	32218	32859	33576	34348	35148	35946	36714	37426	38057	38583
	-30.4	-28.8	-28.3	-29.0	-30.6	-32.5	-34.0	-34.2	-32.8	-29.6	-25.0	-19.5	-13.8	-8.2	-3.1	1.6	6.1	10.8	15.5

IGRF 1980 NORTH COMPONENT (X)

LONG / LAT	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180
90	1342	1170	990	803	609	410	209	6	-198	-399	-598	-792	-980	-1161	-1333	-1494	-1644	-1782	-1906
	-21.0	-20.2	-19.4	-18.3	-17.1	-15.8	-14.4	-12.8	-11.2	-9.5	-7.7	-5.8	-3.9	-2.0	0.0	1.9	3.8	5.7	7.6
85	1920	1746	1600	1483	1395	1336	1302	1290	1297	1316	1343	1372	1397	1412	1413	1394	1352	1285	1191
	-19.5	-18.0	-16.5	-14.8	-13.1	-11.3	-9.6	-7.8	-6.1	-4.4	-2.8	-1.3	0.1	1.5	2.7	3.9	5.0	6.1	7.1
80	2983	2810	2697	2649	2663	2739	2870	3047	3262	3502	3753	4003	4236	4439	4601	4711	4760	4741	4653
	-17.8	-16.1	-14.3	-12.4	-10.5	-8.7	-6.9	-5.2	-3.7	-2.2	-1.0	0.2	1.1	2.0	2.6	3.2	3.6	4.0	4.3
75	4679	4518	4443	4459	4566	4761	5037	5380	5775	6204	6645	7079	7482	7836	8121	8322	8427	8428	8320
	-15.3	-13.9	-12.4	-10.9	-9.4	-7.9	-6.5	-5.2	-4.0	-2.9	-2.0	-1.2	-0.6	-0.1	0.2	0.4	0.5	0.5	0.5
70	7031	6901	6870	6945	7129	7417	7801	8264	8788	9348	9918	10470	10978	11418	11766	12007	12125	12115	11970
	-12.3	-11.6	-10.9	-10.1	-9.4	-8.7	-8.0	-7.2	-6.6	-5.9	-5.3	-4.7	-4.2	-3.8	-3.5	-3.3	-3.1	-3.0	-3.0
65	9958	9881	9900	10026	10262	10607	11050	11575	12158	12774	13391	13980	14511	14959	15302	15524	15612	15562	15372
	-9.4	-9.6	-9.8	-10.1	-10.3	-10.5	-10.5	-10.5	-10.3	-10.0	-9.6	-9.2	-8.6	-8.0	-7.3	-6.7	-6.0	-5.5	-5.0
60	13326	13317	13388	13551	13811	14167	14612	15129	15695	16284	16864	17404	17876	18257	18526	18672	18689	18575	18334
	-7.4	-8.4	-9.5	-10.6	-11.7	-12.5	-13.2	-13.6	-13.8	-13.8	-13.5	-13.0	-12.3	-11.3	-10.2	-8.9	-7.6	-6.3	-5.2
55	16988	17054	17171	17350	17598	17918	18304	18746	19221	19706	20170	20586	20927	21172	21310	21333	21242	21043	20745
	-7.2	-8.6	-10.1	-11.6	-13.0	-14.1	-14.9	-15.4	-15.6	-15.5	-15.2	-14.7	-13.9	-12.7	-11.2	-9.5	-7.6	-5.7	-4.1
50	20808	20947	21096	21266	21466	21703	21977	22283	22605	22922	23208	23439	23593	23655	23617	23480	23254	22950	22587
	-9.1	-10.2	-11.5	-12.8	-13.9	-14.6	-14.8	-14.7	-14.3	-13.9	-13.5	-13.0	-12.4	-11.4	-10.1	-8.3	-6.3	-4.2	-2.3
45	24667	24864	25026	25161	25281	25398	25520	25647	25770	25874	25939	25946	25878	25725	25487	25170	24791	24371	23933
	-12.6	-13.0	-13.5	-13.8	-13.9	-13.4	-12.4	-11.1	-9.7	-8.6	-7.8	-7.5	-7.4	-7.2	-6.7	-5.6	-4.2	-2.5	-0.9
40	28444	28676	28827	28905	28923	28899	28847	28772	28673	28542	28366	28132	27829	27454	27011	26512	25980	25441	24926
	-16.8	-16.0	-15.2	-14.2	-12.7	-10.6	-7.8	-4.8	-2.0	0.1	1.3	1.4	0.7	-0.4	-1.3	-1.8	-1.7	-1.2	-0.5
35	32000	32239	32358	32364	32271	32102	31873	31598	31281	30918	30506	30037	29511	28929	28300	27639	26973	26331	25747
	-20.6	-18.3	-15.9	-13.3	-10.1	-6.2	-1.6	3.1	7.4	10.7	12.3	12.1	10.4	7.9	5.0	2.5	0.7	-0.6	-1.3
30	35174	35394	35465	35393	35195	34893	34510	34060	33550	32985	32367	31697	30983	30233	29459	28680	27919	27207	26579
	-22.5	-18.7	-14.8	-10.7	-6.0	-0.6	5.4	11.4	16.9	20.9	22.8	22.4	19.9	15.9	11.2	6.5	2.5	-0.8	-3.3
25	37793	37977	37996	37854	37570	37167	36667	36086	35434	34719	33949	33135	32291	31432	30574	29735	28934	28200	27562
	-21.6	-16.6	-11.4	-6.0	-0.4	5.7	12.2	18.7	24.5	28.7	30.6	29.9	26.7	21.7	15.6	9.3	3.4	-1.8	-5.9
20	39694	39845	39824	39636	39300	38839	38275	37623	36895	36099	35249	34363	33462	32566	31694	30859	30079	29372	28763
	-17.6	-11.5	-5.5	0.5	6.3	12.2	18.1	23.8	28.7	32.2	33.5	32.5	29.1	23.7	17.1	10.0	2.9	-3.5	-9.0
15	40754	40895	40866	40672	40333	39869	39301	38646	37913	37114	36264	35386	34503	33642	32819	32050	31342	30707	30159
	-10.7	-4.1	2.4	8.2	13.5	18.2	22.4	26.0	28.9	30.6	30.8	29.2	25.9	21.0	14.8	8.0	0.8	-6.0	-12.1
10	40907	41082	41096	40952	40666	40260	39752	39159	38491	37760	36984	36184	35388	34620	33899	33237	32637	32102	31636
	-1.9	4.7	10.9	16.2	20.2	22.9	24.5	25.2	25.1	24.3	22.8	20.6	17.6	13.6	8.8	3.2	-2.9	-9.2	-15.0
5	40159	40424	40538	40505	40335	40045	39655	39179	38632	38027	37379	36712	36048	35413	34825	34292	33816	33391	33011
	7.4	13.4	18.7	22.7	25.0	25.4	24.1	21.4	18.1	14.5	11.2	8.3	5.6	2.9	-0.1	-3.7	-8.1	-12.9	-17.8
0	38583	38988	39257	39389	39387	39264	39035	38716	38326	37878	37391	36883	36377	35892	35445	35044	34688	34368	34069
	15.5	20.0	23.8	26.2	26.6	24.8	20.9	15.3	9.1	3.2	-1.7	-5.3	-7.6	-8.9	-10.1	-11.6	-13.8	-16.8	-20.3

IGRF 1980 NORTH COMPONENT (X)

LAT \ LONG	180	-175	-170	-165	-160	-155	-150	-145	-140	-135	-130	-125	-120	-115	-110	-105	-100	-95	-90
90	-1906	-2016	-2110	-2189	-2250	-2295	-2322	-2331	-2323	-2297	-2253	-2193	-2115	-2022	-1913	-1789	-1652	-1503	-1342
	7.6	9.4	11.1	12.8	14.3	15.8	17.1	18.3	19.3	20.2	21.0	21.5	22.0	22.2	22.3	22.2	22.0	21.6	21.0
85	1191	1070	924	753	563	357	141	-80	-298	-506	-699	-868	-1009	-1115	-1180	-1203	-1179	-1106	-985
	7.1	8.1	9.0	10.0	10.9	11.9	12.9	13.8	14.9	15.9	16.9	17.9	18.9	19.8	20.7	21.5	22.2	22.8	23.2
80	4653	4493	4265	3972	3623	3227	2794	2338	1873	1412	971	561	197	-111	-352	-518	-605	-609	-528
	4.3	4.7	5.1	5.6	6.2	6.9	7.8	8.8	10.1	11.5	13.1	14.8	16.6	18.4	20.3	22.1	23.8	25.5	26.9
75	8320	8104	7782	7364	6859	6282	5650	4980	4293	3608	2944	2322	1759	1271	871	572	380	302	337
	0.5	0.6	0.7	1.0	1.5	2.3	3.4	4.8	6.5	8.5	10.9	13.4	16.1	19.0	21.9	24.8	27.6	30.2	32.6
70	11970	11694	11292	10774	10153	9446	8673	7854	7012	6170	5349	4573	3861	3233	2705	2290	2000	1843	1821
	-3.0	-2.9	-2.7	-2.3	-1.7	-0.7	0.7	2.6	4.9	7.6	10.7	14.1	17.8	21.6	25.4	29.2	33.0	36.5	39.8
65	15372	15046	14592	14021	13348	12588	11760	10885	9984	9078	8189	7339	6546	5832	5213	4707	4327	4085	3989
	-5.0	-4.5	-4.1	-3.5	-2.7	-1.6	0.1	2.3	5.0	8.3	12.0	16.1	20.5	25.0	29.5	34.1	38.6	42.9	47.0
60	18334	17974	17502	16932	16274	15543	14753	13920	13061	12191	11328	10489	9692	8953	8290	7723	7269	6944	6763
	-5.2	-4.3	-3.6	-2.8	-2.0	-0.8	0.9	3.2	6.1	9.6	13.6	18.0	22.6	27.3	32.2	37.1	42.2	47.1	52.0
55	20745	20360	19898	19370	18785	18151	17476	16768	16035	15288	14535	13786	13055	12355	11701	11112	10610	10217	9953
	-4.1	-2.7	-1.7	-1.0	-0.2	0.8	2.2	4.3	7.0	10.3	14.0	18.1	22.3	26.7	31.3	36.2	41.4	46.9	52.6
50	22587	22179	21741	21279	20801	20305	19793	19262	18713	18146	17562	16965	16359	15754	15161	14598	14087	13653	13324
	-2.3	-0.8	0.2	0.9	1.4	2.0	3.1	4.8	7.0	9.6	12.6	15.6	18.7	21.9	25.5	29.7	34.7	40.4	46.8
45	23933	23498	23083	22694	22331	21988	21656	21322	20979	20618	20234	19822	19382	18915	18428	17935	17457	17019	16652
	-0.9	0.4	1.2	1.6	1.8	2.2	3.0	4.2	5.7	7.4	9.0	10.3	11.4	12.7	14.6	17.4	21.6	27.1	33.9
40	24926	24460	24061	23737	23483	23284	23121	22976	22830	22672	22488	22271	22011	21706	21354	20965	20553	20144	19767
	-0.5	0.1	0.5	0.6	0.7	1.0	1.7	2.6	3.4	3.9	3.7	2.7	1.3	-0.1	-0.6	0.3	3.1	8.0	14.8
35	25747	25252	24865	24594	24428	24348	24327	24339	24362	24377	24372	24332	24246	24101	23891	23618	23291	22928	22558
	-1.3	-1.8	-2.1	-2.2	-2.1	-1.5	-0.7	0.1	0.3	-0.5	-2.7	-6.3	-10.6	-15.0	-18.3	-19.7	-18.5	-14.7	-8.5
30	26579	26066	25690	25457	25355	25359	25439	25564	25710	25856	25988	26091	26147	26140	26056	25888	25640	25324	24964
	-3.3	-5.0	-6.1	-6.5	-6.2	-5.2	-4.0	-3.2	-3.5	-5.6	-9.8	-15.9	-23.1	-30.3	-36.2	-39.7	-40.3	-37.9	-32.7
25	27562	27051	26688	26479	26412	26461	26593	26777	26990	27212	27429	27625	27779	27869	27875	27784	27592	27308	26953
	-5.9	-9.0	-10.9	-11.6	-11.1	-9.8	-8.2	-7.4	-8.2	-11.5	-17.4	-25.7	-35.1	-44.4	-52.2	-57.3	-59.2	-58.1	-54.3
20	28763	28276	27931	27731	27667	27715	27846	28031	28250	28488	28731	28962	29159	29295	29347	29295	29131	28861	28501
	-9.0	-13.2	-15.8	-16.8	-16.4	-15.0	-13.4	-12.8	-14.3	-18.6	-25.8	-35.2	-45.8	-56.0	-64.4	-70.1	-72.7	-72.5	-70.0
15	30159	29715	29388	29182	29089	29092	29168	29296	29462	29654	29862	30069	30253	30385	30439	30391	30231	29961	29594
	-12.1	-16.9	-20.1	-21.7	-21.6	-20.6	-19.5	-19.6	-21.8	-26.8	-34.5	-44.1	-54.4	-64.0	-71.6	-76.6	-79.1	-79.3	-78.1
10	31636	31244	30933	30705	30556	30477	30454	30478	30539	30633	30751	30881	31002	31087	31107	31040	30871	30598	30231
	-15.0	-20.0	-23.6	-25.6	-26.2	-26.1	-26.1	-27.2	-30.2	-35.5	-42.8	-51.4	-60.0	-67.4	-73.0	-76.4	-77.9	-78.2	-77.8
5	33011	32672	32373	32113	31892	31709	31562	31451	31376	31337	31329	31345	31366	31371	31335	31235	31053	30784	30429
	-17.8	-22.3	-25.9	-28.4	-29.9	-31.0	-32.3	-34.5	-38.2	-43.3	-49.4	-55.8	-61.5	-65.8	-68.5	-69.6	-69.9	-69.9	-70.2
0	34069	33780	33490	33197	32904	32619	32349	32103	31888	31707	31561	31445	31350	31260	31156	31016	30822	30560	30227
	-20.3	-23.8	-27.1	-29.8	-32.2	-34.4	-37.0	-40.2	-44.1	-48.4	-52.6	-56.0	-58.2	-59.0	-58.6	-57.6	-56.7	-56.6	-57.6

IGRF 1980 NORTH COMPONENT (X)

LONG / LAT	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
90	-1342	-1170	-990	-803	-609	-410	-209	-6	198	399	598	792	980	1161	1333	1494	1644	1782	1906
	21.0	20.2	19.4	18.3	17.1	15.8	14.4	12.8	11.2	9.5	7.7	5.8	3.9	2.0	0.0	-1.9	-3.8	-5.7	-7.6
85	-985	-817	-602	-345	-50	279	636	1013	1405	1803	2201	2590	2966	3319	3646	3939	4195	4410	4580
	23.2	23.4	23.4	23.2	22.8	22.1	21.2	20.0	18.6	16.9	15.0	12.9	10.6	8.2	5.6	3.0	0.2	-2.5	-5.2
80	-528	-364	-121	196	578	1018	1503	2023	2565	3119	3671	4211	4727	5211	5653	6046	6384	6662	6877
	26.9	28.1	29.0	29.7	30.0	30.0	29.5	28.7	27.5	26.0	24.0	21.7	19.1	16.3	13.2	9.9	6.5	3.1	-0.4
75	337	486	742	1097	1541	2060	2639	3262	3913	4574	5231	5868	6472	7034	7542	7990	8373	8686	8926
	32.6	34.7	36.5	37.8	38.8	39.2	39.1	38.5	37.4	35.8	33.7	31.1	28.2	24.9	21.4	17.6	13.7	9.7	5.7
70	1821	1933	2176	2540	3012	3575	4209	4895	5610	6334	7048	7733	8377	8966	9493	9951	10337	10648	10886
	39.8	42.7	45.2	47.1	48.5	49.3	49.3	48.7	47.4	45.5	43.0	40.0	36.6	32.8	28.8	24.6	20.2	15.9	11.5
65	3989	4041	4241	4579	5042	5612	6264	6975	7717	8465	9196	9890	10532	11111	11619	12051	12407	12687	12895
	47.0	50.7	53.9	56.5	58.3	59.3	59.4	58.6	56.9	54.4	51.2	47.5	43.4	39.1	34.5	29.9	25.2	20.6	16.0
60	6763	6735	6863	7144	7565	8108	8745	9448	10185	10925	11643	12317	12931	13474	13941	14330	14640	14875	15042
	52.0	56.6	60.8	64.2	66.7	68.1	68.2	67.2	65.0	61.9	57.9	53.4	48.6	43.5	38.4	33.4	28.4	23.6	18.8
55	9953	9836	9877	10077	10430	10916	11510	12177	12882	13591	14276	14913	15487	15988	16412	16758	17027	17225	17356
	52.6	58.2	63.5	68.1	71.6	73.7	74.4	73.5	71.1	67.5	63.0	57.8	52.3	46.8	41.3	35.9	30.7	25.7	20.7
50	13324	13124	13073	13180	13444	13850	14374	14981	15634	16298	16941	17540	18080	18551	18950	19273	19525	19706	19825
	46.8	53.5	60.1	66.1	71.1	74.5	76.2	76.2	74.3	71.0	66.5	61.3	55.6	49.8	44.2	38.7	33.4	28.2	23.0
45	16652	16387	16249	16257	16418	16724	17156	17683	18271	18884	19492	20069	20599	21070	21475	21812	22077	22274	22409
	33.9	41.6	49.5	57.1	63.8	69.1	72.6	74.2	74.0	72.0	68.5	64.1	58.9	53.5	48.1	42.8	37.6	32.4	27.0
40	19767	19455	19240	19148	19195	19385	19708	20143	20660	21228	21816	22399	22955	23467	23922	24309	24623	24864	25041
	14.8	22.9	31.9	40.9	49.3	56.8	62.8	67.1	69.6	70.1	68.9	66.2	62.4	58.0	53.2	48.4	43.5	38.5	33.1
35	22558	22213	21929	21738	21667	21733	21938	22273	22720	23252	23842	24461	25079	25671	26211	26681	27069	27375	27610
	-8.5	-0.5	8.8	18.8	28.8	38.4	47.3	54.9	60.9	64.9	66.9	66.8	65.1	62.1	58.5	54.4	50.2	45.6	40.5
30	24964	24592	24245	23960	23775	23716	23802	24038	24417	24921	25524	26193	26892	27581	28223	28789	29262	29644	29948
	-32.7	-25.4	-16.5	-6.5	4.4	15.8	27.3	38.4	48.2	56.2	61.7	64.6	65.2	64.0	61.6	58.6	55.2	51.4	47.0
25	26953	26554	26150	25783	25494	25323	25298	25438	25747	26216	26820	27525	28287	29056	29784	30434	30987	31443	31821
	-54.3	-48.3	-40.6	-31.4	-20.6	-8.3	5.1	19.0	32.2	43.6	52.4	58.1	60.9	61.3	60.1	58.2	55.9	53.3	50.0
20	28501	28078	27629	27197	26826	26560	26437	26483	26711	27117	27683	28373	29140	29930	30693	31387	31994	32515	32970
	-70.0	-65.8	-59.9	-52.3	-42.6	-30.6	-16.6	-1.4	13.8	27.5	38.4	46.0	50.3	51.9	51.9	51.1	50.0	48.7	46.8
15	29594	29155	28679	28204	27776	27438	27228	27177	27300	27601	28063	28656	29338	30060	30777	31453	32074	32641	33167
	-78.1	-75.6	-71.9	-66.5	-58.9	-48.5	-35.5	-20.7	-5.5	8.5	20.0	28.2	33.0	35.3	36.0	36.2	36.3	36.4	36.1
10	30231	29791	29307	28814	28351	27957	27666	27507	27497	27639	27925	28332	28829	29384	29966	30553	31136	31714	32292
	-77.8	-77.0	-75.6	-72.8	-67.9	-60.3	-49.9	-37.5	-24.3	-12.0	-1.7	5.6	10.2	12.5	13.6	14.5	15.7	17.0	18.0
5	30429	30004	29530	29035	28551	28109	27738	27459	27287	27227	27276	27424	27657	27963	28334	28764	29253	29796	30383
	-70.2	-70.9	-71.6	-71.5	-69.7	-65.6	-59.0	-50.6	-41.2	-32.3	-24.8	-19.3	-15.8	-13.9	-12.5	-11.1	-9.3	-7.2	-5.3
0	30227	29826	29371	28882	28381	27891	27434	27026	26678	26395	26180	26035	25965	25980	26095	26321	26662	27111	27643
	-57.6	-59.7	-62.3	-64.6	-65.9	-65.5	-63.4	-59.7	-55.2	-50.6	-46.6	-43.6	-41.5	-40.1	-38.7	-37.1	-35.0	-32.6	-30.4

IGRF 1980 NORTH COMPONENT (X)

LONG / LAT	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	27643	28219	28800	29350	29849	30302	30732	31172	31659	32218	32859	33576	34348	35148	35946	36714	37426	38057	38583
	-30.4	-28.8	-28.3	-29.0	-30.6	-32.5	-34.0	-34.2	-32.8	-29.6	-25.0	-19.5	-13.8	-8.2	-3.1	1.6	6.1	10.8	15.5
-5	24400	24860	25333	25786	26210	26622	27055	27548	28129	28813	29593	30449	31351	32269	33177	34053	34879	35637	36312
	-53.6	-51.9	-50.7	-49.9	-49.3	-48.4	-46.7	-43.6	-38.7	-32.0	-24.0	-15.3	-6.8	0.7	6.9	11.6	15.2	18.2	20.8
-10	21029	21302	21600	21902	22215	22565	22993	23534	24206	25006	25911	26888	27902	28922	29924	30894	31822	32700	33516
	-71.9	-70.3	-68.4	-66.1	-63.0	-59.0	-53.9	-47.3	-39.1	-29.5	-19.0	-8.3	1.6	9.9	16.0	19.8	21.6	22.1	22.0
-15	17873	17921	18014	18147	18340	18629	19053	19636	20381	21267	22258	23311	24388	25459	26508	27527	28515	29470	30387
	-83.4	-82.1	-79.6	-75.5	-69.9	-62.9	-54.4	-44.8	-34.1	-22.7	-11.0	0.2	10.1	17.7	22.6	24.5	23.9	21.6	18.4
-20	15187	15022	14927	14914	15014	15264	15691	16305	17092	18015	19028	20086	21150	22199	23222	24219	25197	26161	27112
	-88.0	-86.8	-83.6	-78.0	-70.1	-60.4	-49.4	-37.7	-25.7	-13.7	-2.4	7.8	16.1	21.9	24.6	24.2	21.1	16.0	10.1
-25	13122	12802	12579	12479	12534	12774	13213	13840	14626	15523	16482	17458	18424	19363	20275	21167	22053	22945	23849
	-87.1	-85.5	-81.5	-74.6	-65.0	-53.6	-41.3	-28.8	-16.9	-6.0	3.6	11.4	17.2	20.3	20.6	18.0	12.8	5.8	-1.9
-30	11743	11349	11079	10961	11022	11279	11726	12338	13072	13876	14703	15517	16300	17048	17768	18477	19193	19933	20707
	-82.5	-80.2	-75.3	-67.5	-57.2	-45.4	-33.1	-21.5	-11.2	-2.6	4.1	8.9	11.6	12.1	10.3	6.1	-0.1	-7.8	-16.1
-35	11054	10667	10420	10338	10437	10715	11152	11709	12337	12986	13617	14204	14740	15233	15699	16161	16642	17164	17740
	-76.2	-72.9	-67.2	-59.1	-49.1	-38.2	-27.5	-18.0	-10.5	-5.0	-1.7	-0.2	-0.3	-2.0	-5.2	-9.9	-15.9	-22.9	-30.3
-40	11027	10696	10510	10484	10617	10895	11283	11738	12210	12655	13044	13362	13614	13814	13987	14161	14365	14621	14947
	-69.5	-65.0	-58.8	-50.9	-42.1	-33.2	-25.2	-18.9	-14.7	-12.8	-12.7	-14.1	-16.4	-19.4	-23.0	-27.2	-31.9	-37.1	-42.5
-45	11600	11334	11205	11213	11345	11575	11865	12168	12441	12649	12772	12804	12756	12651	12517	12387	12290	12254	12300
	-62.8	-57.2	-50.7	-43.6	-36.6	-30.2	-25.4	-22.5	-21.8	-23.0	-25.6	-29.1	-32.7	-36.2	-39.4	-42.3	-45.0	-47.8	-50.7
-50	12667	12441	12330	12322	12397	12522	12659	12768	12812	12764	12613	12359	12018	11615	11179	10746	10346	10011	9765
	-55.8	-49.4	-43.0	-37.0	-31.8	-28.0	-26.0	-26.1	-28.1	-31.7	-36.1	-40.7	-44.9	-48.2	-50.5	-52.0	-52.8	-53.3	-53.9
-55	14065	13837	13690	13609	13567	13535	13477	13361	13158	12850	12431	11905	11290	10608	9892	9174	8487	7865	7333
	-48.2	-41.4	-35.3	-30.2	-26.6	-24.8	-24.9	-27.0	-30.6	-35.4	-40.5	-45.4	-49.5	-52.3	-53.9	-54.2	-53.8	-52.8	-51.9
-60	15578	15304	15075	14872	14672	14447	14170	13816	13365	12806	12135	11361	10498	9570	8605	7635	6693	5811	5018
	-39.5	-32.8	-27.2	-22.9	-20.3	-19.6	-20.7	-23.5	-27.6	-32.4	-37.3	-41.8	-45.4	-47.8	-49.0	-49.0	-48.2	-46.9	-45.6
-65	16951	16605	16266	15916	15536	15107	14608	14022	13337	12547	11651	10660	9586	8451	7281	6105	4953	3856	2843
	-30.0	-23.9	-18.8	-15.1	-13.0	-12.5	-13.6	-16.0	-19.4	-23.4	-27.5	-31.3	-34.4	-36.5	-37.7	-38.1	-37.8	-37.2	-36.6
-70	17931	17503	17045	16544	15988	15363	14658	13862	12970	11981	10897	9729	8489	7197	5875	4548	3244	1989	810
	-20.3	-15.1	-10.7	-7.5	-5.4	-4.7	-5.1	-6.6	-8.9	-11.6	-14.6	-17.5	-20.0	-22.1	-23.7	-24.8	-25.5	-26.1	-26.7
-75	18292	17785	17215	16576	15861	15065	14183	13212	12151	11004	9777	8480	7126	5731	4315	2898	1503	153	-1131
	-11.3	-7.3	-3.8	-1.0	1.0	2.1	2.4	1.9	0.8	-0.8	-2.6	-4.7	-6.8	-8.8	-10.7	-12.4	-14.1	-15.8	-17.4
-80	17866	17287	16619	15863	15018	14084	13064	11960	10776	9520	8199	6824	5408	3964	2509	1060	-367	-1753	-3081
	-3.7	-0.9	1.5	3.6	5.2	6.3	6.9	7.1	6.7	6.0	4.9	3.6	2.0	0.2	-1.7	-3.6	-5.7	-7.8	-9.9
-85	16553	15907	15159	14312	13371	12342	11229	10040	8783	7467	6102	4699	3269	1824	377	-1058	-2468	-3841	-5162
	2.5	3.8	5.0	6.1	7.0	7.6	8.0	8.1	8.0	7.6	7.0	6.1	5.0	3.8	2.4	0.8	-0.8	-2.5	-4.2
-90	14330	13625	12816	11910	10913	9833	8678	7457	6180	4855	3494	2105	701	-708	-2112	-3500	-4862	-6186	-7464
	7.4	7.3	7.3	7.1	7.0	6.7	6.5	6.1	5.8	5.3	4.9	4.4	3.8	3.3	2.7	2.1	1.5	0.8	0.2

IGRF 1980 NORTH COMPONENT (X)

LONG / LAT	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180
0	38583	38988	39257	39389	39387	39264	39035	38716	38326	37878	37391	36883	36377	35892	35445	35044	34688	34368	34069
	15.5	20.0	23.8	26.2	26.6	24.8	20.9	15.3	9.1	3.2	-1.7	-5.3	-7.6	-8.9	-10.1	-11.6	-13.8	-16.8	-20.3
-5	36312	36885	37343	37673	37872	37944	37900	37758	37536	37254	36932	36588	36240	35903	35592	35314	35066	34837	34610
	20.8	23.1	24.8	25.3	24.0	20.5	14.8	7.5	-0.4	-7.8	-13.7	-17.6	-19.4	-19.7	-19.4	-19.0	-19.3	-20.5	-22.3
-10	33516	34256	34901	35433	35837	36108	36250	36279	36217	36090	35919	35723	35518	35316	35127	34956	34802	34654	34492
	22.0	21.5	20.8	19.4	16.7	12.2	6.0	-1.6	-9.7	-17.2	-23.0	-26.6	-28.0	-27.6	-26.3	-24.8	-23.7	-23.4	-23.8
-15	30387	31255	32053	32755	33338	33783	34090	34269	34344	34346	34300	34228	34144	34057	33975	33901	33832	33758	33662
	18.4	15.1	11.9	8.7	5.0	0.5	-5.1	-11.6	-18.3	-24.3	-29.0	-31.7	-32.5	-31.8	-30.1	-28.1	-26.4	-25.3	-24.7
-20	27112	28041	28927	29741	30448	31023	31455	31752	31937	32041	32094	32120	32135	32146	32158	32172	32186	32189	32167
	10.1	4.3	-1.0	-5.6	-9.6	-13.5	-17.5	-21.8	-25.9	-29.6	-32.2	-33.6	-33.6	-32.6	-31.0	-29.2	-27.6	-26.2	-25.2
-25	23849	24757	25651	26499	27263	27911	28424	28805	29072	29256	29388	29495	29591	29687	29785	29885	29984	30072	30138
	-1.9	-9.4	-16.0	-21.2	-25.2	-28.0	-30.1	-31.7	-32.9	-33.7	-34.0	-33.6	-32.8	-31.6	-30.2	-28.9	-27.7	-26.6	-25.5
-30	20707	21512	22332	23137	23887	24549	25100	25533	25863	26115	26318	26496	26668	26842	27023	27209	27396	27578	27743
	-16.1	-24.0	-30.9	-36.1	-39.5	-41.2	-41.5	-40.8	-39.4	-37.6	-35.6	-33.7	-31.9	-30.5	-29.4	-28.5	-27.8	-27.0	-26.1
-35	17740	18371	19045	19736	20411	21036	21584	22045	22425	22741	23014	23267	23516	23770	24034	24309	24590	24870	25140
	-30.3	-37.4	-43.4	-47.9	-50.6	-51.3	-50.4	-48.2	-45.1	-41.7	-38.2	-35.2	-32.7	-30.9	-29.8	-29.0	-28.5	-27.9	-27.3
-40	14947	15350	15823	16347	16897	17440	17954	18421	18840	19216	19564	19899	20232	20573	20927	21293	21669	22050	22425
	-42.5	-47.6	-52.1	-55.4	-57.2	-57.4	-56.0	-53.4	-49.9	-45.9	-42.0	-38.5	-35.6	-33.5	-32.0	-31.1	-30.4	-29.7	-29.0
-45	12300	12439	12674	12993	13378	13805	14252	14701	15142	15571	15992	16412	16836	17270	17717	18179	18651	19129	19603
	-50.7	-53.5	-56.0	-58.0	-59.1	-59.1	-58.0	-56.0	-53.1	-49.7	-46.3	-43.0	-40.1	-37.7	-35.9	-34.3	-33.1	-31.9	-30.9
-50	9765	9626	9601	9689	9881	10160	10508	10907	11341	11800	12279	12773	13283	13809	14349	14903	15468	16035	16599
	-53.9	-54.5	-55.4	-56.2	-56.9	-57.1	-56.8	-55.9	-54.3	-52.3	-49.9	-47.4	-44.8	-42.4	-40.1	-37.9	-35.9	-34.1	-32.5
-55	7333	6915	6625	6470	6449	6551	6765	7073	7459	7908	8408	8948	9520	10117	10736	11370	12013	12659	13299
	-51.9	-51.2	-51.0	-51.2	-51.8	-52.5	-53.1	-53.5	-53.4	-52.8	-51.7	-50.1	-48.1	-45.8	-43.2	-40.5	-37.8	-35.2	-32.9
-60	5018	4340	3796	3399	3152	3055	3100	3273	3561	3946	4413	4947	5534	6164	6826	7511	8210	8914	9614
	-45.6	-44.7	-44.3	-44.5	-45.3	-46.5	-47.9	-49.3	-50.4	-51.0	-50.9	-50.2	-48.8	-46.7	-44.0	-41.0	-37.8	-34.7	-31.8
-65	2843	1941	1169	545	77	-230	-380	-381	-242	20	391	855	1396	2000	2654	3346	4064	4798	5539
	-36.6	-36.3	-36.4	-37.1	-38.3	-40.0	-42.0	-43.9	-45.6	-46.9	-47.4	-47.3	-46.3	-44.5	-42.0	-39.0	-35.7	-32.3	-29.0
-70	810	-268	-1225	-2045	-2714	-3226	-3579	-3776	-3824	-3733	-3514	-3182	-2751	-2235	-1647	-1001	-307	423	1180
	-26.7	-27.4	-28.5	-29.9	-31.6	-33.6	-35.7	-37.8	-39.6	-40.9	-41.7	-41.7	-41.0	-39.6	-37.4	-34.7	-31.6	-28.4	-25.1
-75	-1131	-2327	-3417	-4385	-5218	-5909	-6451	-6844	-7089	-7192	-7160	-7001	-6727	-6347	-5875	-5319	-4691	-4000	-3254
	-17.4	-19.2	-21.0	-23.0	-25.1	-27.2	-29.2	-31.0	-32.6	-33.7	-34.4	-34.4	-33.9	-32.7	-31.0	-28.8	-26.2	-23.4	-20.5
-80	-3081	-4335	-5499	-6561	-7508	-8332	-9025	-9584	-10006	-10292	-10443	-10465	-10361	-10138	-9803	-9364	-8827	-8201	-7492
	-9.9	-12.0	-14.2	-16.3	-18.3	-20.2	-21.9	-23.4	-24.6	-25.5	-25.9	-26.0	-25.6	-24.8	-23.6	-22.0	-20.2	-18.2	-16.0
-85	-5162	-6421	-7604	-8702	-9704	-10601	-11388	-12056	-12603	-13025	-13319	-13487	-13527	-13442	-13234	-12907	-12466	-11915	-11260
	-4.2	-6.0	-7.7	-9.3	-10.8	-12.2	-13.5	-14.6	-15.4	-16.0	-16.4	-16.6	-16.5	-16.2	-15.6	-14.8	-13.9	-12.8	-11.7
-90	-7464	-8684	-9839	-10918	-11915	-12821	-13629	-14333	-14929	-15410	-15775	-16019	-16142	-16142	-16019	-15774	-15408	-14926	-14330
	0.2	-0.4	-1.1	-1.7	-2.3	-2.9	-3.5	-4.1	-4.6	-5.1	-5.5	-5.9	-6.3	-6.6	-6.8	-7.1	-7.2	-7.3	-7.4

IGRF 1980 NORTH COMPONENT (X)

LONG / LAT	180	-175	-170	-165	-160	-155	-150	-145	-140	-135	-130	-125	-120	-115	-110	-105	-100	-95	-90
0	34069	33780	33490	33197	32904	32619	32349	32103	31888	31707	31561	31445	31350	31260	31156	31016	30822	30560	30227
	-20.3	-23.8	-27.1	-29.8	-32.2	-34.4	-37.0	-40.2	-44.1	-48.4	-52.6	-56.0	-58.2	-59.0	-58.6	-57.6	-56.7	-56.6	-57.6
-5	34610	34366	34090	33777	33433	33071	32708	32356	32027	31726	31457	31219	31010	30823	30645	30461	30250	29993	29679
	-22.3	-24.7	-27.2	-29.9	-32.7	-35.8	-39.2	-42.9	-46.4	-49.3	-51.1	-51.3	-50.0	-47.6	-44.8	-42.3	-40.9	-41.2	-43.1
-10	34492	34294	34045	33739	33381	32989	32583	32177	31785	31410	31057	30727	30425	30151	29901	29665	29425	29160	28850
	-23.8	-24.9	-26.6	-28.9	-31.6	-34.9	-38.5	-41.9	-44.5	-45.7	-44.9	-42.2	-38.1	-33.3	-29.0	-26.1	-25.2	-26.4	-29.6
-15	33662	33522	33322	33056	32731	32365	31976	31581	31187	30797	30411	30033	29668	29326	29009	28715	28430	28136	27812
	-24.7	-24.8	-25.6	-27.1	-29.4	-32.2	-35.3	-37.8	-39.1	-38.3	-35.3	-30.4	-24.5	-18.7	-14.2	-12.0	-12.3	-15.1	-19.7
-20	32167	32101	31977	31788	31542	31254	30940	30612	30273	29922	29554	29171	28780	28394	28021	27669	27331	26995	26643
	-25.2	-24.6	-24.6	-25.3	-26.7	-28.8	-30.8	-32.1	-31.9	-29.5	-25.0	-18.9	-12.3	-6.7	-3.1	-2.3	-4.4	-8.9	-14.9
-25	30138	30164	30140	30059	29927	29755	29554	29332	29087	28813	28501	28151	27769	27367	26961	26565	26183	25810	25434
	-25.5	-24.6	-24.1	-24.1	-24.8	-25.8	-26.8	-26.9	-25.5	-22.2	-17.0	-10.8	-4.7	-0.1	2.1	1.2	-2.6	-8.4	-15.4
-30	27743	27877	27969	28015	28015	27976	27905	27804	27668	27489	27255	26965	26621	26239	25837	25433	25039	24660	24289
	-26.1	-25.2	-24.5	-24.1	-24.2	-24.6	-24.8	-24.2	-22.3	-18.8	-13.9	-8.4	-3.5	-0.3	0.3	-1.9	-6.6	-13.1	-20.3
-35	25140	25388	25603	25778	25910	26003	26057	26072	26043	25960	25815	25603	25330	25009	24659	24302	23953	23622	23303
	-27.3	-26.5	-25.8	-25.4	-25.4	-25.6	-25.6	-24.9	-23.2	-20.3	-16.4	-12.3	-8.8	-7.0	-7.4	-10.2	-15.1	-21.2	-27.8
-40	22425	22784	23115	23409	23662	23871	24035	24153	24221	24231	24181	24068	23899	23686	23447	23202	22966	22747	22541
	-29.0	-28.3	-27.8	-27.6	-27.7	-28.1	-28.5	-28.4	-27.5	-25.8	-23.4	-20.8	-18.8	-17.9	-18.8	-21.3	-25.4	-30.3	-35.7
-45	19603	20063	20497	20894	21249	21558	21817	22027	22187	22296	22355	22366	22337	22280	22210	22140	22082	22036	21995
	-30.9	-30.1	-29.7	-29.7	-30.2	-31.0	-32.0	-32.8	-33.1	-32.7	-31.8	-30.7	-29.8	-29.5	-30.2	-31.9	-34.7	-38.0	-41.8
-50	16599	17147	17668	18155	18598	18995	19344	19648	19910	20133	20324	20490	20638	20779	20922	21075	21239	21408	21569
	-32.5	-31.3	-30.7	-30.7	-31.4	-32.6	-34.1	-35.7	-37.0	-37.8	-38.1	-38.0	-37.8	-37.8	-38.1	-39.0	-40.4	-42.3	-44.7
-55	13299	13922	14521	15087	15614	16101	16549	16962	17346	17710	18062	18412	18766	19132	19513	19908	20312	20711	21085
	-32.9	-31.2	-30.1	-29.8	-30.3	-31.5	-33.2	-35.0	-36.8	-38.3	-39.3	-39.9	-40.1	-40.2	-40.2	-40.5	-41.0	-42.0	-43.6
-60	9614	10303	10972	11616	12232	12820	13384	13928	14462	14993	15532	16085	16659	17255	17872	18503	19136	19753	20330
	-31.8	-29.4	-27.7	-26.8	-26.7	-27.4	-28.6	-30.1	-31.8	-33.3	-34.5	-35.4	-35.8	-36.1	-36.1	-36.3	-36.7	-37.5	-39.0
-65	5539	6281	7016	7741	8454	9158	9855	10551	11254	11970	12706	13466	14253	15065	15895	16733	17564	18368	19123
	-29.0	-26.2	-23.8	-22.2	-21.3	-21.0	-21.4	-22.1	-23.1	-24.1	-25.1	-25.9	-26.5	-27.0	-27.4	-28.0	-28.8	-30.0	-31.9
-70	1180	1958	2751	3556	4371	5197	6037	6892	7769	8668	9594	10547	11524	12521	13528	14534	15524	16479	17381
	-25.1	-22.0	-19.3	-17.1	-15.3	-14.2	-13.5	-13.3	-13.4	-13.8	-14.3	-14.9	-15.5	-16.3	-17.1	-18.2	-19.6	-21.4	-23.7
-75	-3254	-2461	-1625	-752	156	1098	2071	3076	4111	5176	6268	7384	8518	9663	10810	11946	13059	14134	15156
	-20.5	-17.7	-15.0	-12.5	-10.4	-8.7	-7.3	-6.4	-5.8	-5.5	-5.6	-5.9	-6.5	-7.3	-8.4	-9.8	-11.5	-13.6	-15.9
-80	-7492	-6707	-5853	-4934	-3957	-2926	-1847	-723	440	1636	2859	4102	5358	6618	7872	9110	10321	11493	12616
	-16.0	-13.8	-11.5	-9.4	-7.5	-5.8	-4.3	-3.1	-2.2	-1.6	-1.4	-1.4	-1.8	-2.4	-3.3	-4.5	-6.0	-7.6	-9.5
-85	-11260	-10506	-9661	-8730	-7721	-6641	-5498	-4300	-3054	-1770	-457	877	2223	3570	4908	6229	7522	8777	9985
	-11.7	-10.4	-9.1	-7.9	-6.7	-5.5	-4.5	-3.6	-2.8	-2.2	-1.8	-1.6	-1.6	-1.7	-2.0	-2.5	-3.0	-3.7	-4.4
-90	-14330	-13625	-12816	-11910	-10913	-9833	-8678	-7458	-6180	-4855	-3494	-2106	-701	708	2112	3500	4862	6186	7464
	-7.4	-7.3	-7.3	-7.1	-7.0	-6.7	-6.5	-6.1	-5.8	-5.3	-4.9	-4.4	-3.8	-3.3	-2.7	-2.1	-1.5	-0.8	-0.2

IGRF 1980 NORTH COMPONENT (X)

LONG / LAT	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
0	30227	29826	29371	28882	28381	27891	27434	27026	26678	26395	26180	26035	25965	25980	26095	26321	26662	27111	27643
	-57.6	-59.7	-62.3	-64.6	-65.9	-65.5	-63.4	-59.7	-55.2	-50.6	-46.6	-43.6	-41.5	-40.1	-38.7	-37.1	-35.0	-32.6	-30.4
-5	29679	29301	28863	28376	27854	27314	26770	26234	25714	25217	24750	24326	23966	23697	23551	23550	23703	23998	24400
	-43.1	-46.4	-50.6	-54.9	-58.8	-61.9	-64.0	-65.2	-65.5	-65.4	-64.9	-64.3	-63.5	-62.5	-61.2	-59.6	-57.7	-55.6	-53.6
-10	28850	28483	28052	27560	27013	26422	25798	25148	24482	23807	23135	22487	21891	21384	21005	20784	20727	20822	21029
	-29.6	-34.2	-39.6	-45.5	-51.4	-57.2	-62.7	-67.8	-72.2	-75.7	-78.0	-79.2	-79.2	-78.4	-77.2	-75.8	-74.5	-73.2	-71.9
-15	27812	27438	27004	26501	25931	25299	24611	23875	23102	22301	21489	20689	19932	19255	18697	18283	18020	17893	17873
	-19.7	-25.5	-31.9	-38.7	-45.8	-53.3	-61.1	-68.8	-75.9	-81.7	-85.6	-87.7	-88.0	-87.2	-86.0	-84.9	-84.3	-83.9	-83.4
-20	26643	26254	25812	25303	24721	24066	23340	22552	21714	20840	19950	19067	18221	17442	16762	16198	15756	15425	15187
	-14.9	-21.6	-28.6	-35.8	-43.4	-51.6	-60.3	-69.2	-77.4	-84.0	-88.5	-90.6	-90.7	-89.6	-88.3	-87.6	-87.6	-88.0	-88.0
-25	25434	25037	24598	24099	23526	22872	22137	21329	20463	19557	18634	17717	16833	16004	15251	14586	14012	13526	13122
	-15.4	-22.6	-29.8	-37.0	-44.4	-52.4	-61.0	-69.8	-77.9	-84.3	-88.4	-89.9	-89.5	-88.1	-86.6	-86.0	-86.2	-86.9	-87.1
-30	24289	23909	23499	23035	22498	21872	21155	20354	19484	18570	17637	16711	15815	14966	14178	13457	12808	12234	11743
	-20.3	-27.5	-34.4	-41.1	-48.0	-55.3	-63.2	-71.2	-78.4	-83.9	-87.2	-88.1	-87.1	-85.2	-83.5	-82.6	-82.6	-82.9	-82.5
-35	23303	22984	22640	22243	21768	21195	20517	19741	18884	17973	17040	16111	15211	14356	13557	12819	12149	11556	11054
	-27.8	-34.3	-40.5	-46.5	-52.7	-59.3	-66.3	-73.3	-79.4	-84.0	-86.5	-86.8	-85.4	-83.2	-81.0	-79.5	-78.6	-77.8	-76.2
-40	22541	22331	22093	21794	21406	20907	20286	19551	18720	17823	16896	15969	15070	14217	13423	12697	12046	11484	11027
	-35.7	-41.0	-46.3	-51.5	-57.1	-63.0	-69.4	-75.5	-80.9	-84.9	-86.9	-86.9	-85.3	-82.8	-80.0	-77.4	-75.0	-72.6	-69.5
-45	21995	21940	21842	21669	21390	20983	20439	19764	18979	18116	17211	16300	15414	14576	13803	13107	12500	11993	11600
	-41.8	-45.9	-50.1	-54.7	-59.8	-65.5	-71.4	-77.2	-82.2	-85.9	-87.8	-87.8	-86.1	-83.2	-79.6	-75.8	-71.8	-67.6	-62.8
-50	21569	21698	21765	21738	21588	21295	20853	20268	19561	18764	17915	17050	16204	15404	14671	14019	13462	13009	12667
	-44.7	-47.6	-51.1	-55.3	-60.2	-65.7	-71.5	-77.2	-82.1	-85.7	-87.7	-87.7	-86.0	-82.8	-78.5	-73.5	-67.9	-62.0	-55.8
-55	21085	21409	21652	21785	21783	21630	21320	20862	20277	19594	18848	18076	17310	16581	15909	15313	14803	14387	14065
	-43.6	-46.0	-49.1	-53.1	-57.9	-63.4	-69.1	-74.6	-79.5	-83.0	-85.0	-85.0	-83.2	-79.7	-74.8	-68.9	-62.2	-55.2	-48.2
-60	20330	20842	21261	21562	21724	21735	21592	21304	20888	20370	19780	19151	18512	17889	17305	16775	16309	15910	15578
	-39.0	-41.3	-44.4	-48.4	-53.1	-58.4	-63.9	-69.1	-73.5	-76.7	-78.4	-78.3	-76.3	-72.6	-67.5	-61.1	-54.1	-46.7	-39.5
-65	19123	19805	20391	20860	21197	21393	21446	21362	21156	20848	20459	20016	19543	19060	18586	18134	17710	17317	16951
	-31.9	-34.4	-37.7	-41.6	-46.1	-51.0	-55.8	-60.3	-64.0	-66.6	-67.7	-67.3	-65.2	-61.5	-56.5	-50.4	-43.7	-36.7	-30.0
-70	17381	18210	18949	19582	20096	20486	20748	20888	20913	20837	20674	20441	20155	19830	19479	19111	18730	18338	17931
	-23.7	-26.5	-29.8	-33.5	-37.5	-41.5	-45.4	-48.8	-51.5	-53.2	-53.7	-52.9	-50.8	-47.5	-43.0	-37.8	-32.0	-26.0	-20.3
-75	15156	16112	16987	17770	18452	19027	19492	19847	20097	20246	20302	20274	20170	19999	19766	19478	19136	18741	18292
	-15.9	-18.6	-21.5	-24.6	-27.7	-30.6	-33.3	-35.5	-37.1	-37.9	-37.9	-36.9	-35.0	-32.2	-28.7	-24.6	-20.2	-15.7	-11.3
-80	12616	13679	14671	15585	16411	17145	17782	18319	18755	19090	19325	19463	19505	19454	19312	19082	18764	18358	17866
	-9.5	-11.4	-13.4	-15.4	-17.4	-19.1	-20.5	-21.6	-22.2	-22.4	-21.9	-21.0	-19.5	-17.5	-15.1	-12.4	-9.5	-6.6	-3.7
-85	9985	11138	12225	13241	14176	15024	15781	16439	16997	17449	17793	18027	18151	18162	18061	17849	17526	17093	16553
	-4.4	-5.2	-5.9	-6.6	-7.2	-7.7	-8.0	-8.1	-8.1	-7.8	-7.3	-6.5	-5.6	-4.5	-3.2	-1.9	-0.4	1.0	2.5
-90	7464	8684	9839	10918	11915	12820	13629	14333	14929	15410	15775	16019	16142	16142	16018	15773	15408	14926	14330
	-0.2	0.4	1.1	1.7	2.3	2.9	3.5	4.1	4.6	5.1	5.5	5.9	6.3	6.6	6.8	7.1	7.2	7.3	7.4

IGRF 1980 EAST COMPONENT (Y)

LONG / LAT	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
90	-1342	-1170	-990	-803	-609	-410	-209	-6	198	399	598	792	980	1161	1333	1494	1644	1782	1906
	21.0	20.2	19.4	18.3	17.1	15.8	14.4	12.8	11.2	9.5	7.7	5.8	3.9	2.0	0.0	-1.9	-3.8	-5.7	-7.6
85	-1503	-1136	-762	-387	-18	338	675	987	1270	1520	1733	1906	2038	2130	2181	2193	2170	2115	2033
	26.0	25.2	24.0	22.6	20.9	19.0	16.8	14.5	12.1	9.5	6.9	4.2	1.6	-1.0	-3.5	-5.9	-8.1	-10.2	-12.1
80	-1706	-1190	-666	-147	360	844	1295	1706	2069	2375	2620	2797	2905	2942	2908	2805	2640	2418	2150
	30.8	29.9	28.6	26.8	24.7	22.2	19.5	16.5	13.3	10.1	6.7	3.4	0.2	-2.9	-5.8	-8.5	-11.0	-13.2	-15.0
75	-1899	-1280	-656	-40	559	1131	1665	2150	2578	2939	3223	3423	3532	3546	3462	3282	3010	2655	2230
	35.1	34.1	32.6	30.5	28.0	25.1	21.8	18.2	14.5	10.7	6.9	3.1	-0.5	-3.9	-7.0	-9.8	-12.3	-14.4	-16.1
70	-2036	-1355	-676	-9	637	1252	1828	2354	2822	3221	3540	3768	3893	3908	3805	3582	3241	2791	2244
	38.7	37.6	35.9	33.5	30.6	27.2	23.4	19.4	15.2	11.0	6.9	2.9	-0.8	-4.1	-7.2	-9.8	-12.0	-13.9	-15.4
65	-2095	-1382	-681	-1	652	1269	1847	2377	2853	3265	3602	3849	3993	4020	3919	3682	3307	2799	2173
	41.8	40.5	38.5	35.9	32.5	28.7	24.4	19.9	15.3	10.8	6.5	2.5	-1.0	-4.1	-6.7	-8.9	-10.7	-12.1	-13.2
60	-2078	-1353	-652	16	646	1235	1782	2282	2734	3130	3460	3709	3862	3901	3811	3578	3198	2670	2007
	44.5	43.1	40.8	37.8	34.0	29.6	24.9	19.9	14.9	10.2	5.8	2.0	-1.3	-4.0	-6.0	-7.6	-8.7	-9.5	-10.1
55	-2014	-1285	-595	48	641	1184	1678	2126	2528	2881	3178	3405	3548	3587	3506	3288	2923	2408	1750
	47.2	45.6	43.1	39.7	35.5	30.6	25.3	19.7	14.4	9.4	5.0	1.3	-1.7	-3.9	-5.4	-6.3	-6.7	-6.9	-6.9
50	-1943	-1213	-536	80	634	1126	1562	1948	2286	2577	2818	2998	3107	3127	3044	2841	2506	2031	1419
	49.9	48.3	45.7	42.1	37.5	32.0	26.1	20.0	14.3	9.0	4.6	0.9	-1.9	-3.8	-5.0	-5.4	-5.3	-4.8	-4.3
45	-1902	-1171	-505	89	609	1058	1442	1768	2041	2261	2429	2541	2591	2571	2470	2278	1981	1570	1039
	52.9	51.5	49.0	45.2	40.3	34.3	27.8	21.2	15.1	9.6	5.0	1.3	-1.5	-3.5	-4.6	-5.0	-4.6	-3.8	-2.9
40	-1919	-1183	-524	52	547	966	1314	1594	1809	1958	2045	2071	2043	1961	1829	1641	1389	1060	639
	56.0	55.0	52.8	49.2	44.0	37.6	30.6	23.6	17.2	11.6	6.9	3.0	-0.2	-2.6	-4.3	-5.0	-4.9	-4.1	-3.0
35	-2008	-1264	-609	-45	436	839	1169	1422	1592	1677	1680	1612	1491	1335	1160	973	770	537	249
	59.1	58.7	57.1	53.8	48.6	42.0	34.7	27.4	20.8	15.1	10.3	6.2	2.4	-0.9	-3.6	-5.4	-6.1	-5.7	-4.7
30	-2173	-1417	-766	-211	263	667	997	1242	1385	1415	1337	1171	952	715	495	310	163	35	-106
	61.7	62.3	61.5	58.8	53.9	47.3	39.8	32.4	25.7	20.1	15.3	10.7	6.2	1.6	-2.7	-6.1	-8.0	-8.4	-7.9
25	-2417	-1649	-1000	-451	26	443	792	1047	1176	1161	1007	746	430	116	-145	-321	-407	-421	-408
	63.7	65.3	65.6	63.9	59.6	53.2	45.7	38.2	31.6	26.0	21.1	16.2	10.7	4.6	-1.6	-6.9	-10.5	-12.2	-12.3
20	-2743	-1964	-1319	-770	-280	165	548	826	951	898	674	325	-79	-461	-753	-912	-928	-826	-657
	64.6	67.4	69.2	68.6	65.3	59.4	52.0	44.4	37.7	32.1	27.1	21.7	15.2	7.4	-0.8	-8.2	-13.8	-16.8	-17.6
15	-3154	-2372	-1727	-1169	-653	-165	263	571	696	607	318	-112	-593	-1029	-1338	-1470	-1412	-1192	-873
	64.5	68.5	71.9	72.9	70.7	65.4	58.1	50.3	43.3	37.4	32.0	26.1	18.6	9.4	-0.7	-10.2	-17.6	-22.0	-23.6
10	-3647	-2869	-2221	-1641	-1083	-542	-64	272	393	265	-89	-593	-1139	-1615	-1929	-2025	-1890	-1556	-1094
	63.3	68.7	73.8	76.5	75.5	70.8	63.4	55.2	47.5	40.9	34.9	28.4	20.1	9.8	-1.8	-13.1	-22.1	-27.7	-29.9
5	-4199	-3435	-2777	-2163	-1552	-953	-432	-81	21	-157	-579	-1152	-1752	-2255	-2564	-2619	-2408	-1967	-1373
	61.5	68.1	74.8	79.2	79.4	75.2	67.5	58.4	49.5	41.8	34.9	27.7	18.8	7.9	-4.6	-16.8	-26.9	-33.4	-36.0
0	-4768	-4025	-3352	-2696	-2029	-1383	-839	-499	-442	-689	-1187	-1827	-2472	-2993	-3288	-3300	-3018	-2478	-1764
	59.4	67.1	75.2	81.0	82.1	78.0	69.6	59.2	48.7	39.5	31.5	23.7	14.6	3.7	-8.8	-21.2	-31.7	-38.5	-41.2

IGRF 1980 EAST COMPONENT (Y)

LONG / LAT	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180
90	1906	2016	2110	2189	2250	2295	2322	2331	2323	2297	2253	2193	2115	2022	1913	1789	1652	1503	1342
	-7.6	-9.4	-11.1	-12.8	-14.3	-15.8	-17.1	-18.3	-19.3	-20.2	-21.0	-21.5	-22.0	-22.2	-22.3	-22.2	-22.0	-21.6	-21.0
85	2033	1930	1810	1681	1548	1417	1295	1186	1095	1024	976	951	949	969	1008	1062	1126	1195	1263
	-12.1	-13.7	-15.2	-16.5	-17.5	-18.3	-18.9	-19.3	-19.5	-19.6	-19.5	-19.3	-19.0	-18.6	-18.2	-17.7	-17.2	-16.6	-16.1
80	2150	1846	1519	1183	852	539	259	23	-158	-278	-330	-314	-229	-82	123	374	662	971	1289
	-15.0	-16.6	-17.8	-18.7	-19.4	-19.7	-19.7	-19.5	-19.1	-18.5	-17.8	-17.0	-16.1	-15.2	-14.3	-13.5	-12.8	-12.2	-11.8
75	2230	1749	1234	704	183	-305	-739	-1098	-1365	-1528	-1578	-1513	-1334	-1050	-673	-217	297	848	1413
	-16.1	-17.5	-18.6	-19.3	-19.6	-19.6	-19.3	-18.8	-18.0	-17.0	-15.9	-14.7	-13.5	-12.3	-11.1	-10.2	-9.4	-8.8	-8.5
70	2244	1621	947	251	-436	-1080	-1649	-2115	-2454	-2647	-2684	-2561	-2284	-1863	-1317	-668	56	827	1613
	-15.4	-16.6	-17.4	-17.9	-18.1	-18.1	-17.7	-17.1	-16.3	-15.3	-14.1	-12.9	-11.6	-10.3	-9.1	-8.1	-7.2	-6.7	-6.5
65	2173	1449	657	-168	-985	-1752	-2427	-2974	-3362	-3567	-3577	-3390	-3013	-2464	-1766	-950	-49	900	1862
	-13.2	-14.0	-14.6	-15.1	-15.3	-15.3	-15.2	-14.8	-14.2	-13.5	-12.6	-11.6	-10.6	-9.5	-8.4	-7.5	-6.6	-6.1	-5.8
60	2007	1229	367	-538	-1439	-2288	-3033	-3630	-4040	-4238	-4209	-3954	-3483	-2820	-1996	-1049	-18	1057	2135
	-10.1	-10.5	-10.9	-11.3	-11.7	-12.0	-12.2	-12.3	-12.2	-11.9	-11.5	-11.0	-10.4	-9.7	-9.0	-8.3	-7.5	-6.8	-6.4
55	1750	968	90	-841	-1777	-2662	-3438	-4052	-4462	-4636	-4559	-4234	-3678	-2920	-2000	-961	150	1292	2423
	-6.9	-6.9	-7.1	-7.6	-8.2	-8.9	-9.6	-10.1	-10.5	-10.6	-10.7	-10.7	-10.7	-10.6	-10.4	-10.0	-9.4	-8.5	-7.8
50	1419	682	-158	-1062	-1981	-2856	-3625	-4229	-4617	-4754	-4625	-4234	-3603	-2771	-1783	-692	453	1606	2729
	-4.3	-4.0	-4.0	-4.6	-5.6	-6.8	-7.9	-8.9	-9.6	-9.9	-10.2	-10.5	-10.9	-11.4	-11.8	-12.0	-11.6	-10.7	-9.5
45	1039	391	-360	-1186	-2040	-2865	-3594	-4162	-4512	-4604	-4422	-3971	-3280	-2392	-1364	-254	884	2002	3064
	-2.9	-2.3	-2.3	-3.1	-4.5	-6.3	-8.0	-9.2	-9.8	-10.0	-9.9	-10.1	-10.6	-11.5	-12.5	-13.2	-13.2	-12.4	-10.9
40	639	118	-503	-1208	-1958	-2698	-3360	-3871	-4170	-4211	-3977	-3475	-2736	-1814	-769	333	1431	2477	3437
	-3.0	-2.3	-2.3	-3.4	-5.4	-7.8	-10.0	-11.3	-11.6	-10.9	-9.9	-9.2	-9.2	-10.1	-11.6	-13.0	-13.6	-13.1	-11.5
35	249	-117	-578	-1130	-1746	-2376	-2949	-3387	-3624	-3611	-3327	-2783	-2014	-1074	-34	1037	2071	3018	3848
	-4.7	-4.0	-4.2	-5.7	-8.3	-11.4	-14.0	-15.3	-14.8	-12.8	-10.1	-7.8	-6.7	-7.1	-8.8	-10.7	-12.1	-12.1	-10.9
30	-106	-300	-580	-962	-1428	-1931	-2400	-2755	-2921	-2850	-2521	-1945	-1160	-223	794	1815	2769	3603	4286
	-7.9	-7.3	-7.7	-9.6	-12.8	-16.6	-19.6	-20.6	-19.0	-15.3	-10.4	-5.9	-3.1	-2.5	-4.0	-6.3	-8.4	-9.3	-8.8
25	-408	-423	-518	-722	-1032	-1403	-1762	-2025	-2116	-1985	-1613	-1016	-231	685	1660	2618	3483	4198	4733
	-12.3	-11.9	-12.5	-14.6	-18.3	-22.6	-25.8	-26.5	-23.8	-18.0	-10.7	-3.7	1.3	3.2	2.4	-0.2	-2.9	-4.7	-5.2
20	-657	-495	-406	-438	-594	-835	-1085	-1255	-1268	-1077	-668	-58	713	1592	2511	3395	4169	4770	5166
	-17.6	-17.5	-18.0	-20.1	-24.0	-28.4	-31.6	-31.8	-28.0	-20.4	-10.8	-1.3	5.9	9.4	9.4	7.0	3.8	1.2	-0.5
15	-873	-540	-278	-146	-158	-275	-420	-501	-440	-191	252	867	1614	2445	3299	4106	4791	5290	5569
	-23.6	-23.7	-23.9	-25.5	-29.0	-33.1	-35.9	-35.5	-30.7	-21.7	-10.3	1.2	10.2	15.2	16.2	14.3	11.0	7.7	4.9
10	-1094	-602	-177	108	231	229	181	184	316	617	1090	1707	2427	3205	3991	4722	5328	5744	5932
	-29.9	-29.9	-29.5	-30.3	-32.6	-35.8	-37.8	-36.7	-31.2	-21.3	-8.8	3.7	13.9	20.1	22.0	20.6	17.5	14.0	10.4
5	-1373	-732	-156	273	524	631	676	757	954	1305	1806	2425	3119	3849	4572	5235	5775	6129	6258
	-36.0	-35.7	-34.5	-33.9	-34.6	-36.2	-36.9	-34.9	-28.8	-18.8	-6.3	6.4	16.8	23.4	26.0	25.4	22.8	19.4	15.5
0	-1764	-988	-271	296	673	891	1030	1189	1449	1848	2378	3003	3680	4372	5044	5653	6143	6456	6557
	-41.2	-40.6	-38.4	-36.1	-34.8	-34.3	-33.3	-30.1	-23.8	-14.2	-2.5	9.2	18.9	25.3	28.2	28.2	26.4	23.5	19.6

IGRF 1980 EAST COMPONENT (Y)

LONG / LAT	180	-175	-170	-165	-160	-155	-150	-145	-140	-135	-130	-125	-120	-115	-110	-105	-100	-95	-90
90	1342	1170	990	803	609	410	209	6	-198	-399	-598	-792	-980	-1161	-1333	-1494	-1644	-1782	-1906
	-21.0	-20.2	-19.4	-18.3	-17.1	-15.8	-14.4	-12.8	-11.2	-9.5	-7.7	-5.8	-3.9	-2.0	0.0	1.9	3.8	5.7	7.6
85	1263	1324	1372	1400	1404	1378	1319	1225	1093	923	716	475	202	-97	-419	-755	-1100	-1446	-1785
	-16.1	-15.5	-15.0	-14.4	-13.8	-13.2	-12.6	-11.9	-11.2	-10.3	-9.4	-8.4	-7.3	-6.0	-4.6	-3.1	-1.5	0.3	2.2
80	1289	1599	1889	2144	2350	2497	2577	2582	2507	2353	2120	1812	1435	999	513	-10	-558	-1115	-1669
	-11.8	-11.5	-11.3	-11.3	-11.4	-11.6	-11.8	-12.0	-12.2	-12.3	-12.3	-12.0	-11.6	-11.0	-10.0	-8.8	-7.4	-5.6	-3.7
75	1413	1969	2492	2962	3358	3665	3868	3958	3929	3780	3511	3130	2647	2073	1424	719	-24	-784	-1540
	-8.5	-8.5	-8.7	-9.3	-10.1	-11.1	-12.1	-13.3	-14.4	-15.3	-16.1	-16.6	-16.7	-16.5	-15.9	-14.9	-13.5	-11.7	-9.4
70	1613	2385	3112	3767	4325	4765	5072	5232	5239	5091	4791	4347	3771	3079	2290	1425	509	-433	-1373
	-6.5	-6.7	-7.3	-8.3	-9.7	-11.4	-13.3	-15.4	-17.3	-19.1	-20.6	-21.6	-22.2	-22.4	-21.9	-21.0	-19.5	-17.5	-15.0
65	1862	2800	3682	4476	5155	5696	6080	6295	6333	6192	5876	5393	4756	3980	3088	2101	1047	-45	-1144
	-5.8	-6.0	-6.8	-8.1	-9.9	-12.3	-15.0	-17.8	-20.6	-23.1	-25.2	-26.8	-27.7	-28.1	-27.8	-26.9	-25.3	-23.2	-20.5
60	2135	3179	4156	5034	5785	6387	6822	7076	7142	7019	6707	6217	5558	4746	3799	2739	1592	387	-841
	-6.4	-6.3	-6.9	-8.3	-10.4	-13.2	-16.6	-20.2	-23.7	-26.9	-29.5	-31.5	-32.7	-33.2	-33.0	-32.3	-30.9	-28.8	-26.0
55	2423	3508	4515	5417	6190	6813	7269	7547	7639	7541	7257	6791	6152	5351	4401	3318	2126	850	-473
	-7.8	-7.3	-7.4	-8.5	-10.7	-13.8	-17.7	-22.0	-26.2	-29.9	-32.9	-35.1	-36.4	-37.1	-37.3	-36.9	-36.0	-34.3	-31.7
50	2729	3791	4767	5636	6380	6985	7435	7720	7832	7768	7526	7111	6526	5777	4870	3814	2623	1320	-62
	-9.5	-8.4	-7.9	-8.6	-10.6	-13.9	-18.3	-23.0	-27.7	-31.7	-34.8	-37.0	-38.4	-39.4	-40.0	-40.5	-40.5	-39.8	-37.9
45	3064	4048	4936	5720	6393	6943	7362	7639	7764	7733	7543	7194	6686	6019	5191	4200	3052	1763	362
	-10.9	-9.3	-8.2	-8.4	-10.2	-13.6	-18.2	-23.3	-28.1	-32.0	-34.8	-36.7	-38.1	-39.3	-40.8	-42.5	-44.1	-44.9	-44.3
40	3437	4297	5054	5711	6275	6743	7109	7363	7493	7490	7351	7073	6654	6085	5358	4462	3392	2155	773
	-11.5	-9.6	-8.1	-7.9	-9.7	-13.2	-18.0	-23.0	-27.5	-30.7	-32.7	-33.9	-35.0	-36.6	-39.3	-42.7	-46.4	-49.4	-50.7
35	3848	4553	5146	5647	6075	6440	6739	6958	7083	7102	7007	6796	6463	5998	5385	4603	3638	2485	1158
	-10.9	-9.0	-7.5	-7.5	-9.3	-13.1	-17.8	-22.5	-26.0	-27.9	-28.5	-28.5	-29.1	-31.2	-35.3	-41.0	-47.3	-53.0	-56.5
30	4286	4820	5232	5559	5838	6088	6310	6487	6598	6628	6568	6414	6162	5799	5304	4648	3805	2761	1518
	-8.8	-7.5	-6.6	-7.0	-9.4	-13.4	-18.0	-21.9	-23.9	-23.8	-22.2	-20.6	-20.6	-23.3	-29.1	-37.5	-46.8	-55.3	-61.3
25	4733	5095	5324	5476	5603	5736	5877	6008	6099	6130	6091	5982	5801	5534	5157	4632	3923	3003	1865
	-5.2	-5.0	-5.2	-6.7	-9.9	-14.4	-18.6	-21.2	-21.1	-18.4	-14.3	-10.9	-10.2	-13.7	-21.5	-32.6	-45.0	-56.4	-64.8
20	5166	5369	5430	5419	5405	5428	5493	5575	5639	5662	5633	5556	5434	5256	4992	4598	4026	3236	2211
	-0.5	-1.7	-3.3	-6.3	-10.7	-15.6	-19.4	-20.4	-17.9	-12.2	-5.5	-0.2	1.0	-3.4	-13.4	-27.3	-42.6	-56.5	-66.9
15	5569	5640	5559	5412	5279	5207	5203	5237	5271	5275	5244	5186	5111	5010	4850	4580	4140	3479	2566
	4.9	2.3	-1.0	-5.7	-11.3	-16.7	-19.9	-19.2	-14.1	-5.6	3.7	10.5	11.8	6.2	-6.0	-22.5	-40.1	-55.9	-67.8
10	5932	5905	5723	5476	5253	5108	5046	5036	5036	5015	4970	4918	4874	4833	4763	4602	4281	3738	2930
	10.4	6.5	1.6	-4.6	-11.4	-17.2	-19.7	-17.4	-9.9	1.0	12.3	20.0	20.9	13.9	-0.3	-18.9	-38.3	-55.2	-67.8
5	6258	6172	5931	5627	5350	5156	5051	5003	4966	4913	4845	4784	4754	4754	4750	4677	4456	4013	3297
	15.5	10.7	4.5	-2.9	-10.6	-16.6	-18.5	-14.8	-5.5	7.1	19.4	27.3	27.4	18.8	2.9	-17.2	-37.5	-54.6	-67.0
0	6557	6451	6193	5872	5575	5358	5225	5146	5075	4987	4888	4806	4771	4787	4823	4810	4664	4302	3663
	19.6	14.4	7.5	-0.7	-8.9	-14.8	-16.1	-11.5	-1.2	12.1	24.5	31.7	30.6	20.6	3.3	-17.4	-37.6	-54.1	-65.7

IGRF 1980 EAST COMPONENT (Y)

LAT \ LONG	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
90	-1906	-2016	-2110	-2189	-2250	-2295	-2322	-2331	-2323	-2297	-2253	-2193	-2115	-2022	-1913	-1789	-1652	-1503	-1342
	7.6	9.4	11.1	12.8	14.3	15.8	17.1	18.3	19.3	20.2	21.0	21.5	22.0	22.2	22.3	22.2	22.0	21.6	21.0
85	-1785	-2111	-2415	-2692	-2935	-3137	-3296	-3407	-3467	-3475	-3431	-3336	-3191	-3000	-2766	-2494	-2189	-1856	-1503
	2.2	4.1	6.2	8.3	10.4	12.5	14.6	16.7	18.6	20.4	22.0	23.5	24.7	25.6	26.3	26.7	26.8	26.6	26.0
80	-1669	-2204	-2708	-3168	-3573	-3914	-4183	-4375	-4485	-4514	-4461	-4329	-4123	-3847	-3510	-3118	-2680	-2206	-1706
	-3.7	-1.4	1.0	3.6	6.4	9.2	12.1	15.0	17.7	20.4	22.9	25.1	27.1	28.7	30.0	30.9	31.3	31.3	30.8
75	-1540	-2272	-2961	-3589	-4139	-4599	-4960	-5214	-5359	-5394	-5322	-5148	-4882	-4530	-4105	-3618	-3080	-2503	-1899
	-9.4	-6.9	-4.0	-0.8	2.6	6.2	9.9	13.6	17.2	20.7	23.9	26.9	29.5	31.7	33.4	34.6	35.3	35.5	35.1
70	-1373	-2285	-3144	-3926	-4609	-5176	-5616	-5919	-6085	-6114	-6013	-5792	-5463	-5041	-4539	-3973	-3358	-2708	-2036
	-15.0	-12.0	-8.6	-4.8	-0.6	3.8	8.3	12.9	17.3	21.5	25.5	29.0	32.1	34.7	36.7	38.1	39.0	39.2	38.7
65	-1144	-2217	-3232	-4158	-4967	-5636	-6148	-6494	-6672	-6687	-6550	-6276	-5883	-5391	-4819	-4186	-3511	-2809	-2095
	-20.5	-17.1	-13.1	-8.5	-3.4	1.9	7.5	13.0	18.4	23.4	27.9	31.9	35.2	37.9	40.0	41.4	42.2	42.4	41.8
60	-841	-2054	-3213	-4277	-5209	-5978	-6563	-6949	-7136	-7132	-6954	-6624	-6167	-5609	-4973	-4282	-3558	-2818	-2078
	-26.0	-22.3	-17.7	-12.3	-6.3	0.3	7.2	13.9	20.4	26.2	31.3	35.6	39.0	41.6	43.5	44.7	45.3	45.3	44.5
55	-473	-1802	-3088	-4283	-5337	-6209	-6867	-7296	-7493	-7470	-7252	-6868	-6351	-5733	-5041	-4303	-3539	-2771	-2014
	-31.7	-28.0	-23.1	-16.9	-9.6	-1.6	6.8	15.1	22.8	29.6	35.3	39.8	43.2	45.5	47.1	47.9	48.3	48.0	47.2
50	-62	-1477	-2872	-4186	-5357	-6332	-7069	-7545	-7758	-7724	-7473	-7044	-6478	-5810	-5075	-4298	-3503	-2712	-1943
	-37.9	-34.5	-29.4	-22.5	-14.0	-4.4	5.7	15.6	24.8	32.8	39.3	44.1	47.4	49.5	50.6	51.1	51.1	50.8	49.9
45	362	-1107	-2583	-3998	-5278	-6355	-7175	-7709	-7951	-7920	-7653	-7197	-6597	-5895	-5126	-4318	-3496	-2683	-1902
	-44.3	-41.8	-36.8	-29.4	-20.0	-8.9	2.8	14.5	25.4	34.7	42.2	47.5	51.0	52.9	53.7	54.0	53.9	53.6	52.9
40	773	-712	-2239	-3731	-5105	-6280	-7191	-7798	-8091	-8090	-7834	-7375	-6762	-6040	-5245	-4407	-3555	-2717	-1919
	-50.7	-49.4	-45.0	-37.6	-27.6	-15.5	-2.4	10.9	23.4	34.3	43.0	49.3	53.3	55.4	56.3	56.4	56.4	56.3	56.0
35	1158	-307	-1851	-3394	-4846	-6116	-7126	-7827	-8202	-8265	-8055	-7623	-7019	-6289	-5469	-4595	-3703	-2830	-2008
	-56.5	-56.9	-53.6	-46.7	-36.7	-24.3	-10.4	4.0	18.0	30.5	41.0	48.8	53.9	56.8	57.9	58.3	58.5	58.8	59.1
30	1518	105	-1426	-2995	-4509	-5870	-6991	-7810	-8299	-8465	-8339	-7967	-7394	-6663	-5815	-4894	-3947	-3026	-2173
	-61.3	-63.6	-61.8	-56.1	-46.9	-35.1	-21.2	-6.3	8.9	23.3	35.8	45.8	52.7	56.7	58.7	59.4	60.0	60.8	61.7
25	1865	525	-969	-2545	-4110	-5560	-6801	-7759	-8392	-8696	-8689	-8404	-7879	-7155	-6275	-5296	-4283	-3305	-2417
	-64.8	-69.1	-69.1	-65.0	-57.5	-47.1	-34.2	-19.4	-3.4	12.8	27.9	40.5	49.8	55.5	58.5	59.7	60.6	61.9	63.7
20	2211	957	-488	-2059	-3666	-5202	-6567	-7676	-8474	-8939	-9073	-8896	-8434	-7724	-6814	-5777	-4697	-3664	-2743
	-66.9	-73.0	-74.7	-72.6	-67.4	-59.3	-48.3	-34.3	-17.8	0.2	18.0	33.7	45.7	53.5	57.5	59.3	60.4	62.1	64.6
15	2566	1399	6	-1555	-3197	-4814	-6299	-7558	-8522	-9153	-9437	-9376	-8986	-8300	-7375	-6296	-5167	-4095	-3154
	-67.8	-75.2	-78.5	-78.5	-75.9	-70.6	-62.0	-49.4	-32.7	-13.0	7.5	26.3	41.2	51.0	56.1	58.1	59.3	61.2	64.5
10	2930	1844	500	-1048	-2718	-4405	-5996	-7390	-8504	-9288	-9710	-9761	-9450	-8805	-7891	-6804	-5664	-4585	-3647
	-67.8	-75.8	-80.2	-82.1	-82.2	-79.9	-73.9	-62.9	-46.3	-25.3	-2.2	19.5	37.0	48.5	54.4	56.5	57.4	59.3	63.3
5	3297	2284	987	-547	-2236	-3976	-5651	-7151	-8386	-9291	-9829	-9980	-9748	-9165	-8299	-7253	-6151	-5109	-4199
	-67.0	-75.0	-80.0	-83.4	-85.8	-86.2	-82.7	-73.3	-57.1	-35.0	-10.0	14.1	33.6	46.4	52.7	54.5	55.0	56.9	61.5
0	3663	2715	1462	-51	-1748	-3521	-5251	-6823	-8140	-9131	-9752	-9985	-9833	-9332	-8553	-7599	-6587	-5623	-4768
	-65.7	-73.1	-78.2	-82.5	-86.6	-89.2	-87.7	-79.7	-63.9	-41.2	-14.9	10.6	31.3	44.8	51.2	52.6	52.6	54.4	59.4

IGRF 1980 EAST COMPONENT (Y)

LONG / LAT	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	-4768	-4025	-3352	-2696	-2029	-1383	-839	-499	-442	-689	-1187	-1827	-2472	-2993	-3288	-3300	-3018	-2478	-1764
	59.4	67.1	75.2	81.0	82.1	78.0	69.6	59.2	48.7	39.5	31.5	23.7	14.6	3.7	-8.8	-21.2	-31.7	-38.5	-41.2
-5	-5291	-4575	-3888	-3191	-2483	-1815	-1284	-995	-1018	-1357	-1941	-2648	-3332	-3862	-4140	-4109	-3761	-3136	-2315
	57.6	66.0	75.1	81.6	83.1	78.6	69.2	57.1	44.8	33.9	24.8	16.5	7.7	-2.5	-14.0	-25.7	-35.7	-42.4	-45.0
-10	-5704	-5019	-4324	-3604	-2885	-2239	-1771	-1581	-1722	-2177	-2859	-3632	-4350	-4883	-5140	-5068	-4664	-3965	-3054
	56.6	65.2	74.4	80.8	82.0	76.7	65.9	52.0	37.8	25.3	15.2	6.9	-1.1	-9.8	-19.5	-29.6	-38.4	-44.4	-46.7
-15	-5953	-5304	-4620	-3911	-3228	-2659	-2310	-2266	-2560	-3151	-3936	-4773	-5519	-6051	-6285	-6177	-5724	-4965	-3980
	56.6	64.6	73.1	78.6	78.5	71.8	59.5	44.0	28.2	14.5	3.9	-4.0	-10.5	-17.0	-24.2	-31.9	-38.8	-43.8	-45.7
-20	-6020	-5418	-4773	-4119	-3528	-3094	-2915	-3056	-3525	-4260	-5147	-6043	-6810	-7336	-7547	-7407	-6916	-6112	-5069
	57.5	64.4	71.0	74.6	72.5	64.1	50.2	33.4	16.6	2.4	-8.0	-14.9	-19.4	-23.2	-27.3	-32.1	-36.8	-40.5	-41.9
-25	-5926	-5387	-4817	-4270	-3825	-3575	-3603	-3949	-4598	-5472	-6449	-7392	-8171	-8688	-8879	-8714	-8196	-7361	-6277
	59.1	64.1	68.2	69.0	64.4	54.0	38.7	21.2	4.2	-9.7	-19.2	-24.4	-26.6	-27.4	-28.2	-30.0	-32.3	-34.6	-35.8
-30	-5727	-5277	-4823	-4428	-4172	-4138	-4387	-4937	-5751	-6742	-7788	-8761	-9543	-10049	-10222	-10040	-9509	-8659	-7551
	60.9	63.5	64.5	62.1	54.8	42.4	26.2	8.6	-7.8	-20.6	-28.5	-31.7	-31.3	-29.2	-27.0	-25.9	-26.1	-27.1	-28.1
-35	-5503	-5171	-4869	-4662	-4621	-4811	-5272	-6001	-6948	-8023	-9110	-10092	-10867	-11359	-11521	-11333	-10799	-9950	-8835
	62.3	62.3	60.1	54.4	44.5	30.6	14.0	-3.0	-18.0	-29.1	-35.1	-36.1	-33.5	-28.9	-24.2	-20.8	-19.1	-19.1	-20.1
-40	-5329	-5146	-5026	-5025	-5203	-5605	-6249	-7118	-8155	-9274	-10370	-11341	-12097	-12574	-12728	-12542	-12020	-11184	-10079
	62.7	60.3	55.1	46.6	34.6	19.8	3.5	-12.2	-25.5	-34.5	-38.5	-37.7	-33.4	-27.1	-20.7	-15.7	-12.8	-12.1	-13.1
-45	-5258	-5251	-5329	-5538	-5921	-6504	-7291	-8254	-9336	-10460	-11536	-12475	-13202	-13658	-13807	-13631	-13129	-12320	-11239
	61.7	57.2	49.8	39.4	26.3	11.3	-4.1	-18.2	-29.4	-36.5	-38.8	-36.9	-31.6	-24.6	-17.6	-11.9	-8.4	-7.3	-8.4
-50	-5310	-5497	-5777	-6184	-6746	-7474	-8360	-9373	-10461	-11558	-12587	-13476	-14162	-14593	-14735	-14570	-14095	-13323	-12281
	58.9	53.2	44.6	33.3	20.1	5.8	-8.1	-20.4	-29.7	-35.2	-36.6	-34.1	-28.9	-22.2	-15.5	-10.1	-6.6	-5.6	-6.6
-55	-5470	-5859	-6335	-6920	-7630	-8465	-9411	-10439	-11502	-12546	-13510	-14335	-14967	-15364	-15493	-15338	-14892	-14163	-13172
	54.3	48.3	39.5	28.5	16.2	3.4	-8.8	-19.2	-26.9	-31.3	-32.3	-30.3	-26.0	-20.6	-15.1	-10.6	-7.7	-6.8	-7.8
-60	-5704	-6293	-6950	-7689	-8516	-9426	-10402	-11417	-12434	-13409	-14293	-15041	-15609	-15961	-16070	-15917	-15498	-14816	-13887
	48.2	42.6	34.7	25.0	14.3	3.4	-6.8	-15.4	-21.8	-25.7	-27.0	-26.0	-23.3	-19.7	-16.0	-12.8	-10.9	-10.3	-11.1
-65	-5976	-6751	-7569	-8437	-9354	-10312	-11295	-12280	-13237	-14131	-14927	-15589	-16082	-16379	-16456	-16300	-15903	-15269	-14408
	41.0	36.3	29.8	22.0	13.5	4.8	-3.3	-10.4	-15.9	-19.6	-21.5	-21.8	-20.9	-19.3	-17.4	-15.9	-14.9	-14.7	-15.3
-70	-6259	-7199	-8154	-9125	-10107	-11092	-12065	-13006	-13894	-14702	-15403	-15972	-16384	-16617	-16655	-16487	-16107	-15518	-14727
	33.0	29.6	24.8	19.1	12.7	6.3	0.0	-5.6	-10.2	-13.9	-16.4	-17.9	-18.6	-18.7	-18.5	-18.3	-18.2	-18.4	-18.8
-75	-6544	-7619	-8681	-9728	-10753	-11746	-12694	-13582	-14395	-15113	-15718	-16192	-16520	-16686	-16679	-16494	-16125	-15576	-14852
	24.6	22.4	19.2	15.4	11.1	6.6	2.1	-2.2	-6.0	-9.4	-12.2	-14.4	-16.1	-17.4	-18.3	-19.0	-19.5	-19.9	-20.2
-80	-6836	-8007	-9142	-10235	-11277	-12259	-13170	-13999	-14734	-15364	-15876	-16261	-16507	-16607	-16556	-16350	-15987	-15471	-14805
	16.2	14.9	13.0	10.7	8.0	5.1	2.1	-0.9	-3.8	-6.5	-9.0	-11.3	-13.2	-14.9	-16.2	-17.2	-18.0	-18.5	-18.7
-85	-7142	-8363	-9530	-10635	-11668	-12620	-13484	-14251	-14912	-15461	-15891	-16196	-16372	-16415	-16323	-16096	-15734	-15240	-14618
	8.0	7.2	6.1	4.8	3.3	1.7	0.0	-1.7	-3.5	-5.2	-6.9	-8.5	-9.9	-11.1	-12.2	-13.0	-13.6	-14.0	-14.2
-90	-7464	-8684	-9839	-10918	-11915	-12820	-13629	-14333	-14929	-15410	-15775	-16019	-16142	-16142	-16019	-15773	-15408	-14926	-14330
	0.2	-0.4	-1.1	-1.7	-2.3	-2.9	-3.5	-4.1	-4.6	-5.1	-5.5	-5.9	-6.3	-6.6	-6.8	-7.1	-7.2	-7.3	-7.4

IGRF 1980 EAST COMPONENT (Y)

LONG / LAT	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180
0	-1764	-988	-271	296	673	891	1030	1189	1449	1848	2378	3003	3680	4372	5044	5653	6143	6456	6557
	-41.2	-40.6	-38.4	-36.1	-34.8	-34.3	-33.3	-30.1	-23.8	-14.2	-2.5	9.2	18.9	25.3	28.2	28.2	26.4	23.5	19.6
-5	-2315	-1418	-567	135	643	979	1220	1464	1792	2241	2804	3442	4114	4784	5421	5992	6450	6745	6843
	-45.0	-44.0	-40.7	-36.8	-33.4	-30.5	-27.6	-23.3	-16.8	-8.0	2.1	12.0	20.3	25.8	28.6	29.1	28.1	25.9	22.5
-10	-3054	-2047	-1073	-235	411	881	1241	1584	1990	2496	3097	3758	4438	5101	5722	6273	6717	7011	7128
	-46.7	-45.3	-41.3	-36.1	-30.7	-25.7	-20.8	-15.4	-8.9	-1.2	7.1	14.9	21.2	25.5	27.9	28.7	28.4	27.0	24.3
-15	-3980	-2880	-1790	-818	-23	597	1097	1560	2059	2634	3282	3975	4672	5344	5966	6514	6959	7268	7417
	-45.7	-44.2	-40.0	-34.0	-27.4	-20.8	-14.4	-8.0	-1.5	5.2	11.7	17.3	21.8	24.8	26.6	27.5	27.7	27.1	25.0
-20	-5069	-3891	-2698	-1593	-642	144	806	1411	2023	2680	3385	4115	4840	5531	6165	6723	7183	7516	7706
	-41.9	-40.7	-36.8	-30.9	-23.9	-16.5	-9.3	-2.3	4.1	10.0	15.1	19.1	22.0	24.0	25.3	26.3	26.9	26.7	25.1
-25	-6277	-5039	-3754	-2524	-1415	-451	389	1155	1898	2652	3424	4200	4958	5673	6329	6907	7388	7752	7986
	-35.8	-35.1	-32.1	-27.2	-20.8	-13.7	-6.3	0.7	7.0	12.4	16.7	19.8	22.0	23.5	24.6	25.6	26.3	26.3	25.0
-30	-7551	-6269	-4909	-3564	-2303	-1161	-134	806	1694	2558	3408	4238	5033	5779	6459	7061	7568	7966	8242
	-28.1	-28.1	-26.6	-23.3	-18.4	-12.4	-5.8	0.9	6.9	12.1	16.3	19.3	21.5	23.1	24.4	25.6	26.4	26.4	25.0
-35	-8835	-7527	-6110	-4667	-3269	-1959	-749	366	1408	2392	3331	4223	5064	5843	6552	7180	7715	8144	8461
	-20.1	-21.0	-21.1	-19.8	-17.0	-12.7	-7.3	-1.5	4.2	9.4	13.9	17.5	20.4	22.8	24.7	26.3	27.2	27.1	25.4
-40	-10079	-8763	-7310	-5795	-4284	-2827	-1452	-170	1023	2135	3172	4138	5033	5854	6596	7253	7817	8279	8635
	-13.1	-14.9	-16.5	-17.2	-16.4	-14.1	-10.3	-5.6	-0.3	5.1	10.2	14.8	18.8	22.2	25.1	27.2	28.4	28.1	26.3
-45	-11239	-9936	-8471	-6912	-5321	-3750	-2240	-812	521	1758	2901	3952	4913	5786	6570	7264	7863	8362	8760
	-8.4	-10.8	-13.5	-15.7	-16.7	-16.1	-13.8	-10.1	-5.3	0.1	5.9	11.5	16.7	21.4	25.2	28.0	29.4	29.3	27.3
-50	-12281	-11009	-9560	-7990	-6358	-4716	-3109	-1568	-116	1237	2485	3628	4668	5607	6448	7191	7837	8385	8837
	-6.6	-9.2	-12.4	-15.5	-17.6	-18.1	-17.0	-14.1	-9.8	-4.3	1.8	8.2	14.4	20.0	24.7	28.1	30.0	30.1	28.3
-55	-13172	-11952	-10545	-9001	-7370	-5704	-4045	-2432	-892	556	1901	3138	4266	5285	6199	7011	7723	8338	8863
	-7.8	-10.2	-13.3	-16.4	-18.7	-19.7	-19.1	-16.8	-12.8	-7.5	-1.3	5.4	12.0	18.2	23.4	27.2	29.5	30.0	28.7
-60	-13887	-12736	-11398	-9914	-8326	-6681	-5020	-3379	-1790	-275	1149	2472	3689	4799	5803	6704	7506	8214	8836
	-11.1	-13.0	-15.5	-17.9	-19.8	-20.5	-19.9	-17.7	-14.1	-9.1	-3.2	3.3	9.8	15.9	21.2	25.3	27.9	28.9	28.2
-65	-14408	-13340	-12092	-10696	-9188	-7606	-5987	-4364	-2767	-1221	256	1649	2950	4154	5260	6267	7181	8006	8749
	-15.3	-16.5	-18.0	-19.5	-20.4	-20.4	-19.4	-17.2	-13.7	-9.2	-3.8	2.0	7.9	13.5	18.4	22.4	25.1	26.5	26.5
-70	-14727	-13749	-12604	-11317	-9916	-8430	-6889	-5323	-3757	-2214	-715	725	2095	3386	4595	5719	6758	7716	8596
	-18.8	-19.4	-19.9	-20.3	-20.2	-19.5	-17.9	-15.5	-12.3	-8.3	-3.7	1.2	6.1	10.9	15.1	18.6	21.3	22.9	23.5
-75	-14852	-13964	-12926	-11755	-10473	-9102	-7663	-6180	-4675	-3167	-1675	-214	1203	2566	3867	5101	6265	7357	8377
	-20.2	-20.3	-20.2	-19.7	-18.9	-17.6	-15.7	-13.3	-10.4	-7.1	-3.4	0.4	4.3	8.0	11.4	14.3	16.6	18.2	19.1
-80	-14805	-13997	-13057	-11998	-10833	-9578	-8249	-6862	-5435	-3983	-2521	-1065	374	1784	3156	4480	5749	6958	8103
	-18.7	-18.6	-18.1	-17.4	-16.3	-14.9	-13.1	-11.0	-8.7	-6.1	-3.4	-0.6	2.2	4.8	7.3	9.4	11.2	12.6	13.6
-85	-14618	-13874	-13013	-12046	-10980	-9827	-8597	-7303	-5956	-4569	-3153	-1723	-288	1139	2546	3925	5265	6556	7790
	-14.2	-14.0	-13.7	-13.1	-12.3	-11.3	-10.1	-8.7	-7.2	-5.6	-3.9	-2.2	-0.5	1.1	2.6	4.0	5.2	6.2	7.1
-90	-14330	-13625	-12816	-11910	-10913	-9833	-8678	-7458	-6180	-4855	-3494	-2106	-701	708	2112	3500	4862	6186	7464
	-7.4	-7.3	-7.3	-7.1	-7.0	-6.7	-6.5	-6.1	-5.8	-5.3	-4.9	-4.4	-3.8	-3.3	-2.7	-2.1	-1.5	-0.8	-0.2

IGRF 1980 EAST COMPONENT (Y)

LONG / LAT	180	-175	-170	-165	-160	-155	-150	-145	-140	-135	-130	-125	-120	-115	-110	-105	-100	-95	-90
0	6557	6451	6193	5872	5575	5358	5225	5146	5075	4987	4888	4806	4771	4787	4823	4810	4664	4302	3663
	19.6	14.4	7.5	-0.7	-8.9	-14.8	-16.1	-11.5	-1.2	12.1	24.5	31.7	30.6	20.6	3.3	-17.4	-37.6	-54.1	-65.7
-5	6843	6748	6510	6207	5921	5703	5557	5454	5354	5232	5099	4988	4932	4942	4988	5006	4909	4608	4033
	22.5	17.4	10.4	2.0	-6.3	-12.0	-12.9	-7.8	2.6	15.6	27.1	33.0	30.5	19.3	1.5	-19.1	-38.4	-53.6	-63.8
-10	7128	7069	6875	6616	6363	6160	6014	5896	5773	5624	5462	5320	5235	5221	5256	5279	5206	4946	4422
	24.3	19.6	12.9	4.7	-3.3	-8.7	-9.4	-4.4	5.3	17.1	27.0	31.2	27.4	15.6	-1.9	-21.4	-39.1	-52.6	-61.2
-15	7417	7408	7274	7073	6865	6688	6549	6425	6289	6126	5946	5782	5670	5628	5638	5649	5581	5344	4858
	25.0	20.9	14.7	7.0	-0.4	-5.4	-6.2	-1.9	6.6	16.5	24.5	27.0	22.4	10.7	-5.7	-23.4	-39.0	-50.5	-57.7
-20	7706	7754	7685	7546	7386	7240	7114	6993	6858	6695	6516	6348	6224	6161	6148	6139	6063	5833	5369
	25.1	21.5	15.9	8.8	2.0	-2.8	-3.8	-0.5	6.2	14.1	20.0	21.3	16.3	5.5	-9.0	-24.2	-37.5	-47.0	-53.0
-25	7986	8089	8083	8004	7892	7777	7670	7563	7442	7300	7145	6998	6886	6822	6795	6768	6676	6439	5979
	25.0	21.7	16.5	9.9	3.5	-1.1	-2.6	-0.5	4.4	10.3	14.5	14.9	10.3	1.1	-10.9	-23.4	-34.2	-42.2	-47.4
-30	8242	8397	8449	8424	8358	8278	8196	8114	8024	7924	7818	7719	7645	7601	7578	7539	7427	7169	6694
	25.0	21.8	16.7	10.5	4.4	-0.3	-2.4	-1.6	1.7	5.7	8.6	8.7	5.1	-2.0	-11.2	-21.0	-29.6	-36.3	-41.2
-35	8461	8664	8769	8797	8778	8737	8692	8649	8609	8569	8532	8503	8488	8485	8479	8434	8297	8007	7498
	25.4	22.0	17.0	10.9	4.8	-0.1	-2.8	-3.1	-1.4	1.2	3.3	3.5	1.1	-3.7	-10.3	-17.5	-24.3	-30.1	-35.0
-40	8635	8885	9042	9124	9159	9169	9175	9188	9211	9246	9291	9344	9399	9446	9462	9412	9247	8914	8359
	26.3	22.7	17.5	11.4	5.4	0.3	-3.1	-4.4	-3.9	-2.4	-0.9	-0.4	-1.6	-4.5	-8.8	-13.9	-19.2	-24.4	-29.5
-45	8760	9061	9275	9421	9521	9598	9671	9754	9854	9971	10099	10231	10353	10445	10478	10417	10218	9837	9234
	27.3	23.7	18.5	12.6	6.5	1.3	-2.6	-4.7	-5.2	-4.5	-3.5	-2.9	-3.2	-4.7	-7.4	-11.0	-15.4	-20.2	-25.4
-50	8837	9199	9483	9706	9886	10045	10201	10366	10548	10744	10947	11144	11314	11433	11470	11388	11151	10723	10076
	28.3	24.8	20.0	14.3	8.5	3.3	-0.8	-3.5	-4.8	-5.0	-4.6	-4.1	-4.1	-5.0	-6.7	-9.5	-13.2	-17.7	-22.9
-55	8863	9305	9677	9993	10270	10525	10774	11027	11287	11551	11811	12048	12242	12365	12385	12273	11995	11527	10851
	28.7	25.8	21.6	16.5	11.2	6.3	2.1	-1.0	-3.0	-3.9	-4.3	-4.4	-4.7	-5.5	-7.0	-9.5	-12.8	-17.0	-21.7
-60	8836	9381	9860	10286	10673	11034	11380	11717	12046	12363	12656	12908	13098	13200	13189	13037	12722	12227	11541
	28.2	26.1	22.8	18.6	14.1	9.7	5.7	2.5	0.0	-1.8	-3.0	-3.9	-4.9	-6.2	-7.9	-10.4	-13.5	-17.1	-21.2
-65	8749	9418	10022	10573	11079	11549	11989	12402	12787	13137	13442	13687	13852	13919	13866	13675	13329	12820	12144
	26.5	25.3	23.0	20.0	16.4	12.8	9.2	6.0	3.2	0.8	-1.2	-3.0	-4.8	-6.6	-8.8	-11.3	-14.1	-17.2	-20.4
-70	8596	9404	10146	10827	11454	12031	12559	13038	13466	13835	14138	14362	14494	14519	14425	14200	13835	13325	12672
	23.5	23.1	21.8	19.8	17.3	14.5	11.6	8.6	5.8	3.2	0.7	-1.7	-4.1	-6.4	-8.8	-11.2	-13.7	-16.1	-18.3
-75	8377	9326	10205	11016	11759	12435	13042	13579	14042	14426	14723	14926	15028	15019	14893	14645	14270	13769	13144
	19.1	19.3	18.8	17.8	16.2	14.3	12.1	9.7	7.3	4.8	2.3	-0.2	-2.6	-4.9	-7.2	-9.3	-11.2	-12.9	-14.2
-80	8103	9178	10180	11106	11953	12719	13399	13990	14488	14890	15190	15385	15470	15443	15301	15042	14667	14178	13577
	13.6	14.1	14.1	13.8	13.1	12.0	10.6	9.0	7.3	5.4	3.5	1.6	-0.3	-2.1	-3.8	-5.2	-6.5	-7.4	-8.1
-85	7790	8960	10058	11076	12010	12853	13599	14245	14786	15219	15540	15747	15839	15815	15674	15417	15046	14564	13975
	7.1	7.7	8.0	8.2	8.1	7.9	7.4	6.9	6.2	5.4	4.5	3.6	2.7	1.9	1.2	0.5	0.0	-0.3	-0.5
-90	7464	8684	9839	10918	11915	12820	13629	14333	14929	15410	15775	16019	16142	16142	16019	15773	15408	14926	14330
	-0.2	0.4	1.1	1.7	2.3	2.9	3.5	4.1	4.6	5.1	5.5	5.9	6.3	6.6	6.8	7.1	7.2	7.3	7.4

IGRF 1980 EAST COMPONENT (Y)

LONG / LAT	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
0	3663	2715	1462	-51	-1748	-3521	-5251	-6823	-8140	-9131	-9752	-9985	-9833	-9332	-8553	-7599	-6587	-5623	-4768
	-65.7	-73.1	-78.2	-82.5	-86.6	-89.2	-87.7	-79.7	-63.9	-41.2	-14.9	10.6	31.3	44.8	51.2	52.6	52.6	54.4	59.4
-5	4033	3143	1936	450	-1240	-3025	-4784	-6395	-7757	-8798	-9473	-9768	-9694	-9291	-8631	-7809	-6928	-6074	-5291
	-63.8	-70.3	-75.0	-79.7	-84.9	-88.8	-88.7	-81.7	-66.4	-43.7	-17.0	9.1	30.2	43.8	49.9	51.0	50.7	52.3	57.6
-10	4422	3585	2425	973	-697	-2477	-4242	-5867	-7247	-8310	-9015	-9357	-9357	-9060	-8535	-7867	-7137	-6407	-5704
	-61.2	-66.5	-70.7	-75.5	-81.0	-85.6	-86.1	-79.8	-65.0	-42.8	-16.6	9.1	29.9	43.2	49.1	49.9	49.5	51.2	56.6
-15	4858	4066	2950	1536	-107	-1870	-3627	-5250	-6632	-7702	-8426	-8806	-8873	-8679	-8289	-7772	-7189	-6579	-5953
	-57.7	-62.0	-65.7	-70.3	-75.7	-80.3	-80.9	-74.8	-60.7	-39.5	-14.4	10.2	30.1	43.0	48.7	49.8	49.6	51.3	56.6
-20	5369	4610	3531	2151	538	-1204	-2947	-4561	-5941	-7015	-7755	-8170	-8299	-8197	-7925	-7540	-7082	-6574	-6020
	-53.0	-56.8	-60.2	-64.6	-69.7	-73.8	-74.2	-68.2	-54.8	-34.9	-11.4	11.6	30.5	42.9	48.9	50.5	50.9	52.8	57.5
-25	5979	5235	4178	2824	1235	-485	-2212	-3818	-5197	-6279	-7040	-7492	-7679	-7656	-7479	-7196	-6835	-6411	-5926
	-47.4	-51.0	-54.6	-59.0	-63.7	-67.2	-67.1	-61.2	-48.5	-30.1	-8.4	12.9	30.6	42.8	49.5	52.1	53.3	55.3	59.1
-30	6694	5943	4890	3549	1980	280	-1431	-3028	-4410	-5508	-6298	-6793	-7036	-7081	-6980	-6775	-6490	-6138	-5727
	-41.2	-45.1	-49.1	-53.7	-58.1	-61.1	-60.5	-54.6	-42.7	-25.8	-6.1	13.6	30.5	42.8	50.3	54.3	56.4	58.4	60.9
-35	7498	6722	5657	4319	2764	1085	-605	-2191	-3576	-4694	-5521	-6067	-6370	-6482	-6449	-6312	-6097	-5821	-5503
	-35.0	-39.5	-44.1	-49.0	-53.3	-55.7	-54.7	-48.9	-37.9	-22.4	-4.4	13.9	30.0	42.6	51.2	56.4	59.4	61.2	62.3
-40	8359	7546	6460	5121	3583	1932	271	-1296	-2679	-3818	-4687	-5293	-5667	-5853	-5897	-5838	-5706	-5528	-5329
	-29.5	-34.6	-39.9	-45.0	-49.1	-51.2	-49.8	-44.1	-33.9	-19.7	-3.2	13.8	29.4	42.2	51.7	58.0	61.6	63.1	62.7
-45	9234	8381	7276	5943	4433	2824	1207	-328	-1701	-2858	-3773	-4448	-4907	-5187	-5330	-5375	-5356	-5306	-5258
	-25.4	-30.9	-36.4	-41.5	-45.4	-47.0	-45.3	-39.8	-30.2	-17.3	-2.1	13.7	28.6	41.5	51.5	58.3	62.2	63.3	61.7
-50	10076	9195	8086	6775	5311	3763	2206	718	-635	-1804	-2767	-3520	-4080	-4478	-4750	-4934	-5064	-5178	-5310
	-22.9	-28.3	-33.7	-38.4	-41.7	-42.7	-40.7	-35.3	-26.4	-14.6	-0.8	13.7	27.7	40.1	50.0	57.0	60.8	61.4	58.9
-55	10851	9962	8871	7605	6210	4741	3261	1834	511	-666	-1677	-2515	-3193	-3732	-4163	-4518	-4831	-5138	-5470
	-21.7	-26.7	-31.4	-35.3	-37.7	-38.0	-35.6	-30.3	-22.1	-11.5	0.8	13.8	26.5	37.9	47.1	53.6	57.1	57.3	54.3
-60	11541	10667	9618	8421	7113	5739	4349	2990	1703	521	-537	-1466	-2271	-2968	-3578	-4129	-4648	-5164	-5704
	-21.2	-25.2	-28.9	-31.7	-33.0	-32.4	-29.7	-24.5	-17.1	-7.8	2.8	14.0	24.9	34.7	42.6	48.3	51.2	51.2	48.2
-65	12144	11305	10318	9205	7996	6724	5426	4137	2887	1701	594	-426	-1362	-2222	-3020	-3774	-4505	-5233	-5976
	-20.4	-23.3	-25.7	-27.2	-27.4	-26.1	-23.0	-18.2	-11.8	-4.0	4.8	13.8	22.6	30.4	36.8	41.3	43.6	43.5	41.0
-70	12672	11881	10964	9939	8827	7651	6438	5210	3991	2798	1642	533	-528	-1545	-2523	-3473	-4405	-5330	-6259
	-18.3	-20.0	-21.2	-21.6	-20.9	-19.1	-16.1	-11.9	-6.6	-0.4	6.3	13.1	19.6	25.4	30.0	33.3	34.9	34.8	33.0
-75	13144	12401	11549	10600	9568	8470	7321	6139	4937	3729	2525	1333	158	-999	-2138	-3259	-4366	-5460	-6544
	-14.2	-15.0	-15.3	-15.0	-13.9	-12.0	-9.3	-6.0	-2.0	2.4	7.0	11.6	15.9	19.7	22.8	24.9	25.9	25.8	24.6
-80	13577	12869	12062	11164	10184	9132	8019	6855	5652	4419	3165	1898	625	-648	-1915	-3171	-4414	-5637	-6836
	-8.1	-8.3	-8.2	-7.6	-6.5	-5.1	-3.2	-1.0	1.5	4.2	6.9	9.5	11.9	13.9	15.5	16.6	17.1	17.0	16.2
-85	13975	13282	12491	11609	10641	9596	8482	7306	6078	4806	3499	2166	816	-542	-1899	-3246	-4575	-5877	-7142
	-0.5	-0.5	-0.3	0.0	0.6	1.3	2.1	3.0	4.0	5.0	6.0	6.9	7.7	8.3	8.8	9.0	8.9	8.6	8.0
-90	14330	13625	12816	11910	10913	9833	8678	7457	6180	4855	3494	2105	701	-708	-2112	-3500	-4862	-6186	-7464
	7.4	7.3	7.3	7.1	7.0	6.7	6.5	6.1	5.8	5.3	4.9	4.4	3.8	3.3	2.7	2.1	1.5	0.8	0.2

IGRF 1980 VERTICAL INTENSITY (Z)

LONG / LAT	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
90	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705
	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
85	55504	55531	55571	55626	55694	55774	55866	55968	56080	56198	56322	56450	56579	56709	56837	56960	57078	57189	57291
	13.2	13.5	13.8	14.0	14.2	14.2	14.2	14.1	14.0	13.7	13.4	13.0	12.5	11.9	11.3	10.6	9.8	9.1	8.2
80	54095	54128	54199	54305	54447	54623	54830	55066	55328	55611	55910	56221	56538	56855	57166	57464	57743	57999	58225
	18.4	19.4	20.3	21.1	21.7	22.2	22.5	22.6	22.5	22.2	21.6	20.9	19.9	18.7	17.4	15.9	14.3	12.5	10.7
75	52621	52641	52721	52862	53062	53320	53633	53997	54407	54859	55344	55854	56380	56910	57433	57934	58403	58826	59192
	20.6	22.5	24.2	25.8	27.2	28.3	29.1	29.5	29.7	29.4	28.8	27.8	26.5	24.8	22.8	20.6	18.2	15.6	12.9
70	51123	51121	51200	51359	51597	51911	52301	52762	53291	53882	54526	55213	55931	56664	57393	58098	58757	59350	59854
	19.5	22.3	25.0	27.4	29.6	31.3	32.7	33.5	33.9	33.7	33.0	31.9	30.2	28.2	25.8	23.1	20.2	17.1	13.9
65	49545	49531	49613	49787	50052	50404	50842	51364	51967	52648	53400	54214	55076	55967	56864	57740	58563	59302	59925
	16.1	19.8	23.3	26.5	29.3	31.6	33.3	34.4	34.8	34.5	33.6	32.2	30.3	28.0	25.3	22.5	19.5	16.4	13.3
60	47772	47771	47875	48077	48372	48755	49223	49776	50414	51135	51937	52814	53754	54738	55739	56726	57659	58498	59201
	11.8	16.2	20.4	24.2	27.5	30.2	32.0	33.0	33.2	32.5	31.2	29.3	27.0	24.4	21.6	18.8	16.1	13.5	11.0
55	45671	45709	45859	46108	46446	46865	47359	47928	48573	49295	50098	50979	51930	52933	53963	54985	55957	56832	57560
	7.7	12.9	17.8	22.2	25.9	28.7	30.5	31.2	30.8	29.6	27.5	24.9	22.1	19.1	16.2	13.5	11.3	9.4	8.0
50	43116	43211	43422	43732	44125	44588	45112	45695	46337	47041	47814	48655	49560	50515	51497	52476	53408	54247	54941
	4.3	10.3	16.0	21.2	25.4	28.5	30.2	30.5	29.5	27.5	24.7	21.3	17.8	14.4	11.3	8.7	6.8	5.8	5.5
45	39995	40149	40422	40795	41245	41755	42314	42914	43556	44241	44972	45750	46571	47425	48295	49156	49975	50709	51313
	0.6	7.7	14.6	20.8	25.9	29.5	31.4	31.5	30.1	27.5	24.0	20.2	16.2	12.5	9.1	6.5	4.8	4.3	4.9
40	36203	36403	36727	37150	37646	38197	38789	39413	40065	40740	41435	42144	42861	43580	44289	44975	45618	46191	46661
	-5.2	3.4	11.7	19.4	25.9	30.5	33.0	33.4	32.1	29.4	26.0	22.2	18.3	14.5	11.1	8.3	6.5	6.0	7.0
35	31643	31871	32226	32678	33199	33774	34391	35041	35713	36393	37064	37710	38319	38883	39401	39874	40303	40681	40993
	-15.0	-4.8	5.3	15.0	23.3	29.5	33.2	34.5	33.9	32.1	29.5	26.7	23.7	20.7	17.6	14.7	12.5	11.5	12.2
30	26255	26489	26852	27306	27826	28402	29029	29701	30401	31099	31761	32355	32858	33264	33580	33826	34026	34201	34354
	-30.1	-18.4	-6.2	5.6	16.2	24.5	30.1	33.1	34.1	33.9	33.3	32.5	31.5	29.9	27.7	24.9	22.2	20.3	19.9
25	20058	20273	20616	21041	21529	22079	22699	23387	24116	24841	25505	26056	26461	26715	26835	26863	26847	26834	26852
	-50.2	-37.2	-23.2	-9.1	4.0	14.9	23.0	28.3	31.6	33.9	36.1	38.3	40.1	40.8	40.0	37.5	34.1	30.9	28.9
20	13201	13362	13647	14006	14425	14922	15516	16209	16965	17718	18389	18903	19220	19333	19276	19110	18909	18744	18665
	-73.2	-59.4	-44.0	-27.7	-12.0	1.8	12.8	20.9	27.1	32.4	37.8	43.4	48.5	51.9	52.8	50.7	46.5	41.6	37.4
15	5981	6037	6213	6458	6771	7185	7735	8422	9199	9976	10648	11124	11356	11341	11129	10799	10449	10171	10034
	-95.6	-81.7	-65.4	-47.2	-28.9	-12.0	2.1	13.4	22.6	30.9	39.4	48.2	56.3	62.2	64.5	62.7	57.5	50.5	43.7
10	-1183	-1296	-1290	-1210	-1041	-732	-242	428	1212	1997	2654	3078	3218	3080	2725	2254	1781	1417	1245
	-113.0	-99.7	-83.1	-63.5	-42.6	-22.7	-5.3	9.0	20.8	31.6	42.4	53.3	63.4	70.8	73.9	71.8	65.3	56.0	46.2
5	-7827	-8169	-8389	-8516	-8516	-8326	-7904	-7264	-6493	-5730	-5121	-4780	-4757	-5034	-5536	-6149	-6742	-7192	-7403
	-122.0	-109.8	-93.2	-72.4	-49.4	-26.6	-6.3	10.6	24.4	36.4	47.9	59.3	69.7	77.2	79.9	76.9	68.7	56.9	44.1
0	-13542	-14146	-14621	-14968	-15138	-15062	-14707	-14111	-13386	-12690	-12183	-11977	-12117	-12571	-13251	-14032	-14773	-15340	-15630
	-120.5	-109.5	-93.2	-71.6	-46.7	-21.6	1.0	19.5	34.0	45.8	56.2	66.0	74.7	80.5	81.7	77.1	66.9	52.8	37.3

IGRF 1980 VERTICAL INTENSITY (Z)

LONG / LAT	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180
90	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705
	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
85	57291	57383	57465	57534	57592	57637	57671	57693	57705	57706	57700	57685	57664	57639	57610	57578	57546	57512	57479
	8.2	7.4	6.6	5.8	4.9	4.2	3.4	2.7	2.0	1.4	0.9	0.4	0.0	-0.3	-0.5	-0.7	-0.8	-0.9	-0.8
80	58225	58418	58574	58692	58769	58808	58808	58774	58709	58619	58508	58383	58250	58115	57984	57862	57754	57663	57591
	10.7	8.9	7.0	5.1	3.3	1.6	0.0	-1.5	-2.8	-4.0	-5.0	-5.8	-6.4	-6.8	-7.0	-7.0	-6.9	-6.6	-6.2
75	59192	59490	59714	59858	59920	59901	59806	59641	59417	59146	58841	58517	58190	57873	57580	57324	57113	56955	56855
	12.9	10.1	7.3	4.6	1.9	-0.7	-3.0	-5.2	-7.0	-8.6	-9.9	-10.8	-11.4	-11.7	-11.7	-11.3	-10.7	-9.9	-8.9
70	59854	60253	60532	60681	60695	60576	60332	59976	59528	59008	58442	57857	57279	56734	56245	55832	55511	55292	55184
	13.9	10.6	7.4	4.1	1.0	-1.9	-4.7	-7.1	-9.2	-11.0	-12.4	-13.3	-13.9	-13.9	-13.6	-12.9	-11.9	-10.6	-9.1
65	59925	60405	60718	60848	60787	60537	60110	59527	58816	58012	57153	56280	55432	54647	53958	53393	52972	52710	52615
	13.3	10.1	7.0	4.0	1.1	-1.6	-4.2	-6.5	-8.5	-10.2	-11.5	-12.4	-12.9	-13.0	-12.6	-11.9	-10.7	-9.2	-7.5
60	59201	59728	60048	60137	59984	59589	58968	58149	57171	56083	54937	53787	52688	51686	50823	50132	49639	49357	49294
	11.0	8.7	6.5	4.5	2.5	0.5	-1.3	-3.1	-4.6	-6.0	-7.2	-8.1	-8.7	-9.0	-9.0	-8.7	-8.0	-6.9	-5.5
55	57560	58093	58392	58425	58174	57641	56840	55808	54593	53255	51862	50482	49179	48012	47026	46257	45731	45459	45444
	8.0	7.0	6.3	5.7	5.1	4.4	3.6	2.7	1.8	0.8	-0.1	-1.0	-1.9	-2.8	-3.7	-4.4	-4.8	-4.8	-4.2
50	54941	55437	55690	55661	55327	54682	53743	52547	51152	49629	48057	46517	45084	43822	42781	41997	41488	41262	41315
	5.5	5.9	6.8	7.9	8.8	9.5	9.8	9.6	9.2	8.6	7.8	6.9	5.7	4.1	2.2	0.1	-1.9	-3.4	-4.2
45	51313	51735	51926	51843	51453	50744	49728	48441	46946	45321	43657	42046	40569	39298	38283	37553	37123	36987	37132
	4.9	6.5	8.8	11.2	13.5	15.1	15.9	16.0	15.7	15.1	14.4	13.5	12.2	10.2	7.4	4.0	0.3	-3.1	-5.5
40	46661	46984	47110	46991	46587	45873	44855	43563	42060	40431	38774	37189	35765	34575	33669	33071	32783	32789	33059
	7.0	9.3	12.4	15.7	18.5	20.2	20.8	20.3	19.2	18.1	17.2	16.4	15.3	13.5	10.5	6.3	1.3	-3.6	-7.4
35	40993	41207	41279	41154	40784	40130	39186	37977	36563	35031	33484	32026	30750	29731	29015	28621	28538	28735	29165
	12.2	14.4	17.6	20.9	23.4	24.2	23.3	21.1	18.3	15.9	14.4	13.8	13.5	12.6	10.3	6.4	1.2	-4.4	-9.1
30	34354	34471	34512	34420	34132	33600	32802	31756	30519	29178	27837	26601	25561	24791	24333	24199	24370	24798	25418
	19.9	21.2	23.6	26.1	27.3	26.3	22.9	17.8	12.3	7.8	5.3	4.9	5.9	6.8	6.5	4.1	-0.2	-5.3	-10.0
25	26852	26901	26946	26927	26769	26410	25816	24997	24008	22934	21877	20937	20201	19736	19580	19741	20191	20868	21691
	28.9	28.5	29.4	30.2	29.5	25.9	19.3	10.7	1.8	-5.3	-9.2	-9.4	-6.9	-3.5	-1.0	-0.6	-2.6	-6.1	-9.6
20	18665	18684	18773	18865	18875	18726	18374	17823	17127	16368	15643	15046	14651	14517	14677	15134	15857	16776	17795
	37.4	34.8	33.5	32.1	29.0	22.6	12.8	0.6	-11.7	-21.5	-26.8	-26.9	-22.8	-16.7	-10.9	-7.1	-5.9	-6.6	-8.1
15	10034	10060	10226	10457	10657	10736	10641	10372	9981	9550	9171	8924	8873	9063	9519	10245	11208	12336	13524
	43.7	38.3	34.3	30.5	25.0	16.2	3.7	-11.3	-26.2	-38.0	-44.3	-44.4	-38.9	-30.4	-21.4	-14.1	-9.4	-6.9	-5.6
10	1245	1298	1553	1930	2320	2622	2773	2771	2665	2541	2482	2558	2819	3294	4004	4949	6100	7387	8703
	46.2	37.7	30.8	24.5	17.0	6.6	-7.2	-23.4	-39.4	-52.0	-58.7	-58.5	-52.1	-41.8	-30.4	-20.2	-12.3	-6.6	-2.5
5	-7403	-7335	-7009	-6511	-5958	-5466	-5104	-4881	-4746	-4615	-4408	-4065	-3550	-2845	-1941	-835	445	1838	3243
	44.1	32.4	22.6	14.1	5.2	-5.6	-19.2	-34.6	-49.7	-61.4	-67.4	-66.6	-59.6	-48.5	-35.9	-24.0	-13.8	-5.6	1.1
0	-15630	-15594	-15251	-14690	-14034	-13410	-12896	-12506	-12193	-11875	-11473	-10934	-10233	-9363	-8322	-7112	-5753	-4299	-2842
	37.3	22.8	10.4	0.2	-9.3	-19.5	-31.2	-44.0	-56.2	-65.3	-69.4	-67.5	-60.2	-49.2	-36.7	-24.4	-13.3	-3.6	5.0

IGRF 1980 VERTICAL INTENSITY (Z)

LONG / LAT	180	-175	-170	-165	-160	-155	-150	-145	-140	-135	-130	-125	-120	-115	-110	-105	-100	-95	-90
90	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705
	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
85	57479	57447	57415	57385	57355	57326	57296	57266	57234	57200	57163	57121	57075	57024	56967	56904	56834	56759	56678
	-0.8	-0.8	-0.6	-0.5	-0.2	0.0	0.3	0.6	0.9	1.2	1.6	2.0	2.3	2.7	3.1	3.5	3.9	4.3	4.7
80	57591	57540	57510	57499	57507	57529	57562	57602	57644	57683	57714	57733	57736	57718	57678	57612	57520	57401	57256
	-6.2	-5.7	-5.1	-4.5	-3.8	-3.2	-2.5	-1.9	-1.3	-0.7	-0.2	0.3	0.8	1.2	1.6	2.0	2.4	2.7	3.1
75	56855	56814	56832	56905	57028	57191	57386	57601	57824	58044	58249	58427	58568	58664	58708	58695	58621	58487	58293
	-8.9	-7.8	-6.7	-5.5	-4.4	-3.3	-2.4	-1.6	-0.9	-0.4	-0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
70	55184	55187	55299	55512	55815	56193	56628	57100	57589	58073	58532	58946	59298	59573	59759	59847	59833	59713	59491
	-9.1	-7.4	-5.7	-4.1	-2.6	-1.4	-0.4	0.2	0.5	0.4	0.1	-0.5	-1.2	-2.1	-2.9	-3.8	-4.7	-5.4	-6.1
65	52615	52687	52922	53307	53824	54452	55164	55933	56726	57515	58270	58963	59569	60067	60439	60673	60758	60690	60471
	-7.5	-5.5	-3.6	-1.7	-0.1	1.1	1.8	1.8	1.3	0.3	-1.2	-3.1	-5.1	-7.3	-9.4	-11.5	-13.4	-15.2	-16.7
60	49294	49449	49812	50368	51094	51962	52939	53989	55076	56160	57207	58181	59052	59792	60378	60792	61017	61045	60872
	-5.5	-3.7	-1.8	0.1	1.7	2.6	2.8	2.2	0.5	-1.9	-5.0	-8.5	-12.2	-16.0	-19.7	-23.1	-26.4	-29.4	-32.0
55	45444	45683	46161	46860	47754	48812	49998	51273	52594	53921	55213	56432	57545	58519	59326	59940	60340	60506	60427
	-4.2	-3.0	-1.5	0.2	1.7	2.4	2.2	0.6	-2.2	-6.1	-10.9	-16.3	-21.8	-27.3	-32.6	-37.6	-42.3	-46.8	-50.9
50	41315	41635	42206	43006	44009	45184	46497	47908	49377	50863	52324	53723	55026	56198	57208	58024	58613	58947	59001
	-4.2	-4.1	-3.1	-1.7	-0.3	0.4	-0.2	-2.5	-6.5	-11.9	-18.3	-25.3	-32.3	-39.2	-45.9	-52.4	-58.7	-64.9	-71.0
45	37132	37537	38181	39038	40087	41301	42651	44104	45624	47173	48713	50209	51630	52942	54112	55102	55873	56382	56589
	-5.5	-6.6	-6.3	-5.1	-3.6	-3.0	-3.8	-6.7	-11.6	-18.2	-25.8	-33.9	-41.8	-49.5	-56.9	-64.4	-72.2	-80.3	-88.7
40	33059	33561	34265	35146	36186	37368	38675	40082	41562	43083	44612	46119	47576	48954	50221	51337	52253	52918	53278
	-7.4	-9.6	-9.9	-8.9	-7.4	-6.7	-7.8	-11.3	-17.0	-24.4	-32.6	-40.8	-48.5	-55.8	-63.0	-70.8	-79.6	-89.6	-100.5
35	29165	29781	30543	31425	32415	33511	34709	36000	37367	38783	40222	41660	43074	44441	45732	46909	47921	48707	49202
	-9.1	-12.0	-12.8	-11.9	-10.6	-10.2	-11.8	-16.0	-22.4	-30.1	-38.0	-45.1	-51.2	-56.7	-62.4	-69.4	-78.5	-90.1	-103.5
30	25418	26165	26986	27856	28769	29741	30786	31912	33112	34368	35658	36961	38263	39548	40795	41972	43026	43894	44502
	-10.0	-12.9	-13.8	-13.2	-12.4	-12.8	-15.5	-20.7	-27.8	-35.3	-41.9	-46.6	-49.5	-51.5	-54.3	-59.5	-68.2	-80.7	-96.3
25	21691	22577	23459	24309	25133	25960	26829	27764	28769	29832	30933	32057	33197	34349	35502	36631	37689	38610	39315
	-9.6	-11.9	-12.6	-12.3	-12.3	-14.1	-18.5	-25.2	-32.9	-39.8	-44.1	-45.0	-43.3	-40.5	-39.2	-41.6	-49.2	-62.1	-79.2
20	17795	18814	19756	20587	21321	22006	22699	23442	24248	25109	26007	26932	27886	28876	29908	30966	32009	32971	33770
	-8.1	-9.0	-9.1	-9.1	-10.3	-13.9	-20.3	-28.7	-37.0	-42.6	-43.9	-40.1	-32.8	-24.4	-18.5	-17.7	-23.8	-36.5	-54.6
15	13524	14659	15655	16474	17135	17701	18246	18823	19454	20132	20840	21572	22341	23170	24078	25062	26091	27098	27994
	-5.6	-4.6	-3.8	-3.9	-6.3	-11.9	-20.5	-30.4	-38.8	-42.8	-40.4	-31.6	-18.4	-4.5	5.9	9.5	4.9	-7.6	-26.0
10	8703	9932	10978	11801	12424	12917	13365	13830	14337	14877	15435	16009	16621	17310	18112	19038	20062	21119	22116
	-2.5	0.8	2.8	2.8	-0.6	-7.9	-18.1	-29.0	-37.1	-38.9	-32.8	-19.1	-0.7	17.7	31.5	37.1	33.2	20.9	2.4
5	3243	4541	5638	6490	7122	7606	8030	8458	8912	9384	9856	10329	10834	11424	12150	13035	14064	15172	16265
	1.1	6.5	9.9	10.3	6.5	-1.7	-12.8	-23.8	-30.8	-30.3	-20.7	-3.0	19.0	40.3	55.7	61.9	57.8	45.2	26.8
0	-2842	-1490	-336	577	1272	1818	2298	2771	3256	3740	4203	4647	5108	5649	6333	7196	8232	9383	10554
	5.0	12.1	16.9	18.1	14.5	6.4	-4.5	-14.7	-20.1	-17.3	-5.1	15.1	38.9	60.9	76.0	81.1	75.9	62.6	44.3

IGRF 1980 VERTICAL INTENSITY (Z)

LAT \ LONG	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
90	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705	56705
	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
85	56678	56592	56502	56408	56312	56216	56119	56025	55933	55847	55767	55695	55632	55579	55538	55509	55493	55492	55504
	4.7	5.1	5.6	6.0	6.5	7.0	7.5	7.9	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.4	12.8	13.2
80	57256	57086	56894	56683	56456	56217	55972	55724	55479	55241	55015	54806	54617	54453	54316	54210	54137	54098	54095
	3.1	3.6	4.0	4.5	5.1	5.7	6.3	7.1	7.9	8.7	9.7	10.7	11.7	12.8	14.0	15.1	16.2	17.3	18.4
75	58293	58042	57740	57392	57007	56594	56161	55719	55278	54847	54435	54050	53700	53391	53129	52917	52761	52661	52621
	0.1	0.2	0.3	0.6	0.9	1.4	2.1	2.9	3.8	5.0	6.3	7.7	9.3	11.0	12.8	14.7	16.7	18.6	20.6
70	59491	59169	58758	58267	57711	57104	56462	55803	55143	54498	53882	53307	52785	52325	51932	51612	51369	51206	51123
	-6.1	-6.6	-6.9	-7.1	-7.0	-6.7	-6.1	-5.2	-4.0	-2.6	-0.9	1.1	3.3	5.7	8.3	11.0	13.8	16.7	19.5
65	60471	60104	59602	58978	58253	57450	56593	55708	54823	53959	53138	52379	51694	51094	50587	50177	49866	49656	49545
	-16.7	-18.0	-18.9	-19.5	-19.7	-19.5	-18.7	-17.5	-15.8	-13.7	-11.2	-8.4	-5.4	-2.1	1.4	4.9	8.6	12.4	16.1
60	60872	60501	59941	59210	58335	57346	56280	55174	54068	52993	51981	51055	50230	49519	48928	48458	48111	47883	47772
	-32.0	-34.3	-36.1	-37.3	-37.8	-37.4	-36.3	-34.3	-31.6	-28.2	-24.3	-20.1	-15.7	-11.1	-6.6	-2.0	2.6	7.2	11.8
55	60427	60098	59525	58726	57730	56578	55319	54006	52693	51425	50244	49177	48244	47455	46813	46319	45967	45754	45671
	-50.9	-54.6	-57.6	-59.7	-60.6	-60.2	-58.4	-55.2	-50.8	-45.4	-39.4	-33.1	-26.7	-20.5	-14.5	-8.7	-3.1	2.4	7.7
50	59001	58759	58218	57392	56313	55029	53603	52106	50608	49172	47848	46671	45660	44822	44159	43664	43331	43152	43116
	-71.0	-76.6	-81.4	-84.9	-86.6	-86.4	-83.9	-79.3	-72.9	-65.0	-56.3	-47.3	-38.4	-30.0	-22.2	-15.1	-8.4	-2.0	4.3
45	56589	56466	55995	55184	54062	52685	51127	49477	47823	46244	44802	43536	42465	41595	40920	40433	40123	39981	39995
	-88.7	-96.8	-104.1	-109.7	-113.0	-113.4	-110.7	-105.0	-96.7	-86.3	-74.8	-62.9	-51.3	-40.5	-30.8	-22.2	-14.2	-6.7	0.6
40	53278	53288	52916	52158	51038	49613	47967	46201	44421	42721	41172	39820	38686	37771	37069	36572	36270	36152	36203
	-100.5	-111.6	-122.0	-130.5	-136.1	-138.1	-136.1	-130.2	-120.9	-108.8	-95.0	-80.6	-66.5	-53.5	-41.9	-31.6	-22.4	-13.7	-5.2
35	49202	49345	49092	48423	47352	45930	44244	42404	40524	38712	37049	35587	34351	33346	32573	32025	31696	31576	31643
	-103.5	-117.8	-131.6	-143.6	-152.3	-156.9	-157.0	-152.5	-143.8	-131.6	-116.9	-101.1	-85.2	-70.4	-57.0	-45.3	-34.8	-24.9	-15.0
30	44502	44777	44659	44113	43137	41771	40094	38215	36255	34326	32519	30895	29491	28325	27409	26752	26351	26195	26255
	-96.3	-113.5	-130.8	-146.3	-158.7	-167.1	-170.8	-169.6	-163.7	-153.6	-140.0	-124.2	-107.6	-91.6	-76.9	-63.9	-52.3	-41.2	-30.1
25	39315	39722	39755	39362	38522	37257	35631	33744	31712	29651	27659	25811	24160	22750	21615	20782	20260	20033	20058
	-79.2	-98.9	-119.0	-137.9	-154.2	-167.0	-175.8	-179.9	-179.2	-173.4	-162.9	-148.9	-132.7	-116.1	-100.5	-86.5	-74.1	-62.3	-50.2
20	33770	34313	34511	34293	33619	32487	30942	29066	26968	24761	22551	20427	18468	16748	15331	14269	13582	13246	13201
	-54.6	-75.8	-98.0	-119.5	-139.3	-157.0	-171.7	-182.7	-188.9	-189.4	-183.8	-172.7	-157.9	-141.4	-125.2	-110.6	-97.6	-85.6	-73.2
15	27994	28678	29050	29018	28523	27539	26090	24240	22086	19735	17301	14888	12604	10552	8830	7511	6625	6142	5981
	-26.0	-47.8	-71.0	-94.1	-116.8	-138.9	-159.8	-178.2	-192.2	-199.9	-200.0	-192.7	-179.7	-163.5	-147.0	-132.0	-119.2	-107.6	-95.6
10	22116	22943	23484	23635	23315	22480	21135	19325	17136	14672	12051	9393	6826	4481	2480	914	-185	-852	-1183
	2.4	-19.3	-42.4	-66.1	-90.5	-116.0	-142.3	-167.5	-189.0	-203.6	-209.3	-205.6	-194.3	-178.5	-161.8	-146.9	-134.5	-123.9	-113.0
5	16265	17222	17918	18235	18077	17385	16147	14399	12215	9700	6972	4164	1417	-1126	-3329	-5098	-6400	-7277	-7827
	26.8	5.7	-16.5	-39.5	-64.3	-91.9	-122.0	-152.5	-179.8	-200.0	-210.0	-209.1	-199.0	-183.4	-166.6	-151.9	-140.5	-131.4	-122.0
0	10554	11621	12450	12912	12901	12345	11225	9568	7446	4962	2237	-592	-3382	-5989	-8286	-10183	-11655	-12744	-13542
	44.3	24.2	3.7	-17.9	-41.9	-69.9	-101.8	-135.2	-165.9	-189.3	-201.8	-202.3	-192.7	-177.1	-160.3	-146.0	-135.7	-128.1	-120.5

IGRF 1980 VERTICAL INTENSITY (Z)

LONG / LAT	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	-13542	-14146	-14621	-14968	-15138	-15062	-14707	-14111	-13386	-12690	-12183	-11977	-12117	-12571	-13251	-14032	-14773	-15340	-15630
	-120.5	-109.5	-93.2	-71.6	-46.7	-21.6	1.0	19.5	34.0	45.8	56.2	66.0	74.7	80.5	81.7	77.1	66.9	52.8	37.3
-5	-18057	-18913	-19622	-20161	-20467	-20480	-20187	-19653	-19015	-18447	-18111	-18112	-18480	-19170	-20081	-21081	-22022	-22765	-23201
	-108.4	-98.4	-82.4	-60.3	-34.2	-7.7	16.0	34.9	48.6	58.3	65.8	72.1	77.2	79.9	78.5	71.9	60.0	44.1	26.7
-10	-21290	-22331	-23203	-23862	-24243	-24304	-24062	-23613	-23114	-22744	-22658	-22944	-23613	-24605	-25810	-27089	-28294	-29284	-29947
	-87.8	-78.2	-62.3	-40.1	-13.9	12.8	36.1	53.7	65.0	71.1	73.9	75.2	75.5	74.2	69.8	61.4	48.4	32.0	13.9
-15	-23335	-24451	-25377	-26058	-26440	-26507	-26311	-25975	-25668	-25564	-25800	-26439	-27473	-28824	-30376	-31988	-33514	-34814	-35776
	-61.9	-52.0	-36.2	-14.4	11.0	36.2	57.4	72.0	79.3	80.5	77.9	73.5	68.5	63.0	56.1	46.5	33.7	18.1	1.1
-20	-24409	-25476	-26341	-26948	-27267	-27315	-27174	-26985	-26918	-27133	-27738	-28774	-30205	-31945	-33870	-35842	-37719	-39368	-40677
	-34.2	-23.5	-7.6	13.1	36.4	58.5	75.9	86.0	88.3	84.1	75.8	65.9	56.2	47.3	38.7	29.2	18.1	5.0	-9.2
-25	-24786	-25703	-26417	-26890	-27118	-27149	-27087	-27081	-27290	-27849	-28839	-30271	-32094	-34210	-36496	-38818	-41041	-43040	-44709
	-7.6	4.4	20.2	39.2	59.2	76.9	89.1	93.8	90.7	81.1	67.8	53.5	40.4	29.5	20.5	12.5	4.3	-4.9	-15.0
-30	-24745	-25459	-25987	-26315	-26468	-26515	-26572	-26781	-27281	-28179	-29527	-31315	-33479	-35918	-38512	-41135	-43662	-45977	-47980
	16.2	29.5	44.9	61.6	77.6	90.1	96.7	95.7	87.4	73.5	56.5	39.4	24.6	13.2	5.2	-0.4	-4.8	-9.3	-14.7
-35	-24543	-25058	-25422	-25648	-25778	-25896	-26114	-26558	-27341	-28542	-30188	-32255	-34675	-37350	-40169	-43014	-45773	-48339	-50618
	36.8	51.1	65.7	79.8	91.5	98.8	100.0	94.1	81.9	65.0	46.2	28.2	13.2	2.7	-3.5	-6.2	-6.8	-6.9	-7.6
-40	-24420	-24786	-25051	-25244	-25421	-25665	-26075	-26755	-27789	-29231	-31093	-33343	-35915	-38721	-41661	-44631	-47530	-50260	-52736
	54.6	69.2	82.7	94.1	101.9	104.8	101.7	92.5	78.0	60.1	41.2	23.9	10.3	1.4	-2.7	-2.8	-0.4	2.8	5.6
-45	-24606	-24893	-25133	-25365	-25648	-26053	-26662	-27553	-28786	-30394	-32379	-34708	-37325	-40153	-43107	-46097	-49034	-51831	-54408
	70.3	84.4	96.5	105.4	110.2	110.0	104.4	93.7	78.9	61.8	44.5	29.3	17.6	10.6	8.2	9.7	13.7	18.7	23.2
-50	-25323	-25590	-25863	-26181	-26596	-27165	-27949	-29003	-30366	-32057	-34072	-36383	-38942	-41690	-44555	-47461	-50333	-53093	-55671
	84.2	97.1	107.5	114.5	117.3	115.6	109.3	99.0	85.6	70.9	56.4	43.8	34.5	29.1	27.6	29.4	33.4	38.3	42.8
-55	-26758	-27040	-27370	-27783	-28318	-29018	-29925	-31074	-32488	-34178	-36136	-38340	-40753	-43328	-46008	-48733	-51438	-54060	-56536
	96.1	107.2	115.8	121.3	123.3	121.4	115.9	107.4	96.7	85.1	73.9	64.3	57.1	52.8	51.5	52.6	55.3	58.7	61.7
-60	-29037	-29337	-29715	-30197	-30810	-31584	-32542	-33707	-35091	-36698	-38519	-40538	-42726	-45048	-47459	-49913	-52360	-54746	-57022
	105.3	114.2	121.1	125.5	127.1	125.9	122.1	116.1	108.7	100.5	92.6	85.6	80.2	76.6	74.9	74.7	75.5	76.7	77.6
-65	-32188	-32489	-32884	-33389	-34022	-34798	-35732	-36835	-38111	-39560	-41174	-42940	-44836	-46836	-48908	-51016	-53124	-55191	-57180
	111.1	117.6	122.8	126.3	127.9	127.6	125.6	122.1	117.6	112.5	107.3	102.6	98.6	95.4	93.2	91.8	90.8	90.0	89.0
-70	-36129	-36407	-36781	-37260	-37851	-38563	-39402	-40371	-41471	-42699	-44047	-45504	-47055	-48681	-50359	-52066	-53775	-55459	-57091
	113.1	117.4	121.0	123.6	125.0	125.4	124.7	123.1	120.7	117.9	114.9	111.8	108.9	106.3	103.9	101.8	99.8	97.8	95.7
-75	-40677	-40911	-41230	-41637	-42135	-42725	-43409	-44187	-45056	-46012	-47049	-48158	-49328	-50547	-51801	-53074	-54350	-55612	-56843
	111.6	114.1	116.2	117.9	118.9	119.4	119.4	118.8	117.8	116.4	114.8	112.9	111.0	109.0	106.9	104.8	102.7	100.6	98.3
-80	-45571	-45744	-45980	-46279	-46640	-47064	-47548	-48091	-48689	-49340	-50037	-50776	-51550	-52352	-53172	-54004	-54838	-55666	-56477
	107.9	109.0	109.9	110.6	111.1	111.4	111.5	111.3	110.8	110.2	109.4	108.4	107.2	106.0	104.6	103.2	101.7	100.1	98.5
-85	-50498	-50594	-50723	-50884	-51077	-51300	-51551	-51830	-52134	-52461	-52808	-53173	-53553	-53944	-54343	-54746	-55151	-55553	-55949
	103.1	103.3	103.5	103.6	103.7	103.7	103.6	103.5	103.3	103.0	102.6	102.2	101.7	101.2	100.6	100.0	99.4	98.8	98.1
-90	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121
	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4

IGRF 1980 VERTICAL INTENSITY (Z)

LONG / LAT	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180
0	-15630	-15594	-15251	-14690	-14034	-13410	-12896	-12506	-12193	-11875	-11473	-10934	-10233	-9363	-8322	-7112	-5753	-4299	-2842
	37.3	22.8	10.4	0.2	-9.3	-19.5	-31.2	-44.0	-56.2	-65.3	-69.4	-67.5	-60.2	-49.2	-36.7	-24.4	-13.3	-3.6	5.0
-5	-23201	-23273	-22998	-22460	-21787	-21110	-20517	-20030	-19607	-19171	-18646	-17982	-17163	-16188	-15061	-13789	-12388	-10904	-9416
	26.7	10.2	-4.0	-15.4	-24.8	-33.4	-42.2	-50.9	-58.7	-63.9	-65.2	-61.8	-54.4	-44.2	-32.8	-21.3	-10.5	-0.3	9.1
-10	-29947	-30219	-30110	-29697	-29105	-28465	-27872	-27356	-26885	-26390	-25801	-25073	-24190	-23157	-21984	-20679	-19259	-17761	-16252
	13.9	-3.4	-18.4	-30.1	-38.8	-45.4	-50.7	-54.9	-57.8	-58.6	-56.6	-51.6	-44.1	-35.0	-25.2	-15.5	-5.8	3.9	13.4
-15	-35776	-36333	-36484	-36294	-35878	-35361	-34839	-34351	-33880	-33369	-32758	-32005	-31098	-30041	-28847	-27529	-26101	-24598	-23071
	1.1	-15.4	-29.8	-41.0	-48.7	-53.3	-55.5	-55.7	-54.2	-51.0	-46.0	-39.5	-32.0	-24.0	-16.0	-8.1	0.1	8.8	17.8
-20	-40677	-41578	-42059	-42169	-42004	-41678	-41283	-40866	-40425	-39921	-39308	-38553	-37643	-36584	-35389	-34069	-32644	-31139	-29600
	-9.2	-23.4	-36.0	-45.9	-52.4	-55.5	-55.5	-53.0	-48.6	-42.6	-35.7	-28.2	-20.8	-13.8	-7.2	-0.7	6.1	13.7	22.0
-25	-44709	-45977	-46821	-47272	-47405	-47313	-47082	-46762	-46368	-45881	-45274	-44523	-43621	-42571	-41386	-40078	-38664	-37168	-35628
	-15.0	-25.5	-35.2	-43.2	-48.5	-50.8	-50.1	-46.8	-41.4	-34.5	-27.0	-19.4	-12.4	-6.0	-0.3	5.4	11.5	18.4	26.0
-30	-47980	-49599	-50801	-51598	-52041	-52201	-52151	-51944	-51608	-51144	-50544	-49799	-48908	-47875	-46710	-45426	-44037	-42566	-41043
	-14.7	-20.8	-27.2	-33.0	-37.3	-39.6	-39.5	-37.0	-32.6	-26.7	-20.1	-13.3	-7.0	-1.1	4.4	10.0	16.0	22.8	30.0
-35	-50618	-52539	-54059	-55174	-55911	-56319	-56456	-56373	-56106	-55676	-55091	-54358	-53483	-52473	-51339	-50092	-48746	-47321	-45843
	-7.6	-9.6	-12.7	-16.5	-20.2	-23.1	-24.5	-24.1	-22.1	-18.5	-14.0	-8.9	-3.6	1.9	7.5	13.4	20.0	27.1	34.3
-40	-52736	-54884	-56659	-58040	-59035	-59672	-59995	-60048	-59871	-59496	-58947	-58243	-57398	-56425	-55337	-54144	-52861	-51505	-50100
	5.6	6.8	6.1	3.8	0.4	-3.3	-6.6	-8.9	-9.8	-9.3	-7.4	-4.3	-0.2	4.7	10.4	17.0	24.2	31.9	39.4
-45	-54408	-56697	-58646	-60226	-61429	-62268	-62770	-62971	-62911	-62626	-62148	-61505	-60719	-59808	-58788	-57672	-56476	-55215	-53910
	23.2	26.0	26.7	25.2	21.7	17.1	12.1	7.5	3.9	1.7	1.1	2.2	4.9	9.3	15.0	21.9	29.7	37.8	45.7
-50	-55671	-58003	-60038	-61740	-63092	-64095	-64763	-65123	-65207	-65050	-64688	-64149	-63463	-62651	-61733	-60725	-59643	-58503	-57322
	42.8	45.7	46.5	45.0	41.3	36.1	30.0	23.9	18.5	14.4	12.0	11.6	13.2	16.8	22.2	29.0	36.8	45.1	53.0
-55	-56536	-58811	-60837	-62577	-64011	-65130	-65938	-66453	-66698	-66702	-66495	-66108	-65569	-64900	-64125	-63260	-62322	-61328	-60291
	61.7	63.5	63.4	61.4	57.5	52.1	45.7	39.2	33.2	28.4	25.1	23.8	24.6	27.5	32.2	38.5	45.8	53.5	61.2
-60	-57022	-59142	-61063	-62754	-64192	-65365	-66270	-66915	-67314	-67490	-67463	-67260	-66905	-66419	-65822	-65134	-64370	-63544	-62668
	77.6	77.6	76.4	73.7	69.7	64.5	58.7	52.7	47.2	42.6	39.4	37.9	38.2	40.4	44.2	49.5	55.7	62.5	69.3
-65	-57180	-59054	-60781	-62334	-63693	-64844	-65782	-66507	-67027	-67352	-67499	-67484	-67324	-67038	-66641	-66150	-65577	-64934	-64231
	89.0	87.5	85.2	82.1	78.2	73.7	68.9	64.1	59.7	56.1	53.5	52.2	52.4	53.9	56.8	60.8	65.7	71.1	76.6
-70	-57091	-58646	-60100	-61433	-62630	-63678	-64570	-65302	-65877	-66299	-66575	-66714	-66728	-66626	-66421	-66122	-65739	-65282	-64755
	95.7	93.3	90.6	87.5	84.2	80.6	77.0	73.6	70.5	68.0	66.3	65.4	65.5	66.6	68.6	71.3	74.7	78.5	82.6
-75	-56843	-58027	-59149	-60195	-61155	-62019	-62781	-63436	-63982	-64419	-64749	-64976	-65103	-65136	-65081	-64942	-64726	-64437	-64081
	98.3	96.0	93.6	91.1	88.6	86.1	83.7	81.6	79.7	78.2	77.2	76.7	76.8	77.5	78.6	80.2	82.3	84.6	87.2
-80	-56477	-57263	-58017	-58731	-59397	-60010	-60565	-61059	-61487	-61849	-62144	-62370	-62530	-62624	-62653	-62620	-62526	-62374	-62166
	98.5	96.9	95.3	93.8	92.3	90.9	89.5	88.4	87.4	86.7	86.2	85.9	85.9	86.2	86.7	87.5	88.4	89.6	90.8
-85	-55949	-56336	-56709	-57066	-57405	-57721	-58013	-58278	-58514	-58721	-58896	-59039	-59149	-59225	-59268	-59277	-59253	-59197	-59109
	98.1	97.4	96.8	96.2	95.6	95.1	94.6	94.1	93.8	93.5	93.3	93.1	93.1	93.1	93.2	93.4	93.7	94.0	94.3
-90	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121
	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4

IGRF 1980 VERTICAL INTENSITY (Z)

LAT \ LONG	180	-175	-170	-165	-160	-155	-150	-145	-140	-135	-130	-125	-120	-115	-110	-105	-100	-95	-90
0	-2842	-1490	-336	577	1272	1818	2298	2771	3256	3740	4203	4647	5108	5649	6333	7196	8232	9383	10554
	5.0	12.1	16.9	18.1	14.5	6.4	-4.5	-14.7	-20.1	-17.3	-5.1	15.1	38.9	60.9	76.0	81.1	75.9	62.6	44.3
-5	-9416	-8019	-6798	-5792	-4984	-4314	-3708	-3115	-2523	-1951	-1422	-934	-451	93	771	1629	2671	3852	5080
	9.1	17.4	23.3	25.4	22.7	15.5	5.8	-2.8	-6.3	-1.7	12.1	32.8	56.2	76.9	89.9	92.8	85.9	71.7	53.8
-10	-16252	-14812	-13514	-12393	-11439	-10602	-9822	-9061	-8311	-7597	-6943	-6352	-5790	-5192	-4484	-3611	-2557	-1354	-83
	13.4	22.2	28.8	31.8	30.3	24.5	16.6	9.9	8.2	13.9	27.7	47.3	68.5	86.0	95.9	96.1	87.5	72.8	55.5
-15	-23071	-21588	-20209	-18968	-17857	-16842	-15877	-14933	-14010	-13131	-12323	-11591	-10907	-10213	-9436	-8518	-7432	-6197	-4881
	17.8	26.4	33.3	36.9	36.4	32.2	26.2	21.3	20.7	26.6	39.1	56.0	73.5	87.2	93.6	91.5	81.8	67.4	51.5
-20	-29600	-28080	-26630	-25280	-24030	-22857	-21728	-20623	-19545	-18513	-17551	-16666	-15834	-15008	-14121	-13116	-11960	-10663	-9277
	22.0	30.1	36.7	40.6	40.9	37.9	33.3	29.6	29.4	34.4	44.5	57.8	71.1	80.8	84.3	80.8	71.3	58.4	44.7
-25	-35628	-34087	-32588	-31161	-29810	-28522	-27276	-26058	-24867	-23717	-22623	-21591	-20601	-19615	-18576	-17435	-16159	-14753	-13261
	26.0	33.5	39.6	43.4	43.9	41.7	37.9	34.6	33.9	37.1	44.1	53.5	62.8	69.1	70.8	67.1	59.2	48.8	38.2
-30	-41043	-39508	-37995	-36533	-35132	-33785	-32480	-31203	-29949	-28722	-27527	-26364	-25215	-24049	-22824	-21501	-20056	-18496	-16863
	30.0	36.9	42.6	45.9	46.4	44.3	40.7	37.2	35.4	36.5	40.4	46.1	52.0	56.0	56.9	54.4	48.9	42.0	34.6
-35	-45843	-44345	-42859	-41410	-40010	-38658	-37344	-36055	-34779	-33508	-32238	-30959	-29656	-28305	-26876	-25345	-23702	-21962	-20170
	34.3	41.0	46.2	49.2	49.5	47.4	43.7	39.7	36.8	35.8	36.9	39.7	43.1	45.8	46.9	46.1	43.6	40.0	35.9
-40	-50100	-48674	-47252	-45858	-44502	-43185	-41897	-40624	-39348	-38053	-36723	-35344	-33899	-32372	-30747	-29014	-27179	-25268	-23332
	39.4	46.1	51.2	54.1	54.4	52.4	48.7	44.5	40.7	38.3	37.5	38.3	40.1	42.2	43.8	44.7	44.8	44.0	42.4
-45	-53910	-52584	-51257	-49948	-48663	-47404	-46160	-44914	-43644	-42329	-40949	-39486	-37925	-36254	-34471	-32579	-30599	-28565	-26534
	45.7	52.6	57.8	60.9	61.6	60.1	56.9	53.0	49.1	46.1	44.4	44.1	45.0	46.8	48.9	50.9	52.5	53.4	53.2
-50	-57322	-56118	-54906	-53699	-52501	-51308	-50111	-48892	-47628	-46299	-44882	-43360	-41723	-39966	-38093	-36120	-34075	-31999	-29948
	53.0	60.1	65.6	69.2	70.6	70.1	68.1	65.1	61.9	59.2	57.4	56.8	57.3	58.8	60.9	63.1	65.1	66.4	66.5
-55	-60291	-59225	-58140	-57044	-55937	-54815	-53667	-52478	-51228	-49898	-48471	-46934	-45281	-43512	-41639	-39682	-37672	-35650	-33666
	61.2	68.1	73.8	77.9	80.3	81.0	80.4	78.9	77.1	75.3	74.0	73.6	73.9	75.0	76.5	78.2	79.7	80.4	80.0
-60	-62668	-61752	-60803	-59824	-58815	-57771	-56684	-55539	-54326	-53029	-51637	-50144	-48548	-46855	-45077	-43236	-41360	-39486	-37652
	69.3	75.7	81.2	85.7	88.8	90.8	91.6	91.7	91.2	90.6	90.2	90.1	90.3	90.9	91.7	92.5	92.9	92.7	91.5
-65	-64231	-63475	-62671	-61821	-60924	-59977	-58975	-57909	-56773	-55559	-54264	-52884	-51422	-49887	-48291	-46653	-44995	-43344	-41730
	76.6	82.0	87.0	91.3	94.7	97.4	99.3	100.5	101.3	101.7	102.0	102.2	102.4	102.6	102.8	102.7	102.2	101.2	99.4
-70	-64755	-64166	-63518	-62813	-62051	-61232	-60353	-59413	-58409	-57340	-56205	-55007	-53751	-52445	-51099	-49727	-48345	-46972	-45627
	82.6	86.7	90.6	94.2	97.4	100.1	102.4	104.1	105.5	106.5	107.2	107.7	107.9	107.9	107.7	107.2	106.3	105.0	103.3
-75	-64081	-63659	-63177	-62635	-62037	-61383	-60674	-59911	-59097	-58231	-57319	-56363	-55368	-54342	-53292	-52228	-51159	-50098	-49054
	87.2	89.8	92.4	95.0	97.4	99.5	101.4	103.1	104.4	105.5	106.3	106.9	107.2	107.2	107.0	106.6	105.9	104.9	103.8
-80	-62166	-61905	-61592	-61229	-60820	-60365	-59868	-59331	-58756	-58146	-57505	-56836	-56145	-55435	-54712	-53981	-53248	-52519	-51801
	90.8	92.1	93.5	94.9	96.2	97.5	98.7	99.8	100.7	101.5	102.2	102.6	103.0	103.2	103.2	103.1	102.8	102.5	102.1
-85	-59109	-58989	-58840	-58662	-58457	-58226	-57970	-57693	-57394	-57078	-56745	-56398	-56040	-55673	-55299	-54922	-54545	-54169	-53798
	94.3	94.7	95.2	95.6	96.1	96.5	96.9	97.4	97.8	98.1	98.5	98.8	99.0	99.3	99.4	99.6	99.7	99.8	99.8
-90	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121
	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4

IGRF 1980 VERTICAL INTENSITY (Z)

LONG / LAT	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
0	10554	11621	12450	12912	12901	12345	11225	9568	7446	4962	2237	-592	-3382	-5989	-8286	-10183	-11655	-12744	-13542
	44.3	24.2	3.7	-17.9	-41.9	-69.9	-101.8	-135.2	-165.9	-189.3	-201.8	-202.3	-192.7	-177.1	-160.3	-146.0	-135.7	-128.1	-120.5
-5	5080	6233	7172	7762	7888	7473	6488	4961	2962	596	-2013	-4731	-7424	-9960	-12232	-14168	-15754	-17027	-18057
	53.8	35.0	16.4	-3.0	-25.2	-52.1	-83.6	-117.3	-148.7	-172.8	-185.8	-186.4	-176.7	-160.9	-144.1	-130.3	-121.0	-114.8	-108.4
-10	-83	1139	2175	2886	3151	2886	2062	703	-1117	-3291	-5694	-8198	-10682	-13038	-15184	-17073	-18698	-20089	-21290
	55.5	38.4	22.0	5.1	-14.6	-39.2	-68.5	-100.3	-130.0	-152.6	-164.3	-164.1	-153.8	-137.8	-121.3	-107.9	-99.1	-93.6	-87.8
-15	-4881	-3589	-2456	-1621	-1209	-1305	-1946	-3105	-4707	-6644	-8788	-11020	-13232	-15342	-17294	-19061	-20646	-22065	-23335
	51.5	36.4	22.4	8.1	-8.9	-30.4	-56.5	-84.8	-111.1	-130.8	-140.3	-138.8	-128.0	-112.1	-95.8	-82.7	-73.9	-68.0	-61.9
-20	-9277	-7900	-6658	-5688	-5116	-5032	-5472	-6414	-7781	-9462	-11334	-13280	-15207	-17051	-18775	-20370	-21838	-23187	-24409
	44.7	32.0	20.5	8.6	-5.8	-24.3	-46.7	-70.9	-93.2	-109.4	-116.6	-113.8	-102.9	-87.5	-71.6	-58.3	-48.8	-41.7	-34.2
-25	-13261	-11772	-10405	-9291	-8555	-8285	-8521	-9240	-10370	-11800	-13410	-15089	-16749	-18338	-19831	-21224	-22518	-23712	-24786
	38.2	28.3	19.1	9.3	-2.9	-18.6	-37.7	-58.0	-76.5	-89.6	-94.8	-91.5	-81.0	-66.3	-50.8	-37.2	-26.2	-17.1	-7.6
-30	-16863	-15239	-13736	-12479	-11584	-11136	-11173	-11675	-12574	-13765	-15131	-16567	-17989	-19348	-20620	-21801	-22889	-23878	-24745
	34.6	27.6	20.6	12.4	1.9	-11.8	-28.1	-45.4	-60.8	-71.6	-75.6	-72.3	-62.7	-49.1	-34.1	-19.8	-7.1	4.4	16.2
-35	-20170	-18407	-16774	-15386	-14348	-13737	-13587	-13880	-14553	-15509	-16642	-17850	-19053	-20200	-21266	-22239	-23117	-23890	-24543
	35.9	31.4	26.1	19.2	9.7	-2.6	-17.0	-32.0	-45.3	-54.5	-58.1	-55.3	-47.0	-34.6	-20.1	-5.2	9.2	23.0	36.8
-40	-23332	-21449	-19711	-18219	-17065	-16311	-15987	-16075	-16519	-17236	-18128	-19105	-20090	-21032	-21900	-22679	-23362	-23944	-24420
	42.4	39.7	35.6	29.4	20.6	9.3	-3.8	-17.2	-28.9	-37.3	-40.7	-38.7	-31.6	-20.5	-6.6	8.5	24.1	39.5	54.6
-45	-26534	-24578	-22779	-21222	-19981	-19107	-18620	-18504	-18713	-19175	-19811	-20540	-21294	-22025	-22698	-23298	-23816	-24251	-24606
	53.2	51.5	48.0	42.1	33.8	23.2	11.4	-0.6	-11.1	-18.6	-22.0	-20.7	-14.7	-4.7	8.3	23.2	39.0	54.9	70.3
-50	-29948	-27985	-26182	-24606	-23313	-22341	-21704	-21389	-21358	-21556	-21919	-22384	-22893	-23403	-23884	-24319	-24701	-25032	-25323
	66.5	65.0	61.5	55.9	48.0	38.4	27.9	17.5	8.4	1.9	-1.2	-0.1	5.0	13.8	25.6	39.5	54.5	69.7	84.2
-55	-33666	-31773	-30027	-28480	-27173	-26133	-25369	-24870	-24610	-24550	-24642	-24840	-25101	-25390	-25684	-25968	-26238	-26497	-26758
	80.0	78.2	74.5	69.1	62.0	53.7	44.8	36.3	28.9	23.8	21.4	22.4	26.8	34.4	44.6	56.8	70.0	83.4	96.1
-60	-37652	-35900	-34273	-32806	-31529	-30460	-29606	-28960	-28506	-28218	-28068	-28023	-28056	-28142	-28265	-28415	-28590	-28794	-29037
	91.5	89.2	85.5	80.6	74.6	67.9	61.0	54.6	49.2	45.6	44.2	45.4	49.1	55.4	63.7	73.5	84.3	95.1	105.3
-65	-41730	-40181	-38727	-37392	-36195	-35149	-34260	-33527	-32940	-32488	-32153	-31920	-31771	-31693	-31677	-31716	-31811	-31966	-32188
	99.4	96.9	93.6	89.6	85.0	80.1	75.4	71.1	67.7	65.6	65.1	66.4	69.4	74.2	80.4	87.7	95.6	103.6	111.1
-70	-45627	-44328	-43094	-41940	-40878	-39920	-39068	-38327	-37692	-37161	-36727	-36383	-36122	-35939	-35829	-35792	-35827	-35938	-36129
	103.3	101.2	98.6	95.8	92.7	89.7	86.9	84.5	82.7	81.8	82.0	83.2	85.5	88.8	93.0	97.8	102.9	108.1	113.1
-75	-49054	-48040	-47066	-46140	-45273	-44470	-43736	-43074	-42487	-41976	-41539	-41176	-40886	-40668	-40522	-40448	-40448	-40524	-40677
	103.8	102.4	100.9	99.3	97.7	96.2	94.9	93.9	93.3	93.1	93.5	94.5	96.0	98.0	100.4	103.1	106.0	108.9	111.6
-80	-51801	-51099	-50420	-49768	-49148	-48566	-48025	-47528	-47079	-46680	-46332	-46038	-45798	-45614	-45487	-45419	-45409	-45459	-45571
	102.1	101.6	101.0	100.5	100.0	99.6	99.3	99.1	99.1	99.2	99.6	100.2	101.0	101.9	103.0	104.2	105.5	106.7	107.9
-85	-53798	-53434	-53080	-52740	-52414	-52106	-51818	-51552	-51310	-51094	-50904	-50743	-50612	-50512	-50444	-50408	-50405	-50435	-50498
	99.8	99.9	99.9	100.0	100.0	100.1	100.2	100.3	100.5	100.6	100.8	101.1	101.3	101.6	101.9	102.2	102.5	102.8	103.1
-90	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121	-55121
	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4	98.4

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
90	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753
	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
85	55713	55741	55782	55835	55900	55975	56061	56156	56259	56368	56481	56598	56716	56834	56949	57061	57168	57268	57360
	12.0	12.3	12.5	12.7	12.8	12.8	12.8	12.7	12.5	12.3	11.9	11.5	11.1	10.5	9.9	9.3	8.6	7.9	7.2
80	54557	54595	54667	54771	54906	55072	55265	55484	55725	55984	56257	56539	56826	57111	57391	57658	57909	58138	58341
	17.2	18.1	18.9	19.5	20.0	20.4	20.6	20.6	20.4	20.0	19.4	18.7	17.7	16.6	15.4	14.0	12.5	10.9	9.3
75	53407	53436	53520	53659	53851	54095	54388	54726	55105	55519	55962	56426	56901	57378	57846	58295	58713	59091	59418
	20.0	21.6	23.1	24.4	25.5	26.4	27.0	27.3	27.2	26.8	26.1	25.1	23.7	22.1	20.2	18.1	15.9	13.5	11.0
70	52308	52319	52403	52561	52789	53089	53455	53887	54378	54923	55514	56141	56793	57453	58108	58738	59327	59855	60308
	20.0	22.4	24.6	26.7	28.4	29.8	30.8	31.3	31.4	31.0	30.2	28.9	27.2	25.2	22.9	20.4	17.6	14.8	11.8
65	51238	51236	51321	51491	51744	52078	52491	52981	53545	54179	54876	55625	56414	57224	58035	58823	59561	60224	60786
	17.9	21.0	23.9	26.5	28.7	30.5	31.7	32.4	32.5	32.0	30.9	29.3	27.4	25.1	22.5	19.8	16.9	14.0	11.1
60	50127	50133	50233	50423	50699	51058	51498	52019	52618	53296	54048	54866	55738	56645	57563	58463	59311	60073	60715
	15.0	18.6	21.9	24.9	27.4	29.3	30.6	31.1	30.9	30.0	28.5	26.6	24.3	21.8	19.1	16.4	13.8	11.2	8.8
55	48899	48937	49072	49298	49606	49992	50451	50983	51591	52276	53038	53873	54773	55718	56684	57638	58543	59357	60040
	12.6	16.5	20.1	23.3	25.9	27.7	28.7	28.7	28.0	26.5	24.4	21.9	19.1	16.3	13.6	11.1	8.9	7.0	5.4
50	47495	47584	47772	48047	48398	48815	49293	49832	50433	51103	51844	52658	53536	54465	55421	56370	57274	58087	58766
	11.5	15.6	19.4	22.7	25.2	26.8	27.3	26.8	25.3	23.0	20.0	16.8	13.5	10.3	7.5	5.1	3.4	2.3	1.9
45	45885	46034	46281	46610	47006	47457	47957	48501	49094	49741	50447	51214	52039	52910	53806	54697	55546	56310	56943
	11.5	16.0	20.0	23.4	25.8	27.2	27.2	26.0	23.7	20.5	16.8	12.8	8.9	5.4	2.4	0.1	-1.3	-1.7	-1.1
40	44061	44270	44572	44949	45386	45868	46386	46937	47523	48148	48816	49529	50284	51071	51874	52668	53421	54096	54651
	12.2	16.9	21.1	24.7	27.2	28.3	28.0	26.2	23.2	19.3	15.0	10.5	6.3	2.4	-0.8	-3.1	-4.2	-4.2	-2.8
35	42044	42305	42652	43067	43532	44034	44563	45118	45698	46305	46939	47598	48280	48975	49669	50346	50982	51546	52005
	12.5	17.5	22.0	25.6	28.1	29.1	28.5	26.3	22.9	18.7	14.1	9.5	5.2	1.3	-1.9	-4.2	-5.3	-4.9	-3.1
30	39886	40193	40576	41016	41495	42001	42530	43079	43648	44236	44838	45451	46066	46675	47267	47831	48351	48805	49167
	12.2	17.2	21.6	25.2	27.5	28.3	27.4	25.0	21.4	17.2	12.9	8.6	4.7	1.2	-1.8	-3.9	-4.9	-4.3	-2.2
25	37693	38042	38454	38908	39388	39886	40397	40925	41470	42030	42601	43173	43736	44281	44797	45277	45708	46077	46363
	11.6	16.2	20.0	23.0	24.7	25.0	23.7	21.0	17.6	13.7	9.9	6.4	3.2	0.4	-1.9	-3.6	-4.1	-3.2	-0.8
20	35620	36012	36451	36916	37391	37867	38344	38829	39329	39846	40379	40918	41452	41968	42454	42900	43295	43623	43868
	11.4	15.1	17.9	19.5	19.9	19.1	17.0	14.0	10.6	7.3	4.2	1.6	-0.5	-2.4	-3.8	-4.5	-4.3	-2.8	0.3
15	33849	34289	34761	35241	35709	36156	36582	37000	37429	37885	38373	38891	39425	39960	40477	40957	41381	41728	41980
	12.7	15.1	16.0	15.5	13.8	11.1	7.6	4.0	0.5	-2.4	-4.7	-6.3	-7.4	-8.1	-8.4	-7.8	-6.3	-3.5	0.5
10	32519	33020	33538	34043	34510	34923	35284	35615	35952	36330	36774	37289	37865	38476	39092	39679	40204	40633	40941
	15.1	16.0	14.8	11.6	6.9	1.5	-3.9	-8.7	-12.4	-15.0	-16.5	-17.1	-17.2	-16.7	-15.5	-13.3	-9.9	-5.3	0.3
5	31654	32236	32815	33358	33829	34207	34494	34727	34964	35268	35684	36232	36897	37644	38426	39188	39878	40447	40859
	17.2	16.7	13.2	6.9	-1.0	-9.6	-17.4	-23.5	-27.6	-29.6	-30.1	-29.6	-28.4	-26.5	-23.7	-19.5	-13.9	-7.1	0.5
0	31148	31822	32472	33056	33530	33867	34080	34221	34375	34634	35065	35695	36506	37448	38452	39443	40349	41107	41666
	16.6	14.9	9.3	0.3	-11.0	-22.6	-32.7	-40.1	-44.1	-45.1	-44.0	-41.7	-38.7	-35.0	-30.3	-24.1	-16.4	-7.4	2.1

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180
90	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753
	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
85	57360	57442	57515	57578	57630	57670	57700	57720	57730	57731	57723	57709	57689	57664	57636	57605	57572	57539	57505
	7.2	6.4	5.7	4.9	4.2	3.4	2.8	2.1	1.5	1.0	0.5	0.1	-0.3	-0.6	-0.8	-0.9	-1.0	-1.1	-1.0
80	58341	58515	58656	58763	58836	58874	58879	58853	58800	58724	58629	58521	58404	58284	58167	58055	57954	57866	57793
	9.3	7.6	5.9	4.2	2.6	1.0	-0.4	-1.8	-3.0	-4.1	-4.9	-5.7	-6.2	-6.6	-6.8	-6.8	-6.7	-6.5	-6.1
75	59418	59687	59892	60028	60094	60091	60022	59893	59713	59490	59236	58963	58684	58410	58154	57925	57732	57581	57478
	11.0	8.5	6.0	3.5	1.1	-1.2	-3.3	-5.3	-7.0	-8.4	-9.6	-10.5	-11.1	-11.4	-11.4	-11.1	-10.6	-9.9	-9.0
70	60308	60669	60928	61077	61113	61038	60857	60580	60223	59802	59338	58852	58366	57902	57478	57113	56820	56610	56490
	11.8	8.8	5.8	2.9	0.0	-2.6	-5.2	-7.4	-9.4	-11.1	-12.4	-13.4	-13.9	-14.1	-13.9	-13.2	-12.3	-11.1	-9.7
65	60786	61225	61523	61668	61655	61484	61166	60715	60153	59508	58809	58089	57379	56712	56114	55612	55224	54966	54846
	11.1	8.1	5.2	2.4	-0.3	-3.0	-5.4	-7.6	-9.6	-11.3	-12.6	-13.6	-14.1	-14.2	-13.9	-13.1	-12.0	-10.5	-8.8
60	60715	61207	61524	61647	61570	61292	60827	60194	59424	58553	57621	56671	55747	54888	54131	53507	53040	52747	52637
	8.8	6.5	4.2	2.1	0.1	-1.9	-3.8	-5.6	-7.3	-8.7	-9.9	-10.9	-11.5	-11.7	-11.6	-11.1	-10.2	-8.9	-7.2
55	60040	60553	60865	60952	60804	60420	59814	59011	58049	56973	55833	54682	53573	52554	51668	50949	50424	50109	50014
	5.4	4.2	3.2	2.2	1.3	0.4	-0.6	-1.6	-2.7	-3.7	-4.7	-5.7	-6.5	-7.1	-7.6	-7.8	-7.6	-6.9	-5.9
50	58766	59267	59552	59595	59378	58901	58176	57233	56115	54873	53567	52260	51011	49876	48900	48120	47563	47242	47165
	1.9	1.9	2.3	2.9	3.4	3.8	3.9	3.8	3.4	2.8	2.1	1.2	0.1	-1.1	-2.5	-3.8	-4.8	-5.4	-5.4
45	56943	57401	57643	57638	57364	56817	56009	54970	53744	52390	50974	49566	48232	47030	46011	45209	44648	44339	44282
	-1.1	0.2	2.1	4.1	6.1	7.8	9.0	9.7	9.9	9.8	9.2	8.4	7.0	5.2	2.8	0.2	-2.4	-4.5	-5.9
40	54651	55043	55232	55183	54870	54285	53435	52350	51074	49670	48207	46760	45399	44187	43172	42388	41854	41575	41545
	-2.8	-0.4	2.7	6.0	9.2	11.9	13.8	15.1	15.7	15.8	15.4	14.6	13.1	10.7	7.5	3.7	-0.5	-4.3	-7.1
35	52005	52320	52453	52368	52036	51445	50598	49519	48254	46863	45418	43996	42668	41497	40531	39802	39322	39091	39094
	-3.1	0.1	4.1	8.3	12.3	15.6	17.9	19.2	19.8	19.9	19.6	18.8	17.2	14.7	10.9	6.1	0.7	-4.6	-8.7
30	49167	49407	49489	49379	49048	48480	47673	46649	45449	44131	42765	41426	40183	39098	38217	37569	37163	36989	37026
	-2.2	1.4	5.9	10.7	15.1	18.5	20.7	21.7	22.0	21.8	21.3	20.6	19.1	16.6	12.6	7.3	1.1	-5.0	-10.2
25	46363	46542	46584	46460	46143	45616	44878	43945	42854	41658	40420	39208	38090	37121	36345	35787	35454	35332	35392
	-0.8	3.1	7.9	12.8	17.2	20.4	22.1	22.7	22.4	21.8	21.1	20.3	19.0	16.6	12.8	7.4	1.0	-5.6	-11.2
20	43868	44011	44028	43898	43601	43126	42470	41650	40696	39651	38571	37513	36536	35691	35017	34538	34257	34160	34215
	0.3	4.5	9.5	14.4	18.6	21.4	22.7	22.7	22.0	21.0	20.0	19.0	17.6	15.3	11.6	6.5	0.3	-6.1	-11.8
15	41980	42118	42127	41995	41717	41290	40719	40017	39207	38324	37407	36504	35663	34927	34331	33897	33629	33512	33518
	0.5	5.5	10.8	15.7	19.6	22.0	23.0	22.7	21.6	20.3	19.0	17.6	15.9	13.4	9.8	5.0	-0.8	-6.8	-12.3
10	40941	41107	41125	40997	40733	40346	39849	39257	38584	37851	37083	36315	35583	34924	34367	33934	33627	33438	33343
	0.3	6.4	12.2	17.3	20.9	23.1	23.8	23.3	22.0	20.4	18.6	16.7	14.3	11.4	7.7	3.1	-2.3	-7.9	-13.1
5	40859	41090	41140	41026	40776	40422	39988	39490	38934	38328	37682	37016	36357	35735	35177	34699	34308	33998	33755
	0.5	8.0	14.7	20.0	23.5	25.4	25.7	24.9	23.3	21.2	18.8	16.0	12.9	9.3	5.3	0.7	-4.3	-9.5	-14.4
0	41666	42002	42117	42040	41818	41500	41122	40704	40245	39739	39183	38587	37967	37350	36756	36202	35694	35232	34811
	2.1	11.1	18.7	24.3	27.7	29.1	28.8	27.3	24.9	22.0	18.6	14.8	10.9	6.7	2.5	-2.0	-6.7	-11.7	-16.6

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	180	-175	-170	-165	-160	-155	-150	-145	-140	-135	-130	-125	-120	-115	-110	-105	-100	-95	-90
90	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753
	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
85	57505	57472	57439	57407	57375	57343	57312	57279	57245	57210	57171	57130	57085	57035	56980	56921	56857	56788	56715
	-1.0	-1.0	-0.8	-0.7	-0.5	-0.2	0.0	0.3	0.6	0.9	1.3	1.6	2.0	2.3	2.7	3.1	3.5	3.8	4.2
80	57793	57737	57699	57676	57668	57673	57687	57707	57729	57748	57761	57764	57754	57727	57681	57614	57525	57415	57282
	-6.1	-5.6	-5.1	-4.5	-3.9	-3.3	-2.7	-2.0	-1.5	-0.9	-0.4	0.1	0.5	1.0	1.4	1.8	2.2	2.6	3.0
75	57478	57423	57417	57456	57537	57652	57793	57951	58116	58279	58429	58556	58654	58714	58732	58702	58623	58493	58314
	-9.0	-8.0	-6.9	-5.8	-4.7	-3.7	-2.8	-2.1	-1.4	-0.9	-0.5	-0.2	0.0	0.1	0.2	0.2	0.3	0.4	0.5
70	56490	56463	56526	56673	56895	57180	57512	57875	58250	58621	58971	59283	59543	59740	59864	59908	59868	59743	59534
	-9.7	-8.1	-6.5	-5.0	-3.6	-2.4	-1.5	-0.8	-0.5	-0.4	-0.6	-1.0	-1.5	-2.0	-2.6	-3.2	-3.7	-4.2	-4.5
65	54846	54865	55020	55301	55694	56178	56731	57329	57945	58556	59135	59662	60116	60481	60742	60891	60921	60828	60613
	-8.8	-6.9	-5.0	-3.2	-1.7	-0.5	0.1	0.3	-0.1	-0.9	-2.0	-3.5	-5.1	-6.7	-8.3	-9.7	-11.1	-12.2	-13.2
60	52637	52710	52961	53376	53934	54611	55378	56202	57052	57895	58702	59445	60099	60644	61063	61341	61469	61440	61252
	-7.2	-5.3	-3.4	-1.6	-0.1	0.7	0.9	0.3	-1.0	-3.1	-5.6	-8.4	-11.4	-14.3	-17.1	-19.7	-22.0	-24.0	-25.7
55	50014	50137	50470	50995	51688	52522	53461	54470	55512	56551	57553	58488	59327	60048	60629	61052	61303	61369	61243
	-5.9	-4.4	-2.7	-1.1	0.2	0.7	0.3	-1.1	-3.6	-7.0	-11.1	-15.5	-20.0	-24.4	-28.5	-32.3	-35.7	-38.8	-41.4
50	47165	47326	47715	48312	49093	50027	51078	52209	53382	54558	55703	56785	57776	58650	59383	59953	60339	60522	60487
	-5.4	-4.7	-3.5	-2.1	-1.1	-0.8	-1.7	-3.9	-7.6	-12.3	-17.9	-23.9	-29.8	-35.6	-41.0	-46.0	-50.6	-54.9	-58.8
45	44282	44470	44888	45516	46331	47302	48397	49580	50813	52059	53284	54458	55552	56541	57399	58100	58616	58921	58990
	-5.9	-6.2	-5.7	-4.6	-3.7	-3.5	-4.8	-7.7	-12.3	-18.3	-25.1	-32.3	-39.4	-46.3	-52.7	-58.8	-64.6	-70.3	-75.7
40	41545	41750	42173	42794	43592	44542	45617	46783	48008	49257	50497	51701	52842	53895	54835	55632	56253	56664	56832
	-7.1	-8.6	-8.8	-8.0	-7.2	-7.1	-8.6	-12.0	-17.4	-24.2	-31.9	-39.8	-47.5	-54.8	-61.8	-68.6	-75.6	-82.6	-89.7
35	39094	39311	39720	40302	41041	41920	42918	44009	45166	46355	47549	48722	49850	50910	51877	52721	53405	53891	54139
	-8.7	-11.3	-12.1	-11.7	-11.0	-11.0	-12.8	-16.6	-22.4	-29.7	-37.7	-45.7	-53.2	-60.2	-67.1	-74.1	-81.8	-90.1	-98.8
30	37026	37246	37625	38143	38789	39556	40432	41400	42437	43516	44609	45695	46751	47759	48696	49532	50231	50751	51049
	-10.2	-13.6	-15.0	-15.0	-14.6	-15.0	-17.1	-21.4	-27.5	-34.8	-42.5	-49.7	-56.1	-62.1	-68.0	-74.7	-82.5	-91.6	-101.7
25	35392	35601	35930	36360	36887	37510	38230	39038	39916	40841	41789	42739	43674	44577	45431	46208	46874	47387	47703
	-11.2	-15.1	-17.1	-17.7	-17.9	-18.8	-21.5	-26.2	-32.5	-39.5	-46.2	-51.9	-56.6	-60.7	-65.1	-70.7	-78.2	-87.6	-98.4
20	34215	34385	34640	34960	35345	35803	36343	36964	37654	38394	39161	39938	40711	41469	42198	42874	43467	43938	44245
	-11.8	-16.0	-18.5	-19.7	-20.7	-22.5	-25.9	-31.0	-37.2	-43.5	-48.8	-52.7	-55.1	-57.0	-59.5	-63.6	-70.1	-79.2	-90.1
15	33518	33610	33758	33945	34171	34450	34796	35214	35697	36228	36790	37368	37953	38538	39112	39658	40147	40547	40817
	-12.3	-16.6	-19.5	-21.4	-23.3	-26.0	-30.1	-35.4	-41.2	-46.5	-50.3	-52.3	-52.6	-52.3	-52.8	-55.2	-60.4	-68.4	-78.6
10	33343	33312	33319	33348	33401	33493	33639	33846	34111	34421	34765	35130	35513	35908	36310	36703	37065	37366	37572
	-13.1	-17.4	-20.7	-23.3	-26.0	-29.4	-33.8	-38.9	-44.1	-48.3	-50.7	-51.0	-49.8	-47.9	-46.8	-47.7	-51.2	-57.6	-66.4
5	33755	33559	33391	33242	33112	33013	32957	32951	32993	33079	33199	33348	33523	33724	33942	34168	34380	34553	34661
	-14.4	-18.9	-22.6	-25.9	-29.1	-32.7	-36.9	-41.3	-45.5	-48.5	-49.9	-49.4	-47.4	-44.8	-42.8	-42.3	-44.2	-48.7	-55.3
0	34811	34422	34059	33717	33397	33106	32849	32631	32453	32314	32213	32148	32120	32125	32157	32201	32241	32256	32225
	-16.6	-21.2	-25.4	-29.2	-32.6	-36.0	-39.3	-42.6	-45.5	-47.6	-48.4	-47.8	-46.0	-43.5	-41.2	-39.8	-40.2	-42.6	-46.9

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
90	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753
	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
85	56715	56637	56557	56474	56389	56304	56220	56137	56058	55984	55916	55855	55802	55759	55726	55704	55695	55697	55713
	4.2	4.6	5.1	5.5	5.9	6.4	6.8	7.3	7.8	8.2	8.7	9.2	9.6	10.1	10.5	11.0	11.4	11.7	12.0
80	57282	57130	56959	56772	56572	56363	56148	55932	55719	55513	55318	55138	54976	54837	54722	54635	54578	54551	54557
	3.0	3.4	3.9	4.4	5.0	5.6	6.2	6.9	7.7	8.5	9.4	10.3	11.3	12.3	13.3	14.3	15.3	16.3	17.2
75	58314	58089	57820	57515	57178	56818	56441	56058	55675	55301	54944	54611	54309	54043	53818	53640	53510	53431	53407
	0.5	0.7	1.0	1.3	1.8	2.4	3.0	3.9	4.8	5.9	7.1	8.4	9.9	11.5	13.1	14.8	16.5	18.3	20.0
70	59534	59245	58882	58455	57973	57449	56897	56329	55761	55204	54673	54176	53724	53326	52987	52712	52506	52371	52308
	-4.5	-4.7	-4.8	-4.7	-4.4	-3.9	-3.2	-2.2	-1.1	0.3	1.9	3.7	5.7	7.8	10.1	12.5	15.0	17.5	20.0
65	60613	60281	59840	59302	58682	57998	57269	56518	55764	55027	54325	53673	53083	52566	52127	51773	51506	51328	51238
	-13.2	-13.9	-14.3	-14.5	-14.3	-13.7	-12.8	-11.5	-9.9	-7.9	-5.7	-3.2	-0.5	2.4	5.3	8.4	11.6	14.8	17.9
60	61252	60909	60418	59793	59054	58224	57332	56407	55479	54576	53722	52936	52234	51625	51118	50714	50415	50220	50127
	-25.7	-27.0	-27.9	-28.3	-28.2	-27.4	-26.0	-24.0	-21.4	-18.4	-15.0	-11.4	-7.6	-3.8	0.0	3.8	7.6	11.4	15.0
55	61243	60924	60418	59738	58907	57955	56919	55841	54759	53713	52734	51846	51066	50403	49863	49444	49147	48967	48899
	-41.4	-43.6	-45.1	-45.9	-45.8	-44.7	-42.5	-39.3	-35.2	-30.5	-25.3	-20.0	-14.7	-9.6	-4.7	-0.1	4.3	8.5	12.6
50	60487	60225	59737	59035	58143	57097	55945	54739	53533	52375	51306	50353	49534	48857	48320	47921	47655	47516	47495
	-58.8	-62.1	-64.7	-66.1	-66.1	-64.6	-61.4	-56.7	-50.7	-43.7	-36.2	-28.6	-21.2	-14.4	-8.3	-2.7	2.3	7.0	11.5
45	58990	58806	58363	57668	56746	55639	54404	53104	51808	50575	49454	48476	47656	46998	46497	46143	45929	45846	45885
	-75.7	-80.5	-84.4	-86.8	-87.3	-85.5	-81.5	-75.1	-67.0	-57.4	-47.2	-36.9	-27.2	-18.4	-10.8	-4.2	1.6	6.8	11.5
40	56832	56732	56350	55686	54766	53634	52354	51001	49654	48385	47249	46279	45489	44876	44429	44135	43982	43961	44061
	-89.7	-96.3	-101.8	-105.6	-106.9	-105.3	-100.6	-93.0	-82.9	-70.9	-58.0	-45.1	-32.9	-22.1	-12.8	-5.1	1.4	7.0	12.2
35	54139	54115	53799	53187	52299	51179	49896	48533	47177	45909	44788	43850	43107	42550	42165	41935	41846	41886	42044
	-98.8	-107.2	-114.6	-120.0	-122.5	-121.5	-116.8	-108.5	-97.1	-83.4	-68.3	-53.1	-38.7	-25.9	-15.1	-6.3	1.0	7.1	12.5
30	51049	51086	50836	50289	49460	48391	47148	45818	44492	43255	42172	41280	40590	40092	39770	39603	39576	39675	39886
	-101.7	-111.8	-121.0	-128.0	-131.9	-132.1	-128.1	-120.1	-108.4	-93.8	-77.5	-60.6	-44.4	-29.9	-17.7	-7.8	0.2	6.7	12.2
25	47703	47783	47594	47123	46376	45390	44224	42964	41701	40522	39495	38658	38026	37590	37332	37231	37269	37429	37693
	-98.4	-109.7	-120.2	-128.7	-134.2	-135.8	-133.2	-126.4	-115.5	-101.1	-84.4	-66.5	-49.1	-33.2	-19.8	-9.0	-0.5	6.1	11.6
20	44245	44347	44211	43817	43166	42284	41224	40064	38892	37794	36840	36075	35516	35156	34979	34959	35073	35300	35620
	-90.1	-101.8	-113.0	-122.5	-129.2	-132.4	-131.6	-126.6	-117.3	-104.0	-87.6	-69.5	-51.3	-34.5	-20.3	-8.8	-0.1	6.5	11.4
15	40817	40920	40821	40497	39941	39172	38233	37193	36135	35143	34291	33626	33171	32922	32857	32945	33156	33465	33849
	-78.6	-89.9	-101.0	-110.7	-118.2	-122.8	-123.9	-121.0	-113.6	-101.7	-86.1	-68.1	-49.7	-32.6	-17.9	-6.3	2.3	8.5	12.7
10	37572	37647	37559	37282	36807	36144	35328	34420	33497	32642	31926	31404	31097	31001	31086	31315	31647	32055	32519
	-66.4	-76.3	-86.5	-95.7	-103.4	-108.9	-111.4	-110.2	-104.5	-94.0	-79.2	-61.9	-43.9	-27.2	-13.1	-2.0	6.3	11.9	15.1
5	34661	34671	34555	34291	33867	33290	32589	31819	31050	30360	29820	29479	29359	29448	29711	30099	30570	31094	31654
	-55.3	-63.4	-71.9	-80.1	-87.3	-92.9	-96.1	-95.8	-91.1	-81.6	-67.8	-51.6	-35.0	-20.0	-7.5	2.4	9.8	14.8	17.2
0	32225	32125	31934	31637	31224	30704	30103	29471	28869	28367	28027	27890	27969	28248	28684	29227	29835	30480	31148
	-46.9	-52.7	-59.3	-66.0	-72.2	-77.2	-80.1	-79.8	-75.3	-66.3	-53.7	-39.5	-25.6	-13.5	-3.7	4.2	10.5	14.8	16.6

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
0	31148	31822	32472	33056	33530	33867	34080	34221	34375	34634	35065	35695	36506	37448	38452	39443	40349	41107	41666
	16.6	14.9	9.3	0.3	-11.0	-22.6	-32.7	-40.1	-44.1	-45.1	-44.0	-41.7	-38.7	-35.0	-30.3	-24.1	-16.4	-7.4	2.1
-5	30812	31570	32279	32888	33348	33637	33781	33854	33969	34239	34750	35527	36544	37732	39002	40261	41420	42404	43153
	11.5	8.8	1.5	-9.9	-23.7	-37.8	-49.5	-57.3	-60.5	-59.6	-56.0	-51.0	-45.5	-39.7	-33.0	-25.1	-15.8	-5.2	5.6
-10	30463	31267	31995	32590	33008	33240	33329	33375	33513	33872	34539	35533	36811	38284	39850	41400	42837	44075	45049
	1.4	-2.3	-10.8	-23.8	-39.2	-54.5	-66.7	-73.8	-75.0	-71.1	-64.0	-55.5	-47.0	-38.9	-30.6	-21.7	-11.7	-0.8	10.3
-15	29990	30776	31462	31994	32339	32508	32568	32641	32875	33403	34301	35570	37148	38931	40803	42651	44374	45882	47108
	-12.5	-17.4	-26.9	-40.6	-56.4	-71.3	-82.4	-87.3	-85.3	-77.4	-66.1	-53.9	-42.4	-32.4	-23.3	-14.4	-5.1	4.9	14.9
-20	29371	30068	30650	31074	31327	31443	31514	31676	32080	32846	34029	35607	37498	39587	41754	43887	45885	47661	49147
	-28.7	-34.9	-45.1	-58.6	-73.4	-86.4	-94.7	-95.9	-89.6	-77.3	-61.8	-46.3	-32.6	-21.6	-12.7	-5.1	2.3	9.9	17.6
-25	28665	29216	29653	29950	30118	30216	30353	30668	31302	32349	33836	35718	37898	40259	42683	45064	47306	49327	51059
	-45.3	-53.0	-63.5	-76.0	-88.5	-98.1	-102.1	-98.6	-87.5	-71.0	-52.3	-34.7	-20.1	-9.3	-1.8	3.5	7.9	12.2	16.7
-30	27982	28369	28658	28849	28973	29110	29374	29897	30793	32125	33892	36030	38440	41009	43628	46198	48633	50855	52801
	-61.3	-70.3	-80.6	-91.3	-100.5	-105.7	-104.6	-96.0	-80.7	-61.2	-40.8	-22.7	-8.7	0.7	6.0	8.4	9.4	10.0	11.0
-35	27474	27720	27903	28043	28192	28436	28881	29639	30790	32367	34347	36660	39214	41906	44640	47327	49888	52252	54360
	-75.9	-85.8	-95.4	-103.7	-109.1	-109.5	-103.5	-90.8	-72.8	-52.1	-31.9	-14.9	-2.5	4.8	7.6	7.2	5.0	2.5	0.5
-40	27319	27481	27627	27792	28036	28439	29091	30071	31429	33176	35277	37668	40268	42991	45752	48475	51087	53525	55732
	-89.0	-98.9	-107.3	-113.1	-114.8	-111.2	-101.7	-86.7	-68.0	-48.1	-29.7	-14.8	-4.7	0.5	1.2	-1.2	-5.5	-10.3	-14.3
-45	27707	27851	28029	28281	28663	29241	30080	31231	32720	34543	36669	39041	41595	44259	46963	49641	52228	54667	56902
	-100.4	-109.5	-116.2	-119.6	-118.5	-112.5	-101.6	-86.6	-69.2	-51.7	-36.0	-23.7	-15.8	-12.4	-12.9	-16.3	-21.3	-26.8	-31.4
-50	28808	28980	29229	29590	30108	30831	31801	33046	34578	36389	38450	40719	43145	45672	48241	50797	53283	55647	57840
	-109.4	-117.1	-122.1	-123.6	-121.2	-114.6	-104.3	-91.1	-76.6	-62.3	-49.8	-40.1	-34.1	-31.6	-32.4	-35.6	-40.1	-44.8	-48.8
-55	30721	30935	31252	31701	32314	33120	34143	35399	36890	38609	40532	42628	44858	47179	49544	51907	54219	56435	58512
	-115.4	-121.4	-124.9	-125.5	-123.0	-117.3	-109.0	-98.7	-87.7	-76.9	-67.5	-60.3	-55.6	-53.5	-53.8	-55.8	-58.8	-61.9	-64.3
-60	33442	33682	34038	34528	35172	35987	36986	38176	39555	41116	42841	44706	46684	48740	50840	52943	55014	57012	58903
	-118.1	-122.3	-124.8	-125.2	-123.3	-119.3	-113.4	-106.4	-98.8	-91.4	-84.8	-79.5	-75.8	-73.7	-73.1	-73.6	-74.6	-75.7	-76.4
-65	36866	37106	37460	37939	38553	39312	40221	41282	42491	43842	45320	46909	48588	50332	52114	53904	55674	57394	59036
	-117.4	-120.3	-122.0	-122.4	-121.3	-119.0	-115.5	-111.3	-106.6	-101.9	-97.5	-93.7	-90.8	-88.6	-87.2	-86.4	-85.8	-85.1	-84.2
-70	40816	41033	41351	41776	42314	42967	43737	44622	45619	46721	47918	49197	50543	51940	53366	54803	56229	57624	58966
	-114.0	-115.8	-116.9	-117.3	-116.9	-115.8	-114.0	-111.7	-109.1	-106.4	-103.6	-101.1	-98.7	-96.7	-94.9	-93.2	-91.7	-90.0	-88.3
-75	45078	45256	45516	45859	46288	46801	47399	48078	48836	49665	50559	51510	52506	53538	54591	55654	56712	57752	58762
	-108.9	-109.8	-110.4	-110.6	-110.5	-110.0	-109.2	-108.0	-106.7	-105.2	-103.5	-101.8	-100.1	-98.4	-96.7	-95.0	-93.2	-91.5	-89.6
-80	49423	49553	49739	49981	50279	50633	51039	51495	51999	52546	53132	53751	54398	55065	55747	56435	57122	57802	58466
	-103.0	-103.3	-103.4	-103.5	-103.3	-103.0	-102.6	-102.0	-101.3	-100.4	-99.5	-98.5	-97.4	-96.2	-95.0	-93.8	-92.5	-91.2	-89.9
-85	53619	53691	53791	53918	54072	54252	54456	54683	54931	55199	55484	55783	56094	56415	56742	57073	57404	57733	58057
	-97.4	-97.3	-97.2	-97.1	-96.9	-96.7	-96.4	-96.1	-95.8	-95.4	-94.9	-94.4	-93.9	-93.4	-92.9	-92.3	-91.7	-91.1	-90.6
-90	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440
	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180
0	41666	42002	42117	42040	41818	41500	41122	40704	40245	39739	39183	38587	37967	37350	36756	36202	35694	35232	34811
	2.1	11.1	18.7	24.3	27.7	29.1	28.8	27.3	24.9	22.0	18.6	14.8	10.9	6.7	2.5	-2.0	-6.7	-11.7	-16.6
-5	43153	43637	43860	43860	43697	43432	43115	42767	42386	41957	41467	40914	40309	39673	39026	38381	37745	37122	36515
	5.6	15.6	23.8	29.5	32.7	33.5	32.3	29.7	26.1	21.9	17.3	12.5	7.8	3.3	-1.0	-5.3	-9.7	-14.4	-19.3
-10	45049	45726	46107	46233	46169	45987	45743	45464	45149	44779	44334	43806	43202	42538	41832	41096	40339	39567	38789
	10.3	20.5	28.7	34.4	37.2	37.2	35.1	31.2	26.3	20.7	14.8	9.1	3.9	-0.8	-5.0	-8.9	-13.0	-17.4	-22.3
-15	47108	48013	48597	48896	48976	48909	48755	48547	48287	47959	47543	47029	46419	45727	44967	44153	43293	42397	41478
	14.9	24.1	31.7	36.8	39.2	38.7	35.8	31.0	25.0	18.3	11.6	5.3	-0.3	-4.9	-8.9	-12.5	-16.3	-20.5	-25.5
-20	49147	50301	51118	51626	51883	51957	51908	51771	51558	51259	50859	50349	49730	49014	48213	47339	46402	45413	44388
	17.6	24.9	31.0	35.2	37.1	36.4	33.4	28.5	22.2	15.3	8.3	1.8	-3.8	-8.3	-12.1	-15.6	-19.3	-23.6	-28.5
-25	51059	52461	53519	54252	54704	54934	54998	54934	54761	54480	54084	53571	52943	52210	51381	50469	49482	48435	47343
	16.7	21.3	25.4	28.5	30.1	29.7	27.3	23.2	17.8	11.6	5.2	-0.8	-6.0	-10.5	-14.3	-17.9	-21.9	-26.4	-31.6
-30	52801	54426	55710	56660	57308	57697	57877	57886	57750	57482	57087	56568	55933	55190	54349	53420	52413	51340	50221
	11.0	12.7	14.8	16.8	18.2	18.6	17.6	15.3	11.7	7.2	2.3	-2.6	-7.2	-11.4	-15.5	-19.6	-24.2	-29.3	-34.8
-35	54360	56165	57641	58783	59610	60151	60446	60531	60438	60189	59798	59279	58644	57902	57064	56140	55139	54075	52964
	0.5	-0.4	-0.2	1.0	2.6	4.1	5.0	4.9	3.9	1.8	-1.0	-4.4	-8.1	-12.1	-16.4	-21.2	-26.6	-32.5	-38.6
-40	55732	57660	59280	60576	61554	62233	62640	62810	62773	62559	62190	61687	61067	60344	59528	58631	57662	56635	55565
	-14.3	-16.8	-17.7	-16.9	-14.9	-12.2	-9.4	-7.1	-5.6	-5.1	-5.7	-7.3	-10.0	-13.6	-18.2	-23.6	-29.8	-36.4	-43.2
-45	56902	58890	60595	61998	63094	63890	64406	64670	64710	64557	64238	63779	63201	62520	61750	60904	59993	59030	58029
	-31.4	-34.5	-35.7	-34.8	-32.2	-28.5	-24.2	-19.9	-16.2	-13.6	-12.3	-12.4	-14.1	-17.3	-21.9	-27.6	-34.3	-41.5	-48.7
-50	57840	59818	61547	63004	64177	65066	65683	66048	66186	66124	65889	65509	65006	64400	63706	62939	62112	61238	60328
	-48.8	-51.4	-52.1	-50.7	-47.6	-43.1	-37.9	-32.5	-27.5	-23.6	-21.0	-20.1	-21.0	-23.7	-28.0	-33.8	-40.5	-47.8	-55.2
-55	58512	60410	62098	63552	64756	65706	66407	66872	67119	67171	67052	66785	66393	65897	65312	64655	63938	63173	62373
	-64.3	-65.6	-65.3	-63.4	-59.8	-55.1	-49.6	-44.0	-38.8	-34.4	-31.4	-30.0	-30.4	-32.6	-36.5	-41.8	-48.1	-55.0	-62.1
-60	58903	60653	62234	63623	64807	65776	66532	67080	67432	67605	67617	67487	67234	66876	66429	65908	65324	64689	64014
	-76.4	-76.1	-74.8	-72.3	-68.6	-64.1	-59.1	-54.1	-49.4	-45.4	-42.7	-41.3	-41.5	-43.2	-46.5	-51.0	-56.4	-62.5	-68.7
-65	59036	60573	61983	63247	64352	65289	66055	66651	67084	67363	67501	67509	67403	67196	66901	66530	66094	65602	65061
	-84.2	-82.8	-80.7	-77.9	-74.5	-70.7	-66.6	-62.6	-58.9	-55.9	-53.8	-52.7	-52.9	-54.3	-56.8	-60.3	-64.6	-69.5	-74.5
-70	58966	60237	61420	62501	63468	64314	65035	65628	66095	66441	66671	66794	66817	66749	66600	66376	66086	65737	65334
	-88.3	-86.3	-83.9	-81.4	-78.5	-75.5	-72.6	-69.8	-67.3	-65.3	-63.9	-63.3	-63.6	-64.6	-66.4	-68.9	-72.0	-75.5	-79.2
-75	58762	59728	60641	61489	62265	62962	63575	64103	64543	64897	65165	65352	65461	65495	65460	65359	65198	64979	64708
	-89.6	-87.7	-85.8	-83.7	-81.7	-79.7	-77.8	-76.1	-74.7	-73.6	-72.9	-72.6	-72.8	-73.5	-74.7	-76.3	-78.2	-80.4	-82.8
-80	58466	59108	59722	60302	60842	61338	61787	62186	62533	62826	63066	63251	63384	63464	63494	63474	63407	63295	63138
	-89.9	-88.6	-87.3	-86.1	-84.9	-83.8	-82.8	-82.0	-81.3	-80.8	-80.5	-80.4	-80.6	-81.0	-81.6	-82.4	-83.4	-84.5	-85.8
-85	58057	58373	58678	58969	59245	59503	59741	59958	60152	60321	60466	60584	60676	60742	60781	60793	60779	60739	60674
	-90.6	-90.0	-89.5	-89.0	-88.6	-88.2	-87.8	-87.5	-87.3	-87.1	-87.0	-87.0	-87.1	-87.2	-87.4	-87.7	-88.0	-88.4	-88.8
-90	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440
	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6

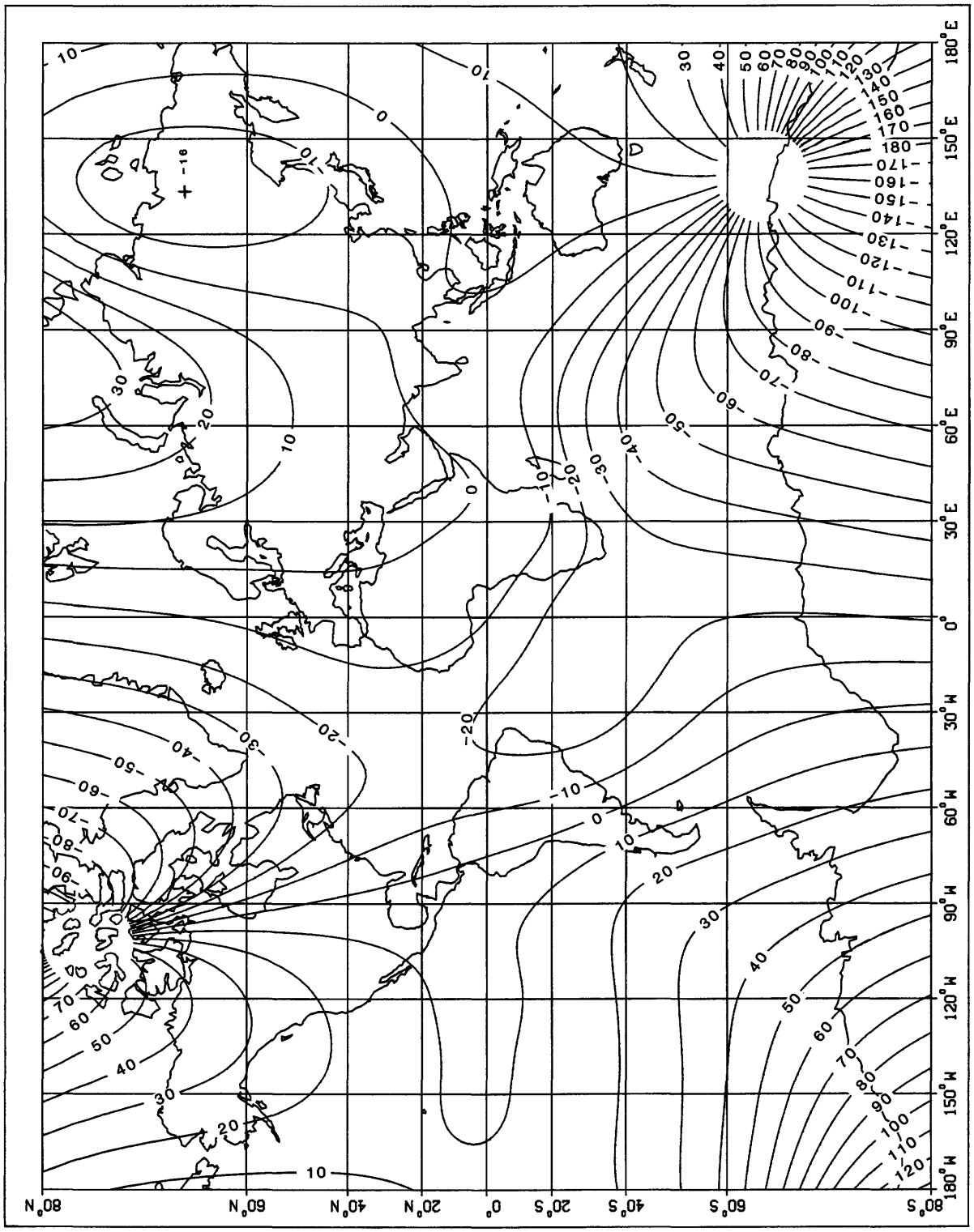
IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	180	-175	-170	-165	-160	-155	-150	-145	-140	-135	-130	-125	-120	-115	-110	-105	-100	-95	-90
0	34811	34422	34059	33717	33397	33106	32849	32631	32453	32314	32213	32148	32120	32125	32157	32201	32241	32256	32225
	-16.6	-21.2	-25.4	-29.2	-32.6	-36.0	-39.3	-42.6	-45.5	-47.6	-48.4	-47.8	-46.0	-43.5	-41.2	-39.8	-40.2	-42.6	-46.9
-5	36515	35929	35365	34828	34317	33836	33383	32960	32569	32214	31899	31628	31403	31216	31058	30913	30762	30589	30379
	-19.3	-24.2	-28.8	-32.9	-36.3	-39.0	-41.3	-43.1	-44.8	-46.0	-46.6	-46.4	-45.4	-43.6	-41.6	-39.7	-38.8	-39.3	-41.5
-10	38789	38019	37269	36547	35856	35195	34558	33945	33357	32802	32289	31825	31410	31037	30689	30347	29991	29607	29187
	-22.3	-27.5	-32.4	-36.6	-39.7	-41.7	-42.7	-43.2	-43.6	-44.0	-44.6	-44.9	-44.8	-44.0	-42.5	-40.6	-38.8	-38.0	-38.6
-15	41478	40554	39644	38762	37913	37093	36297	35520	34763	34035	33347	32707	32114	31559	31022	30479	29911	29302	28652
	-25.5	-30.7	-35.7	-39.9	-42.6	-43.7	-43.7	-42.9	-42.2	-41.9	-42.3	-43.0	-43.6	-43.6	-42.7	-41.1	-39.2	-37.9	-37.6
-20	44388	43349	42317	41310	40335	39391	38470	37567	36681	35817	34985	34191	33433	32702	31975	31229	30443	29605	28718
	-28.5	-33.8	-38.8	-42.7	-44.9	-45.3	-44.3	-42.5	-40.8	-39.8	-39.7	-40.3	-41.2	-41.8	-41.6	-40.7	-39.4	-38.3	-38.1
-25	47343	46230	45119	44030	42971	41944	40942	39957	38985	38026	37084	36161	35255	34354	33439	32488	31484	30418	29300
	-31.6	-36.9	-41.8	-45.3	-47.1	-46.9	-45.1	-42.4	-39.8	-38.0	-37.2	-37.5	-38.3	-39.2	-39.8	-39.9	-39.7	-39.7	-40.2
-30	50221	49076	47930	46802	45705	44639	43598	42574	41556	40538	39519	38493	37455	36395	35298	34146	32930	31648	30317
	-34.8	-40.3	-45.1	-48.4	-49.7	-49.0	-46.7	-43.4	-40.1	-37.5	-36.0	-35.7	-36.4	-37.6	-39.0	-40.2	-41.5	-42.9	-44.6
-35	52964	51828	50688	49564	48468	47402	46359	45327	44293	43245	42172	41065	39914	38712	37447	36112	34704	33232	31719
	-38.6	-44.4	-49.2	-52.4	-53.6	-52.7	-50.1	-46.5	-42.8	-39.6	-37.6	-36.9	-37.4	-38.8	-40.9	-43.3	-45.9	-48.7	-51.5
-40	55565	54472	53374	52289	51227	50188	49166	48147	47115	46051	44940	43770	42529	41210	39808	38324	36765	35147	33502
	-43.2	-49.4	-54.4	-57.8	-59.1	-58.4	-56.0	-52.6	-48.9	-45.7	-43.4	-42.5	-42.9	-44.5	-47.0	-50.2	-53.8	-57.4	-60.9
-45	58029	57006	55977	54955	53947	52953	51964	50967	49942	48870	47734	46519	45215	43816	42324	40744	39093	37394	35681
	-48.7	-55.3	-60.7	-64.5	-66.3	-66.2	-64.5	-61.8	-58.6	-55.8	-53.7	-52.8	-53.2	-54.8	-57.5	-60.9	-64.7	-68.5	-71.9
-50	60328	59396	58454	57510	56568	55626	54675	53702	52689	51617	50471	49236	47904	46473	44949	43342	41672	39966	38257
	-55.2	-62.0	-67.7	-71.9	-74.4	-75.2	-74.6	-73.0	-70.9	-68.9	-67.4	-66.8	-67.2	-68.7	-71.0	-74.1	-77.4	-80.6	-83.3
-55	62373	61547	60703	59845	58977	58093	57185	56242	55250	54193	53058	51836	50521	49115	47623	46061	44449	42811	41179
	-62.1	-68.7	-74.4	-79.0	-82.2	-84.1	-84.7	-84.4	-83.6	-82.7	-82.0	-81.8	-82.3	-83.5	-85.2	-87.4	-89.7	-91.9	-93.5
-60	64014	63304	62566	61803	61015	60197	59344	58446	57494	56477	55388	54220	52972	51646	50252	48803	47315	45812	44319
	-68.7	-74.7	-80.2	-84.8	-88.5	-91.2	-92.9	-93.8	-94.2	-94.3	-94.4	-94.7	-95.2	-96.1	-97.2	-98.5	-99.7	-100.6	-101.1
-65	65061	64477	63854	63194	62498	61762	60983	60155	59273	58333	57329	56261	55130	53939	52697	51415	50107	48790	47482
	-74.5	-79.6	-84.4	-88.6	-92.3	-95.3	-97.7	-99.4	-100.7	-101.6	-102.4	-103.0	-103.6	-104.2	-104.8	-105.3	-105.6	-105.7	-105.4
-70	65334	64881	64382	63838	63251	62619	61941	61216	60443	59619	58745	57821	56851	55839	54792	53718	52627	51532	50443
	-79.2	-83.0	-86.8	-90.3	-93.5	-96.3	-98.7	-100.7	-102.4	-103.7	-104.7	-105.6	-106.2	-106.7	-107.0	-107.1	-107.0	-106.8	-106.2
-75	64708	64386	64016	63601	63142	62639	62094	61508	60881	60215	59511	58771	58000	57201	56380	55542	54694	53844	52998
	-82.8	-85.3	-87.8	-90.3	-92.6	-94.8	-96.8	-98.6	-100.1	-101.4	-102.4	-103.3	-103.9	-104.4	-104.7	-104.8	-104.7	-104.5	-104.1
-80	63138	62940	62701	62424	62110	61760	61377	60962	60517	60044	59546	59025	58483	57925	57354	56773	56187	55600	55017
	-85.8	-87.1	-88.5	-89.9	-91.2	-92.6	-93.8	-95.0	-96.0	-97.0	-97.8	-98.5	-99.1	-99.5	-99.9	-100.1	-100.2	-100.3	-100.3
-85	60674	60584	60470	60334	60175	59996	59797	59581	59347	59098	58836	58562	58278	57985	57687	57384	57080	56775	56473
	-88.8	-89.3	-89.8	-90.3	-90.8	-91.4	-91.9	-92.4	-92.9	-93.3	-93.8	-94.2	-94.5	-94.9	-95.2	-95.4	-95.7	-95.8	-96.0
-90	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440
	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6

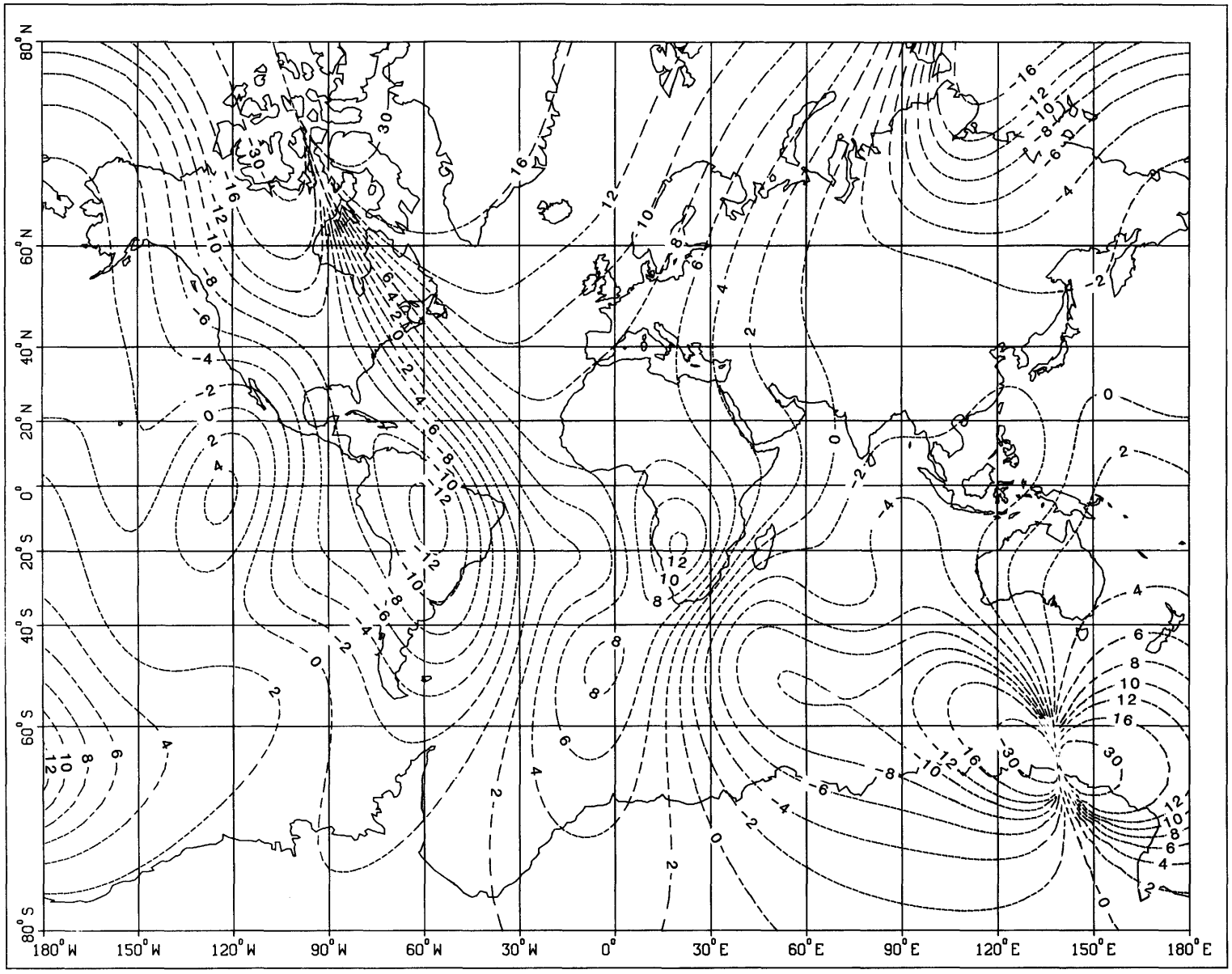
IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5	0
0	32225	32125	31934	31637	31224	30704	30103	29471	28869	28367	28027	27890	27969	28248	28684	29227	29835	30480	31148
	-46.9	-52.7	-59.3	-66.0	-72.2	-77.2	-80.1	-79.8	-75.3	-66.3	-53.7	-39.5	-25.6	-13.5	-3.7	4.2	10.5	14.8	16.6
-5	30379	30121	29804	29422	28976	28479	27958	27454	27022	26714	26577	26638	26897	27333	27906	28571	29292	30045	30812
	-41.5	-45.1	-49.8	-54.9	-59.7	-63.4	-65.3	-64.1	-59.1	-50.5	-39.6	-28.2	-18.0	-9.8	-3.4	2.0	6.8	10.3	11.5
-10	29187	28730	28240	27727	27205	26695	26225	25833	25557	25429	25474	25699	26093	26634	27288	28024	28813	29634	30463
	-38.6	-40.6	-43.6	-47.2	-50.5	-52.7	-52.9	-50.3	-44.6	-36.6	-27.6	-19.6	-13.6	-9.7	-6.9	-4.2	-1.2	1.2	1.4
-15	28652	27969	27275	26595	25960	25401	24952	24642	24491	24511	24698	25040	25517	26105	26784	27532	28331	29161	29990
	-37.6	-38.6	-40.6	-43.0	-44.9	-45.4	-43.8	-39.7	-33.3	-25.9	-19.1	-14.4	-12.3	-12.3	-12.9	-12.9	-12.1	-11.4	-12.5
-20	28718	27802	26889	26024	25251	24616	24153	23886	23818	23938	24219	24630	25142	25732	26387	27095	27844	28614	29371
	-38.1	-38.9	-40.4	-42.0	-42.7	-41.7	-38.4	-33.0	-26.1	-19.3	-14.3	-12.2	-13.1	-16.1	-19.6	-22.3	-24.0	-25.6	-28.7
-25	29300	28157	27032	25982	25063	24331	23823	23556	23522	23689	24013	24448	24957	25516	26112	26739	27389	28041	28665
	-40.2	-41.4	-42.9	-44.0	-43.7	-41.5	-36.9	-30.3	-23.0	-16.6	-12.8	-12.3	-15.2	-20.2	-25.9	-31.2	-35.7	-40.0	-45.3
-30	30317	28969	27655	26438	25382	24545	23967	23659	23605	23762	24076	24492	24964	25465	25979	26500	27020	27523	27982
	-44.6	-46.5	-48.1	-48.8	-47.8	-44.6	-39.0	-31.7	-24.1	-17.9	-14.5	-14.7	-18.4	-24.5	-31.8	-39.3	-46.5	-53.6	-61.3
-35	31719	30203	28739	27388	26217	25281	24616	24231	24107	24199	24449	24799	25199	25616	26031	26434	26817	27169	27474
	-51.5	-54.0	-55.8	-56.2	-54.6	-50.6	-44.4	-36.8	-29.1	-22.9	-19.6	-19.8	-23.5	-30.0	-38.3	-47.5	-56.9	-66.3	-75.9
-40	33502	31870	30304	28865	27609	26587	25830	25344	25109	25086	25220	25456	25745	26052	26354	26638	26897	27125	27319
	-60.9	-63.7	-65.4	-65.4	-63.3	-58.9	-52.6	-45.0	-37.6	-31.5	-28.2	-28.2	-31.6	-38.0	-46.7	-56.7	-67.5	-78.4	-89.0
-45	35681	33995	32387	30907	29605	28519	27675	27076	26707	26534	26513	26596	26742	26916	27095	27267	27425	27570	27707
	-71.9	-74.5	-75.7	-75.2	-72.8	-68.3	-62.3	-55.4	-48.6	-43.2	-40.1	-40.0	-43.1	-49.1	-57.5	-67.7	-78.7	-89.8	-100.4
-50	38257	36586	34994	33524	32214	31093	30179	29475	28969	28636	28444	28357	28343	28373	28430	28501	28583	28682	28808
	-83.3	-85.1	-85.6	-84.6	-82.0	-77.8	-72.4	-66.5	-61.0	-56.6	-54.2	-54.3	-57.1	-62.6	-70.3	-79.6	-89.8	-100.0	-109.4
-55	41179	39586	38067	36654	35376	34253	33298	32513	31892	31417	31069	30823	30658	30553	30498	30484	30511	30586	30721
	-93.5	-94.3	-94.0	-92.6	-89.9	-86.2	-81.9	-77.3	-73.2	-70.1	-68.5	-69.0	-71.7	-76.4	-83.0	-90.9	-99.4	-107.9	-115.4
-60	44319	42860	41463	40151	38944	37857	36900	36076	35381	34806	34342	33974	33689	33479	33335	33255	33241	33300	33442
	-101.1	-101.0	-100.1	-98.5	-96.1	-93.1	-89.8	-86.6	-83.9	-82.0	-81.3	-82.1	-84.5	-88.4	-93.6	-99.6	-106.1	-112.5	-118.1
-65	47482	46201	44967	43795	42700	41693	40782	39969	39256	38639	38115	37679	37325	37050	36851	36729	36686	36730	36866
	-105.4	-104.7	-103.6	-102.0	-100.1	-97.9	-95.7	-93.7	-92.1	-91.2	-91.2	-92.1	-94.1	-97.0	-100.6	-104.9	-109.3	-113.6	-117.4
-70	50443	49374	48336	47341	46399	45517	44702	43959	43290	42696	42178	41735	41368	41076	40860	40723	40667	40696	40816
	-106.2	-105.4	-104.4	-103.2	-101.9	-100.6	-99.3	-98.2	-97.5	-97.2	-97.4	-98.3	-99.6	-101.6	-103.9	-106.5	-109.2	-111.8	-114.0
-75	52998	52165	51353	50567	49816	49105	48439	47823	47259	46752	46304	45916	45591	45330	45137	45012	44959	44980	45078
	-104.1	-103.6	-103.0	-102.4	-101.7	-101.0	-100.5	-100.1	-99.9	-99.9	-100.1	-100.7	-101.5	-102.6	-103.8	-105.1	-106.5	-107.8	-108.9
-80	55017	54441	53879	53332	52807	52307	51835	51396	50992	50626	50301	50019	49783	49594	49454	49366	49331	49349	49423
	-100.3	-100.2	-100.0	-99.9	-99.7	-99.6	-99.5	-99.4	-99.5	-99.6	-99.8	-100.0	-100.4	-100.8	-101.3	-101.7	-102.2	-102.7	-103.0
-85	56473	56175	55884	55602	55330	55072	54828	54601	54393	54204	54038	53894	53775	53681	53613	53573	53560	53576	53619
	-96.0	-96.2	-96.3	-96.4	-96.5	-96.6	-96.7	-96.7	-96.8	-96.9	-97.0	-97.1	-97.1	-97.2	-97.3	-97.3	-97.4	-97.4	-97.4
-90	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440
	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6

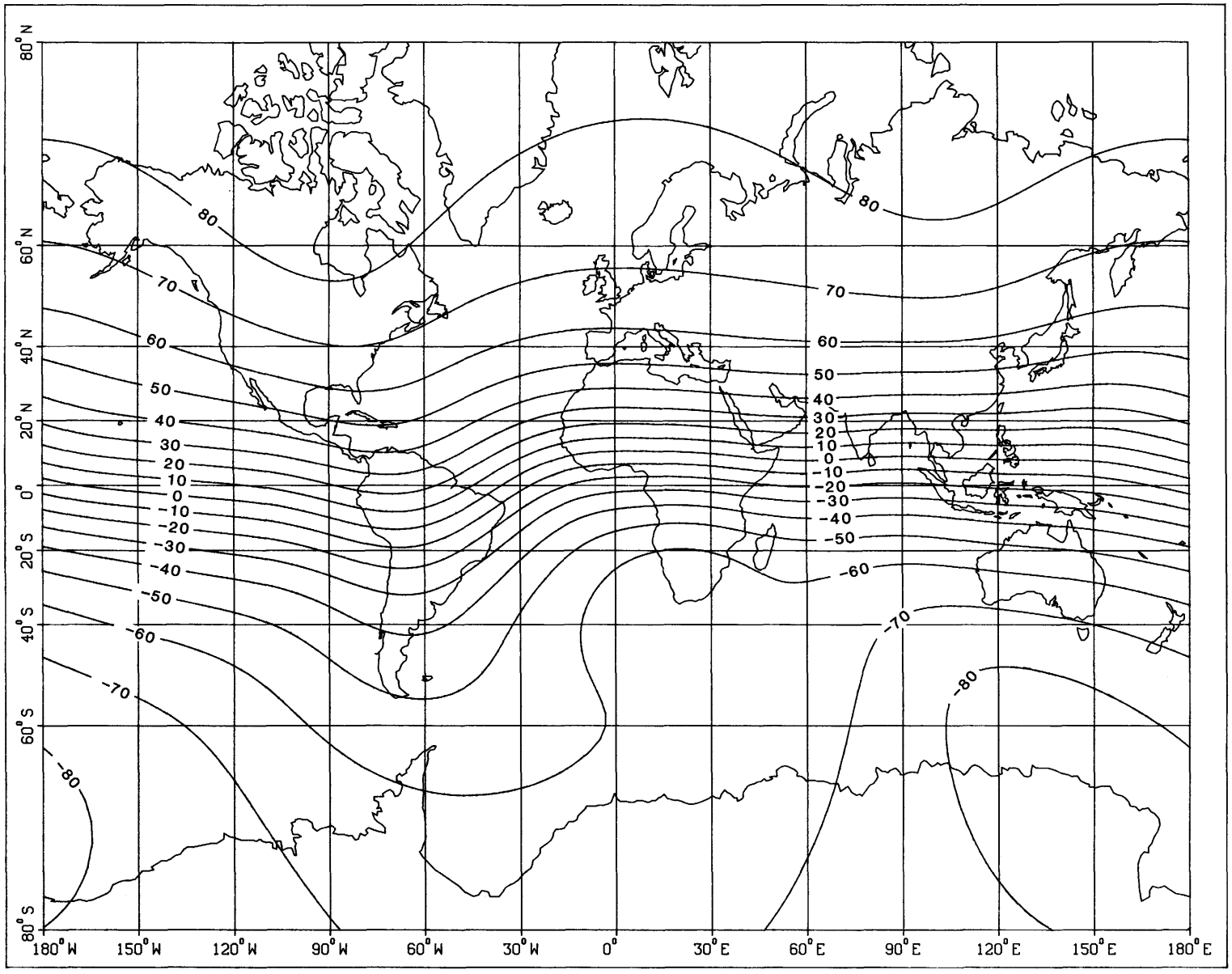
CHARTS

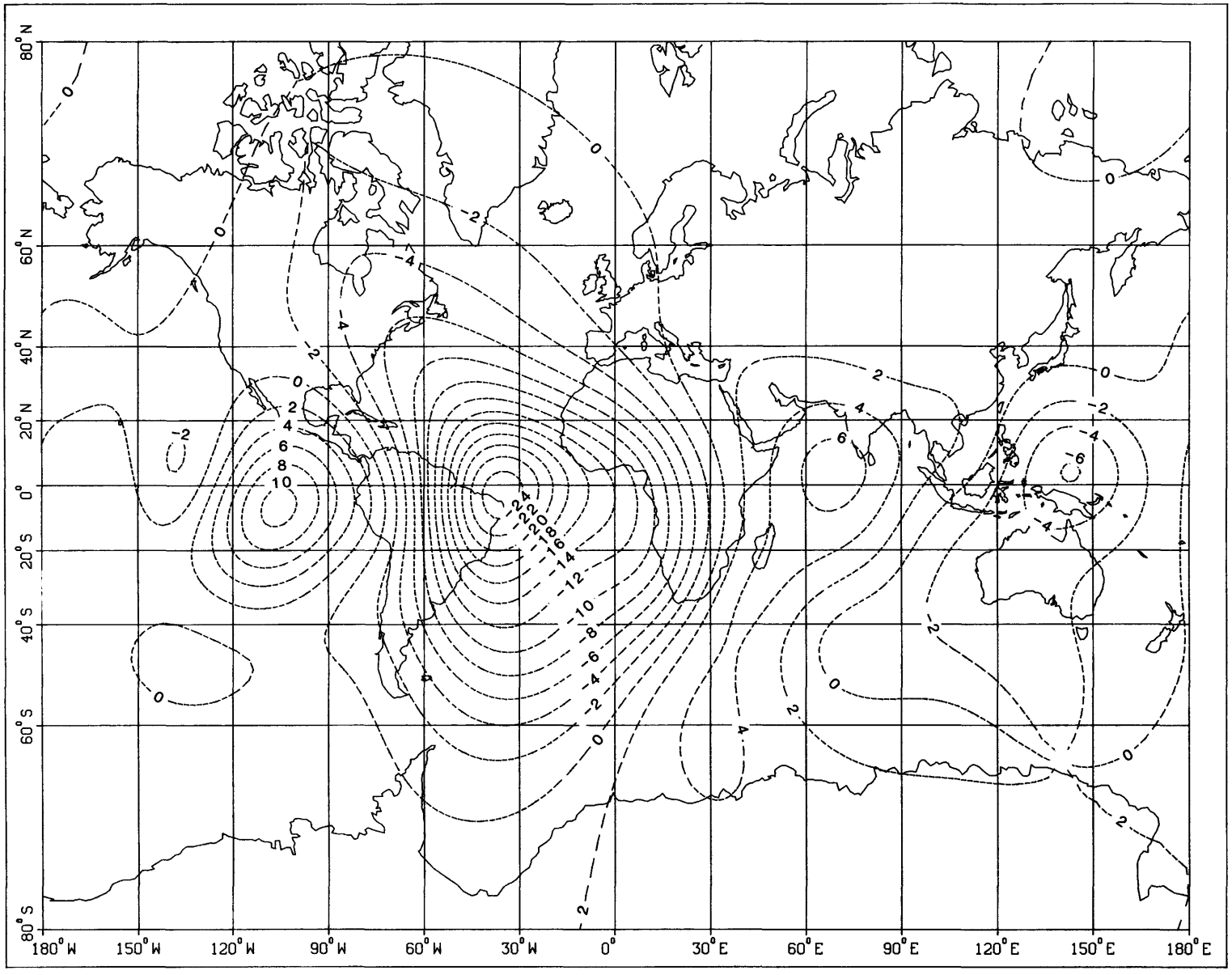

IGRF 1980
Declination (D)
(degrees)

IGRF 1980 Annual Change of Declination ($\dot{D}$) (minutes/yr)

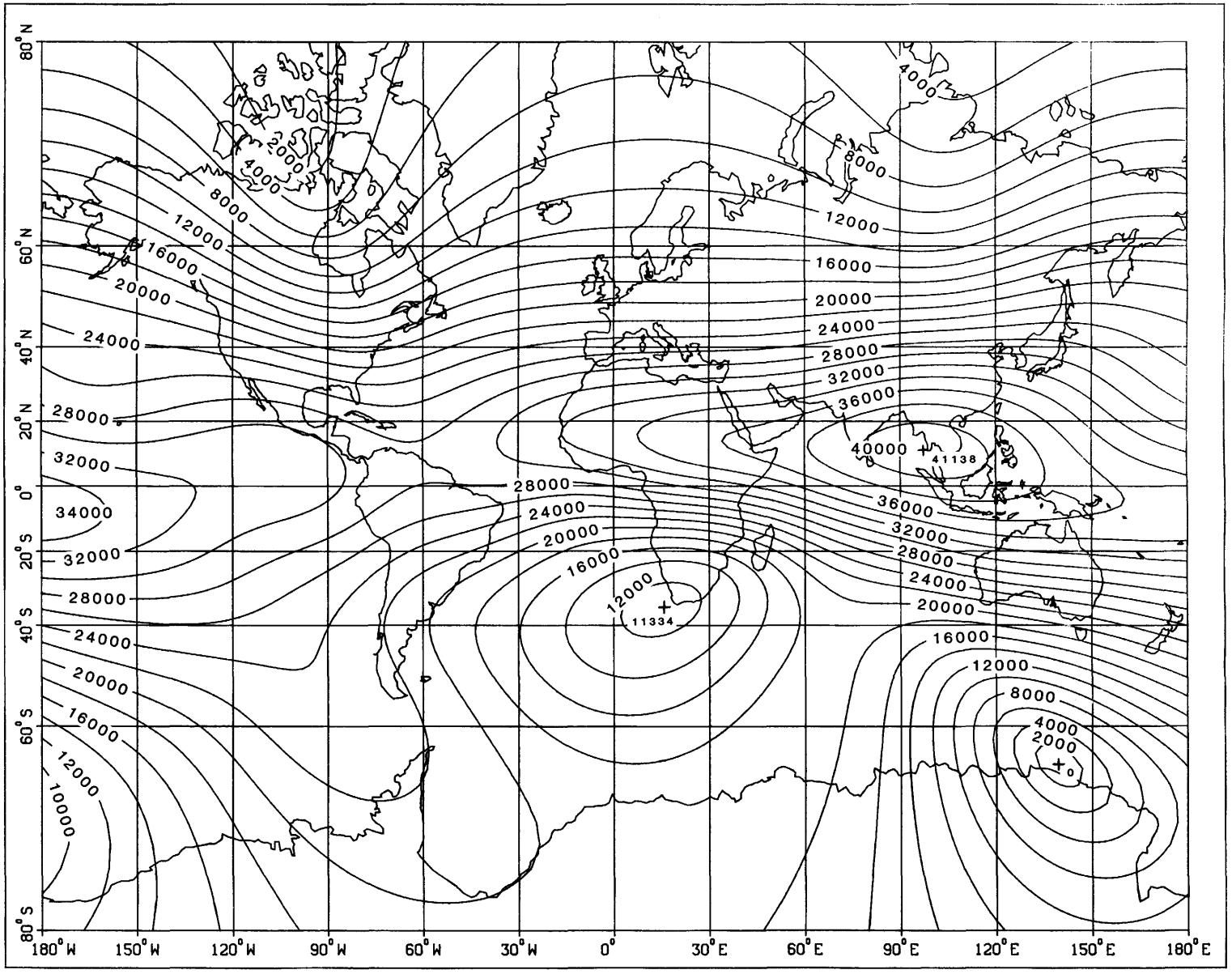


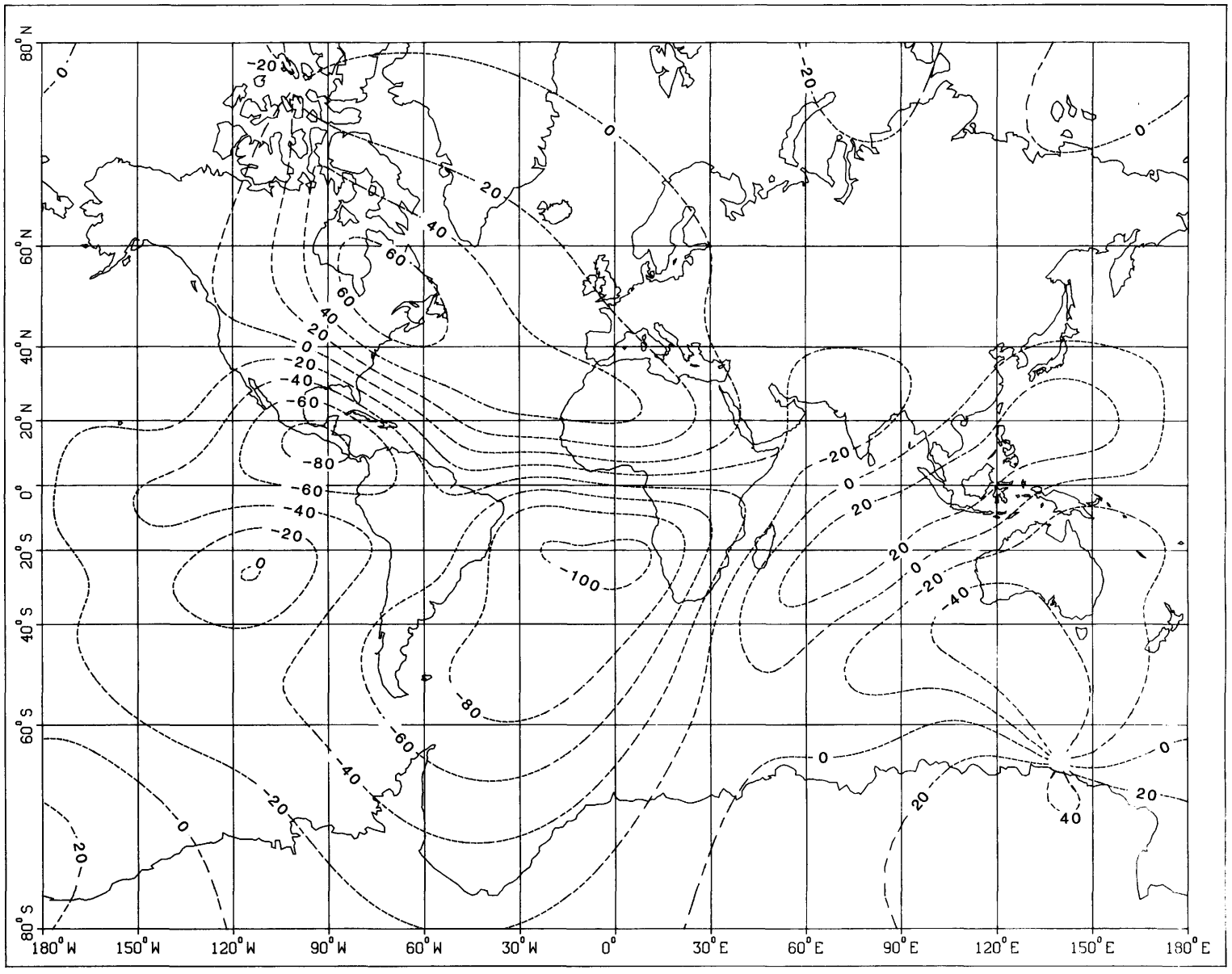
IGRF 1980 Inclination (I) (degrees)

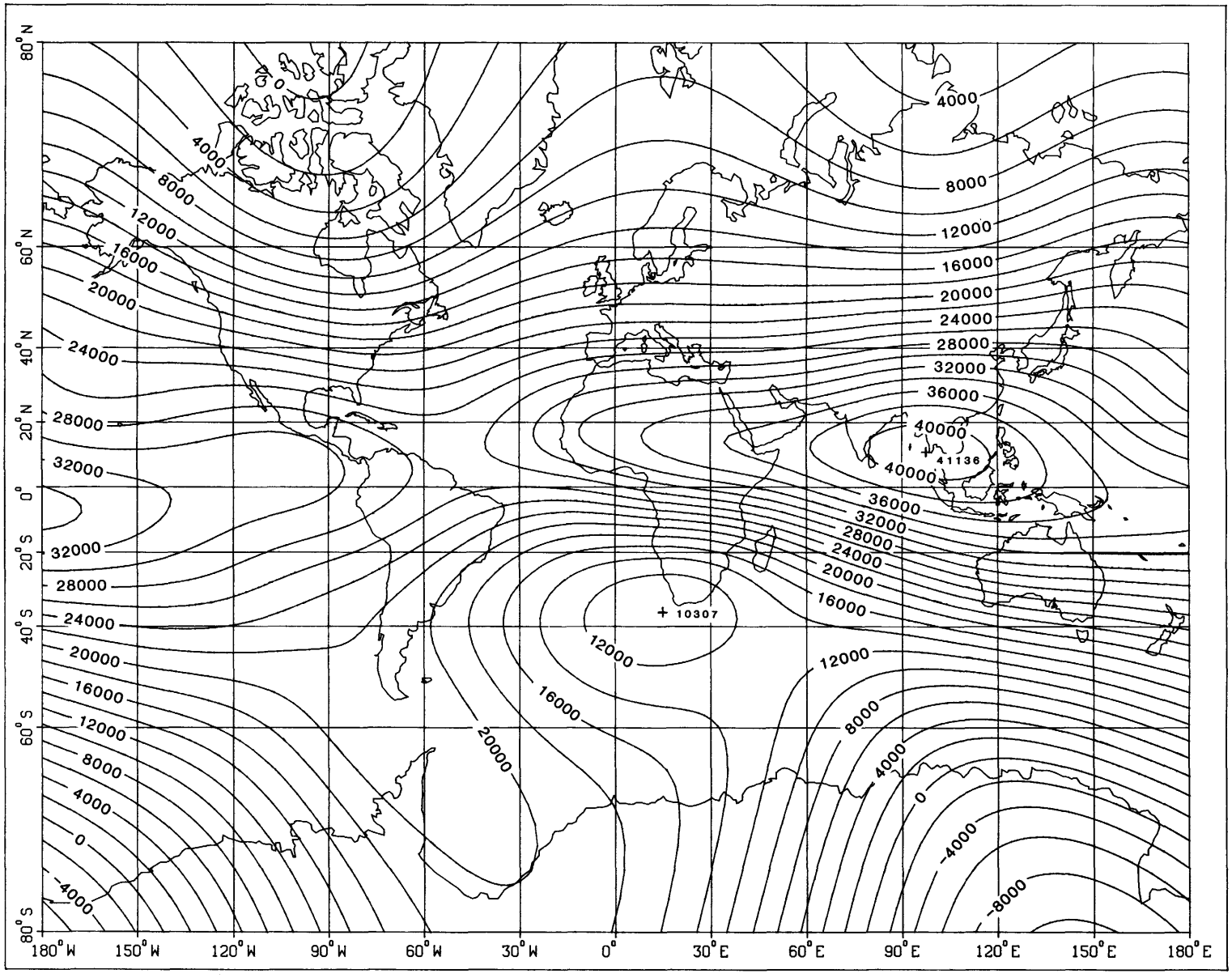


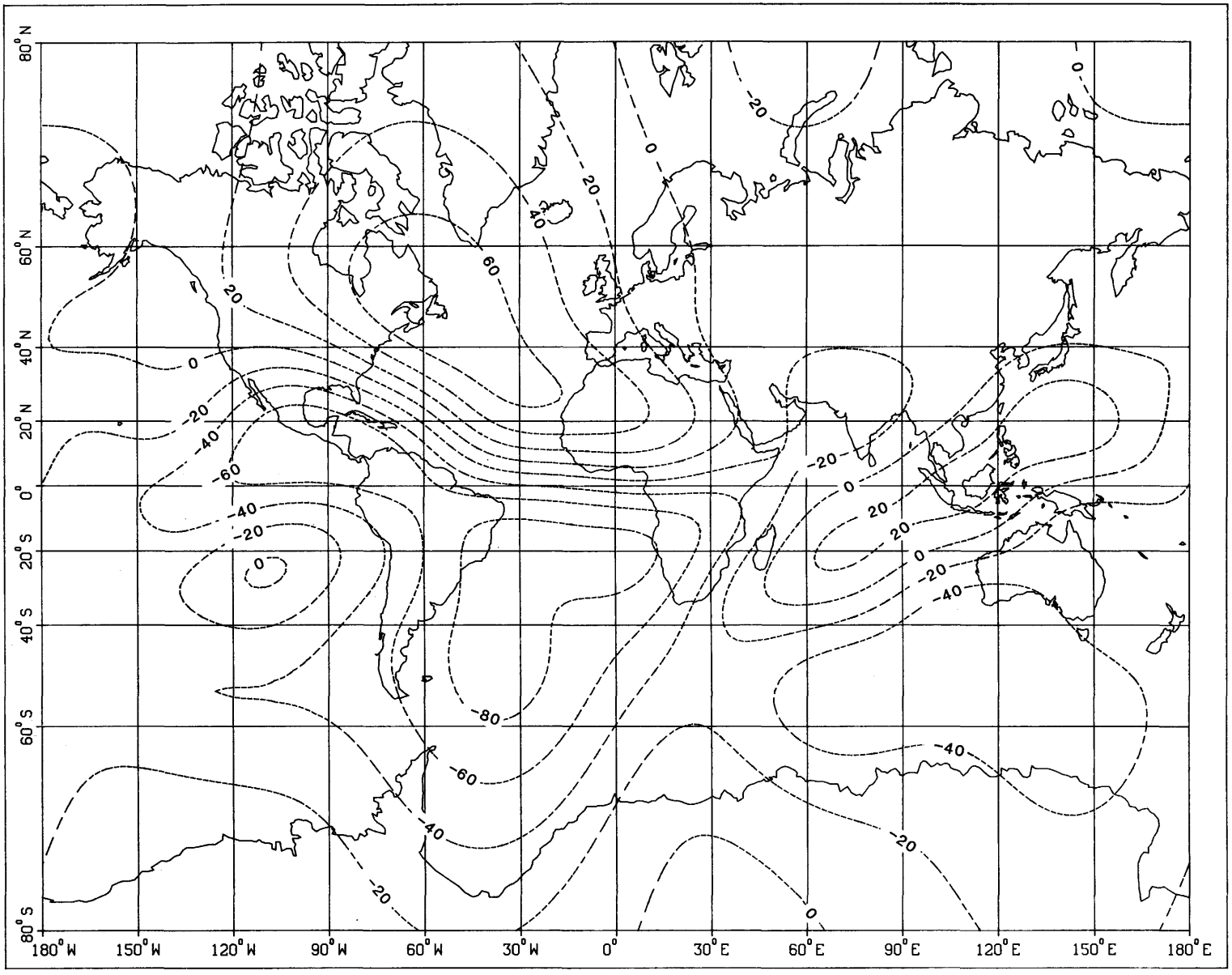

IGRF 1980
Annual Change of Inclination (İ)
(minutes/yr)
80°N
60°N
40°N
20°N
0°
20°S
40°S
60°S
80°S
180°W
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
180°E

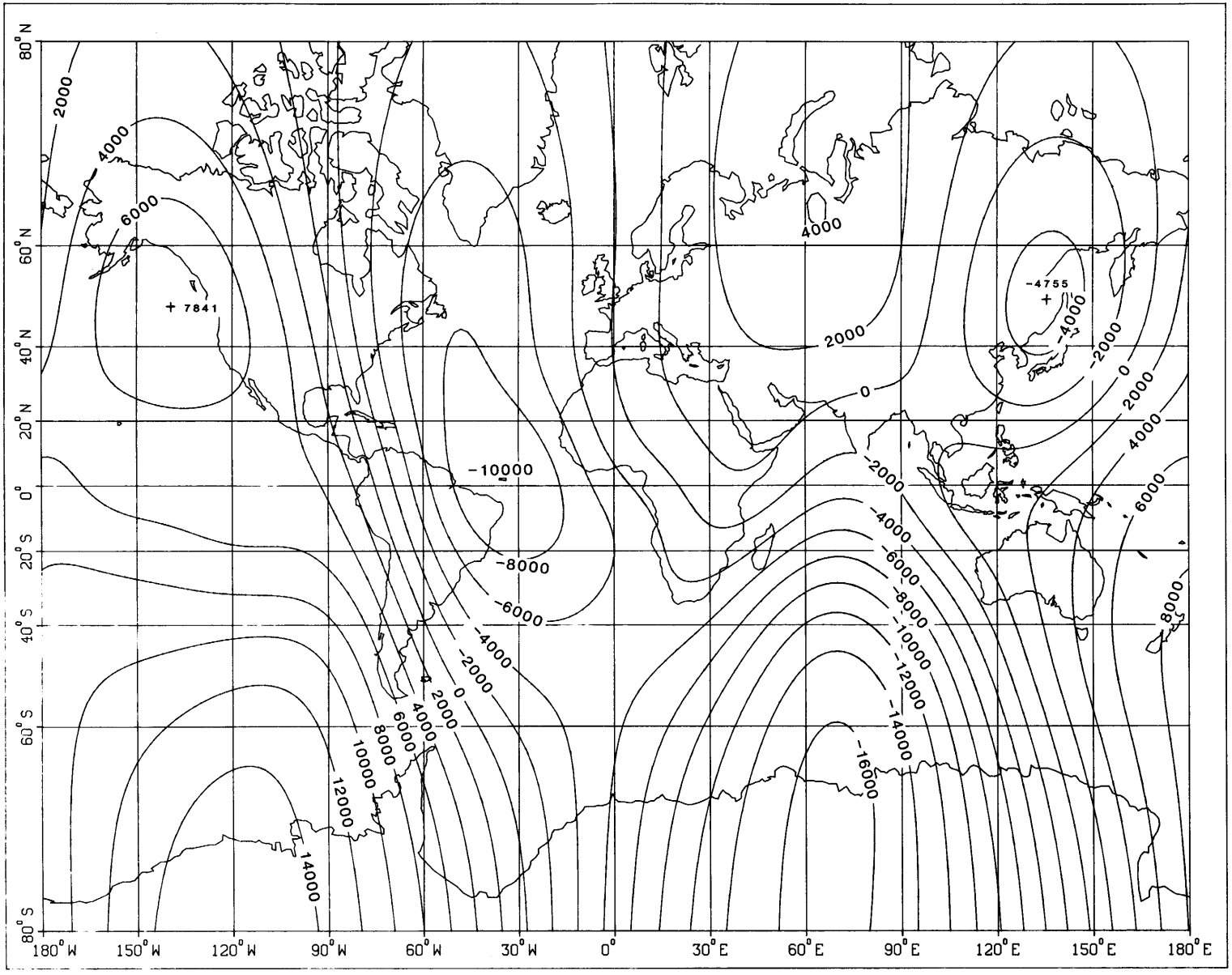
IGRF 1980 Horizontal Intensity (H) (nT)

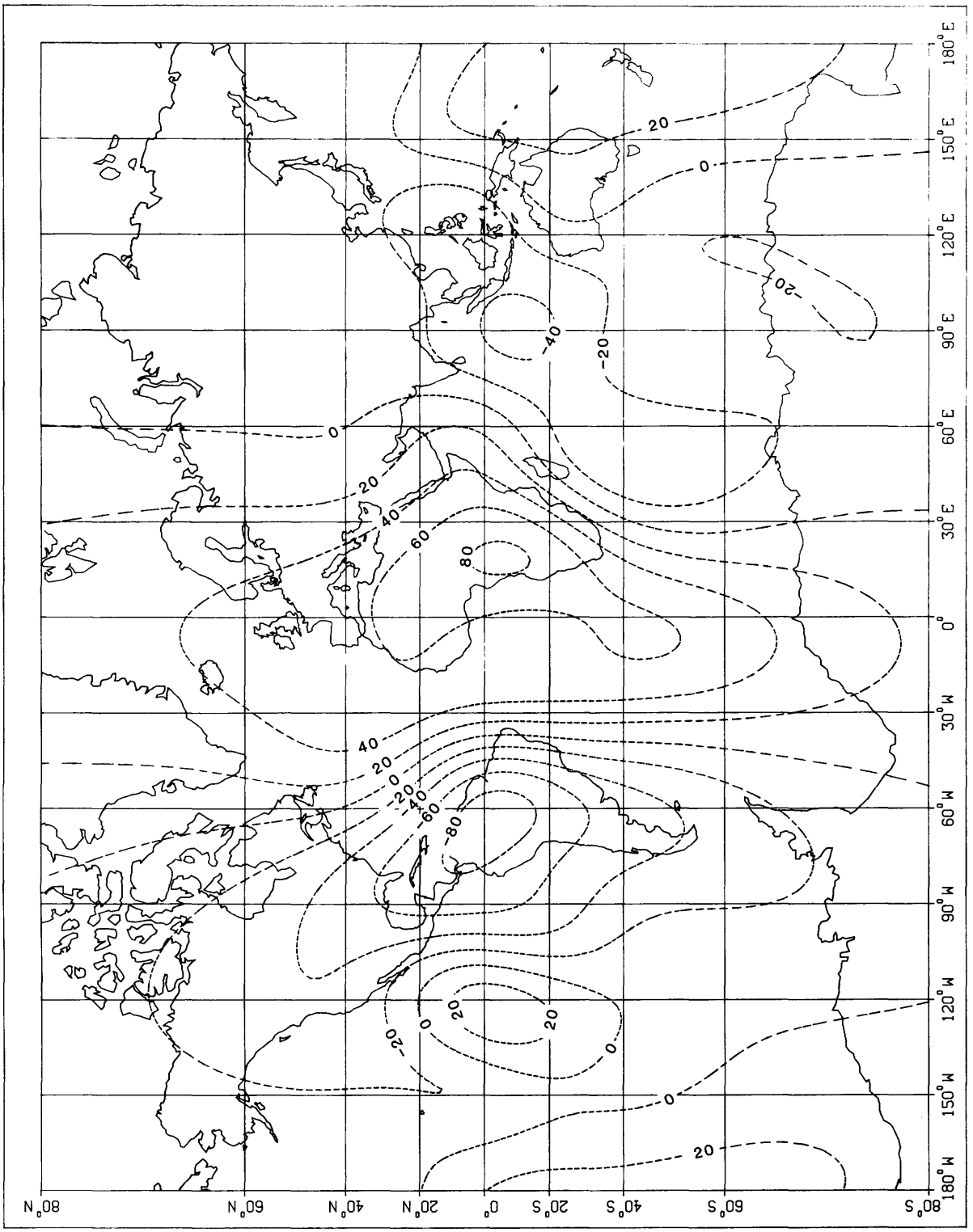


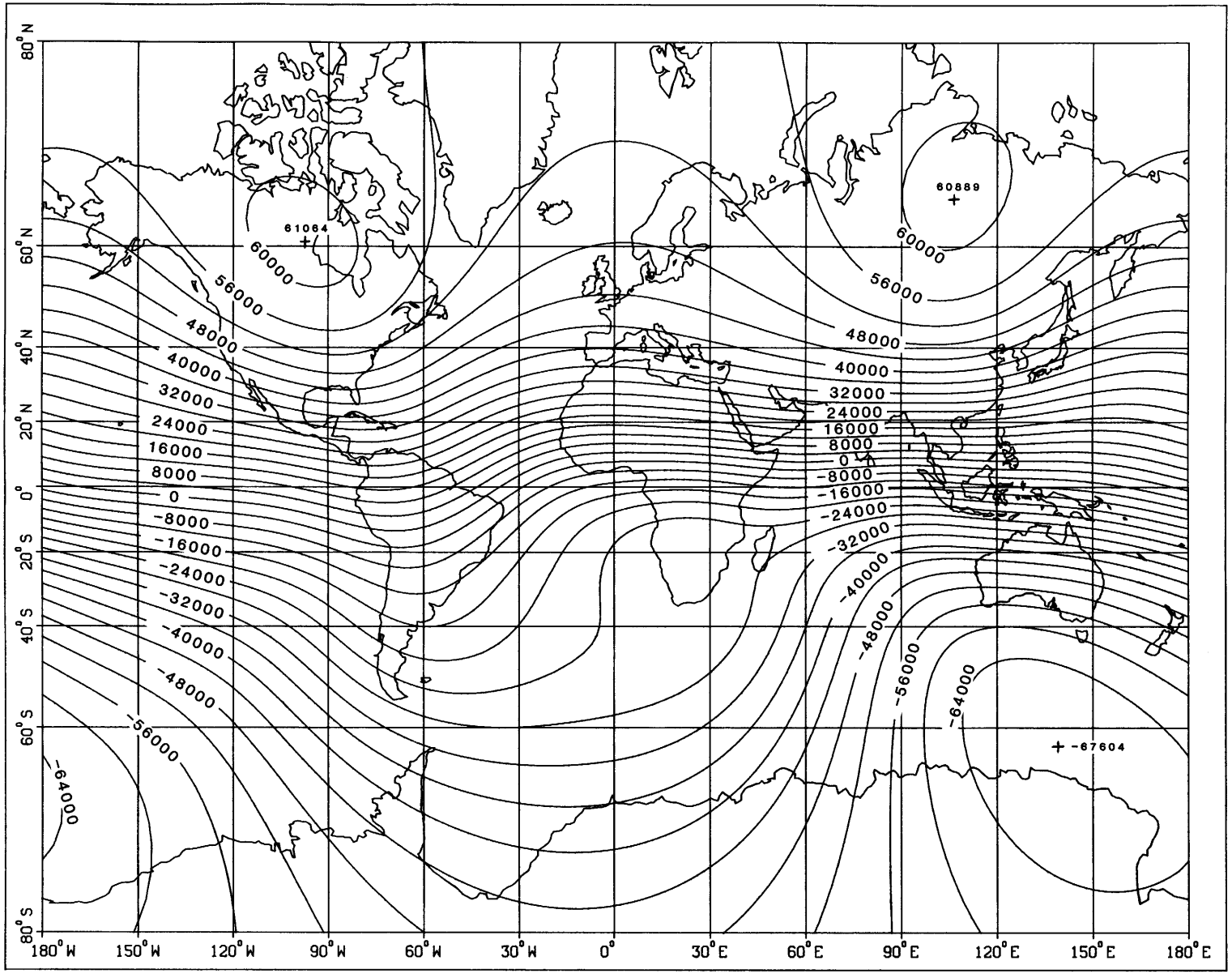

IGRF 1980
Annual Change of Horizontal Intensity (Ḣ)
(nT/yr)
80°N
60°N
40°N
20°N
0°
20°S
40°S
60°S
80°S
180°W
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
180°E

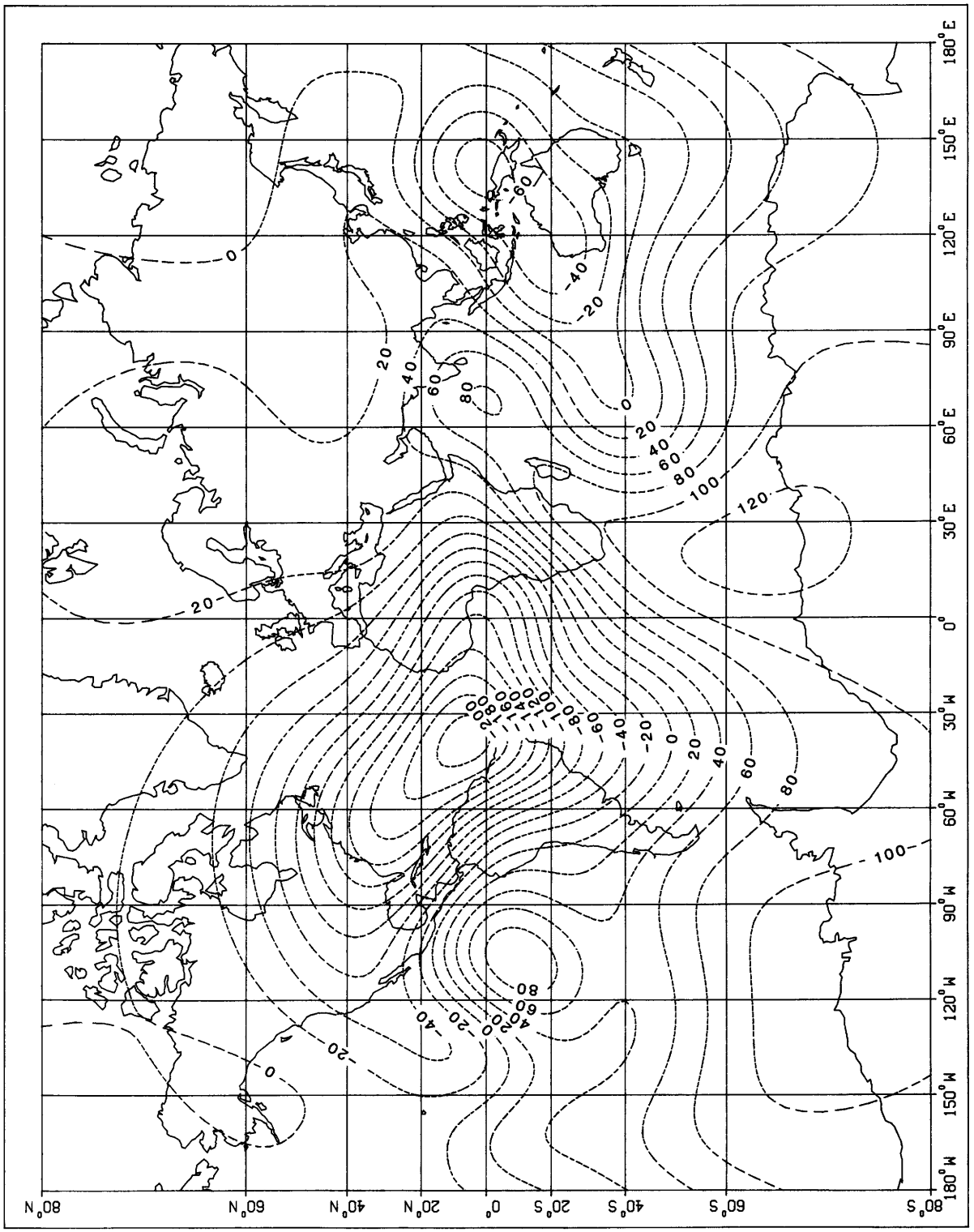

IGRF 1980
North Component (X)
(nT)
80°N
60°N
40°N
20°N
0°
20°S
40°S
60°S
80°S
180°W
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
180°E
0
4000
8000
12000
16000
20000
24000
28000
32000
36000
40000
-4000
-8000
+ 41136
+ 10307


IGRF 1980
Annual Change of North Component (Ẋ)
(nT/yr)
80°N
60°N
40°N
20°N
0°
20°S
40°S
60°S
80°S
180°W
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
180°E
0
-20
-40
-60
-80
20
40
60

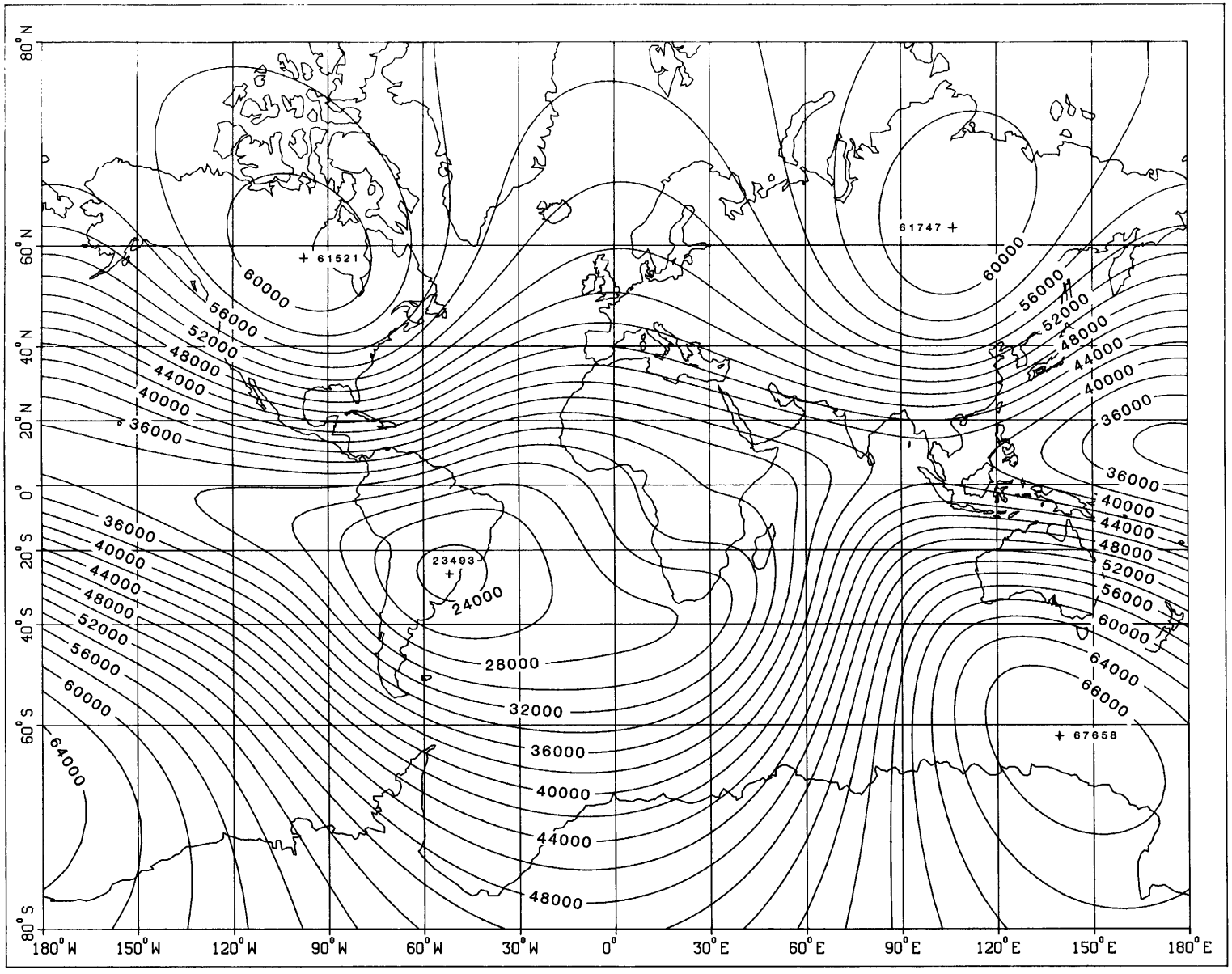

IGRF 1980
East Component (Y)
(nT)
80°N
60°N
40°N
20°N
0°
20°S
40°S
60°S
80°S
180°W
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
180°E
+ 7841
-4755
2000
4000
6000
-10000
-8000
-6000
-4000
-2000
0
2000
4000
6000
8000
10000
12000
14000
-16000
-14000
-12000
-10000
-8000
-6000
-4000
-2000
0
2000
4000
6000
8000

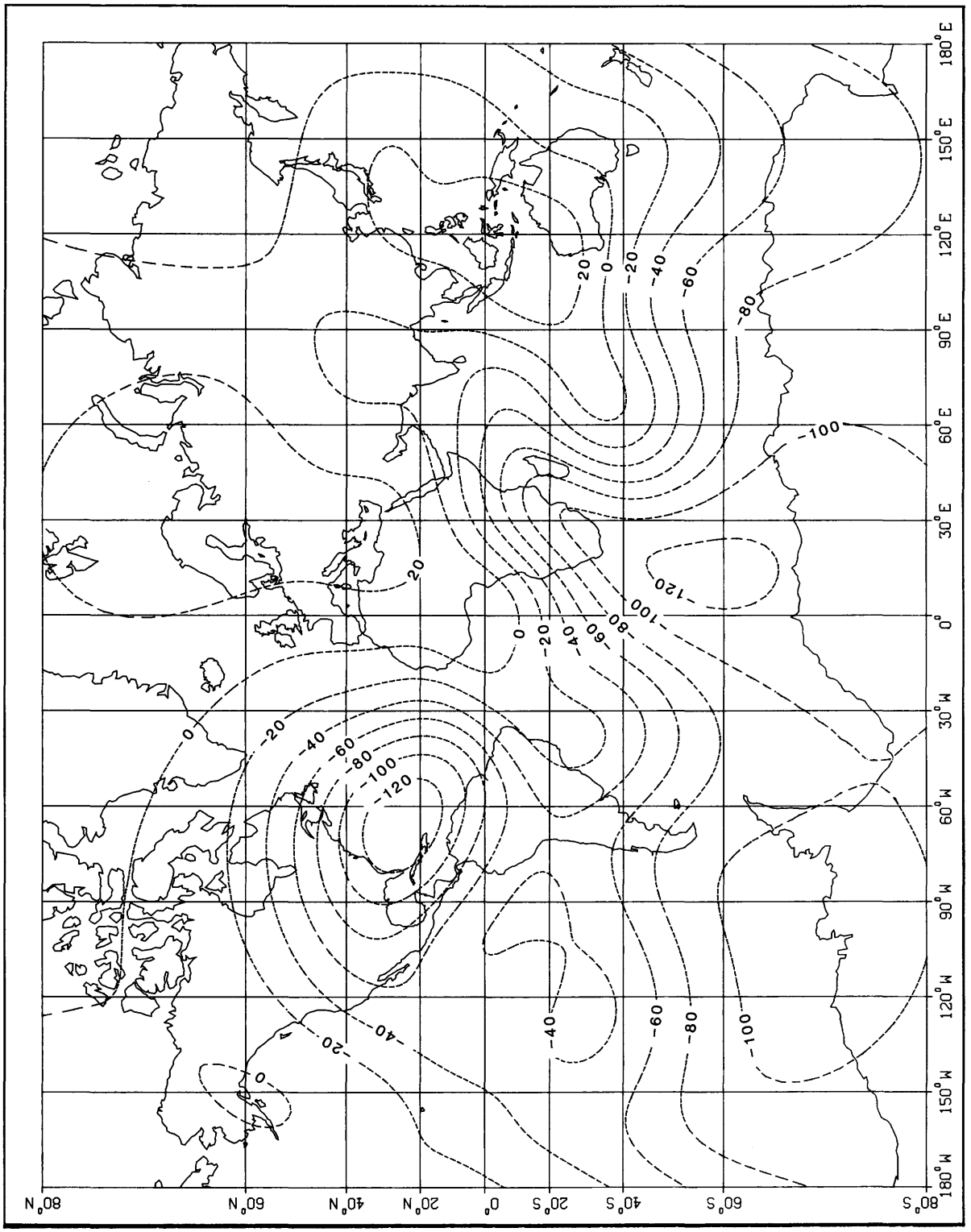

IGRF 1980
Annual Change of East Component (Ẏ)
(nT/yr)
80°N
60°N
40°N
20°N
0°
20°S
40°S
60°S
80°S
180°W
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
180°E
-80
-60
-40
-20
0
20
40
60
80


IGRF 1980
Vertical Intensity (Z)
(nT)
80°N
60°N
40°N
20°N
0°
20°S
40°S
60°S
80°S
180°W
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
180°E
61064
60889
-67604
60000
56000
48000
40000
32000
24000
16000
8000
0
-8000
-16000
-24000
-32000
-40000
-48000
-56000
-64000


IGRF 1980
Annual Change of Vertical Intensity (Ż)
(nT/yr)
80°N
60°N
40°N
20°N
0°
20°S
40°S
60°S
80°S
180°E
150°E
120°E
90°E
60°E
30°E
0°
30°W
60°W
90°W
120°W
150°W
180°W

IGRF 1980 Total Intensity (F) (nT)




IGRF 1980
Annual Change of Total Intensity (Ḟ)
(nT/yr)
80°N
60°N
40°N
20°N
0°
20°S
40°S
60°S
80°S
180°W
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
180°E
20
0
-20
-40
-60
-80
-100
-120

GRID VALUES OF TOTAL MAGNETIC INTENSITY (*F*) (2°×2°)

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
90	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753
	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
88	56361	56366	56371	56377	56383	56390	56398	56406	56415	56424	56434	56444	56455	56466	56478	56490	56503	56516	56529
	8.2	8.2	8.2	8.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2	8.2	8.2	8.1
86	55935	55943	55953	55965	55977	55992	56007	56025	56043	56063	56084	56107	56130	56155	56182	56209	56237	56266	56296
	10.8	10.9	10.9	11.0	11.1	11.1	11.2	11.2	11.2	11.3	11.3	11.3	11.3	11.3	11.3	11.2	11.2	11.2	11.1
84	55486	55497	55510	55526	55545	55566	55590	55616	55645	55676	55709	55745	55783	55823	55866	55910	55956	56004	56053
	13.2	13.4	13.5	13.7	13.8	13.9	14.0	14.1	14.2	14.3	14.3	14.4	14.4	14.4	14.4	14.4	14.4	14.3	14.3
82	55024	55036	55051	55071	55095	55122	55153	55188	55227	55269	55315	55365	55417	55473	55533	55595	55660	55728	55798
	15.4	15.7	15.9	16.1	16.3	16.5	16.7	16.9	17.0	17.1	17.3	17.4	17.4	17.5	17.5	17.5	17.5	17.5	17.4
80	54557	54568	54585	54607	54634	54667	54705	54748	54796	54849	54906	54969	55037	55109	55185	55265	55350	55438	55530
	17.2	17.6	17.9	18.3	18.6	18.9	19.1	19.4	19.6	19.8	20.0	20.2	20.3	20.4	20.5	20.6	20.6	20.6	20.6
78	54092	54101	54118	54141	54171	54207	54251	54300	54357	54419	54488	54563	54644	54732	54824	54923	55026	55135	55249
	18.7	19.1	19.6	20.0	20.5	20.9	21.2	21.6	21.9	22.2	22.5	22.8	23.0	23.1	23.3	23.4	23.5	23.5	23.5
76	53633	53640	53655	53678	53709	53748	53796	53851	53914	53985	54064	54151	54244	54345	54454	54569	54690	54818	54952
	19.7	20.3	20.8	21.4	21.9	22.5	23.0	23.4	23.9	24.3	24.6	25.0	25.3	25.5	25.7	25.9	26.0	26.1	26.1
74	53183	53186	53199	53221	53253	53294	53344	53404	53473	53551	53638	53734	53839	53953	54075	54205	54343	54489	54642
	20.2	20.9	21.6	22.3	23.0	23.6	24.2	24.8	25.4	25.9	26.3	26.8	27.1	27.5	27.8	28.0	28.2	28.3	28.3
72	52742	52741	52751	52772	52803	52845	52898	52961	53034	53118	53213	53317	53432	53556	53690	53833	53986	54147	54317
	20.3	21.1	22.0	22.8	23.6	24.4	25.1	25.8	26.4	27.0	27.6	28.1	28.6	29.0	29.3	29.6	29.9	30.0	30.1
70	52308	52304	52311	52330	52361	52403	52458	52523	52601	52689	52789	52901	53023	53157	53301	53455	53620	53795	53980
	20.0	21.0	21.9	22.9	23.8	24.6	25.5	26.3	27.1	27.8	28.4	29.0	29.6	30.0	30.5	30.8	31.1	31.3	31.4
68	51880	51872	51877	51895	51925	51968	52023	52091	52172	52264	52369	52486	52615	52756	52909	53073	53248	53434	53631
	19.4	20.4	21.5	22.6	23.6	24.6	25.5	26.4	27.3	28.1	28.8	29.5	30.1	30.6	31.1	31.5	31.8	32.0	32.2
66	51453	51442	51446	51462	51493	51536	51593	51663	51747	51843	51952	52074	52208	52355	52514	52686	52869	53065	53272
	18.5	19.6	20.8	22.0	23.1	24.2	25.2	26.2	27.1	28.0	28.8	29.6	30.2	30.8	31.3	31.8	32.1	32.3	32.5
64	51022	51010	51013	51030	51061	51106	51165	51237	51324	51423	51536	51662	51801	51953	52118	52295	52485	52687	52902
	17.4	18.7	19.9	21.2	22.4	23.5	24.7	25.7	26.7	27.7	28.6	29.3	30.1	30.7	31.2	31.6	32.0	32.2	32.3
62	50581	50570	50574	50592	50625	50673	50734	50810	50900	51003	51119	51249	51392	51548	51718	51900	52095	52302	52522
	16.2	17.6	18.9	20.2	21.5	22.8	24.0	25.1	26.1	27.1	28.0	28.9	29.6	30.2	30.8	31.2	31.5	31.7	31.9
60	50127	50118	50124	50145	50182	50233	50298	50378	50471	50578	50699	50833	50980	51140	51313	51498	51697	51908	52132
	15.0	16.5	17.9	19.3	20.6	21.9	23.2	24.3	25.5	26.5	27.4	28.3	29.0	29.6	30.2	30.6	30.9	31.0	31.1

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72
90	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753
	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
88	56529	56543	56557	56571	56586	56601	56616	56631	56646	56662	56678	56694	56709	56725	56741	56757	56773	56788	56804
	8.1	8.1	8.1	8.0	8.0	7.9	7.9	7.8	7.7	7.7	7.6	7.5	7.5	7.4	7.3	7.2	7.1	7.1	7.0
86	56296	56327	56359	56392	56425	56459	56493	56528	56563	56599	56634	56670	56706	56742	56777	56813	56848	56883	56918
	11.1	11.1	11.0	10.9	10.8	10.7	10.6	10.5	10.4	10.2	10.1	10.0	9.8	9.6	9.5	9.3	9.1	8.9	8.7
84	56053	56104	56157	56211	56266	56322	56379	56436	56495	56554	56613	56672	56732	56791	56851	56909	56968	57025	57082
	14.3	14.2	14.1	14.0	13.9	13.7	13.6	13.4	13.2	13.0	12.8	12.6	12.4	12.1	11.9	11.6	11.3	11.0	10.7
82	55798	55871	55946	56024	56103	56183	56265	56349	56433	56518	56604	56690	56776	56862	56947	57032	57116	57199	57281
	17.4	17.4	17.3	17.1	17.0	16.8	16.6	16.4	16.2	15.9	15.7	15.4	15.0	14.7	14.4	14.0	13.6	13.2	12.8
80	55530	55626	55725	55826	55930	56037	56146	56257	56369	56482	56596	56711	56826	56940	57054	57168	57280	57391	57499
	20.6	20.5	20.4	20.3	20.1	19.9	19.7	19.4	19.2	18.8	18.5	18.1	17.7	17.3	16.9	16.4	15.9	15.4	14.8
78	55249	55367	55489	55615	55745	55878	56014	56153	56294	56436	56580	56724	56869	57014	57159	57302	57444	57584	57722
	23.5	23.4	23.3	23.2	23.1	22.8	22.6	22.3	22.0	21.6	21.2	20.8	20.3	19.8	19.3	18.7	18.1	17.5	16.8
76	54952	55092	55237	55388	55543	55702	55865	56031	56201	56372	56546	56721	56896	57072	57248	57422	57594	57765	57932
	26.1	26.1	26.0	25.9	25.7	25.5	25.2	24.9	24.6	24.2	23.7	23.2	22.7	22.1	21.5	20.8	20.1	19.4	18.6
74	54642	54802	54968	55141	55320	55504	55693	55887	56084	56284	56487	56692	56898	57104	57310	57515	57719	57920	58117
	28.3	28.3	28.3	28.2	28.0	27.8	27.5	27.2	26.8	26.3	25.8	25.3	24.7	24.0	23.3	22.6	21.8	21.0	20.1
72	54317	54496	54682	54876	55076	55283	55497	55715	55938	56166	56396	56630	56865	57101	57337	57573	57806	58037	58265
	30.1	30.1	30.1	30.0	29.8	29.6	29.3	28.9	28.5	28.0	27.5	26.9	26.2	25.5	24.7	23.9	23.1	22.2	21.2
70	53980	54174	54378	54590	54810	55038	55273	55514	55761	56014	56270	56530	56793	57057	57321	57585	57848	58108	58364
	31.4	31.5	31.4	31.3	31.1	30.9	30.6	30.2	29.7	29.2	28.6	28.0	27.2	26.5	25.7	24.8	23.9	22.9	21.9
68	53631	53839	54057	54284	54521	54767	55021	55282	55551	55825	56105	56389	56676	56966	57257	57548	57837	58124	58407
	32.2	32.2	32.2	32.1	31.9	31.7	31.3	30.9	30.4	29.8	29.2	28.5	27.7	26.9	26.0	25.1	24.2	23.2	22.1
66	53272	53490	53720	53960	54211	54471	54741	55019	55305	55599	55899	56204	56513	56826	57140	57455	57769	58081	58389
	32.5	32.5	32.5	32.4	32.2	31.9	31.5	31.0	30.5	29.9	29.2	28.4	27.6	26.8	25.9	24.9	23.9	22.9	21.8
64	52902	53129	53367	53618	53879	54151	54433	54725	55026	55335	55652	55975	56303	56635	56969	57305	57640	57974	58304
	32.3	32.4	32.3	32.2	31.9	31.6	31.2	30.6	30.0	29.4	28.7	27.9	27.0	26.1	25.1	24.2	23.1	22.1	21.0
62	52522	52755	53000	53257	53527	53807	54099	54401	54713	55035	55364	55701	56044	56392	56743	57096	57450	57802	58150
	31.9	31.9	31.8	31.6	31.2	30.8	30.4	29.8	29.1	28.4	27.6	26.8	25.9	24.9	23.9	22.9	21.9	20.8	19.7
60	52132	52369	52618	52880	53154	53440	53738	54048	54367	54697	55036	55384	55738	56098	56462	56829	57196	57563	57927
	31.1	31.0	30.9	30.6	30.2	29.8	29.2	28.5	27.8	27.0	26.2	25.3	24.3	23.3	22.3	21.2	20.2	19.1	18.0

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108
90	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753
	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
88	56804	56819	56835	56850	56865	56879	56894	56908	56922	56935	56948	56961	56974	56986	56997	57009	57019	57030	57040
	7.0	6.9	6.8	6.7	6.6	6.5	6.4	6.3	6.2	6.1	6.0	5.9	5.7	5.6	5.5	5.4	5.3	5.2	5.1
86	56918	56952	56986	57019	57051	57082	57113	57143	57172	57200	57227	57253	57278	57302	57325	57346	57367	57386	57404
	8.7	8.5	8.3	8.1	7.9	7.7	7.5	7.2	7.0	6.8	6.5	6.3	6.1	5.8	5.6	5.4	5.1	4.9	4.7
84	57082	57138	57192	57246	57298	57349	57398	57445	57490	57534	57576	57616	57653	57688	57722	57752	57781	57807	57831
	10.7	10.4	10.0	9.7	9.4	9.0	8.7	8.3	7.9	7.6	7.2	6.8	6.4	6.1	5.7	5.3	4.9	4.6	4.2
82	57281	57361	57439	57516	57590	57661	57731	57797	57860	57921	57978	58031	58082	58128	58171	58211	58246	58278	58306
	12.8	12.3	11.9	11.4	10.9	10.4	9.9	9.4	8.9	8.4	7.9	7.4	6.8	6.3	5.8	5.3	4.7	4.2	3.7
80	57499	57606	57710	57811	57909	58004	58094	58181	58263	58341	58414	58483	58546	58604	58656	58703	58745	58781	58811
	14.8	14.3	13.7	13.1	12.5	11.9	11.2	10.6	9.9	9.3	8.6	7.9	7.2	6.6	5.9	5.2	4.5	3.9	3.2
78	57722	57856	57988	58115	58238	58357	58471	58579	58681	58777	58867	58950	59026	59095	59156	59210	59256	59295	59326
	16.8	16.1	15.4	14.7	14.0	13.2	12.4	11.7	10.9	10.0	9.2	8.4	7.6	6.8	5.9	5.1	4.3	3.5	2.7
76	57932	58096	58256	58411	58560	58704	58841	58972	59094	59209	59316	59414	59502	59582	59652	59712	59762	59802	59833
	18.6	17.8	17.0	16.2	15.3	14.4	13.5	12.6	11.7	10.7	9.8	8.9	7.9	6.9	6.0	5.1	4.1	3.2	2.3
74	58117	58311	58499	58682	58858	59028	59189	59342	59486	59619	59743	59855	59957	60046	60124	60189	60242	60283	60311
	20.1	19.2	18.3	17.4	16.4	15.4	14.4	13.4	12.4	11.3	10.2	9.2	8.1	7.1	6.0	4.9	3.9	2.9	1.9
72	58265	58487	58704	58915	59118	59313	59498	59674	59838	59990	60131	60258	60371	60470	60555	60625	60679	60719	60743
	21.2	20.3	19.3	18.3	17.2	16.1	15.0	13.9	12.8	11.7	10.5	9.4	8.2	7.1	5.9	4.8	3.7	2.6	1.5
70	58364	58615	58860	59098	59327	59546	59755	59952	60137	60308	60464	60605	60729	60837	60928	61001	61056	61094	61113
	21.9	20.9	19.8	18.7	17.6	16.5	15.3	14.2	13.0	11.8	10.6	9.4	8.2	7.0	5.8	4.6	3.5	2.3	1.2
68	58407	58685	58957	59220	59474	59717	59948	60167	60370	60558	60729	60883	61018	61134	61230	61305	61360	61394	61406
	22.1	21.0	19.9	18.8	17.7	16.5	15.3	14.1	12.9	11.7	10.5	9.3	8.1	6.8	5.6	4.4	3.3	2.1	0.9
66	58389	58691	58987	59274	59551	59816	60068	60306	60527	60731	60916	61081	61226	61348	61448	61525	61578	61607	61612
	21.8	20.7	19.6	18.4	17.3	16.1	14.9	13.7	12.5	11.3	10.1	8.9	7.7	6.6	5.4	4.2	3.0	1.9	0.8
64	58304	58628	58946	59254	59552	59837	60108	60363	60601	60819	61016	61191	61344	61471	61574	61651	61701	61725	61721
	21.0	19.9	18.8	17.6	16.5	15.3	14.2	13.0	11.9	10.7	9.6	8.4	7.3	6.2	5.1	3.9	2.9	1.8	0.7
62	58150	58494	58830	59157	59473	59775	60063	60333	60584	60815	61023	61206	61365	61497	61601	61676	61723	61740	61727
	19.7	18.6	17.5	16.4	15.3	14.2	13.1	12.0	10.9	9.9	8.8	7.7	6.7	5.7	4.7	3.7	2.7	1.7	0.7
60	57927	58286	58638	58980	59311	59628	59929	60212	60475	60715	60932	61122	61285	61419	61524	61597	61639	61648	61625
	18.0	16.9	15.9	14.8	13.8	12.7	11.7	10.7	9.7	8.8	7.8	6.9	6.0	5.1	4.2	3.4	2.5	1.7	0.9

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138	140	142	144
90	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753
	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
88	57040	57049	57058	57067	57075	57083	57090	57096	57102	57108	57113	57118	57122	57126	57129	57132	57135	57136	57138
	5.1	5.0	4.9	4.8	4.7	4.6	4.5	4.4	4.3	4.2	4.1	4.0	3.9	3.8	3.8	3.7	3.6	3.5	3.5
86	57404	57420	57436	57450	57463	57474	57485	57494	57502	57509	57515	57519	57523	57526	57527	57528	57527	57526	57524
	4.7	4.5	4.2	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.9	1.7	1.6	1.4	1.3
84	57831	57853	57872	57889	57903	57915	57925	57933	57939	57943	57944	57944	57942	57938	57933	57926	57917	57907	57896
	4.2	3.9	3.5	3.1	2.8	2.5	2.1	1.8	1.5	1.2	0.9	0.6	0.4	0.1	-0.1	-0.4	-0.6	-0.8	-1.0
82	58306	58330	58351	58367	58380	58390	58396	58398	58397	58393	58386	58376	58364	58348	58331	58311	58290	58266	58241
	3.7	3.2	2.7	2.2	1.8	1.3	0.8	0.4	0.0	-0.4	-0.8	-1.2	-1.5	-1.9	-2.2	-2.5	-2.8	-3.1	-3.3
80	58811	58836	58855	58869	58877	58881	58879	58872	58861	58845	58824	58800	58772	58741	58706	58669	58629	58587	58543
	3.2	2.6	1.9	1.3	0.7	0.1	-0.4	-1.0	-1.5	-2.0	-2.5	-3.0	-3.4	-3.9	-4.2	-4.6	-4.9	-5.3	-5.5
78	59326	59350	59366	59374	59375	59369	59356	59337	59311	59279	59241	59199	59151	59099	59043	58983	58920	58855	58788
	2.7	2.0	1.2	0.4	-0.3	-1.0	-1.7	-2.3	-3.0	-3.6	-4.2	-4.7	-5.2	-5.7	-6.2	-6.6	-7.0	-7.3	-7.6
76	59833	59853	59863	59864	59855	59837	59810	59774	59731	59679	59620	59555	59484	59407	59325	59239	59149	59057	58962
	2.3	1.4	0.5	-0.4	-1.2	-2.0	-2.8	-3.6	-4.3	-5.0	-5.7	-6.3	-6.9	-7.4	-7.9	-8.4	-8.8	-9.2	-9.5
74	60311	60326	60329	60320	60299	60266	60222	60167	60103	60028	59945	59854	59755	59649	59538	59422	59302	59179	59053
	1.9	0.9	-0.1	-1.1	-2.0	-2.9	-3.8	-4.6	-5.4	-6.2	-6.9	-7.6	-8.3	-8.9	-9.4	-9.9	-10.4	-10.8	-11.1
72	60743	60752	60745	60724	60689	60639	60576	60499	60411	60311	60201	60080	59951	59814	59671	59522	59368	59211	59052
	1.5	0.4	-0.6	-1.7	-2.7	-3.7	-4.6	-5.5	-6.4	-7.2	-8.0	-8.7	-9.4	-10.0	-10.6	-11.1	-11.6	-12.0	-12.4
70	61113	61113	61096	61062	61010	60941	60857	60757	60642	60515	60374	60223	60061	59890	59712	59528	59338	59145	58950
	1.2	0.0	-1.0	-2.1	-3.2	-4.2	-5.2	-6.1	-7.0	-7.9	-8.7	-9.4	-10.1	-10.8	-11.4	-11.9	-12.4	-12.9	-13.2
68	61406	61398	61369	61319	61249	61160	61052	60927	60785	60628	60456	60271	60075	59869	59654	59433	59206	58976	58744
	0.9	-0.2	-1.3	-2.4	-3.4	-4.5	-5.5	-6.4	-7.3	-8.2	-9.0	-9.8	-10.5	-11.2	-11.8	-12.4	-12.8	-13.3	-13.6
66	61612	61593	61551	61485	61396	61285	61153	61001	60831	60642	60438	60219	59987	59745	59493	59233	58968	58700	58430
	0.8	-0.3	-1.4	-2.5	-3.5	-4.5	-5.5	-6.4	-7.3	-8.2	-9.0	-9.8	-10.5	-11.2	-11.8	-12.3	-12.8	-13.2	-13.6
64	61721	61691	61634	61551	61442	61309	61152	60973	60772	60552	60315	60061	59794	59514	59224	58927	58624	58317	58010
	0.7	-0.3	-1.4	-2.4	-3.3	-4.3	-5.2	-6.1	-7.0	-7.8	-8.6	-9.3	-10.0	-10.7	-11.3	-11.8	-12.3	-12.7	-13.1
62	61727	61684	61612	61512	61383	61226	61044	60837	60607	60355	60084	59796	59492	59176	58849	58514	58173	57829	57485
	0.7	-0.2	-1.1	-2.1	-2.9	-3.8	-4.7	-5.5	-6.3	-7.1	-7.8	-8.5	-9.2	-9.8	-10.4	-10.9	-11.3	-11.8	-12.1
60	61625	61570	61482	61364	61214	61035	60827	60592	60333	60050	59746	59424	59085	58733	58370	57998	57621	57240	56860
	0.9	0.1	-0.7	-1.5	-2.3	-3.1	-3.8	-4.6	-5.3	-6.0	-6.6	-7.3	-7.9	-8.5	-9.0	-9.5	-9.9	-10.3	-10.7

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	144	146	148	150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180
90	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753
	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
88	57138	57139	57140	57140	57140	57139	57138	57136	57135	57133	57130	57127	57124	57121	57117	57113	57108	57104	57099
	3.5	3.4	3.3	3.3	3.2	3.2	3.1	3.1	3.0	3.0	2.9	2.9	2.9	2.8	2.8	2.8	2.8	2.8	2.8
86	57524	57521	57517	57512	57507	57502	57495	57488	57481	57473	57465	57456	57447	57437	57428	57418	57408	57397	57387
	1.3	1.2	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
84	57896	57884	57871	57857	57842	57827	57811	57794	57777	57760	57742	57725	57707	57690	57672	57655	57638	57622	57605
	-1.0	-1.2	-1.3	-1.5	-1.6	-1.8	-1.9	-2.0	-2.0	-2.1	-2.2	-2.2	-2.3	-2.3	-2.3	-2.3	-2.3	-2.2	-2.2
82	58241	58215	58187	58159	58130	58100	58070	58040	58010	57980	57951	57922	57893	57866	57839	57814	57789	57766	57744
	-3.3	-3.5	-3.7	-3.9	-4.1	-4.2	-4.3	-4.4	-4.5	-4.6	-4.6	-4.6	-4.6	-4.6	-4.6	-4.5	-4.5	-4.4	-4.3
80	58543	58498	58451	58404	58356	58308	58261	58213	58167	58121	58077	58034	57993	57954	57917	57882	57850	57820	57793
	-5.5	-5.8	-6.0	-6.2	-6.4	-6.5	-6.6	-6.7	-6.8	-6.8	-6.8	-6.8	-6.8	-6.7	-6.6	-6.5	-6.4	-6.3	-6.1
78	58788	58719	58649	58579	58509	58438	58369	58301	58235	58171	58110	58051	57996	57944	57896	57852	57812	57776	57745
	-7.6	-7.9	-8.2	-8.4	-8.5	-8.7	-8.8	-8.8	-8.9	-8.8	-8.8	-8.7	-8.6	-8.5	-8.4	-8.2	-8.0	-7.8	-7.5
76	58962	58866	58769	58672	58575	58480	58386	58295	58207	58122	58042	57966	57895	57830	57770	57716	57669	57628	57593
	-9.5	-9.8	-10.1	-10.3	-10.4	-10.5	-10.6	-10.6	-10.6	-10.6	-10.5	-10.4	-10.2	-10.0	-9.8	-9.5	-9.2	-8.9	-8.6
74	59053	58926	58799	58672	58546	58423	58303	58186	58074	57967	57867	57772	57685	57606	57534	57471	57417	57371	57335
	-11.1	-11.4	-11.7	-11.9	-12.0	-12.1	-12.1	-12.1	-12.1	-12.0	-11.8	-11.6	-11.4	-11.1	-10.8	-10.5	-10.1	-9.7	-9.3
72	59052	58891	58731	58572	58415	58262	58113	57969	57832	57702	57580	57466	57363	57269	57186	57114	57053	57004	56967
	-12.4	-12.7	-12.9	-13.1	-13.2	-13.3	-13.3	-13.3	-13.2	-13.0	-12.8	-12.5	-12.2	-11.9	-11.5	-11.1	-10.6	-10.1	-9.6
70	58950	58755	58559	58366	58177	57992	57813	57641	57478	57324	57180	57048	56927	56820	56725	56645	56579	56527	56490
	-13.2	-13.5	-13.8	-13.9	-14.0	-14.1	-14.1	-14.0	-13.9	-13.6	-13.4	-13.1	-12.7	-12.3	-11.8	-11.3	-10.8	-10.3	-9.7
68	58744	58512	58281	58053	57830	57613	57403	57203	57013	56835	56670	56518	56381	56260	56155	56067	55996	55943	55908
	-13.6	-13.9	-14.2	-14.3	-14.4	-14.5	-14.4	-14.3	-14.2	-13.9	-13.6	-13.3	-12.9	-12.4	-11.9	-11.3	-10.7	-10.1	-9.4
66	58430	58161	57894	57630	57373	57124	56884	56656	56440	56238	56051	55881	55729	55595	55480	55385	55311	55257	55224
	-13.6	-13.9	-14.1	-14.3	-14.4	-14.4	-14.4	-14.3	-14.1	-13.8	-13.5	-13.1	-12.7	-12.2	-11.6	-11.0	-10.4	-9.7	-9.0
64	58010	57703	57400	57102	56812	56531	56261	56005	55763	55539	55332	55144	54976	54830	54707	54606	54528	54475	54445
	-13.1	-13.4	-13.6	-13.8	-13.9	-13.9	-13.9	-13.8	-13.6	-13.4	-13.0	-12.7	-12.2	-11.7	-11.2	-10.6	-9.9	-9.2	-8.5
62	57485	57142	56804	56472	56149	55838	55539	55257	54991	54744	54518	54314	54133	53976	53844	53738	53658	53606	53580
	-12.1	-12.4	-12.7	-12.9	-13.0	-13.0	-13.0	-12.9	-12.8	-12.6	-12.3	-11.9	-11.5	-11.0	-10.5	-9.9	-9.3	-8.6	-7.8
60	56860	56483	56111	55747	55393	55052	54727	54419	54131	53864	53620	53401	53207	53040	52901	52791	52710	52659	52637
	-10.7	-11.0	-11.3	-11.5	-11.6	-11.7	-11.8	-11.7	-11.6	-11.5	-11.2	-11.0	-10.6	-10.2	-9.7	-9.1	-8.5	-7.9	-7.2

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	180	-178	-176	-174	-172	-170	-168	-166	-164	-162	-160	-158	-156	-154	-152	-150	-148	-146	-144
90	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753
	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
88	57099	57093	57088	57082	57076	57070	57063	57056	57049	57042	57035	57027	57019	57011	57003	56994	56986	56977	56968
	2.8	2.7	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.9	2.9	2.9	2.9	3.0	3.0	3.1	3.1
86	57387	57376	57365	57354	57343	57332	57320	57309	57297	57285	57274	57262	57250	57237	57225	57212	57200	57187	57174
	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9	1.0	1.1	1.2
84	57605	57589	57574	57558	57544	57529	57515	57502	57488	57476	57463	57451	57439	57427	57415	57404	57392	57380	57369
	-2.2	-2.2	-2.1	-2.0	-2.0	-1.9	-1.8	-1.7	-1.6	-1.5	-1.4	-1.3	-1.1	-1.0	-0.9	-0.7	-0.6	-0.4	-0.3
82	57744	57723	57704	57686	57669	57654	57640	57628	57616	57606	57597	57589	57581	57575	57569	57564	57559	57554	57549
	-4.3	-4.2	-4.1	-4.0	-3.8	-3.7	-3.5	-3.4	-3.2	-3.0	-2.9	-2.7	-2.5	-2.3	-2.1	-1.9	-1.7	-1.5	-1.3
80	57793	57769	57747	57728	57712	57699	57688	57679	57674	57670	57668	57669	57671	57675	57681	57687	57695	57703	57711
	-6.1	-5.9	-5.7	-5.5	-5.3	-5.1	-4.9	-4.6	-4.4	-4.2	-3.9	-3.7	-3.4	-3.2	-2.9	-2.7	-2.4	-2.2	-1.9
78	57745	57718	57696	57678	57665	57656	57651	57651	57654	57661	57672	57686	57703	57722	57744	57768	57793	57820	57847
	-7.5	-7.3	-7.0	-6.7	-6.4	-6.1	-5.8	-5.5	-5.2	-4.8	-4.5	-4.2	-3.9	-3.6	-3.3	-3.0	-2.7	-2.4	-2.1
76	57593	57566	57544	57530	57522	57520	57525	57536	57552	57574	57601	57633	57669	57709	57752	57799	57847	57897	57949
	-8.6	-8.2	-7.9	-7.5	-7.1	-6.7	-6.3	-5.9	-5.5	-5.1	-4.7	-4.4	-4.0	-3.6	-3.3	-3.0	-2.6	-2.3	-2.1
74	57335	57307	57289	57280	57280	57288	57305	57331	57364	57404	57451	57505	57565	57629	57698	57771	57848	57926	58007
	-9.3	-8.8	-8.4	-7.9	-7.4	-7.0	-6.5	-6.0	-5.5	-5.1	-4.6	-4.2	-3.8	-3.4	-3.0	-2.6	-2.3	-2.0	-1.7
72	56967	56941	56928	56926	56936	56957	56989	57032	57084	57146	57217	57296	57383	57476	57575	57679	57786	57897	58010
	-9.6	-9.1	-8.5	-8.0	-7.4	-6.9	-6.3	-5.8	-5.2	-4.7	-4.2	-3.7	-3.3	-2.9	-2.5	-2.1	-1.8	-1.5	-1.3
70	56490	56468	56461	56468	56490	56526	56575	56637	56712	56798	56895	57003	57119	57243	57375	57512	57655	57801	57949
	-9.7	-9.0	-8.4	-7.8	-7.2	-6.5	-5.9	-5.3	-4.7	-4.1	-3.6	-3.1	-2.6	-2.2	-1.8	-1.5	-1.2	-0.9	-0.7
68	55908	55890	55891	55908	55943	55995	56063	56147	56246	56358	56483	56620	56768	56926	57092	57265	57444	57627	57814
	-9.4	-8.8	-8.1	-7.4	-6.7	-6.0	-5.3	-4.6	-4.0	-3.4	-2.8	-2.3	-1.9	-1.5	-1.1	-0.8	-0.6	-0.4	-0.3
66	55224	55212	55221	55250	55299	55369	55456	55563	55686	55825	55980	56148	56328	56520	56722	56931	57148	57369	57595
	-9.0	-8.3	-7.6	-6.8	-6.1	-5.3	-4.6	-3.9	-3.2	-2.6	-2.1	-1.5	-1.1	-0.7	-0.4	-0.2	0.0	0.1	0.1
64	54445	54439	54457	54499	54563	54650	54758	54887	55035	55201	55385	55584	55798	56024	56261	56507	56761	57020	57284
	-8.5	-7.7	-6.9	-6.2	-5.4	-4.6	-3.9	-3.2	-2.5	-1.9	-1.3	-0.8	-0.4	0.0	0.2	0.4	0.4	0.4	0.3
62	53580	53580	53608	53661	53741	53845	53973	54124	54297	54490	54702	54931	55177	55436	55707	55989	56279	56576	56877
	-7.8	-7.1	-6.3	-5.5	-4.7	-3.9	-3.2	-2.5	-1.8	-1.2	-0.6	-0.2	0.2	0.5	0.7	0.7	0.7	0.6	0.3
60	52637	52644	52681	52746	52840	52961	53108	53280	53477	53695	53934	54192	54468	54758	55062	55378	55702	56034	56371
	-7.2	-6.5	-5.7	-4.9	-4.1	-3.4	-2.6	-1.9	-1.2	-0.7	-0.1	0.3	0.6	0.8	0.9	0.9	0.8	0.5	0.1

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	-144	-142	-140	-138	-136	-134	-132	-130	-128	-126	-124	-122	-120	-118	-116	-114	-112	-110	-108
90	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753
	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
88	56968	56958	56949	56939	56929	56919	56909	56899	56888	56878	56867	56856	56845	56833	56822	56810	56798	56787	56775
	3.1	3.1	3.2	3.2	3.3	3.3	3.4	3.5	3.5	3.6	3.6	3.7	3.8	3.8	3.9	4.0	4.1	4.1	4.2
86	57174	57160	57146	57132	57118	57104	57089	57073	57058	57041	57025	57008	56990	56973	56954	56935	56916	56896	56876
	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.4	2.5	2.6	2.7	2.9	3.0	3.1	3.2
84	57369	57357	57344	57332	57319	57305	57291	57277	57262	57246	57229	57211	57193	57173	57152	57131	57108	57084	57059
	-0.3	-0.2	0.0	0.1	0.3	0.4	0.6	0.8	0.9	1.1	1.2	1.4	1.5	1.7	1.9	2.0	2.2	2.4	2.5
82	57549	57545	57540	57535	57529	57523	57516	57508	57499	57489	57477	57464	57449	57433	57414	57394	57372	57348	57322
	-1.3	-1.1	-0.9	-0.7	-0.6	-0.4	-0.2	0.0	0.2	0.4	0.6	0.7	0.9	1.1	1.3	1.5	1.6	1.8	2.0
80	57711	57720	57729	57737	57745	57751	57757	57761	57764	57765	57764	57760	57754	57745	57734	57719	57702	57681	57657
	-1.9	-1.7	-1.5	-1.2	-1.0	-0.8	-0.6	-0.4	-0.2	0.0	0.2	0.4	0.5	0.7	0.9	1.1	1.2	1.4	1.5
78	57847	57875	57903	57930	57957	57982	58006	58028	58048	58065	58079	58090	58097	58101	58100	58095	58086	58072	58053
	-2.1	-1.9	-1.6	-1.4	-1.2	-1.0	-0.7	-0.5	-0.4	-0.2	0.0	0.1	0.3	0.4	0.6	0.7	0.9	1.0	1.1
76	57949	58001	58053	58105	58156	58205	58253	58297	58339	58377	58411	58441	58466	58485	58499	58507	58509	58505	58494
	-2.1	-1.8	-1.5	-1.3	-1.1	-0.9	-0.7	-0.5	-0.4	-0.3	-0.1	0.0	0.1	0.2	0.3	0.3	0.4	0.5	0.5
74	58007	58088	58169	58250	58330	58408	58483	58555	58623	58686	58744	58796	58842	58881	58913	58938	58954	58962	58961
	-1.7	-1.5	-1.2	-1.0	-0.9	-0.7	-0.6	-0.5	-0.4	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
72	58010	58125	58239	58353	58466	58576	58682	58785	58882	58974	59060	59138	59208	59270	59322	59366	59399	59422	59435
	-1.3	-1.1	-0.9	-0.7	-0.6	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.6	-0.7	-0.8	-0.9	-1.0	-1.1	-1.2	-1.3
70	57949	58100	58250	58400	58548	58694	58835	58971	59101	59224	59339	59446	59543	59630	59706	59771	59823	59864	59891
	-0.7	-0.6	-0.5	-0.4	-0.4	-0.4	-0.5	-0.6	-0.7	-0.9	-1.1	-1.2	-1.5	-1.7	-1.9	-2.1	-2.4	-2.6	-2.9
68	57814	58002	58191	58379	58565	58747	58924	59096	59260	59417	59564	59701	59827	59941	60043	60131	60205	60264	60309
	-0.3	-0.2	-0.2	-0.3	-0.4	-0.5	-0.7	-1.0	-1.2	-1.5	-1.9	-2.2	-2.6	-3.0	-3.3	-3.7	-4.1	-4.5	-4.9
66	57595	57822	58050	58277	58501	58721	58936	59144	59344	59535	59716	59885	60041	60184	60312	60425	60522	60603	60666
	0.1	0.1	-0.1	-0.3	-0.5	-0.8	-1.2	-1.6	-2.1	-2.5	-3.0	-3.6	-4.1	-4.7	-5.2	-5.8	-6.3	-6.9	-7.4
64	57284	57550	57817	58083	58346	58604	58857	59102	59338	59564	59778	59980	60167	60339	60495	60635	60756	60859	60943
	0.3	0.1	-0.1	-0.5	-0.9	-1.4	-2.0	-2.6	-3.2	-3.9	-4.6	-5.4	-6.1	-6.8	-7.6	-8.3	-9.1	-9.8	-10.5
62	56877	57181	57486	57790	58091	58387	58676	58958	59229	59490	59738	59972	60190	60393	60577	60744	60891	61017	61123
	0.3	0.0	-0.5	-1.0	-1.6	-2.3	-3.1	-3.9	-4.8	-5.7	-6.6	-7.6	-8.5	-9.5	-10.4	-11.4	-12.3	-13.2	-14.1
60	56371	56711	57052	57392	57729	58061	58386	58702	59008	59303	59584	59850	60099	60332	60545	60739	60912	61063	61192
	0.1	-0.4	-1.0	-1.8	-2.6	-3.5	-4.5	-5.6	-6.7	-7.8	-9.0	-10.2	-11.4	-12.5	-13.7	-14.9	-16.0	-17.1	-18.2

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	-108	-106	-104	-102	-100	-98	-96	-94	-92	-90	-88	-86	-84	-82	-80	-78	-76	-74	-72
90	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753
	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
88	56775	56763	56750	56738	56726	56713	56701	56688	56676	56663	56651	56638	56626	56613	56601	56588	56576	56564	56552
	4.2	4.3	4.4	4.4	4.5	4.6	4.7	4.8	4.8	4.9	5.0	5.1	5.2	5.3	5.3	5.4	5.5	5.6	5.7
86	56876	56855	56834	56812	56790	56767	56744	56721	56697	56672	56648	56623	56598	56572	56547	56521	56495	56469	56443
	3.2	3.4	3.5	3.6	3.8	3.9	4.0	4.2	4.3	4.5	4.6	4.7	4.9	5.0	5.2	5.3	5.5	5.6	5.8
84	57059	57033	57006	56977	56947	56917	56885	56851	56817	56782	56746	56708	56670	56631	56591	56551	56510	56468	56426
	2.5	2.7	2.8	3.0	3.2	3.3	3.5	3.7	3.9	4.0	4.2	4.4	4.6	4.7	4.9	5.1	5.3	5.5	5.7
82	57322	57293	57263	57230	57195	57158	57119	57077	57034	56988	56940	56891	56839	56786	56731	56675	56618	56559	56499
	2.0	2.2	2.3	2.5	2.7	2.8	3.0	3.2	3.4	3.6	3.8	3.9	4.1	4.3	4.5	4.7	4.9	5.1	5.4
80	57657	57629	57598	57564	57525	57484	57439	57390	57338	57282	57224	57162	57097	57029	56959	56885	56810	56732	56653
	1.5	1.7	1.9	2.0	2.2	2.3	2.5	2.7	2.8	3.0	3.2	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7
78	58053	58029	58000	57965	57926	57882	57832	57777	57717	57653	57583	57509	57430	57348	57261	57170	57076	56978	56878
	1.1	1.2	1.3	1.5	1.6	1.7	1.8	2.0	2.1	2.2	2.4	2.5	2.7	2.8	3.0	3.2	3.4	3.6	3.8
76	58494	58476	58451	58420	58381	58335	58282	58223	58156	58083	58003	57917	57824	57726	57623	57514	57400	57282	57159
	0.5	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.8	1.9	2.1	2.3	2.4
74	58961	58952	58934	58907	58871	58825	58771	58707	58635	58554	58464	58366	58260	58147	58026	57899	57765	57626	57481
	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.1	-0.1	0.0	0.1	0.2	0.3	0.5	0.6
72	59435	59436	59427	59406	59374	59330	59276	59210	59133	59045	58946	58837	58719	58590	58453	58307	58153	57992	57824
	-1.3	-1.5	-1.6	-1.7	-1.8	-1.9	-1.9	-2.0	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1	-2.0	-1.9	-1.8	-1.7
70	59891	59906	59907	59894	59868	59829	59775	59708	59628	59534	59428	59309	59178	59036	58882	58719	58545	58362	58171
	-2.9	-3.1	-3.3	-3.5	-3.7	-3.9	-4.1	-4.3	-4.4	-4.5	-4.6	-4.7	-4.8	-4.8	-4.8	-4.8	-4.7	-4.6	-4.5
68	60309	60338	60352	60350	60331	60297	60247	60181	60098	60001	59888	59761	59619	59463	59295	59114	58921	58718	58504
	-4.9	-5.2	-5.6	-5.9	-6.2	-6.5	-6.8	-7.1	-7.3	-7.5	-7.7	-7.8	-8.0	-8.1	-8.1	-8.1	-8.1	-8.1	-8.0
66	60666	60712	60740	60750	60742	60715	60669	60606	60524	60424	60306	60172	60021	59853	59671	59474	59263	59040	58805
	-7.4	-7.9	-8.4	-8.9	-9.3	-9.7	-10.1	-10.5	-10.8	-11.1	-11.4	-11.6	-11.8	-12.0	-12.1	-12.1	-12.2	-12.2	-12.1
64	60943	61008	61052	61076	61079	61062	61023	60964	60884	60784	60664	60524	60365	60188	59994	59782	59555	59313	59058
	-10.5	-11.1	-11.8	-12.4	-13.0	-13.5	-14.0	-14.5	-15.0	-15.4	-15.7	-16.0	-16.3	-16.5	-16.7	-16.8	-16.9	-16.9	-16.8
62	61123	61207	61270	61310	61326	61320	61291	61239	61163	61065	60944	60801	60637	60452	60247	60023	59781	59522	59247
	-14.1	-14.9	-15.7	-16.5	-17.2	-17.9	-18.6	-19.2	-19.7	-20.2	-20.7	-21.1	-21.5	-21.8	-22.0	-22.2	-22.3	-22.3	-22.2
60	61192	61297	61379	61437	61469	61477	61459	61415	61346	61252	61133	60990	60822	60631	60418	60183	59928	59654	59362
	-18.2	-19.2	-20.2	-21.1	-22.0	-22.8	-23.6	-24.4	-25.1	-25.7	-26.3	-26.8	-27.2	-27.6	-27.9	-28.1	-28.3	-28.3	-28.3

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	-72	-70	-68	-66	-64	-62	-60	-58	-56	-54	-52	-50	-48	-46	-44	-42	-40	-38	-36
90	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753
	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
88	56552	56540	56528	56517	56506	56495	56484	56473	56463	56453	56443	56434	56425	56417	56408	56401	56393	56387	56380
	5.7	5.8	5.9	5.9	6.0	6.1	6.2	6.3	6.4	6.4	6.5	6.6	6.7	6.8	6.9	6.9	7.0	7.1	7.2
86	56443	56417	56391	56365	56339	56314	56289	56264	56239	56215	56192	56169	56147	56125	56105	56085	56066	56048	56030
	5.8	5.9	6.1	6.2	6.4	6.5	6.7	6.8	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	8.5
84	56426	56384	56341	56298	56255	56212	56169	56127	56085	56043	56002	55962	55923	55884	55847	55811	55776	55742	55710
	5.7	5.9	6.1	6.3	6.5	6.7	6.9	7.1	7.3	7.5	7.7	8.0	8.2	8.4	8.6	8.8	9.1	9.3	9.5
82	56499	56438	56376	56314	56251	56188	56124	56061	55998	55936	55874	55813	55753	55694	55637	55581	55527	55474	55424
	5.4	5.6	5.8	6.0	6.3	6.5	6.7	7.0	7.2	7.5	7.8	8.0	8.3	8.6	8.9	9.2	9.5	9.8	10.1
80	56653	56572	56489	56405	56320	56234	56148	56062	55975	55889	55804	55719	55635	55553	55473	55394	55318	55244	55172
	4.7	5.0	5.2	5.4	5.7	5.9	6.2	6.5	6.8	7.1	7.4	7.7	8.0	8.3	8.7	9.0	9.4	9.8	10.1
78	56878	56775	56669	56562	56453	56342	56231	56119	56007	55895	55784	55673	55564	55456	55350	55247	55146	55048	54954
	3.8	4.0	4.2	4.5	4.7	5.0	5.3	5.6	5.9	6.2	6.5	6.9	7.3	7.6	8.0	8.4	8.8	9.3	9.7
76	57159	57033	56904	56771	56637	56500	56362	56223	56084	55944	55805	55667	55530	55395	55262	55132	55005	54882	54763
	2.4	2.6	2.9	3.1	3.4	3.6	3.9	4.2	4.5	4.9	5.2	5.6	6.0	6.4	6.9	7.3	7.8	8.3	8.8
74	57481	57331	57176	57018	56857	56693	56527	56360	56192	56023	55855	55688	55522	55359	55198	55041	54887	54737	54592
	0.6	0.8	1.0	1.3	1.5	1.8	2.1	2.4	2.7	3.1	3.5	3.9	4.3	4.8	5.2	5.8	6.3	6.8	7.4
72	57824	57650	57470	57286	57097	56905	56711	56514	56317	56119	55921	55724	55529	55336	55147	54961	54780	54603	54432
	-1.7	-1.5	-1.3	-1.1	-0.9	-0.6	-0.3	0.0	0.4	0.8	1.2	1.6	2.1	2.6	3.2	3.7	4.3	4.9	5.6
70	58171	57973	57768	57557	57341	57120	56897	56671	56443	56215	55988	55761	55536	55314	55096	54882	54673	54469	54272
	-4.5	-4.4	-4.2	-4.0	-3.8	-3.5	-3.2	-2.8	-2.4	-2.0	-1.6	-1.1	-0.5	0.0	0.6	1.3	1.9	2.6	3.3
68	58504	58282	58052	57814	57570	57322	57069	56814	56557	56299	56041	55784	55530	55279	55032	54790	54553	54323	54101
	-8.0	-7.9	-7.7	-7.5	-7.2	-6.9	-6.6	-6.2	-5.8	-5.3	-4.8	-4.2	-3.6	-3.0	-2.3	-1.6	-0.9	-0.1	0.7
66	58805	58560	58305	58041	57771	57494	57213	56928	56642	56354	56066	55780	55497	55217	54942	54672	54409	54154	53907
	-12.1	-12.0	-11.8	-11.6	-11.3	-11.0	-10.6	-10.2	-9.7	-9.1	-8.5	-7.9	-7.2	-6.5	-5.7	-4.9	-4.0	-3.1	-2.1
64	59058	58790	58511	58223	57926	57622	57313	57000	56684	56367	56050	55736	55424	55116	54813	54518	54229	53950	53680
	-16.8	-16.7	-16.5	-16.3	-16.0	-15.6	-15.2	-14.6	-14.1	-13.4	-12.7	-12.0	-11.2	-10.3	-9.4	-8.4	-7.4	-6.4	-5.3
62	59247	58959	58657	58345	58023	57693	57356	57015	56672	56326	55982	55639	55299	54965	54636	54315	54003	53701	53409
	-22.2	-22.1	-21.9	-21.6	-21.3	-20.8	-20.3	-19.7	-19.0	-18.2	-17.4	-16.5	-15.5	-14.5	-13.4	-12.3	-11.1	-9.9	-8.6
60	59362	59054	58731	58396	58050	57695	57332	56964	56593	56221	55849	55479	55114	54753	54400	54056	53722	53398	53087
	-28.3	-28.2	-27.9	-27.6	-27.2	-26.6	-26.0	-25.3	-24.4	-23.5	-22.5	-21.4	-20.2	-19.0	-17.7	-16.4	-15.0	-13.5	-12.1

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	0
90	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753	56753
	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
88	56380	56374	56369	56364	56360	56356	56353	56350	56348	56347	56346	56346	56346	56347	56349	56351	56354	56357	56361
	7.2	7.2	7.3	7.4	7.4	7.5	7.6	7.6	7.7	7.8	7.8	7.9	7.9	8.0	8.0	8.0	8.1	8.1	8.2
86	56030	56014	55999	55985	55972	55961	55950	55941	55934	55927	55922	55919	55917	55916	55917	55919	55923	55928	55935
	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.5	9.7	9.8	9.9	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8
84	55710	55680	55651	55624	55599	55576	55555	55536	55519	55505	55493	55483	55476	55471	55469	55469	55472	55478	55486
	9.5	9.7	10.0	10.2	10.4	10.6	10.9	11.1	11.3	11.5	11.7	11.9	12.1	12.3	12.5	12.7	12.9	13.1	13.2
82	55424	55376	55330	55287	55246	55209	55174	55142	55114	55089	55067	55048	55034	55023	55015	55012	55012	55016	55024
	10.1	10.4	10.7	11.0	11.3	11.6	11.9	12.2	12.5	12.8	13.1	13.5	13.8	14.0	14.3	14.6	14.9	15.2	15.4
80	55172	55104	55038	54976	54918	54863	54812	54765	54722	54684	54650	54621	54597	54578	54563	54554	54550	54551	54557
	10.1	10.5	10.9	11.3	11.7	12.1	12.5	12.9	13.3	13.7	14.1	14.5	14.9	15.3	15.7	16.1	16.5	16.9	17.2
78	54954	54863	54775	54692	54614	54540	54471	54407	54348	54295	54248	54206	54171	54142	54119	54102	54092	54089	54092
	9.7	10.2	10.6	11.1	11.6	12.1	12.6	13.1	13.6	14.1	14.6	15.1	15.7	16.2	16.7	17.2	17.7	18.2	18.7
76	54763	54647	54537	54432	54332	54237	54149	54067	53991	53922	53860	53805	53757	53717	53685	53660	53643	53634	53633
	8.8	9.3	9.9	10.4	11.0	11.6	12.2	12.8	13.4	14.0	14.6	15.3	15.9	16.5	17.2	17.8	18.4	19.1	19.7
74	54592	54452	54317	54189	54067	53951	53843	53742	53649	53563	53486	53417	53357	53305	53262	53228	53204	53189	53183
	7.4	8.0	8.6	9.3	9.9	10.6	11.3	12.0	12.7	13.4	14.2	14.9	15.7	16.4	17.2	18.0	18.7	19.5	20.2
72	54432	54267	54108	53956	53812	53675	53547	53427	53316	53214	53122	53039	52966	52903	52850	52807	52775	52753	52742
	5.6	6.3	6.9	7.7	8.4	9.2	10.0	10.8	11.6	12.4	13.3	14.2	15.0	15.9	16.8	17.7	18.6	19.4	20.3
70	54272	54082	53899	53724	53558	53401	53253	53115	52987	52869	52762	52666	52580	52506	52444	52392	52353	52325	52308
	3.3	4.1	4.9	5.7	6.5	7.4	8.3	9.2	10.1	11.1	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0
68	54101	53886	53680	53484	53297	53120	52953	52798	52654	52521	52400	52292	52195	52111	52040	51981	51934	51901	51880
	0.7	1.6	2.5	3.4	4.4	5.3	6.3	7.3	8.4	9.4	10.5	11.6	12.7	13.8	14.9	16.0	17.1	18.3	19.4
66	53907	53669	53441	53223	53017	52821	52638	52466	52308	52162	52029	51909	51803	51711	51632	51566	51515	51477	51453
	-2.1	-1.2	-0.2	0.9	1.9	3.0	4.1	5.2	6.4	7.6	8.7	9.9	11.1	12.4	13.6	14.8	16.0	17.2	18.5
64	53680	53420	53171	52934	52709	52497	52298	52113	51941	51784	51641	51512	51398	51298	51214	51144	51088	51048	51022
	-5.3	-4.2	-3.0	-1.9	-0.7	0.5	1.8	3.0	4.3	5.6	6.9	8.2	9.5	10.8	12.1	13.4	14.8	16.1	17.4
62	53409	53129	52861	52607	52366	52139	51926	51729	51547	51380	51228	51093	50973	50868	50780	50707	50650	50608	50581
	-8.6	-7.3	-6.0	-4.7	-3.4	-2.0	-0.6	0.7	2.1	3.5	4.9	6.3	7.8	9.2	10.6	12.0	13.4	14.8	16.2
60	53087	52788	52504	52234	51979	51739	51516	51308	51118	50943	50786	50646	50522	50415	50324	50251	50193	50152	50127
	-12.1	-10.6	-9.1	-7.6	-6.1	-4.6	-3.0	-1.5	0.0	1.5	3.1	4.6	6.1	7.6	9.1	10.6	12.1	13.6	15.0

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
60	50127	50118	50124	50145	50182	50233	50298	50378	50471	50578	50699	50833	50980	51140	51313	51498	51697	51908	52132
	15.0	16.5	17.9	19.3	20.6	21.9	23.2	24.3	25.5	26.5	27.4	28.3	29.0	29.6	30.2	30.6	30.9	31.0	31.1
58	49654	49648	49658	49684	49725	49781	49852	49936	50034	50146	50271	50409	50560	50724	50900	51089	51290	51503	51730
	14.0	15.5	16.9	18.4	19.8	21.1	22.4	23.6	24.8	25.8	26.7	27.6	28.3	28.9	29.4	29.8	30.1	30.2	30.2
56	49157	49157	49173	49204	49251	49313	49390	49480	49585	49702	49832	49975	50130	50297	50476	50667	50870	51086	51313
	13.0	14.6	16.1	17.6	19.0	20.4	21.7	23.0	24.1	25.2	26.1	27.0	27.7	28.3	28.7	29.0	29.2	29.3	29.2
54	48634	48640	48663	48702	48756	48825	48909	49006	49117	49240	49376	49524	49683	49854	50037	50230	50435	50652	50880
	12.3	13.9	15.5	17.0	18.5	19.9	21.2	22.5	23.6	24.7	25.6	26.5	27.1	27.7	28.1	28.3	28.4	28.4	28.2
52	48080	48095	48126	48173	48235	48313	48405	48510	48628	48758	48900	49053	49217	49392	49578	49774	49980	50198	50426
	11.8	13.4	15.0	16.6	18.1	19.5	20.9	22.2	23.4	24.4	25.3	26.1	26.8	27.2	27.6	27.7	27.8	27.6	27.3
50	47495	47518	47558	47614	47686	47772	47873	47986	48112	48249	48398	48557	48726	48906	49094	49293	49501	49719	49947
	11.5	13.2	14.8	16.4	18.0	19.4	20.8	22.1	23.3	24.3	25.2	26.0	26.6	27.0	27.3	27.3	27.3	27.0	26.6
48	46877	46909	46959	47024	47105	47201	47310	47432	47566	47711	47866	48032	48206	48390	48582	48783	48993	49212	49439
	11.4	13.1	14.8	16.4	18.0	19.5	20.9	22.2	23.4	24.4	25.3	26.1	26.6	27.0	27.2	27.2	27.0	26.6	26.1
46	46224	46266	46325	46401	46491	46596	46714	46845	46987	47139	47302	47473	47653	47841	48037	48241	48453	48672	48899
	11.4	13.2	15.0	16.6	18.3	19.8	21.2	22.5	23.7	24.8	25.6	26.3	26.8	27.2	27.3	27.2	26.9	26.4	25.7
44	45537	45589	45658	45743	45843	45957	46084	46223	46372	46532	46701	46879	47064	47256	47456	47662	47876	48096	48323
	11.6	13.5	15.2	17.0	18.6	20.2	21.6	23.0	24.2	25.2	26.1	26.8	27.2	27.5	27.5	27.4	27.0	26.4	25.6
42	44815	44877	44956	45050	45159	45282	45417	45564	45721	45888	46063	46246	46436	46633	46836	47045	47259	47480	47708
	11.9	13.8	15.6	17.4	19.1	20.7	22.2	23.5	24.7	25.8	26.6	27.3	27.7	27.9	27.9	27.7	27.2	26.5	25.6
40	44061	44132	44220	44323	44441	44572	44715	44869	45032	45205	45386	45574	45768	45969	46175	46386	46602	46824	47052
	12.2	14.1	16.0	17.8	19.5	21.1	22.7	24.1	25.3	26.3	27.2	27.8	28.2	28.4	28.3	28.0	27.4	26.7	25.7
38	43275	43355	43452	43563	43689	43827	43977	44138	44307	44486	44671	44863	45061	45265	45473	45686	45904	46127	46354
	12.4	14.4	16.3	18.1	19.9	21.6	23.1	24.5	25.8	26.8	27.7	28.3	28.7	28.8	28.7	28.3	27.7	26.8	25.8
36	42461	42549	42654	42773	42906	43051	43207	43373	43548	43731	43920	44116	44317	44522	44733	44947	45166	45389	45616
	12.5	14.5	16.5	18.4	20.2	21.9	23.4	24.9	26.1	27.2	28.0	28.6	29.0	29.1	28.9	28.5	27.8	26.9	25.8
34	41621	41718	41830	41957	42096	42247	42408	42579	42758	42944	43137	43335	43537	43745	43956	44171	44390	44613	44839
	12.5	14.6	16.6	18.5	20.3	22.0	23.6	25.0	26.3	27.3	28.2	28.7	29.1	29.1	28.9	28.4	27.7	26.8	25.6
32	40761	40866	40985	41118	41263	41420	41586	41761	41943	42131	42326	42525	42729	42937	43148	43363	43582	43804	44029
	12.4	14.5	16.5	18.4	20.2	21.9	23.5	24.9	26.2	27.2	28.0	28.6	28.8	28.9	28.6	28.1	27.3	26.3	25.1
30	39886	39999	40125	40264	40415	40576	40746	40924	41109	41299	41495	41694	41898	42105	42316	42530	42747	42968	43191
	12.2	14.3	16.3	18.2	19.9	21.6	23.2	24.6	25.8	26.8	27.5	28.0	28.3	28.2	27.9	27.4	26.6	25.6	24.3

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72
60	52132	52369	52618	52880	53154	53440	53738	54048	54367	54697	55036	55384	55738	56098	56462	56829	57196	57563	57927
	31.1	31.0	30.9	30.6	30.2	29.8	29.2	28.5	27.8	27.0	26.2	25.3	24.3	23.3	22.3	21.2	20.2	19.1	18.0
58	51730	51969	52220	52485	52761	53051	53352	53665	53990	54325	54670	55024	55385	55754	56127	56504	56882	57259	57635
	30.2	30.0	29.8	29.4	29.0	28.4	27.7	27.0	26.2	25.3	24.4	23.4	22.4	21.3	20.3	19.2	18.1	17.1	16.0
56	51313	51553	51806	52070	52348	52638	52940	53254	53580	53917	54265	54622	54988	55361	55739	56122	56507	56891	57274
	29.2	28.9	28.6	28.1	27.6	26.9	26.1	25.3	24.4	23.4	22.4	21.3	20.2	19.1	18.0	16.9	15.8	14.8	13.7
54	50880	51120	51371	51635	51912	52200	52501	52814	53139	53476	53823	54180	54546	54920	55301	55685	56073	56461	56848
	28.2	27.8	27.4	26.8	26.1	25.3	24.4	23.5	22.5	21.4	20.3	19.1	18.0	16.8	15.7	14.5	13.4	12.3	11.3
52	50426	50665	50915	51177	51451	51737	52035	52345	52667	53000	53344	53699	54062	54434	54812	55196	55582	55970	56356
	27.3	26.8	26.3	25.6	24.7	23.8	22.8	21.7	20.6	19.4	18.2	16.9	15.7	14.5	13.2	12.1	10.9	9.9	8.9
50	49947	50185	50433	50693	50963	51246	51539	51844	52161	52489	52828	53178	53536	53903	54276	54655	55037	55421	55803
	26.6	26.0	25.3	24.4	23.5	22.4	21.3	20.0	18.8	17.5	16.1	14.8	13.5	12.2	10.9	9.7	8.6	7.5	6.5
48	49439	49676	49923	50179	50446	50723	51012	51311	51622	51944	52276	52617	52968	53328	53693	54064	54439	54815	55191
	26.1	25.4	24.5	23.5	22.4	21.2	19.9	18.6	17.2	15.8	14.3	12.9	11.5	10.1	8.8	7.5	6.3	5.2	4.2
46	48899	49135	49379	49633	49895	50168	50451	50744	51047	51361	51685	52018	52359	52709	53065	53425	53790	54156	54521
	25.7	24.9	23.9	22.8	21.6	20.2	18.8	17.3	15.8	14.3	12.7	11.2	9.7	8.3	6.9	5.6	4.4	3.3	2.2
44	48323	48557	48800	49050	49309	49577	49854	50140	50436	50741	51055	51378	51709	52047	52391	52739	53091	53444	53796
	25.6	24.6	23.5	22.3	20.9	19.5	17.9	16.3	14.7	13.1	11.4	9.8	8.3	6.7	5.3	3.9	2.7	1.6	0.5
42	47708	47941	48182	48429	48685	48947	49219	49498	49786	50082	50386	50698	51017	51342	51673	52007	52345	52683	53020
	25.6	24.5	23.3	22.0	20.5	18.9	17.3	15.6	13.8	12.1	10.4	8.7	7.1	5.5	4.0	2.7	1.4	0.2	-0.8
40	47052	47284	47523	47768	48020	48278	48544	48816	49096	49383	49677	49978	50284	50596	50912	51231	51553	51874	52194
	25.7	24.5	23.2	21.8	20.2	18.5	16.8	15.0	13.2	11.4	9.7	7.9	6.3	4.6	3.1	1.7	0.4	-0.8	-1.8
38	46354	46586	46824	47066	47315	47569	47829	48095	48367	48645	48928	49217	49511	49809	50110	50413	50718	51022	51324
	25.8	24.5	23.1	21.6	19.9	18.2	16.4	14.6	12.8	10.9	9.1	7.4	5.7	4.0	2.5	1.1	-0.3	-1.5	-2.5
36	45616	45847	46083	46324	46569	46819	47074	47334	47598	47867	48141	48418	48699	48983	49269	49556	49843	50129	50413
	25.8	24.5	23.0	21.4	19.7	17.9	16.1	14.3	12.4	10.6	8.8	7.0	5.3	3.7	2.1	0.7	-0.6	-1.8	-2.9
34	44839	45070	45304	45542	45785	46031	46281	46535	46792	47053	47317	47583	47852	48122	48393	48664	48934	49201	49466
	25.6	24.2	22.7	21.1	19.4	17.6	15.8	13.9	12.1	10.3	8.5	6.8	5.1	3.5	2.0	0.5	-0.8	-2.0	-3.0
32	44029	44258	44491	44726	44965	45208	45453	45701	45952	46205	46459	46715	46972	47229	47486	47741	47994	48245	48492
	25.1	23.8	22.2	20.6	18.9	17.1	15.3	13.5	11.7	9.9	8.2	6.5	4.9	3.4	1.9	0.5	-0.8	-1.9	-2.9
30	43191	43418	43648	43881	44117	44355	44596	44838	45083	45328	45574	45820	46066	46311	46554	46795	47033	47267	47497
	24.3	22.9	21.4	19.8	18.1	16.4	14.6	12.9	11.1	9.5	7.8	6.2	4.7	3.2	1.8	0.5	-0.7	-1.8	-2.8

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108
60	57927	58286	58638	58980	59311	59628	59929	60212	60475	60715	60932	61122	61285	61419	61524	61597	61639	61648	61625
	18.0	16.9	15.9	14.8	13.8	12.7	11.7	10.7	9.7	8.8	7.8	6.9	6.0	5.1	4.2	3.4	2.5	1.7	0.9
58	57635	58005	58369	58723	59066	59394	59706	59999	60270	60518	60741	60936	61102	61237	61340	61410	61446	61447	61414
	16.0	14.9	13.9	12.9	11.9	11.0	10.1	9.2	8.4	7.5	6.7	6.0	5.2	4.5	3.8	3.1	2.4	1.8	1.1
56	57274	57653	58025	58387	58738	59074	59393	59693	59970	60224	60450	60648	60815	60949	61050	61115	61145	61137	61093
	13.7	12.7	11.7	10.8	9.9	9.1	8.3	7.5	6.8	6.2	5.5	5.0	4.4	3.9	3.4	2.9	2.4	1.9	1.5
54	56848	57230	57606	57973	58328	58669	58992	59295	59576	59832	60060	60258	60424	60556	60653	60713	60736	60719	60664
	11.3	10.3	9.4	8.6	7.8	7.0	6.4	5.8	5.2	4.7	4.3	3.9	3.6	3.2	3.0	2.7	2.4	2.2	1.9
52	56356	56739	57116	57483	57839	58181	58505	58809	59090	59345	59572	59769	59932	60061	60153	60207	60222	60196	60130
	8.9	7.9	7.1	6.3	5.6	4.9	4.4	3.9	3.6	3.3	3.0	2.9	2.7	2.6	2.6	2.6	2.5	2.5	2.5
50	55803	56183	56556	56920	57274	57612	57934	58235	58514	58766	58990	59183	59342	59466	59552	59600	59607	59572	59496
	6.5	5.6	4.7	4.0	3.4	2.9	2.5	2.2	2.0	1.9	1.8	1.9	2.0	2.1	2.3	2.5	2.8	3.0	3.2
48	55191	55563	55929	56288	56635	56968	57283	57579	57852	58099	58318	58505	58658	58776	58856	58896	58895	58852	58766
	4.2	3.4	2.6	1.9	1.4	1.0	0.7	0.5	0.5	0.6	0.7	1.0	1.3	1.7	2.1	2.6	3.1	3.5	4.0
46	54521	54883	55240	55588	55926	56250	56557	56844	57109	57348	57559	57739	57886	57996	58069	58102	58093	58042	57947
	2.2	1.4	0.6	0.0	-0.4	-0.8	-0.9	-1.0	-0.8	-0.6	-0.2	0.2	0.8	1.4	2.1	2.8	3.5	4.2	4.9
44	53796	54145	54489	54825	55151	55463	55759	56035	56290	56519	56721	56892	57030	57133	57198	57223	57207	57148	57046
	0.5	-0.3	-1.0	-1.6	-2.0	-2.3	-2.3	-2.2	-2.0	-1.6	-1.0	-0.4	0.4	1.2	2.1	3.1	4.0	4.9	5.9
42	53020	53354	53682	54003	54314	54612	54894	55158	55400	55618	55809	55970	56099	56193	56249	56267	56244	56178	56070
	-0.8	-1.7	-2.4	-2.9	-3.3	-3.5	-3.4	-3.2	-2.9	-2.3	-1.6	-0.8	0.2	1.2	2.3	3.5	4.6	5.8	6.9
40	52194	52511	52823	53127	53421	53703	53969	54218	54446	54651	54830	54980	55099	55184	55232	55243	55213	55142	55027
	-1.8	-2.7	-3.4	-3.9	-4.2	-4.4	-4.3	-4.0	-3.5	-2.8	-2.0	-1.0	0.1	1.4	2.7	4.0	5.4	6.7	8.0
38	51324	51623	51916	52201	52477	52741	52991	53223	53436	53627	53793	53931	54039	54115	54156	54159	54123	54047	53929
	-2.5	-3.4	-4.1	-4.6	-4.9	-4.9	-4.8	-4.4	-3.9	-3.1	-2.1	-1.0	0.3	1.7	3.1	4.6	6.2	7.7	9.1
36	50413	50692	50966	51233	51489	51735	51967	52182	52379	52555	52708	52834	52931	52997	53030	53027	52986	52906	52785
	-2.9	-3.7	-4.4	-4.9	-5.2	-5.3	-5.1	-4.6	-4.0	-3.1	-2.1	-0.8	0.6	2.1	3.7	5.4	7.0	8.7	10.2
34	49466	49727	49981	50228	50466	50693	50906	51104	51285	51446	51585	51699	51786	51843	51868	51859	51814	51730	51608
	-3.0	-3.9	-4.5	-5.0	-5.3	-5.3	-5.1	-4.6	-3.9	-3.0	-1.8	-0.5	1.0	2.7	4.4	6.2	7.9	9.7	11.4
32	48492	48733	48969	49197	49416	49624	49820	50001	50166	50312	50438	50540	50616	50664	50683	50668	50619	50534	50410
	-2.9	-3.8	-4.4	-4.9	-5.1	-5.1	-4.9	-4.4	-3.6	-2.6	-1.4	0.0	1.6	3.3	5.2	7.0	8.9	10.7	12.4
30	47497	47721	47939	48149	48351	48541	48720	48886	49035	49167	49280	49371	49437	49478	49489	49470	49418	49331	49209
	-2.8	-3.6	-4.2	-4.6	-4.9	-4.8	-4.5	-4.0	-3.2	-2.2	-0.9	0.6	2.3	4.1	5.9	7.9	9.8	11.7	13.4

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138	140	142	144
60	61625	61570	61482	61364	61214	61035	60827	60592	60333	60050	59746	59424	59085	58733	58370	57998	57621	57240	56860
	0.9	0.1	-0.7	-1.5	-2.3	-3.1	-3.8	-4.6	-5.3	-6.0	-6.6	-7.3	-7.9	-8.5	-9.0	-9.5	-9.9	-10.3	-10.7
58	61414	61345	61242	61106	60936	60734	60501	60240	59952	59639	59303	58948	58576	58189	57791	57384	56972	56557	56143
	1.1	0.5	-0.2	-0.8	-1.5	-2.1	-2.7	-3.3	-3.9	-4.5	-5.1	-5.7	-6.2	-6.7	-7.2	-7.7	-8.1	-8.5	-8.9
56	61093	61011	60893	60739	60549	60325	60069	59782	59466	59125	58759	58373	57968	57549	57118	56678	56233	55786	55341
	1.5	1.0	0.5	0.1	-0.4	-0.9	-1.3	-1.8	-2.3	-2.8	-3.3	-3.8	-4.2	-4.7	-5.1	-5.5	-5.9	-6.3	-6.7
54	60664	60570	60437	60265	60057	59812	59534	59223	58881	58513	58119	57704	57270	56820	56358	55888	55413	54937	54463
	1.9	1.7	1.4	1.2	0.9	0.6	0.2	-0.1	-0.4	-0.8	-1.2	-1.6	-1.9	-2.3	-2.7	-3.1	-3.5	-3.8	-4.2
52	60130	60024	59877	59690	59464	59200	58901	58568	58203	57810	57390	56948	56487	56010	55521	55024	54522	54019	53518
	2.5	2.5	2.4	2.4	2.3	2.2	2.0	1.8	1.6	1.4	1.1	0.9	0.6	0.2	-0.1	-0.4	-0.8	-1.1	-1.5
50	59496	59378	59218	59016	58775	58494	58176	57823	57438	57022	56580	56115	55630	55128	54615	54093	53567	53041	52519
	3.2	3.4	3.6	3.7	3.8	3.9	3.9	3.9	3.8	3.7	3.6	3.4	3.2	3.0	2.7	2.4	2.1	1.7	1.4
48	58766	58638	58466	58252	57996	57700	57367	56996	56593	56158	55697	55211	54705	54183	53649	53107	52561	52015	51474
	4.0	4.4	4.8	5.2	5.5	5.7	5.9	6.0	6.1	6.1	6.1	6.0	5.9	5.7	5.5	5.3	5.0	4.7	4.3
46	57947	57809	57627	57402	57135	56827	56479	56095	55676	55226	54749	54246	53724	53184	52633	52074	51512	50950	50394
	4.9	5.5	6.2	6.7	7.2	7.6	8.0	8.2	8.4	8.6	8.6	8.6	8.6	8.5	8.3	8.1	7.8	7.5	7.2
44	57046	56900	56710	56476	56199	55881	55523	55127	54697	54235	53744	53229	52693	52141	51577	51005	50430	49856	49289
	5.9	6.7	7.5	8.3	8.9	9.5	10.0	10.4	10.7	10.9	11.1	11.1	11.2	11.1	11.0	10.8	10.6	10.3	9.9
42	56070	55917	55720	55480	55196	54871	54505	54102	53663	53192	52693	52169	51624	51062	50489	49908	49325	48744	48169
	6.9	8.0	8.9	9.8	10.7	11.4	12.0	12.5	12.9	13.2	13.4	13.5	13.6	13.6	13.5	13.3	13.1	12.9	12.5
40	55027	54870	54668	54423	54135	53805	53435	53027	52584	52108	51604	51074	50524	49958	49380	48794	48207	47622	47045
	8.0	9.2	10.4	11.4	12.3	13.1	13.8	14.4	14.9	15.2	15.5	15.7	15.8	15.8	15.7	15.6	15.4	15.1	14.8
38	53929	53768	53564	53316	53026	52695	52323	51914	51469	50992	50486	49955	49404	48837	48258	47673	47086	46501	45925
	9.1	10.5	11.8	12.9	13.9	14.8	15.6	16.2	16.7	17.1	17.4	17.5	17.6	17.7	17.6	17.5	17.3	17.1	16.7
36	52785	52622	52417	52169	51880	51549	51179	50771	50328	49853	49350	48822	48274	47710	47135	46554	45971	45391	44819
	10.2	11.7	13.1	14.3	15.4	16.4	17.2	17.8	18.3	18.7	18.9	19.1	19.2	19.2	19.2	19.1	18.9	18.7	18.3
34	51608	51444	51240	50994	50707	50380	50014	49611	49173	48704	48207	47686	47145	46588	46020	45447	44872	44301	43738
	11.4	12.9	14.4	15.7	16.8	17.7	18.5	19.2	19.6	20.0	20.2	20.4	20.5	20.5	20.4	20.3	20.1	19.9	19.5
32	50410	50248	50046	49804	49521	49200	48841	48445	48016	47556	47068	46557	46026	45481	44924	44362	43800	43241	42691
	12.4	14.1	15.5	16.8	18.0	18.9	19.7	20.3	20.7	21.0	21.2	21.3	21.3	21.3	21.2	21.1	20.9	20.6	20.3
30	49209	49048	48850	48613	48337	48023	47673	47287	46869	46421	45946	45449	44932	44401	43859	43312	42765	42222	41688
	13.4	15.1	16.6	17.9	19.0	19.9	20.7	21.2	21.6	21.8	21.9	22.0	21.9	21.8	21.7	21.5	21.3	21.1	20.8

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	144	146	148	150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180
60	56860	56483	56111	55747	55393	55052	54727	54419	54131	53864	53620	53401	53207	53040	52901	52791	52710	52659	52637
	-10.7	-11.0	-11.3	-11.5	-11.6	-11.7	-11.8	-11.7	-11.6	-11.5	-11.2	-11.0	-10.6	-10.2	-9.7	-9.1	-8.5	-7.9	-7.2
58	56143	55733	55329	54934	54552	54184	53834	53503	53194	52908	52648	52415	52211	52035	51891	51777	51695	51645	51627
	-8.9	-9.2	-9.5	-9.7	-9.9	-10.1	-10.2	-10.2	-10.2	-10.1	-10.0	-9.8	-9.5	-9.2	-8.8	-8.3	-7.8	-7.2	-6.6
56	55341	54900	54466	54044	53635	53243	52870	52518	52190	51889	51614	51369	51155	50973	50823	50707	50625	50577	50563
	-6.7	-7.0	-7.3	-7.6	-7.9	-8.1	-8.3	-8.4	-8.5	-8.5	-8.5	-8.5	-8.3	-8.1	-7.9	-7.5	-7.1	-6.6	-6.1
54	54463	53994	53534	53086	52654	52239	51846	51476	51132	50816	50530	50275	50053	49865	49711	49594	49512	49466	49456
	-4.2	-4.6	-4.9	-5.2	-5.6	-5.9	-6.1	-6.4	-6.6	-6.8	-6.9	-7.0	-7.1	-7.0	-6.9	-6.7	-6.4	-6.1	-5.7
52	53518	53025	52542	52072	51618	51185	50774	50389	50031	49704	49407	49144	48916	48724	48568	48449	48368	48325	48319
	-1.5	-1.9	-2.3	-2.7	-3.0	-3.4	-3.8	-4.2	-4.6	-4.9	-5.3	-5.5	-5.7	-5.9	-6.0	-6.0	-5.9	-5.7	-5.4
50	52519	52004	51500	51011	50541	50091	49666	49268	48900	48563	48259	47990	47758	47563	47405	47287	47207	47167	47165
	1.4	1.0	0.5	0.1	-0.4	-0.9	-1.4	-1.9	-2.5	-3.0	-3.5	-4.0	-4.4	-4.8	-5.1	-5.3	-5.4	-5.5	-5.4
48	51474	50941	50420	49916	49431	48969	48533	48125	47749	47405	47096	46824	46589	46393	46236	46119	46041	46004	46005
	4.3	3.9	3.4	2.9	2.3	1.7	1.1	0.4	-0.3	-1.0	-1.8	-2.5	-3.2	-3.8	-4.3	-4.8	-5.1	-5.3	-5.4
46	50394	49847	49313	48797	48301	47830	47386	46972	46590	46242	45931	45657	45422	45227	45071	44956	44882	44847	44853
	7.2	6.7	6.2	5.7	5.0	4.3	3.5	2.7	1.8	0.9	-0.1	-1.0	-1.9	-2.8	-3.6	-4.3	-4.9	-5.4	-5.7
44	49289	48732	48189	47664	47162	46685	46236	45818	45434	45085	44774	44501	44268	44075	43922	43811	43740	43709	43718
	9.9	9.5	8.9	8.3	7.6	6.8	5.9	4.9	3.9	2.7	1.6	0.4	-0.8	-1.9	-3.0	-4.0	-4.8	-5.5	-6.1
42	48169	47606	47058	46529	46023	45543	45093	44675	44291	43944	43635	43366	43136	42947	42799	42692	42626	42599	42612
	12.5	12.0	11.5	10.8	10.0	9.2	8.1	7.0	5.8	4.5	3.1	1.7	0.2	-1.2	-2.5	-3.7	-4.8	-5.8	-6.6
40	47045	46479	45929	45399	44894	44415	43967	43551	43172	42829	42525	42261	42037	41854	41712	41611	41549	41528	41545
	14.8	14.3	13.8	13.1	12.2	11.3	10.2	8.9	7.5	6.1	4.5	2.8	1.2	-0.5	-2.1	-3.6	-5.0	-6.1	-7.1
38	45925	45361	44813	44286	43784	43310	42867	42457	42084	41748	41451	41194	40978	40803	40668	40574	40519	40502	40524
	16.7	16.3	15.7	15.0	14.1	13.1	11.9	10.6	9.1	7.4	5.7	3.8	1.9	0.0	-1.8	-3.5	-5.1	-6.6	-7.8
36	44819	44261	43719	43199	42704	42237	41802	41401	41037	40710	40423	40175	39968	39802	39676	39589	39541	39530	39556
	18.3	17.9	17.3	16.6	15.7	14.7	13.4	12.0	10.4	8.6	6.7	4.7	2.6	0.5	-1.6	-3.6	-5.4	-7.0	-8.4
34	43738	43189	42657	42147	41662	41206	40781	40392	40038	39723	39447	39210	39014	38858	38741	38663	38622	38617	38648
	19.5	19.1	18.5	17.8	16.9	15.9	14.6	13.1	11.4	9.5	7.5	5.3	3.1	0.8	-1.5	-3.6	-5.6	-7.5	-9.1
32	42691	42154	41635	41138	40666	40224	39813	39436	39096	38794	38530	38306	38122	37976	37870	37800	37767	37769	37803
	20.3	19.9	19.4	18.7	17.8	16.7	15.4	13.9	12.2	10.2	8.1	5.8	3.4	1.0	-1.4	-3.7	-5.9	-7.9	-9.7
30	41688	41167	40664	40183	39727	39300	38904	38543	38217	37929	37680	37469	37297	37163	37066	37006	36980	36987	37026
	20.8	20.3	19.8	19.1	18.3	17.2	15.9	14.4	12.6	10.7	8.5	6.1	3.7	1.1	-1.4	-3.9	-6.2	-8.3	-10.2

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	180	-178	-176	-174	-172	-170	-168	-166	-164	-162	-160	-158	-156	-154	-152	-150	-148	-146	-144
60	52637	52644	52681	52746	52840	52961	53108	53280	53477	53695	53934	54192	54468	54758	55062	55378	55702	56034	56371
	-7.2	-6.5	-5.7	-4.9	-4.1	-3.4	-2.6	-1.9	-1.2	-0.7	-0.1	0.3	0.6	0.8	0.9	0.9	0.8	0.5	0.1
58	51627	51642	51687	51764	51871	52008	52173	52365	52582	52824	53088	53372	53675	53995	54329	54675	55031	55396	55765
	-6.6	-5.9	-5.2	-4.4	-3.7	-2.9	-2.2	-1.5	-0.9	-0.3	0.2	0.6	0.8	1.0	1.0	0.9	0.6	0.2	-0.4
56	50563	50584	50638	50725	50844	50995	51176	51385	51622	51885	52171	52479	52806	53151	53512	53886	54271	54664	55063
	-6.1	-5.5	-4.8	-4.1	-3.4	-2.7	-2.0	-1.4	-0.8	-0.2	0.2	0.6	0.8	0.9	0.8	0.6	0.2	-0.4	-1.1
54	49456	49483	49544	49641	49771	49934	50129	50353	50607	50887	51192	51520	51869	52236	52620	53017	53426	53844	54269
	-5.7	-5.2	-4.6	-4.0	-3.4	-2.7	-2.1	-1.5	-0.9	-0.4	0.1	0.4	0.5	0.5	0.4	0.0	-0.5	-1.2	-2.1
52	48319	48351	48419	48524	48663	48837	49043	49280	49547	49842	50162	50507	50873	51258	51661	52078	52507	52946	53392
	-5.4	-5.1	-4.6	-4.1	-3.6	-3.0	-2.4	-1.8	-1.2	-0.8	-0.4	-0.1	0.0	-0.1	-0.3	-0.7	-1.3	-2.2	-3.2
50	47165	47201	47275	47386	47533	47715	47930	48177	48455	48761	49093	49450	49830	50229	50646	51078	51523	51979	52442
	-5.4	-5.2	-4.9	-4.5	-4.0	-3.5	-2.9	-2.4	-1.9	-1.4	-1.1	-0.8	-0.8	-0.9	-1.2	-1.7	-2.4	-3.4	-4.6
48	46005	46046	46125	46241	46394	46582	46804	47058	47343	47657	47997	48363	48751	49160	49588	50031	50487	50954	51430
	-5.4	-5.4	-5.3	-5.0	-4.6	-4.2	-3.7	-3.2	-2.7	-2.3	-2.0	-1.8	-1.7	-1.9	-2.2	-2.8	-3.6	-4.7	-6.1
46	44853	44897	44980	45101	45258	45450	45676	45934	46224	46542	46887	47258	47651	48066	48499	48948	49411	49885	50369
	-5.7	-5.8	-5.9	-5.7	-5.5	-5.1	-4.7	-4.2	-3.8	-3.4	-3.1	-2.9	-2.8	-3.0	-3.4	-4.1	-5.0	-6.2	-7.7
44	43718	43766	43853	43976	44136	44330	44558	44819	45109	45429	45775	46147	46541	46957	47392	47843	48308	48785	49272
	-6.1	-6.4	-6.6	-6.6	-6.5	-6.2	-5.9	-5.4	-5.0	-4.6	-4.3	-4.1	-4.1	-4.3	-4.8	-5.5	-6.5	-7.8	-9.4
42	42612	42664	42753	42879	43040	43235	43463	43722	44011	44329	44673	45042	45434	45847	46279	46728	47192	47668	48153
	-6.6	-7.1	-7.5	-7.6	-7.6	-7.5	-7.2	-6.8	-6.4	-6.0	-5.7	-5.5	-5.5	-5.8	-6.2	-7.0	-8.1	-9.5	-11.1
40	41545	41600	41691	41818	41979	42173	42399	42655	42940	43253	43592	43955	44341	44748	45174	45617	46074	46544	47025
	-7.1	-7.9	-8.4	-8.7	-8.8	-8.8	-8.5	-8.2	-7.8	-7.5	-7.2	-7.0	-7.0	-7.3	-7.8	-8.6	-9.7	-11.2	-13.0
38	40524	40581	40675	40802	40962	41153	41375	41626	41905	42211	42541	42896	43272	43670	44086	44519	44966	45427	45899
	-7.8	-8.7	-9.4	-9.9	-10.1	-10.1	-10.0	-9.7	-9.3	-9.0	-8.7	-8.5	-8.6	-8.8	-9.4	-10.2	-11.4	-13.0	-14.8
36	39556	39617	39711	39838	39996	40184	40400	40644	40915	41210	41530	41873	42237	42621	43024	43444	43879	44326	44785
	-8.4	-9.6	-10.4	-11.0	-11.4	-11.5	-11.4	-11.1	-10.8	-10.5	-10.2	-10.1	-10.1	-10.4	-11.0	-11.9	-13.2	-14.8	-16.7
34	38648	38711	38806	38932	39087	39270	39479	39715	39974	40258	40565	40893	41242	41610	41997	42400	42819	43251	43694
	-9.1	-10.4	-11.4	-12.1	-12.6	-12.7	-12.7	-12.5	-12.3	-12.0	-11.7	-11.6	-11.7	-12.0	-12.7	-13.6	-14.9	-16.6	-18.6
32	37803	37869	37965	38089	38239	38416	38617	38842	39089	39359	39650	39961	40293	40643	41011	41395	41794	42207	42631
	-9.7	-11.1	-12.3	-13.1	-13.7	-13.9	-14.0	-13.9	-13.7	-13.4	-13.2	-13.2	-13.3	-13.7	-14.3	-15.4	-16.7	-18.5	-20.5
30	37026	37093	37189	37310	37456	37625	37816	38029	38262	38516	38789	39082	39393	39723	40069	40432	40809	41200	41603
	-10.2	-11.8	-13.1	-14.0	-14.7	-15.0	-15.2	-15.1	-15.0	-14.8	-14.6	-14.6	-14.8	-15.3	-16.0	-17.1	-18.6	-20.3	-22.5

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	-144	-142	-140	-138	-136	-134	-132	-130	-128	-126	-124	-122	-120	-118	-116	-114	-112	-110	-108
60	56371	56711	57052	57392	57729	58061	58386	58702	59008	59303	59584	59850	60099	60332	60545	60739	60912	61063	61192
	0.1	-0.4	-1.0	-1.8	-2.6	-3.5	-4.5	-5.6	-6.7	-7.8	-9.0	-10.2	-11.4	-12.5	-13.7	-14.9	-16.0	-17.1	-18.2
58	55765	56139	56513	56887	57257	57623	57981	58331	58670	58996	59309	59606	59886	60147	60389	60611	60810	60986	61139
	-0.4	-1.1	-1.9	-2.8	-3.9	-5.0	-6.3	-7.6	-8.9	-10.3	-11.7	-13.2	-14.6	-16.0	-17.4	-18.8	-20.1	-21.4	-22.7
56	55063	55466	55871	56275	56676	57072	57461	57842	58211	58568	58910	59236	59545	59835	60105	60353	60579	60781	60958
	-1.1	-2.0	-3.0	-4.2	-5.4	-6.8	-8.3	-9.8	-11.5	-13.1	-14.8	-16.5	-18.1	-19.8	-21.4	-23.0	-24.6	-26.1	-27.5
54	54269	54699	55130	55561	55989	56412	56829	57237	57634	58018	58388	58741	59077	59394	59691	59965	60217	60444	60645
	-2.1	-3.1	-4.3	-5.7	-7.2	-8.8	-10.6	-12.4	-14.2	-16.1	-18.1	-20.0	-21.9	-23.8	-25.7	-27.5	-29.2	-31.0	-32.6
52	53392	53843	54297	54751	55202	55649	56089	56521	56942	57351	57746	58124	58485	58828	59149	59449	59725	59976	60202
	-3.2	-4.5	-5.9	-7.5	-9.2	-11.1	-13.0	-15.1	-17.2	-19.3	-21.5	-23.7	-25.8	-28.0	-30.0	-32.1	-34.1	-36.0	-37.8
50	52442	52911	53382	53854	54325	54791	55251	55703	56145	56575	56992	57392	57776	58141	58485	58808	59108	59383	59632
	-4.6	-6.0	-7.6	-9.4	-11.3	-13.4	-15.6	-17.9	-20.3	-22.7	-25.1	-27.5	-29.8	-32.2	-34.5	-36.7	-38.9	-41.0	-43.0
48	51430	51911	52396	52882	53367	53849	54325	54794	55253	55700	56135	56555	56958	57343	57708	58052	58374	58670	58941
	-6.1	-7.6	-9.4	-11.4	-13.5	-15.9	-18.3	-20.8	-23.4	-26.0	-28.6	-31.2	-33.8	-36.3	-38.8	-41.2	-43.6	-45.9	-48.1
46	50369	50859	51353	51848	52343	52836	53324	53805	54277	54738	55188	55623	56042	56445	56828	57191	57531	57848	58139
	-7.7	-9.4	-11.3	-13.5	-15.8	-18.3	-21.0	-23.7	-26.5	-29.3	-32.1	-34.9	-37.6	-40.3	-42.9	-45.5	-48.0	-50.5	-52.9
44	49272	49766	50264	50765	51266	51765	52260	52749	53231	53702	54163	54610	55042	55458	55857	56235	56592	56927	57236
	-9.4	-11.2	-13.3	-15.6	-18.1	-20.8	-23.6	-26.5	-29.5	-32.4	-35.4	-38.3	-41.2	-44.1	-46.8	-49.5	-52.2	-54.8	-57.3
42	48153	48646	49145	49647	50149	50651	51149	51642	52129	52606	53074	53529	53971	54397	54807	55198	55569	55918	56243
	-11.1	-13.1	-15.3	-17.8	-20.5	-23.3	-26.2	-29.3	-32.3	-35.4	-38.5	-41.6	-44.5	-47.5	-50.3	-53.1	-55.9	-58.6	-61.2
40	47025	47514	48008	48507	49007	49506	50004	50497	50984	51464	51935	52394	52842	53275	53693	54093	54474	54835	55172
	-13.0	-15.0	-17.4	-19.9	-22.7	-25.7	-28.7	-31.9	-35.1	-38.2	-41.4	-44.5	-47.5	-50.5	-53.4	-56.3	-59.0	-61.8	-64.5
38	45899	46379	46866	47357	47851	48345	48837	49327	49811	50289	50759	51219	51668	52104	52526	52932	53320	53689	54036
	-14.8	-17.0	-19.4	-22.1	-25.0	-28.0	-31.1	-34.3	-37.6	-40.8	-44.0	-47.1	-50.1	-53.1	-56.0	-58.8	-61.6	-64.4	-67.2
36	44785	45254	45729	46209	46693	47177	47661	48143	48621	49093	49558	50015	50461	50897	51319	51727	52118	52491	52844
	-16.7	-18.9	-21.4	-24.2	-27.1	-30.2	-33.4	-36.6	-39.9	-43.1	-46.2	-49.3	-52.3	-55.2	-58.0	-60.8	-63.6	-66.4	-69.1
34	43694	44147	44607	45073	45543	46014	46486	46956	47424	47886	48343	48793	49234	49664	50083	50489	50880	51254	51608
	-18.6	-20.9	-23.5	-26.3	-29.2	-32.4	-35.5	-38.7	-41.9	-45.1	-48.1	-51.1	-54.0	-56.8	-59.5	-62.2	-64.9	-67.6	-70.3
32	42631	43065	43508	43956	44409	44864	45321	45776	46230	46679	47124	47563	47994	48416	48828	49228	49615	49986	50339
	-20.5	-22.9	-25.5	-28.3	-31.3	-34.4	-37.5	-40.7	-43.8	-46.8	-49.7	-52.6	-55.3	-57.9	-60.5	-63.0	-65.6	-68.1	-70.8
30	41603	42016	42437	42865	43298	43734	44172	44609	45046	45479	45909	46333	46751	47161	47563	47953	48332	48696	49045
	-22.5	-24.9	-27.5	-30.3	-33.3	-36.4	-39.4	-42.5	-45.4	-48.3	-51.0	-53.6	-56.1	-58.5	-60.9	-63.2	-65.6	-68.0	-70.6

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	-108	-106	-104	-102	-100	-98	-96	-94	-92	-90	-88	-86	-84	-82	-80	-78	-76	-74	-72
60	61192	61297	61379	61437	61469	61477	61459	61415	61346	61252	61133	60990	60822	60631	60418	60183	59928	59654	59362
	-18.2	-19.2	-20.2	-21.1	-22.0	-22.8	-23.6	-24.4	-25.1	-25.7	-26.3	-26.8	-27.2	-27.6	-27.9	-28.1	-28.3	-28.3	-28.3
58	61139	61267	61369	61446	61496	61519	61514	61482	61422	61334	61220	61078	60909	60714	60495	60252	59985	59698	59390
	-22.7	-23.9	-25.0	-26.2	-27.2	-28.2	-29.2	-30.1	-30.9	-31.7	-32.4	-33.0	-33.6	-34.0	-34.4	-34.7	-34.9	-35.0	-35.0
56	60958	61109	61233	61330	61399	61439	61450	61431	61382	61303	61195	61056	60889	60694	60470	60220	59945	59646	59325
	-27.5	-28.9	-30.3	-31.6	-32.8	-34.0	-35.1	-36.2	-37.2	-38.1	-38.9	-39.7	-40.4	-41.0	-41.5	-41.8	-42.1	-42.2	-42.2
54	60645	60820	60967	61085	61174	61233	61260	61256	61221	61153	61053	60921	60757	60563	60338	60084	59802	59493	59160
	-32.6	-34.2	-35.8	-37.2	-38.7	-40.0	-41.3	-42.6	-43.7	-44.8	-45.9	-46.8	-47.6	-48.3	-48.9	-49.4	-49.7	-49.9	-49.9
52	60202	60400	60570	60710	60820	60898	60944	60957	60936	60881	60791	60667	60510	60318	60094	59838	59551	59235	58893
	-37.8	-39.6	-41.4	-43.0	-44.7	-46.2	-47.7	-49.2	-50.5	-51.8	-53.0	-54.1	-55.1	-56.0	-56.7	-57.3	-57.7	-57.9	-57.9
50	59632	59853	60046	60208	60339	60438	60503	60533	60528	60487	60410	60296	60145	59959	59737	59481	59192	58871	58520
	-43.0	-45.0	-47.0	-48.8	-50.6	-52.4	-54.1	-55.8	-57.3	-58.8	-60.2	-61.5	-62.7	-63.8	-64.7	-65.4	-65.9	-66.2	-66.3
48	58941	59185	59399	59584	59736	59855	59939	59988	60000	59974	59910	59807	59666	59486	59269	59014	58724	58400	58044
	-48.1	-50.3	-52.4	-54.5	-56.5	-58.5	-60.4	-62.3	-64.1	-65.8	-67.4	-68.9	-70.3	-71.6	-72.7	-73.5	-74.2	-74.6	-74.7
46	58139	58404	58639	58844	59017	59156	59259	59326	59355	59345	59296	59205	59074	58903	58691	58440	58151	57826	57466
	-52.9	-55.2	-57.5	-59.8	-62.0	-64.2	-66.4	-68.5	-70.5	-72.5	-74.4	-76.2	-77.8	-79.3	-80.5	-81.6	-82.4	-82.9	-83.2
44	57236	57519	57774	57998	58190	58348	58470	58555	58602	58608	58572	58495	58375	58213	58008	57762	57476	57151	56789
	-57.3	-59.8	-62.3	-64.7	-67.1	-69.5	-71.9	-74.3	-76.6	-78.8	-81.0	-83.0	-84.9	-86.6	-88.1	-89.4	-90.4	-91.1	-91.4
42	56243	56543	56814	57056	57265	57441	57581	57683	57746	57767	57747	57682	57574	57422	57226	56986	56704	56381	56020
	-61.2	-63.8	-66.5	-69.1	-71.7	-74.3	-76.9	-79.5	-82.1	-84.6	-87.0	-89.4	-91.5	-93.5	-95.3	-96.8	-98.0	-98.8	-99.3
40	55172	55485	55771	56028	56253	56444	56600	56718	56796	56832	56826	56775	56679	56537	56350	56117	55841	55522	55163
	-64.5	-67.3	-70.0	-72.8	-75.6	-78.4	-81.2	-84.1	-86.9	-89.7	-92.4	-95.1	-97.5	-99.8	-101.8	-103.6	-105.0	-106.0	-106.7
38	54036	54359	54656	54925	55163	55368	55537	55669	55761	55812	55818	55780	55696	55565	55387	55163	54894	54580	54225
	-67.2	-70.0	-72.8	-75.7	-78.7	-81.7	-84.7	-87.8	-90.9	-94.0	-97.0	-100.0	-102.7	-105.3	-107.6	-109.6	-111.3	-112.6	-113.4
36	52844	53174	53479	53757	54006	54222	54403	54547	54651	54714	54733	54707	54634	54514	54346	54132	53870	53564	53215
	-69.1	-72.0	-74.9	-77.9	-81.0	-84.1	-87.4	-90.7	-94.1	-97.4	-100.7	-104.0	-107.0	-109.9	-112.5	-114.8	-116.7	-118.2	-119.3
34	51608	51942	52252	52536	52792	53016	53206	53360	53474	53548	53578	53563	53501	53392	53235	53030	52778	52481	52139
	-70.3	-73.2	-76.1	-79.2	-82.4	-85.7	-89.1	-92.6	-96.2	-99.9	-103.5	-107.0	-110.4	-113.5	-116.4	-119.0	-121.2	-122.9	-124.2
32	50339	50673	50984	51271	51530	51760	51956	52118	52241	52323	52363	52358	52307	52209	52062	51868	51626	51338	51006
	-70.8	-73.6	-76.5	-79.6	-82.9	-86.3	-89.9	-93.6	-97.4	-101.3	-105.1	-108.9	-112.6	-116.1	-119.3	-122.1	-124.6	-126.6	-128.1
30	49045	49375	49684	49971	50231	50463	50663	50829	50959	51049	51097	51101	51059	50971	50836	50653	50422	50145	49824
	-70.6	-73.2	-76.1	-79.2	-82.5	-86.0	-89.7	-93.6	-97.6	-101.7	-105.8	-109.8	-113.8	-117.5	-121.0	-124.1	-126.8	-129.1	-130.8

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	-72	-70	-68	-66	-64	-62	-60	-58	-56	-54	-52	-50	-48	-46	-44	-42	-40	-38	-36
60	59362	59054	58731	58396	58050	57695	57332	56964	56593	56221	55849	55479	55114	54753	54400	54056	53722	53398	53087
	-28.3	-28.2	-27.9	-27.6	-27.2	-26.6	-26.0	-25.3	-24.4	-23.5	-22.5	-21.4	-20.2	-19.0	-17.7	-16.4	-15.0	-13.5	-12.1
58	59390	59065	58723	58366	57997	57618	57231	56838	56441	56042	55645	55249	54859	54475	54099	53733	53377	53035	52706
	-35.0	-34.8	-34.5	-34.1	-33.6	-33.0	-32.2	-31.3	-30.3	-29.2	-28.0	-26.7	-25.3	-23.8	-22.3	-20.7	-19.0	-17.3	-15.6
56	59325	58983	58624	58247	57857	57456	57045	56628	56207	55784	55362	54943	54529	54123	53726	53339	52966	52606	52262
	-42.2	-42.0	-41.7	-41.2	-40.6	-39.9	-38.9	-37.9	-36.7	-35.3	-33.9	-32.3	-30.6	-28.9	-27.0	-25.1	-23.2	-21.2	-19.3
54	59160	58805	58429	58035	57625	57203	56771	56331	55887	55441	54997	54555	54120	53694	53277	52874	52484	52109	51752
	-49.9	-49.7	-49.3	-48.8	-48.1	-47.2	-46.1	-44.8	-43.4	-41.8	-40.1	-38.2	-36.2	-34.1	-32.0	-29.7	-27.5	-25.2	-22.9
52	58893	58525	58135	57725	57298	56857	56404	55944	55479	55012	54547	54085	53631	53186	52753	52334	51930	51544	51175
	-57.9	-57.8	-57.4	-56.8	-55.9	-54.9	-53.6	-52.2	-50.5	-48.6	-46.6	-44.4	-42.0	-39.6	-37.0	-34.4	-31.8	-29.1	-26.5
50	58520	58143	57741	57317	56874	56416	55945	55466	54982	54496	54012	53533	53061	52601	52153	51721	51306	50909	50533
	-66.3	-66.1	-65.7	-65.0	-64.1	-62.9	-61.4	-59.7	-57.8	-55.6	-53.2	-50.7	-48.0	-45.2	-42.2	-39.2	-36.2	-33.1	-30.1
48	58044	57659	57246	56810	56354	55881	55395	54899	54398	53896	53395	52900	52414	51939	51480	51037	50613	50209	49828
	-74.7	-74.6	-74.2	-73.4	-72.4	-71.1	-69.4	-67.5	-65.3	-62.8	-60.1	-57.2	-54.1	-50.8	-47.5	-44.0	-40.6	-37.1	-33.6
46	57466	57074	56654	56209	55741	55255	54755	54246	53730	53213	52699	52190	51692	51206	50737	50286	49855	49447	49062
	-83.2	-83.1	-82.7	-81.9	-80.8	-79.3	-77.5	-75.3	-72.8	-70.0	-67.0	-63.7	-60.2	-56.5	-52.8	-48.9	-45.0	-41.1	-37.2
44	56789	56394	55968	55515	55039	54543	54032	53510	52983	52454	51928	51408	50900	50406	49929	49473	49038	48628	48242
	-91.4	-91.4	-91.0	-90.2	-89.0	-87.4	-85.4	-83.1	-80.3	-77.2	-73.9	-70.2	-66.3	-62.2	-58.0	-53.7	-49.4	-45.0	-40.7
42	56020	55623	55194	54735	54252	53748	53229	52698	52162	51623	51088	50561	50045	49545	49063	48604	48167	47757	47373
	-99.3	-99.4	-99.0	-98.2	-97.0	-95.3	-93.2	-90.6	-87.7	-84.3	-80.6	-76.6	-72.4	-67.9	-63.2	-58.5	-53.7	-48.9	-44.2
40	55163	54766	54336	53875	53388	52879	52354	51817	51273	50728	50187	49654	49134	48630	48146	47685	47249	46840	46459
	-106.7	-106.9	-106.6	-105.9	-104.6	-102.9	-100.6	-97.9	-94.7	-91.2	-87.2	-82.9	-78.3	-73.4	-68.4	-63.2	-58.0	-52.8	-47.6
38	54225	53832	53402	52941	52453	51942	51413	50873	50325	49776	49232	48696	48173	47668	47184	46723	46290	45884	45507
	-113.4	-113.7	-113.6	-112.9	-111.6	-109.9	-107.6	-104.8	-101.4	-97.6	-93.4	-88.8	-83.9	-78.7	-73.4	-67.8	-62.2	-56.6	-51.1
36	53215	52826	52400	51941	51454	50943	50415	49873	49325	48775	48229	47693	47170	46666	46183	45726	45296	44895	44524
	-119.3	-119.8	-119.7	-119.2	-118.0	-116.2	-113.9	-111.0	-107.6	-103.7	-99.3	-94.5	-89.3	-83.8	-78.1	-72.3	-66.3	-60.4	-54.4
34	52139	51757	51336	50882	50399	49892	49366	48827	48280	47732	47188	46653	46133	45631	45152	44699	44274	43879	43515
	-124.2	-124.9	-125.0	-124.6	-123.5	-121.8	-119.5	-116.6	-113.2	-109.2	-104.6	-99.7	-94.3	-88.6	-82.7	-76.5	-70.3	-64.0	-57.7
32	51006	50632	50220	49773	49297	48795	48275	47740	47198	46654	46114	45584	45068	44571	44097	43650	43231	42843	42486
	-128.1	-129.0	-129.3	-129.0	-128.1	-126.5	-124.3	-121.5	-118.0	-114.0	-109.4	-104.4	-98.9	-93.0	-86.9	-80.5	-74.0	-67.5	-60.9
30	49824	49460	49058	48621	48154	47661	47148	46621	46086	45549	45016	44492	43982	43492	43025	42584	42172	41791	41443
	-130.8	-131.9	-132.5	-132.4	-131.6	-130.2	-128.1	-125.4	-122.0	-118.1	-113.5	-108.4	-102.9	-96.9	-90.7	-84.2	-77.5	-70.7	-63.9

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	0
60	53087	52788	52504	52234	51979	51739	51516	51308	51118	50943	50786	50646	50522	50415	50324	50251	50193	50152	50127
	-12.1	-10.6	-9.1	-7.6	-6.1	-4.6	-3.0	-1.5	0.0	1.5	3.1	4.6	6.1	7.6	9.1	10.6	12.1	13.6	15.0
58	52706	52391	52092	51809	51542	51292	51060	50845	50649	50470	50309	50165	50040	49932	49842	49770	49714	49676	49654
	-15.6	-13.9	-12.2	-10.5	-8.8	-7.1	-5.4	-3.7	-2.0	-0.3	1.3	2.9	4.6	6.2	7.7	9.3	10.9	12.4	14.0
56	52262	51933	51622	51328	51052	50795	50556	50337	50136	49954	49792	49648	49524	49418	49330	49260	49208	49174	49157
	-19.3	-17.3	-15.3	-13.3	-11.4	-9.4	-7.5	-5.7	-3.8	-2.1	-0.3	1.5	3.2	4.9	6.5	8.2	9.8	11.4	13.0
54	51752	51412	51091	50789	50506	50244	50001	49779	49577	49396	49234	49092	48970	48868	48784	48719	48673	48644	48634
	-22.9	-20.6	-18.3	-16.1	-13.9	-11.7	-9.6	-7.5	-5.5	-3.6	-1.7	0.2	2.0	3.8	5.6	7.3	9.0	10.6	12.3
52	51175	50827	50498	50191	49904	49639	49395	49173	48972	48792	48634	48496	48378	48280	48203	48144	48105	48084	48080
	-26.5	-23.9	-21.3	-18.7	-16.2	-13.8	-11.4	-9.2	-7.0	-4.9	-2.8	-0.8	1.1	3.0	4.8	6.6	8.3	10.1	11.8
50	50533	50178	49845	49534	49246	48981	48738	48518	48320	48144	47990	47858	47746	47655	47585	47534	47502	47490	47495
	-30.1	-27.1	-24.1	-21.2	-18.4	-15.7	-13.1	-10.7	-8.3	-6.0	-3.8	-1.7	0.4	2.3	4.3	6.1	7.9	9.7	11.5
48	49828	49469	49134	48822	48535	48271	48032	47816	47623	47453	47305	47180	47076	46993	46930	46888	46865	46862	46877
	-33.6	-30.2	-26.9	-23.7	-20.6	-17.6	-14.7	-12.0	-9.4	-6.9	-4.5	-2.3	-0.1	1.9	3.9	5.9	7.7	9.6	11.4
46	49062	48702	48367	48057	47773	47513	47279	47069	46882	46720	46580	46462	46367	46293	46239	46207	46193	46199	46224
	-37.2	-33.4	-29.6	-26.0	-22.6	-19.3	-16.1	-13.2	-10.3	-7.7	-5.1	-2.8	-0.5	1.7	3.8	5.8	7.7	9.6	11.4
44	48242	47883	47550	47244	46964	46710	46482	46280	46101	45947	45816	45708	45621	45557	45513	45490	45486	45502	45537
	-40.7	-36.5	-32.3	-28.4	-24.5	-20.9	-17.5	-14.2	-11.2	-8.3	-5.7	-3.1	-0.7	1.5	3.7	5.8	7.8	9.7	11.6
42	47373	47016	46687	46386	46113	45866	45646	45452	45282	45137	45016	44917	44841	44786	44752	44739	44745	44771	44815
	-44.2	-39.5	-35.0	-30.6	-26.5	-22.5	-18.8	-15.3	-12.0	-9.0	-6.1	-3.4	-0.9	1.5	3.7	5.9	7.9	9.9	11.9
40	46459	46107	45783	45489	45223	44985	44773	44588	44429	44293	44182	44093	44027	43982	43959	43955	43972	44007	44061
	-47.6	-42.6	-37.7	-32.9	-28.4	-24.1	-20.1	-16.4	-12.8	-9.6	-6.6	-3.7	-1.1	1.4	3.7	6.0	8.1	10.2	12.2
38	45507	45161	44844	44557	44300	44070	43869	43693	43544	43419	43317	43239	43183	43148	43134	43141	43167	43212	43275
	-51.1	-45.6	-40.3	-35.2	-30.4	-25.8	-21.5	-17.5	-13.7	-10.2	-7.0	-4.1	-1.3	1.3	3.7	6.0	8.2	10.3	12.4
36	44524	44184	43875	43597	43348	43128	42936	42770	42631	42516	42425	42357	42311	42286	42282	42299	42334	42389	42461
	-54.4	-48.6	-43.0	-37.5	-32.4	-27.5	-22.9	-18.6	-14.6	-11.0	-7.6	-4.5	-1.6	1.1	3.6	6.0	8.3	10.4	12.5
34	43515	43183	42882	42612	42372	42161	41979	41824	41694	41590	41509	41451	41415	41400	41406	41432	41477	41540	41621
	-57.7	-51.6	-45.6	-39.9	-34.4	-29.2	-24.3	-19.8	-15.6	-11.8	-8.2	-4.9	-1.9	0.9	3.5	5.9	8.2	10.4	12.5
32	42486	42161	41869	41607	41377	41176	41004	40858	40739	40644	40574	40526	40500	40495	40511	40546	40600	40672	40761
	-60.9	-54.5	-48.2	-42.2	-36.4	-30.9	-25.8	-21.0	-16.6	-12.6	-8.9	-5.5	-2.3	0.5	3.2	5.7	8.1	10.3	12.4
30	41443	41126	40842	40590	40369	40177	40014	39879	39770	39685	39625	39587	39571	39576	39601	39646	39709	39789	39886
	-63.9	-57.2	-50.7	-44.4	-38.3	-32.6	-27.3	-22.3	-17.7	-13.4	-9.6	-6.0	-2.8	0.2	2.9	5.5	7.8	10.1	12.2

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
30	39886	39999	40125	40264	40415	40576	40746	40924	41109	41299	41495	41694	41898	42105	42316	42530	42747	42968	43191
	12.2	14.3	16.3	18.2	19.9	21.6	23.2	24.6	25.8	26.8	27.5	28.0	28.3	28.2	27.9	27.4	26.6	25.6	24.3
28	39006	39125	39258	39404	39559	39725	39898	40078	40265	40456	40652	40851	41054	41260	41468	41680	41895	42113	42334
	12.0	14.0	15.9	17.8	19.5	21.1	22.6	23.9	25.0	26.0	26.7	27.1	27.3	27.2	26.8	26.2	25.4	24.3	23.1
26	38128	38255	38394	38545	38706	38875	39051	39233	39421	39612	39807	40005	40206	40410	40616	40824	41035	41249	41466
	11.7	13.7	15.5	17.3	18.9	20.4	21.8	23.0	24.1	24.9	25.5	25.8	25.9	25.7	25.3	24.6	23.8	22.7	21.4
24	37263	37397	37543	37700	37865	38038	38216	38400	38588	38780	38974	39170	39368	39568	39770	39974	40180	40389	40601
	11.4	13.3	15.1	16.7	18.2	19.6	20.9	21.9	22.8	23.5	23.9	24.1	24.1	23.8	23.3	22.6	21.6	20.5	19.2
22	36423	36565	36717	36879	37049	37225	37407	37592	37781	37971	38164	38357	38551	38747	38944	39142	39343	39545	39750
	11.3	13.1	14.7	16.2	17.5	18.7	19.8	20.6	21.3	21.8	22.1	22.1	21.9	21.5	20.8	20.0	19.0	17.8	16.6
20	35620	35770	35929	36096	36271	36451	36635	36822	37011	37201	37391	37581	37771	37962	38153	38344	38537	38731	38927
	11.4	13.0	14.5	15.8	16.9	17.9	18.7	19.3	19.7	19.9	19.9	19.7	19.3	18.7	17.9	17.0	15.9	14.7	13.4
18	34866	35024	35190	35363	35543	35727	35914	36103	36292	36481	36669	36856	37042	37226	37409	37593	37776	37961	38147
	11.7	13.2	14.4	15.5	16.4	17.0	17.5	17.9	18.0	17.9	17.6	17.1	16.5	15.6	14.7	13.5	12.3	11.0	9.7
16	34172	34337	34511	34692	34877	35065	35256	35446	35637	35825	36011	36194	36375	36552	36728	36901	37074	37248	37423
	12.3	13.5	14.6	15.4	16.0	16.3	16.5	16.4	16.2	15.8	15.1	14.3	13.3	12.2	11.0	9.7	8.3	6.9	5.5
14	33545	33721	33903	34090	34282	34476	34670	34864	35055	35243	35427	35607	35782	35952	36118	36281	36443	36603	36765
	13.1	14.1	14.9	15.4	15.7	15.7	15.5	15.1	14.4	13.5	12.5	11.3	10.0	8.5	7.0	5.5	3.9	2.4	0.9
12	32993	33179	33371	33567	33765	33965	34165	34362	34555	34743	34926	35102	35270	35433	35589	35741	35889	36036	36182
	14.1	14.9	15.4	15.7	15.6	15.2	14.6	13.7	12.6	11.3	9.8	8.1	6.4	4.6	2.8	1.0	-0.8	-2.5	-4.1
10	32519	32716	32918	33123	33330	33538	33743	33944	34140	34329	34510	34682	34845	34999	35145	35284	35418	35550	35681
	15.1	15.8	16.0	16.0	15.5	14.8	13.7	12.3	10.7	8.9	6.9	4.8	2.6	0.4	-1.8	-3.9	-5.9	-7.8	-9.5
8	32120	32330	32544	32760	32977	33192	33404	33610	33810	34000	34179	34348	34504	34650	34784	34910	35030	35146	35260
	16.2	16.6	16.6	16.2	15.4	14.3	12.7	10.9	8.8	6.4	3.9	1.3	-1.4	-4.0	-6.6	-9.1	-11.4	-13.4	-15.3
6	31793	32017	32244	32472	32699	32923	33143	33355	33558	33750	33928	34093	34243	34379	34503	34615	34720	34819	34917
	17.0	17.2	17.0	16.3	15.2	13.6	11.6	9.3	6.6	3.7	0.7	-2.5	-5.7	-8.8	-11.8	-14.5	-17.1	-19.4	-21.4
4	31530	31769	32009	32250	32488	32723	32950	33169	33376	33569	33746	33907	34050	34177	34289	34388	34478	34561	34643
	17.4	17.5	17.0	16.1	14.6	12.6	10.2	7.4	4.2	0.8	-2.8	-6.5	-10.2	-13.8	-17.2	-20.3	-23.1	-25.6	-27.7
2	31319	31573	31828	32082	32333	32577	32813	33038	33249	33443	33619	33776	33912	34030	34130	34215	34290	34358	34425
	17.3	17.2	16.6	15.4	13.6	11.2	8.4	5.1	1.4	-2.6	-6.7	-10.9	-15.1	-19.1	-22.9	-26.4	-29.5	-32.1	-34.3
0	31148	31419	31688	31955	32218	32472	32716	32947	33161	33356	33530	33681	33811	33919	34007	34080	34140	34194	34248
	16.6	16.4	15.6	14.1	12.0	9.3	6.0	2.3	-1.9	-6.3	-11.0	-15.7	-20.3	-24.8	-29.0	-32.7	-36.0	-38.8	-41.1

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72
30	43191	43418	43648	43881	44117	44355	44596	44838	45083	45328	45574	45820	46066	46311	46554	46795	47033	47267	47497
	24.3	22.9	21.4	19.8	18.1	16.4	14.6	12.9	11.1	9.5	7.8	6.2	4.7	3.2	1.8	0.5	-0.7	-1.8	-2.8
28	42334	42557	42784	43014	43246	43480	43716	43953	44191	44429	44667	44905	45140	45374	45606	45834	46058	46278	46493
	23.1	21.7	20.2	18.6	17.0	15.3	13.6	12.0	10.3	8.8	7.2	5.7	4.3	2.9	1.6	0.4	-0.7	-1.7	-2.6
26	41466	41686	41909	42134	42361	42591	42821	43053	43285	43517	43748	43977	44205	44429	44650	44868	45081	45288	45490
	21.4	20.0	18.6	17.0	15.4	13.8	12.3	10.7	9.2	7.7	6.3	5.0	3.7	2.4	1.3	0.2	-0.9	-1.8	-2.6
24	40601	40815	41032	41252	41474	41698	41923	42150	42376	42602	42827	43049	43270	43487	43700	43909	44113	44311	44504
	19.2	17.9	16.4	14.9	13.4	11.9	10.5	9.0	7.6	6.3	5.1	3.9	2.7	1.6	0.6	-0.4	-1.3	-2.1	-2.8
22	39750	39957	40168	40381	40596	40814	41033	41254	41475	41695	41915	42132	42348	42559	42767	42971	43169	43362	43548
	16.6	15.2	13.8	12.4	10.9	9.5	8.2	6.9	5.6	4.5	3.4	2.3	1.3	0.4	-0.5	-1.3	-2.1	-2.7	-3.3
20	38927	39127	39329	39534	39741	39952	40165	40379	40595	40811	41026	41240	41452	41661	41867	42068	42264	42454	42638
	13.4	12.0	10.6	9.3	7.9	6.6	5.4	4.2	3.1	2.1	1.2	0.3	-0.5	-1.3	-2.0	-2.7	-3.3	-3.8	-4.2
18	38147	38336	38528	38724	38923	39125	39331	39539	39750	39962	40174	40387	40598	40807	41013	41216	41414	41606	41792
	9.7	8.3	7.0	5.6	4.4	3.2	2.1	1.0	0.1	-0.8	-1.5	-2.3	-2.9	-3.5	-4.0	-4.5	-4.9	-5.3	-5.5
16	37423	37600	37780	37965	38153	38347	38545	38747	38953	39162	39374	39586	39799	40012	40222	40430	40633	40832	41024
	5.5	4.1	2.8	1.5	0.3	-0.8	-1.8	-2.7	-3.4	-4.2	-4.8	-5.3	-5.8	-6.2	-6.6	-6.9	-7.1	-7.2	-7.2
14	36765	36929	37096	37268	37445	37629	37819	38015	38218	38425	38637	38853	39070	39289	39507	39724	39938	40147	40351
	0.9	-0.5	-1.8	-3.1	-4.2	-5.2	-6.1	-6.8	-7.5	-8.0	-8.5	-8.9	-9.2	-9.4	-9.6	-9.7	-9.7	-9.6	-9.4
12	36182	36331	36484	36643	36809	36982	37164	37355	37554	37762	37976	38197	38422	38651	38881	39111	39339	39564	39784
	-4.1	-5.6	-6.9	-8.1	-9.2	-10.1	-10.8	-11.5	-12.0	-12.4	-12.7	-12.9	-13.0	-13.1	-13.1	-13.0	-12.7	-12.4	-11.9
10	35681	35814	35952	36096	36249	36413	36587	36774	36972	37181	37400	37629	37865	38106	38352	38600	38847	39092	39332
	-9.5	-11.1	-12.4	-13.6	-14.5	-15.3	-16.0	-16.5	-16.8	-17.1	-17.2	-17.3	-17.2	-17.1	-16.9	-16.5	-16.1	-15.5	-14.8
8	35260	35377	35499	35630	35771	35924	36092	36276	36474	36687	36914	37153	37404	37663	37928	38197	38468	38737	39002
	-15.3	-16.9	-18.2	-19.4	-20.3	-20.9	-21.4	-21.8	-22.0	-22.0	-22.0	-21.9	-21.6	-21.3	-20.9	-20.3	-19.6	-18.8	-17.8
6	34917	35018	35124	35241	35371	35516	35679	35861	36062	36282	36520	36773	37042	37321	37610	37905	38203	38501	38795
	-21.4	-23.0	-24.4	-25.5	-26.3	-26.8	-27.2	-27.3	-27.3	-27.2	-26.9	-26.6	-26.2	-25.6	-24.9	-24.1	-23.2	-22.1	-20.7
4	34643	34728	34820	34924	35044	35183	35344	35527	35733	35963	36215	36486	36776	37080	37396	37721	38050	38379	38707
	-27.7	-29.4	-30.8	-31.8	-32.5	-32.9	-33.0	-32.9	-32.7	-32.4	-31.9	-31.3	-30.6	-29.8	-28.9	-27.8	-26.6	-25.2	-23.5
2	34425	34495	34575	34669	34782	34917	35077	35265	35480	35723	35992	36286	36600	36933	37280	37638	38001	38367	38730
	-34.3	-36.1	-37.4	-38.3	-38.8	-39.0	-38.9	-38.6	-38.1	-37.4	-36.7	-35.8	-34.8	-33.8	-32.6	-31.2	-29.7	-28.0	-26.0
0	34248	34306	34375	34461	34570	34705	34869	35065	35293	35553	35844	36163	36506	36871	37252	37646	38048	38452	38854
	-41.1	-42.8	-44.1	-44.8	-45.1	-45.0	-44.6	-44.0	-43.2	-42.2	-41.1	-40.0	-38.7	-37.3	-35.8	-34.2	-32.3	-30.3	-28.0

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108
30	47497	47721	47939	48149	48351	48541	48720	48886	49035	49167	49280	49371	49437	49478	49489	49470	49418	49331	49209
	-2.8	-3.6	-4.2	-4.6	-4.9	-4.8	-4.5	-4.0	-3.2	-2.2	-0.9	0.6	2.3	4.1	5.9	7.9	9.8	11.7	13.4
28	46493	46701	46903	47098	47283	47458	47622	47772	47908	48027	48128	48208	48266	48299	48305	48281	48227	48140	48018
	-2.6	-3.4	-4.0	-4.4	-4.5	-4.5	-4.1	-3.6	-2.7	-1.6	-0.3	1.3	3.0	4.8	6.7	8.7	10.7	12.6	14.4
26	45490	45686	45875	46055	46227	46389	46539	46677	46800	46908	46999	47070	47120	47146	47147	47120	47064	46977	46858
	-2.6	-3.3	-3.8	-4.1	-4.2	-4.1	-3.7	-3.1	-2.2	-1.1	0.3	1.9	3.7	5.5	7.5	9.5	11.5	13.4	15.2
24	44504	44689	44868	45038	45199	45350	45490	45617	45731	45830	45911	45975	46018	46038	46035	46006	45948	45862	45745
	-2.8	-3.4	-3.8	-4.0	-4.0	-3.8	-3.4	-2.7	-1.7	-0.5	0.9	2.5	4.3	6.3	8.2	10.3	12.2	14.1	15.9
22	43548	43727	43898	44061	44215	44359	44491	44612	44718	44810	44885	44942	44979	44996	44989	44957	44900	44814	44700
	-3.3	-3.7	-4.0	-4.1	-4.1	-3.7	-3.2	-2.4	-1.4	-0.1	1.4	3.1	4.9	6.9	8.9	10.9	12.9	14.8	16.5
20	42638	42815	42984	43144	43295	43435	43563	43679	43781	43868	43939	43992	44025	44038	44028	43995	43937	43853	43741
	-4.2	-4.5	-4.6	-4.6	-4.3	-3.9	-3.2	-2.3	-1.1	0.3	1.8	3.6	5.5	7.5	9.5	11.5	13.5	15.3	17.0
18	41792	41970	42141	42303	42454	42595	42723	42838	42939	43025	43093	43143	43174	43185	43173	43139	43081	42998	42889
	-5.5	-5.6	-5.5	-5.3	-4.9	-4.2	-3.4	-2.3	-1.0	0.5	2.2	4.0	6.0	8.0	10.0	12.1	14.0	15.8	17.5
16	41024	41210	41387	41554	41711	41856	41989	42107	42210	42296	42365	42415	42445	42454	42441	42406	42348	42266	42160
	-7.2	-7.1	-6.8	-6.4	-5.8	-4.9	-3.8	-2.6	-1.1	0.6	2.4	4.3	6.4	8.4	10.5	12.6	14.5	16.3	17.9
14	40351	40547	40735	40914	41081	41235	41375	41500	41608	41698	41770	41821	41852	41861	41848	41813	41755	41674	41570
	-9.4	-9.0	-8.5	-7.8	-6.9	-5.8	-4.5	-3.0	-1.3	0.5	2.5	4.6	6.7	8.9	11.0	13.1	15.0	16.8	18.4
12	39784	39996	40200	40394	40575	40743	40895	41030	41146	41244	41320	41375	41408	41419	41407	41372	41314	41234	41131
	-11.9	-11.3	-10.5	-9.5	-8.3	-7.0	-5.4	-3.6	-1.7	0.4	2.6	4.9	7.1	9.4	11.6	13.7	15.6	17.4	19.0
10	39332	39566	39790	40003	40204	40388	40556	40705	40834	40941	41025	41086	41123	41136	41125	41091	41034	40955	40854
	-14.8	-13.9	-12.8	-11.4	-9.9	-8.2	-6.3	-4.2	-2.0	0.3	2.7	5.2	7.6	10.0	12.2	14.4	16.3	18.1	19.6
8	39002	39261	39510	39747	39970	40176	40363	40530	40673	40793	40887	40956	40999	41017	41009	40976	40920	40842	40744
	-17.8	-16.5	-15.1	-13.5	-11.6	-9.5	-7.3	-4.9	-2.3	0.3	2.9	5.6	8.2	10.7	13.1	15.3	17.3	19.0	20.5
6	38795	39082	39360	39626	39875	40106	40316	40503	40664	40799	40906	40986	41037	41060	41056	41027	40973	40897	40800
	-20.7	-19.2	-17.4	-15.4	-13.2	-10.8	-8.1	-5.4	-2.5	0.4	3.3	6.2	9.0	11.6	14.1	16.4	18.4	20.2	21.7
4	38707	39027	39337	39634	39913	40172	40408	40618	40801	40954	41077	41169	41230	41261	41263	41238	41188	41114	41020
	-23.5	-21.7	-19.5	-17.2	-14.6	-11.8	-8.8	-5.7	-2.5	0.7	3.9	7.0	10.0	12.8	15.4	17.7	19.8	21.6	23.1
2	38730	39086	39432	39763	40075	40366	40630	40867	41073	41247	41388	41496	41569	41611	41621	41602	41557	41488	41398
	-26.0	-23.8	-21.3	-18.6	-15.7	-12.5	-9.2	-5.8	-2.3	1.3	4.7	8.1	11.2	14.2	16.9	19.3	21.4	23.2	24.7
0	38854	39249	39633	40001	40349	40673	40970	41236	41468	41666	41828	41953	42042	42096	42117	42107	42069	42006	41921
	-28.0	-25.5	-22.7	-19.6	-16.4	-12.9	-9.2	-5.5	-1.7	2.1	5.8	9.4	12.7	15.9	18.7	21.2	23.3	25.1	26.6

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138	140	142	144
30	49209	49048	48850	48613	48337	48023	47673	47287	46869	46421	45946	45449	44932	44401	43859	43312	42765	42222	41688
	13.4	15.1	16.6	17.9	19.0	19.9	20.7	21.2	21.6	21.8	21.9	22.0	21.9	21.8	21.7	21.5	21.3	21.1	20.8
28	48018	47861	47668	47437	47169	46865	46526	46152	45748	45314	44855	44373	43874	43360	42837	42308	41780	41255	40740
	14.4	16.0	17.5	18.8	19.9	20.7	21.4	21.9	22.2	22.3	22.4	22.3	22.2	22.1	21.9	21.7	21.4	21.2	20.9
26	46858	46704	46516	46293	46035	45741	45415	45056	44666	44250	43808	43346	42866	42372	41870	41363	40855	40352	39858
	15.2	16.8	18.3	19.5	20.6	21.4	21.9	22.3	22.5	22.6	22.6	22.4	22.3	22.0	21.8	21.6	21.3	21.0	20.7
24	45745	45596	45414	45199	44951	44670	44357	44013	43641	43243	42821	42380	41922	41451	40971	40488	40004	39524	39053
	15.9	17.5	18.9	20.1	21.1	21.8	22.3	22.6	22.8	22.7	22.6	22.4	22.1	21.8	21.5	21.3	21.0	20.6	20.3
22	44700	44555	44380	44174	43936	43668	43369	43043	42689	42311	41911	41492	41057	40610	40156	39697	39238	38783	38337
	16.5	18.1	19.4	20.6	21.5	22.1	22.6	22.8	22.8	22.7	22.5	22.2	21.9	21.5	21.2	20.8	20.5	20.1	19.8
20	43741	43601	43433	43235	43009	42753	42470	42161	41826	41469	41091	40696	40286	39865	39436	39003	38571	38141	37720
	17.0	18.6	19.9	20.9	21.8	22.3	22.7	22.8	22.8	22.6	22.4	22.0	21.6	21.2	20.8	20.4	20.0	19.6	19.2
18	42889	42753	42591	42402	42187	41944	41677	41385	41070	40734	40379	40008	39623	39228	38826	38419	38013	37610	37213
	17.5	19.0	20.2	21.2	22.0	22.5	22.8	22.9	22.8	22.6	22.2	21.8	21.3	20.9	20.4	20.0	19.5	19.1	18.6
16	42160	42028	41872	41692	41486	41257	41005	40730	40434	40120	39788	39441	39082	38713	38337	37957	37576	37199	36827
	17.9	19.4	20.6	21.5	22.2	22.7	22.9	22.9	22.8	22.5	22.1	21.7	21.2	20.7	20.1	19.6	19.1	18.6	18.1
14	41570	41442	41292	41119	40923	40706	40468	40211	39934	39641	39331	39008	38674	38331	37980	37626	37271	36917	36569
	18.4	19.8	20.9	21.8	22.5	22.9	23.1	23.1	22.9	22.6	22.1	21.7	21.1	20.5	20.0	19.4	18.8	18.3	17.7
12	41131	41007	40862	40696	40510	40304	40080	39839	39581	39307	39020	38720	38410	38091	37766	37436	37105	36774	36447
	19.0	20.3	21.4	22.2	22.8	23.2	23.3	23.3	23.1	22.7	22.3	21.8	21.2	20.6	20.0	19.3	18.7	18.0	17.3
10	40854	40733	40592	40433	40255	40060	39849	39623	39383	39129	38862	38584	38297	38001	37699	37392	37083	36774	36467
	19.6	20.9	22.0	22.8	23.3	23.7	23.8	23.7	23.5	23.1	22.6	22.0	21.4	20.8	20.1	19.4	18.6	17.9	17.1
8	40744	40625	40488	40334	40165	39980	39781	39570	39345	39109	38862	38606	38340	38066	37785	37500	37211	36920	36631
	20.5	21.8	22.8	23.6	24.1	24.3	24.4	24.3	24.0	23.6	23.1	22.5	21.8	21.1	20.3	19.5	18.7	17.8	16.9
6	40800	40684	40551	40403	40241	40065	39878	39680	39471	39252	39023	38785	38539	38285	38025	37758	37488	37214	36940
	21.7	22.9	23.9	24.6	25.0	25.2	25.2	25.0	24.7	24.3	23.7	23.0	22.3	21.5	20.6	19.7	18.7	17.7	16.7
4	41020	40908	40779	40636	40481	40314	40138	39952	39757	39554	39342	39122	38894	38659	38416	38167	37912	37654	37393
	23.1	24.3	25.2	25.8	26.2	26.3	26.2	26.0	25.6	25.0	24.4	23.6	22.8	21.9	20.9	19.9	18.8	17.6	16.4
2	41398	41289	41165	41028	40880	40722	40555	40381	40200	40011	39815	39611	39400	39181	38954	38720	38480	38234	37985
	24.7	25.9	26.7	27.3	27.6	27.6	27.4	27.1	26.6	25.9	25.2	24.3	23.3	22.3	21.2	20.0	18.7	17.4	16.1
0	41921	41818	41700	41569	41428	41279	41122	40960	40790	40615	40433	40245	40048	39844	39632	39411	39183	38949	38708
	26.6	27.7	28.5	28.9	29.1	29.1	28.8	28.3	27.7	26.9	25.9	24.9	23.8	22.6	21.3	20.0	18.6	17.1	15.6

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	144	146	148	150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180
30	41688	41167	40664	40183	39727	39300	38904	38543	38217	37929	37680	37469	37297	37163	37066	37006	36980	36987	37026
	20.8	20.3	19.8	19.1	18.3	17.2	15.9	14.4	12.6	10.7	8.5	6.1	3.7	1.1	-1.4	-3.9	-6.2	-8.3	-10.2
28	40740	40238	39753	39290	38852	38443	38064	37719	37409	37136	36901	36704	36544	36422	36335	36283	36265	36277	36318
	20.9	20.5	19.9	19.3	18.5	17.4	16.1	14.6	12.9	10.9	8.7	6.3	3.7	1.1	-1.5	-4.0	-6.4	-8.7	-10.7
26	39858	39377	38913	38470	38051	37661	37300	36972	36679	36421	36200	36016	35869	35757	35680	35635	35623	35639	35682
	20.7	20.3	19.8	19.1	18.3	17.3	16.1	14.6	12.8	10.9	8.6	6.2	3.7	1.0	-1.6	-4.2	-6.7	-9.0	-11.0
24	39053	38595	38153	37731	37333	36962	36620	36310	36032	35790	35583	35411	35274	35172	35103	35065	35057	35075	35119
	20.3	19.9	19.4	18.8	18.0	17.0	15.8	14.3	12.6	10.6	8.5	6.1	3.5	0.9	-1.8	-4.4	-6.9	-9.3	-11.4
22	38337	37902	37483	37084	36706	36355	36031	35738	35477	35248	35054	34893	34766	34671	34608	34574	34568	34587	34629
	19.8	19.4	18.9	18.2	17.5	16.5	15.3	13.9	12.2	10.3	8.1	5.8	3.2	0.6	-2.0	-4.6	-7.1	-9.5	-11.6
20	37720	37309	36914	36536	36180	35847	35542	35264	35017	34802	34618	34466	34346	34257	34198	34166	34160	34177	34215
	19.2	18.7	18.2	17.6	16.8	15.8	14.7	13.3	11.6	9.8	7.6	5.3	2.9	0.3	-2.3	-4.9	-7.4	-9.7	-11.8
18	37213	36827	36454	36098	35761	35447	35158	34895	34661	34456	34281	34136	34021	33934	33876	33843	33834	33846	33877
	18.6	18.1	17.6	16.9	16.1	15.1	14.0	12.6	11.0	9.1	7.1	4.8	2.4	-0.1	-2.6	-5.1	-7.6	-9.9	-12.0
16	36827	36463	36113	35777	35459	35162	34887	34637	34413	34216	34047	33906	33793	33706	33645	33608	33592	33596	33617
	18.1	17.5	16.9	16.2	15.4	14.4	13.2	11.8	10.2	8.4	6.4	4.2	1.9	-0.5	-3.0	-5.4	-7.8	-10.1	-12.2
14	36569	36228	35897	35580	35279	34996	34734	34494	34278	34087	33921	33781	33666	33576	33509	33464	33439	33432	33439
	17.7	17.0	16.3	15.5	14.6	13.6	12.4	11.0	9.4	7.6	5.7	3.6	1.3	-1.0	-3.4	-5.8	-8.1	-10.4	-12.4
12	36447	36126	35814	35514	35228	34957	34705	34473	34262	34073	33908	33765	33646	33549	33473	33416	33378	33355	33347
	17.3	16.6	15.8	14.9	13.9	12.8	11.6	10.2	8.6	6.8	4.9	2.8	0.6	-1.6	-3.9	-6.3	-8.5	-10.7	-12.7
10	36467	36164	35869	35583	35308	35048	34803	34576	34367	34179	34010	33862	33735	33627	33539	33468	33413	33372	33343
	17.1	16.2	15.3	14.3	13.3	12.1	10.8	9.3	7.7	5.9	4.0	2.0	-0.1	-2.3	-4.5	-6.8	-9.0	-11.1	-13.1
8	36631	36344	36063	35789	35524	35271	35031	34806	34597	34405	34231	34075	33936	33815	33711	33622	33547	33485	33434
	16.9	15.9	14.9	13.8	12.6	11.3	9.9	8.4	6.8	5.0	3.2	1.2	-0.9	-3.0	-5.2	-7.4	-9.5	-11.6	-13.5
6	36940	36668	36398	36133	35876	35628	35390	35165	34953	34755	34572	34405	34253	34115	33993	33883	33786	33699	33623
	16.7	15.6	14.4	13.2	11.9	10.5	9.0	7.5	5.8	4.1	2.2	0.3	-1.8	-3.8	-5.9	-8.0	-10.1	-12.2	-14.1
4	37393	37132	36871	36614	36362	36116	35878	35650	35433	35227	35034	34853	34685	34529	34385	34253	34131	34018	33914
	16.4	15.2	13.9	12.5	11.1	9.6	8.1	6.5	4.8	3.0	1.2	-0.7	-2.7	-4.7	-6.8	-8.8	-10.9	-12.9	-14.8
2	37985	37733	37480	37227	36978	36733	36493	36260	36036	35820	35614	35418	35232	35056	34890	34732	34584	34443	34309
	16.1	14.7	13.3	11.8	10.2	8.7	7.1	5.4	3.7	1.9	0.1	-1.8	-3.7	-5.7	-7.7	-9.7	-11.7	-13.7	-15.6
0	38708	38464	38216	37967	37719	37472	37229	36990	36756	36530	36310	36097	35892	35694	35504	35321	35145	34975	34811
	15.6	14.0	12.5	10.9	9.2	7.6	5.9	4.2	2.5	0.7	-1.1	-2.9	-4.8	-6.7	-8.7	-10.7	-12.6	-14.6	-16.6

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	180	-178	-176	-174	-172	-170	-168	-166	-164	-162	-160	-158	-156	-154	-152	-150	-148	-146	-144
30	37026	37093	37189	37310	37456	37625	37816	38029	38262	38516	38789	39082	39393	39723	40069	40432	40809	41200	41603
	-10.2	-11.8	-13.1	-14.0	-14.7	-15.0	-15.2	-15.1	-15.0	-14.8	-14.6	-14.6	-14.8	-15.3	-16.0	-17.1	-18.6	-20.3	-22.5
28	36318	36387	36481	36598	36738	36898	37078	37277	37495	37731	37985	38257	38547	38853	39176	39515	39868	40235	40613
	-10.7	-12.4	-13.7	-14.8	-15.5	-16.0	-16.2	-16.2	-16.1	-16.0	-16.0	-16.1	-16.3	-16.9	-17.7	-18.9	-20.4	-22.3	-24.4
26	35682	35751	35842	35954	36086	36236	36404	36588	36788	37005	37239	37488	37754	38035	38333	38646	38973	39313	39666
	-11.0	-12.8	-14.3	-15.4	-16.2	-16.8	-17.1	-17.2	-17.2	-17.2	-17.3	-17.4	-17.8	-18.4	-19.4	-20.7	-22.3	-24.2	-26.4
24	35119	35185	35272	35378	35501	35639	35793	35960	36143	36339	36550	36775	37016	37271	37542	37827	38126	38438	38763
	-11.4	-13.2	-14.7	-15.9	-16.8	-17.4	-17.8	-18.1	-18.2	-18.3	-18.5	-18.7	-19.2	-20.0	-21.1	-22.4	-24.1	-26.1	-28.4
22	34629	34692	34773	34870	34982	35107	35245	35395	35557	35731	35918	36119	36333	36560	36803	37059	37328	37611	37906
	-11.6	-13.5	-15.0	-16.3	-17.3	-18.0	-18.5	-18.8	-19.1	-19.3	-19.6	-20.0	-20.7	-21.5	-22.7	-24.2	-26.0	-28.0	-30.3
20	34215	34271	34344	34430	34529	34640	34760	34891	35032	35183	35345	35519	35705	35904	36117	36343	36582	36834	37097
	-11.8	-13.7	-15.3	-16.6	-17.7	-18.5	-19.1	-19.5	-19.9	-20.2	-20.7	-21.2	-22.0	-23.0	-24.3	-25.9	-27.8	-29.9	-32.2
18	33877	33924	33986	34060	34144	34237	34339	34449	34567	34694	34830	34977	35135	35304	35487	35681	35889	36109	36340
	-12.0	-13.9	-15.5	-16.9	-18.0	-18.9	-19.6	-20.1	-20.6	-21.1	-21.7	-22.5	-23.4	-24.5	-25.9	-27.6	-29.6	-31.7	-34.0
16	33617	33653	33701	33759	33826	33901	33982	34070	34164	34266	34375	34494	34622	34762	34913	35076	35251	35438	35636
	-12.2	-14.1	-15.7	-17.1	-18.3	-19.3	-20.1	-20.7	-21.4	-22.0	-22.8	-23.6	-24.7	-26.0	-27.5	-29.3	-31.3	-33.4	-35.7
14	33439	33460	33492	33532	33580	33633	33692	33756	33825	33901	33983	34073	34172	34281	34400	34531	34673	34826	34990
	-12.4	-14.3	-15.9	-17.4	-18.6	-19.7	-20.6	-21.4	-22.2	-22.9	-23.8	-24.8	-26.0	-27.4	-29.0	-30.9	-32.9	-35.0	-37.3
12	33347	33349	33362	33381	33407	33438	33473	33511	33555	33603	33657	33717	33786	33864	33952	34050	34159	34278	34408
	-12.7	-14.5	-16.2	-17.7	-19.0	-20.1	-21.1	-22.1	-23.0	-23.9	-24.9	-26.0	-27.3	-28.8	-30.5	-32.4	-34.4	-36.5	-38.7
10	33343	33325	33315	33311	33313	33319	33328	33340	33356	33376	33401	33432	33471	33518	33573	33639	33714	33799	33894
	-13.1	-14.9	-16.6	-18.1	-19.5	-20.7	-21.8	-22.8	-23.9	-24.9	-26.0	-27.3	-28.7	-30.2	-31.9	-33.8	-35.8	-37.9	-40.0
8	33434	33391	33357	33327	33303	33281	33263	33248	33235	33227	33223	33224	33232	33247	33271	33303	33345	33396	33456
	-13.5	-15.4	-17.1	-18.6	-20.0	-21.3	-22.6	-23.7	-24.8	-26.0	-27.2	-28.5	-30.0	-31.5	-33.3	-35.1	-37.0	-39.0	-41.0
6	33623	33554	33492	33434	33381	33332	33285	33240	33199	33161	33127	33098	33075	33059	33051	33050	33059	33075	33100
	-14.1	-15.9	-17.7	-19.3	-20.8	-22.2	-23.5	-24.7	-25.9	-27.2	-28.5	-29.8	-31.3	-32.9	-34.5	-36.3	-38.1	-40.0	-41.8
4	33914	33816	33725	33638	33555	33475	33398	33324	33253	33185	33121	33061	33008	32960	32920	32886	32861	32843	32834
	-14.8	-16.7	-18.4	-20.1	-21.6	-23.1	-24.5	-25.8	-27.2	-28.5	-29.8	-31.2	-32.6	-34.2	-35.8	-37.4	-39.1	-40.8	-42.5
2	34309	34182	34059	33941	33827	33716	33609	33504	33402	33304	33209	33119	33035	32956	32883	32818	32759	32707	32663
	-15.6	-17.5	-19.3	-21.0	-22.6	-24.2	-25.7	-27.1	-28.5	-29.8	-31.2	-32.6	-34.0	-35.4	-36.9	-38.4	-39.9	-41.5	-42.9
0	34811	34652	34498	34348	34202	34059	33920	33784	33651	33522	33397	33277	33162	33051	32947	32849	32757	32671	32592
	-16.6	-18.5	-20.3	-22.1	-23.8	-25.4	-27.0	-28.4	-29.9	-31.3	-32.6	-34.0	-35.3	-36.6	-38.0	-39.3	-40.7	-42.0	-43.3

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	-144	-142	-140	-138	-136	-134	-132	-130	-128	-126	-124	-122	-120	-118	-116	-114	-112	-110	-108
30	41603	42016	42437	42865	43298	43734	44172	44609	45046	45479	45909	46333	46751	47161	47563	47953	48332	48696	49045
	-22.5	-24.9	-27.5	-30.3	-33.3	-36.4	-39.4	-42.5	-45.4	-48.3	-51.0	-53.6	-56.1	-58.5	-60.9	-63.2	-65.6	-68.0	-70.6
28	40613	41002	41400	41805	42216	42630	43046	43462	43878	44293	44704	45110	45512	45907	46294	46672	47039	47394	47734
	-24.4	-26.9	-29.5	-32.3	-35.3	-38.2	-41.2	-44.1	-46.8	-49.5	-52.0	-54.3	-56.6	-58.7	-60.8	-62.9	-65.0	-67.3	-69.6
26	39666	40029	40401	40780	41166	41555	41947	42340	42733	43125	43514	43901	44283	44659	45029	45391	45744	46085	46414
	-26.4	-28.8	-31.5	-34.3	-37.1	-40.0	-42.8	-45.5	-48.1	-50.4	-52.7	-54.7	-56.7	-58.5	-60.3	-62.1	-63.9	-65.9	-68.1
24	38763	39098	39442	39794	40151	40514	40879	41246	41614	41981	42346	42709	43069	43424	43774	44118	44453	44779	45093
	-28.4	-30.8	-33.5	-36.2	-39.0	-41.7	-44.3	-46.8	-49.1	-51.2	-53.1	-54.8	-56.4	-57.9	-59.4	-60.8	-62.4	-64.1	-66.1
22	37906	38211	38525	38848	39176	39510	39846	40185	40525	40865	41204	41542	41877	42208	42536	42858	43173	43480	43778
	-30.3	-32.8	-35.4	-38.0	-40.7	-43.2	-45.6	-47.9	-49.9	-51.7	-53.3	-54.7	-55.9	-57.0	-58.1	-59.3	-60.5	-61.9	-63.6
20	37097	37371	37654	37946	38243	38546	38852	39161	39471	39782	40093	40403	40711	41017	41319	41618	41911	42198	42476
	-32.2	-34.7	-37.2	-39.8	-42.3	-44.6	-46.8	-48.8	-50.5	-52.0	-53.2	-54.3	-55.1	-55.9	-56.6	-57.4	-58.3	-59.5	-60.9
18	36340	36581	36832	37091	37356	37626	37900	38178	38457	38737	39018	39298	39578	39856	40132	40405	40675	40939	41196
	-34.0	-36.5	-38.9	-41.4	-43.7	-45.9	-47.9	-49.6	-51.0	-52.1	-53.0	-53.7	-54.2	-54.6	-55.0	-55.4	-56.0	-56.8	-57.9
16	35636	35844	36061	36286	36518	36755	36996	37240	37487	37735	37984	38234	38484	38733	38981	39227	39471	39711	39946
	-35.7	-38.1	-40.5	-42.8	-45.0	-47.0	-48.7	-50.1	-51.3	-52.1	-52.7	-53.0	-53.1	-53.2	-53.2	-53.4	-53.6	-54.1	-55.0
14	34990	35164	35347	35538	35735	35937	36144	36354	36567	36783	36999	37217	37436	37655	37874	38093	38310	38524	38735
	-37.3	-39.6	-41.9	-44.1	-46.1	-47.8	-49.3	-50.5	-51.4	-51.9	-52.2	-52.2	-52.0	-51.8	-51.5	-51.3	-51.3	-51.5	-52.0
12	34408	34547	34695	34850	35012	35179	35351	35527	35706	35887	36070	36256	36443	36631	36820	37010	37199	37387	37573
	-38.7	-41.0	-43.1	-45.1	-46.9	-48.5	-49.8	-50.7	-51.3	-51.6	-51.6	-51.3	-50.9	-50.4	-49.8	-49.4	-49.1	-49.0	-49.3
10	33894	33998	34111	34230	34356	34488	34624	34765	34909	35056	35206	35358	35513	35670	35828	35988	36149	36310	36469
	-40.0	-42.1	-44.1	-45.9	-47.5	-48.9	-50.0	-50.7	-51.1	-51.1	-50.9	-50.4	-49.8	-49.0	-48.3	-47.6	-47.1	-46.8	-46.9
8	33456	33525	33601	33685	33775	33871	33971	34076	34185	34298	34414	34533	34655	34780	34908	35038	35169	35302	35434
	-41.0	-43.0	-44.8	-46.5	-47.9	-49.1	-50.0	-50.5	-50.7	-50.6	-50.2	-49.6	-48.8	-47.9	-46.9	-46.1	-45.4	-44.9	-44.7
6	33100	33133	33174	33222	33275	33335	33400	33469	33543	33621	33703	33789	33878	33972	34068	34168	34270	34374	34478
	-41.8	-43.6	-45.3	-46.8	-48.1	-49.1	-49.8	-50.1	-50.2	-50.0	-49.5	-48.7	-47.8	-46.8	-45.8	-44.9	-44.0	-43.4	-43.0
4	32834	32831	32836	32848	32865	32889	32917	32951	32990	33034	33082	33135	33192	33253	33319	33388	33460	33535	33611
	-42.5	-44.1	-45.6	-46.9	-48.0	-48.8	-49.4	-49.7	-49.6	-49.3	-48.8	-48.0	-47.1	-46.0	-45.0	-43.9	-43.0	-42.3	-41.8
2	32663	32625	32594	32569	32551	32539	32532	32531	32535	32544	32559	32578	32603	32633	32668	32706	32748	32793	32840
	-42.9	-44.4	-45.6	-46.8	-47.7	-48.4	-48.9	-49.1	-49.0	-48.7	-48.1	-47.4	-46.5	-45.4	-44.4	-43.3	-42.4	-41.6	-40.9
0	32592	32520	32453	32393	32339	32291	32249	32213	32182	32158	32140	32127	32120	32118	32122	32130	32142	32157	32174
	-43.3	-44.4	-45.5	-46.5	-47.3	-47.9	-48.3	-48.4	-48.3	-48.0	-47.5	-46.8	-46.0	-45.1	-44.1	-43.0	-42.1	-41.2	-40.5

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	-108	-106	-104	-102	-100	-98	-96	-94	-92	-90	-88	-86	-84	-82	-80	-78	-76	-74	-72
30	49045	49375	49684	49971	50231	50463	50663	50829	50959	51049	51097	51101	51059	50971	50836	50653	50422	50145	49824
	-70.6	-73.2	-76.1	-79.2	-82.5	-86.0	-89.7	-93.6	-97.6	-101.7	-105.8	-109.8	-113.8	-117.5	-121.0	-124.1	-126.8	-129.1	-130.8
28	47734	48057	48361	48644	48903	49134	49336	49504	49638	49733	49788	49800	49768	49690	49565	49393	49174	48910	48601
	-69.6	-72.2	-75.0	-78.0	-81.3	-84.9	-88.7	-92.7	-96.8	-101.1	-105.4	-109.7	-113.8	-117.8	-121.5	-124.9	-127.9	-130.4	-132.3
26	46414	46728	47024	47300	47554	47782	47982	48151	48287	48386	48446	48465	48441	48373	48258	48098	47892	47640	47344
	-68.1	-70.5	-73.2	-76.1	-79.4	-82.9	-86.8	-90.9	-95.1	-99.5	-104.0	-108.5	-112.8	-117.0	-120.9	-124.5	-127.7	-130.5	-132.7
24	45093	45394	45679	45946	46192	46415	46612	46779	46915	47016	47080	47105	47088	47028	46925	46776	46582	46344	46063
	-66.1	-68.3	-70.8	-73.6	-76.8	-80.3	-84.2	-88.3	-92.6	-97.1	-101.7	-106.3	-110.8	-115.2	-119.3	-123.1	-126.5	-129.4	-131.8
22	43778	44063	44335	44591	44827	45042	45233	45397	45531	45633	45699	45728	45718	45666	45573	45435	45255	45031	44765
	-63.6	-65.6	-67.9	-70.6	-73.7	-77.1	-80.9	-85.0	-89.4	-93.9	-98.6	-103.3	-107.9	-112.4	-116.6	-120.5	-124.1	-127.2	-129.9
20	42476	42744	43001	43242	43467	43672	43856	44014	44144	44245	44312	44344	44339	44295	44211	44085	43917	43707	43456
	-60.9	-62.6	-64.7	-67.2	-70.1	-73.5	-77.2	-81.2	-85.6	-90.1	-94.8	-99.5	-104.1	-108.7	-113.0	-117.1	-120.8	-124.1	-126.9
18	41196	41445	41684	41910	42121	42314	42488	42639	42764	42862	42929	42963	42962	42924	42848	42732	42577	42381	42146
	-57.9	-59.4	-61.3	-63.6	-66.3	-69.5	-73.1	-77.0	-81.3	-85.8	-90.4	-95.1	-99.7	-104.3	-108.7	-112.8	-116.6	-120.0	-122.9
16	39946	40174	40393	40602	40797	40977	41140	41281	41400	41493	41558	41593	41594	41562	41493	41387	41243	41060	40840
	-55.0	-56.2	-57.8	-59.9	-62.4	-65.4	-68.8	-72.6	-76.7	-81.1	-85.6	-90.2	-94.8	-99.3	-103.7	-107.8	-111.6	-115.1	-118.2
14	38735	38940	39139	39328	39507	39672	39821	39952	40062	40149	40210	40243	40246	40217	40154	40056	39922	39752	39545
	-52.0	-53.0	-54.4	-56.2	-58.5	-61.3	-64.5	-68.1	-72.0	-76.2	-80.5	-85.0	-89.5	-93.9	-98.2	-102.3	-106.1	-109.6	-112.7
12	37573	37754	37931	38100	38259	38407	38542	38660	38760	38838	38894	38924	38926	38899	38840	38748	38623	38464	38270
	-49.3	-50.0	-51.1	-52.7	-54.7	-57.2	-60.2	-63.6	-67.3	-71.2	-75.4	-79.6	-84.0	-88.2	-92.4	-96.4	-100.2	-103.7	-106.8
10	36469	36626	36779	36926	37065	37195	37312	37416	37503	37572	37620	37644	37643	37615	37559	37472	37353	37203	37021
	-46.9	-47.3	-48.1	-49.4	-51.2	-53.5	-56.2	-59.2	-62.7	-66.4	-70.3	-74.3	-78.4	-82.5	-86.5	-90.3	-94.0	-97.4	-100.6
8	35434	35565	35693	35817	35934	36044	36143	36230	36303	36359	36396	36413	36407	36376	36319	36234	36120	35977	35804
	-44.7	-44.9	-45.5	-46.6	-48.1	-50.0	-52.4	-55.2	-58.3	-61.7	-65.3	-69.1	-72.9	-76.7	-80.5	-84.2	-87.7	-91.1	-94.2
6	34478	34582	34684	34783	34877	34965	35044	35112	35168	35209	35234	35240	35226	35189	35129	35044	34932	34793	34627
	-43.0	-43.0	-43.4	-44.2	-45.4	-47.0	-49.1	-51.5	-54.3	-57.4	-60.6	-64.1	-67.6	-71.2	-74.7	-78.2	-81.6	-84.8	-87.8
4	33611	33687	33762	33835	33904	33967	34024	34071	34107	34131	34140	34133	34108	34063	33997	33908	33795	33658	33497
	-41.8	-41.6	-41.7	-42.2	-43.2	-44.5	-46.2	-48.3	-50.7	-53.4	-56.3	-59.4	-62.7	-65.9	-69.2	-72.4	-75.6	-78.6	-81.5
2	32840	32887	32935	32980	33023	33060	33092	33116	33130	33134	33125	33101	33062	33005	32929	32834	32717	32579	32420
	-40.9	-40.6	-40.5	-40.8	-41.4	-42.4	-43.8	-45.5	-47.6	-49.9	-52.5	-55.2	-58.1	-61.1	-64.0	-67.0	-69.9	-72.8	-75.5
0	32174	32192	32210	32227	32241	32251	32256	32255	32245	32225	32195	32151	32095	32023	31934	31829	31705	31563	31403
	-40.5	-40.0	-39.8	-39.8	-40.2	-40.9	-41.9	-43.3	-45.0	-46.9	-49.1	-51.5	-54.0	-56.6	-59.3	-62.0	-64.7	-67.3	-69.8

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	-72	-70	-68	-66	-64	-62	-60	-58	-56	-54	-52	-50	-48	-46	-44	-42	-40	-38	-36
30	49824	49460	49058	48621	48154	47661	47148	46621	46086	45549	45016	44492	43982	43492	43025	42584	42172	41791	41443
	-130.8	-131.9	-132.5	-132.4	-131.6	-130.2	-128.1	-125.4	-122.0	-118.1	-113.5	-108.4	-102.9	-96.9	-90.7	-84.2	-77.5	-70.7	-63.9
28	48601	48249	47859	47434	46978	46496	45994	45477	44951	44423	43899	43383	42881	42399	41940	41507	41104	40731	40391
	-132.3	-133.7	-134.5	-134.6	-134.1	-132.9	-131.0	-128.4	-125.2	-121.3	-116.8	-111.8	-106.3	-100.3	-94.0	-87.4	-80.6	-73.6	-66.7
26	47344	47007	46631	46219	45777	45308	44818	44314	43800	43283	42769	42263	41772	41299	40849	40425	40031	39667	39336
	-132.7	-134.3	-135.3	-135.7	-135.4	-134.4	-132.8	-130.4	-127.4	-123.7	-119.4	-114.5	-109.0	-103.1	-96.8	-90.1	-83.2	-76.2	-69.1
24	46063	45741	45380	44984	44556	44103	43628	43137	42637	42133	41632	41138	40658	40197	39757	39344	38959	38606	38284
	-131.8	-133.7	-135.0	-135.6	-135.6	-134.9	-133.4	-131.4	-128.6	-125.1	-121.0	-116.3	-111.0	-105.2	-98.9	-92.3	-85.4	-78.2	-71.0
22	44765	44458	44113	43734	43323	42886	42428	41954	41469	40980	40493	40013	39546	39097	38669	38267	37894	37551	37241
	-129.9	-132.0	-133.5	-134.4	-134.6	-134.2	-133.1	-131.3	-128.8	-125.6	-121.7	-117.3	-112.1	-106.5	-100.3	-93.8	-86.9	-79.7	-72.4
20	43456	43166	42839	42477	42084	41665	41224	40768	40300	39828	39356	38892	38439	38004	37590	37201	36840	36510	36212
	-126.9	-129.2	-130.9	-132.0	-132.6	-132.4	-131.6	-130.2	-128.0	-125.1	-121.6	-117.3	-112.5	-107.0	-101.0	-94.5	-87.6	-80.5	-73.2
18	42146	41872	41562	41218	40844	40444	40022	39584	39135	38681	38227	37779	37343	36923	36524	36150	35803	35488	35204
	-122.9	-125.4	-127.3	-128.7	-129.5	-129.7	-129.2	-128.1	-126.2	-123.7	-120.4	-116.5	-111.9	-106.6	-100.8	-94.4	-87.7	-80.6	-73.2
16	40840	40582	40290	39964	39609	39229	38827	38408	37979	37543	37108	36679	36260	35858	35476	35118	34789	34489	34222
	-118.2	-120.8	-122.9	-124.5	-125.6	-126.0	-125.9	-125.1	-123.6	-121.3	-118.4	-114.8	-110.4	-105.4	-99.7	-93.5	-86.8	-79.8	-72.5
14	39545	39304	39028	38721	38385	38024	37642	37244	36835	36420	36005	35595	35196	34813	34450	34112	33801	33520	33273
	-112.7	-115.5	-117.8	-119.6	-120.9	-121.6	-121.7	-121.2	-120.0	-118.1	-115.5	-112.2	-108.1	-103.2	-97.8	-91.7	-85.2	-78.2	-71.0
12	38270	38043	37784	37494	37177	36836	36474	36097	35709	35315	34922	34533	34156	33793	33452	33134	32845	32587	32361
	-106.8	-109.6	-112.0	-114.0	-115.5	-116.5	-116.9	-116.6	-115.7	-114.1	-111.8	-108.7	-104.8	-100.2	-95.0	-89.1	-82.6	-75.7	-68.6
10	37021	36807	36563	36290	35991	35669	35328	34972	34605	34234	33863	33497	33142	32803	32485	32192	31926	31692	31491
	-100.6	-103.4	-105.9	-108.0	-109.6	-110.8	-111.4	-111.4	-110.8	-109.4	-107.3	-104.5	-100.8	-96.4	-91.3	-85.6	-79.2	-72.5	-65.5
8	35804	35602	35371	35114	34832	34529	34208	33873	33528	33180	32832	32491	32161	31848	31555	31288	31049	30842	30669
	-94.2	-97.0	-99.5	-101.7	-103.4	-104.7	-105.5	-105.7	-105.3	-104.1	-102.2	-99.6	-96.1	-91.9	-86.9	-81.3	-75.1	-68.5	-61.6
6	34627	34434	34216	33972	33706	33421	33119	32806	32484	32159	31836	31521	31217	30931	30666	30427	30217	30040	29896
	-87.8	-90.5	-93.0	-95.2	-97.0	-98.4	-99.3	-99.6	-99.3	-98.3	-96.6	-94.0	-90.7	-86.7	-81.8	-76.4	-70.4	-64.0	-57.3
4	33497	33311	33102	32871	32620	32351	32069	31776	31477	31176	30879	30590	30315	30057	29822	29613	29435	29288	29176
	-81.5	-84.2	-86.6	-88.8	-90.6	-92.0	-92.9	-93.3	-93.1	-92.2	-90.5	-88.1	-84.9	-80.9	-76.2	-70.9	-65.1	-58.9	-52.5
2	32420	32239	32038	31817	31579	31326	31062	30789	30513	30237	29966	29705	29458	29231	29027	28850	28704	28590	28511
	-75.5	-78.0	-80.3	-82.4	-84.2	-85.6	-86.5	-86.9	-86.6	-85.8	-84.1	-81.8	-78.6	-74.8	-70.2	-65.1	-59.5	-53.6	-47.4
0	31403	31224	31028	30815	30589	30350	30103	29851	29597	29346	29101	28869	28652	28456	28284	28140	28027	27946	27900
	-69.8	-72.2	-74.4	-76.3	-78.0	-79.3	-80.1	-80.4	-80.2	-79.3	-77.6	-75.3	-72.2	-68.4	-64.0	-59.1	-53.7	-48.1	-42.3

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	0
30	41443	41126	40842	40590	40369	40177	40014	39879	39770	39685	39625	39587	39571	39576	39601	39646	39709	39789	39886
	-63.9	-57.2	-50.7	-44.4	-38.3	-32.6	-27.3	-22.3	-17.7	-13.4	-9.6	-6.0	-2.8	0.2	2.9	5.5	7.8	10.1	12.2
28	40391	40083	39808	39565	39353	39171	39018	38893	38793	38719	38669	38641	38635	38650	38685	38739	38812	38901	39006
	-66.7	-59.8	-53.0	-46.5	-40.2	-34.2	-28.6	-23.4	-18.6	-14.2	-10.2	-6.6	-3.2	-0.2	2.6	5.2	7.6	9.8	12.0
26	39336	39037	38771	38538	38336	38164	38021	37906	37817	37754	37714	37697	37702	37727	37772	37836	37917	38015	38128
	-69.1	-62.0	-55.0	-48.3	-41.8	-35.6	-29.8	-24.5	-19.5	-14.9	-10.8	-7.0	-3.6	-0.5	2.4	5.0	7.4	9.6	11.7
24	38284	37995	37739	37516	37324	37163	37031	36927	36850	36798	36769	36764	36780	36816	36871	36945	37036	37142	37263
	-71.0	-63.8	-56.7	-49.8	-43.1	-36.8	-30.8	-25.2	-20.1	-15.4	-11.1	-7.2	-3.7	-0.6	2.3	4.9	7.2	9.4	11.4
22	37241	36963	36718	36506	36326	36177	36057	35965	35901	35861	35845	35852	35880	35927	35994	36078	36179	36294	36423
	-72.4	-65.1	-57.9	-50.8	-44.0	-37.5	-31.3	-25.6	-20.4	-15.5	-11.2	-7.2	-3.7	-0.5	2.4	5.0	7.3	9.4	11.3
20	36212	35947	35715	35516	35349	35213	35107	35030	34979	34953	34951	34972	35013	35073	35152	35247	35358	35483	35620
	-73.2	-65.8	-58.5	-51.3	-44.4	-37.7	-31.5	-25.6	-20.3	-15.3	-10.9	-6.9	-3.3	-0.1	2.8	5.3	7.6	9.6	11.4
18	35204	34953	34736	34552	34400	34280	34190	34129	34094	34085	34099	34134	34190	34264	34355	34463	34584	34719	34866
	-73.2	-65.8	-58.4	-51.2	-44.1	-37.4	-31.1	-25.1	-19.7	-14.7	-10.2	-6.2	-2.6	0.6	3.5	5.9	8.1	10.0	11.7
16	34222	33988	33788	33622	33488	33386	33315	33272	33256	33265	33296	33349	33421	33510	33615	33736	33869	34015	34172
	-72.5	-65.1	-57.7	-50.4	-43.3	-36.5	-30.1	-24.1	-18.6	-13.6	-9.1	-5.1	-1.5	1.7	4.5	6.9	9.0	10.8	12.3
14	33273	33058	32878	32732	32619	32539	32489	32467	32472	32501	32552	32624	32713	32819	32940	33074	33221	33378	33545
	-71.0	-63.6	-56.2	-48.9	-41.8	-35.0	-28.6	-22.6	-17.1	-12.2	-7.7	-3.6	-0.1	3.1	5.8	8.1	10.1	11.7	13.1
12	32361	32169	32012	31889	31800	31743	31717	31719	31748	31799	31872	31965	32073	32197	32335	32485	32645	32815	32993
	-68.6	-61.3	-53.9	-46.7	-39.6	-32.9	-26.6	-20.7	-15.3	-10.3	-5.9	-1.9	1.6	4.6	7.3	9.5	11.4	12.9	14.1
10	31491	31325	31193	31097	31034	31004	31004	31033	31086	31163	31260	31374	31504	31647	31803	31969	32144	32328	32519
	-65.5	-58.2	-51.0	-43.9	-37.0	-30.4	-24.2	-18.4	-13.1	-8.3	-4.0	-0.1	3.3	6.3	8.8	11.0	12.8	14.1	15.1
8	30669	30530	30427	30359	30326	30324	30353	30409	30490	30592	30714	30852	31003	31167	31342	31525	31717	31916	32120
	-61.6	-54.6	-47.5	-40.6	-33.9	-27.5	-21.5	-15.9	-10.8	-6.2	-2.0	1.7	5.0	7.9	10.3	12.4	14.1	15.3	16.2
6	29896	29788	29715	29678	29675	29703	29762	29847	29956	30085	30232	30394	30569	30754	30948	31150	31359	31574	31793
	-57.3	-50.4	-43.6	-36.9	-30.5	-24.4	-18.7	-13.4	-8.6	-4.2	-0.2	3.3	6.5	9.2	11.6	13.6	15.1	16.3	17.0
4	29176	29100	29059	29054	29081	29141	29229	29344	29481	29637	29810	29996	30193	30400	30615	30836	31063	31294	31530
	-52.5	-45.9	-39.4	-33.1	-27.0	-21.3	-15.9	-11.0	-6.5	-2.4	1.3	4.6	7.6	10.2	12.5	14.3	15.8	16.8	17.4
2	28511	28467	28458	28485	28544	28634	28752	28894	29059	29241	29439	29649	29869	30097	30332	30572	30818	31067	31319
	-47.4	-41.3	-35.1	-29.2	-23.6	-18.3	-13.5	-9.0	-4.8	-1.1	2.3	5.4	8.2	10.7	12.8	14.6	16.0	16.9	17.3
0	27900	27889	27912	27969	28059	28178	28324	28494	28684	28891	29112	29344	29586	29835	30089	30349	30613	30879	31148
	-42.3	-36.6	-31.0	-25.6	-20.5	-15.7	-11.4	-7.3	-3.7	-0.3	2.8	5.6	8.2	10.5	12.5	14.1	15.4	16.3	16.6

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
0	31148	31419	31688	31955	32218	32472	32716	32947	33161	33356	33530	33681	33811	33919	34007	34080	34140	34194	34248
	16.6	16.4	15.6	14.1	12.0	9.3	6.0	2.3	-1.9	-6.3	-11.0	-15.7	-20.3	-24.8	-29.0	-32.7	-36.0	-38.8	-41.1
-2	31005	31290	31574	31854	32128	32391	32643	32878	33094	33288	33459	33605	33727	33825	33902	33963	34011	34052	34094
	15.2	14.8	13.8	12.1	9.7	6.7	3.1	-1.1	-5.7	-10.6	-15.7	-20.9	-26.0	-30.8	-35.3	-39.3	-42.8	-45.7	-48.0
-4	30875	31175	31472	31763	32046	32318	32574	32813	33029	33222	33389	33528	33642	33730	33796	33845	33882	33913	33946
	12.9	12.4	11.2	9.3	6.7	3.4	-0.5	-5.1	-10.1	-15.4	-21.0	-26.5	-31.9	-37.1	-41.9	-46.1	-49.7	-52.7	-54.9
-6	30748	31060	31368	31668	31959	32236	32496	32735	32950	33139	33300	33432	33536	33615	33671	33710	33738	33761	33789
	9.8	9.2	7.9	5.8	3.0	-0.6	-4.9	-9.7	-15.1	-20.8	-26.6	-32.5	-38.3	-43.7	-48.6	-53.0	-56.7	-59.6	-61.7
-8	30614	30935	31250	31557	31852	32132	32392	32629	32841	33024	33177	33301	33396	33464	33511	33542	33562	33582	33607
	6.0	5.2	3.7	1.5	-1.6	-5.4	-9.9	-15.0	-20.6	-26.6	-32.8	-38.9	-44.8	-50.4	-55.5	-59.9	-63.5	-66.3	-68.3
-10	30463	30790	31110	31420	31716	31995	32252	32484	32689	32864	33008	33122	33207	33267	33305	33329	33346	33363	33391
	1.4	0.5	-1.2	-3.6	-6.8	-10.8	-15.5	-20.9	-26.7	-32.9	-39.2	-45.5	-51.6	-57.2	-62.3	-66.7	-70.2	-72.8	-74.5
-12	30292	30621	30941	31250	31543	31816	32067	32291	32487	32651	32785	32888	32963	33014	33045	33065	33080	33100	33134
	-3.8	-4.9	-6.7	-9.3	-12.7	-16.9	-21.8	-27.3	-33.3	-39.5	-46.0	-52.3	-58.4	-64.1	-69.0	-73.2	-76.5	-78.9	-80.1
-14	30097	30423	30739	31041	31327	31592	31832	32045	32229	32381	32503	32594	32659	32702	32729	32747	32764	32790	32835
	-9.5	-10.8	-12.8	-15.6	-19.1	-23.4	-28.5	-34.1	-40.1	-46.4	-52.9	-59.2	-65.2	-70.7	-75.5	-79.5	-82.4	-84.3	-85.2
-16	29877	30195	30502	30795	31069	31321	31547	31746	31915	32053	32162	32242	32298	32334	32358	32377	32400	32436	32496
	-15.6	-17.2	-19.4	-22.3	-26.0	-30.4	-35.5	-41.1	-47.2	-53.5	-59.8	-66.0	-71.8	-77.1	-81.6	-85.2	-87.7	-89.1	-89.4
-18	29634	29940	30233	30511	30769	31005	31215	31396	31549	31672	31767	31836	31884	31916	31939	31962	31994	32045	32125
	-22.1	-23.8	-26.2	-29.4	-33.2	-37.7	-42.8	-48.4	-54.4	-60.5	-66.7	-72.6	-78.2	-83.1	-87.2	-90.3	-92.3	-93.1	-92.8
-20	29371	29660	29936	30195	30434	30650	30840	31003	31138	31246	31327	31386	31427	31457	31483	31514	31560	31629	31733
	-28.7	-30.7	-33.3	-36.6	-40.5	-45.1	-50.2	-55.7	-61.5	-67.5	-73.4	-79.0	-84.1	-88.5	-92.1	-94.7	-96.1	-96.2	-95.2
-22	29094	29362	29616	29854	30071	30265	30434	30577	30694	30785	30854	30905	30942	30973	31005	31048	31110	31203	31336
	-35.4	-37.7	-40.5	-44.0	-48.0	-52.5	-57.5	-62.9	-68.5	-74.2	-79.7	-84.9	-89.5	-93.4	-96.4	-98.3	-99.0	-98.4	-96.6
-24	28808	29053	29283	29496	29688	29859	30006	30129	30228	30306	30364	30409	30445	30480	30522	30580	30665	30784	30949
	-42.0	-44.6	-47.7	-51.3	-55.3	-59.9	-64.8	-70.0	-75.3	-80.6	-85.7	-90.3	-94.4	-97.6	-99.9	-101.0	-101.0	-99.6	-97.1
-26	28522	28741	28945	29132	29300	29447	29572	29676	29759	29824	29875	29916	29955	29998	30054	30132	30242	30392	30592
	-48.6	-51.5	-54.8	-58.5	-62.6	-67.1	-71.8	-76.8	-81.7	-86.6	-91.2	-95.2	-98.6	-101.1	-102.6	-103.0	-102.1	-100.0	-96.6
-28	28244	28435	28613	28774	28917	29041	29146	29233	29302	29358	29405	29447	29492	29547	29621	29723	29862	30046	30284
	-55.1	-58.2	-61.7	-65.5	-69.6	-74.0	-78.6	-83.2	-87.8	-92.1	-96.1	-99.5	-102.2	-103.9	-104.6	-104.1	-102.4	-99.5	-95.3
-30	27982	28147	28299	28435	28555	28658	28745	28817	28877	28927	28973	29021	29077	29149	29245	29374	29545	29766	30043
	-61.3	-64.7	-68.4	-72.3	-76.4	-80.6	-84.9	-89.2	-93.4	-97.2	-100.5	-103.2	-105.1	-106.0	-105.9	-104.6	-102.1	-98.3	-93.4

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72
0	34248	34306	34375	34461	34570	34705	34869	35065	35293	35553	35844	36163	36506	36871	37252	37646	38048	38452	38854
	-41.1	-42.8	-44.1	-44.8	-45.1	-45.0	-44.6	-44.0	-43.2	-42.2	-41.1	-40.0	-38.7	-37.3	-35.8	-34.2	-32.3	-30.3	-28.0
-2	34094	34142	34205	34287	34395	34533	34706	34914	35159	35441	35757	36105	36481	36881	37300	37734	38176	38621	39065
	-48.0	-49.7	-50.7	-51.3	-51.3	-50.9	-50.2	-49.2	-48.0	-46.6	-45.1	-43.6	-42.0	-40.2	-38.4	-36.4	-34.3	-32.0	-29.4
-4	33946	33989	34047	34129	34241	34388	34573	34798	35065	35373	35718	36100	36512	36951	37411	37886	38371	38861	39348
	-54.9	-56.4	-57.3	-57.6	-57.2	-56.5	-55.3	-53.9	-52.2	-50.4	-48.5	-46.6	-44.5	-42.4	-40.3	-38.0	-35.5	-32.9	-30.0
-6	33789	33828	33888	33974	34095	34255	34457	34705	34998	35336	35715	36133	36585	37066	37569	38089	38620	39155	39687
	-61.7	-63.0	-63.6	-63.5	-62.8	-61.6	-60.0	-58.0	-55.8	-53.5	-51.2	-48.7	-46.3	-43.8	-41.3	-38.6	-35.9	-33.0	-29.9
-8	33607	33648	33713	33809	33944	34122	34347	34621	34946	35318	35735	36194	36689	37213	37763	38329	38907	39489	40068
	-68.3	-69.3	-69.6	-69.0	-67.9	-66.1	-63.9	-61.4	-58.7	-55.8	-52.9	-50.0	-47.1	-44.2	-41.3	-38.4	-35.4	-32.2	-28.9
-10	33391	33438	33513	33624	33777	33979	34232	34539	34898	35309	35768	36270	36811	37382	37979	38594	39220	39850	40477
	-74.5	-75.2	-75.0	-74.0	-72.2	-69.9	-67.1	-64.0	-60.7	-57.2	-53.8	-50.4	-47.0	-43.7	-40.5	-37.2	-34.0	-30.6	-27.2
-12	33134	33192	33282	33413	33591	33821	34107	34450	34849	35303	35806	36355	36943	37563	38209	38873	39548	40226	40902
	-80.1	-80.4	-79.7	-78.1	-75.8	-72.8	-69.4	-65.6	-61.7	-57.6	-53.6	-49.7	-45.9	-42.2	-38.7	-35.2	-31.7	-28.2	-24.7
-14	32835	32908	33019	33174	33382	33646	33969	34353	34795	35294	35845	36442	37079	37749	38445	39158	39883	40610	41335
	-85.2	-84.9	-83.6	-81.4	-78.4	-74.8	-70.7	-66.2	-61.6	-57.0	-52.5	-48.0	-43.8	-39.8	-36.0	-32.3	-28.7	-25.1	-21.5
-16	32496	32590	32725	32911	33152	33454	33819	34247	34736	35283	35883	36530	37217	37937	38682	39446	40219	40995	41767
	-89.4	-88.6	-86.6	-83.8	-80.1	-75.7	-70.9	-65.8	-60.6	-55.4	-50.3	-45.4	-40.8	-36.5	-32.5	-28.6	-24.9	-21.4	-17.9
-18	32125	32243	32409	32629	32909	33253	33662	34137	34674	35271	35921	36618	37356	38126	38920	39732	40553	41377	42195
	-92.8	-91.3	-88.6	-85.0	-80.6	-75.6	-70.1	-64.3	-58.5	-52.8	-47.2	-42.0	-37.1	-32.5	-28.3	-24.4	-20.7	-17.2	-13.8
-20	31733	31881	32080	32339	32660	33049	33506	34029	34617	35263	35964	36711	37498	38316	39159	40018	40885	41754	42617
	-95.2	-92.9	-89.6	-85.2	-80.1	-74.4	-68.2	-61.8	-55.5	-49.3	-43.4	-37.8	-32.6	-27.9	-23.6	-19.7	-16.1	-12.7	-9.6
-22	31336	31516	31754	32053	32420	32856	33361	33934	34571	35267	36017	36813	37647	38512	39401	40304	41215	42127	43033
	-96.6	-93.6	-89.5	-84.4	-78.6	-72.2	-65.4	-58.5	-51.7	-45.1	-38.9	-33.1	-27.8	-23.0	-18.6	-14.8	-11.3	-8.2	-5.4
-24	30949	31167	31444	31788	32201	32685	33239	33861	34547	35292	36088	36930	37810	38718	39649	40594	41546	42498	43443
	-97.1	-93.3	-88.4	-82.6	-76.1	-69.1	-61.9	-54.5	-47.3	-40.4	-34.0	-28.0	-22.7	-17.9	-13.6	-9.9	-6.7	-3.9	-1.4
-26	30592	30849	31170	31559	32019	32550	33152	33822	34555	35345	36186	37071	37991	38940	39910	40893	41881	42869	43850
	-96.6	-92.0	-86.5	-80.0	-72.9	-65.4	-57.7	-50.1	-42.6	-35.5	-28.9	-22.9	-17.6	-12.9	-8.8	-5.3	-2.4	0.1	2.2
-28	30284	30583	30947	31382	31888	32466	33114	33829	34605	35437	36319	37242	38199	39184	40188	41204	42225	43245	44257
	-95.3	-90.1	-83.8	-76.8	-69.2	-61.3	-53.3	-45.4	-37.8	-30.6	-24.0	-18.1	-12.8	-8.3	-4.5	-1.3	1.3	3.4	5.1
-30	30043	30384	30793	31272	31823	32445	33136	33892	34707	35577	36494	37450	38440	39454	40487	41532	42581	43628	44667
	-93.4	-87.5	-80.7	-73.2	-65.3	-57.1	-48.9	-40.8	-33.2	-26.0	-19.5	-13.7	-8.7	-4.4	-0.8	2.0	4.3	6.0	7.2

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108
0	38854	39249	39633	40001	40349	40673	40970	41236	41468	41666	41828	41953	42042	42096	42117	42107	42069	42006	41921
	-28.0	-25.5	-22.7	-19.6	-16.4	-12.9	-9.2	-5.5	-1.7	2.1	5.8	9.4	12.7	15.9	18.7	21.2	23.3	25.1	26.6
-2	39065	39502	39926	40334	40720	41080	41410	41708	41970	42194	42379	42525	42633	42702	42736	42737	42709	42654	42577
	-29.4	-26.5	-23.5	-20.1	-16.5	-12.8	-8.8	-4.8	-0.7	3.3	7.2	11.0	14.5	17.7	20.6	23.2	25.4	27.2	28.6
-4	39348	39828	40295	40744	41170	41569	41936	42267	42561	42814	43026	43195	43324	43412	43462	43478	43462	43418	43351
	-30.0	-26.9	-23.6	-20.0	-16.2	-12.1	-8.0	-3.7	0.5	4.7	8.8	12.7	16.4	19.7	22.7	25.3	27.5	29.3	30.7
-6	39687	40213	40724	41216	41684	42123	42528	42896	43223	43508	43749	43945	44098	44208	44278	44311	44311	44281	44227
	-29.9	-26.6	-23.0	-19.2	-15.2	-11.0	-6.7	-2.3	2.1	6.4	10.6	14.6	18.4	21.8	24.8	27.5	29.7	31.4	32.8
-8	40068	40640	41197	41733	42244	42725	43170	43576	43940	44259	44531	44757	44937	45072	45165	45219	45237	45225	45186
	-28.9	-25.4	-21.7	-17.8	-13.7	-9.4	-5.0	-0.6	3.9	8.3	12.6	16.6	20.4	23.8	26.9	29.5	31.7	33.4	34.7
-10	40477	41096	41699	42281	42837	43360	43846	44292	44694	45049	45356	45615	45825	45988	46107	46185	46225	46233	46213
	-27.2	-23.6	-19.8	-15.8	-11.7	-7.4	-3.0	1.4	5.9	10.3	14.5	18.5	22.3	25.7	28.7	31.3	33.5	35.2	36.4
-12	40902	41569	42219	42847	43447	44014	44543	45030	45472	45865	46209	46502	46745	46939	47087	47192	47257	47289	47290
	-24.7	-21.0	-17.3	-13.3	-9.3	-5.1	-0.8	3.6	7.9	12.2	16.4	20.3	24.0	27.3	30.3	32.8	34.9	36.5	37.7
-14	41335	42049	42746	43420	44065	44676	45248	45777	46260	46693	47075	47405	47683	47911	48091	48225	48319	48376	48402
	-21.5	-17.9	-14.2	-10.4	-6.5	-2.5	1.6	5.8	10.0	14.1	18.0	21.8	25.3	28.5	31.4	33.8	35.8	37.3	38.4
-16	41767	42528	43271	43991	44681	45336	45952	46524	47048	47522	47943	48312	48627	48891	49105	49272	49396	49482	49534
	-17.9	-14.4	-10.9	-7.3	-3.6	0.2	4.0	7.9	11.8	15.6	19.3	22.9	26.2	29.2	31.9	34.2	36.1	37.6	38.6
-18	42195	43002	43791	44555	45289	45988	46647	47261	47827	48342	48804	49212	49566	49867	50117	50319	50476	50592	50672
	-13.8	-10.5	-7.3	-3.9	-0.6	2.8	6.3	9.8	13.4	16.8	20.2	23.5	26.5	29.3	31.8	34.0	35.7	37.1	38.0
-20	42617	43468	44300	45108	45885	46626	47327	47983	48590	49147	49649	50098	50491	50831	51118	51355	51547	51695	51806
	-9.6	-6.6	-3.6	-0.7	2.3	5.3	8.3	11.4	14.5	17.6	20.6	23.5	26.2	28.7	31.0	33.0	34.6	35.8	36.6
-22	43033	43925	44799	45648	46465	47247	47989	48686	49334	49931	50474	50962	51395	51774	52099	52373	52600	52782	52924
	-5.4	-2.7	-0.1	2.4	4.9	7.4	9.9	12.5	15.1	17.7	20.3	22.8	25.2	27.4	29.4	31.1	32.6	33.7	34.5
-24	43443	44374	45287	46174	47030	47850	48631	49366	50054	50690	51273	51800	52273	52690	53054	53365	53627	53844	54018
	-1.4	0.9	3.0	5.1	7.0	9.0	11.0	13.0	15.1	17.2	19.3	21.4	23.4	25.2	27.0	28.5	29.8	30.8	31.5
-26	43850	44817	45764	46687	47578	48435	49251	50024	50748	51422	52043	52609	53120	53575	53976	54325	54623	54873	55079
	2.2	4.0	5.7	7.2	8.6	10.0	11.4	12.9	14.4	16.0	17.6	19.2	20.7	22.3	23.7	25.0	26.1	27.0	27.7
-28	44257	45255	46234	47188	48112	49001	49851	50657	51417	52126	52783	53385	53933	54425	54863	55247	55580	55864	56103
	5.1	6.5	7.6	8.6	9.4	10.2	11.1	11.9	12.9	13.9	15.0	16.1	17.3	18.5	19.6	20.7	21.6	22.4	23.1
-30	44667	45693	46699	47681	48633	49551	50431	51268	52059	52801	53491	54128	54710	55238	55710	56129	56496	56813	57082
	7.2	8.1	8.7	9.1	9.4	9.6	9.9	10.2	10.6	11.0	11.6	12.3	13.1	13.9	14.8	15.6	16.4	17.1	17.7

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138	140	142	144
0	41921	41818	41700	41569	41428	41279	41122	40960	40790	40615	40433	40245	40048	39844	39632	39411	39183	38949	38708
	26.6	27.7	28.5	28.9	29.1	29.1	28.8	28.3	27.7	26.9	25.9	24.9	23.8	22.6	21.3	20.0	18.6	17.1	15.6
-2	42577	42482	42371	42247	42115	41974	41828	41676	41518	41356	41187	41012	40829	40638	40439	40230	40013	39787	39555
	28.6	29.6	30.3	30.7	30.8	30.6	30.2	29.6	28.7	27.8	26.7	25.5	24.2	22.8	21.3	19.8	18.2	16.6	14.9
-4	43351	43265	43163	43049	42925	42794	42658	42516	42371	42220	42063	41901	41730	41551	41363	41165	40957	40739	40512
	30.7	31.7	32.3	32.6	32.5	32.2	31.6	30.8	29.8	28.6	27.4	25.9	24.4	22.8	21.2	19.4	17.7	15.8	14.0
-6	44227	44152	44061	43957	43844	43723	43598	43467	43332	43193	43048	42897	42737	42569	42391	42201	42001	41790	41569
	32.8	33.7	34.2	34.4	34.2	33.7	32.9	32.0	30.8	29.4	27.9	26.2	24.5	22.7	20.8	18.9	16.9	14.9	12.9
-8	45186	45126	45048	44956	44855	44746	44632	44512	44389	44260	44126	43985	43836	43677	43507	43326	43132	42926	42709
	34.7	35.6	36.0	36.0	35.7	35.1	34.1	32.9	31.5	30.0	28.2	26.4	24.4	22.3	20.2	18.1	15.9	13.8	11.7
-10	46213	46169	46107	46030	45942	45846	45743	45635	45523	45405	45281	45149	45009	44858	44696	44521	44334	44132	43918
	36.4	37.2	37.5	37.4	37.0	36.2	35.1	33.7	32.1	30.3	28.3	26.3	24.1	21.8	19.5	17.2	14.8	12.5	10.3
-12	47290	47266	47222	47161	47088	47006	46916	46820	46718	46611	46496	46373	46241	46098	45942	45773	45590	45392	45180
	37.7	38.3	38.6	38.4	37.8	36.9	35.7	34.1	32.4	30.4	28.2	25.9	23.6	21.1	18.6	16.1	13.6	11.2	8.8
-14	48402	48400	48376	48334	48278	48210	48134	48050	47959	47862	47756	47641	47516	47379	47229	47065	46886	46691	46480
	38.4	39.0	39.2	38.9	38.3	37.2	35.9	34.2	32.3	30.2	27.8	25.4	22.8	20.2	17.6	14.9	12.3	9.7	7.3
-16	49534	49556	49554	49533	49495	49443	49381	49310	49230	49142	49045	48938	48819	48687	48542	48381	48205	48012	47803
	38.6	39.1	39.2	38.9	38.2	37.0	35.6	33.8	31.8	29.6	27.2	24.6	21.9	19.2	16.4	13.6	10.9	8.3	5.8
-18	50672	50721	50744	50744	50725	50691	50644	50585	50517	50438	50348	50248	50135	50008	49866	49708	49534	49342	49134
	38.0	38.5	38.5	38.2	37.4	36.3	34.8	33.0	30.9	28.6	26.2	23.5	20.8	18.0	15.2	12.3	9.6	6.9	4.3
-20	51806	51883	51931	51954	51956	51939	51908	51862	51805	51735	51653	51558	51450	51327	51188	51032	50859	50668	50460
	36.6	37.1	37.1	36.8	36.0	34.9	33.4	31.6	29.6	27.3	24.8	22.2	19.5	16.7	13.8	11.0	8.3	5.6	3.0
-22	52924	53030	53105	53152	53174	53177	53161	53129	53082	53021	52946	52857	52753	52632	52496	52341	52169	51978	51770
	34.5	34.9	34.9	34.6	33.9	32.8	31.4	29.8	27.8	25.6	23.2	20.6	18.0	15.2	12.5	9.7	7.0	4.4	1.9
-24	54018	54154	54255	54327	54372	54393	54393	54375	54339	54287	54218	54134	54033	53915	53780	53626	53454	53263	53054
	31.5	31.9	31.9	31.7	31.1	30.1	28.9	27.3	25.5	23.5	21.2	18.8	16.3	13.7	11.0	8.4	5.8	3.3	0.8
-26	55079	55245	55375	55471	55538	55578	55595	55590	55565	55521	55459	55380	55282	55166	55031	54878	54706	54514	54304
	27.7	28.1	28.2	28.0	27.5	26.8	25.7	24.3	22.7	20.9	18.9	16.7	14.4	12.0	9.5	7.1	4.6	2.2	-0.1
-28	56103	56298	56455	56577	56665	56725	56758	56767	56753	56718	56662	56587	56492	56378	56244	56091	55918	55726	55515
	23.1	23.5	23.7	23.6	23.3	22.8	21.9	20.8	19.5	18.0	16.2	14.3	12.3	10.2	8.0	5.7	3.5	1.3	-0.9
-30	57082	57308	57492	57638	57748	57827	57877	57899	57897	57870	57821	57750	57659	57546	57413	57260	57087	56894	56682
	17.7	18.2	18.5	18.6	18.5	18.2	17.6	16.9	15.9	14.6	13.2	11.7	10.0	8.2	6.3	4.3	2.3	0.3	-1.6

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	144	146	148	150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180
0	38708	38464	38216	37967	37719	37472	37229	36990	36756	36530	36310	36097	35892	35694	35504	35321	35145	34975	34811
	15.6	14.0	12.5	10.9	9.2	7.6	5.9	4.2	2.5	0.7	-1.1	-2.9	-4.8	-6.7	-8.7	-10.7	-12.6	-14.6	-16.6
-2	39555	39316	39072	38825	38576	38326	38078	37832	37589	37349	37114	36884	36659	36440	36225	36016	35811	35612	35417
	14.9	13.2	11.5	9.8	8.1	6.3	4.6	2.9	1.2	-0.6	-2.4	-4.2	-6.0	-7.9	-9.8	-11.7	-13.7	-15.6	-17.6
-4	40512	40278	40037	39790	39539	39286	39032	38777	38523	38271	38021	37773	37528	37286	37047	36812	36579	36350	36125
	14.0	12.2	10.3	8.5	6.7	4.9	3.2	1.5	-0.3	-2.0	-3.7	-5.5	-7.2	-9.1	-10.9	-12.8	-14.8	-16.7	-18.7
-6	41569	41337	41098	40850	40597	40340	40079	39815	39550	39285	39019	38754	38489	38225	37962	37701	37441	37184	36928
	12.9	11.0	9.0	7.1	5.2	3.4	1.7	-0.1	-1.8	-3.5	-5.1	-6.8	-8.6	-10.3	-12.1	-14.0	-15.9	-17.9	-19.9
-8	42709	42480	42241	41993	41737	41474	41206	40934	40658	40379	40098	39816	39532	39247	38961	38675	38389	38104	37820
	11.7	9.6	7.5	5.5	3.6	1.8	0.0	-1.7	-3.4	-5.0	-6.6	-8.2	-9.9	-11.6	-13.4	-15.2	-17.1	-19.1	-21.1
-10	43918	43691	43452	43202	42943	42675	42400	42119	41832	41541	41245	40946	40644	40339	40031	39722	39411	39100	38789
	10.3	8.1	5.9	3.9	1.9	0.1	-1.7	-3.3	-5.0	-6.5	-8.1	-9.7	-11.3	-13.0	-14.7	-16.5	-18.4	-20.3	-22.3
-12	45180	44954	44715	44463	44200	43928	43646	43356	43059	42756	42447	42132	41813	41489	41161	40830	40496	40161	39826
	8.8	6.5	4.3	2.2	0.2	-1.6	-3.4	-5.0	-6.6	-8.1	-9.6	-11.1	-12.7	-14.3	-16.0	-17.7	-19.6	-21.6	-23.6
-14	46480	46255	46015	45761	45495	45217	44929	44631	44325	44010	43688	43360	43024	42683	42337	41986	41632	41275	40916
	7.3	4.9	2.6	0.5	-1.4	-3.3	-5.0	-6.6	-8.1	-9.6	-11.1	-12.5	-14.0	-15.6	-17.3	-19.0	-20.9	-22.8	-24.8
-16	47803	47577	47336	47081	46811	46529	46235	45930	45614	45290	44956	44615	44265	43909	43546	43177	42804	42427	42048
	5.8	3.3	1.1	-1.1	-3.0	-4.9	-6.5	-8.1	-9.6	-11.0	-12.5	-13.9	-15.4	-16.9	-18.5	-20.3	-22.1	-24.0	-26.1
-18	49134	48908	48666	48408	48135	47849	47549	47238	46915	46581	46237	45884	45523	45152	44775	44391	44001	43607	43209
	4.3	1.9	-0.4	-2.5	-4.5	-6.3	-7.9	-9.5	-11.0	-12.4	-13.7	-15.1	-16.6	-18.1	-19.7	-21.5	-23.3	-25.3	-27.3
-20	50460	50234	49990	49730	49455	49164	48860	48543	48213	47871	47519	47156	46783	46402	46011	45614	45210	44801	44388
	3.0	0.6	-1.7	-3.8	-5.7	-7.5	-9.2	-10.7	-12.1	-13.5	-14.9	-16.3	-17.8	-19.3	-20.9	-22.6	-24.5	-26.5	-28.5
-22	51770	51543	51298	51036	50758	50464	50156	49833	49498	49150	48790	48419	48037	47646	47245	46836	46420	45999	45573
	1.9	-0.5	-2.8	-4.8	-6.7	-8.5	-10.2	-11.7	-13.1	-14.5	-15.9	-17.3	-18.8	-20.4	-22.0	-23.8	-25.7	-27.7	-29.7
-24	53054	52826	52579	52316	52035	51739	51427	51101	50761	50407	50042	49664	49275	48875	48466	48049	47623	47192	46755
	0.8	-1.5	-3.6	-5.7	-7.6	-9.3	-10.9	-12.5	-13.9	-15.4	-16.8	-18.3	-19.8	-21.4	-23.1	-24.9	-26.8	-28.9	-31.0
-26	54304	54075	53827	53562	53280	52981	52666	52337	51993	51636	51266	50883	50489	50083	49668	49243	48811	48372	47928
	-0.1	-2.3	-4.4	-6.3	-8.2	-9.9	-11.5	-13.1	-14.6	-16.1	-17.6	-19.1	-20.7	-22.3	-24.1	-26.0	-28.0	-30.1	-32.2
-28	55515	55284	55036	54769	54485	54185	53868	53537	53191	52830	52457	52071	51673	51264	50844	50415	49978	49534	49084
	-0.9	-2.9	-4.9	-6.8	-8.6	-10.3	-11.9	-13.5	-15.1	-16.6	-18.2	-19.8	-21.5	-23.3	-25.1	-27.1	-29.2	-31.3	-33.5
-30	56682	56450	56201	55933	55648	55346	55029	54696	54349	53987	53612	53224	52824	52413	51991	51559	51120	50673	50221
	-1.6	-3.5	-5.4	-7.2	-8.9	-10.6	-12.2	-13.9	-15.5	-17.1	-18.8	-20.5	-22.3	-24.2	-26.1	-28.2	-30.4	-32.6	-34.8

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	180	-178	-176	-174	-172	-170	-168	-166	-164	-162	-160	-158	-156	-154	-152	-150	-148	-146	-144
0	34811	34652	34498	34348	34202	34059	33920	33784	33651	33522	33397	33277	33162	33051	32947	32849	32757	32671	32592
	-16.6	-18.5	-20.3	-22.1	-23.8	-25.4	-27.0	-28.4	-29.9	-31.3	-32.6	-34.0	-35.3	-36.6	-38.0	-39.3	-40.7	-42.0	-43.3
-2	35417	35227	35040	34858	34680	34505	34334	34167	34003	33844	33688	33537	33391	33250	33114	32984	32859	32740	32627
	-17.6	-19.5	-21.4	-23.3	-25.0	-26.7	-28.3	-29.9	-31.4	-32.7	-34.1	-35.4	-36.6	-37.8	-39.0	-40.2	-41.3	-42.4	-43.4
-4	36125	35903	35685	35471	35260	35054	34851	34652	34458	34268	34082	33901	33724	33553	33386	33224	33067	32915	32768
	-18.7	-20.7	-22.6	-24.5	-26.3	-28.1	-29.8	-31.4	-32.9	-34.3	-35.5	-36.8	-37.9	-39.0	-40.0	-40.9	-41.8	-42.7	-43.5
-6	36928	36676	36427	36181	35939	35701	35467	35238	35013	34793	34578	34367	34160	33959	33761	33568	33380	33196	33017
	-19.9	-21.9	-23.9	-25.8	-27.7	-29.5	-31.3	-32.9	-34.4	-35.7	-37.0	-38.1	-39.1	-40.0	-40.8	-41.6	-42.3	-42.9	-43.5
-8	37820	37538	37259	36983	36710	36442	36178	35919	35665	35416	35171	34931	34696	34465	34238	34015	33796	33581	33370
	-21.1	-23.1	-25.2	-27.2	-29.1	-31.0	-32.7	-34.4	-35.9	-37.2	-38.4	-39.4	-40.3	-41.0	-41.6	-42.2	-42.6	-43.0	-43.4
-10	38789	38480	38172	37867	37566	37269	36976	36689	36406	36129	35856	35588	35325	35065	34810	34558	34310	34066	33825
	-22.3	-24.4	-26.5	-28.5	-30.5	-32.4	-34.2	-35.8	-37.3	-38.6	-39.7	-40.6	-41.3	-41.9	-42.4	-42.7	-42.9	-43.1	-43.3
-12	39826	39490	39156	38824	38496	38172	37852	37537	37228	36924	36624	36330	36040	35754	35471	35192	34917	34645	34376
	-23.6	-25.7	-27.7	-29.8	-31.8	-33.8	-35.6	-37.2	-38.6	-39.9	-40.9	-41.7	-42.3	-42.7	-43.0	-43.1	-43.2	-43.1	-43.1
-14	40916	40557	40199	39842	39489	39140	38795	38455	38120	37791	37467	37147	36832	36521	36214	35910	35609	35310	35016
	-24.8	-26.9	-29.0	-31.1	-33.2	-35.1	-36.9	-38.5	-39.9	-41.1	-42.0	-42.7	-43.2	-43.5	-43.6	-43.5	-43.3	-43.1	-42.9
-16	42048	41668	41288	40909	40533	40161	39793	39430	39072	38720	38373	38031	37693	37359	37028	36701	36377	36055	35736
	-26.1	-28.2	-30.3	-32.4	-34.4	-36.4	-38.2	-39.7	-41.1	-42.2	-43.1	-43.7	-44.0	-44.1	-44.0	-43.8	-43.5	-43.1	-42.6
-18	43209	42810	42411	42012	41616	41224	40835	40452	40073	39700	39332	38970	38611	38257	37906	37558	37213	36870	36530
	-27.3	-29.4	-31.5	-33.6	-35.7	-37.6	-39.4	-40.9	-42.2	-43.3	-44.0	-44.5	-44.7	-44.7	-44.5	-44.1	-43.6	-43.0	-42.4
-20	44388	43973	43557	43141	42727	42317	41910	41509	41112	40721	40335	39954	39578	39205	38836	38470	38107	37747	37388
	-28.5	-30.6	-32.8	-34.9	-36.9	-38.8	-40.5	-42.0	-43.3	-44.2	-44.9	-45.3	-45.4	-45.2	-44.9	-44.3	-43.6	-42.9	-42.2
-22	45573	45144	44714	44284	43856	43430	43009	42592	42180	41773	41372	40975	40583	40196	39811	39430	39052	38676	38303
	-29.7	-31.9	-34.0	-36.1	-38.1	-40.0	-41.6	-43.1	-44.3	-45.2	-45.8	-46.0	-46.0	-45.8	-45.3	-44.6	-43.8	-42.9	-42.0
-24	46755	46316	45874	45433	44993	44555	44121	43691	43267	42847	42433	42024	41620	41220	40823	40430	40039	39651	39265
	-31.0	-33.1	-35.2	-37.3	-39.3	-41.1	-42.8	-44.2	-45.3	-46.1	-46.6	-46.8	-46.7	-46.3	-45.7	-44.9	-43.9	-42.9	-41.9
-26	47928	47480	47030	46580	46131	45684	45240	44801	44366	43937	43513	43094	42680	42270	41864	41462	41062	40664	40268
	-32.2	-34.4	-36.5	-38.6	-40.6	-42.4	-44.0	-45.3	-46.4	-47.1	-47.5	-47.6	-47.4	-46.9	-46.2	-45.3	-44.2	-43.1	-41.9
-28	49084	48631	48175	47719	47263	46810	46360	45913	45472	45036	44605	44179	43758	43342	42929	42520	42113	41708	41305
	-33.5	-35.7	-37.8	-39.9	-41.9	-43.7	-45.2	-46.5	-47.5	-48.2	-48.6	-48.6	-48.3	-47.7	-46.9	-45.9	-44.7	-43.5	-42.2
-30	50221	49765	49306	48846	48387	47930	47476	47026	46580	46140	45705	45275	44850	44429	44012	43598	43187	42778	42370
	-34.8	-37.0	-39.2	-41.3	-43.3	-45.1	-46.6	-47.9	-48.8	-49.4	-49.7	-49.7	-49.3	-48.7	-47.8	-46.7	-45.4	-44.1	-42.7

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	-144	-142	-140	-138	-136	-134	-132	-130	-128	-126	-124	-122	-120	-118	-116	-114	-112	-110	-108
0	32592	32520	32453	32393	32339	32291	32249	32213	32182	32158	32140	32127	32120	32118	32122	32130	32142	32157	32174
	-43.3	-44.4	-45.5	-46.5	-47.3	-47.9	-48.3	-48.4	-48.3	-48.0	-47.5	-46.8	-46.0	-45.1	-44.1	-43.0	-42.1	-41.2	-40.5
-2	32627	32520	32418	32323	32234	32151	32074	32003	31939	31881	31830	31786	31747	31714	31687	31664	31646	31631	31618
	-43.4	-44.4	-45.3	-46.1	-46.7	-47.2	-47.6	-47.7	-47.7	-47.4	-47.0	-46.4	-45.7	-44.8	-43.9	-43.0	-42.1	-41.2	-40.4
-4	32768	32627	32491	32362	32238	32121	32010	31905	31808	31718	31634	31558	31488	31425	31367	31314	31265	31220	31176
	-43.5	-44.3	-45.0	-45.6	-46.1	-46.5	-46.8	-47.0	-47.0	-46.8	-46.5	-46.0	-45.5	-44.8	-44.0	-43.1	-42.2	-41.4	-40.6
-6	33017	32842	32674	32510	32353	32202	32058	31921	31791	31669	31554	31447	31346	31252	31164	31081	31002	30926	30852
	-43.5	-44.0	-44.5	-45.0	-45.4	-45.7	-46.0	-46.2	-46.2	-46.2	-46.0	-45.7	-45.3	-44.7	-44.1	-43.3	-42.6	-41.7	-40.9
-8	33370	33164	32963	32767	32578	32395	32218	32049	31888	31735	31589	31451	31321	31197	31079	30966	30856	30750	30644
	-43.4	-43.7	-44.1	-44.4	-44.7	-44.9	-45.2	-45.4	-45.5	-45.6	-45.5	-45.4	-45.1	-44.7	-44.2	-43.6	-42.9	-42.1	-41.4
-10	33825	33589	33357	33131	32910	32696	32489	32289	32097	31914	31738	31570	31410	31257	31109	30966	30826	30689	30553
	-43.3	-43.4	-43.6	-43.7	-43.9	-44.1	-44.3	-44.6	-44.7	-44.9	-45.0	-44.9	-44.8	-44.6	-44.2	-43.8	-43.2	-42.5	-41.7
-12	34376	34111	33850	33595	33345	33101	32865	32636	32415	32202	31998	31801	31612	31429	31252	31079	30910	30742	30574
	-43.1	-43.0	-43.0	-43.1	-43.1	-43.3	-43.5	-43.7	-43.9	-44.1	-44.3	-44.4	-44.5	-44.4	-44.2	-43.8	-43.3	-42.7	-42.0
-14	35016	34724	34437	34154	33877	33606	33342	33086	32837	32596	32364	32139	31921	31709	31503	31301	31101	30902	30703
	-42.9	-42.6	-42.5	-42.4	-42.3	-42.4	-42.5	-42.8	-43.0	-43.3	-43.6	-43.8	-43.9	-44.0	-43.9	-43.6	-43.3	-42.8	-42.1
-16	35736	35421	35110	34802	34500	34204	33914	33632	33357	33090	32830	32578	32332	32092	31857	31625	31396	31166	30935
	-42.6	-42.2	-41.9	-41.7	-41.5	-41.5	-41.6	-41.8	-42.0	-42.3	-42.7	-42.9	-43.2	-43.3	-43.4	-43.2	-43.0	-42.6	-42.0
-18	36530	36194	35860	35531	35206	34887	34574	34267	33968	33675	33390	33111	32838	32571	32307	32046	31786	31526	31263
	-42.4	-41.8	-41.3	-41.0	-40.7	-40.6	-40.6	-40.7	-41.0	-41.3	-41.6	-42.0	-42.3	-42.5	-42.6	-42.6	-42.5	-42.2	-41.8
-20	37388	37033	36681	36332	35988	35648	35313	34985	34662	34346	34036	33732	33433	33138	32847	32557	32267	31975	31680
	-42.2	-41.4	-40.8	-40.3	-39.9	-39.7	-39.6	-39.7	-39.9	-40.1	-40.5	-40.9	-41.2	-41.5	-41.7	-41.8	-41.8	-41.6	-41.3
-22	38303	37931	37563	37198	36836	36478	36125	35776	35433	35095	34762	34433	34109	33787	33468	33149	32828	32506	32179
	-42.0	-41.1	-40.3	-39.7	-39.2	-38.8	-38.6	-38.6	-38.7	-39.0	-39.3	-39.7	-40.1	-40.4	-40.7	-40.9	-40.9	-40.9	-40.7
-24	39265	38881	38499	38120	37743	37369	36999	36633	36271	35912	35557	35206	34857	34509	34162	33814	33465	33111	32752
	-41.9	-40.9	-39.9	-39.1	-38.5	-38.0	-37.7	-37.6	-37.7	-37.9	-38.1	-38.5	-38.9	-39.3	-39.6	-39.9	-40.1	-40.2	-40.2
-26	40268	39874	39481	39090	38701	38314	37930	37548	37168	36791	36415	36042	35669	35296	34923	34547	34167	33783	33392
	-41.9	-40.8	-39.7	-38.8	-38.0	-37.4	-37.0	-36.8	-36.8	-36.9	-37.1	-37.4	-37.8	-38.2	-38.6	-39.0	-39.3	-39.5	-39.7
-28	41305	40903	40502	40102	39703	39305	38908	38512	38117	37722	37328	36933	36538	36141	35741	35337	34929	34514	34091
	-42.2	-40.9	-39.7	-38.7	-37.8	-37.1	-36.5	-36.2	-36.1	-36.1	-36.3	-36.6	-36.9	-37.4	-37.8	-38.3	-38.7	-39.1	-39.4
-30	42370	41963	41556	41149	40742	40335	39927	39519	39109	38699	38287	37872	37455	37035	36610	36179	35742	35298	34844
	-42.7	-41.4	-40.1	-38.9	-37.9	-37.1	-36.4	-36.0	-35.7	-35.7	-35.8	-36.0	-36.4	-36.8	-37.3	-37.9	-38.4	-39.0	-39.5

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	-108	-106	-104	-102	-100	-98	-96	-94	-92	-90	-88	-86	-84	-82	-80	-78	-76	-74	-72
0	32174	32192	32210	32227	32241	32251	32256	32255	32245	32225	32195	32151	32095	32023	31934	31829	31705	31563	31403
	-40.5	-40.0	-39.8	-39.8	-40.2	-40.9	-41.9	-43.3	-45.0	-46.9	-49.1	-51.5	-54.0	-56.6	-59.3	-62.0	-64.7	-67.3	-69.8
-2	31618	31606	31594	31581	31566	31547	31523	31493	31456	31411	31356	31290	31213	31122	31018	30899	30766	30616	30452
	-40.4	-39.8	-39.4	-39.2	-39.3	-39.7	-40.5	-41.5	-42.8	-44.4	-46.2	-48.2	-50.4	-52.7	-55.1	-57.5	-60.0	-62.3	-64.6
-4	31176	31134	31091	31048	31001	30952	30897	30837	30771	30697	30615	30524	30422	30310	30186	30051	29904	29744	29573
	-40.6	-39.9	-39.4	-39.0	-38.9	-39.0	-39.4	-40.1	-41.1	-42.3	-43.8	-45.5	-47.4	-49.4	-51.4	-53.6	-55.7	-57.9	-59.9
-6	30852	30778	30704	30629	30550	30468	30382	30290	30192	30087	29975	29855	29727	29590	29444	29289	29125	28952	28771
	-40.9	-40.2	-39.5	-39.0	-38.7	-38.6	-38.7	-39.1	-39.8	-40.7	-41.9	-43.2	-44.8	-46.5	-48.3	-50.2	-52.1	-54.0	-55.8
-8	30644	30539	30433	30325	30214	30099	29979	29853	29721	29584	29439	29288	29131	28966	28795	28617	28433	28244	28050
	-41.4	-40.6	-39.8	-39.2	-38.7	-38.4	-38.3	-38.4	-38.8	-39.5	-40.3	-41.4	-42.7	-44.2	-45.7	-47.3	-49.0	-50.7	-52.2
-10	30553	30416	30278	30136	29991	29842	29687	29526	29360	29187	29008	28824	28634	28440	28240	28037	27831	27623	27414
	-41.7	-41.0	-40.2	-39.5	-38.8	-38.4	-38.1	-38.0	-38.2	-38.6	-39.2	-40.1	-41.1	-42.3	-43.6	-45.0	-46.5	-47.9	-49.3
-12	30574	30405	30234	30059	29879	29695	29504	29307	29105	28896	28682	28462	28239	28012	27783	27552	27321	27092	26865
	-42.0	-41.3	-40.5	-39.7	-39.0	-38.4	-38.0	-37.8	-37.8	-38.0	-38.4	-39.1	-39.9	-40.9	-42.1	-43.3	-44.5	-45.7	-46.8
-14	30703	30502	30298	30089	29875	29654	29427	29194	28954	28708	28457	28201	27942	27682	27421	27160	26903	26650	26404
	-42.1	-41.4	-40.7	-39.9	-39.2	-38.5	-38.0	-37.7	-37.6	-37.7	-38.0	-38.5	-39.2	-40.0	-41.0	-42.0	-43.0	-44.1	-45.0
-16	30935	30702	30464	30221	29971	29715	29451	29181	28903	28619	28330	28038	27743	27447	27153	26862	26577	26299	26031
	-42.0	-41.4	-40.7	-40.0	-39.3	-38.6	-38.1	-37.7	-37.5	-37.6	-37.8	-38.2	-38.8	-39.5	-40.3	-41.2	-42.1	-42.9	-43.6
-18	31263	30997	30726	30448	30163	29870	29570	29262	28946	28624	28298	27968	27636	27305	26977	26654	26340	26036	25745
	-41.8	-41.2	-40.6	-40.0	-39.3	-38.7	-38.2	-37.9	-37.7	-37.7	-37.9	-38.2	-38.8	-39.4	-40.1	-40.9	-41.7	-42.3	-42.8
-20	31680	31381	31076	30764	30443	30114	29777	29431	29078	28718	28354	27986	27618	27251	26889	26535	26191	25860	25546
	-41.3	-40.9	-40.4	-39.9	-39.4	-38.9	-38.5	-38.2	-38.0	-38.1	-38.3	-38.6	-39.1	-39.7	-40.4	-41.1	-41.7	-42.2	-42.6
-22	32179	31847	31508	31161	30805	30440	30065	29682	29292	28894	28492	28088	27683	27282	26886	26500	26126	25769	25430
	-40.7	-40.5	-40.2	-39.8	-39.4	-39.1	-38.8	-38.6	-38.6	-38.7	-39.0	-39.4	-39.9	-40.4	-41.1	-41.7	-42.2	-42.6	-42.8
-24	32752	32387	32014	31632	31240	30839	30429	30009	29581	29147	28708	28268	27828	27392	26964	26547	26144	25760	25397
	-40.2	-40.1	-39.9	-39.8	-39.6	-39.4	-39.3	-39.3	-39.4	-39.7	-40.0	-40.5	-41.0	-41.6	-42.2	-42.7	-43.2	-43.4	-43.5
-26	33392	32994	32587	32170	31744	31307	30860	30405	29941	29471	28997	28522	28048	27580	27120	26672	26242	25831	25445
	-39.7	-39.8	-39.9	-39.9	-39.9	-40.0	-40.1	-40.3	-40.5	-40.9	-41.4	-41.9	-42.5	-43.1	-43.7	-44.2	-44.6	-44.8	-44.7
-28	34091	33661	33220	32770	32309	31837	31356	30865	30366	29862	29354	28846	28340	27840	27350	26875	26417	25982	25573
	-39.4	-39.7	-40.0	-40.3	-40.5	-40.8	-41.2	-41.6	-42.0	-42.6	-43.2	-43.8	-44.5	-45.1	-45.7	-46.2	-46.5	-46.6	-46.4
-30	34844	34381	33908	33425	32930	32425	31909	31385	30854	30317	29777	29237	28701	28172	27655	27153	26670	26212	25781
	-39.5	-40.0	-40.5	-41.0	-41.5	-42.0	-42.6	-43.2	-43.9	-44.6	-45.3	-46.1	-46.8	-47.5	-48.1	-48.6	-48.8	-48.8	-48.5

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	-72	-70	-68	-66	-64	-62	-60	-58	-56	-54	-52	-50	-48	-46	-44	-42	-40	-38	-36
0	31403	31224	31028	30815	30589	30350	30103	29851	29597	29346	29101	28869	28652	28456	28284	28140	28027	27946	27900
	-69.8	-72.2	-74.4	-76.3	-78.0	-79.3	-80.1	-80.4	-80.2	-79.3	-77.6	-75.3	-72.2	-68.4	-64.0	-59.1	-53.7	-48.1	-42.3
-2	30452	30272	30079	29873	29656	29431	29200	28966	28734	28508	28290	28087	27900	27736	27597	27485	27405	27357	27344
	-64.6	-66.8	-68.8	-70.6	-72.1	-73.2	-73.9	-74.2	-73.8	-72.8	-71.1	-68.7	-65.7	-62.0	-57.7	-53.0	-47.9	-42.7	-37.4
-4	29573	29390	29197	28995	28786	28572	28356	28141	27930	27727	27537	27362	27206	27073	26966	26887	26839	26824	26841
	-59.9	-61.9	-63.7	-65.3	-66.6	-67.5	-68.1	-68.1	-67.6	-66.4	-64.7	-62.3	-59.2	-55.6	-51.5	-47.0	-42.3	-37.5	-32.6
-6	28771	28582	28387	28186	27983	27779	27576	27378	27188	27009	26844	26697	26571	26469	26393	26346	26330	26344	26391
	-55.8	-57.5	-59.1	-60.5	-61.5	-62.2	-62.6	-62.4	-61.7	-60.4	-58.5	-56.0	-53.0	-49.5	-45.5	-41.3	-37.0	-32.6	-28.3
-8	28050	27853	27653	27452	27252	27056	26865	26683	26512	26355	26215	26095	25997	25925	25879	25862	25875	25918	25991
	-52.2	-53.7	-55.1	-56.2	-57.0	-57.4	-57.5	-57.1	-56.1	-54.7	-52.6	-50.1	-47.1	-43.7	-39.9	-36.0	-32.1	-28.2	-24.4
-10	27414	27205	26998	26795	26597	26406	26225	26057	25904	25767	25651	25557	25486	25442	25424	25435	25474	25543	25640
	-49.3	-50.5	-51.6	-52.4	-52.9	-53.1	-52.9	-52.2	-51.1	-49.4	-47.2	-44.6	-41.6	-38.3	-34.8	-31.2	-27.6	-24.2	-21.1
-12	26865	26642	26426	26218	26019	25832	25660	25503	25366	25248	25153	25083	25037	25018	25027	25063	25126	25217	25335
	-46.8	-47.8	-48.6	-49.2	-49.5	-49.4	-48.8	-47.9	-46.5	-44.6	-42.3	-39.7	-36.7	-33.5	-30.2	-26.9	-23.8	-20.9	-18.3
-14	26404	26166	25938	25722	25521	25336	25169	25023	24899	24798	24722	24673	24650	24654	24685	24744	24829	24939	25075
	-45.0	-45.7	-46.3	-46.6	-46.5	-46.2	-45.4	-44.1	-42.5	-40.4	-38.0	-35.3	-32.4	-29.3	-26.2	-23.3	-20.5	-18.1	-16.1
-16	26031	25775	25534	25309	25103	24918	24755	24616	24503	24416	24357	24326	24323	24347	24399	24477	24580	24707	24856
	-43.6	-44.2	-44.5	-44.5	-44.2	-43.5	-42.5	-41.0	-39.1	-36.9	-34.3	-31.6	-28.7	-25.7	-22.9	-20.2	-17.9	-15.9	-14.4
-18	25745	25471	25214	24979	24766	24578	24416	24282	24178	24103	24057	24042	24055	24097	24165	24259	24377	24518	24678
	-42.8	-43.2	-43.2	-43.0	-42.4	-41.5	-40.1	-38.4	-36.3	-33.9	-31.3	-28.5	-25.6	-22.8	-20.2	-17.8	-15.8	-14.2	-13.1
-20	25546	25251	24978	24730	24508	24316	24153	24022	23923	23856	23822	23818	23845	23900	23983	24090	24219	24370	24539
	-42.6	-42.7	-42.5	-42.1	-41.2	-40.0	-38.4	-36.5	-34.2	-31.7	-28.9	-26.1	-23.2	-20.5	-18.1	-16.0	-14.3	-13.1	-12.4
-22	25430	25115	24824	24562	24330	24131	23965	23834	23738	23677	23650	23655	23692	23757	23850	23966	24105	24263	24438
	-42.8	-42.7	-42.4	-41.7	-40.6	-39.2	-37.4	-35.2	-32.7	-30.0	-27.2	-24.3	-21.6	-19.0	-16.6	-14.7	-13.3	-12.4	-12.0
-24	25397	25060	24752	24474	24231	24023	23852	23718	23622	23563	23540	23551	23594	23667	23766	23889	24033	24195	24373
	-43.5	-43.3	-42.7	-41.8	-40.6	-38.9	-36.9	-34.5	-31.9	-29.1	-26.2	-23.3	-20.5	-18.0	-15.8	-14.1	-12.8	-12.1	-12.0
-26	25445	25087	24760	24467	24210	23992	23814	23675	23576	23517	23494	23507	23553	23629	23731	23857	24003	24167	24345
	-44.7	-44.3	-43.6	-42.5	-41.0	-39.2	-37.0	-34.5	-31.7	-28.8	-25.8	-22.9	-20.2	-17.7	-15.6	-14.0	-12.9	-12.3	-12.4
-28	25573	25194	24848	24539	24269	24039	23851	23706	23601	23538	23513	23524	23569	23645	23747	23872	24017	24179	24354
	-46.4	-45.9	-45.0	-43.7	-42.1	-40.1	-37.7	-35.0	-32.2	-29.2	-26.1	-23.2	-20.4	-18.0	-16.0	-14.4	-13.4	-13.0	-13.2
-30	25781	25382	25018	24693	24408	24166	23967	23812	23699	23629	23598	23605	23645	23716	23814	23936	24076	24233	24403
	-48.5	-47.8	-46.8	-45.4	-43.6	-41.5	-39.0	-36.2	-33.2	-30.1	-27.1	-24.1	-21.4	-18.9	-16.9	-15.4	-14.5	-14.1	-14.4

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	0
0	27900	27889	27912	27969	28059	28178	28324	28494	28684	28891	29112	29344	29586	29835	30089	30349	30613	30879	31148
	-42.3	-36.6	-31.0	-25.6	-20.5	-15.7	-11.4	-7.3	-3.7	-0.3	2.8	5.6	8.2	10.5	12.5	14.1	15.4	16.3	16.6
-2	27344	27364	27418	27505	27623	27769	27941	28135	28348	28578	28820	29073	29335	29603	29876	30154	30436	30720	31005
	-37.4	-32.1	-27.0	-22.2	-17.7	-13.6	-9.8	-6.3	-3.1	-0.2	2.6	5.1	7.4	9.5	11.4	13.0	14.2	14.9	15.2
-4	26841	26891	26974	27089	27232	27402	27597	27813	28046	28295	28556	28827	29107	29392	29683	29978	30275	30575	30875
	-32.6	-27.9	-23.5	-19.3	-15.4	-11.9	-8.7	-5.8	-3.1	-0.7	1.7	3.9	6.0	7.9	9.6	11.0	12.1	12.8	12.9
-6	26391	26469	26578	26716	26882	27074	27287	27521	27772	28037	28313	28600	28894	29194	29500	29809	30121	30435	30748
	-28.3	-24.2	-20.4	-16.9	-13.7	-10.8	-8.3	-6.0	-3.8	-1.8	0.1	2.0	3.8	5.5	7.0	8.3	9.3	9.8	9.8
-8	25991	26094	26226	26386	26571	26779	27008	27256	27520	27797	28086	28384	28690	29003	29320	29641	29965	30290	30614
	-24.4	-20.9	-17.8	-15.0	-12.5	-10.3	-8.4	-6.7	-5.1	-3.6	-2.1	-0.5	1.0	2.4	3.8	4.9	5.7	6.1	6.0
-10	25640	25765	25916	26093	26293	26515	26756	27015	27288	27574	27871	28178	28492	28813	29139	29468	29800	30132	30463
	-21.1	-18.2	-15.8	-13.6	-11.8	-10.4	-9.1	-8.0	-6.9	-5.8	-4.8	-3.6	-2.4	-1.2	-0.1	0.8	1.5	1.7	1.4
-12	25335	25478	25646	25837	26049	26281	26530	26795	27074	27365	27667	27978	28296	28622	28952	29286	29622	29958	30292
	-18.3	-16.1	-14.2	-12.8	-11.7	-10.8	-10.2	-9.6	-9.1	-8.5	-7.8	-7.1	-6.2	-5.3	-4.5	-3.8	-3.3	-3.3	-3.8
-14	25075	25233	25414	25615	25835	26073	26327	26595	26876	27169	27471	27783	28103	28428	28759	29094	29430	29765	30097
	-16.1	-14.4	-13.2	-12.4	-11.9	-11.7	-11.6	-11.6	-11.6	-11.5	-11.2	-10.8	-10.3	-9.8	-9.2	-8.8	-8.6	-8.8	-9.5
-16	24856	25027	25217	25426	25652	25892	26147	26415	26695	26986	27286	27595	27911	28233	28561	28891	29222	29552	29877
	-14.4	-13.3	-12.6	-12.4	-12.4	-12.8	-13.2	-13.7	-14.2	-14.6	-14.8	-14.8	-14.7	-14.5	-14.2	-14.1	-14.2	-14.7	-15.6
-18	24678	24858	25056	25269	25496	25738	25991	26256	26532	26817	27112	27414	27723	28038	28357	28679	29000	29320	29634
	-13.1	-12.5	-12.4	-12.6	-13.2	-14.0	-15.0	-16.0	-16.9	-17.7	-18.3	-18.8	-19.1	-19.2	-19.4	-19.6	-20.1	-20.8	-22.1
-20	24539	24725	24927	25142	25370	25609	25859	26118	26387	26664	26950	27242	27541	27844	28152	28460	28768	29073	29371
	-12.4	-12.2	-12.4	-13.1	-14.2	-15.4	-16.8	-18.2	-19.6	-20.8	-21.9	-22.8	-23.5	-24.0	-24.6	-25.2	-26.0	-27.1	-28.7
-22	24438	24628	24831	25046	25271	25506	25750	26002	26261	26528	26802	27082	27367	27656	27947	28239	28529	28815	29094
	-12.0	-12.1	-12.8	-13.8	-15.2	-16.9	-18.6	-20.4	-22.2	-23.8	-25.3	-26.6	-27.8	-28.8	-29.8	-30.8	-32.0	-33.5	-35.4
-24	24373	24564	24766	24979	25200	25429	25665	25908	26156	26411	26671	26935	27204	27475	27748	28020	28289	28553	28808
	-12.0	-12.4	-13.3	-14.7	-16.4	-18.3	-20.4	-22.6	-24.7	-26.7	-28.6	-30.4	-31.9	-33.4	-34.9	-36.4	-38.0	-39.8	-42.0
-26	24345	24534	24734	24943	25158	25379	25605	25837	26073	26313	26557	26805	27055	27306	27557	27807	28052	28292	28522
	-12.4	-13.0	-14.1	-15.7	-17.6	-19.8	-22.2	-24.7	-27.1	-29.5	-31.8	-33.9	-36.0	-37.9	-39.8	-41.8	-43.8	-46.1	-48.6
-28	24354	24540	24735	24937	25144	25356	25572	25791	26013	26238	26465	26694	26923	27153	27381	27606	27827	28040	28244
	-13.2	-13.9	-15.2	-16.9	-19.0	-21.4	-24.0	-26.7	-29.5	-32.2	-34.9	-37.4	-39.9	-42.3	-44.6	-47.0	-49.5	-52.2	-55.1
-30	24403	24583	24771	24964	25162	25363	25567	25772	25979	26187	26396	26605	26813	27020	27224	27425	27619	27806	27982
	-14.4	-15.2	-16.5	-18.4	-20.6	-23.1	-25.9	-28.8	-31.8	-34.9	-37.9	-40.8	-43.7	-46.5	-49.3	-52.1	-55.0	-58.1	-61.3

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	180	-178	-176	-174	-172	-170	-168	-166	-164	-162	-160	-158	-156	-154	-152	-150	-148	-146	-144
-30	50221	49765	49306	48846	48387	47930	47476	47026	46580	46140	45705	45275	44850	44429	44012	43598	43187	42778	42370
	-34.8	-37.0	-39.2	-41.3	-43.3	-45.1	-46.6	-47.9	-48.8	-49.4	-49.7	-49.7	-49.3	-48.7	-47.8	-46.7	-45.4	-44.1	-42.7
-32	51336	50879	50420	49959	49500	49041	48586	48135	47688	47246	46809	46377	45950	45528	45109	44693	44280	43868	43457
	-36.2	-38.5	-40.8	-42.9	-44.8	-46.6	-48.1	-49.3	-50.3	-50.8	-51.1	-51.0	-50.6	-49.9	-48.9	-47.8	-46.5	-45.1	-43.6
-34	52427	51972	51515	51057	50599	50142	49688	49238	48792	48351	47915	47484	47058	46635	46217	45801	45387	44975	44563
	-37.8	-40.1	-42.4	-44.5	-46.5	-48.3	-49.8	-51.0	-51.9	-52.5	-52.7	-52.6	-52.1	-51.4	-50.4	-49.2	-47.9	-46.4	-44.9
-36	53495	53045	52592	52138	51684	51231	50781	50335	49892	49454	49021	48593	48169	47749	47332	46918	46505	46094	45682
	-39.4	-41.8	-44.2	-46.4	-48.4	-50.1	-51.7	-52.9	-53.8	-54.3	-54.6	-54.4	-54.0	-53.3	-52.3	-51.1	-49.7	-48.3	-46.7
-38	54541	54097	53651	53203	52755	52309	51865	51424	50987	50554	50126	49702	49282	48865	48452	48041	47630	47220	46810
	-41.2	-43.7	-46.1	-48.3	-50.4	-52.2	-53.7	-55.0	-55.9	-56.5	-56.7	-56.6	-56.2	-55.5	-54.5	-53.3	-52.0	-50.6	-49.0
-40	55565	55130	54692	54252	53813	53374	52938	52505	52075	51649	51227	50808	50394	49982	49573	49166	48759	48351	47942
	-43.2	-45.7	-48.2	-50.5	-52.6	-54.4	-56.0	-57.3	-58.2	-58.8	-59.1	-59.1	-58.7	-58.1	-57.2	-56.0	-54.8	-53.4	-51.9
-42	56568	56142	55714	55285	54855	54427	54000	53576	53154	52736	52322	51911	51503	51097	50693	50290	49887	49482	49075
	-45.3	-47.9	-50.4	-52.8	-54.9	-56.8	-58.5	-59.8	-60.8	-61.5	-61.8	-61.8	-61.6	-61.0	-60.2	-59.2	-58.0	-56.6	-55.2
-44	57548	57134	56718	56300	55882	55465	55049	54635	54223	53815	53409	53005	52604	52205	51807	51409	51009	50608	50204
	-47.5	-50.3	-52.8	-55.2	-57.4	-59.4	-61.1	-62.5	-63.6	-64.3	-64.7	-64.9	-64.7	-64.2	-63.5	-62.6	-61.6	-60.4	-59.1
-46	58504	58103	57700	57295	56890	56485	56081	55678	55278	54879	54482	54088	53694	53302	52910	52517	52122	51724	51322
	-50.0	-52.7	-55.4	-57.8	-60.1	-62.1	-63.8	-65.3	-66.5	-67.3	-67.9	-68.1	-68.1	-67.7	-67.2	-66.4	-65.5	-64.5	-63.3
-48	59432	59046	58657	58266	57875	57483	57092	56702	56312	55924	55538	55152	54767	54382	53996	53608	53218	52823	52424
	-52.5	-55.3	-58.0	-60.5	-62.8	-64.9	-66.7	-68.2	-69.5	-70.4	-71.1	-71.5	-71.6	-71.4	-71.0	-70.5	-69.7	-68.8	-67.9
-50	60328	59957	59583	59208	58831	58454	58076	57698	57321	56944	56568	56192	55815	55437	55058	54675	54290	53899	53503
	-55.2	-58.0	-60.7	-63.2	-65.5	-67.7	-69.5	-71.2	-72.5	-73.6	-74.4	-74.9	-75.2	-75.2	-75.0	-74.6	-74.1	-73.4	-72.6
-52	61184	60829	60472	60112	59751	59388	59025	58660	58296	57931	57565	57198	56830	56460	56087	55711	55331	54944	54552
	-57.9	-60.7	-63.4	-65.9	-68.3	-70.4	-72.4	-74.1	-75.5	-76.7	-77.6	-78.3	-78.7	-78.9	-78.9	-78.7	-78.4	-77.9	-77.4
-54	61991	61654	61314	60971	60625	60278	59929	59579	59227	58874	58519	58162	57803	57441	57076	56706	56331	55950	55561
	-60.7	-63.4	-66.1	-68.6	-70.9	-73.1	-75.1	-76.9	-78.4	-79.7	-80.7	-81.6	-82.2	-82.5	-82.7	-82.8	-82.6	-82.4	-82.0
-56	62739	62421	62098	61772	61444	61112	60778	60442	60104	59763	59420	59073	58724	58371	58013	57650	57281	56906	56522
	-63.4	-66.1	-68.7	-71.2	-73.5	-75.7	-77.7	-79.5	-81.1	-82.5	-83.6	-84.6	-85.4	-85.9	-86.3	-86.5	-86.6	-86.6	-86.4
-58	63418	63118	62814	62506	62194	61879	61561	61239	60915	60587	60256	59920	59581	59237	58888	58533	58171	57802	57425
	-66.1	-68.7	-71.2	-73.6	-75.9	-78.1	-80.1	-81.9	-83.5	-85.0	-86.3	-87.3	-88.2	-89.0	-89.5	-89.9	-90.2	-90.4	-90.4
-60	64014	63734	63448	63159	62865	62566	62264	61958	61648	61333	61015	60691	60363	60029	59690	59344	58990	58629	58260
	-68.7	-71.2	-73.6	-75.9	-78.1	-80.2	-82.2	-84.0	-85.7	-87.2	-88.5	-89.7	-90.7	-91.6	-92.3	-92.9	-93.3	-93.7	-93.9

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72
-30	30043	30384	30793	31272	31823	32445	33136	33892	34707	35577	36494	37450	38440	39454	40487	41532	42581	43628	44667
	-93.4	-87.5	-80.7	-73.2	-65.3	-57.1	-48.9	-40.8	-33.2	-26.0	-19.5	-13.7	-8.7	-4.4	-0.8	2.0	4.3	6.0	7.2
-32	29886	30269	30720	31242	31835	32498	33227	34020	34869	35771	36717	37702	38718	39757	40814	41881	42953	44022	45083
	-91.2	-84.7	-77.5	-69.6	-61.4	-53.0	-44.7	-36.7	-29.1	-22.1	-15.8	-10.2	-5.4	-1.4	1.9	4.4	6.2	7.5	8.3
-34	29826	30250	30742	31303	31934	32633	33396	34219	35097	36025	36995	38002	39037	40096	41171	42255	43344	44430	45508
	-88.8	-81.9	-74.3	-66.2	-57.9	-49.5	-41.2	-33.3	-25.9	-19.1	-13.0	-7.7	-3.2	0.5	3.4	5.5	7.0	7.9	8.2
-36	29873	30335	30864	31461	32126	32855	33646	34494	35395	36342	37330	38352	39402	40474	41560	42656	43756	44854	45944
	-86.5	-79.3	-71.5	-63.3	-55.0	-46.7	-38.6	-30.9	-23.7	-17.2	-11.4	-6.4	-2.2	1.1	3.6	5.4	6.5	7.0	6.9
-38	30034	30531	31093	31721	32413	33167	33980	34847	35763	36724	37723	38755	39812	40891	41984	43086	44191	45294	46391
	-84.6	-77.2	-69.3	-61.2	-53.0	-44.9	-37.0	-29.6	-22.8	-16.6	-11.1	-6.5	-2.7	0.3	2.4	3.9	4.6	4.8	4.4
-40	30311	30839	31429	32082	32796	33569	34397	35277	36203	37171	38174	39209	40268	41348	42441	43543	44648	45752	46850
	-83.2	-75.8	-68.0	-60.1	-52.1	-44.3	-36.7	-29.7	-23.2	-17.4	-12.4	-8.1	-4.7	-2.0	-0.2	0.9	1.4	1.2	0.5
-42	30704	31257	31871	32543	33273	34059	34896	35781	36711	37679	38682	39713	40768	41843	42930	44027	45127	46226	47320
	-82.6	-75.3	-67.7	-60.0	-52.4	-44.9	-37.8	-31.2	-25.1	-19.7	-15.1	-11.2	-8.1	-5.8	-4.2	-3.4	-3.2	-3.6	-4.5
-44	31209	31782	32413	33099	33839	34631	35471	36356	37283	38246	39241	40264	41310	42373	43450	44536	45625	46714	47799
	-82.8	-75.7	-68.5	-61.1	-53.9	-46.9	-40.2	-34.1	-28.5	-23.5	-19.2	-15.7	-12.9	-10.9	-9.6	-9.0	-8.9	-9.5	-10.5
-46	31819	32408	33050	33743	34487	35280	36117	36997	37915	38867	39850	40859	41889	42937	43998	45067	46141	47215	48285
	-83.9	-77.1	-70.3	-63.4	-56.6	-50.1	-43.9	-38.2	-33.1	-28.5	-24.7	-21.5	-19.0	-17.2	-16.1	-15.7	-15.8	-16.4	-17.5
-48	32529	33127	33774	34470	35212	35999	36828	37696	38601	39537	40502	41492	42502	43529	44569	45617	46671	47725	48776
	-85.7	-79.4	-73.0	-66.6	-60.4	-54.4	-48.8	-43.6	-38.9	-34.7	-31.2	-28.4	-26.1	-24.6	-23.6	-23.3	-23.5	-24.1	-25.2
-50	33329	33931	34578	35270	36005	36782	37598	38450	39335	40251	41194	42159	43145	44147	45161	46184	47212	48241	49268
	-88.3	-82.5	-76.6	-70.8	-65.1	-59.6	-54.5	-49.8	-45.5	-41.8	-38.6	-36.1	-34.1	-32.7	-31.8	-31.6	-31.8	-32.4	-33.4
-52	34213	34813	35455	36138	36861	37623	38420	39251	40114	41004	41920	42858	43814	44786	45770	46763	47762	48762	49760
	-91.4	-86.1	-80.8	-75.5	-70.4	-65.5	-60.9	-56.6	-52.8	-49.5	-46.7	-44.3	-42.5	-41.3	-40.5	-40.2	-40.4	-41.0	-41.9
-54	35172	35765	36397	37067	37773	38515	39289	40095	40930	41792	42676	43582	44505	45444	46394	47353	48317	49284	50249
	-94.8	-90.1	-85.3	-80.6	-76.1	-71.7	-67.6	-63.9	-60.5	-57.5	-55.0	-52.9	-51.2	-50.1	-49.4	-49.1	-49.1	-49.6	-50.3
-56	36200	36781	37398	38050	38735	39452	40201	40978	41781	42609	43460	44329	45216	46117	47029	47949	48876	49805	50734
	-98.3	-94.2	-90.0	-85.9	-81.9	-78.1	-74.5	-71.2	-68.2	-65.5	-63.2	-61.4	-59.9	-58.8	-58.1	-57.7	-57.7	-57.9	-58.5
-58	37290	37855	38453	39082	39742	40432	41150	41894	42663	43454	44266	45097	45943	46802	47673	48552	49436	50324	51212
	-101.8	-98.2	-94.6	-91.0	-87.6	-84.2	-81.1	-78.2	-75.6	-73.2	-71.2	-69.5	-68.1	-67.1	-66.3	-65.9	-65.8	-65.9	-66.2
-60	38437	38981	39555	40159	40790	41448	42132	42841	43572	44323	45094	45882	46684	47499	48325	49158	49997	50840	51683
	-104.9	-101.9	-98.8	-95.8	-92.8	-90.0	-87.3	-84.8	-82.5	-80.4	-78.6	-77.0	-75.8	-74.7	-74.0	-73.5	-73.2	-73.1	-73.2

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108
-30	44667	45693	46699	47681	48633	49551	50431	51268	52059	52801	53491	54128	54710	55238	55710	56129	56496	56813	57082
	7.2	8.1	8.7	9.1	9.4	9.6	9.9	10.2	10.6	11.0	11.6	12.3	13.1	13.9	14.8	15.6	16.4	17.1	17.7
-32	45083	46131	47160	48166	49142	50085	50991	51856	52675	53446	54167	54835	55450	56010	56515	56967	57366	57715	58014
	8.3	8.7	8.8	8.6	8.4	8.1	7.8	7.5	7.4	7.4	7.5	7.8	8.1	8.6	9.2	9.9	10.5	11.2	11.8
-34	45508	46574	47621	48645	49641	50606	51533	52421	53265	54062	54810	55507	56151	56741	57277	57759	58189	58567	58895
	8.2	8.2	7.8	7.2	6.4	5.6	4.8	4.1	3.4	2.9	2.6	2.5	2.5	2.7	3.1	3.6	4.1	4.7	5.3
-36	45944	47022	48082	49120	50132	51112	52058	52965	53830	54649	55421	56142	56812	57429	57993	58503	58960	59366	59722
	6.9	6.5	5.7	4.6	3.4	2.2	0.9	-0.3	-1.3	-2.2	-2.9	-3.4	-3.6	-3.7	-3.5	-3.2	-2.7	-2.2	-1.5
-38	46391	47476	48544	49592	50614	51606	52565	53487	54368	55206	55997	56740	57432	58073	58661	59196	59679	60111	60491
	4.4	3.5	2.4	1.0	-0.6	-2.2	-3.8	-5.4	-6.8	-8.0	-9.0	-9.7	-10.2	-10.5	-10.5	-10.3	-9.9	-9.3	-8.6
-40	46850	47937	49008	50060	51087	52087	53055	53987	54880	55732	56539	57299	58010	58670	59280	59837	60343	60797	61200
	0.5	-0.6	-2.0	-3.7	-5.5	-7.4	-9.3	-11.1	-12.8	-14.3	-15.5	-16.5	-17.2	-17.6	-17.7	-17.6	-17.2	-16.6	-15.8
-42	47320	48403	49473	50524	51552	52554	53526	54464	55365	56226	57044	57817	58543	59220	59847	60423	60949	61423	61847
	-4.5	-5.8	-7.4	-9.3	-11.3	-13.4	-15.5	-17.5	-19.3	-21.0	-22.3	-23.4	-24.3	-24.8	-25.0	-24.9	-24.5	-23.9	-23.0
-44	47799	48874	49936	50982	52006	53005	53976	54915	55820	56686	57511	58293	59029	59719	60360	60952	61494	61985	62428
	-10.5	-12.0	-13.7	-15.7	-17.9	-20.0	-22.2	-24.3	-26.2	-27.9	-29.4	-30.5	-31.4	-31.9	-32.1	-32.0	-31.6	-31.0	-30.0
-46	48285	49347	50397	51432	52447	53439	54405	55341	56243	57110	57937	58724	59467	60165	60816	61420	61975	62481	62939
	-17.5	-19.0	-20.8	-22.8	-24.9	-27.1	-29.3	-31.4	-33.3	-35.0	-36.4	-37.6	-38.4	-38.9	-39.1	-39.0	-38.5	-37.8	-36.8
-48	48776	49820	50853	51872	52874	53854	54809	55736	56633	57495	58321	59107	59853	60555	61213	61825	62390	62908	63378
	-25.2	-26.7	-28.4	-30.4	-32.4	-34.5	-36.6	-38.5	-40.4	-42.0	-43.4	-44.4	-45.2	-45.7	-45.8	-45.6	-45.1	-44.3	-43.1
-50	49268	50290	51301	52301	53283	54246	55187	56101	56986	57840	58659	59441	60185	60887	61547	62164	62735	63262	63742
	-33.4	-34.8	-36.4	-38.2	-40.1	-42.0	-43.9	-45.7	-47.4	-48.8	-50.1	-51.0	-51.7	-52.0	-52.1	-51.8	-51.1	-50.2	-49.0
-52	49760	50754	51740	52714	53674	54615	55536	56432	57302	58142	58950	59724	60461	61159	61817	62434	63009	63540	64028
	-41.9	-43.1	-44.5	-46.0	-47.7	-49.4	-51.1	-52.7	-54.1	-55.4	-56.4	-57.2	-57.7	-57.9	-57.8	-57.4	-56.7	-55.7	-54.4
-54	50249	51211	52166	53111	54043	54958	55854	56728	57578	58400	59192	59952	60679	61369	62021	62635	63209	63741	64233
	-50.3	-51.3	-52.5	-53.8	-55.2	-56.6	-58.0	-59.3	-60.5	-61.5	-62.3	-62.9	-63.2	-63.2	-63.0	-62.4	-61.6	-60.6	-59.2
-56	50734	51659	52579	53490	54389	55274	56141	56988	57813	58612	59384	60127	60838	61516	62158	62765	63334	63864	64356
	-58.5	-59.2	-60.1	-61.1	-62.2	-63.3	-64.4	-65.4	-66.3	-67.1	-67.6	-68.0	-68.1	-67.9	-67.5	-66.9	-66.0	-64.8	-63.4
-58	51212	52097	52978	53851	54713	55562	56396	57212	58007	58780	59527	60248	60939	61600	62229	62824	63384	63909	64398
	-66.2	-66.7	-67.3	-68.0	-68.8	-69.6	-70.3	-71.0	-71.6	-72.0	-72.3	-72.4	-72.3	-72.0	-71.5	-70.7	-69.7	-68.5	-67.1
-60	51683	52524	53361	54192	55014	55824	56620	57400	58162	58903	59622	60316	60984	61623	62234	62814	63362	63877	64359
	-73.2	-73.4	-73.8	-74.2	-74.6	-75.1	-75.5	-75.9	-76.2	-76.4	-76.4	-76.3	-76.0	-75.5	-74.8	-73.9	-72.9	-71.6	-70.2

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138	140	142	144
-30	57082	57308	57492	57638	57748	57827	57877	57899	57897	57870	57821	57750	57659	57546	57413	57260	57087	56894	56682
	17.7	18.2	18.5	18.6	18.5	18.2	17.6	16.9	15.9	14.6	13.2	11.7	10.0	8.2	6.3	4.3	2.3	0.3	-1.6
-32	58014	58268	58479	58649	58782	58880	58946	58982	58991	58973	58931	58865	58777	58666	58534	58382	58208	58015	57802
	11.8	12.3	12.8	13.0	13.2	13.1	12.9	12.4	11.8	11.0	9.9	8.8	7.4	6.0	4.4	2.8	1.1	-0.6	-2.4
-34	58895	59176	59412	59606	59760	59878	59960	60011	60031	60023	59988	59928	59843	59735	59605	59453	59281	59087	58875
	5.3	6.0	6.5	7.0	7.4	7.6	7.7	7.6	7.4	6.9	6.3	5.6	4.6	3.6	2.4	1.1	-0.3	-1.7	-3.2
-36	59722	60029	60289	60506	60681	60817	60916	60981	61013	61015	60989	60935	60855	60751	60624	60474	60302	60110	59898
	-1.5	-0.8	-0.1	0.6	1.2	1.8	2.2	2.5	2.6	2.6	2.4	2.1	1.6	0.9	0.1	-0.8	-1.8	-3.0	-4.2
-38	60491	60822	61106	61345	61540	61695	61811	61890	61935	61948	61931	61884	61811	61712	61588	61441	61273	61083	60873
	-8.6	-7.8	-6.9	-6.0	-5.1	-4.3	-3.5	-2.9	-2.3	-2.0	-1.7	-1.6	-1.7	-1.9	-2.3	-2.9	-3.6	-4.4	-5.4
-40	61200	61554	61860	62120	62335	62508	62640	62735	62793	62818	62811	62773	62707	62615	62497	62355	62190	62004	61798
	-15.8	-14.9	-13.9	-12.8	-11.6	-10.5	-9.4	-8.4	-7.5	-6.7	-6.1	-5.6	-5.2	-5.1	-5.1	-5.3	-5.7	-6.2	-6.9
-42	61847	62221	62548	62827	63061	63252	63401	63511	63584	63622	63626	63599	63542	63457	63347	63211	63053	62872	62671
	-23.0	-22.0	-20.8	-19.5	-18.1	-16.7	-15.4	-14.0	-12.8	-11.6	-10.6	-9.7	-9.0	-8.5	-8.1	-8.0	-8.1	-8.3	-8.8
-44	62428	62821	63166	63463	63716	63924	64090	64216	64304	64355	64372	64357	64311	64237	64135	64009	63858	63686	63492
	-30.0	-28.9	-27.6	-26.1	-24.5	-22.9	-21.3	-19.6	-18.1	-16.6	-15.2	-14.0	-13.0	-12.1	-11.5	-11.0	-10.8	-10.8	-11.0
-46	62939	63349	63710	64025	64295	64520	64703	64845	64949	65015	65046	65044	65011	64949	64859	64743	64603	64440	64256
	-36.8	-35.5	-34.1	-32.4	-30.7	-28.9	-27.0	-25.2	-23.3	-21.6	-19.9	-18.5	-17.1	-16.0	-15.0	-14.3	-13.9	-13.6	-13.7
-48	63378	63802	64178	64509	64794	65036	65236	65394	65514	65596	65643	65656	65637	65589	65512	65409	65282	65131	64959
	-43.1	-41.8	-40.2	-38.5	-36.6	-34.6	-32.6	-30.5	-28.5	-26.5	-24.7	-23.0	-21.4	-20.0	-18.9	-18.0	-17.3	-16.9	-16.7
-50	63742	64177	64566	64911	65211	65468	65683	65858	65994	66093	66156	66186	66183	66151	66090	66002	65889	65754	65596
	-49.0	-47.6	-45.9	-44.1	-42.1	-40.0	-37.9	-35.7	-33.5	-31.4	-29.4	-27.5	-25.8	-24.3	-22.9	-21.8	-21.0	-20.4	-20.2
-52	64028	64471	64871	65227	65541	65812	66043	66234	66386	66502	66582	66629	66644	66629	66585	66515	66419	66300	66159
	-54.4	-52.9	-51.2	-49.3	-47.2	-45.1	-42.8	-40.6	-38.3	-36.2	-34.1	-32.1	-30.2	-28.6	-27.2	-26.0	-25.0	-24.3	-24.0
-54	64233	64682	65090	65456	65781	66065	66310	66516	66684	66817	66915	66980	67013	67017	66992	66940	66864	66763	66641
	-59.2	-57.7	-55.9	-54.0	-51.9	-49.7	-47.5	-45.2	-42.9	-40.7	-38.6	-36.6	-34.7	-33.0	-31.5	-30.3	-29.3	-28.5	-28.0
-56	64356	64808	65221	65594	65928	66224	66481	66701	66886	67035	67150	67234	67286	67309	67304	67272	67216	67136	67034
	-63.4	-61.9	-60.1	-58.2	-56.1	-53.9	-51.7	-49.5	-47.3	-45.1	-43.0	-41.0	-39.1	-37.4	-35.9	-34.7	-33.6	-32.9	-32.4
-58	64398	64850	65264	65642	65983	66287	66555	66788	66987	67152	67284	67385	67457	67499	67515	67504	67469	67411	67331
	-67.1	-65.5	-63.8	-61.9	-59.9	-57.8	-55.6	-53.5	-51.3	-49.2	-47.2	-45.2	-43.4	-41.8	-40.4	-39.1	-38.1	-37.4	-36.9
-60	64359	64807	65220	65600	65944	66255	66532	66775	66986	67165	67314	67432	67522	67584	67620	67631	67617	67581	67524
	-70.2	-68.6	-66.9	-65.1	-63.2	-61.2	-59.1	-57.1	-55.1	-53.1	-51.2	-49.4	-47.7	-46.1	-44.8	-43.6	-42.7	-41.9	-41.5

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	144	146	148	150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180
-30	56682	56450	56201	55933	55648	55346	55029	54696	54349	53987	53612	53224	52824	52413	51991	51559	51120	50673	50221
	-1.6	-3.5	-5.4	-7.2	-8.9	-10.6	-12.2	-13.9	-15.5	-17.1	-18.8	-20.5	-22.3	-24.2	-26.1	-28.2	-30.4	-32.6	-34.8
-32	57802	57570	57320	57052	56766	56465	56147	55814	55466	55104	54729	54341	53940	53529	53106	52675	52235	51788	51336
	-2.4	-4.1	-5.8	-7.5	-9.2	-10.8	-12.5	-14.1	-15.8	-17.5	-19.3	-21.1	-23.1	-25.1	-27.2	-29.4	-31.6	-33.9	-36.2
-34	58875	58643	58392	58124	57839	57538	57221	56889	56542	56181	55807	55420	55021	54611	54190	53761	53322	52878	52427
	-3.2	-4.7	-6.3	-7.9	-9.5	-11.1	-12.7	-14.4	-16.2	-18.0	-19.9	-21.8	-23.9	-26.0	-28.3	-30.6	-33.0	-35.4	-37.8
-36	59898	59667	59418	59151	58867	58567	58252	57921	57577	57218	56847	56463	56067	55660	55243	54817	54383	53942	53495
	-4.2	-5.5	-6.9	-8.3	-9.9	-11.4	-13.1	-14.8	-16.6	-18.6	-20.5	-22.6	-24.8	-27.1	-29.5	-31.9	-34.4	-36.9	-39.4
-38	60873	60644	60397	60132	59850	59553	59240	58913	58572	58217	57849	57470	57078	56676	56265	55844	55416	54981	54541
	-5.4	-6.5	-7.7	-9.0	-10.5	-12.0	-13.7	-15.4	-17.3	-19.3	-21.4	-23.6	-25.9	-28.4	-30.9	-33.4	-36.0	-38.6	-41.2
-40	61798	61572	61328	61067	60789	60496	60187	59865	59528	59178	58816	58442	58057	57662	57257	56844	56424	55997	55565
	-6.9	-7.8	-8.8	-10.0	-11.3	-12.8	-14.5	-16.2	-18.2	-20.2	-22.4	-24.8	-27.2	-29.8	-32.4	-35.1	-37.8	-40.5	-43.2
-42	62671	62451	62212	61956	61684	61396	61093	60776	60446	60103	59748	59381	59004	58617	58222	57818	57407	56990	56568
	-8.8	-9.4	-10.3	-11.3	-12.6	-14.0	-15.6	-17.4	-19.4	-21.5	-23.8	-26.2	-28.7	-31.4	-34.1	-36.9	-39.7	-42.5	-45.3
-44	63492	63279	63047	62798	62533	62252	61957	61648	61325	60991	60644	60287	59919	59542	59157	58764	58364	57958	57548
	-11.0	-11.5	-12.2	-13.1	-14.2	-15.6	-17.2	-19.0	-20.9	-23.1	-25.4	-27.9	-30.6	-33.3	-36.1	-39.0	-41.9	-44.7	-47.5
-46	64256	64052	63830	63590	63334	63062	62776	62477	62164	61840	61504	61157	60801	60436	60062	59681	59294	58901	58504
	-13.7	-13.9	-14.5	-15.3	-16.3	-17.6	-19.1	-20.9	-22.9	-25.1	-27.4	-30.0	-32.6	-35.4	-38.3	-41.2	-44.2	-47.1	-50.0
-48	64959	64767	64556	64328	64083	63823	63548	63260	62960	62647	62323	61989	61646	61294	60934	60567	60193	59815	59432
	-16.7	-16.8	-17.2	-17.9	-18.9	-20.1	-21.6	-23.3	-25.3	-27.4	-29.8	-32.3	-35.0	-37.9	-40.8	-43.7	-46.7	-49.6	-52.5
-50	65596	65418	65221	65006	64775	64528	64267	63993	63706	63407	63098	62778	62450	62112	61767	61416	61058	60695	60328
	-20.2	-20.2	-20.4	-21.0	-21.9	-23.0	-24.4	-26.1	-28.0	-30.2	-32.5	-35.0	-37.7	-40.5	-43.4	-46.4	-49.3	-52.3	-55.2
-52	66159	65997	65817	65618	65403	65172	64927	64668	64397	64115	63821	63518	63205	62885	62556	62221	61880	61534	61184
	-24.0	-23.8	-24.0	-24.5	-25.3	-26.4	-27.7	-29.3	-31.2	-33.3	-35.6	-38.0	-40.7	-43.4	-46.3	-49.2	-52.1	-55.0	-57.9
-54	66641	66498	66336	66155	65958	65746	65519	65278	65025	64760	64485	64199	63905	63602	63292	62975	62652	62324	61991
	-28.0	-27.9	-28.0	-28.4	-29.1	-30.1	-31.3	-32.9	-34.7	-36.7	-38.9	-41.3	-43.8	-46.5	-49.3	-52.1	-55.0	-57.9	-60.7
-56	67034	66911	66770	66610	66433	66240	66033	65813	65580	65335	65079	64813	64539	64256	63965	63667	63363	63054	62739
	-32.4	-32.2	-32.2	-32.6	-33.2	-34.1	-35.3	-36.7	-38.4	-40.3	-42.4	-44.7	-47.2	-49.7	-52.4	-55.1	-57.9	-60.7	-63.4
-58	67331	67230	67110	66972	66817	66647	66462	66263	66051	65828	65593	65349	65095	64833	64563	64286	64002	63713	63418
	-36.9	-36.6	-36.7	-37.0	-37.5	-38.4	-39.5	-40.8	-42.4	-44.2	-46.2	-48.3	-50.6	-53.1	-55.6	-58.2	-60.8	-63.5	-66.1
-60	67524	67446	67349	67234	67103	66956	66794	66618	66429	66229	66017	65795	65564	65324	65076	64820	64557	64288	64014
	-41.5	-41.2	-41.2	-41.5	-42.0	-42.8	-43.8	-45.0	-46.5	-48.1	-50.0	-52.0	-54.2	-56.4	-58.8	-61.2	-63.7	-66.2	-68.7

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	180	-178	-176	-174	-172	-170	-168	-166	-164	-162	-160	-158	-156	-154	-152	-150	-148	-146	-144
-30	50221	49765	49306	48846	48387	47930	47476	47026	46580	46140	45705	45275	44850	44429	44012	43598	43187	42778	42370
	-34.8	-37.0	-39.2	-41.3	-43.3	-45.1	-46.6	-47.9	-48.8	-49.4	-49.7	-49.7	-49.3	-48.7	-47.8	-46.7	-45.4	-44.1	-42.7
-32	51336	50879	50420	49959	49500	49041	48586	48135	47688	47246	46809	46377	45950	45528	45109	44693	44280	43868	43457
	-36.2	-38.5	-40.8	-42.9	-44.8	-46.6	-48.1	-49.3	-50.3	-50.8	-51.1	-51.0	-50.6	-49.9	-48.9	-47.8	-46.5	-45.1	-43.6
-34	52427	51972	51515	51057	50599	50142	49688	49238	48792	48351	47915	47484	47058	46635	46217	45801	45387	44975	44563
	-37.8	-40.1	-42.4	-44.5	-46.5	-48.3	-49.8	-51.0	-51.9	-52.5	-52.7	-52.6	-52.1	-51.4	-50.4	-49.2	-47.9	-46.4	-44.9
-36	53495	53045	52592	52138	51684	51231	50781	50335	49892	49454	49021	48593	48169	47749	47332	46918	46505	46094	45682
	-39.4	-41.8	-44.2	-46.4	-48.4	-50.1	-51.7	-52.9	-53.8	-54.3	-54.6	-54.4	-54.0	-53.3	-52.3	-51.1	-49.7	-48.3	-46.7
-38	54541	54097	53651	53203	52755	52309	51865	51424	50987	50554	50126	49702	49282	48865	48452	48041	47630	47220	46810
	-41.2	-43.7	-46.1	-48.3	-50.4	-52.2	-53.7	-55.0	-55.9	-56.5	-56.7	-56.6	-56.2	-55.5	-54.5	-53.3	-52.0	-50.6	-49.0
-40	55565	55130	54692	54252	53813	53374	52938	52505	52075	51649	51227	50808	50394	49982	49573	49166	48759	48351	47942
	-43.2	-45.7	-48.2	-50.5	-52.6	-54.4	-56.0	-57.3	-58.2	-58.8	-59.1	-59.1	-58.7	-58.1	-57.2	-56.0	-54.8	-53.4	-51.9
-42	56568	56142	55714	55285	54855	54427	54000	53576	53154	52736	52322	51911	51503	51097	50693	50290	49887	49482	49075
	-45.3	-47.9	-50.4	-52.8	-54.9	-56.8	-58.5	-59.8	-60.8	-61.5	-61.8	-61.8	-61.6	-61.0	-60.2	-59.2	-58.0	-56.6	-55.2
-44	57548	57134	56718	56300	55882	55465	55049	54635	54223	53815	53409	53005	52604	52205	51807	51409	51009	50608	50204
	-47.5	-50.3	-52.8	-55.2	-57.4	-59.4	-61.1	-62.5	-63.6	-64.3	-64.7	-64.9	-64.7	-64.2	-63.5	-62.6	-61.6	-60.4	-59.1
-46	58504	58103	57700	57295	56890	56485	56081	55678	55278	54879	54482	54088	53694	53302	52910	52517	52122	51724	51322
	-50.0	-52.7	-55.4	-57.8	-60.1	-62.1	-63.8	-65.3	-66.5	-67.3	-67.9	-68.1	-68.1	-67.7	-67.2	-66.4	-65.5	-64.5	-63.3
-48	59432	59046	58657	58266	57875	57483	57092	56702	56312	55924	55538	55152	54767	54382	53996	53608	53218	52823	52424
	-52.5	-55.3	-58.0	-60.5	-62.8	-64.9	-66.7	-68.2	-69.5	-70.4	-71.1	-71.5	-71.6	-71.4	-71.0	-70.5	-69.7	-68.8	-67.9
-50	60328	59957	59583	59208	58831	58454	58076	57698	57321	56944	56568	56192	55815	55437	55058	54675	54290	53899	53503
	-55.2	-58.0	-60.7	-63.2	-65.5	-67.7	-69.5	-71.2	-72.5	-73.6	-74.4	-74.9	-75.2	-75.2	-75.0	-74.6	-74.1	-73.4	-72.6
-52	61184	60829	60472	60112	59751	59388	59025	58660	58296	57931	57565	57198	56830	56460	56087	55711	55331	54944	54552
	-57.9	-60.7	-63.4	-65.9	-68.3	-70.4	-72.4	-74.1	-75.5	-76.7	-77.6	-78.3	-78.7	-78.9	-78.9	-78.7	-78.4	-77.9	-77.4
-54	61991	61654	61314	60971	60625	60278	59929	59579	59227	58874	58519	58162	57803	57441	57076	56706	56331	55950	55561
	-60.7	-63.4	-66.1	-68.6	-70.9	-73.1	-75.1	-76.9	-78.4	-79.7	-80.7	-81.6	-82.2	-82.5	-82.7	-82.8	-82.6	-82.4	-82.0
-56	62739	62421	62098	61772	61444	61112	60778	60442	60104	59763	59420	59073	58724	58371	58013	57650	57281	56906	56522
	-63.4	-66.1	-68.7	-71.2	-73.5	-75.7	-77.7	-79.5	-81.1	-82.5	-83.6	-84.6	-85.4	-85.9	-86.3	-86.5	-86.6	-86.6	-86.4
-58	63418	63118	62814	62506	62194	61879	61561	61239	60915	60587	60256	59920	59581	59237	58888	58533	58171	57802	57425
	-66.1	-68.7	-71.2	-73.6	-75.9	-78.1	-80.1	-81.9	-83.5	-85.0	-86.3	-87.3	-88.2	-89.0	-89.5	-89.9	-90.2	-90.4	-90.4
-60	64014	63734	63448	63159	62865	62566	62264	61958	61648	61333	61015	60691	60363	60029	59690	59344	58990	58629	58260
	-68.7	-71.2	-73.6	-75.9	-78.1	-80.2	-82.2	-84.0	-85.7	-87.2	-88.5	-89.7	-90.7	-91.6	-92.3	-92.9	-93.3	-93.7	-93.9

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	-144	-142	-140	-138	-136	-134	-132	-130	-128	-126	-124	-122	-120	-118	-116	-114	-112	-110	-108
-30	42370	41963	41556	41149	40742	40335	39927	39519	39109	38699	38287	37872	37455	37035	36610	36179	35742	35298	34844
	-42.7	-41.4	-40.1	-38.9	-37.9	-37.1	-36.4	-36.0	-35.7	-35.7	-35.8	-36.0	-36.4	-36.8	-37.3	-37.9	-38.4	-39.0	-39.5
-32	43457	43047	42636	42224	41811	41396	40979	40560	40138	39713	39284	38852	38414	37971	37522	37066	36601	36128	35644
	-43.6	-42.2	-40.8	-39.5	-38.4	-37.5	-36.7	-36.2	-35.9	-35.7	-35.8	-36.0	-36.3	-36.8	-37.4	-38.0	-38.6	-39.3	-40.0
-34	44563	44150	43737	43321	42903	42482	42058	41629	41196	40758	40314	39864	39407	38943	38471	37990	37499	36998	36486
	-44.9	-43.4	-42.0	-40.7	-39.5	-38.4	-37.6	-37.0	-36.6	-36.4	-36.4	-36.5	-36.9	-37.4	-37.9	-38.6	-39.4	-40.2	-41.1
-36	45682	45269	44853	44435	44014	43588	43156	42719	42276	41826	41368	40902	40428	39944	39450	38946	38431	37905	37366
	-46.7	-45.2	-43.7	-42.3	-41.1	-40.0	-39.1	-38.4	-37.9	-37.7	-37.6	-37.8	-38.1	-38.6	-39.2	-40.0	-40.8	-41.8	-42.8
-38	46810	46397	45981	45561	45137	44706	44269	43825	43373	42912	42441	41961	41470	40968	40455	39930	39392	38842	38280
	-49.0	-47.5	-46.0	-44.6	-43.3	-42.2	-41.3	-40.6	-40.0	-39.7	-39.7	-39.8	-40.1	-40.6	-41.3	-42.1	-43.0	-44.0	-45.1
-40	47942	47530	47115	46694	46267	45833	45391	44940	44480	44009	43527	43034	42529	42011	41480	40936	40379	39808	39224
	-51.9	-50.4	-48.9	-47.5	-46.3	-45.1	-44.2	-43.4	-42.9	-42.6	-42.5	-42.6	-42.9	-43.4	-44.1	-44.9	-45.9	-47.0	-48.2
-42	49075	48665	48249	47828	47399	46962	46516	46060	45592	45113	44621	44117	43599	43067	42521	41961	41387	40798	40196
	-55.2	-53.8	-52.4	-51.1	-49.8	-48.7	-47.8	-47.0	-46.5	-46.2	-46.1	-46.2	-46.5	-47.0	-47.7	-48.5	-49.6	-50.7	-52.0
-44	50204	49795	49380	48958	48528	48088	47639	47178	46704	46218	45718	45204	44676	44132	43574	43001	42413	41810	41194
	-59.1	-57.8	-56.4	-55.2	-54.0	-53.0	-52.1	-51.3	-50.8	-50.5	-50.4	-50.5	-50.8	-51.3	-52.0	-52.9	-53.9	-55.1	-56.4
-46	51322	50915	50501	50079	49648	49206	48754	48289	47811	47319	46813	46291	45755	45203	44635	44052	43454	42842	42215
	-63.3	-62.1	-60.9	-59.8	-58.7	-57.8	-56.9	-56.3	-55.8	-55.5	-55.4	-55.5	-55.8	-56.3	-57.0	-57.8	-58.9	-60.0	-61.3
-48	52424	52019	51606	51184	50753	50310	49856	49389	48907	48412	47901	47375	46832	46275	45701	45112	44508	43889	43256
	-67.9	-66.8	-65.8	-64.8	-63.9	-63.0	-62.3	-61.7	-61.2	-61.0	-60.9	-61.0	-61.3	-61.8	-62.5	-63.3	-64.3	-65.4	-66.6
-50	53503	53100	52689	52268	51837	51394	50939	50471	49988	49490	48977	48448	47904	47343	46767	46176	45569	44949	44315
	-72.6	-71.8	-70.9	-70.1	-69.3	-68.5	-67.9	-67.4	-67.0	-66.8	-66.8	-66.9	-67.2	-67.7	-68.3	-69.1	-70.0	-71.0	-72.2
-52	54552	54151	53742	53324	52894	52452	51997	51529	51047	50549	50036	49508	48964	48404	47829	47239	46635	46017	45386
	-77.4	-76.7	-76.1	-75.4	-74.8	-74.2	-73.7	-73.3	-73.0	-72.9	-72.8	-73.0	-73.3	-73.7	-74.3	-75.0	-75.9	-76.8	-77.8
-54	55561	55164	54758	54342	53915	53476	53023	52558	52077	51583	51073	50548	50008	49452	48882	48298	47699	47088	46465
	-82.0	-81.6	-81.1	-80.7	-80.2	-79.8	-79.4	-79.1	-78.9	-78.8	-78.9	-79.0	-79.3	-79.7	-80.3	-80.9	-81.7	-82.5	-83.4
-56	56522	56130	55728	55317	54893	54458	54010	53549	53073	52584	52080	51561	51028	50481	49919	49344	48756	48157	47546
	-86.4	-86.2	-86.0	-85.7	-85.4	-85.1	-84.9	-84.7	-84.6	-84.6	-84.7	-84.9	-85.1	-85.5	-86.0	-86.5	-87.2	-87.9	-88.7
-58	57425	57039	56643	56237	55820	55391	54949	54495	54027	53546	53050	52541	52019	51483	50934	50372	49798	49214	48620
	-90.4	-90.4	-90.4	-90.3	-90.1	-90.0	-89.9	-89.9	-89.9	-89.9	-90.0	-90.2	-90.5	-90.8	-91.2	-91.7	-92.3	-92.9	-93.5
-60	58260	57882	57494	57095	56686	56265	55833	55388	54930	54460	53976	53480	52972	52450	51917	51373	50817	50252	49678
	-93.9	-94.1	-94.2	-94.3	-94.3	-94.4	-94.4	-94.4	-94.5	-94.6	-94.8	-95.0	-95.2	-95.6	-95.9	-96.3	-96.7	-97.2	-97.7

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	-108	-106	-104	-102	-100	-98	-96	-94	-92	-90	-88	-86	-84	-82	-80	-78	-76	-74	-72
-30	34844	34381	33908	33425	32930	32425	31909	31385	30854	30317	29777	29237	28701	28172	27655	27153	26670	26212	25781
	-39.5	-40.0	-40.5	-41.0	-41.5	-42.0	-42.6	-43.2	-43.9	-44.6	-45.3	-46.1	-46.8	-47.5	-48.1	-48.6	-48.8	-48.8	-48.5
-32	35644	35151	34646	34130	33603	33066	32519	31963	31400	30833	30263	29695	29131	28576	28033	27506	27001	26521	26070
	-40.0	-40.7	-41.4	-42.2	-42.9	-43.7	-44.5	-45.3	-46.2	-47.0	-47.9	-48.8	-49.6	-50.3	-50.9	-51.3	-51.5	-51.4	-51.0
-34	36486	35963	35429	34883	34326	33758	33181	32595	32004	31409	30812	30218	29629	29050	28485	27937	27411	26911	26442
	-41.1	-42.0	-42.9	-43.8	-44.8	-45.8	-46.8	-47.8	-48.9	-49.9	-50.9	-51.9	-52.8	-53.5	-54.1	-54.5	-54.6	-54.5	-54.0
-36	37366	36816	36254	35679	35094	34499	33894	33282	32665	32045	31425	30808	30197	29597	29012	28446	27902	27386	26900
	-42.8	-43.8	-44.9	-46.1	-47.2	-48.4	-49.6	-50.8	-52.0	-53.2	-54.3	-55.4	-56.3	-57.0	-57.6	-58.0	-58.0	-57.8	-57.2
-38	38280	37705	37117	36518	35908	35287	34659	34024	33384	32742	32102	31465	30837	30219	29618	29036	28477	27947	27447
	-45.1	-46.3	-47.6	-48.9	-50.2	-51.6	-52.9	-54.3	-55.6	-56.9	-58.1	-59.1	-60.1	-60.9	-61.4	-61.7	-61.7	-61.4	-60.7
-40	39224	38627	38018	37396	36765	36123	35474	34819	34161	33502	32845	32193	31549	30919	30304	29710	29140	28597	28086
	-48.2	-49.5	-50.9	-52.3	-53.8	-55.2	-56.7	-58.2	-59.6	-60.9	-62.1	-63.2	-64.1	-64.9	-65.4	-65.6	-65.6	-65.2	-64.4
-42	40196	39581	38953	38314	37665	37006	36341	35671	34998	34325	33655	32992	32338	31697	31074	30470	29891	29340	28819
	-52.0	-53.4	-54.8	-56.3	-57.8	-59.4	-60.9	-62.4	-63.8	-65.2	-66.4	-67.5	-68.4	-69.1	-69.5	-69.7	-69.5	-69.0	-68.2
-44	41194	40564	39923	39270	38607	37936	37259	36577	35894	35213	34535	33864	33204	32557	31928	31319	30734	30177	29650
	-56.4	-57.8	-59.2	-60.8	-62.3	-63.9	-65.4	-66.9	-68.3	-69.6	-70.8	-71.9	-72.7	-73.3	-73.7	-73.7	-73.5	-73.0	-72.1
-46	42215	41575	40924	40261	39590	38911	38227	37539	36851	36165	35484	34810	34147	33498	32867	32256	31669	31108	30577
	-61.3	-62.7	-64.1	-65.6	-67.1	-68.7	-70.2	-71.6	-73.0	-74.2	-75.3	-76.3	-77.0	-77.5	-77.8	-77.8	-77.5	-76.9	-75.9
-48	43256	42611	41955	41288	40613	39931	39244	38556	37867	37181	36500	35828	35167	34520	33890	33280	32694	32133	31600
	-66.6	-67.9	-69.3	-70.7	-72.2	-73.6	-75.1	-76.4	-77.7	-78.8	-79.8	-80.6	-81.2	-81.6	-81.8	-81.7	-81.3	-80.6	-79.7
-50	44315	43669	43012	42346	41672	40992	40308	39623	38939	38257	37582	36915	36260	35618	34994	34389	33806	33248	32716
	-72.2	-73.4	-74.7	-76.0	-77.4	-78.7	-80.0	-81.2	-82.3	-83.3	-84.2	-84.8	-85.3	-85.6	-85.6	-85.4	-85.0	-84.2	-83.2
-52	45386	44744	44092	43431	42763	42090	41415	40738	40062	39390	38724	38067	37421	36789	36174	35576	35000	34447	33919
	-77.8	-78.9	-80.1	-81.3	-82.5	-83.6	-84.8	-85.8	-86.8	-87.6	-88.3	-88.8	-89.2	-89.3	-89.2	-88.9	-88.4	-87.6	-86.6
-54	46465	45832	45189	44538	43882	43220	42557	41893	41230	40572	39920	39277	38644	38025	37421	36835	36268	35723	35202
	-83.4	-84.4	-85.4	-86.4	-87.4	-88.4	-89.3	-90.2	-91.0	-91.6	-92.1	-92.5	-92.7	-92.7	-92.5	-92.1	-91.5	-90.7	-89.7
-56	47546	46925	46296	45661	45019	44374	43727	43080	42436	41795	41161	40534	39919	39315	38727	38154	37600	37066	36553
	-88.7	-89.5	-90.3	-91.2	-92.0	-92.8	-93.5	-94.2	-94.8	-95.3	-95.6	-95.8	-95.9	-95.8	-95.5	-95.0	-94.3	-93.5	-92.5
-58	48620	48017	47406	46789	46167	45543	44917	44291	43667	43048	42435	41829	41233	40649	40079	39523	38984	38463	37961
	-93.5	-94.1	-94.8	-95.5	-96.1	-96.7	-97.3	-97.8	-98.2	-98.5	-98.6	-98.7	-98.6	-98.4	-98.0	-97.5	-96.8	-96.0	-95.0
-60	49678	49096	48507	47913	47315	46715	46113	45512	44913	44319	43730	43148	42575	42013	41463	40927	40405	39900	39413
	-97.7	-98.2	-98.7	-99.2	-99.7	-100.1	-100.5	-100.8	-101.0	-101.1	-101.2	-101.1	-100.9	-100.6	-100.1	-99.6	-98.9	-98.0	-97.1

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	-72	-70	-68	-66	-64	-62	-60	-58	-56	-54	-52	-50	-48	-46	-44	-42	-40	-38	-36
-30	25781	25382	25018	24693	24408	24166	23967	23812	23699	23629	23598	23605	23645	23716	23814	23936	24076	24233	24403
	-48.5	-47.8	-46.8	-45.4	-43.6	-41.5	-39.0	-36.2	-33.2	-30.1	-27.1	-24.1	-21.4	-18.9	-16.9	-15.4	-14.5	-14.1	-14.4
-32	26070	25652	25271	24930	24630	24374	24163	23996	23873	23793	23754	23752	23784	23847	23938	24052	24185	24334	24495
	-51.0	-50.3	-49.1	-47.6	-45.7	-43.4	-40.8	-37.9	-34.9	-31.7	-28.6	-25.6	-22.9	-20.5	-18.5	-17.0	-16.1	-15.8	-16.0
-34	26442	26007	25610	25253	24938	24668	24443	24263	24128	24035	23983	23970	23991	24043	24122	24225	24347	24484	24634
	-54.0	-53.1	-51.8	-50.2	-48.2	-45.8	-43.1	-40.2	-37.1	-33.9	-30.8	-27.8	-25.1	-22.6	-20.7	-19.2	-18.3	-17.9	-18.2
-36	26900	26449	26037	25665	25335	25051	24811	24617	24467	24359	24293	24265	24271	24308	24373	24461	24568	24691	24827
	-57.2	-56.2	-54.9	-53.2	-51.1	-48.6	-45.9	-42.9	-39.8	-36.6	-33.5	-30.5	-27.8	-25.4	-23.4	-21.9	-21.0	-20.6	-20.8
-38	27447	26982	26556	26170	25826	25527	25272	25062	24896	24772	24688	24642	24631	24650	24697	24767	24857	24962	25081
	-60.7	-59.7	-58.2	-56.4	-54.3	-51.8	-49.0	-46.1	-43.0	-39.8	-36.7	-33.8	-31.1	-28.7	-26.7	-25.3	-24.3	-23.9	-24.1
-40	28086	27609	27170	26771	26414	26100	25830	25603	25420	25278	25175	25109	25078	25076	25102	25151	25220	25305	25403
	-64.4	-63.3	-61.8	-60.0	-57.8	-55.3	-52.6	-49.6	-46.6	-43.5	-40.4	-37.6	-34.9	-32.6	-30.6	-29.1	-28.2	-27.7	-27.9
-42	28819	28333	27884	27473	27103	26775	26489	26246	26044	25883	25759	25672	25618	25594	25596	25622	25667	25729	25804
	-68.2	-67.1	-65.5	-63.7	-61.5	-59.0	-56.3	-53.4	-50.5	-47.5	-44.5	-41.7	-39.2	-36.9	-35.0	-33.6	-32.6	-32.1	-32.2
-44	29650	29156	28698	28277	27895	27554	27253	26993	26773	26591	26446	26336	26258	26209	26186	26186	26206	26243	26293
	-72.1	-70.9	-69.3	-67.5	-65.3	-62.9	-60.3	-57.5	-54.6	-51.7	-48.9	-46.2	-43.8	-41.6	-39.8	-38.4	-37.5	-37.1	-37.1
-46	30577	30078	29613	29184	28792	28438	28123	27847	27608	27406	27239	27105	27002	26927	26878	26852	26845	26855	26878
	-75.9	-74.7	-73.1	-71.3	-69.2	-66.8	-64.3	-61.7	-58.9	-56.2	-53.5	-51.0	-48.7	-46.7	-45.0	-43.7	-42.8	-42.4	-42.5
-48	31600	31098	30629	30193	29792	29428	29099	28807	28551	28329	28140	27982	27855	27754	27678	27624	27589	27571	27568
	-79.7	-78.4	-76.9	-75.1	-73.0	-70.8	-68.4	-65.9	-63.3	-60.8	-58.3	-56.0	-53.8	-51.9	-50.4	-49.2	-48.4	-48.0	-48.1
-50	32716	32214	31741	31301	30893	30519	30179	29873	29599	29358	29149	28969	28816	28690	28587	28506	28444	28399	28368
	-83.2	-82.0	-80.5	-78.7	-76.8	-74.7	-72.4	-70.1	-67.7	-65.4	-63.1	-61.0	-59.0	-57.3	-55.9	-54.9	-54.2	-53.9	-54.0
-52	33919	33418	32946	32503	32090	31709	31358	31039	30751	30493	30263	30062	29886	29735	29607	29500	29411	29339	29281
	-86.6	-85.3	-83.9	-82.2	-80.4	-78.4	-76.3	-74.2	-72.0	-69.9	-67.9	-66.0	-64.2	-62.7	-61.5	-60.6	-60.0	-59.8	-60.0
-54	35202	34705	34234	33791	33375	32988	32630	32300	31999	31725	31479	31257	31061	30887	30735	30603	30489	30392	30309
	-89.7	-88.5	-87.1	-85.5	-83.8	-82.0	-80.1	-78.1	-76.2	-74.3	-72.5	-70.8	-69.3	-68.0	-66.9	-66.2	-65.7	-65.6	-65.9
-56	36553	36063	35597	35155	34739	34349	33985	33648	33336	33049	32787	32549	32334	32140	31966	31812	31675	31554	31449
	-92.5	-91.3	-90.0	-88.5	-87.0	-85.3	-83.6	-81.9	-80.2	-78.5	-76.9	-75.5	-74.2	-73.1	-72.2	-71.6	-71.3	-71.3	-71.6
-58	37961	37481	37021	36584	36170	35780	35413	35070	34750	34454	34179	33927	33696	33485	33293	33119	32962	32821	32695
	-95.0	-93.9	-92.6	-91.3	-89.9	-88.4	-86.9	-85.3	-83.8	-82.4	-81.1	-79.8	-78.8	-77.9	-77.2	-76.7	-76.5	-76.6	-76.9
-60	39413	38944	38494	38064	37655	37267	36900	36555	36230	35927	35644	35381	35137	34912	34705	34515	34342	34184	34040
	-97.1	-96.1	-94.9	-93.7	-92.5	-91.1	-89.8	-88.5	-87.2	-86.0	-84.9	-83.9	-83.0	-82.3	-81.8	-81.4	-81.3	-81.5	-81.9

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	0
-30	24403	24583	24771	24964	25162	25363	25567	25772	25979	26187	26396	26605	26813	27020	27224	27425	27619	27806	27982
	-14.4	-15.2	-16.5	-18.4	-20.6	-23.1	-25.9	-28.8	-31.8	-34.9	-37.9	-40.8	-43.7	-46.5	-49.3	-52.1	-55.0	-58.1	-61.3
-32	24495	24666	24844	25027	25214	25403	25593	25784	25974	26165	26354	26543	26730	26914	27094	27269	27437	27598	27749
	-16.0	-16.9	-18.2	-20.1	-22.4	-25.1	-28.0	-31.1	-34.3	-37.6	-40.9	-44.2	-47.4	-50.7	-53.9	-57.1	-60.4	-63.8	-67.3
-34	24634	24794	24960	25130	25304	25479	25654	25829	26003	26175	26345	26513	26678	26839	26996	27147	27291	27427	27554
	-18.2	-19.0	-20.4	-22.2	-24.6	-27.3	-30.3	-33.5	-36.9	-40.4	-44.0	-47.6	-51.2	-54.8	-58.4	-62.0	-65.7	-69.4	-73.1
-36	24827	24972	25123	25279	25438	25597	25756	25914	26070	26224	26375	26522	26666	26806	26940	27068	27190	27304	27409
	-20.8	-21.6	-23.0	-24.8	-27.2	-29.9	-32.9	-36.3	-39.8	-43.5	-47.3	-51.1	-55.0	-58.9	-62.9	-66.8	-70.7	-74.7	-78.7
-38	25081	25208	25343	25481	25623	25765	25906	26046	26184	26319	26451	26579	26703	26822	26935	27043	27144	27239	27327
	-24.1	-24.8	-26.1	-27.9	-30.2	-32.9	-36.0	-39.4	-43.0	-46.9	-50.8	-54.9	-59.0	-63.2	-67.4	-71.5	-75.7	-79.9	-84.0
-40	25403	25511	25626	25745	25867	25991	26114	26235	26354	26471	26583	26692	26797	26897	26992	27082	27167	27246	27319
	-27.9	-28.6	-29.8	-31.6	-33.8	-36.5	-39.6	-43.0	-46.7	-50.6	-54.7	-58.9	-63.1	-67.5	-71.9	-76.2	-80.6	-84.8	-89.0
-42	25804	25890	25983	26081	26182	26285	26388	26490	26591	26688	26783	26874	26961	27044	27123	27198	27269	27335	27399
	-32.2	-32.9	-34.1	-35.8	-38.0	-40.6	-43.6	-47.0	-50.7	-54.7	-58.8	-63.1	-67.5	-71.9	-76.4	-80.9	-85.3	-89.6	-93.8
-44	26293	26354	26423	26499	26578	26659	26742	26824	26905	26984	27061	27135	27206	27275	27340	27402	27462	27520	27577
	-37.1	-37.7	-38.9	-40.5	-42.6	-45.2	-48.2	-51.5	-55.2	-59.1	-63.2	-67.5	-71.9	-76.4	-80.9	-85.4	-89.8	-94.1	-98.3
-46	26878	26914	26958	27009	27065	27124	27185	27247	27309	27370	27430	27489	27545	27601	27655	27707	27760	27812	27866
	-42.5	-43.0	-44.1	-45.7	-47.8	-50.2	-53.1	-56.4	-60.0	-63.8	-67.9	-72.1	-76.5	-80.9	-85.4	-89.8	-94.2	-98.4	-102.4
-48	27568	27577	27595	27621	27653	27690	27729	27771	27814	27858	27902	27946	27990	28034	28078	28124	28171	28220	28273
	-48.1	-48.7	-49.8	-51.3	-53.2	-55.6	-58.4	-61.6	-65.1	-68.8	-72.7	-76.9	-81.1	-85.4	-89.8	-94.1	-98.3	-102.3	-106.1
-50	28368	28350	28342	28343	28351	28365	28383	28405	28430	28457	28486	28516	28549	28583	28620	28660	28704	28753	28808
	-54.0	-54.6	-55.6	-57.1	-59.0	-61.3	-63.9	-66.9	-70.3	-73.8	-77.6	-81.6	-85.7	-89.8	-93.9	-98.0	-102.0	-105.8	-109.4
-52	29281	29237	29204	29180	29165	29157	29154	29157	29164	29175	29190	29209	29231	29257	29288	29324	29367	29416	29473
	-60.0	-60.6	-61.6	-63.0	-64.8	-67.0	-69.5	-72.3	-75.5	-78.9	-82.4	-86.2	-90.0	-93.9	-97.8	-101.6	-105.3	-108.9	-112.2
-54	30309	30240	30182	30136	30098	30069	30047	30031	30022	30018	30020	30028	30041	30060	30086	30119	30161	30211	30272
	-65.9	-66.5	-67.5	-68.8	-70.5	-72.6	-74.9	-77.6	-80.5	-83.7	-87.0	-90.5	-94.1	-97.7	-101.3	-104.8	-108.2	-111.5	-114.5
-56	31449	31357	31277	31209	31150	31102	31061	31029	31005	30988	30978	30976	30981	30994	31015	31046	31087	31139	31202
	-71.6	-72.2	-73.1	-74.4	-76.0	-78.0	-80.2	-82.6	-85.3	-88.2	-91.3	-94.5	-97.7	-101.0	-104.3	-107.5	-110.6	-113.5	-116.2
-58	32695	32583	32483	32395	32319	32252	32196	32149	32111	32082	32061	32050	32048	32056	32074	32102	32142	32195	32261
	-76.9	-77.6	-78.5	-79.7	-81.2	-83.0	-85.0	-87.2	-89.7	-92.3	-95.1	-98.0	-100.9	-103.9	-106.8	-109.6	-112.4	-115.0	-117.4
-60	34040	33910	33794	33689	33597	33515	33445	33385	33335	33295	33266	33247	33239	33241	33256	33282	33321	33374	33442
	-81.9	-82.5	-83.4	-84.5	-85.9	-87.5	-89.3	-91.4	-93.6	-95.9	-98.4	-100.9	-103.5	-106.1	-108.7	-111.2	-113.7	-115.9	-118.1

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
-60	33442	33525	33625	33743	33880	34038	34216	34418	34644	34895	35172	35477	35810	36172	36564	36986	37439	37923	38437
	-118.1	-120.0	-121.6	-123.0	-124.1	-124.8	-125.2	-125.3	-125.0	-124.3	-123.3	-121.9	-120.2	-118.2	-115.9	-113.4	-110.7	-107.9	-104.9
-62	34736	34820	34922	35041	35180	35339	35519	35721	35946	36195	36469	36769	37096	37449	37830	38239	38676	39141	39634
	-118.2	-119.8	-121.2	-122.4	-123.3	-124.0	-124.4	-124.4	-124.2	-123.6	-122.8	-121.7	-120.3	-118.6	-116.7	-114.7	-112.4	-110.0	-107.6
-64	36133	36217	36318	36437	36574	36732	36910	37109	37330	37574	37842	38133	38449	38790	39156	39548	39965	40408	40876
	-117.8	-119.2	-120.4	-121.4	-122.2	-122.8	-123.1	-123.2	-123.0	-122.6	-121.9	-121.0	-119.9	-118.6	-117.1	-115.4	-113.6	-111.6	-109.6
-66	37621	37703	37801	37918	38053	38206	38379	38573	38787	39023	39280	39560	39862	40187	40535	40906	41300	41717	42158
	-116.9	-118.1	-119.1	-120.0	-120.6	-121.1	-121.4	-121.6	-121.5	-121.2	-120.7	-120.0	-119.1	-118.1	-116.9	-115.5	-114.1	-112.5	-110.9
-68	39186	39265	39360	39473	39602	39750	39916	40101	40306	40530	40774	41039	41324	41630	41957	42305	42673	43063	43472
	-115.6	-116.6	-117.5	-118.2	-118.7	-119.2	-119.5	-119.6	-119.5	-119.3	-119.0	-118.5	-117.8	-117.0	-116.1	-115.1	-113.9	-112.7	-111.4
-70	40816	40891	40981	41088	41211	41351	41508	41682	41875	42085	42314	42561	42827	43112	43415	43737	44077	44436	44813
	-114.0	-114.8	-115.5	-116.1	-116.6	-116.9	-117.2	-117.3	-117.3	-117.2	-116.9	-116.6	-116.1	-115.5	-114.8	-114.0	-113.1	-112.2	-111.2
-72	42496	42566	42651	42750	42865	42995	43142	43304	43482	43677	43888	44116	44360	44621	44899	45193	45503	45829	46172
	-112.1	-112.7	-113.3	-113.7	-114.1	-114.4	-114.6	-114.7	-114.8	-114.7	-114.5	-114.3	-113.9	-113.5	-113.0	-112.4	-111.8	-111.1	-110.3
-74	44212	44276	44354	44446	44551	44671	44805	44953	45116	45293	45485	45691	45912	46148	46398	46662	46941	47233	47540
	-110.0	-110.5	-110.9	-111.2	-111.5	-111.8	-111.9	-112.0	-112.0	-112.0	-111.9	-111.7	-111.5	-111.1	-110.8	-110.3	-109.9	-109.3	-108.8
-76	45948	46006	46077	46160	46255	46363	46483	46616	46762	46920	47091	47275	47471	47680	47901	48135	48380	48638	48906
	-107.7	-108.1	-108.4	-108.6	-108.8	-109.0	-109.1	-109.2	-109.2	-109.2	-109.1	-108.9	-108.8	-108.5	-108.2	-107.9	-107.6	-107.2	-106.7
-78	47690	47742	47805	47878	47962	48057	48163	48279	48407	48545	48694	48854	49024	49205	49396	49598	49809	50030	50261
	-105.4	-105.6	-105.8	-106.0	-106.1	-106.2	-106.3	-106.3	-106.3	-106.3	-106.2	-106.1	-105.9	-105.8	-105.5	-105.3	-105.0	-104.7	-104.4
-80	49423	49468	49522	49585	49658	49739	49829	49928	50036	50154	50279	50414	50558	50710	50870	51039	51215	51400	51592
	-103.0	-103.1	-103.2	-103.3	-103.4	-103.4	-103.5	-103.5	-103.4	-103.4	-103.3	-103.2	-103.1	-103.0	-102.8	-102.6	-102.4	-102.1	-101.9
-82	51132	51170	51215	51267	51327	51393	51467	51548	51636	51731	51833	51942	52058	52180	52309	52444	52585	52733	52886
	-100.7	-100.7	-100.8	-100.8	-100.8	-100.8	-100.8	-100.8	-100.7	-100.7	-100.6	-100.5	-100.4	-100.3	-100.1	-99.9	-99.8	-99.6	-99.4
-84	52803	52833	52868	52908	52954	53005	53062	53124	53191	53263	53340	53423	53510	53602	53699	53800	53906	54017	54131
	-98.4	-98.4	-98.4	-98.4	-98.4	-98.4	-98.3	-98.3	-98.2	-98.1	-98.1	-98.0	-97.9	-97.8	-97.7	-97.5	-97.4	-97.2	-97.1
-86	54421	54441	54466	54494	54525	54560	54599	54641	54686	54735	54787	54842	54900	54962	55027	55094	55165	55238	55314
	-96.3	-96.3	-96.3	-96.2	-96.2	-96.1	-96.1	-96.0	-96.0	-95.9	-95.9	-95.8	-95.7	-95.6	-95.5	-95.4	-95.3	-95.2	-95.1
-88	55971	55982	55995	56009	56025	56043	56063	56084	56107	56132	56158	56186	56215	56246	56278	56312	56347	56383	56421
	-94.4	-94.3	-94.3	-94.3	-94.2	-94.2	-94.2	-94.1	-94.1	-94.1	-94.0	-94.0	-93.9	-93.9	-93.8	-93.8	-93.7	-93.6	-93.6
-90	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440
	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72
-60	38437	38981	39555	40159	40790	41448	42132	42841	43572	44323	45094	45882	46684	47499	48325	49158	49997	50840	51683
	-104.9	-101.9	-98.8	-95.8	-92.8	-90.0	-87.3	-84.8	-82.5	-80.4	-78.6	-77.0	-75.8	-74.7	-74.0	-73.5	-73.2	-73.1	-73.2
-62	39634	40154	40701	41275	41874	42498	43145	43815	44505	45214	45940	46682	47438	48205	48983	49768	50558	51352	52147
	-107.6	-105.0	-102.5	-99.9	-97.4	-95.0	-92.7	-90.6	-88.6	-86.8	-85.1	-83.7	-82.5	-81.6	-80.8	-80.2	-79.8	-79.5	-79.4
-64	40876	41369	41886	42427	42992	43578	44185	44813	45459	46123	46802	47496	48202	48920	49646	50379	51118	51860	52604
	-109.6	-107.5	-105.4	-103.3	-101.2	-99.2	-97.3	-95.4	-93.7	-92.1	-90.7	-89.4	-88.3	-87.3	-86.5	-85.9	-85.3	-84.9	-84.6
-66	42158	42620	43104	43610	44137	44683	45249	45832	46432	47048	47679	48322	48976	49641	50314	50993	51678	52366	53055
	-110.9	-109.2	-107.5	-105.8	-104.1	-102.4	-100.8	-99.3	-97.8	-96.4	-95.2	-94.0	-93.0	-92.0	-91.2	-90.5	-89.8	-89.3	-88.8
-68	43472	43902	44351	44819	45306	45810	46331	46869	47421	47987	48566	49157	49757	50367	50985	51608	52236	52868	53501
	-111.4	-110.1	-108.8	-107.4	-106.0	-104.6	-103.3	-102.0	-100.8	-99.6	-98.4	-97.4	-96.4	-95.5	-94.7	-93.9	-93.2	-92.6	-92.0
-70	44813	45207	45619	46048	46493	46953	47428	47918	48420	48935	49461	49998	50543	51097	51657	52223	52793	53366	53941
	-111.2	-110.2	-109.1	-108.0	-106.9	-105.8	-104.7	-103.6	-102.6	-101.6	-100.6	-99.6	-98.7	-97.9	-97.1	-96.3	-95.6	-94.9	-94.2
-72	46172	46529	46902	47290	47691	48106	48534	48974	49426	49889	50361	50842	51331	51827	52329	52837	53347	53861	54376
	-110.3	-109.5	-108.7	-107.8	-106.9	-106.0	-105.1	-104.2	-103.4	-102.5	-101.6	-100.8	-100.0	-99.2	-98.4	-97.6	-96.9	-96.2	-95.5
-74	47540	47859	48191	48536	48894	49262	49642	50032	50432	50842	51259	51684	52116	52555	52998	53445	53896	54350	54805
	-108.8	-108.1	-107.5	-106.8	-106.1	-105.4	-104.7	-103.9	-103.2	-102.5	-101.7	-101.0	-100.3	-99.5	-98.8	-98.1	-97.4	-96.7	-96.0
-76	48906	49187	49478	49779	50091	50413	50744	51084	51432	51787	52150	52519	52894	53274	53658	54046	54437	54830	55224
	-106.7	-106.3	-105.8	-105.2	-104.7	-104.1	-103.5	-102.9	-102.3	-101.7	-101.1	-100.4	-99.8	-99.1	-98.5	-97.8	-97.2	-96.5	-95.9
-78	50261	50501	50751	51009	51275	51549	51831	52120	52416	52718	53026	53339	53657	53979	54305	54633	54964	55298	55632
	-104.4	-104.0	-103.6	-103.2	-102.8	-102.3	-101.9	-101.4	-100.9	-100.4	-99.8	-99.3	-98.7	-98.2	-97.6	-97.1	-96.5	-95.9	-95.3
-80	51592	51792	51999	52213	52433	52660	52893	53132	53376	53625	53879	54136	54398	54663	54931	55201	55473	55747	56022
	-101.9	-101.6	-101.3	-101.0	-100.6	-100.3	-99.9	-99.5	-99.1	-98.7	-98.3	-97.8	-97.4	-96.9	-96.5	-96.0	-95.5	-95.0	-94.5
-82	52886	53046	53210	53380	53555	53735	53920	54109	54302	54498	54699	54902	55108	55317	55528	55741	55955	56171	56388
	-99.4	-99.2	-98.9	-98.7	-98.4	-98.1	-97.9	-97.6	-97.2	-96.9	-96.6	-96.3	-95.9	-95.5	-95.2	-94.8	-94.4	-94.1	-93.7
-84	54131	54250	54373	54499	54629	54763	54900	55039	55182	55328	55476	55626	55778	55932	56088	56245	56403	56562	56722
	-97.1	-96.9	-96.7	-96.6	-96.4	-96.2	-95.9	-95.7	-95.5	-95.3	-95.0	-94.8	-94.5	-94.3	-94.0	-93.7	-93.5	-93.2	-92.9
-86	55314	55392	55473	55557	55642	55730	55820	55912	56006	56102	56199	56297	56397	56498	56600	56703	56806	56911	57015
	-95.1	-95.0	-94.9	-94.7	-94.6	-94.5	-94.3	-94.2	-94.0	-93.9	-93.7	-93.6	-93.4	-93.3	-93.1	-92.9	-92.8	-92.6	-92.4
-88	56421	56460	56500	56541	56583	56627	56671	56716	56763	56809	56857	56906	56955	57004	57054	57105	57156	57207	57258
	-93.6	-93.5	-93.5	-93.4	-93.3	-93.3	-93.2	-93.1	-93.0	-93.0	-92.9	-92.8	-92.7	-92.7	-92.6	-92.5	-92.4	-92.4	-92.3
-90	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440
	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6

IGRF 1980 TOTAL INTENSITY (F)

LAT \ LONG	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108
-60	51683	52524	53361	54192	55014	55824	56620	57400	58162	58903	59622	60316	60984	61623	62234	62814	63362	63877	64359
	-73.2	-73.4	-73.8	-74.2	-74.6	-75.1	-75.5	-75.9	-76.2	-76.4	-76.4	-76.3	-76.0	-75.5	-74.8	-73.9	-72.9	-71.6	-70.2
-62	52147	52940	53731	54516	55293	56060	56814	57555	58279	58985	59670	60334	60974	61588	62177	62737	63269	63771	64242
	-79.4	-79.4	-79.4	-79.6	-79.7	-79.9	-80.0	-80.1	-80.1	-80.0	-79.8	-79.5	-79.0	-78.4	-77.6	-76.6	-75.5	-74.2	-72.8
-64	52604	53347	54087	54823	55552	56272	56981	57678	58361	59027	59676	60305	60913	61499	62061	62598	63110	63594	64051
	-84.6	-84.4	-84.2	-84.1	-84.0	-83.9	-83.7	-83.5	-83.3	-83.0	-82.6	-82.1	-81.4	-80.7	-79.8	-78.8	-77.6	-76.4	-75.0
-66	53055	53744	54431	55115	55792	56463	57124	57774	58412	59035	59644	60235	60807	61360	61892	62402	62890	63353	63792
	-88.8	-88.4	-88.0	-87.7	-87.4	-87.0	-86.7	-86.3	-85.8	-85.3	-84.7	-84.1	-83.3	-82.5	-81.5	-80.5	-79.4	-78.1	-76.8
-68	53501	54134	54765	55394	56017	56635	57245	57846	58435	59013	59578	60127	60661	61178	61676	62156	62615	63054	63471
	-92.0	-91.4	-90.9	-90.4	-89.9	-89.4	-88.9	-88.3	-87.7	-87.1	-86.4	-85.6	-84.8	-83.9	-82.9	-81.9	-80.8	-79.6	-78.4
-70	53941	54516	55090	55662	56229	56792	57348	57897	58436	58966	59484	59989	60481	60958	61420	61865	62293	62703	63095
	-94.2	-93.5	-92.9	-92.3	-91.7	-91.0	-90.4	-89.7	-89.0	-88.3	-87.5	-86.7	-85.8	-84.9	-83.9	-82.9	-81.9	-80.8	-79.7
-72	54376	54892	55407	55920	56430	56936	57437	57931	58418	58897	59366	59824	60272	60707	61129	61537	61931	62309	62672
	-95.5	-94.8	-94.1	-93.4	-92.7	-92.0	-91.3	-90.6	-89.8	-89.1	-88.3	-87.4	-86.6	-85.7	-84.8	-83.8	-82.9	-81.9	-80.9
-74	54805	55260	55715	56169	56620	57069	57513	57952	58385	58811	59229	59639	60039	60430	60809	61178	61534	61878	62208
	-96.0	-95.3	-94.6	-93.9	-93.2	-92.5	-91.8	-91.0	-90.3	-89.5	-88.7	-87.9	-87.1	-86.3	-85.4	-84.6	-83.7	-82.8	-82.0
-76	55224	55619	56014	56408	56801	57190	57577	57960	58337	58710	59076	59435	59787	60131	60467	60793	61109	61415	61711
	-95.9	-95.2	-94.6	-93.9	-93.2	-92.5	-91.8	-91.1	-90.4	-89.7	-89.0	-88.3	-87.5	-86.8	-86.1	-85.3	-84.6	-83.8	-83.1
-78	55632	55967	56302	56636	56969	57300	57629	57955	58277	58595	58909	59217	59519	59815	60104	60386	60660	60926	61184
	-95.3	-94.7	-94.1	-93.5	-92.9	-92.3	-91.7	-91.1	-90.5	-89.8	-89.2	-88.6	-87.9	-87.3	-86.7	-86.0	-85.4	-84.8	-84.2
-80	56022	56297	56573	56848	57122	57396	57667	57936	58203	58466	58726	58982	59234	59481	59722	59959	60189	60413	60631
	-94.5	-94.0	-93.5	-93.0	-92.5	-92.0	-91.5	-91.0	-90.4	-89.9	-89.4	-88.9	-88.4	-87.8	-87.3	-86.8	-86.3	-85.8	-85.4
-82	56388	56605	56822	57039	57256	57472	57687	57900	58111	58320	58527	58730	58931	59128	59322	59511	59696	59877	60053
	-93.7	-93.3	-92.9	-92.5	-92.1	-91.7	-91.3	-90.9	-90.5	-90.1	-89.7	-89.3	-88.9	-88.5	-88.1	-87.7	-87.4	-87.0	-86.7
-84	56722	56882	57043	57203	57363	57523	57682	57840	57996	58152	58305	58457	58607	58754	58899	59041	59180	59317	59450
	-92.9	-92.6	-92.4	-92.1	-91.8	-91.5	-91.2	-90.9	-90.6	-90.4	-90.1	-89.8	-89.5	-89.3	-89.0	-88.8	-88.5	-88.3	-88.0
-86	57015	57120	57226	57331	57436	57541	57645	57749	57852	57955	58056	58156	58255	58353	58449	58544	58637	58728	58817
	-92.4	-92.2	-92.1	-91.9	-91.7	-91.5	-91.4	-91.2	-91.0	-90.9	-90.7	-90.5	-90.4	-90.2	-90.1	-89.9	-89.8	-89.6	-89.5
-88	57258	57310	57362	57413	57465	57517	57568	57619	57670	57721	57771	57820	57870	57918	57966	58013	58059	58105	58149
	-92.3	-92.2	-92.1	-92.0	-92.0	-91.9	-91.8	-91.7	-91.7	-91.6	-91.5	-91.4	-91.4	-91.3	-91.2	-91.2	-91.1	-91.1	-91.0
-90	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440
	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138	140	142	144
-60	64359	64807	65220	65600	65944	66255	66532	66775	66986	67165	67314	67432	67522	67584	67620	67631	67617	67581	67524
	-70.2	-68.6	-66.9	-65.1	-63.2	-61.2	-59.1	-57.1	-55.1	-53.1	-51.2	-49.4	-47.7	-46.1	-44.8	-43.6	-42.7	-41.9	-41.5
-62	64242	64682	65091	65469	65814	66128	66411	66663	66884	67076	67238	67373	67480	67561	67616	67648	67656	67642	67607
	-72.8	-71.3	-69.7	-67.9	-66.1	-64.2	-62.3	-60.4	-58.6	-56.7	-55.0	-53.3	-51.8	-50.4	-49.1	-48.0	-47.2	-46.5	-46.1
-64	64051	64481	64881	65253	65596	65911	66196	66453	66683	66884	67059	67207	67329	67427	67501	67552	67581	67589	67577
	-75.0	-73.6	-72.0	-70.4	-68.7	-67.0	-65.2	-63.5	-61.8	-60.2	-58.6	-57.1	-55.7	-54.4	-53.3	-52.4	-51.6	-51.0	-50.6
-66	63792	64206	64595	64958	65295	65606	65891	66151	66384	66593	66777	66936	67072	67184	67275	67344	67392	67420	67428
	-76.8	-75.5	-74.0	-72.5	-71.0	-69.4	-67.9	-66.3	-64.8	-63.4	-62.0	-60.7	-59.4	-58.3	-57.4	-56.6	-55.9	-55.4	-55.0
-68	63471	63867	64240	64590	64917	65221	65502	65760	65995	66207	66396	66564	66710	66834	66939	67023	67088	67134	67162
	-78.4	-77.1	-75.8	-74.4	-73.0	-71.7	-70.3	-69.0	-67.6	-66.4	-65.2	-64.1	-63.0	-62.1	-61.3	-60.6	-60.0	-59.6	-59.3
-70	63095	63468	63821	64155	64469	64762	65035	65287	65519	65731	65923	66095	66248	66381	66496	66593	66671	66733	66778
	-79.7	-78.5	-77.3	-76.1	-74.9	-73.7	-72.6	-71.4	-70.3	-69.2	-68.2	-67.3	-66.4	-65.6	-65.0	-64.4	-63.9	-63.6	-63.4
-72	62672	63019	63349	63662	63958	64236	64497	64740	64966	65173	65363	65536	65692	65830	65952	66057	66146	66220	66278
	-80.9	-79.8	-78.8	-77.8	-76.7	-75.7	-74.7	-73.7	-72.8	-71.9	-71.1	-70.3	-69.6	-69.0	-68.5	-68.0	-67.7	-67.4	-67.3
-74	62208	62525	62829	63118	63392	63652	63897	64126	64341	64540	64724	64894	65048	65187	65311	65421	65517	65599	65667
	-82.0	-81.1	-80.2	-79.3	-78.4	-77.6	-76.8	-76.0	-75.2	-74.5	-73.9	-73.2	-72.7	-72.2	-71.8	-71.4	-71.2	-71.0	-70.9
-76	61711	61995	62268	62529	62779	63016	63241	63453	63652	63839	64013	64174	64323	64458	64581	64692	64790	64876	64950
	-83.1	-82.3	-81.6	-80.9	-80.1	-79.5	-78.8	-78.2	-77.6	-77.0	-76.5	-76.0	-75.6	-75.2	-74.9	-74.7	-74.5	-74.3	-74.3
-78	61184	61433	61673	61903	62124	62335	62536	62727	62907	63077	63237	63385	63524	63651	63768	63875	63971	64056	64131
	-84.2	-83.6	-83.0	-82.4	-81.9	-81.3	-80.8	-80.3	-79.9	-79.4	-79.1	-78.7	-78.4	-78.1	-77.9	-77.7	-77.6	-77.5	-77.4
-80	60631	60842	61046	61243	61432	61614	61787	61953	62110	62260	62400	62533	62657	62772	62878	62976	63066	63146	63218
	-85.4	-84.9	-84.5	-84.0	-83.6	-83.2	-82.8	-82.4	-82.1	-81.8	-81.5	-81.3	-81.0	-80.9	-80.7	-80.6	-80.5	-80.4	-80.4
-82	60053	60224	60390	60551	60706	60855	60998	61135	61266	61391	61510	61621	61727	61825	61917	62002	62081	62152	62217
	-86.7	-86.3	-86.0	-85.7	-85.4	-85.1	-84.8	-84.6	-84.3	-84.1	-83.9	-83.7	-83.6	-83.5	-83.4	-83.3	-83.2	-83.2	-83.2
-84	59450	59579	59705	59827	59946	60060	60170	60276	60378	60475	60567	60655	60738	60816	60890	60958	61022	61080	61134
	-88.0	-87.8	-87.6	-87.4	-87.2	-87.0	-86.8	-86.6	-86.5	-86.4	-86.2	-86.1	-86.0	-85.9	-85.9	-85.8	-85.8	-85.8	-85.8
-86	58817	58903	58988	59071	59150	59228	59303	59375	59445	59511	59575	59636	59693	59748	59799	59848	59893	59935	59973
	-89.5	-89.3	-89.2	-89.1	-89.0	-88.9	-88.8	-88.7	-88.6	-88.5	-88.5	-88.4	-88.3	-88.3	-88.3	-88.2	-88.2	-88.2	-88.2
-88	58149	58193	58235	58277	58317	58356	58394	58431	58466	58500	58533	58564	58594	58622	58649	58674	58698	58720	58740
	-91.0	-91.0	-90.9	-90.8	-90.8	-90.8	-90.7	-90.7	-90.6	-90.6	-90.6	-90.6	-90.5	-90.5	-90.5	-90.5	-90.5	-90.5	-90.5
-90	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440
	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	144	146	148	150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180
-60	67524	67446	67349	67234	67103	66956	66794	66618	66429	66229	66017	65795	65564	65324	65076	64820	64557	64288	64014
	-41.5	-41.2	-41.2	-41.5	-42.0	-42.8	-43.8	-45.0	-46.5	-48.1	-50.0	-52.0	-54.2	-56.4	-58.8	-61.2	-63.7	-66.2	-68.7
-62	67607	67553	67480	67389	67281	67158	67020	66868	66704	66527	66339	66141	65933	65716	65490	65257	65016	64768	64514
	-46.1	-45.8	-45.8	-46.1	-46.5	-47.2	-48.2	-49.3	-50.6	-52.2	-53.8	-55.7	-57.7	-59.8	-62.0	-64.2	-66.5	-68.8	-71.2
-64	67577	67545	67495	67428	67345	67246	67133	67006	66866	66713	66550	66376	66191	65998	65795	65585	65366	65140	64908
	-50.6	-50.4	-50.4	-50.6	-51.1	-51.7	-52.5	-53.6	-54.8	-56.1	-57.7	-59.3	-61.1	-63.0	-65.0	-67.1	-69.2	-71.3	-73.5
-66	67428	67419	67392	67348	67288	67213	67124	67022	66906	66778	66639	66489	66329	66159	65980	65793	65597	65393	65182
	-55.0	-54.9	-54.9	-55.1	-55.5	-56.1	-56.8	-57.7	-58.8	-60.0	-61.4	-62.9	-64.5	-66.2	-68.0	-69.8	-71.7	-73.6	-75.6
-68	67162	67173	67167	67145	67108	67056	66990	66911	66819	66715	66600	66474	66338	66191	66036	65871	65698	65516	65327
	-59.3	-59.2	-59.2	-59.4	-59.8	-60.3	-61.0	-61.8	-62.7	-63.8	-65.0	-66.3	-67.7	-69.2	-70.7	-72.4	-74.1	-75.8	-77.5
-70	66778	66806	66819	66817	66800	66770	66726	66669	66600	66519	66426	66323	66210	66086	65954	65812	65661	65502	65334
	-63.4	-63.3	-63.4	-63.6	-63.9	-64.3	-64.9	-65.6	-66.4	-67.3	-68.4	-69.5	-70.7	-72.0	-73.3	-74.8	-76.2	-77.7	-79.2
-72	66278	66322	66350	66365	66367	66355	66330	66294	66245	66185	66114	66033	65941	65840	65729	65609	65480	65342	65196
	-67.3	-67.2	-67.3	-67.5	-67.7	-68.1	-68.6	-69.2	-69.9	-70.7	-71.5	-72.5	-73.5	-74.6	-75.8	-77.0	-78.2	-79.5	-80.8
-74	65667	65722	65763	65792	65808	65812	65805	65785	65755	65714	65662	65601	65529	65448	65358	65258	65150	65033	64908
	-70.9	-70.9	-70.9	-71.1	-71.3	-71.7	-72.1	-72.6	-73.1	-73.8	-74.5	-75.3	-76.1	-77.0	-78.0	-79.0	-80.0	-81.1	-82.1
-76	64950	65011	65062	65100	65128	65145	65150	65146	65131	65106	65071	65027	64973	64911	64839	64759	64671	64574	64469
	-74.3	-74.3	-74.4	-74.5	-74.7	-75.0	-75.3	-75.7	-76.2	-76.7	-77.3	-77.9	-78.6	-79.3	-80.1	-80.9	-81.7	-82.5	-83.4
-78	64131	64196	64251	64296	64331	64356	64372	64378	64375	64364	64343	64313	64276	64229	64175	64112	64042	63964	63878
	-77.4	-77.5	-77.5	-77.6	-77.8	-78.0	-78.3	-78.6	-79.0	-79.4	-79.8	-80.3	-80.8	-81.4	-82.0	-82.6	-83.3	-83.9	-84.6
-80	63218	63282	63337	63384	63422	63452	63474	63488	63494	63492	63482	63465	63440	63407	63368	63321	63267	63206	63138
	-80.4	-80.4	-80.5	-80.6	-80.7	-80.9	-81.1	-81.3	-81.6	-81.9	-82.2	-82.6	-83.0	-83.4	-83.8	-84.3	-84.8	-85.3	-85.8
-82	62217	62275	62326	62371	62408	62439	62464	62481	62492	62497	62495	62486	62472	62451	62423	62390	62351	62305	62254
	-83.2	-83.2	-83.2	-83.3	-83.4	-83.5	-83.7	-83.8	-84.0	-84.2	-84.4	-84.7	-85.0	-85.3	-85.6	-85.9	-86.2	-86.6	-86.9
-84	61134	61182	61225	61263	61296	61324	61347	61365	61378	61385	61388	61386	61378	61366	61349	61327	61301	61269	61233
	-85.8	-85.8	-85.8	-85.8	-85.9	-86.0	-86.1	-86.2	-86.3	-86.4	-86.6	-86.7	-86.9	-87.1	-87.3	-87.5	-87.7	-87.9	-88.2
-86	59973	60008	60040	60068	60093	60115	60133	60147	60159	60166	60171	60172	60169	60163	60154	60141	60125	60106	60083
	-88.2	-88.2	-88.2	-88.2	-88.3	-88.3	-88.4	-88.4	-88.5	-88.5	-88.6	-88.7	-88.8	-88.9	-89.0	-89.1	-89.2	-89.4	-89.5
-88	58740	58759	58776	58792	58805	58817	58828	58836	58843	58848	58851	58853	58853	58851	58847	58842	58835	58826	58815
	-90.5	-90.5	-90.5	-90.5	-90.5	-90.5	-90.5	-90.5	-90.6	-90.6	-90.6	-90.6	-90.7	-90.7	-90.8	-90.8	-90.9	-90.9	-91.0
-90	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440
	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	180	-178	-176	-174	-172	-170	-168	-166	-164	-162	-160	-158	-156	-154	-152	-150	-148	-146	-144
-60	64014	63734	63448	63159	62865	62566	62264	61958	61648	61333	61015	60691	60363	60029	59690	59344	58990	58629	58260
	-68.7	-71.2	-73.6	-75.9	-78.1	-80.2	-82.2	-84.0	-85.7	-87.2	-88.5	-89.7	-90.7	-91.6	-92.3	-92.9	-93.3	-93.7	-93.9
-62	64514	64255	63989	63718	63442	63162	62876	62586	62290	61990	61685	61374	61058	60736	60407	60071	59728	59377	59017
	-71.2	-73.5	-75.7	-77.9	-80.1	-82.1	-84.0	-85.8	-87.4	-89.0	-90.4	-91.6	-92.7	-93.7	-94.5	-95.2	-95.8	-96.3	-96.8
-64	64908	64669	64423	64172	63915	63652	63384	63110	62830	62545	62254	61958	61654	61345	61028	60704	60373	60033	59685
	-73.5	-75.6	-77.7	-79.8	-81.7	-83.7	-85.5	-87.2	-88.9	-90.4	-91.8	-93.0	-94.2	-95.3	-96.2	-97.0	-97.7	-98.4	-98.9
-66	65182	64964	64739	64508	64270	64026	63775	63519	63256	62987	62712	62430	62142	61846	61543	61233	60916	60590	60255
	-75.6	-77.5	-79.4	-81.3	-83.2	-85.0	-86.7	-88.3	-89.9	-91.4	-92.7	-94.0	-95.2	-96.3	-97.3	-98.2	-99.0	-99.7	-100.3
-68	65327	65130	64926	64715	64497	64272	64041	63802	63557	63305	63047	62782	62509	62230	61943	61648	61346	61036	60718
	-77.5	-79.2	-81.0	-82.7	-84.3	-86.0	-87.6	-89.1	-90.6	-92.0	-93.3	-94.5	-95.7	-96.8	-97.8	-98.7	-99.6	-100.3	-101.0
-70	65334	65159	64976	64785	64587	64382	64170	63951	63724	63491	63251	63003	62749	62487	62218	61941	61657	61365	61066
	-79.2	-80.7	-82.3	-83.8	-85.3	-86.8	-88.2	-89.6	-90.9	-92.2	-93.5	-94.6	-95.7	-96.8	-97.8	-98.7	-99.5	-100.3	-101.1
-72	65196	65042	64880	64710	64533	64348	64156	63957	63750	63537	63316	63088	62853	62610	62361	62104	61840	61569	61290
	-80.8	-82.1	-83.4	-84.7	-86.0	-87.3	-88.6	-89.8	-91.0	-92.2	-93.3	-94.4	-95.4	-96.4	-97.3	-98.2	-99.0	-99.8	-100.5
-74	64908	64775	64634	64485	64329	64165	63994	63815	63629	63437	63237	63030	62816	62595	62367	62132	61891	61642	61387
	-82.1	-83.2	-84.4	-85.5	-86.6	-87.7	-88.8	-89.8	-90.9	-91.9	-92.9	-93.9	-94.8	-95.7	-96.5	-97.3	-98.1	-98.8	-99.5
-76	64469	64356	64236	64108	63972	63830	63680	63522	63358	63187	63010	62825	62634	62436	62232	62021	61804	61581	61351
	-83.4	-84.3	-85.2	-86.1	-87.0	-88.0	-88.9	-89.8	-90.6	-91.5	-92.4	-93.2	-94.0	-94.8	-95.5	-96.2	-96.9	-97.6	-98.2
-78	63878	63785	63685	63577	63462	63341	63213	63078	62936	62788	62634	62473	62306	62133	61954	61770	61579	61383	61181
	-84.6	-85.3	-86.0	-86.7	-87.5	-88.2	-88.9	-89.7	-90.4	-91.1	-91.8	-92.5	-93.1	-93.8	-94.4	-95.0	-95.6	-96.2	-96.7
-80	63138	63064	62983	62895	62801	62701	62595	62482	62364	62240	62110	61974	61833	61686	61534	61377	61215	61047	60875
	-85.8	-86.3	-86.8	-87.4	-87.9	-88.5	-89.0	-89.6	-90.2	-90.7	-91.2	-91.8	-92.3	-92.8	-93.3	-93.8	-94.3	-94.8	-95.2
-82	62254	62197	62135	62067	61993	61914	61829	61740	61645	61545	61440	61330	61216	61097	60973	60845	60713	60577	60436
	-86.9	-87.3	-87.7	-88.1	-88.5	-88.9	-89.3	-89.7	-90.1	-90.5	-90.9	-91.3	-91.7	-92.1	-92.4	-92.8	-93.2	-93.5	-93.9
-84	61233	61192	61147	61098	61043	60985	60922	60855	60784	60709	60630	60548	60461	60371	60277	60179	60078	59974	59867
	-88.2	-88.4	-88.6	-88.9	-89.2	-89.4	-89.7	-90.0	-90.2	-90.5	-90.8	-91.0	-91.3	-91.6	-91.8	-92.1	-92.3	-92.6	-92.8
-86	60083	60058	60029	59997	59961	59923	59882	59838	59790	59740	59688	59632	59574	59513	59450	59384	59316	59246	59173
	-89.5	-89.6	-89.8	-89.9	-90.0	-90.2	-90.3	-90.5	-90.7	-90.8	-91.0	-91.1	-91.3	-91.4	-91.6	-91.8	-91.9	-92.1	-92.2
-88	58815	58803	58789	58774	58757	58738	58717	58696	58672	58647	58621	58593	58564	58533	58501	58468	58434	58398	58361
	-91.0	-91.0	-91.1	-91.1	-91.2	-91.2	-91.3	-91.4	-91.4	-91.5	-91.6	-91.6	-91.7	-91.8	-91.8	-91.9	-92.0	-92.1	-92.1
-90	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440
	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	-144	-142	-140	-138	-136	-134	-132	-130	-128	-126	-124	-122	-120	-118	-116	-114	-112	-110	-108
-60	58260	57882	57494	57095	56686	56265	55833	55388	54930	54460	53976	53480	52972	52450	51917	51373	50817	50252	49678
	-93.9	-94.1	-94.2	-94.3	-94.3	-94.4	-94.4	-94.4	-94.5	-94.6	-94.8	-95.0	-95.2	-95.6	-95.9	-96.3	-96.7	-97.2	-97.7
-62	59017	58648	58270	57881	57482	57073	56651	56219	55774	55318	54850	54369	53878	53375	52861	52337	51804	51261	50711
	-96.8	-97.1	-97.4	-97.6	-97.8	-97.9	-98.1	-98.3	-98.4	-98.6	-98.8	-99.0	-99.2	-99.5	-99.8	-100.1	-100.5	-100.8	-101.2
-64	59685	59328	58962	58586	58200	57803	57396	56979	56550	56111	55661	55200	54728	54247	53756	53256	52747	52231	51707
	-98.9	-99.4	-99.8	-100.1	-100.4	-100.7	-101.0	-101.2	-101.4	-101.7	-101.9	-102.1	-102.4	-102.6	-102.9	-103.1	-103.4	-103.7	-103.9
-66	60255	59912	59561	59199	58829	58449	58059	57659	57249	56830	56401	55962	55514	55057	54591	54118	53637	53149	52656
	-100.3	-100.9	-101.4	-101.9	-102.3	-102.6	-103.0	-103.3	-103.6	-103.8	-104.1	-104.3	-104.6	-104.8	-105.0	-105.2	-105.4	-105.6	-105.8
-68	60718	60392	60057	59713	59361	59000	58630	58250	57862	57466	57060	56646	56224	55795	55357	54913	54463	54007	53545
	-101.0	-101.7	-102.3	-102.8	-103.3	-103.7	-104.1	-104.4	-104.8	-105.1	-105.3	-105.6	-105.8	-106.0	-106.2	-106.4	-106.6	-106.7	-106.8
-70	61066	60758	60443	60119	59788	59448	59101	58745	58381	58010	57631	57245	56851	56451	56045	55632	55215	54792	54365
	-101.1	-101.7	-102.4	-102.9	-103.4	-103.9	-104.3	-104.7	-105.1	-105.4	-105.7	-106.0	-106.2	-106.4	-106.6	-106.8	-106.9	-107.0	-107.1
-72	61290	61004	60711	60410	60102	59787	59465	59135	58798	58455	58105	57749	57386	57018	56644	56266	55883	55496	55105
	-100.5	-101.2	-101.8	-102.4	-102.9	-103.4	-103.9	-104.3	-104.6	-105.0	-105.3	-105.5	-105.8	-106.0	-106.2	-106.3	-106.4	-106.5	-106.6
-74	61387	61125	60856	60581	60299	60010	59715	59414	59107	58794	58475	58151	57822	57487	57149	56806	56459	56109	55756
	-99.5	-100.2	-100.8	-101.3	-101.8	-102.3	-102.8	-103.2	-103.5	-103.9	-104.2	-104.5	-104.7	-104.9	-105.1	-105.2	-105.3	-105.4	-105.5
-76	61351	61115	60874	60626	60372	60113	59848	59578	59302	59022	58736	58446	58152	57854	57552	57246	56937	56626	56312
	-98.2	-98.8	-99.3	-99.9	-100.3	-100.8	-101.2	-101.6	-102.0	-102.3	-102.6	-102.9	-103.1	-103.3	-103.5	-103.6	-103.7	-103.8	-103.9
-78	61181	60973	60761	60543	60320	60092	59859	59622	59380	59134	58884	58631	58373	58113	57849	57582	57313	57042	56768
	-96.7	-97.2	-97.7	-98.2	-98.6	-99.0	-99.4	-99.8	-100.1	-100.4	-100.7	-100.9	-101.2	-101.4	-101.5	-101.7	-101.8	-101.9	-102.0
-80	60875	60698	60517	60331	60141	59947	59748	59546	59340	59131	58918	58702	58483	58262	58038	57812	57584	57354	57122
	-95.2	-95.6	-96.0	-96.4	-96.8	-97.2	-97.5	-97.8	-98.1	-98.4	-98.6	-98.9	-99.1	-99.3	-99.5	-99.6	-99.8	-99.9	-100.0
-82	60436	60292	60144	59992	59836	59677	59515	59350	59181	59010	58837	58661	58482	58302	58119	57935	57749	57562	57374
	-93.9	-94.2	-94.5	-94.9	-95.1	-95.4	-95.7	-96.0	-96.2	-96.5	-96.7	-96.9	-97.1	-97.3	-97.4	-97.6	-97.7	-97.9	-98.0
-84	59867	59757	59643	59527	59408	59286	59162	59036	58907	58776	58643	58509	58372	58234	58095	57954	57812	57670	57526
	-92.8	-93.1	-93.3	-93.6	-93.8	-94.0	-94.2	-94.4	-94.6	-94.8	-95.0	-95.1	-95.3	-95.5	-95.6	-95.7	-95.9	-96.0	-96.1
-86	59173	59098	59021	58942	58862	58779	58695	58609	58521	58432	58342	58250	58158	58064	57969	57874	57777	57681	57583
	-92.2	-92.4	-92.5	-92.7	-92.8	-93.0	-93.1	-93.3	-93.4	-93.5	-93.6	-93.8	-93.9	-94.0	-94.1	-94.2	-94.3	-94.4	-94.5
-88	58361	58323	58284	58244	58203	58161	58118	58074	58030	57984	57938	57892	57844	57797	57748	57700	57651	57601	57552
	-92.1	-92.2	-92.3	-92.3	-92.4	-92.5	-92.6	-92.6	-92.7	-92.8	-92.8	-92.9	-93.0	-93.0	-93.1	-93.1	-93.2	-93.3	-93.3
-90	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440
	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	-108	-106	-104	-102	-100	-98	-96	-94	-92	-90	-88	-86	-84	-82	-80	-78	-76	-74	-72
-60	49678	49096	48507	47913	47315	46715	46113	45512	44913	44319	43730	43148	42575	42013	41463	40927	40405	39900	39413
	-97.7	-98.2	-98.7	-99.2	-99.7	-100.1	-100.5	-100.8	-101.0	-101.1	-101.2	-101.1	-100.9	-100.6	-100.1	-99.6	-98.9	-98.0	-97.1
-62	50711	50154	49591	49023	48452	47879	47305	46732	46161	45594	45032	44476	43929	43392	42865	42351	41850	41363	40892
	-101.2	-101.6	-101.9	-102.3	-102.6	-102.8	-103.1	-103.2	-103.3	-103.3	-103.2	-103.0	-102.7	-102.3	-101.9	-101.3	-100.6	-99.8	-98.9
-64	51707	51178	50644	50105	49564	49021	48478	47935	47395	46858	46326	45800	45281	44770	44269	43779	43301	42835	42383
	-103.9	-104.2	-104.4	-104.6	-104.8	-104.9	-105.0	-105.0	-105.0	-104.9	-104.7	-104.4	-104.1	-103.6	-103.1	-102.5	-101.9	-101.1	-100.3
-66	52656	52157	51654	51148	50639	50129	49619	49109	48602	48097	47597	47102	46613	46132	45659	45196	44743	44300	43870
	-105.8	-106.0	-106.1	-106.2	-106.2	-106.3	-106.2	-106.2	-106.0	-105.9	-105.6	-105.3	-104.9	-104.5	-104.0	-103.4	-102.8	-102.1	-101.4
-68	53545	53080	52611	52138	51664	51189	50714	50240	49767	49297	48831	48369	47912	47462	47020	46585	46159	45743	45337
	-106.8	-106.9	-107.0	-107.0	-107.0	-106.9	-106.8	-106.7	-106.5	-106.3	-106.0	-105.7	-105.3	-104.9	-104.4	-103.9	-103.3	-102.7	-102.1
-70	54365	53935	53501	53065	52627	52189	51751	51313	50877	50443	50012	49585	49163	48746	48336	47932	47536	47148	46769
	-107.1	-107.1	-107.1	-107.1	-107.0	-107.0	-106.8	-106.7	-106.5	-106.2	-105.9	-105.6	-105.3	-104.9	-104.4	-104.0	-103.5	-103.0	-102.5
-72	55105	54711	54315	53917	53517	53117	52717	52317	51919	51523	51130	50739	50353	49971	49595	49224	48860	48502	48152
	-106.6	-106.6	-106.6	-106.6	-106.5	-106.4	-106.3	-106.1	-105.9	-105.7	-105.4	-105.1	-104.8	-104.5	-104.1	-103.7	-103.3	-102.9	-102.5
-74	55756	55401	55043	54684	54324	53964	53603	53243	52884	52527	52172	51820	51471	51126	50785	50450	50119	49794	49476
	-105.5	-105.5	-105.5	-105.5	-105.4	-105.3	-105.2	-105.1	-104.9	-104.7	-104.5	-104.3	-104.0	-103.7	-103.5	-103.2	-102.8	-102.5	-102.2
-76	56312	55997	55679	55360	55041	54721	54401	54082	53764	53447	53132	52820	52510	52203	51900	51600	51306	51016	50731
	-103.9	-103.9	-104.0	-104.0	-103.9	-103.9	-103.8	-103.7	-103.6	-103.4	-103.3	-103.1	-102.9	-102.7	-102.5	-102.3	-102.1	-101.9	-101.6
-78	56768	56494	56218	55940	55663	55385	55107	54830	54553	54278	54004	53732	53463	53196	52931	52671	52414	52160	51911
	-102.0	-102.1	-102.1	-102.2	-102.2	-102.1	-102.1	-102.1	-102.0	-101.9	-101.8	-101.7	-101.6	-101.5	-101.4	-101.2	-101.1	-101.0	-100.8
-80	57122	56890	56656	56422	56187	55952	55717	55483	55250	55017	54786	54556	54328	54102	53879	53658	53440	53225	53014
	-100.0	-100.1	-100.2	-100.2	-100.2	-100.3	-100.3	-100.3	-100.3	-100.3	-100.2	-100.2	-100.1	-100.1	-100.0	-100.0	-99.9	-99.9	-99.8
-82	57374	57185	56995	56805	56614	56424	56233	56043	55853	55665	55477	55291	55106	54922	54741	54562	54385	54211	54040
	-98.0	-98.1	-98.2	-98.2	-98.3	-98.4	-98.4	-98.5	-98.5	-98.5	-98.6	-98.6	-98.6	-98.6	-98.6	-98.6	-98.6	-98.6	-98.6
-84	57526	57382	57237	57092	56947	56802	56657	56512	56368	56224	56082	55940	55799	55660	55522	55386	55252	55120	54989
	-96.1	-96.2	-96.3	-96.4	-96.5	-96.6	-96.6	-96.7	-96.8	-96.8	-96.9	-96.9	-97.0	-97.0	-97.1	-97.1	-97.1	-97.2	-97.2
-86	57583	57485	57387	57289	57191	57092	56994	56896	56799	56702	56605	56509	56414	56320	56227	56136	56045	55956	55868
	-94.5	-94.6	-94.7	-94.8	-94.9	-95.0	-95.0	-95.1	-95.2	-95.2	-95.3	-95.4	-95.4	-95.5	-95.5	-95.6	-95.6	-95.7	-95.7
-88	57552	57502	57452	57402	57352	57302	57252	57203	57153	57104	57055	57007	56959	56911	56864	56818	56772	56727	56683
	-93.3	-93.4	-93.4	-93.5	-93.6	-93.6	-93.7	-93.7	-93.8	-93.8	-93.8	-93.9	-93.9	-94.0	-94.0	-94.0	-94.1	-94.1	-94.2
-90	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440
	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	-72	-70	-68	-66	-64	-62	-60	-58	-56	-54	-52	-50	-48	-46	-44	-42	-40	-38	-36
-60	39413	38944	38494	38064	37655	37267	36900	36555	36230	35927	35644	35381	35137	34912	34705	34515	34342	34184	34040
	-97.1	-96.1	-94.9	-93.7	-92.5	-91.1	-89.8	-88.5	-87.2	-86.0	-84.9	-83.9	-83.0	-82.3	-81.8	-81.4	-81.3	-81.5	-81.9
-62	40892	40437	40000	39580	39179	38796	38433	38088	37762	37455	37167	36896	36644	36409	36191	35989	35802	35630	35473
	-98.9	-97.9	-96.9	-95.8	-94.7	-93.6	-92.4	-91.3	-90.3	-89.2	-88.3	-87.5	-86.8	-86.3	-85.9	-85.7	-85.7	-85.9	-86.3
-64	42383	41946	41523	41117	40726	40352	39994	39654	39330	39024	38734	38460	38203	37962	37736	37526	37330	37149	36981
	-100.3	-99.5	-98.6	-97.6	-96.6	-95.7	-94.7	-93.8	-92.9	-92.1	-91.4	-90.7	-90.2	-89.8	-89.5	-89.4	-89.5	-89.7	-90.1
-66	43870	43452	43048	42657	42280	41918	41570	41238	40920	40617	40330	40057	39799	39556	39327	39113	38912	38725	38551
	-101.4	-100.6	-99.8	-99.0	-98.2	-97.4	-96.6	-95.9	-95.2	-94.5	-93.9	-93.5	-93.1	-92.8	-92.6	-92.6	-92.7	-93.0	-93.4
-68	45337	44942	44558	44186	43826	43479	43144	42823	42515	42221	41940	41672	41418	41177	40949	40734	40533	40344	40168
	-102.1	-101.4	-100.8	-100.1	-99.4	-98.8	-98.2	-97.6	-97.0	-96.5	-96.1	-95.7	-95.5	-95.3	-95.2	-95.2	-95.4	-95.6	-96.0
-70	46769	46399	46038	45688	45348	45020	44702	44396	44102	43819	43548	43290	43043	42809	42586	42376	42178	41992	41818
	-102.5	-101.9	-101.4	-100.8	-100.3	-99.8	-99.3	-98.8	-98.4	-98.1	-97.7	-97.5	-97.3	-97.2	-97.2	-97.3	-97.4	-97.7	-98.1
-72	48152	47810	47476	47150	46834	46527	46230	45942	45665	45398	45142	44896	44662	44438	44225	44023	43832	43653	43485
	-102.5	-102.1	-101.6	-101.2	-100.8	-100.4	-100.1	-99.7	-99.4	-99.2	-99.0	-98.8	-98.7	-98.7	-98.7	-98.8	-98.9	-99.2	-99.5
-74	49476	49163	48858	48561	48271	47989	47715	47450	47194	46946	46708	46480	46261	46051	45852	45663	45483	45314	45155
	-102.2	-101.9	-101.6	-101.3	-101.0	-100.7	-100.4	-100.2	-100.0	-99.8	-99.7	-99.6	-99.6	-99.6	-99.6	-99.7	-99.9	-100.1	-100.3
-76	50731	50451	50178	49911	49650	49396	49149	48909	48677	48453	48237	48029	47829	47638	47456	47283	47118	46963	46817
	-101.6	-101.4	-101.2	-101.0	-100.8	-100.6	-100.5	-100.3	-100.2	-100.1	-100.0	-100.0	-100.0	-100.0	-100.1	-100.2	-100.3	-100.5	-100.7
-78	51911	51667	51428	51193	50964	50741	50524	50313	50108	49910	49719	49535	49358	49189	49027	48873	48727	48589	48459
	-100.8	-100.7	-100.6	-100.4	-100.3	-100.2	-100.1	-100.0	-100.0	-99.9	-99.9	-99.9	-99.9	-100.0	-100.0	-100.1	-100.2	-100.4	-100.5
-80	53014	52807	52604	52405	52210	52020	51835	51656	51481	51312	51149	50992	50841	50696	50557	50426	50301	50183	50072
	-99.8	-99.7	-99.7	-99.6	-99.6	-99.5	-99.5	-99.5	-99.4	-99.4	-99.4	-99.5	-99.5	-99.5	-99.6	-99.7	-99.8	-99.9	-100.0
-82	54040	53871	53706	53544	53386	53232	53081	52935	52793	52655	52522	52394	52271	52153	52041	51934	51832	51736	51646
	-98.6	-98.6	-98.5	-98.5	-98.5	-98.5	-98.5	-98.6	-98.6	-98.6	-98.6	-98.6	-98.7	-98.7	-98.8	-98.8	-98.9	-99.0	-99.0
-84	54989	54861	54736	54613	54493	54376	54262	54151	54043	53939	53838	53741	53648	53558	53473	53392	53315	53243	53175
	-97.2	-97.2	-97.2	-97.3	-97.3	-97.3	-97.3	-97.4	-97.4	-97.4	-97.5	-97.5	-97.5	-97.6	-97.6	-97.7	-97.7	-97.7	-97.8
-86	55868	55782	55698	55615	55534	55456	55379	55304	55232	55162	55095	55030	54968	54908	54851	54798	54747	54698	54654
	-95.7	-95.7	-95.8	-95.8	-95.9	-95.9	-95.9	-96.0	-96.0	-96.0	-96.1	-96.1	-96.1	-96.1	-96.2	-96.2	-96.2	-96.2	-96.3
-88	56683	56639	56597	56555	56515	56475	56437	56400	56364	56329	56295	56263	56232	56202	56174	56148	56122	56099	56077
	-94.2	-94.2	-94.2	-94.2	-94.3	-94.3	-94.3	-94.3	-94.4	-94.4	-94.4	-94.4	-94.4	-94.5	-94.5	-94.5	-94.5	-94.5	-94.5
-90	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440
	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6

IGRF 1980 TOTAL INTENSITY (F)

LONG / LAT	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	0
-60	34040	33910	33794	33689	33597	33515	33445	33385	33335	33295	33266	33247	33239	33241	33256	33282	33321	33374	33442
	-81.9	-82.5	-83.4	-84.5	-85.9	-87.5	-89.3	-91.4	-93.6	-95.9	-98.4	-100.9	-103.5	-106.1	-108.7	-111.2	-113.7	-115.9	-118.1
-62	35473	35329	35199	35081	34975	34881	34799	34728	34668	34620	34583	34557	34544	34542	34553	34577	34615	34668	34736
	-86.3	-86.9	-87.7	-88.8	-90.0	-91.5	-93.1	-94.9	-96.9	-98.9	-101.1	-103.3	-105.6	-107.8	-110.1	-112.3	-114.4	-116.3	-118.2
-64	36981	36827	36686	36558	36443	36339	36248	36169	36101	36046	36002	35972	35953	35948	35956	35978	36014	36066	36133
	-90.1	-90.7	-91.5	-92.5	-93.6	-94.9	-96.3	-97.9	-99.5	-101.3	-103.2	-105.1	-107.0	-109.0	-110.9	-112.8	-114.5	-116.2	-117.8
-66	38551	38391	38243	38108	37986	37876	37778	37693	37620	37560	37512	37477	37455	37447	37452	37471	37506	37555	37621
	-93.4	-93.9	-94.6	-95.5	-96.5	-97.6	-98.8	-100.2	-101.6	-103.1	-104.7	-106.3	-107.9	-109.5	-111.1	-112.7	-114.2	-115.6	-116.9
-68	40168	40005	39855	39716	39591	39477	39376	39287	39211	39148	39097	39060	39035	39024	39027	39045	39077	39124	39186
	-96.0	-96.5	-97.1	-97.9	-98.7	-99.7	-100.7	-101.8	-103.0	-104.3	-105.6	-106.9	-108.3	-109.6	-110.9	-112.2	-113.4	-114.6	-115.6
-70	41818	41656	41506	41368	41242	41128	41027	40937	40860	40796	40744	40705	40679	40667	40668	40683	40713	40757	40816
	-98.1	-98.5	-99.0	-99.6	-100.4	-101.1	-102.0	-102.9	-103.9	-104.9	-106.0	-107.0	-108.1	-109.2	-110.2	-111.3	-112.2	-113.2	-114.0
-72	43485	43328	43182	43048	42925	42814	42715	42627	42552	42488	42437	42399	42373	42359	42360	42373	42400	42441	42496
	-99.5	-99.9	-100.3	-100.8	-101.4	-102.0	-102.7	-103.4	-104.2	-105.0	-105.8	-106.7	-107.5	-108.3	-109.2	-110.0	-110.7	-111.5	-112.1
-74	45155	45007	44869	44742	44626	44521	44426	44343	44271	44211	44162	44125	44100	44087	44086	44098	44123	44161	44212
	-100.3	-100.6	-101.0	-101.4	-101.9	-102.4	-102.9	-103.4	-104.0	-104.6	-105.3	-105.9	-106.5	-107.2	-107.8	-108.4	-109.0	-109.5	-110.0
-76	46817	46681	46554	46437	46330	46233	46146	46070	46004	45948	45903	45869	45846	45834	45834	45845	45867	45902	45948
	-100.7	-100.9	-101.2	-101.5	-101.8	-102.2	-102.6	-103.0	-103.4	-103.9	-104.3	-104.8	-105.3	-105.7	-106.2	-106.6	-107.0	-107.4	-107.7
-78	48459	48338	48225	48121	48026	47940	47862	47794	47736	47687	47647	47617	47597	47587	47587	47597	47618	47649	47690
	-100.5	-100.7	-100.9	-101.1	-101.4	-101.6	-101.9	-102.2	-102.5	-102.8	-103.1	-103.4	-103.7	-104.0	-104.3	-104.6	-104.9	-105.2	-105.4
-80	50072	49968	49871	49783	49701	49628	49562	49504	49454	49413	49380	49355	49339	49331	49332	49341	49360	49387	49423
	-100.0	-100.1	-100.2	-100.4	-100.5	-100.7	-100.9	-101.1	-101.3	-101.5	-101.7	-101.8	-102.0	-102.2	-102.4	-102.6	-102.7	-102.9	-103.0
-82	51646	51562	51483	51411	51346	51286	51233	51187	51147	51114	51088	51069	51057	51052	51053	51062	51078	51102	51132
	-99.0	-99.1	-99.2	-99.3	-99.4	-99.5	-99.6	-99.7	-99.8	-99.9	-100.0	-100.1	-100.2	-100.3	-100.4	-100.5	-100.6	-100.6	-100.7
-84	53175	53112	53053	52999	52950	52906	52866	52832	52803	52779	52760	52747	52739	52736	52739	52747	52760	52779	52803
	-97.8	-97.8	-97.9	-97.9	-98.0	-98.0	-98.1	-98.1	-98.2	-98.2	-98.2	-98.3	-98.3	-98.4	-98.4	-98.4	-98.4	-98.4	-98.4
-86	54654	54612	54573	54538	54505	54477	54451	54429	54411	54396	54384	54376	54372	54371	54373	54380	54390	54403	54421
	-96.3	-96.3	-96.3	-96.3	-96.3	-96.4	-96.4	-96.4	-96.4	-96.4	-96.4	-96.4	-96.4	-96.4	-96.4	-96.4	-96.4	-96.3	-96.3
-88	56077	56056	56037	56020	56005	55991	55979	55968	55960	55953	55948	55944	55943	55943	55945	55949	55955	55962	55971
	-94.5	-94.5	-94.5	-94.5	-94.5	-94.5	-94.5	-94.5	-94.5	-94.5	-94.5	-94.5	-94.5	-94.5	-94.4	-94.4	-94.4	-94.4	-94.4
-90	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440	57440
	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6	-92.6

APPENDIX

SPHERICAL HARMONIC COEFFICIENTS FOR THE INTERNATIONAL GEOMAGNETIC REFERENCE FIELD (1965–1985)

Appendix Spherical Harmonic Coefficients for the International Geomagnetic Reference Field

	n	m	Main Field (nT) DGRF 1965	DGRF 1970	DGRF 1975	IGRF 1980	SV (nT/yr) 1980-85
g	1	0	-30334	-30220	-30100	-29988	22.4
g	1	1	-2119	-2068	-2013	-1957	11.3
h	1	1	5776	5737	5675	5606	-15.9
g	2	0	-1662	-1781	-1902	-1997	-18.3
g	2	1	2997	3000	3010	3028	3.2
h	2	1	-2016	-2047	-2067	-2129	-12.7
g	2	2	1594	1611	1632	1662	7.0
h	2	2	114	25	-68	-199	-25.2
g	3	0	1297	1287	1276	1279	0.0
g	3	1	-2038	-2091	-2144	-2181	-6.5
h	3	1	-404	-366	-333	-335	0.2
g	3	2	1292	1278	1260	1251	-0.7
h	3	2	240	251	262	271	2.7
g	3	3	856	838	830	833	1.0
h	3	3	-165	-196	-223	-252	-7.9
g	4	0	957	952	946	938	-1.4
g	4	1	804	800	791	783	-1.4
h	4	1	148	167	191	212	4.6
g	4	2	479	461	438	398	-8.2
h	4	2	-269	-266	-265	-257	1.6
g	4	3	-390	-395	-405	-419	-1.8
h	4	3	13	26	39	53	2.9
g	4	4	252	234	216	199	-5.0
h	4	4	-269	-279	-288	-298	0.4
g	5	0	-219	-216	-218	-219	1.5
g	5	1	358	359	356	357	0.4
h	5	1	19	26	31	46	1.8
g	5	2	254	262	264	261	-0.8
h	5	2	128	139	148	149	-0.4
g	5	3	-31	-42	-59	-74	-3.3
h	5	3	-126	-139	-152	-150	0.0
g	5	4	-157	-160	-159	-162	0.2
h	5	4	-97	-91	-83	-78	1.3
g	5	5	-62	-56	-49	-48	1.4
h	5	5	81	83	88	92	2.1
g	6	0	45	43	45	49	0.4
g	6	1	61	64	66	65	0.0
h	6	1	-11	-12	-13	-15	-0.5
g	6	2	8	15	28	42	3.4
h	6	2	100	100	99	93	-1.4
g	6	3	-228	-212	-198	-192	0.8
h	6	3	68	72	75	71	0.0
g	6	4	4	2	1	4	0.8
h	6	4	-32	-37	-41	-43	-1.6
g	6	5	1	3	6	14	0.3
h	6	5	-8	-6	-4	-2	0.5
g	6	6	-111	-112	-111	-108	-0.1
h	6	6	-7	1	11	17	0.0
g	7	0	75	72	71	70	-1.0
g	7	1	-57	-57	-56	-59	-0.8
h	7	1	-61	-70	-77	-83	-0.4
g	7	2	4	1	1	2	0.4
h	7	2	-27	-27	-26	-28	0.4
g	7	3	13	14	16	20	0.5
h	7	3	-2	-4	-5	-5	0.2
g	7	4	-26	-22	-14	-13	1.6
h	7	4	6	8	10	16	1.4
g	7	5	-6	-2	0	1	0.1
h	7	5	26	23	22	18	-0.5
g	7	6	13	13	12	11	0.1
h	7	6	-23	-23	-23	-23	-0.1
g	7	7	1	-2	-5	-2	0.0
h	7	7	-12	-11	-12	-10	1.1
g	8	0	13	14	14	20	0.8
g	8	1	5	6	6	7	-0.2
h	8	1	7	7	6	7	-0.1
g	8	2	-4	-2	-1	1	-0.3
h	8	2	-12	-15	-16	-18	-0.7
g	8	3	-14	-13	-12	-11	0.3
h	8	3	9	6	4	4	0.0
g	8	4	0	-3	-8	-7	-0.8
h	8	4	-16	-17	-19	-22	-0.8
g	8	5	8	5	4	4	-0.2
h	8	5	4	6	6	9	0.2
g	8	6	-1	0	0	3	0.7
h	8	6	24	21	18	16	0.2
g	8	7	11	11	10	7	-0.3
h	8	7	-3	-6	-10	-13	-1.1
g	8	8	4	3	1	-1	1.2
h	8	8	-17	-16	-17	-15	0.8
g	9	0	8	8	7	6	
g	9	1	10	10	10	11	
h	9	1	-22	-21	-21	-21	
g	9	2	2	2	2	2	
h	9	2	15	16	16	16	
g	9	3	-13	-12	-12	-12	
h	9	3	7	6	7	9	
g	9	4	10	10	10	9	
h	9	4	-4	-4	-4	-5	
g	9	5	-1	-1	-1	-3	
h	9	5	-5	-5	-5	-7	
g	9	6	-1	0	-1	-1	
h	9	6	10	10	10	9	
g	9	7	5	3	4	7	
h	9	7	10	11	11	10	
g	9	8	1	1	1	1	
h	9	8	-4	-2	-3	-6	
g	9	9	-2	-1	-2	-5	
h	9	9	1	1	1	2	
g	10	0	-2	-3	-3	-3	
g	10	1	-3	-3	-3	-4	
h	10	1	2	1	1	1	
g	10	2	2	2	2	2	
h	10	2	1	1	1	1	
g	10	3	-5	-5	-5	-5	
h	10	3	2	3	3	2	
g	10	4	-2	-1	-2	-2	
h	10	4	6	4	4	5	
g	10	5	4	6	5	5	
h	10	5	-4	-4	-4	-4	
g	10	6	4	4	4	3	
h	10	6	0	0	-1	-1	
g	10	7	0	1	1	1	
h	10	7	-2	-1	-1	-2	
g	10	8	2	0	0	2	
h	10	8	3	3	3	4	
g	10	9	2	3	3	3	
h	10	9	0	1	1	-1	
g	10	10	0	-1	-1	0	
h	10	10	-6	-4	-5	-6	

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