Gravity Measurements at Sea by Use of the T.S.S.G.

Part 2. Results of the Measurements

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Abstract

Among numerous cruises on which gravity was measured by use of the T.S.S.G. the cruises of the Umitaka-maru of the Tokyo University of Fisheries made in July and August 1966 and from November 1967 to February 1968, the cruises of the Hakuho-maru of the Ocean Research Institute, University of Tokyo made in August 1967, in July and August 1968 and from April to June 1969, and the cruise of the Meiyo of the Hydrographic Office, Maritime Safety Agency of Japan are selected to illustrate actual situations of gravity measurements during each of the cruises. Gravity measurements by use of the Vening Meinesz gravity meter made in 1934 and 1935 by Matsuyama *et al.* are also taken up and compared with the measurements by use of the T.S.S.G.

Gravity values obtained by these measurements have been compiled into gravity tables, and maps or profiles of certain tectonically intimate areas have been drawn. The areas selected from tectonical viewpoint are; Japan trench and its vicinity, Suiko sea-mount at the emperor ridge, Brisbane Hill at the coral sea, Shatzky rise (north-west Pacific rise), Bismark plateau, Mariana trench and Solomon trench.

§1. Description of Cruises on which Gravity Measurements were made

Accuracy of gravity measurements at sea depends much on the ships where gravity meters are settled, and conditions of measurement such as calibration points or sailing methods are likely to be determined by ship's situations. Therefore it is important to have correct knowledges about the ship for enhancing accuracies of measurements. In this section descriptions of the measurement in each cruise are given with particular reference to the following items;

- 1) characteristics of dynamic gravity meters in use
- 2) effects of various vibrations on the ship
- 3) effect of temperature
- 4) ship's motions and 2nd order corrections
- 5) verticality of the gravity meter axis
- 6) Calibrations
- 7) Eötvös corrections

for seven cruises on which the T.S.S.G.'s were used. Though measurements were not by the T.S.S.G. the measurements made in 1934 and 1935 by use of the Vening Meinesz

gravity meter in the Japan trench and its vicinities by MATSUYAMA *et al.* (1934) are also described in this section because they are not only of historical importance but also still as reliable as the present day measurements.

1-1 Gravity measurements by use of a Vening Meinesz Gravity meter in 1934 and 1935

Details of these measurements have already been obscured. Here KUMAGAI (1953) is referred concerning the measurements carried out in October 1934 and 1935 by M. MATSUYAMA, N. KUMAGAI and M. HURUTANI on board submarines. The measured areas are across the Japan trench in 1934 and across the Izu Ogasawara trench in 1935.

The first test on board a submarine RO-57 was made at the Sagami Bay and actual measurements across the Japan trench followed it, starting from Yokosuka on October 17th and returning there on November 1st. 27 measurements were performed during this cruise with 25 dives, in two cases of which measurements were made twice each, but it does not mean that they were made at the same place (the measured positions of both 1934 and 1935 are indicated in Fig. 1.).

Fig. 1. Positions of measurements of gravity by use of the Vening Meinesz gravity meter, 1934 and 1935.

As a gravity base station the second class gravity station of the Potsdam system located at $35^{\circ}01.6'N$ and $135^{\circ}47.2'E$ at the department of geology and mineralogy, Kyoto University was used, where the gravity value is 979.721 ± 0.0018 gal.

The instrument used had been purchased by the Japan Geodetic Commission in July 1932 from the N. V. Nederlandsche Seintestellen Fabriek, Hilversum, Holland, and adjusted and calibrated by KUMAGAI at the department of geology and mineralogy, Kyoto University.

Positions of the measured places were determined by both the astronomical observations and the ship's log. The water depths were obtained from the charts published by the then Hydrographic Office of the Japanese Navy.

The period of the Vening Meinesz Pendulum is slightly over $1/2$ sec. Its temperature coefficient is about $-10^{-5}/^{\circ}C$ which corresponds to $+20$ mgal/ $^{\circ}C$. As the pressure of the air

Fig. 2. Free air anomaly contour over the Japan trench drawn by Kumagai. Contour interval is 50 mgal.

also influences the pendulum corrections for the pressure are applied to the measured period according to $-5 \times 10^{-6} D$, where D is a relative density of air expressed by

$$D = \frac{b - 0.375e}{760(1 + 0.003665t)} \quad 1-1 \quad (1)$$

where t is temperature ($^{\circ}C$), e vapour pressure in mmHg and b barometric height in mmHg.

There are found no discussions of the ship's motion or the Eötvös effect in KUMAGAI's paper. Though it is unable for us to tell something about the submarine measurements because no informations are available of the capacity of the then submarines, more or less than 10 mgal effect due to the current such as Kuroshio is suspected to have existed. Other things that seem to have had influences on accuracies of the measurement include the daily variation of chronometers, to which Kumagai referred by stating that he took all corrections into account that were possible to make at that time.

The standard formula of gravity used to

calculate gravity anomalies is the Helmert's formula given in 1901. This is by about 15 mgal smaller than the International formula given in 1936. This difference is taken into account when the gravity values are compared with those measured by the T.S.S.G. Free air anomaly contour drawn by KUMAGAI is quoted in Fig. 2.

1-2 Gravity measurements in 1966 by use of the T.S.S.G. on board the Umitaka-maru

From July to August in 1966 gravity measurements were made in the north part of the sea around Japan (Japan trench, continental shelves south of Hokkaido, north part of the Japan sea, Musashi bank and continental shelves off Sanriku and Kanto districts) on board the Umitaka-maru of Tokyo University of Fisheries (TOMODA and SEGAWA 1966).

The T.S.S.G. was first equipped on the Umitaka-maru in October 1963 and since then used for the world wide measurements in case of the Indian ocean expedition from 1963 to 1964, the southern sea expedition from 1964 to 1965, the Hawaii and Mexico expedition from 1965 to 1966, measurements near and around Japan in 1966, the southern

sea expedition from 1966 to 1967, measurements near and around Japan in 1967 and the Coral and Tasman sea expedition from 1967 to 1968. The situations of the ship have therefore been well familiarized (TOMODA 1967, SEGAWA 1967 and TOMODA, OZAWA and SEGAWA 1968).

Tracks of the Umitaka-maru in case of the measurement in 1966 are shown in Fig. 3. Method of measurement was of the punching tape system (refer Part 1). The measurement was started at Tateyama at 14^h30^m on July 18th. The ship proceeded northward up to Kushiro and then visited Hakodate, Otaru by way of Rebun Is. and Musashi bank in the north Japan sea. She returned to Tateyama on August 19th.

The dynamic gravity meter used in this cruise is the so called "Z-0", which was constructed in 1963 and used for the measurements in case of the Indian ocean expedition from 1963 to 1964 and the southern sea expedition from 1964 to 1965. Just after it

Fig. 3. Ship's track of the Umitaka-maru in July and August 1966.

Fig. 4. Results of measurement when the ship was anchoring at the harbours in July and August 1966.

was constructed it showed a positive drift but became steady in about a day with less than 1 mgal/day drift. Its natural frequency is 1750 Hz at 42°C and its "Q" value was 100,000 at the time of construction but now it has been lowered to about 30,000. The fall of "Q" value is not necessarily connected to the drift rate of the meter. The results of measurements when the ship was at anchor are shown in Fig. 4. Variations of the apparent gravity seen in the figure can be looked upon as a clue to know conditions of the meter.

What were most troublesome in the measurements of this cruise are vibrations caused by gyro spin motors and those caused by ship's engines. Vibrations of several hundred Hz occur at the gyrotable due to the rotation of a spin motor, producing accelerations of normally 100-200 gal r.m.s. amplitude. However vibrations up to 500 gal sometimes occur due to unbalancing of the rotor. Such noises can not be reduced to as small as it may not cause decreases of gravity due to the 2nd order effect. Measurements at Tateyama seen in Fig. 4 seem particularly affected by such vibrations giving rise to fluctuations of the values of ± 20 mgal. In other measurements such fluctuations are reduced to ± 5 mgal. Variations found in the measurements at Kushiro appear to be a diurnal variation, but it is not assured. Long period variations in other measurements may be caused either by variations of vibration strength or by deflections of the vertical gyroscope. In such a respect the measurements in this cruise may involve errors as large as ± 20 mgal.

Vibrations of the ship's floor caused by engines and screws are especially strong on the Umitaka-maru, and it is likely that they increase year by year with superannuation of the ship. Resonances of vibration seem to occur when the engine is in full rotation (190 r/m). The frequency of vibration is from 3 to 20 Hz and can not be eliminated by usual shock absorbers. The amount of the effect of vibrations can be estimated by measuring the differences of apparent gravities which take place when the engine is

started or stopped while the ship is proceeding in the direction of the least Eötvös effect. The 2nd order effect due to ship's floor vibrations is remarkable when the ship is in full speed and it has been estimated to be approximately -35 mgal decrease. Therefore corrections of +35 mgal have been applied to all the data measured under such conditions.

In Figs. 5 and 6 results of temperature coefficient measurement are shown with respect to the dynamic gravity meter "Z-0". In Fig. 5 it is seen that the meter "Z-0" is more sensitive to the speed of temperature change than temperature itself. The temperature coefficient measured by the differences of apparent gravity at stationary states is obtained from Fig. 6. It is a positive value of +10 mgal/°C. Signs of the co-efficients are not always positive but some gravity meters have negative co-efficients, as will be indicated later.

The dynamic gravity meter is enclosed in an oven whose temperature is regulated within variation of $\pm 0.01^\circ\text{C}$ in short term accuracy.

Fig. 5. Temperature response of the dynamic gravity meter Z-0.

Fig. 6. Determination of the temperature coefficient of the dynamic gravity meter Z-0.

but in the presence of long term temperature variations the meter is subjected to temperature variation of about one twentieth of the ambient temperature variation. Conspicuous variation of room temperature was observed between Tateyama and Kushiro of the order of 15°C , for which corrections have been made according to the temperature co-efficient.

Verticality of the gravity meter was checked sufficiently in the harbours and it is assured that it maintained an accuracy of better than $\pm 4'$. Accuracy in the cruising state however was not checked. It is reasonably suspected that some amount of deflection may have occurred, as is discussed in Part 1.

Sea conditions were favourable in the most part of the measurements in which the amounts of the 2nd order corrections are comparatively small, as is shown in Fig. 7, with the exception of the measurement be-

tween Otaru and Tateyama. The 2nd order corrections have been applied uniformly according to the formula $\Delta g = 0.20\bar{\alpha}^2$ in mgal, where $\bar{\alpha}^2$ is an averaged dispersion of vertical accelerations in $(\text{gal})^2$.

Eötvös corrections have been calculated from the formula $\Delta E = (44.94 \cos \varphi) \Delta L$ in mgal, where φ is latitude and ΔL is longitude difference in 10 min (the unit in'), on the basis of positions determined by astronomical observations or by Loran fixings. However data of ship's positions can never be directly applied to the Eötvös corrections but it is necessary to smoothe them before the applications, with reference to informations such as rotation of engines, water currents or wind velocity. The Eötvös corrections are also indicated in Fig. 7 in relation to the number attached to gravity values.

Calibrations of the dynamic gravity meter were made at the harbour which the Umitaka-maru visited. Gravities of the stations, though they were not directly measured by a land gravity meter but deduced from values of the surrounding area by use of a land gravity map, are compared with the gravities measured by the T.S.S.G. The results of comparison are tabulated in Table 1.

The gravities g_m 's are those which are determined according to an idealized equation of the dynamic gravity meter mentioned in Part 1, with a single gravity constant calibrated at the preceding base station. So the differences $(g_m - g_s)$'s may well be supposed to be caused by the "elastic tension". From the differences between Tateyama and Kushiro and between Otaru and Tateyama the elastic tension can be calculated for "Z-0", according to the formula mentioned in Part 1. In Fig. 8 are plotted the differences $g_m -$

Fig. 7. Variations of the 2nd order correction and the Eötvös correction in the measurement of the Umitaka-maru in July and August 1966.

Table 1

Date	Base	g_s	g_m	$g_m - g_s$
July 16-18	Tateyama	979.795 gal	979.795 gal	0 mgal
July 22-25	Kushiro	980.620	980.662	+42
July 28-Aug. 1	Hakodate	980.420	980.410	-10
Aug. 12-15	Otaru	980.520	980.535	+15
Aug. 19	Tateyama	979.795	979.775	-20

Fig. 8. $g_m - g_e$ in relation to Δg_e .

Table 2

Dynamic gravity meter	Z-0 made in 1963
averaged frequency	1750 Hz at 42°C
temperature co-efficient	+10 mgal/°C
Q-value	100,000—30,000
elastic tension	+39 gals

g_e in relation to Δg_e . A slope of the most fitted line to be drawn in the figure will give an approximate value of the elastic tension though it is likely to be subjected to errors owing to the unknown factors of measurement. It is found that the elastic tension A for the dynamic gravity meter "Z-0" is +39 gal. With this elastic tension corrections are made to all the gravity values obtained at the cruising state according to the way described in Part 1.

It is interesting to note that the positive elastic tension is accompanied with a positive temperature co-efficient, to which we will refer in case of other cruises as well.

In Table 2 characteristics of the dynamic gravity meter "Z-0" are summed.

1-3 Gravity measurements between 1967 and 1968 by use of the T. S. S. G. on board the Umitaka-maru

From November 1st 1967 to February 23rd 1968 gravity measurements were made in the Pacific ocean, Coral sea and Tasman sea on board the Umitaka-maru by use of the T.S.S.G. The ship started from Take-shiba pier in the bay of Tokyo and visited

Fig. 9. Ship's track of the Umitaka-maru from Nov. 1967 to Feb. 1968.

Port Moresby, Thursday island, Cairns, Sydney, Hobart and Brisbane. The ship's track is shown in Fig. 9. In addition to these visits which had been scheduled there were two unscheduled places where the ship anchored, Hervey Bay of Australia and Yaizu Harbour of Japan. Gravity measurements were made by use of the T.S.S.G.-D.P.U. (ref. Part 1).

The dynamic gravity meter used on this cruise is "Z-2", which was constructed in 1963 together with the meter "Z-0". Q-value

Fig. 10. Drift measurement of the dynamic gravity meter Z-2 between April 24th and May 16th, 1964.

was 50,000 at the time of construction. Drift rate just after the construction showed a positive value and became steady in about a day with a drift rate of less than 1 mgal/day. There is a comparatively long term observation of drift with the meter "Z-2" which was carried out about 6 months after the construction (Fig. 10). From the figure it is found that no long term drift is recognized but short term fluctuations of ± 3 mgal. After that Q-value was lowered gradually and showed a value of 10,000 at the time of departure from Tokyo in the present expedition. Natural frequency of the meter "Z-2" is 1910 Hz at 46.5°C .

On November 12th when the ship was cruising in the sea near Caroline islands an accident occurred: A thermister attached to the dynamic gravity meter to control the oven temperature was broken and the temperature in it rised as high as it melted the hermetic seal of the meter. After this trouble Q-value was extremely lowered owing to the air leaked into from the molten seal. This accident once made us think it was impossible to continue the measurements. But fortunately we could make the dynamic gravity meter vibrate again after repairs and resumed the measurement, when the natural frequency of the meter was 1907 Hz at 46.5°C and the Q-value was 2000.

Drift measurements at harbours are shown in Fig. 11. Fluctuations of the measured values found in the measurements at Hobart, Brisbane and Yaizu are probably caused by the deflection of the measuring axis of the

meter. The use of an overheated gravity meter of low Q-value showed a useful instruction that such matters did not become fatal defects. Temperature co-efficient of "Z-2" which was once overheated was measured when the ship stayed at Hobart (Fig. 12). According to the measurement the coefficient of the overheated meter is found to be $-70 \text{ mgal}/^{\circ}\text{C}$ (Fig. 13). For the sake of comparison drift measurements and the measurement of temperature co-efficient carried

Fig. 11. Results of measurement when the ship was anchoring at the harbours from Nov. 1967 to Feb. 1968.

Fig. 12. Temperature response of the once overheated dynamic gravity meter Z-2.

Fig. 13. Determination of the temperature co-efficient of the once overheated dynamic gravity meter Z-2.

Fig. 14. Results of measurement when the ship was anchoring at the harbours from July to August 1967.

out on the cruise of the Umitaka-maru around south part of Japan in July and August 1967 (ref. Part 1) are indicated in Figs. 14 and 15. On this cruise the meter "Z-2" was used also. From the figures it seems there is no distinction between the two cases if slight differences are neglected coming from the reasons other than those of the dynamic

Fig. 15. Temperature response of the dynamic gravity meter Z-2 in its normal state.

Fig. 16. Determination of the temperature co-efficient of the dynamic gravity meter Z-2 in its normal state.

gravity meter, showing that the temperature co-efficient of "Z-2" at normal state was also about $-70 \text{ mgal}/^{\circ}\text{C}$ (Fig. 16).

In the measurement of this cruise we suffered from short period vibrations of the floor as was the case in the measurement made in 1966 and 1967. Vibrations from the rotor of the vertical gyroscope could be reduced by adjusting the speed of rotation. Long term air temperature variations throughout the cruise were observed to be 25°C , but its effect could be made as small as possible by adjusting ventilations and by making calibrations at every visiting port.

The 2nd order corrections were made according to a simplified method, which is described in Part 1 with respect to the

Fig. 17. Variations of the 2nd order corrections and the Eötvös corrections in the measurement of the Umitaka-maru from Nov. 1967 to Feb. 1968.

Table 3

Date	Base	g_s	g_m	$g_m - g_s$
Nov. 1	Takeshiba Tokyo	979.790 gal	979.790 gal	0 mgal
Nov. 23-25	Port Moresby	978.245	—	—
Dec. 2-5	Thursday island	978.261	978.261	0
Dec. 13-16	Cairns	978.513	978.504	-9
Dec. 30-Jan. 4	Sydney	979.690	979.708	+18 ?
Jan. 10-15	Hobart	980.443	980.405	-40
Jan. 24-29	Brisbane	979.179	979.224	+45
Feb. 20-21	Yaizu	979.773	979.752	-21

T.S.S.G.-D.P.U. As the 2nd order correction co-efficient we took $0.021 \text{ mgal}/(\text{gal})^2$. In Fig. 17 the results of 2nd order corrections are indicated in relation to the number attached to gravity values.

Eötvös corrections were made in the same way as is described in section 1-2. The results are indicated also in Fig. 17 in relation to the number attached to gravity values.

Calibrations of the gravity meter were made at every port except for Port Moresby, where gravity values of the piers were measured by use of a La Coste-Romberg land gravity meter. In Table 3 date, base stations, gravity values of the stations g_s measured by the land gravity meter, gravity values g_m measured by the T.S.S.G. and the differences

Fig. 18. $g_m - g_s$ in relation to Δg_s .

$g_m - g_s$ are listed. The elastic tension A of the meter "Z-2" can be calculated from the relation $(g_m - g_s)$ to the variations of g_s , as is shown in Fig. 18. Distributions of

Table 4

Dynamic gravity meter	Z-2 made in 1963
averaged frequency	1910 (or 1907) Hz at 46.5°C
temperature co-efficient	-70 mgal/°C
Q-value	50000-10000-2000
elastic tension	-39 gals

$(g_m - g_s)$ in the figure can be represented by a line passing the origin, except for a point measured at Sydney. The reason why the value at Sydney is exceptional is that there was a trouble in the gyro erection devices just before arriving at Sydney when the gyrotable was too much deflected to recover the initial state. From a slope of the line drawn in the figure we can get the elastic tension of "Z-2" as -39 gal, which is opposite in sign compared with that of the meter "Z-0". As is noted in section 1-2 a negative elastic tension seems to be related to a negative temperature co-efficient. With the elastic tension thus obtained corrections are made also to all the gravity values measured at the cruising state according to the way described in Part 1. In Table 4 characteristics

Fig. 19. Ship's track of the Hakuho-maru, cruise KH-67-2 in August 1967.

of the gravity meter "Z-2" are summed.

1-4 Gravity measurements in August 1967 by use of the T. S. S. G. on board the Hakuho-maru, cruise KH-67-2

From August 9th to 18th a newly built research vessel the Hakuho-maru of the Ocean Research Institute, University of Tokyo was first used for the measurement of gravity. On this cruise named KH-67-2 gravity was measured from Muroran, Hokkaido to Tokyo with triple crossings of the Japan trench. The system of the measurement was of the paper tape punching method (ref. Part 1). Dynamic gravity meter "Z-0" was used. Details of this measurement will be reported by Tomoda *et al* (Tomoda and Koizumi, 1968 personal communication). Ship's tracks are shown in Fig. 19.

1-5 Gravity measurements in July and August 1968 by use of the T. S. S. G. on board the Hakuho-maru, cruise KH-68-3

From July 19th to August 16th 1968 gravity measurements were made in the north Pacific ocean including the Japan trench, Emperor sea mounts and Shatsky rise on board the Hakuho-maru (TOMODA *et al.*, 1968, Preliminary Report of the Hakuho-maru, Cruise KH-68-3). By this time the Hakuho-maru has been equipped with a high speed electronic computer with sufficient memory circuits (Facom 270-20).

Though in this case on-line real time processings of gravity data were not started the computer served well to process the punched tapes on practically real time basis, preceding the true on-line processings performed on the cruise KH-68-4 (ref. Part 1). Ship's track is

Fig. 20. Ship's track of the Hakuho-maru, cruise KH-68-3 in July and August 1968.

shown in Fig. 20.

The dynamic gravity meter used on this cruise is named "No-68-7-14", which was constructed in 1968. Its Q-value is 30,000, and its natural frequency is 1582 Hz at 40°C. Measurements were started from Tateyama, where an abnormal positive drift of the meter was observed and prevented us to make calibrations, which we had to wait to do until we returned to Tokyo. The results of measurements at the harbours, Tateyama, the entrance of Tokyo Bay (off Haneda) and the Harumi pier of the Ocean Research Institute are shown in Fig. 21.

Fig. 21. Results of measurement when the ship was anchoring at the harbours in July and August 1968.

Fig. 22. Temperature response of the dynamic gravity meter NO-68-7-14.

After leaving Tateyama temperature in the gravity meter room was gradually elevated, and it became hard to keep the present oven temperature which had been set 40°C. So we were obliged to alter the preset point to be 43.5°C at 16^h00^m on July 21st, when the ship was cruising. Fig. 22 shows variations of apparent gravity which occurred in this case. From this figure it is found that the variation of apparent gravity is -170 mgal due to temperature variation of +3.5°C, if the effects of latitude, water depth and coriolis forces are taken into account. Temperature co-efficient of -49 mgal/°C is obtained from this measurement with the meter No-68-7-14.

The gravity meter room of the Hakuho-maru is air-conditioned but it is controlled by a ship's central air conditioner with a single control system. Therefore it is impossible to control each room according to each condition. The temperature variation of the gravity meter room was 25°C±5°C. If a variation of ±0.25°C is supposed in the temperature of the oven corrections of ±13 mgal must be made to the measured values.

Distributions of the 2nd order corrections are shown in Fig. 23, which are as a whole not so large with a maximum value of 40 mgal. The 2nd order correction co-efficient is taken as 0.021 mgal/(gal)².

Eötvös corrections are made according to the same method in section 1-2. In Fig. 23 distributions of Eötvös corrections are also shown in relation to the number attached to the gravity values.

In the measurement at Tateyama the first value indicated in Fig. 21 agrees with the true gravity of the station 979.795 gal, but it increases with time by about 30 mgal. With the same gravity constant first determined at Tateyama, however, the value observed at Harumi when we returned there is 979.780 gal which is only 7 mgals smaller than the true value. From these facts it is found that the positive drift observed at Tateyama changed to a negative drift and almost recovered the initial state, though details of the variation are unable to be clarified.

Fig. 23. Variations of the 2nd order corrections and the Eötvös corrections in the measurement of the Hakuho-maru, cruise KH-68-3 in July and August 1968.

Fig. 24. $g_m - g_e$ in relation to Δg_e .

The dynamic gravity meter No-68-7-14 has a large elastic tension of -98 gal which had not been determined until another cruise of the Hakuho-maru KH-68-4, southern-cross expedition carried out from November 1968

Table 5

Base	g_e gal	g_m gal	$g_m - g_e$ mgal
Apia	978.645	978.645	0
Wellington	980.302	980.125	-177
Sydney	979.705	979.742	+ 37
Noumea	978.902	978.973	+ 71
Tokyo	979.800	979.705	- 95

to March 1969 (ref. Preliminary Report of the Hakuho-maru, Cruise KH-68-4 edited by Horibe).

In the cruise KH-68-4 the ship visited Apia, Wellington, Sydney, Noumea and Tokyo, where the gravities g_m measured by the T. S.S.G. were compared with those g_e measured by a La Coste-Romberg gravity meter. The results are shown in Table 5 and in Fig. 24,

from which the elastic tension can be calculated as is indicated in Part 1.

Vibrations of the floor caused by engines are extremely small on the Hakuho-maru. The measurement of floor vibration just after the construction of the ship showed that they were less than 5 gal in acceleration at the gravity meter room. It is easy to eliminate such amount of vibration by means of a usual shock absorber. Vibrations of ship's body are, however, caused remarkably by water hammers in the Hakuho-maru, of the frequency of 2-3 Hz, which it is difficult to reduce completely. The effect of such vibrations has not been estimated yet.

Vibrations of the gyrotable were negligibly small. In Table 6 characteristics of the dynamic gravity meter No-68-7-14 are summed.

Table 6

Dynamic gravity meter	No-68-7-14 made in 1968
averaged frequency	1582 Hz at 40°C
temperature co-efficient	-49 mgal/°C
Q-value	30,000
elastic tension	-98 gals

1-6 Gravity measurements from April to June 1969 by use of the T. S. S. G. on board the Hakuho-maru, cruise KH-69-2

Details of this measurement are described by the author in the other publication (Preliminary Report of the Hakuho-maru, Cruise KH-69-2, edited by NASU and TOMODA, in press). So only brief descriptions will be given here.

The cruise KH-69-2 was planned to investigate the Japan trench and the Japan Sea and carried out from April 26th to June 14th. Ship's track is shown in Fig. 25. Gravity measurements carried out on this cruise are characterized by the on-line real time processings of two T.S.S.G. gravity meters operated at the same time. The gravity meters were settled at the same floor close to each other and operated quite independently. One of the dynamic gravity meters used was No-68-7-14 which had been in use since 1968 and the other was No-67-11-9 which had been

Fig. 25. Ship's track of the Hakuho-maru, cruise KH-69-2 from April to June 1969.

constructed in 1967 but kept unused. The characteristics of the latter gravity meter are listed in Table 7.

Table 7

Dynamic gravity meter	No-67-11-9 made in 1967
averaged frequency	1476 Hz at 38°C
temperature co-efficient	-25 mgal/°C
Q-value	4,500
elastic tension	-70.6 gal

Gravity data obtained in this cruise are now being arranged and will be published in near future (therefore these data are not included in this paper), but for comparison between the two simultaneous measurements the gravity value outputs from the computer, though they are not corrected for the Eötvös effect, are directly compared. An example of the comparison measurements is shown in Fig. 26, where gravities along the track from Toyama to Tokyo by way of Tsugaru strait (the track indicated by A, B, C and D in Fig. 25) are plotted. These values were obtained in a period of about a week.

Agreement between the two measurements is considered to be satisfactory for the present instruments when averaged differences have been estimated to be less than 3 mgal.

Fig. 26. Comparison of the results obtained by two sets of the T.S.S.G. gravity meters installed at the same place.

1-7 Gravity measurements in June 1968 by use of the T. S. S. G. on board the Meiyo

These measurements were carried out by the Hydrographic Office, Maritime Safety Agency of Japan (Data report of Hydrographic observations, series of astronomy and geodesy, No. 4, September 1969). The ship RV Meiyo started from Shiogama on June 2nd and went

northward to Horoizumi near the Erimo peninsula, where she anchored and made calibrations. After surveying continental shelves and slopes south of Erimo she returned to Shiogama on June 8th. On June 12th the Meiyo left Shiogama again and surveyed the Japan trench by crossing it four times until June 25th when she returned to Onahama. The ship left Onahama on June 27th and went to Kurihama on June 29th. Ship's tracks are shown in Fig. 27.

The dynamic gravity meter used for this measurement is Hydrographic Office type No. 1 which was made in 1965. Ambient temperature between Shiogama and Horoizumi showed a maximum variation of 20°C. Quantities of the 2nd order corrections are less than 30 mgal in the measurements south of the Erimo peninsula, less than 150 mgal in the measurements crossing the Japan trench eastwards, less than 10 mgal in the measurements crossing the Japan trench westwards and less than 70 mgal in the measurements of north-to-south direction.

As is described in Part 1 the T. S. S. G. of the Hydrographic Office is of the paper tape punching system and corrections for the 2nd order effect are made by the interpolation method (TOKUHIRO, 1967).

§ 2. Results

Gravity values are tabulated in this section. The values are those which have been ob-

Fig. 27. Ship's track of the Meiyo in June 1968.

tained for the most part by the T.S.S.G. with the exception of those measured by MATSUYAMA *et al.* by use of the Vening Meinesz gravity meter over the Japan trench.

Tables are classified into several divisions from tectonical point of view as;

1. The Japan trench and its vicinity.
2. The Mariana trench.
3. The Solomon trench.
4. The Brisbane hill.
5. The Suiko seamount.
6. The Shatsky rise.
7. The Bismark plateau.

In tables are listed from the left column to the right data numbers, date of measurement, positions, standard gravities according to the International formula, measured gravities, water depths, simple Bouguer corrections, calculated Bouguer corrections, free air anomalies, simple Bouguer anomalies and calculated Bouguer anomalies. Corrections for the Eötvös effect, the 2nd order effect and the elastic tension are not displayed. Simple Bouguer corrections are calculated by assuming that water depth of a thousand meters uniformly corresponds to a correction of 69 mgal. As to the calculated Bouguer corrections refer to appendices.

Gravity Table 1

The Japan trench and its vicinity

Note

This table includes those values which were obtained by a submarine observation by use of the Vening Meinesz gravity meter in 1934 (sec. 1-1), observation by the Umitaka-maru by use of the T.S.S.G. in 1966 (sec. 1-2), and observations by the Hakuho-maru in 1967 (sec. 1-4) and 1968 (sec. 1-5). Gravity values measured by the Meiyo in 1968 (sec. 1-7) are also included in making the contour maps (Data report of Hydrographic observations, Series of Astronomy and Geodesy, No. 4, September, 1969). In Fig. 28 measuring tracks of this area are shown, where tracks of the Meiyo are also included. In Figs. 29, 30, 31 and 32 mean topography, mean free air anomaly, mean Bouguer anomalies and mean Bouguer corrections over a mesh of $10' \times 10'$

Fig. 28. Measuring tracks in and near the Japan trench before 1968.

are displayed respectively, where land gravity values measured by the Geographical survey institute of Japan (1955, 1957 and 1964) are partially taken into account. Bouguer corrections in Fig. 32 applied to obtain mean Bouguer anomalies are not the simple Bouguer corrections but those which have been calculated from the mean topography by use of the Talwani's method in three dimensions (TALWANI and EWING, 1960) on the basis of the bathymetric chart No. 6301 published by the Hydrographic office of Japan. Details of this calculations are described in Appendices 1 and 2-1. Contour maps are also drawn with respect to both the free air anomalies and the Bouguer anomalies as are shown in Figs. 33 and 34 on the basis of the values displayed in the previous figures. The contour interval is 25 mgals.

Interpretation

Two regions of negative Bouguer anomaly located at both sides of the Hidaka-Erimo line are conspicuous. The Hidaka mountain area

Fig. 29. Mean water depth over meshes $10' \times 10'$ in and near the Japan trench. Unit in meter.
On land the values indicate mean elevation.

is trending from north to south at the Hokkaido district, passing by the Erimo peninsula. Bouguer anomalies of both the regions show negative values lower than -100 mgal.

These regions are comparatively shallow. According to a geological map (Tectonic map of Japan, 2, geologic provinces, compiled by Hiroshi ISOMI, 1965, the Geological Survey

Fig. 30. Mean free air anomaly in mgal over meshes of $10' \times 10'$ in and near the Japan trench.

The values indicated in parenthesis are numbers of measured points in a mesh.

Institute of Japan, published in 1968) positive free air and Bouguer anomalies over the Hidaka mountains correspond to the area where the named Hidaka metamorphic rocks are distributed. The negative Bouguer anomaly region west of the Erimo peninsula

exists at the extension of a tertiary zone trending parallel to the west side of the Hidaka mountains, the negative region east of the Erimo peninsula existing at the extension of a quaternary zone trending parallel to the east side of the same mountains. At

Fig. 31. Mean Bouguer anomaly in mgal over meshes of $10' \times 10'$ in and near the Japan trench.

the south margin of the negative region earthquakes occur frequently, which are named 'Tokachi-oki earthquake' (earthquakes at sea off the Tokachi district).

A region of positive free air anomaly higher than 100 mgal is found over the Kitakami

mountains at the Honshu and extended over the sea region off the Sanriku coast. The maximum Bouguer anomalies exist trending north to south off the Sanriku coast between Kamaishi and Ōfunato, where the zone of Variscan geosynclinal deposit and Cretaceous

Fig. 32. Mean Bouguer correction in mgal over meshes of $10' \times 10'$ in and near the Japan trench.

granites are found.

Free air gravity anomalies over the Japan trench show minimum values of about -200 mgals at the north and south part. The values at the middle part of the trench are a little higher than the former. This is

partly because of sedimentation which has made the sediment at the middle part of the trench particularly thicker than at the both ends and made the bottom shallower. This fact will be verified by the Bouguer anomaly distributions which show no particu-

Fig. 33. Contour map of free air anomaly over the Japan trench and its vicinity. Contour interval is 25 mgal.

Fig. 34. Contour map of Bouguer anomaly over the Japan trench and its vicinity. Contour interval is 25 mgal.

Fig. 35. Profiles of free air anomaly across the Japan trench.

lar distinction between the middle part and the north and south parts. In Figs. 35 and 36 profiles of free air and Bouguer anomalies across the Japan trench are indicated along the parallels from 36°N to 43°N at the interval of one degree, together with profiles of the bottom topography. A line connecting points of minimum free air anomalies does not agree

Fig. 36. Profiles of Bouguer anomaly across the Japan trench.

with the trench axis, but lies by 5-10 miles apart from the axis towards the land. The phenomenon will be simply explained by the lateral effect of an isostatically expected root of the continental mass which is supposed to

show sudden thickening below the continental slope of the Honshu. According to a calculation of the depth of Mohorovicic surface from a profile of Bouguer gravity anomaly across the trench off the Sanriku coast (the data obtained in the cruise KH-67-2 of the Hakuho-maru) it is found that the M-surface is suddenly deepened at the continental slope (more or less 30 km) (SEGAWA, 1969). It is not always true, however, that the minimum line of free air anomaly is apart from the trench axis. In case of the Mariana trench the minimum line agrees exactly with the trench axis (refer Gravity Table 2).

Gravity Table 2
The Mariana trench

Note

This table consists of values obtained in 1968

Fig. 37. Measuring track across the Mariana trench in 1968.

Fig. 38. Profiles of topography, free air anomaly and calculated Bouguer anomaly across the Mariana trench.

by the observations on board the Umitaka-maru (sec. 1-3). In Fig. 37 the measuring track is shown. Calculated Bouguer anomalies in which the effect of topography is taken into account with the assumption of 2 dimensional case are also given in addition to simple Bouguer anomalies (see Appendix 3). Profiles of free air and Bouguer gravity anomalies and the topography are shown in Fig. 38. Numbers indicated in Fig. 37 along the ship's track and in Fig. 38 along the profile are those attached to gravity values found in the table, and can be used as indices.

Interpretation

This is a measurement across the Mariana trench from south to north. The deepest point which the ship traversed was 9600 m, which is called the Nero deep. Free air anomaly at the deepest point is -230 mgal. Different from the case of the Japan trench the point of minimum free air anomaly agrees with the trench axis in the case of the Mariana trench. At the northern slope of this trench (at the side of the Mariana islands) the depth of Mohorovicic surface is estimated to be 15 km. It is much shallower compared with the case of the Japan trench (SEGAWA, 1969). The deepest Mohorovicic surface lies below Guam and Saipan islands and shows the depth of about 25 km. As a general tendency the Mohorovicic surface seems to be deepened gradually from south to north across the trench, unless minute undulation is taken into account.

Gravity Table 3 The Solomon trench.

Note

This table consists of values obtained in 1968 by the observations on board the Umitaka-maru (sec. 1-3). In Fig. 39 the measuring track is shown. Calculated Bouguer anomalies in which the effect of topography is taken into account with the assumption of 2 dimensional case are also given in addition to simple Bouguer anomalies (see Appendix 3). Profiles of free air and Bouguer gravity anomalies and the topography are shown in Fig. 40. Numbers indicated in Fig. 39 along

Fig. 39. Measuring track across the Solomon trench in 1968.

the ship's track and in Fig. 40 along the profile are those attached to gravity values found in the table, and can be used as indices.

Interpretation

This is a measurement running north-westwards along the Solomon islands, crossing the Solomon trench obliquely and entering the Bismark archipelago sea by way of the St. George strait. Minimum free air anomaly is found above a point of maximum depth showing a value of -280 mgal. According to the paper (SEGAWA, 1969) Mohorovicic depth near the St. George strait between the New Britain island and the New Ireland island is estimated to be 30 km.

Gravity Table 4 The Brisbane Hill

Note

This table consists of values obtained in 1967 and 1968 by the observations on board the Umitaka-maru (sec. 1-3). The Brisbane hill is a bank lying off the east coast of Australia in the Coral sea. Measuring tracks with contours of topography are shown in

Fig. 40. Profiles of topography, free air anomaly and calculated Bouguer anomaly across the Solomon trench.

Fig. 41. Ship's track near the Brisbane Hill in 1968.

Figs. 41 and 42. The tracks A-A', B-B', C-C' and D-D' correspond to the profiles A-A', B-B', C-C' and D-D' drawn in

Figs. 43 and 44. Calculated Bouguer anomalies are given in addition to simple Bouguer anomalies in the table (see Appendix 3). Profiles of free air and Bouguer gravity anomalies and the topography are shown in Fig. 43.

Interpretation

The Brisbane hill is a bank lying east of Brisbane at the east of Australia. Free air anomalies observed near the top of the bank show the values of 200-250 mgal. Bouguer anomalies obtained by taking the topography of the mountains into account, assuming the density difference between rock and water to be 1.64 gr/cm^3 (Fig. 43), show relatively lower values above the top of the mountains. This situation may of course be changed with the density differences which is adopted in the calculation. In Fig. 44 comparisons are made between observed free air anomalies and calculated free air anomalies. Calculated

Fig. 42. Measuring tracks with contours of topography at the Brisbane Hill. Interval of solid contour line is 500 m. Interval between solid and dotted contour line is 250 m. The deepest contour shows 4750 m.

Fig. 43. Profiles of topography, free air anomaly and calculated Bouguer anomaly along the tracks A-A', B-B', C-C' and D-D' indicated in Fig. 42.

Fig. 44. Comparison of observed free air anomalies with calculated free air anomalies at the Brisbane Hill. ○—○ observed. ●—● calculated.

free air anomalies are obtained by assuming that the standard depth of the ocean bottom is 4750 m and that the bank is completely non-isostatic. Density of rocks composing the bank is changed from 2.27 gr/cm^3 to 3.27 gr/cm^3 with the interval of 0.2 gr/cm^3 . From these calculations an averaged density, which seems to be most fitted to the observations, is estimated to be $2.27\text{--}2.47 \text{ gr/cm}^3$. This is too small to be the density of the bank. It may be wrong to try to fit forcibly the calculated free air anomalies of an non-isostatic seamount to the observed one. The differences between the calculated and the observed free air anomalies appear rather systematic; the observed free air anomalies are lower than the calculated one above the top of the bank and show negative values locally at the foot of the bank. This may well be thought to be a character of a mountain which is more or less isostatically constructed.

Gravity Table 5 The Suiko seamount

Note

This table consists of values obtained in

1968 by the observations on board the Hakuho-maru (cruise KH-68-3) (sec. 1-5). The Suiko seamount is located in the Emperor ridge in the north Pacific ocean. In Fig. 45 measuring tracks are shown. In Figs. 46, 47 and 48 mean topography, mean free air gravity anomalies and mean calculated Bouguer anomalies (see Appendix 2-3) over a mesh of $2' \times 2'$ are displayed. Contour maps of topography in Fig. 49 and of free air gravity anomaly in Fig. 50 are drawn according to Figs. 46 and 47 respectively.

Interpretation

In Fig. 51 profiles of topography, observed free air anomalies, calculated free air anomalies (obtained by assuming that the standard water depth is 6400 m, that the mountain is non-isostatic and that the density of rocks composing the mountain is 2.27 , 2.67 or 3.07 gr/cm^3 respectively) and calculated Bouguer anomalies are indicated along parallels of $43^\circ 50' \text{N}$, 44°N , $44^\circ 10' \text{N}$, $44^\circ 20' \text{N}$, $44^\circ 24' \text{N}$, $44^\circ 30' \text{N}$, $44^\circ 34'$, $44^\circ 40' \text{N}$, $44^\circ 50' \text{N}$ and 45°N . The shallowest point of the seamount lies along the parallel of $44^\circ 34' \text{N}$. It is soon found that the observed free air anomalies are quite

Fig. 45. Measuring tracks at the Suiko seamount in 1968.

Fig. 46. Mean water depth in meter over meshes of $2' \times 2'$ at the Suiko seamount.

different from the calculated one. Topography of the Suiko seamount is unsymmetric between east and west. The depth at the foot of the east side is particularly large, showing a depth of 6400m, whereas it is 5800m at the west side. Free air anomalies at the foot of the mountain show negative values; -80 mgal at the east and -60 mgal at the west. Free air anomalies near the top of the mountain show a largest value of 340 mgal. The negative free air anomalies observed at the foot of the mountain can not be explained unless an isostatic mass beneath the mountain is supposed to exist. The Bouguer gravity anomalies calculated by assuming the density difference to be 1.64

gr/cm³ show relatively higher values above the top of the mountain. In this respect the Suiko seamount is different from the Brisbane hill.

Gravity Table 6 The Shatsky rise

Note

This table consists of values obtained in 1968 by the observations on board the Hakuho-maru (cruise KH-68-3) (sec. 1-5). The Shatsky rise is located in the northwest Pacific ocean trending from north to south. In Fig. 52 measuring tracks are shown. In Fig. 53 profiles of free air anomalies and calculated Bouguer anomalies with profiles of topography

Fig. 47. Mean free air anomaly in mgal over meshes of 2' x 2' at the Suiko seamount.

Fig. 48. Mean calculated Bouguer anomaly in mgal over meshes of $2' \times 2'$ at the Suiko seamount.

are shown (see Appendix 3). At both ends of the profiles the time of measurement is indicated as indices.

Interpretation

In Fig. 53 topography, free air anomalies and calculated Bouguer anomalies are shown along two tracks, one of which crosses the rise from west to east and the other from east to west. In these measurements it is remarkable that the free air anomalies do not so much increase above the rise. This is probably because of a compensating mass existing beneath the rise. At the foot of the rise relative decrease of free air anomaly by about 10–20 mgal is found as in the case of other seamount, and the region continues in the wide range. Though the height of the rise is not

so large its width is four times as large as that of the Brisbane hill or the Suiko seamount. Decrease of Gravity caused by the distance between the rise and the observation points, therefore, is expected to be small.

Gravity Table 7 The Bismark plateau

Note

This table consists of values obtained in 1967 and 1968 by the observations on board the Umitaka-maru (sec. 1-3). The Bismark plateau is a temporary name, which means the area surrounded by the Bismark archipelagoes, making an uplifted region bounded by the Vitiaz trench to the north and by the Solomon trench to the south. In Fig. 54 measuring

Fig. 49. Contour map of bottom topography at the Suiko seamount. Unit in meter.

Fig. 50. Contour map of free air anomalies at the Suiko seamount. Unit in mgal.

Fig. 51. Profiles of topography, observed free air anomalies, calculated free air anomalies and calculated Bouguer anomalies across the Suiko seamount.

●—● observed free air anomaly. — calculated free air anomaly.
○—○ calculated Bouguer anomaly.

From left to right; (upper) 45°N, 44°50'N, 44°40'N, 44°34'N, 44°30'
(lower) 44°24'N, 44°20', 44°10'N, 44°N, 43°50'N

Fig. 52. Measuring tracks across the Shatsky rise in 1968 marked by ●—●.

Fig. 53. Profiles of topography, free air anomalies and calculated Bouguer anomalies across the Shatzky rise (a), (b).

Fig. 54. Measuring tracks across the Bismark archipelago sea in 1967 and 1968.

tracks are shown. In Fig. 55 profiles of free air anomalies and calculated Bouguer anomalies with profiles of topography are shown (see Appendix 3). Numbers indicated in Fig. 54 along the ship's tracks and in Fig. 55 along the profiles are those attached to gravity values found in the table, and can be used as indices. In this figure gravity anomalies measured by submarine observations by use of a Vening Meinesz gravity meter, which are quoted from WORZEL (1965), are plotted also. Though there might be several mile differences in the measured positions agreement of both measurements is supposed to be well.

Interpretation

In Fig. 55 are shown topography, free air anomalies and calculated Bouguer anomalies along the track from north to south by way of the Vitiaz strait and those values along the track from south to north by way of St. George strait. Averaged free air anomalies in the Bismark plateau, of which the averaged depth is about 2000 m, show positive values of about 40–50 mgal. Conspicuous negative free air anomalies are observed at the Vitiaz trench locating at the

north end of the plateau as well as at the Solomon trench locating at the south end. Moreover the free air anomalies appear scarcely correlated to the topography above the plateau, implying that there exist complicated subsurface structures. It seems that the Bismark plateau has been subjected by as large tectonic activities as the Japan island and the vicinity.

§ 3. Summary of Part 1 and 2

In 1961 a surface ship gravity meter was developed by Tomoda *et al* at the Geophysical Institute, University of Tokyo. This was named Tokyo Surface Ship Gravity Meter or the T.S.S.G. Gravity measurement at sea was first made in success by Vening Meinesz of Holland in 1923 by use of a Vening Meinesz pendulum on board submarines. Measurement on surface ships had been unsuccessful until 1950's when the La Coste and the Askania surface ship gravity meters appeared. Both of these gravity meters are of the spring type. Gilbert in England, on the other hand, developed a string type gravity meter in 1948, and Lozinskaya in Russia also tried the same type gravity meter in 1949. But it is reported that these gravity meters did not work well as a surface ship instrument to measure gravity under general sea conditions. The T.S.S.G. followed the preceding works and was successfully used, as a first trial, for surface ship measurement under rough sea conditions. These three types of gravity meters consist of a single string tensioned vertically, though the ways of suspension are somewhat different with one another. A string type gravity meter equipped with two strings was tested by C. G. Wing of the Massachusetts Institute of Technology in 1966 (WING 1969), and one equipped with three strings was tested also and now is used by the Geographical Survey Institute of Japan.

A string type gravity meter is characterized by small size, digital output and wide dynamic range. These characteristics have made it easy to make use of electronic computers, which are making progress year by year, to

(a)

(b)

Fig. 55. Profiles of topography, free air anomalies and calculated Bouguer anomalies across the Bismark archipelago sea (a), (b). O--- gravity measured by Vening Meinesz pendulum.

obtain 10^{-6} relative accuracy. In addition, the T.S.S.G. is composed of exclusively unmovable parts. As is the case of the La Coste's or Askania surface ship gravity meter the meter which has movable beams are likely to be subjected by cross coupling errors caused by the coupling of vertical and horizontal accelerations according to the way of response of the movable beams. The T.S.S.G. is free from such errors.

The verticality of the measuring axis of the T.S.S.G. is maintained by a vertical gyroscope. It is assured that the verticality is $10''$ in the short term accuracy and $4'$ in the long term accuracy. Fluctuation of the vertical, if it is coupled with horizontal accelerations, produces a large amount of error, but in the actual measurement the error is not affected by the intensity of horizontal accelerations, and shows variation of merely several mgals. This is an evidence that the fluctuation of the vertical in phase with the horizontal accelerations is more or less $10''$ in the short term. The accuracy in the long term, on the other hand, can be checked by a pair of damped bubble tubes, and $4'$ accuracy assures 1 mgal accuracy of gravity values.

Though the T.S.S.G. is endowed with various merits mentioned above the nature of the meter has not been completely understood. The first part of this paper is devoted to the description of the nature of the meter and the improved methods of data processing to enhance accuracy of measurement.

Gravity measurements by use of the T.S.S.G. between 1961 and 1969 have been made by the Ocean Research Institute, University of Tokyo and the Hydrographic Office, Maritime Safety Agency. The length of time expended for the measurements aboard totals more than 1000 days and the measured distance amounts to 200,000 miles. The author himself participated in the surveys over 600 days, in which improvement of the data processing methods as well as actual surveys was carried out. A measurement on board the Hakuho-maru carried out in 1969 is worthy of special mention, when it was assured that the instrumental difference of two sets of the T.S.S.G.

operated quite independently was less than ± 3 mgal. Such data were obtained on real time basis by the aid of an electronic computer equipped in the ship for process control.

As to the characteristics of the meter we study deviations of a string in use from an idealized string. The detector of the T.S.S.G. (the dynamic gravity meter) is tensioned by a weight attached to the lower end and supported sideways horizontally by a pair of leaf springs in order to prevent it from swinging. It is difficult to eliminate slight bendings from these springs, which exert initial tension to the vertical string. Furthermore, intrinsic elasticity of the string can not be neglected especially with a detector designed small.

In various papers the following equation is adopted as a fundamental relation which holds for the string gravity meter.

$$g(t) + \alpha(t) = k[f(t)]^2 \quad (1)$$

where $g(t)$, $\alpha(t)$ and $f(t)$ are gravity, ship's vertical acceleration and frequency of the string expressed as functions of time. For the present T.S.S.G. this equation does not sufficiently represent the state of the detector. New relation required in the T.S.S.G. should be

$$g(t) + \alpha(t) = k[f(t) - \sigma]^2 - a_0 \quad (2)$$

where σ is frequency due to elasticity of the string, with which the string vibrates with no tension acting on it, and a_0 is initial tension expressed in terms of acceleration. f and σ are, for example, 2000 Hz and 40 Hz, respectively. a_0 shows values ranging from $\pm 20 \sim \pm 100$ gal. Unless the effect of elasticity is taken into account the measured gravity will suffer from errors of 10~100 mgal.

The largest unavoidable difficulty with which we meet in operating the string gravity meter is the 2nd order correction originating from intermittent measurements of frequency. This correction is made to compensate for the decrease of averaged acceleration if it is calculated from squares of averaged frequency. It has been known that the correction is approximately proportional to dispersions of the ship's vertical acceleration, but the co-efficient

of proportion could not exactly be determined. We deal with this problem by examining data obtained in the actual measurement. The results are

[1] It is most reasonable to interpolate data of frequency measured intermittently over the sampling interval by use of, say, the 4th order polynomials in order to obtain the 2nd order correction, provided that the period of ship's vertical acceleration is 3~8 sec and that the sampling interval of frequency or period of the string is about 0.5 sec. This method meets the conditions required when the variation of ship's motion is of complex spectra and the spectral distribution varies with time.

[2] The actual 2nd order effects are always larger than those expected from an idealized relation (1) of the string. This question has been explained from the standpoint of elasticity; residual frequency caused by the elasticity of string σ produces the 1st order term with respect to f which, if neglected, causes an apparent 2nd order effect independently of but in phase with the 2nd order effect due to the sampling interval.

In the second part of the paper we describe the process of measurements and their results. Of the gravity measurements which were made by the author those measurements made in the period from 1966 to 1969 have been selected and described in detail. As the results of measurement the following regions, in which the author is most interested from tectonical point of view, are particularly picked up and discussed: The Japan trench and its vicinity, the Mariana trench, the Solomon trench, the Bismark archipelago sea, the Shatsky rise, the Suiko seamount and Brisbane hill. Gravity values over these areas are all tabulated.

It is found from the distribution of free air gravity anomaly over the Japan trench that a line connecting points of minimum free air anomaly lies by about 10 miles apart from the trench axis towards Honshu. This rule does not hold, however, in case of all trenches, implying a peculiarity of the Japan trench that it is accompanied with sudden

thickening of crust just beneath the slope of continental side. The free air anomalies are lower at the north and south of the trench compared with those of the middle part. The minimum value amounts to -200 mgal. Judging from the fact that the water depth is shallower at the middle part and that no differences are found in the Bouguer anomaly distribution, sediments or sedimentary rock may be particularly thick at the middle part of the trench.

There are regions of large negative Bouguer anomaly west and east of the Erimo peninsula of Hokkaido. The west negative region was first found by MATSUYAMA *et al.* in 1934, and the east negative region was found by the author. These anomalous regions are extended over from the land of Hokkaido, and appear as if they agree with extensions of the tertiary or quaternary layers existing at both sides of the Hidaka mountains.

A region of high free air anomaly over +150 mgal is found at the north east of Honshu. This positive area extends eastwards over the continental shelf. The area of maximum Bouguer anomaly lies at the side of continental shelf.

In the Mariana and Solomon trench we have obtained gravities along one track with each. At both of these trenches minimum free air anomaly is found just above the trench axis. The deepest point at the Mariana trench is 9600 m (Nero deep) where the free air anomaly is -230 mgal, and the deepest point at the Solomon trench is 7900 m where the free air anomaly is -280 mgal. Both trenches are much larger in scale compared with the Japan trench. The thickening of crust occurring towards the continental sides (the side towards the Mariana islands or the Solomon islands) seems to be made more gradually at these trenches than at the Japan trench.

Distributions of free air anomaly at the Brisbane Hill and the Suiko seamount indicate that they are all more or less isostatic. It is an evidence from which we have got the results that observed free air anomalies are very different from calculated free air anom-

alies obtained on the assumption of complete non-isostasy. The difference is characterized by a local decrease of gravity around the foot of the mountains. Owing to the lowering of gravity the free air anomaly indicates negative values of $-60 \sim -80$ mgal at the Suiko seamount and of -50 mgal at the Brisbane Hill. At the Shatsky rise which is of larger scale than the former the relative lowering of gravity is also found around it, of the magnitude of 10 mgal. If we try to get a mean density of the mountains by forcibly fitting the observed anomaly to the calculated one by use of the least square method we have a mean density of about 2.3 gr/cm^3 , which is too small for the density of rock composing the mountains.

There are measurements along two tracks in the Bismark archipelago sea. Distributions of gravity anomaly in this region imply how complex its subsurface structure is. This area surrounded by the New Ireland island, New Britain island and New Guinea is accompanied by two trenches, the Vitiaz trench to the north and the Solomon trench to the south, and makes a plateau of the depth of 2000 m . The free air anomaly in this plateau is as an average $+50$ mgal. Its variation is scarcely related to the bottom topography. The negative free air anomaly found near the Vitiaz strait is conspicuous, and the same tendency of the anomaly is found also at the St. George strait between the New Britain and the New Ireland islands. The bottom of the Bismark archipelago sea may have been uplifted by a certain force uniformly over all the region which had originally been of the isostatic composition.

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Appendix 1

Calculation of Bouguer corrections in three dimensional case

Calculated Bouguer corrections are obtained

Fig. 56.

from the bottom topography by three dimensional calculations of the effect of water layers. To make three dimensional calculations of the gravitational attraction a modified Talwani's method (TALWANI and EWING, 1960 and SEGAWA, 1969) is used.

With the assumption of uniform density the gravitational attractions of a three dimensional body can be obtained by a surface integral over whole surface of the body, which can be further simplified by dividing the body into a group of thin plates where the integral is converted to summation of line integrals along rims of the plates. If the plate is substituted by a body of simpler form, which is rimmed by portions of straight line perpendicular to each other (Fig. 56), contribution of the plate in gravitational attractions is expressed as

$$g_j = k^2 \rho h_j \sum_{n=1}^{N_j} (-1)^{n-1} \times \tan^{-1} \frac{(x_n - X)(y_n - Y)}{(z_j - Z) \sqrt{(x_n - X)^2 + (y_n - Y)^2 + (z_j - Z)^2}}$$

A-1-1

where co-ordinates x, y, X and Y are placed in horizontal planes, z and Z are placed vertical, and

Fig. 57.

- analytical values
● numerically calculated values

g_j ; vertical attraction of the j -th plate
 k^2 ; universal constant of gravitation
 ρ ; density of the body
 h_j ; thickness of the j -th plate
 N_j ; number of vertices on the j -th plate
 X, Y, Z ; position where the gravitational attraction is observed
 x_n, y_n, z_n ; position of the n -th vertex on the j -th plate

Hence the vertical attraction of all the plates is given by numerical integration with respect to j as

$$g = \sum_{j=1}^m W_j g_j \quad \text{A-1-2}$$

where m is the number of the plates, and W_j is a weight function according to the Newton-Cotes' numerical integration. Legitimacy of this method has been checked by applying it to a sphere of 10 km in radius, when vertical attractions have been calculated on a horizontal line 15 km distant from the center of the sphere and passing above the center, by dividing the sphere into 20 horizontal plates of 1 km thick, enclosed by portions of straight line with the shortest length of 1 km. The result is shown in Fig. 57. Comparison with the result of analytical calculation shows differences less than several milligals.

Appendix 2-1

Calculation of Bouguer corrections at the Japan trench and its vicinity

Mean contributions of water layer have been calculated with each mesh of $10' \times 10'$ in extent to be used for Bouguer corrections to the values corresponding to the area. An area is taken which is enclosed by parallels of 35°N and 44°N and meridians of 140°E and 148°E . Let the water layer involved in it be divided by 17 horizontal surfaces of the depth of 0, 200, 500, 1000, 1500, 2000, ---- 7000 and 7500 m. A chart No. 6301 published by the Hydrographic office is used as a base of the bottom topography and contours corresponding to the respective depth are approximately traced by use of straight lines perpendicular to each other, some of which are parallel to the parallels and others to the meridian. The shortest sides of the polygon drawn in this way are $5'$ in both latitudinal and longitudinal direction. The real length of the shortest side is however longer in the longitudinal direction than in the latitudinal direction. Then positions of vertices of the polygons are read. Assuming the density difference between water and crust to be 1.64 gr/cm^3 the calculated Bouguer corrections can be obtained according to equations A-1-1 and A-1-2.

Appendix 2-2

Calculation of Bouguer corrections at the Brisbane hill

Topography at and near the Brisbane hill is contoured at the interval of every 250 m. So the height of the seamount measured from an assumed basic plane at the depth of 4750 m is first divided by horizontal planes at distance of every 250 meters, and gravitational contributions due to it are calculated according to the method mentioned in the Appendix 1, when the contours are approximated by polygons consisting of mutually perpendicular sides of which the shortest length is 2778 m. Then the gravitational effect of the seamount is subtracted from that of an infinite horizontal layer of 4750 m in thickness. In these calculations density dif-

ferences are assumed to be 1.64 gr/cm^3 . We can thus obtain calculated Bouguer corrections above the Brisbane hill with the assumption that the water depth surrounding it is 4750 m.

Appendix 2-3

Calculation of Bouguer corrections at the Suiko seamount

Calculation of Bouguer corrections at the Suiko seamount is made just the same as at the Brisbane hill except for the length of the shortest side of polygons, which in the case of the Suiko seamount is selected to be 1 mile (1852 m) and depth of the sea surrounding it which is assumed to be 6400 m.

Fig. 58.

Appendix 3

Calculation of Bouguer corrections in two dimensional case

Calculation of Bouguer corrections to be applied to two dimensional observations is

made according to Hubbert's method (HUBBERT, 1948) by use of two dimensional observations of water depth.

Supposing a section of a two dimensional body is represented by a polygon ABCD---A

Fig. 59.

vertical component of the gravitational attraction due to the polygon at point P is given by the following equation (Fig. 58)

$$\begin{aligned} g &= 2k^2 \rho \oint r \sin \theta d\theta \\ &= 2k^2 \rho \oint z d\theta \end{aligned} \quad \text{A-3-1}$$

where k^2 is a universal constant of gravitation, ρ density of the body and $\oint$ means a line integral along the rim of the polygon. Though equation A-3-1 holds for a body of general shape it can be more simplified and expressed by only the positions of vertices in the case of polygons.

In the actual calculation of two dimensional Bouguer corrections, sea surface is taken as an upper horizontal side and sea bottom sectioned by points where water depth is measured is taken as groups of the lower sides. Water depth is usually measured at the interval of every 2 to 4 km distance though it depends on the ship's speed. Left and right sides which are usually taken to be vertical are extended over a little outside the measured area by assuming a certain depth which seems most probable.

Thus Bouguer corrections for the measurements of the Mariana trench, the Solomon trench, the Shatsky rise and the Bismark plateau have been calculated on the assumption that the observed topography represents cross sections of two dimensional topography. Calculated Bouguer corrections are compared with the simple Bouguer corrections, for example, in the case of the Mariana trench in Fig. 59.

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Notations for the Attached Tables

NO; number attached to the Gravity Tables
DATE; year, month, day and time. EX. 6607191829 means 18^h 29^m, July 19th, 1966

LAT; latitude

LONG; longitude

r; standard gravity according to the international formula

G; measured gravity

DEP; water depth

Bs; simple Bouguer correction

Bc; calculated Bouguer correction

dGf; free air gravity anomaly

dGb; simple Bouguer gravity anomaly

dGb; calculated Bouguer gravity anomaly

Gravity Table 1. The Japan trench and its vicinity.

1-1 Measurement by use of the Vening Meinesz gravity meter in 1934.

1-2 Measurement by use of the T. S. S. G. on board the Umitakamaru in July and August 1966.

1-3 Measurement by use of the T. S. S. G. on board the Hakuho-maru in August 1967.

1-4 Measurement by use of the T. S. S. G. on board the Hakuho-maru in July and August 1968.

Table 1-1

NO	DATE	LAT	LONG	r	G	DEP	Bs	Bc	dGf	dGb	dGb
1	341015	35 07.8N	139 30.4E	979757	979752	700	48				
2	15	34 56.1N	139 23.2E	979740	979745	1470	101		- 4	44	
3	17	35 00.4N	141 04.4E	979746	979666	2100	145	165	- 79	66	86
4	19	34 48.2N	143 33.4E	979726	979732	5800	400		- 7	407	
5	18	34 48.2N	143 33.4E	979723	979749	5800	386		21	407	
6	18	35 09.6N	144 39.8E	979760	979808	5600	386		49	435	
7	18	35 32.9N	143 28.5E	979792	979791	5800	400	359	0	400	399
8	19	38.0N	143 08.5E	979799	979763	5900	407	424	- 35	372	389
9	19	47.4N	142 25.2E	979812	979711	3500	242	378	-160	142	278
10	31	36 12.5N	141 15.5E	979849	979876	750	55	78	28	83	106
11	20	37 12.5N	144 03.9E	979836	979833	5700	393	398	- 2	391	386
12	20	37 24.4N	144 03.9E	979852	979873	6800	449	435	- 76	311	329
13	20	34.5N	143 19.0E	979868	979885	4700	324	311	- 62	242	229
14	31	58.0N	141 59.0E	980001	980128	400	28	35	128	156	163
15	21	39 55.9N	145 58.5E	980086	980129	5200	359	364	44	403	308
16	21	57.4N	145 53.7E	980088	980134	5200	359	364	47	406	311
17	21	39 22.1N	143 57.1E	980111	980129	5100	373	375	-19	412	414
18	21	35.2N	143 05.4E	980144	980111	1900	131	132	-32	144	159
19	21	35.2N	143 05.4E	980144	980111	1900	131	132	-32	144	159
20	27	40 24.0N	147 18.0E	980216	980253	5300	366	361	36	404	399
21	27	40 44.0N	146 22.2E	980246	980297	5300	366	335	52	418	387
22	27	41 00.5N	145 32.8E	980271	980255	5800	400	402	-15	385	387
23	26	42 07.0N	144 13.4E	980280	980141	4500	311	327	-138	173	189
24	26	42 07.0N	144 13.4E	980280	980141	4500	311	327	-138	173	189
25	26	30.5N	143 06.0E	980316	980237	1000	69	61	- 57	12	4
26	30	40 59.7N	142 23.0E	980270	980223	1300	90	84	- 46	44	38
27	26	41 59.5N	141 56.0E	980359	980237	1000	69	59	-121	- 52	- 62
28	28	42 16.4N	145 32.0E	980383	980306	3200	221	272	- 76	145	156
29	28	44.7N	145 04.4E	980427	980532	160	11	32	106	117	138

Table 1-2

NO	DATE	LAT	LONG	r	G	DEP	Bs	Bc	dGf	dGb	dGb
1	6607191829	39 19.5N	144 37.4E	980033	980016	5783	399	396	- 17	382	379
2	1841	22.0N	144 37.4E	980036	980018	5667	399	400	- 17	374	383
3	1853	24.5N	37.4E	980040	980031	5710	394	400	- 27	369	391
4	1905	27.0N	37.4E	980044	980017	5739	396	400	- 27	369	373
5	1917	29.3N	37.4E	980047	980017	5870	405	400	- 30	375	370
6	1929	31.6N	37.4E	980050	980015	5884	406	408	- 35	371	373
7	1931	34.1N	37.4E	980053	980013	5898	408	408	- 35	371	375
8	1933	36.5N	37.4E	980057	980009	5912	401	408	- 38	373	360
9	1935	39.1N	37.4E	980061	980001	6000	414	413	- 43	371	376
10	2017	41.4N	37.4E	980065	980022	6000	414	413	- 43	371	376
11	2029	43.9N	37.4E	980068	980021	6130	423	413	- 47	376	366
12	2041	46.4N	37.4E	980072	980025	6203	428	413	- 47	381	366
13	2051	48.9N	37.4E	980076	980029	6264	432	418	- 55	375	361
14	2103	51.4N	37.4E	980079	980025	6264	432	418	- 55	375	361
15	2117	54.0N	37.4E	980083	980025	6203	428	418	- 58	370	360
16	2129	56.7N	37.4E	980087	980020	6145	424	418	- 67	357	351
17	2141	59.2N	37.7E	980091	980022	6087	420	418	- 69	351	349
18	2153	39 01.6N	37.7E	980094	980027	6087	420	423	- 67	353	356
19	2215	04.1N	37.7E	980108	980043	6139	423	423	- 67	350	357
20	2229	09.1N	37.8E	980105	980038	6029	416	423	- 67	349	356
21	2253	14.1N	37.9E	980113	980043	6159	425	423	- 70	355	353
22	2305	16.7N	38.0E	980117	980049	6203	428	423	- 68	360	355
23	2317	19.2N	38.0E	980120	980052	6232	430	423	- 68	362	355
24	2329	21.7N	38.0E	980124	980047	6188	427	425	- 77	350	348
25	2341	24.2N	38.0E	980128	980064	6029	416	425	- 64	352	361
26	2353	26.6N	38.0E	980131	980074	6029	416	425	- 57	359	368
27	2353	29.0N	38.1E	980135	980063	6043	417	425	- 72	355	353
28	6607200005	31.4N	38.1E	980138	980086	6058	418	427	- 52	366	375
29	0017	36.2N	38.1E	980145	980075	6203	428	427	- 70	359	357
30	0053	38.6N	38.2E	980149	980084	6290	434	427	- 65	369	362
31	0105	41.0N	38.2E	980152	980099	6348	438	429	- 53	385	376
32	0117	43.4N	38.2E	980156	980108	6420	443	429	- 48	395	381
33	0129	45.8N	38.3E	980159	980114	6275	433	429	- 45	388	384
34	0141	48.2N	38.3E	980163	980115	6043	427	429	- 48	369	391
35	0203	52.8N	38.3E	980170	980106	6188	427	436	- 54	367	372
36	0217	55.2N	38.3E	980173	980104	6159	425	436	- 63	356	367
37	0229	57.5N	38.3E	980177	980114	6261	432	436	- 63	369	373
38	0241	60.0N	38.3E	980180	980128	6304	435	436	- 52	383	384
39	0341	11.7N	38.2E	980198	980130	6449	445	453	- 68	377	387
40	0405	14.0N	38.2E	980205	980103	6507	449	453	- 96	353	357
41	0453	25.9N	38.2E	980205	980103	6507	449	453	- 96	353	357
42	0505	29.2N	38.1E	980224	980128	6725	444	459	- 99	365	360
43	0505	29.2N	38.1E	980224	980128	6768	467	459	- 99	371	373
44	0941	19.9N	38.3E	980299	980138	4420	305	310	-161	144	149
45	0953	21.8N	38.4E	980302	980139	4580	316	310	-163	153	147
46	1005	23.8N	38.5E	980305	980131	4391	303	310	-174	129	136
47	1029	27.7N	38.6E	980311	980135	4493	310	310	-176	134	134
48	1041	29.7N	38.7E	980314	980135	4507	311	310	-179	132	131
49	1053	31.6N	38.7E	980317	980137	4638	320	287	-180	140	107
50	1105	33.5N	38.8E	980320	980133	4783	330	287	-187	143	100
51	1117	35.4N	38.9E	980322	980137	4783	330	287	-185	145	102
52	1129	37.2N	39.0E	980325	980139	4555	315	287	-184	129	101
53	1141	39.0N	39.0E	980328	980147	4304	297	287	-181	116	106
54	1205	42.5N	39.2E	980333	980181	3594	248	213	-152	96	61
55	1217	44.4N	39.1E	980336	980176	3377	233	213	-160	73	53

NO	DATE	LAT	LONG	r	g	DEP	B _s	B _c	dGr	dCb	dG'
18561	6607201229	41 46.3N	144 39.0E	980339	980187	3174	219	213	-152	67	61
18562	1241	42.2N	39.0E	980341	980212	2841	196	213	-129	67	84
18564	1305	51.9N	38.9E	980347	980228	2449	169	147	-119	50	28
18565	1317	53.8N	38.8E	980350	980220	2319	160	147	-130	30	17
18566	1329	55.7N	38.8E	980353	980227	2072	143	147	-126	17	21
18568	1353	59.4N	38.7E	980358	980260	1986	137	147	-98	39	49
18570	1417	42 03.2N	38.6E	980364	980250	1899	131	133	-114	17	19
18571	1429	44.9N	38.6E	980366	980259	1884	130	133	-107	23	27
18572	1441	46.8N	38.6E	980369	980263	1826	126	133	-106	20	26
18573	1453	48.7N	38.5E	980372	980263	1841	127	133	-109	18	24
18574	1505	50.5N	38.5E	980375	980264	1870	129	130	-111	18	19
18575	1517	52.4N	38.4E	980378	980269	1870	129	130	-109	20	21
18576	1529	54.2N	38.4E	980380	980274	1870	129	130	-106	23	24
18577	1541	56.1N	38.4E	980383	980264	1826	126	130	-119	13	11
18579	1605	59.7N	38.2E	980389	980281	1797	124	130	-108	16	22
18582	1707	29.2N	37.7E	980403	980303	1507	104	112	-100	4	12
18583	1719	31.1N	37.6E	980406	980307	1884	130	78	-99	31	-21
18585	1743	35.2N	37.5E	980412	980355	1145	79	78	-57	22	21
18586	1755	37.3N	37.3E	980415	980374	884	61	78	-41	20	37
18587	1807	38.3N	37.2E	980416	980407	681	47	78	-9	38	69
18840	6607251210	42 54.2N	144 17.4E	980440	980551	58	4	8	111	115	119
18841	1222	52.6N	16.2E	980438	980544	101	7	8	106	113	114
18842	1234	50.8N	14.6E	980435	980519	159	11	8	84	95	92
18843	1246	48.9N	12.6E	980432	980500	130	9	42	68	77	110
18845	1310	44.9N	09.2E	980426	980455	174	12	8	29	41	37
18847	1334	41.2N	06.3E	980421	980403	232	16	8	18	-2	-10
18848	1346	37.3N	04.1E	980418	980316	572	26	50	-46	-20	4
18849	1358	35.7N	01.2E	980413	980346	478	33	50	-67	-34	-17
18850	1410	30.1N	55.5E	980404	980324	290	20	30	-80	-60	-50
18853	1446	28.2N	53.8E	980401	980316	290	20	50	-85	-65	-35
18854	1458	26.2N	52.6E	980398	980302	304	21	50	-96	-75	-46
18855	1510	24.3N	50.7E	980395	980289	319	22	50	-106	-84	-56
18856	1522	22.3N	48.8E	980392	980278	348	24	9	-114	-94	-105
18857	1534	20.3N	46.9E	980381	980329	710	49	57	-52	3	5
18859	1558	18.1N	45.0E	980386	980254	377	26	42	-132	-106	-90
18860	1610	15.7N	43.0E	980383	980253	348	24	42	-130	-106	-88
18862	1634	11.8N	39.5E	980377	980295	261	18	3	-82	-64	-79
18863	1646	09.4N	37.5E	980372	980312	203	14	14	-61	-47	-47
18864	1658	07.5N	36.4E	980370	980317	174	12	14	-53	-41	-39
18866	1722	03.8N	33.6E	980365	980327	145	10	14	-38	-28	-24
18867	1734	02.3N	32.6E	980363	980325	130	9	14	-38	-29	-24
18870	1810	41 57.7N	29.5E	980356	980320	130	9	3	-36	-27	-33
18871	1822	56.1N	28.4E	980353	980316	130	9	3	-37	-28	-34
18872	1834	54.6N	27.3E	980351	980314	130	8	3	-35	-26	-31
18873	1846	53.0N	26.0E	980348	980311	130	8	3	-35	-27	-32
18874	1858	51.0N	24.1E	980347	980317	130	8	3	-30	-21	-27
18875	1910	50.2N	24.1E	980344	980318	116	8	3	-26	-18	-23
18876	1922	56.1N	28.4E	980353	980316	130	9	3	-37	-28	-34
18877	1934	54.6N	27.3E	980351	980314	130	8	3	-35	-26	-31
18878	1946	53.0N	26.0E	980348	980311	130	8	3	-35	-27	-32
18879	1958	51.0N	24.1E	980347	980317	130	8	3	-30	-21	-27
18880	2010	50.2N	24.1E	980344	980318	116	8	3	-26	-18	-23

NO	DATE	LAT	LON	r	G	DEP	B _s	B _c	dGr	dGb	dG6	NO	DATE	LAT	LON	r	G	DEP	B _s	B _c	dGr	dGb	dG6
9930	6608170742	41 33.4N	141 10.3E	980320	980387	304	21	23	67	88	84	19991	6608172038	39 15.0N	142 03.0E	980111	980271	145	10	14	167	167	171
9931	0918	31.6N	21.4E	980317	980383	261	18	18	66	84	84	19992	2030	33.2N	02.1E	980114	980279	145	10	14	168	168	178
9932	0930	31.6N	21.4E	980317	980386	145	10	18	69	79	87	19994	2054	09.6N	00.7E	980106	980278	145	10	26	172	182	198
9933	0942	31.7N	28.0E	980316	980391	58	4	13	75	79	93	19995	2106	07.3N	00.0E	980103	980263	145	10	26	160	170	186
9934	0930	21.8N	33.6E	980302	980345	130	5	33	63	72	56	19996	2118	05.3N	141 59.1E	980100	980263	145	10	2	163	173	185
9935	0942	17.1N	34.6E	980295	980342	565	38	41	53	91	94	19997	2130	03.3N	58.2E	980096	980269	145	10	2	173	183	175
9936	0954	17.1N	34.6E	980295	980344	565	39	41	49	88	90	19999	2154	30 59.8N	57.4E	980092	980271	159	11	8	169	180	177
9941	1018	12.4N	35.3E	980288	980358	594	41	41	70	111	111	20000	2206	57.8N	56.5E	980089	980273	159	11	8	169	180	177
9942	1030	10.6N	35.7E	980284	980363	581	40	41	79	119	120	20001	2218	56.1N	56.5E	980086	980270	188	13	8	184	194	182
9943	1042	07.6N	36.1E	980281	980365	551	38	43	122	117	122	20002	2230	56.4N	56.0E	980084	980268	174	12	8	184	194	182
9944	1054	05.2N	36.6E	980277	980359	527	36	33	82	118	115	20003	2242	52.4N	55.6E	980081	980255	168	13	8	174	187	182
9945	1106	02.7N	36.8E	980274	980342	507	35	33	68	103	101	20004	2254	50.6N	54.6E	980078	980234	188	13	8	156	166	164
9946	1118	00.2N	36.7E	980270	980338	449	31	33	58	89	91	20005	2306	48.8N	53.8E	980075	980227	188	13	19	152	165	171
9947	1130	00.2N	36.7E	980266	980346	391	27	18	80	107	96	20006	2318	47.0N	53.1E	980073	980216	188	13	19	143	156	162
9948	1142	54.5N	36.9E	980262	980343	333	23	18	81	104	99	20007	2330	46.8N	52.5E	980070	980215	203	14	19	145	156	162
9949	1154	52.0N	37.1E	980258	980349	246	17	18	91	108	109	20008	2342	44.6N	50.5E	980066	980197	203	14	19	131	145	150
9950	1206	50.0N	37.9E	980255	980342	174	12	18	87	99	105	20009	2354	42.0N	50.6E	980066	980197	203	14	19	131	145	150
9951	1218	47.6N	39.1E	980251	980344	130	9	1	33	102	94	20025	6608180406	02.7N	35.9E	980008	980122	145	10	2	114	124	116
9952	1230	45.2N	40.3E	980248	980337	101	7	2	89	96	91	20026	0430	00.6N	35.1E	980005	980114	145	10	2	109	119	111
9953	1242	42.8N	41.5E	980244	980334	87	6	2	86	92	86	20027	0448	37 58.9N	34.3E	980002	980107	145	10	2	105	115	107
9954	1254	40.6N	42.8E	980240	980331	87	6	2	84	92	84	20028	0462	57.0N	33.5E	980000	980107	145	10	2	107	117	109
9955	1306	37.9N	43.7E	980236	980328	87	6	2	92	98	94	20030	0506	56.4N	32.6E	979997	980107	145	10	2	110	120	112
9956	1318	35.6N	44.8E	980233	980325	87	6	2	92	98	94	20031	0518	51.1N	31.0E	979991	980108	145	10	2	117	127	119
9957	1330	33.3N	45.9E	980230	980320	87	6	2	90	96	92	20032	0530	49.3N	30.2E	979988	980101	145	10	2	113	123	115
9958	1342	30.9N	47.0E	980227	980325	87	6	2	98	104	100	20033	0545	46.6E	27.6E	979980	980089	130	9	2	109	118	111
9959	1354	28.6N	48.3E	980223	980327	87	6	1	104	110	105	20036	0619	41.6N	26.0E	979977	980081	130	9	2	104	113	106
9960	1406	26.2N	49.5E	980219	980320	72	5	1	101	106	102	20035	0666	43.5N	24.2E	979969	980081	130	9	2	92	101	94
9961	1418	23.9N	50.7E	980216	980328	72	5	2	112	117	114	20039	0654	35.8N	24.2E	979969	980081	130	9	2	92	101	94
9962	1430	21.6N	51.8E	980212	980334	72	5	2	122	127	124	20040	0706	33.7N	23.3E	979969	980081	130	9	2	92	101	94
9963	1442	19.2N	53.0E	980209	980344	87	6	2	135	141	137	20041	0718	31.3N	22.4E	979962	980057	130	9	3	95	104	97
9965	1506	14.4N	55.5E	980202	980347	101	7	2	148	155	140	20042	0730	29.0N	21.5E	979959	980054	130	9	3	95	104	97
9966	1518	12.1N	56.6E	980198	980336	87	6	2	138	145	140	20043	0742	26.7N	20.6E	979956	980047	130	9	3	91	100	94
9967	1530	09.9N	57.7E	980194	980347	101	7	2	138	145	140	20044	0754	24.5N	19.7E	979952	980043	130	9	3	91	100	94
9968	1542	07.6N	58.8E	980192	980350	101	7	2	138	145	140	20045	0806	22.2N	18.8E	979949	980031	130	9	2	82	91	84
9970	1606	02.8N	142 01.3E	980316	980311	101	7	2	126	133	128	20046	0818	18.9N	17.7E	979946	980024	130	9	2	78	87	80
9972	1630	39 58.1N	02.2E	980178	980298	101	7	2	120	127	122	20046	0830	16.5N	16.5E	979942	980017	130	9	2	75	84	77
9973	1642	35.9N	03.3E	980174	980298	116	8	2	114	132	116	20047	0842	14.5N	15.5E	979939	980012	130	9	2	75	84	77
9974	1654	33.5N	03.9E	980171	980298	116	8	2	114	132	116	20048	0854	11.6N	14.3E	979934	980013	130	9	2	75	84	77
9975	1706	31.0N	04.5E	980167	980291	116	8	2	124	132	126	20049	0906	09.1N	13.2E	979930	980013	130	9	2	75	84	77
9976	1718	28.6N	05.1E	980163	980291	116	8	2	124	132	126	20050	0906	09.1N	13.2E	979930	980013	130	9	2	75	84	77
9976	1718	28.6N	05.1E	980163	980291	116	8	2	124	132	126	20050	0906	09.1N	13.2E	979930	980013	130	9	2	75	84	77
9976	1718	28.6N	05.1E	980163	980291	116	8	2	124	132	126	20050	0906	09.1N	13.2E	979930	980013	130	9	2	75	84	77
9977	1730	26.2N	05.7E	980160	980295	130	9	2	125	134	127	20052	0930	04.9N	11.3E	979924	980003	130	9	3	79	88	82
9977	1730	26.2N	05.7E	980160	980295	130	9	2	125	134	127	20052	0942	02.7N	10.4E	979921	979994	130	9	3	73	81	76
9980	1806	38.7N	07.7E	980149	980304	159	11	3	155	166	158	20053	1006	36 58.4N	08.7E	979915	979980	130	9	2	65	74	67
9981	1818	36.4N	08.6E	980146	980302	159	11	3	156	167	159	20055	1018	34.1N	07.8E	979912	979982	130	9	2	70	79	72
9982	1830	34.1N	09.3E	980142	980302	174	12	3	160	172	163	20056	1030	32.3N	06.9E	979909	979987	130	9	2	76	75	78
9983	1842	31.6N	08.6E	980138	980287	159	11	8	149	160	152	20057	1042	30.1N	06.1E	979906	979985	130	9	2	76	75	78
9984	1854	28.9N	07.1E	980135	980286	159	11	8	147	158	155	20058	1054	28.3N	05.2E	979903	979964	130	9	2	61	70	63
9985	1906	26.6N	07.1E	980131	980286	159	11	8	147	158	155	20059	1106	24.1N	04.2E	979900	979963	130	10	3	63	73	66
9986	1918	24.7N	06.4E	980128	980281	145	10	8	153	163	161	20060	1118	22.8N	03.3E	979896	979962	130	9	3	68	77	71
9987	1930	22.8N	06.1E	980125	980278	145	10	8	151	161	161	20061	1130	21.0N	02.4E	979890	979943	130	9	3	53	62	56
9988	1942	21.0N	05.6E	980123	980274	145	10	8	151	161	161	20062	1142	19.2N	01.5E	979886	979946	130	9	20	60	69	80
9989	1954	18.8N	04.9E	980120	980271	145	10	14	151	161	161	20064	1154	16.8N	00.3E	979883	979937	130	9	2	54	63	56
9990	2006	16.8N	03.9E	980117	980270	145	10	14	153	163	167	20065	1206	14.0N	00.3E	979883	979937	130	9	2	54	63	56

Table 1-3

NO	DATE	LAT	LONG	r	G	DEP	B _g	B _e	dGt	dG _b	dG _c	dG _d
20066	600810 1218	36 34.5N 140	59.4E	979800 979814	130	9	2	54	63	62	55	55
20067	1230	36.2N	57.4E	979877 979830	130	9	2	53	62	55	55	55
20068	1242	30.6N	56.7E	979875 979826	130	9	2	51	60	53	54	54
20069	1254	28.5N	55.8E	979872 979812	145	10	14	40	50	54	54	54
20071	1318	24.2N	54.0E	979865 979901	159	11	14	36	47	50	50	50
20072	1330	22.0N	53.1E	979862 979906	159	11	14	44	55	58	58	58
20073	1342	17.7N	52.3E	979859 979903	159	11	14	44	55	58	58	58
20074	1354	17.3N	52.3E	979856 979907	159	11	14	44	55	58	58	58
20076	1418	13.2N	53.0E	979850 979898	188	13	14	58	61	62	62	62
20077	1430	11.0N	53.2E	979847 979903	188	13	14	58	61	62	62	62
20078	1442	08.7N	53.6E	979843 979906	174	12	9	63	75	72	72	72
20080	1506	04.3N	54.3E	979837 979904	145	10	9	33	43	43	43	43
20081	1518	35 54.7E	979834 979903	145	10	9	33	43	43	43	43	43
20082	1530	35 54.7E	979834 979903	145	10	9	33	43	43	43	43	43
20083	1542	35 54.7E	979834 979903	145	10	9	33	43	43	43	43	43
20084	1554	55.4N	55.8E	979824 979890	116	8	3	70	78	73	69	66
20085	1606	53.3N	55.2E	979821 979884	87	6	3	63	69	66	66	66
20086	1618	51.2N	56.5E	979818 979894	58	4	3	76	80	79	79	79
20087	1630	49.2N	56.9E	979815 979891	58	4	3	66	70	69	69	69
20088	1642	47.0N	57.2E	979812 979881	43	3	3	69	71	68	68	68
20089	1654	42.8N	57.1E	979809 979878	43	3	3	69	71	68	68	68
20090	1706	42.8N	57.1E	979806 979845	43	3	3	69	71	68	68	68
20091	1718	40.7N	56.1E	979803 979846	29	2	3	43	45	46	46	46
20093	1742	36.5N	53.1E	979797 979836	29	2	3	39	41	42	42	42
20094	1754	34.3N	51.7E	979794 979817	43	3	3	23	26	26	26	26
20095	1806	32.3N	50.3E	979791 979809	43	3	3	18	21	21	21	21
20097	1830	28.9N	47.2E	979786 979786	58	4	3	0	4	4	4	4
20098	1842	26.9N	46.2E	979784 979787	58	4	3	0	4	4	4	4
20100	1906	22.8N	43.2E	979778 979794	72	5	3	16	21	19	19	19
20101	1918	20.7N	41.9E	979775 979791	72	5	3	16	21	19	19	19
20103	1942	16.8N	39.4E	979769 979810	72	5	2	41	46	43	43	43
20104	1954	13.4N	37.4E	979764 979806	97	5	2	39	45	41	41	41
20105	2006	13.4N	35.8E	979764 979814	72	5	2	50	55	52	52	52
20107	2030	10.1N	32.0E	979760 979790	58	4	2	30	34	32	32	32
20108	2042	08.5N	30.1E	979758 979787	72	5	13	29	34	42	42	42
20110	2106	05.3N	26.2E	979753 979816	101	7	13	63	70	76	76	76
20111	2118	04.0N	24.7E	979751 979809	145	10	13	58	68	71	71	71
20113	2142	01.4N	19.7E	979748 979764	406	28	7	11	44	23	23	23
20114	2154	01.4N	17.0E	979746 979735	899	62	7	11	44	23	23	23
20115	2206	34 58.9N	14.5E	979744 979699	1406	97	7	11	44	23	23	23
20116	2218	57.8N	12.2E	979742 979704	1072	74	3	11	44	23	23	23
20117	2230	56.7N	09.9E	979741 979731	768	53	3	11	44	23	23	23
20118	2242	55.5N	07.9E	979739 979726	351	28	3	11	44	23	23	23
20119	2254	54.3N	04.7E	979737 979764	406	28	3	11	44	23	23	23
20121	2318	51.7N 139	59.1E	979734 979800	203	14	66	80	80	80	80	80
20122	2330	50.3N	56.2E	979732 979793	159	11	61	72	72	72	72	72
20124	2354	50.7N	50.2E	979732 979800	87	6	68	74	74	74	74	74
20125	6008190006	51.8N	47.6E	979734 979802	72	5	68	73	73	73	73	73
20126	0018	54.0N	46.2E	979737 979787	304	21	50	71	71	71	71	71
20127	0030	55.9N	44.9E	979740 979757	72	5	5	37	40	37	37	37
20128	0052	59.9N	42.9E	979745 979759	232	16	3	14	30	43	43	43
20130	0106	35 00.2N	46.9E	979746 979734	346	24	12	12	12	12	12	12

DATE	LAT	LONG	r	t	DEP	B _a	B _e	dG	dG	dG	dG
42111	6708100130	41 07.3N 143 10.2E	980280 980097	2040	141	145	-183	-42	-39	383	387
42112	0150	06.0N 142.0E	980277 980100	2030	130	145	-173	-33	-28	384	386
42113	0150	06.0N 142.0E	980277 980100	2030	130	145	-173	-33	-28	384	386
42114	0200	04.0N 16.3E	980276 980107	2020	139	145	-169	-30	-24	381	378
42115	0210	03.0N 18.3E	980274 980113	2010	139	145	-164	-22	-16	383	381
42116	0220	02.0N 20.3E	980273 980121	2000	138	154	-152	-14	2	375	375
42117	0240	00.0N 24.5E	980270 980133	2000	138	154	-137	1	17	371	372
42118	0250	26.5E	980266 980139	2000	138	153	-129	9	4	371	372
42119	0300	28.6E	980267 980144	2000	138	153	-125	15	10	371	372
42120	0310	30.6E	980265 980150	2000	138	152	-115	23	37	371	372
42121	0320	32.7E	980265 980157	2000	138	152	-107	31	45	371	372
42122	0330	34.7E	980262 980160	1990	137	152	-102	35	50	371	372
42123	0340	36.7E	980261 980166	2020	139	152	-95	44	57	371	372
42124	0350	38.6E	980259 980166	2100	145	152	-91	52	59	371	372
42125	0400	40.9E	980258 980167	2180	151	191	-91	60	100	371	372
42126	0410	42.7E	980258 980166	2280	157	191	-92	65	99	371	372
42127	0420	44.0E	980256 980160	2420	167	191	-96	71	95	371	372
42128	0430	45.6E	980256 980160	2590	179	191	-95	84	96	371	372
42129	0440	47.2E	980255 980155	2780	192	191	-100	92	91	371	372
42130	0450	48.9E	980255 980154	3060	211	200	-101	110	99	371	372
42131	0500	50.5E	980253 980150	3435	237	280	-103	134	177	371	372
42132	0510	52.4E	980253 980146	3810	263	280	-106	144	184	371	372
42133	0520	54.1E	980252 980146	4060	280	280	-132	144	144	371	372
42134	0530	56.6E	980250 980106	4290	296	280	-144	152	136	371	372
42135	0540	58.8E	980249 980096	4550	314	280	-153	161	127	371	372
42136	0550	61.1E	980247 980089	4670	322	343	-158	164	185	371	372
42137	0600	63.3E	980246 980083	4650	321	343	-163	158	180	371	372
42138	0610	65.5E	980244 980069	4630	319	343	-169	150	174	371	372
42139	0620	67.8E	980244 980061	5010	346	343	-176	170	167	371	372
42140	0630	70.1E	980237 980038	6950	480	407	-199	281	208	371	372
42141	0640	72.4E	980235 980042	6940	479	462	-193	286	249	371	372
42142	0650	74.7E	980234 980041	6750	465	462	-183	283	279	371	372
42143	0700	77.0E	980232 980062	7170	495	462	-170	325	292	371	372
42144	0710	79.3E	980230 980039	6460	446	407	-201	245	206	371	372
42145	0720	81.6E	980238 980031	6750	466	407	-207	259	200	371	372
42146	0730	83.9E	980237 980038	6950	480	407	-199	281	208	371	372
42147	0740	86.2E	980235 980042	6940	479	462	-193	286	249	371	372
42148	0750	88.5E	980234 980041	6750	465	462	-183	283	279	371	372
42149	0760	90.8E	980232 980062	7170	495	462	-170	325	292	371	372
42150	0770	93.1E	980230 980039	6460	446	407	-201	245	206	371	372
42151	0780	95.4E	980238 980031	6750	466	407	-207	259	200	371	372
42152	0790	97.7E	980237 980038	6950	480	407	-199	281	208	371	372
42153	0800	100.0E	980235 980042	6940	479	462	-193	286	249	371	372
42154	0810	102.3E	980234 980041	6750	465	462	-183	283	279	371	372
42155	0820	104.6E	980232 980062	7170	495	462	-170	325	292	371	372
42156	0830	106.9E	980230 980039	6460	446	407	-201	245	206	371	372
42157	0840	109.2E	980238 980031	6750	466	407	-207	259	200	371	372
42158	0850	111.5E	980237 980038	6950	480	407	-199	281	208	371	372
42159	0900	113.8E	980235 980042	6940	479	462	-193	286	249	371	372
42160	0910	116.1E	980234 980041	6750	465	462	-183	283	279	371	372
42161	0920	118.4E	980232 980062	7170	495	462	-170	325	292	371	372
42162	0930	120.7E	980230 980039	6460	446	407	-201	245	206	371	372
42163	0940	123.0E	980238 980031	6750	466	407	-207	259	200	371	372
42164	0950	125.3E	980237 980038	6950	480	407	-199	281	208	371	372
42165	1000	127.6E	980235 980042	6940	479	462	-193	286	249	371	372
42166	1010	129.9E	980234 980041	6750	465	462	-183	283	279	371	372
42167	1020	132.2E	980232 980062	7170	495	462	-170	325	292	371	372
42168	1030	134.5E	980230 980039	6460	446	407	-201	245	206	371	372
42169	1040	136.8E	980238 980031	6750	466	407	-207	259	200	371	372
42170	1050	139.1E	980237 980038	6950	480	407	-199	281	208	371	372
42171	1060	141.4E	980235 980042	6940	479	462	-193	286	249	371	372
42172	1070	143.7E	980234 980041	6750	465	462	-183	283	279	371	372
42173	1080	146.0E	980232 980062	7170	495	462	-170	325	292	371	372
42174	1090	148.3E	980230 980039	6460	446	407	-201	245	206	371	372
42175	1100	150.6E	980238 980031	6750	466	407	-207	259	200	371	372
42176	1110	152.9E	980237 980038	6950	480	407	-199	281	208	371	372
42177	1120	155.2E	980235 980042	6940	479	462	-193	286	249	371	372
42178	1130	157.5E	980234 980041	6750	465	462	-183	283	279	371	372
42179	1140	159.8E	980232 980062	7170	495	462	-170	325	292	371	372
42180	1150	162.1E	980230 980039	6460	446	407	-201	245	206	371	372
42181	1160	164.4E	980238 980031	6750	466	407	-207	259	200	371	372
42182	1170	166.7E	980237 980038	6950	480	407	-199	281	208	371	372
42183	1180	169.0E	980235 980042	6940	479	462	-193	286	249	371	372
42184	1190	171.3E	980234 980041	6750	465	462	-183	283	279	371	372
42185	1200	173.6E	980232 980062	7170	495	462	-170	325	292	371	372
42186	1210	175.9E	980230 980039	6460	446	407	-201	245	206	371	372
42187	1220	178.2E	980238 980031	6750	466	407	-207	259	200	371	372
42188	1230	180.5E	980237 980038	6950	480	407	-199	281	208	371	372
42189	1240	182.8E	980235 980042	6940	479	462	-193	286	249	371	372
42190	1250	185.1E	980234 980041	6750	465	462	-183	283	279	371	372
42191	1260	187.4E	980232 980062	7170	495	462	-170	325	292	371	372
42192	1270	189.7E	980230 980039	6460	446	407	-201	245	206	371	372
42193	1280	192.0E	980238 980031	6750	466	407	-207	259	200	371	372
42194	1290	194.3E	980237 980038	6950	480	407	-199	281	208	371	372
42195	1300	196.6E	980235 980042	6940	479	462	-193	286	249	371	372
42196	1310	198.9E	980234 980041	6750	465	462	-183	283	279	371	372
42197	1320	201.2E	980232 980062	7170	495	462	-170	325	292	371	372
42198	1330	203.5E	980230 980039	6460	446	407	-201	245	206	371	372
42199	1340	205.8E	980238 980031	6750	466	407	-207	259	200	371	372
42200	1350	208.1E	980237 980038	6950	480	407	-199	281	208	371	372
42201	1360	210.4E	980235 980042	6940	479	462	-193	286	249	371	372
42202	1370	212.7E	980234 980041	6750	465	462	-183	283	279	371	372
42203	1380	215.0E	980232 980062	7170	495	462	-170	325	292	371	372
42204	1390	217.3E	980230 980039	6460	446	407	-201	245	206	371	372
42205	1400	219.6E	980238 980031	6750	466	407	-207	259	200	371	372
42206	1410	221.9E	980237 980038	6950	480	407	-199	281	208	371	372
42207	1420	224.2E	980235 980042	6940	479	462	-193	286	249	371	372
42208	1430	226.5E	980234 980041	6750	465	462	-183	283	279	371	372
42209	1440	228.8E	980232 980062	7170	495	462	-170	325	292	371	372
42210	1450	231.1E	980230 980039	6460	446	407	-201	245	206	371	372
42211	1460	233.4E	980238 980031	6750	466	407	-207	259	200	371	372
42212	1470	235.7E	980237 980038	6950	480	407	-199	281	208	371	372
42213	1480	238.0E	980235 980042	6940	479	462	-193	286			

NO	DATE	LAT	LONG	T	G	DEP	Ba	Be	dGr	dCb	dG
42406	6708120240	38 35.8N 144 08.6E	980057 979910	7145	493	468	-147	346	321	43088	43088
42407	0250	36.1N 144 06.1E	980057 979910	7385	510	468	-157	353	311	43089	43089
42408	0310	36.6N 144 01.9E	980058 979875	7410	511	468	-183	328	285	43090	43090
42409	0320	36.9N 144 00.3E	980058 979875	7410	511	468	-183	328	285	43091	43091
42410	0330	37.1N 143 58.3E	980058 979885	6860	473	431	-189	284	242	43092	43092
42411	0340	37.3N 143 56.5E	980058 979885	6635	458	431	-175	285	252	43093	43093
42412	0350	37.5N 143 54.6E	980060 979901	6210	435	431	-175	276	272	43094	43094
42413	0400	37.8N 143 52.7E	980060 979905	6140	416	431	-155	261	275	43095	43095
42414	0410	38.3N 143 50.0E	980060 979922	5120	412	431	-138	274	253	43096	43096
42415	0420	38.9N 143 47.3E	980061 979933	5710	354	370	-122	272	248	43097	43097
42416	0430	39.4N 143 44.2E	980061 979956	5115	354	370	-105	248	245	43098	43098
42417	0440	39.8N 143 42.1E	980063 979965	4425	305	370	-98	207	272	43099	43099
42418	0450	40.1N 139.5E	980063 979982	3925	271	370	-81	190	272	43100	43100
42419	0500	40.4N 137.0E	980064 979897	3605	249	370	-67	182	272	43101	43101
42420	0510	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43102	43102
42421	0520	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43103	43103
42422	0530	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43104	43104
42423	0540	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43105	43105
42424	0550	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43106	43106
42425	0600	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43107	43107
42426	0610	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43108	43108
42427	0620	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43109	43109
42428	0630	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43110	43110
42429	0640	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43111	43111
42430	0650	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43112	43112
42431	0700	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43113	43113
42432	0710	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43114	43114
42433	0720	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43115	43115
42434	0730	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43116	43116
42435	0740	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43117	43117
42436	0750	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43118	43118
42437	0800	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43119	43119
42438	0810	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43120	43120
42439	0820	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43121	43121
42440	0830	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43122	43122
42441	0840	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43123	43123
42442	0850	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43124	43124
42443	0900	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43125	43125
42444	0910	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43126	43126
42445	0920	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43127	43127
42446	0930	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43128	43128
42447	0940	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43129	43129
42448	0950	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43130	43130
42449	1000	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43131	43131
42450	1010	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43132	43132
42451	1020	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43133	43133
42452	1030	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43134	43134
42453	1040	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43135	43135
42454	1050	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43136	43136
42455	1100	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43137	43137
42456	1110	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43138	43138
42457	1120	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43139	43139
42458	1130	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43140	43140
42459	1140	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43141	43141
42460	1150	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43142	43142
42461	1200	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43143	43143
42462	1210	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43144	43144
42463	1220	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43145	43145
42464	1230	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43146	43146
42465	1240	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43147	43147
42466	1250	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43148	43148
42467	1300	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43149	43149
42468	1310	40.5N 137.0E	980064 979897	3605	249	370	-67	182	272	43150	43150

Table 1-4

NO	DATE	LAT	LONG	r	G	DEP	B _s	B _e	4G _r	4G _b	4G _t	B _e	DEP	r	G	DEP	B _s	B _e	4G _r	4G _b	4G _t
6807200010	60132	37.82N	142.03E	799920	799927	1530	106	115	7	113	122	106	115	7	113	122	106	115	7	113	122
6807200020	60133	02.00N	05.35E	799920	799927	1530	106	115	7	113	122	106	115	7	113	122	106	115	7	113	122
6807200030	60134	00.30N	07.05E	799918	799905	1830	123	115	-13	116	120	123	115	-13	116	120	123	115	-13	116	120
6807200040	60135	00.40N	08.65E	799918	799901	1930	130	121	-17	116	120	130	121	-17	116	120	130	121	-17	116	120
6807200050	60135	00.50N	10.35E	799918	799889	2040	141	149	-29	112	120	141	149	-29	112	120	141	149	-29	112	120
6807200060	60136	01.00N	12.05E	799918	799884	2220	153	149	-34	111	115	153	149	-34	111	115	153	149	-34	111	115
6807200070	60137	01.10N	13.85E	799918	799868	2530	161	149	-50	111	99	161	149	-50	111	99	161	149	-50	111	99
6807200080	60140	01.40N	19.45E	799917	799827	2330	161	196	-90	71	106	161	196	-90	71	106	161	196	-90	71	106
6807200090	60151	03.30N	59.13N	799916	798907	4300	284	318	-109	175	205	284	318	-109	175	205	284	318	-109	175	205
6807200100	60152	03.40N	42.65E	799916	798903	4320	297	318	-113	184	205	297	318	-113	184	205	297	318	-113	184	205
6807200110	60153	03.50N	43.95E	799916	798904	4250	297	318	-112	185	206	297	318	-112	185	206	297	318	-112	185	206
6807200120	60154	03.58N	45.35E	799916	798906	4250	293	318	-110	183	208	293	318	-110	183	208	293	318	-110	183	208
6807200130	60155	04.10N	45.35E	799916	799797	4280	295	318	-119	179	199	295	318	-119	179	199	295	318	-119	179	199
6807200140	60156	04.20N	59.23N	799916	797977	4140	286	318	-119	167	199	286	318	-119	167	199	286	318	-119	167	199
6807200150	60157	04.30N	51.35E	799917	797978	4140	320	359	-130	190	219	320	359	-130	190	219	320	359	-130	190	219
6807200160	60158	04.40N	53.25E	799917	797978	4440	320	359	-130	190	219	320	359	-130	190	219	320	359	-130	190	219
6807200170	60159	04.50N	55.25E	799917	797978	4900	338	369	-134	204	233	338	369	-134	204	233	338	369	-134	204	233
6807200180	60160	05.00N	57.25E	799917	797976	5020	346	352	-141	205	215	346	352	-141	205	215	346	352	-141	205	215
6807200190	60161	05.10N	59.15E	799917	797979	5110	353	352	-138	215	214	353	352	-138	215	214	353	352	-138	215	214
6807200200	60162	05.20N	00.31N	799917	797979	5210	355	400	-138	217	262	355	400	-138	217	262	355	400	-138	217	262
6807200210	60163	05.30N	03.15E	799918	797977	5510	359	400	-141	218	259	359	400	-141	218	259	359	400	-141	218	259
6807200220	60164	05.40N	04.75E	799918	797977	5550	383	400	-145	258	251	383	400	-145	258	251	383	400	-145	258	251
6807200230	60165	05.50N	06.35E	799918	797969	5850	404	400	-143	255	255	404	400	-143	255	255	404	400	-143	255	255
6807200240	60166	06.00N	07.95E	799918	797961	6100	421	400	-157	264	243	421	400	-157	264	243	421	400	-157	264	243
6807200250	60167	06.10N	09.45E	799918	797954	6410	442	400	-164	278	236	442	400	-164	278	236	442	400	-164	278	236
6807200260	60168	06.20N	10.95E	799918	797951	6680	461	450	-167	294	283	461	450	-167	294	283	461	450	-167	294	283
6807200270	60169	06.30N	13.55E	799920	797947	6670	460	450	-173	287	277	460	450	-173	287	277	460	450	-173	287	277
6807200280	60170	06.40N	15.65E	799918	797944	6510	452	450	-174	278	276	452	450	-174	278	276	452	450	-174	278	276
6807200290	60171	06.50N	17.05E	799918	797943	6550	452	450	-175	279	275	452	450	-175	279	275	452	450	-175	279	275
6807200300	60172	07.00N	21.75E	799918	797942	6850	480	477	-179	304	293	480	477	-179	304	293	480	477	-179	304	293
6807200310	60173	07.10N	23.45E	799918	797942	7160	494	477	-169	325	308	494	477	-169	325	308	494	477	-169	325	308
6807200320	60174	07.20N	25.45E	799918	797944	7270	502	477	-174	328	303	502	477	-174	328	303	502	477	-174	328	303
6807200330	60175	00.50N	00.50N	799924	797969	7110	491	480	-155	336	325	491	480	-155	336	325	491	480	-155	336	325
6807200340	60208	00.55N	31.65E	799924	797975	7070	488	480	-149	339	331	488	480	-149	339	331	488	480	-149	339	331
6807200350	60209	05.4N	34.45E	799924	797975	7070	488	480	-149	339	331	488	480	-149	339	331	488	480	-149	339	331
6807200360	60210	05.4N	37.25E	799924	797971	6910	477	480	-143	334	337	477	480	-143	334	337	477	480	-143	334	337
6807200370	60211	05.5N	40.15E	799926	797968	6750	466	462	-135	331	327	466	462	-135	331	327	466	462	-135	331	327
6807200380	60212	05.6N	42.95E	799924	797964	6560	452	462	-129	324	333	452	462	-129	324	333	452	462	-129	324	333
6807200390	60213	05.7N	45.75E	799924	797964	6560	452	462	-129	324	333	452	462	-129	324	333	452	462	-129	324	333
6807200400	60214	04.2N	48.75E	799924	797964	6560	452	462	-129	324	333	452	462	-129	324	333	452	462	-129	324	333
6807200410	60215	04.2N	50.55E	799923	7979814	6580	454	435	-107	347	328	454	435	-107	347	328	454	435	-107	347	328
6807200420	60216	03.7N	56.25E	799923	7979826	6360	439	435	-94	345	341	439	435	-94	345	341	439	435	-94	345	341
6807200430	60217	03.52N	58.45E	799923	7979828	6240	431	435	-90	341	345	431	435	-90	341	345	431	435	-90	341	345
6807200440	60218	03.52N	60.35E	799923	7979834	6100	421	421	-84	337	337	421	421	-84	337	337	421	421	-84	337	337
6807200450	60219	02.8N	00.35E	799921	7979840	6030	416	421	-72	344	349	416	421	-72	344	349	416	421	-72	344	349
6807200460	60220	01.50N	07.25E	799920	7979860	5820	402	421	-60	342	361	402	421	-60	342	361	402	421	-60	342	361
6807200470	60223	01.7N	07.25E	799920	7979860	5820	402	421	-60	342	361	402	421	-60	342	361	402	421	-60	342	361
6807200480	60224	01.8N	07.25E	799918	7979867	5820	402	407	-51	349	356	402	407	-51	349	356	402	407	-51	349	356
6807200490	60225	01.9N	11.35E	799918	7979867	5820	402	407	-51	349	356	402	407	-51	349	356	402	407	-51	349	356
6807200500	60226	00.7N	13.15E	799917	7979867	5790	400	407	-48	349	359	400	407	-48	349	359	400	407	-48	349	359
6807200510	60227	00.3N	14.85E	799917	7979862	5670	391	407	-35	356	372	391	407	-35	356	372	391	407	-35	356	372
6807200520	60228	00.0N	16.95E	799917	7979860	5640	389	401	-37	352	364	389	401	-37	352	364	389	401	-37	352	364
6807200530	60229	59.6N	18.15E	799916	7979865	5610	387	401	-51	336	350	387	401	-51	336	350	387	401	-51	336	350
6807200540	60230	59.6N	18.15E	799916	7979865	5610	387	401	-51	336	350	387	401	-51	336	350	387	401	-51	336	350
6807200550	60231	59.6N	18.15E	799916	7979865	5610	387	401	-51	336	350	387	401	-51	336	350	387	401	-51	336	350
6807200560	60232	59.6N	18.15E	799916	7979865	5610	387	401	-51	336	350	387	401	-51	336	350	387	401	-51	336	350
6807200570	60233	59.6N	18.15E	799916	7979865	5610	387	401	-51	336	350	387	401	-51	336	350	387	401	-51	336	350
6807200580	60234	59.6N	18.15E	799916	7979865	5610	387	401	-51	336	350	387									

NO	DATE	LAT	LONG	F	G	DEP	Ba	Be	dGr	dGb	4Gd
60231	6807201700	36 58.7N	144 21.4E	779916	779868	5660	386	399	-48	338	351
60232		58.6N	23.4E	779916	779870	5660	384	399	-48	338	351
60233	1710	58.6N	25.3E	779916	779870	5520	381	399	-46	335	353
60234	1730	58.5N	27.2E	779916	779871	5480	378	399	-45	333	354
60235	1740	58.7N	28.9E	779916	779874	5460	377	399	-42	333	357
60236	1750	59.0N	30.6E	779916	779880	5410	373	398	-46	337	362
60237	1800	59.2N	32.3E	779916	779885	5400	373	398	-41	342	367
60238	1810	59.2N	34.2E	779916	779891	5440	375	398	-35	350	373
60239	1820	59.2N	36.1E	779916	779896	5420	374	398	-16	358	382
60240	1830	59.2N	38.0E	779916	779905	5200	359	398	-11	348	387
60241	1840	59.3N	40.0E	779916	779908	4630	319	398	-8	311	390
60242	1850	59.3N	42.0E	779916	779914	4560	315	398	-2	313	396
60243	1900	59.3N	45.8E	779916	779930	4440	304	398	14	320	413
60244	1910	59.3N	47.7E	779916	779936	4380	302	398	20	322	418
60245	1920	59.2N	49.6E	779916	779942	4050	279	398	26	305	424
60246	1930	59.1N	51.5E	779916	779942	3580	247	398	28	275	426
60247	1940	59.4N	53.4E	779916	779940	3820	264	398	24	288	422
60248	1950	59.4N	55.3E	779917	779932	4410	304	398	15	319	413
60249	2000	59.5N	57.2E	779917	779924	4420	307	398	7	312	405
60250	2010	59.6N	59.1E	779917	779916	4600	317	398	-1	316	397
60251	2020	59.7N	61.0E	779917	779916	5300	366	397	-31	335	366
60252	2030	59.8N	62.9E	779918	779876	5890	406	397	-42	364	355
60253	2040	59.9N	64.8E	779918	779871	5860	404	397	-47	357	350
60254	2050	60.0N	66.7E	779918	779875	5800	400	397	-45	357	354
60255	2100	60.1N	68.6E	779920	779877	5710	394	397	-43	351	354
60256	2110	60.2N	70.5E	779920	779888	5480	378	397	-32	346	365
60257	2120	60.3N	72.4E	779921	779900	5130	354	397	-21	333	376
60258	2130	60.4N	74.3E	779921	779906	5800	400	397	-15	385	382
60259	2140	60.5N	76.2E	779923	779915	4900	338	397	-8	330	389
60260	2150	60.6N	78.1E	779923	779910	5210	353	397	-9	350	388
60261	2160	60.7N	80.0E	779924	779915	5210	353	397	-9	350	388
60262	2170	60.8N	81.9E	779924	779915	5210	353	397	-9	350	388
60263	2180	60.9N	83.8E	779924	779915	5210	353	397	-9	350	388
60264	2190	61.0N	85.7E	779924	779915	5210	353	397	-9	350	388
60265	2200	61.1N	87.6E	779924	779915	5210	353	397	-9	350	388
60266	2210	61.2N	89.5E	779924	779915	5210	353	397	-9	350	388
60267	2220	61.3N	91.4E	779924	779915	5210	353	397	-9	350	388
60268	2230	61.4N	93.3E	779924	779915	5210	353	397	-9	350	388
60269	2240	61.5N	95.2E	779924	779915	5210	353	397	-9	350	388
60270	2250	61.6N	97.1E	779924	779915	5210	353	397	-9	350	388
60271	2260	61.7N	99.0E	779924	779915	5210	353	397	-9	350	388
60272	2270	61.8N	100.9E	779924	779915	5210	353	397	-9	350	388
60273	2280	61.9N	102.8E	779924	779915	5210	353	397	-9	350	388
60274	2290	62.0N	104.7E	779924	779915	5210	353	397	-9	350	388
60275	2300	62.1N	106.6E	779924	779915	5210	353	397	-9	350	388
60276	2310	62.2N	108.5E	779924	779915	5210	353	397	-9	350	388
60277	2320	62.3N	110.4E	779924	779915	5210	353	397	-9	350	388
60278	2330	62.4N	112.3E	779924	779915	5210	353	397	-9	350	388
60279	2340	62.5N	114.2E	779924	779915	5210	353	397	-9	350	388
60280	2350	62.6N	116.1E	779924	779915	5210	353	397	-9	350	388
60281	2360	62.7N	118.0E	779924	779915	5210	353	397	-9	350	388
60282	2370	62.8N	120.0E	779924	779915	5210	353	397	-9	350	388
60283	2380	62.9N	121.9E	779924	779915	5210	353	397	-9	350	388
60284	2390	63.0N	123.8E	779924	779915	5210	353	397	-9	350	388
60285	2400	63.1N	125.7E	779924	779915	5210	353	397	-9	350	388
60286	2410	63.2N	127.6E	779924	779915	5210	353	397	-9	350	388
60287	2420	63.3N	129.5E	779924	779915	5210	353	397	-9	350	388
60288	2430	63.4N	131.4E	779924	779915	5210	353	397	-9	350	388
60289	2440	63.5N	133.3E	779924	779915	5210	353	397	-9	350	388
60290	2450	63.6N	135.2E	779924	779915	5210	353	397	-9	350	388

NO	DATE	LAT	LONG	F	G	DEP	B _a	B _e	dG _r	dG _b	dG _c	dG _d	dG _e	dG _f	dG _g	dG _h	dG _i	dG _j	dG _k	dG _l	dG _m	dG _n	dG _o	dG _p	dG _q	dG _r	dG _s	dG _t	dG _u	dG _v	dG _w	dG _x	dG _y	dG _z			
63696	6808122320	36 00.5N 146 01.6E	79832 79852	5620 388 395	21 409 416	63756	6808140520	36 01.1N 143 22.2E	79832 79847	4980 344 407	15 359 422																										
63697	2330	00.5N 145 58.5E	79832 79850	5660 391 396	21 409 416	63757	0930	19.9E	79832 79827	5430 375 435	8 367 427																										
63698	2350	00.7N 145 58.5E	79832 79850	5660 391 396	21 409 416	63758	0940	17.9E	79832 79827	5900 407 435	25 382 410																										
63699	2350	00.7N 145 58.5E	79832 79850	5660 391 396	21 409 416	63759	1000	13.5E	79832 79793	6370 440 435	35 401 396																										
63700	6808140000	00.8N	79832 79853	5690 393 396	21 414 417	63760																															
63701	0010	00.6N	79832 79848	5690 393 396	16 409 412	63761																															
63702	0020	00.5N	79832 79848	5670 391 396	16 409 412	63762	1020	11.5E	79832 79788	6520 450 435	44 406 391																										
63703	0030	00.4N	79832 79848	5700 395 396	17 410 413	63763	1030	09.5E	79832 79784	6500 449 461	48 401 413																										
63704	0040	00.3N	79831 79848	5680 392 396	17 410 413	63764	1040	07.5E	79832 79778	6550 452 461	48 404 413																										
63705	0050	00.2N	79831 79849	5680 392 396	18 410 414	63765																															
63706	0100	00.1N	79831 79847	5680 392 396	16 408 412	63766	1100	05.5E	79832 79777	5800 400 461	53 347 408																										
63707	0110	00.0N	79831 79847	5680 392 396	16 408 412	63767	1110	03.5E	79832 79777	5600 386 461	62 324 399																										
63708	0120	00.0N	79831 79849	5690 393 396	18 411 414	63768	1120	01.5N 142 58.4E	79832 79774	6050 417 460	73 344 387																										
63709	0130	35 59.9N 25.2E	79831 79850	5700 393 396	19 412 415	63769	1130	00.5N 56.3E	79832 79774	6400 442 460	88 354 372																										
63710	0140	59.8N 25.2E	79831 79847	5680 392 396	16 408 412	63770	1140	00.4N 54.2E	79832 79771	6500 449 460	99 350 361																										
63711	0150	59.8N 19.7E	79831 79848	5670 391 396	17 408 413	63771	1150	00.8N 50.4E	79832 79774	7200 488 460	118 300 342																										
63712	0200	59.7N 16.7E	79831 79849	5660 391 396	18 409 414	63772	1200	01.0N 48.4E	79832 79770	7270 501 463	128 323 335																										
63713	0210	59.9N 14.1E	79831 79851	5630 388 396	20 408 416	63773	1210	01.0N 48.8E	79832 79766	7510 504 463	136 368 327																										
63714	0220	36 00.1N 11.3E	79831 79854	5680 392 396	23 415 419	63774	1220	01.0N 43.0E	79832 79768	7470 515 463	144 371 319																										
63715	0230	00.3N	79831 79854	5680 392 396	23 415 419	63775	1230	01.0N	79832 79768	7470 515 463	144 371 319																										
63716	0240	00.0N	79831 79849	5680 392 396	18 410 414	63776	1240	01.0N 41.2E	79832 79768	7600 524 463	149 375 314																										
63717	0250	00.0N	79831 79851	5680 392 396	22 415 418	63777	1250	01.0N 39.4E	79832 79768	7600 524 421	149 375 314																										
63718	0300	00.0N	79831 79851	5680 392 396	22 415 418	63778	1300	01.0N 36.7E	79832 79768	6700 482 421	150 372 291																										
63719	0310	59.3N 14.4E	79829 79849	5700 393 396	20 413 416	63779	1310	01.0N 33.9E	79832 79768	6280 433 421	146 207 275																										
63720	0320	59.3N	79829 79847	5680 392 396	18 410 414	63780	1320	01.0N	79832 79768	6280 433 421	146 207 275																										
63721	0330	59.2N	79829 79846	5680 392 396	17 409 413	63781	1330	01.0N 32.0E	79832 79768	5820 402 421	145 257 276																										
63722	0340	59.1N	79829 79848	5670 391 396	19 410 415	63782	1340	01.1N 30.0E	79832 79767	5200 359 356	135 224 221																										
63723	0350	59.0N	79829 79846	5670 391 396	17 408 413	63783	1350	01.2N 28.0E	79832 79767	4700 331 356	122 227 227																										
63724	0400	58.9N	79829 79844	5670 391 396	18 409 414	63784	1400	01.3N 26.0E	79832 79771	4630 319 356	117 202 239																										
63725	0410	58.9N	79829 79847	5670 391 396	18 409 414	63785	1410	01.3N 24.5E	79832 79771	4700 324 356	117 202 239																										
63726	0420	58.8N	79829 79846	5670 391 396	17 408 413	63786	1420	01.4N 23.0E	79832 79772	4720 326 356	107 219 249																										
63727	0430	58.8N	79829 79851	5690 393 396	22 415 418	63787	1430	01.4N 21.5E	79832 79772	4500 311 356	107 204 249																										
63728	0440	58.8N	79829 79848	5700 393 396	19 412 415	63788	1440	01.5N 19.6E	79834 79772	4400 304 296	108 196 188																										
63729	0450	58.7N	79829 79846	5730 395 396	17 412 413	63789	1450	01.6N 17.6E	79834 79772	4330 299 296	102 197 154																										
63730	0500	58.7N	79829 79851	5730 395 396	22 417 418	63790	1500	01.7N 15.6E	79834 79773	4130 285 296	97 188 199																										
63731	0510	58.7N	79829 79854	5700 393 396	25 418 421	63791	1510	01.8N 13.8E	79834 79774	4040 279 296	89 190 207																										
63732	0520	58.6N	79829 79853	5720 395 396	24 419 420	63792	1520	01.8N 11.8E	79834 79774	4000 276 296	89 190 207																										
63733	0530	58.6N	79829 79854	5740 396 396	25 421 421	63793	1530	01.9N 10.4E	79834 79774	3550 252 296	86 166 210																										
63734	0540	58.6N	79829 79856	5730 395 396	27 422 423	63794	1540	01.9N 08.8E	79834 79775	3440 237 243	79 158 164																										
63735	0550	58.6N	79829 79856	5700 393 396	27 420 423	63795	1550	02.0N 07.2E	79834 79775	3360 232 243	79 153 164																										
63736	0600	58.6N	79829 79853	5680 392 396	24 416 420	63796	1600	02.0N 05.5E	79834 79775	3210 221 243	75 146 168																										
63737	0610	58.7N	79829 79848	5630 385 396	19 412 415	63797	1610	01.5N 04.0E	79834 79775	3360 232 243	75 157 168																										
63738	0620	58.6N	79829 79846	5670 391 396	17 408 413	63798	1620	01.1N 02.5E	79832 79775	3180 219 243	74 145 169																										
63739	0630	58.6N	79829 79846	5670 391 396	17 408 413	63799	1630	00.6N 00.6E	79832 79775	3180 219 243	74 145 169																										
63740	0640	58.9N	79829 79841	5700 393 396	12 405 408	63800	1640	00.2N 141 57.4E																													

Gravity Table 2. The Mariana trench.

NO	DATE	LAT	LONG	r	G	DEP	B _s	B _e	dCt	dCb	dCg	dCb	dCg
63816	6808141920	35	56.0N	141	26.9E	979825	979779	2000	138	143	-46	92	97
63817	1930	56.0N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63818	1940	56.1N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63819	1950	56.1N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63820	2000	56.2N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63821	2010	56.3N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63822	2020	56.4N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63823	2030	56.5N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63824	2040	56.6N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63825	2050	56.7N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63826	2100	56.8N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63827	2110	56.9N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63828	2120	57.0N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63829	2130	57.1N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63830	2140	57.2N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63831	2150	57.3N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63832	2200	57.4N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63833	2210	57.5N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63834	2220	57.6N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63835	2230	57.7N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63836	2240	57.8N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63837	2250	57.9N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63838	2300	58.0N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63839	2310	58.1N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63840	2320	58.2N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97
63841	2330	58.3N	141	26.9E	979825	979779	1800	124	144	-46	92	97	97

NO	DATE	LAT	LONG	r	G	DEP	B _a	B _e	dG _r	dG _b	dG _t	dG _v
5946	6802120230	11 26.3N	149 10.2E	778251	778263	5804	400	400	12	412	412	323
5947	0240	27.7N	08.8E	778253	778265	5804	400	400	12	412	412	323
5948	0250	27.7N	07.4E	778253	778275	5804	400	400	22	422	422	306
5949	0300	31.8N	04.6E	778253	778275	5804	400	400	15	415	415	313
5950	0310	31.8N	04.6E	778255	778270	5804	400	400	15	415	415	323
5951	0320	33.1N	03.2E	778255	778270	5804	400	400	15	415	415	336
5952	0330	34.5N	01.8E	778257	778272	5804	400	400	15	415	415	338
5953	0340	35.8N	00.4E	778257	778275	5804	400	400	15	415	415	356
5954	0350	35.8N	00.4E	778258	778275	5804	400	400	17	417	417	353
5955	0400	37.2N	148 59.0E	778258	778275	5804	400	400	17	417	417	353
5956	0410	39.8N	56.2E	778260	778282	5804	400	400	22	422	422	353
5957	0420	41.2N	54.8E	778260	778282	5804	400	400	22	422	422	353
5958	0430	42.6N	53.4E	778261	778284	5804	400	400	23	423	423	370
5959	0440	44.0N	52.0E	778262	778287	5799	400	400	25	425	425	373
5960	0450	45.3N	50.6E	778265	778281	5794	400	400	18	418	418	384
5961	0500	46.7N	49.2E	778264	778294	5784	399	399	30	429	429	384
5962	0510	48.1N	47.8E	778264	778288	5774	400	399	24	424	424	380
5963	0520	49.5N	46.4E	778265	778289	5774	398	398	25	425	425	375
5964	0530	50.9N	45.0E	778265	778289	5774	398	398	25	425	425	375
5965	0540	52.2N	43.6E	778267	778288	5754	397	398	21	418	419	372
5966	0550	53.5N	42.1E	778267	778284	5744	398	397	6	404	403	367
5967	0600	54.9N	40.7E	778269	778286	5734	397	397	17	414	414	376
5968	0610	56.2N	39.3E	778270	778297	5729	395	396	27	422	423	376
5969	0620	57.6N	37.9E	778270	778297	5729	395	396	27	422	423	376
5970	0630	59.2N	36.3E	778271	778294	5729	395	395	25	418	418	370
5971	0640	60.7N	34.8E	778272	778295	5709	393	395	23	416	418	377
5972	0650	62.1N	33.4E	778273	778296	5714	394	394	23	417	417	367
5973	0700	63.5N	31.9E	778274	778297	5709	394	394	23	417	417	377
5974	0710	65.1N	30.4E	778275	778298	5699	393	393	23	416	416	376
5975	0720	66.5N	28.9E	778276	778295	5684	392	393	19	411	412	376
5976	0730	68.0N	27.4E	778277	778295	5659	390	392	18	408	410	388
5977	0740	69.5N	25.9E	778277	778292	5634	392	391	15	407	406	381
5978	0750	70.9N	24.4E	778277	778292	5634	392	391	15	407	406	381
5979	0800	72.3N	22.9E	778278	778292	5634	392	391	15	407	406	381
5980	0810	73.7N	21.4E	778280	778294	5664	391	390	14	405	404	366
5981	0820	75.1N	19.9E	778281	778290	5679	392	389	9	401	398	364
5982	0830	76.5N	18.4E	778282	778295	5664	391	388	13	404	401	376
5983	0840	77.9N	16.9E	778283	778295	5664	391	387	13	404	400	376
5984	0850	79.3N	15.4E	778283	778295	5664	391	387	13	404	400	376
5985	0900	80.7N	13.9E	778285	778295	5639	389	384	10	399	394	352
5986	0910	82.1N	12.4E	778286	778296	5509	380	376	10	390	386	357
5987	0920	83.5N	10.9E	778288	778291	5484	378	372	3	381	375	356
5988	0930	84.9N	09.4E	778288	778295	5414	374	366	7	381	375	355
5989	0940	86.3N	07.9E	778288	778295	5379	371	358	5	376	363	349
5990	0950	87.7N	06.4E	778290	778314	5219	360	347	24	384	371	354
5991	1000	89.1N	04.9E	778291	778314	5219	360	347	24	384	371	354
5992	1010	90.5N	03.4E	778292	778314	5219	360	347	24	384	371	354
5993	1020	91.9N	01.9E	778292	778314	5219	360	347	24	384	371	354
5994	1030	93.3N	00.4E	778293	778314	5219	360	347	24	384	371	354
5995	1040	94.7N	00.4E	778293	778314	5219	360	347	24	384	371	354
5996	1050	96.1N	00.4E	778294	778314	5219	360	347	24	384	371	354
5997	1100	97.5N	00.4E	778295	778314	5219	360	347	24	384	371	354
5998	1110	98.9N	00.4E	778295	778314	5219	360	347	24	384	371	354
5999	1120	100.3N	00.4E	778295	778314	5219	360	347	24	384	371	354
6000	1130	101.7N	00.4E	778295	778314	5219	360	347	24	384	371	354
6001	1140	103.1N	00.4E	778295	778314	5219	360	347	24	384	371	354
6002	1150	104.5N	00.4E	778295	778314	5219	360	347	24	384	371	354
6003	1200	105.9N	00.4E	778295	778314	5219	360	347	24	384	371	354
6004	1210	107.3N	00.4E	778295	778314	5219	360	347	24	384	371	354
6005	1220	108.7N	00.4E	778295	778314	5219	360	347	24	384	371	354

NO	DATE	LAT	LDN	r	G	DEP	B _a	B _e	dgr	dcb	dcb'
6066	6802122200	14	34.3N	147 02.1E	970375	978218	6144	424	453	-157	267
6067	2230	36.0N	01.3E	970376	978222	6219	433	441	-156	277	285
6068	2220	37.7N	01.3E	970378	978226	6249	433	441	-156	277	285
6069	2230	37.7N	146 58.7E	970378	978226	6249	433	441	-156	277	285
6070	2230	37.7N	146 58.7E	970378	978226	6249	433	441	-156	277	285
6071	2250	42.9N	58.1E	970381	978272	6259	432	426	-109	323	317
6072	2300	44.6N	57.3E	970383	978287	6279	431	414	-96	317	318
6073	2310	46.3N	56.6E	970384	978289	6279	431	402	-96	303	307
6074	2320	48.1N	55.8E	970385	978306	6289	431	391	-74	290	303
6075	2330	49.8N	55.1E	970387	978313	6304	366	380	-74	292	306
6076	2340	51.5N	54.3E	970388	978331	6309	351	370	-57	294	313
6077	2350	53.3N	53.6E	970389	978341	6314	341	363	-48	293	315
6078	6802130000	55.0N	52.9E	970390	978354	6319	341	356	-36	300	312
6079	0010	56.7N	52.3E	970392	978348	6324	341	358	-44	300	312
6080	0020	58.5N	51.5E	970393	978352	6329	341	353	-41	305	312
6081	0030	60.2N	50.8E	970394	978344	6334	341	351	-50	293	304
6082	0040	62.0N	49.9E	970395	978334	6339	341	348	-32	296	306
6083	0050	63.8N	48.9E	970396	978324	6344	341	344	-32	296	306
6084	0100	65.5N	48.0E	970397	978314	6349	341	341	-28	303	313
6085	0110	67.3N	47.1E	970398	978304	6354	341	338	-28	303	313
6086	0120	69.0N	46.2E	970399	978294	6359	341	335	-28	303	313
6087	0130	70.8N	45.3E	970400	978284	6364	341	332	-28	303	313
6088	0140	72.6N	44.4E	970401	978274	6369	341	329	-28	303	313
6089	0150	74.4N	43.5E	970402	978264	6374	341	326	-28	303	313
6090	0200	76.2N	42.6E	970403	978254	6379	341	323	-28	303	313
6091	0210	78.0N	41.7E	970404	978244	6384	341	320	-28	303	313
6092	0220	79.8N	40.8E	970405	978234	6389	341	317	-28	303	313
6093	0230	81.6N	39.9E	970406	978224	6394	341	314	-28	303	313
6094	0240	83.4N	39.0E	970407	978214	6399	341	311	-28	303	313
6095	0250	85.2N	38.1E	970408	978204	6404	341	308	-28	303	313
6096	0300	87.0N	37.2E	970409	978194	6409	341	305	-28	303	313
6097	0310	88.8N	36.3E	970410	978184	6414	341	302	-28	303	313
6098	0320	90.6N	35.4E	970411	978174	6419	341	299	-28	303	313
6099	0330	92.4N	34.5E	970412	978164	6424	341	296	-28	303	313
6100	0340	94.2N	33.6E	970413	978154	6429	341	293	-28	303	313
6101	0350	96.0N	32.7E	970414	978144	6434	341	290	-28	303	313
6102	0400	97.8N	31.8E	970415	978134	6439	341	287	-28	303	313
6103	0410	99.6N	30.9E	970416	978124	6444	341	284	-28	303	313
6104	0420	101.4N	30.0E	970417	978114	6449	341	281	-28	303	313
6105	0430	103.2N	29.1E	970418	978104	6454	341	278	-28	303	313
6106	0440	105.0N	28.2E	970419	978094	6459	341	275	-28	303	313
6107	0450	106.8N	27.3E	970420	978084	6464	341	272	-28	303	313
6108	0500	108.6N	26.4E	970421	978074	6469	341	269	-28	303	313
6109	0510	110.4N	25.5E	970422	978064	6474	341	266	-28	303	313
6110	0520	112.2N	24.6E	970423	978054	6479	341	263	-28	303	313
6111	0530	114.0N	23.7E	970424	978044	6484	341	260	-28	303	313
6112	0540	115.8N	22.8E	970425	978034	6489	341	257	-28	303	313
6113	0550	117.6N	21.9E	970426	978024	6494	341	254	-28	303	313
6114	0600	119.4N	21.0E	970427	978014	6499	341	251	-28	303	313
6115	0610	121.2N	20.1E	970428	978004	6504	341	248	-28	303	313
6116	0620	123.0N	19.2E	970429	977994	6509	341	245	-28	303	313
6117	0630	124.8N	18.3E	970430	977984	6514	341	242	-28	303	313
6118	0640	126.6N	17.4E	970431	977974	6519	341	239	-28	303	313
6119	0650	128.4N	16.5E	970432	977964	6524	341	236	-28	303	313
6120	0700	130.2N	15.6E	970433	977954	6529	341	233	-28	303	313
6121	0710	132.0N	14.7E	970434	977944	6534	341	230	-28	303	313
6122	0720	133.8N	13.8E	970435	977934	6539	341	227	-28	303	313
6123	0730	135.6N	12.9E	970436	977924	6544	341	224	-28	303	313
6124	0740	137.4N	12.0E	970437	977914	6549	341	221	-28	303	313
6125	0750	139.2N	11.1E	970438	977904	6554	341	218	-28	303	313

Gravity Table 3. The Solomon trench.

NO	DATE	LAT	LONG	F	G	DEP	Ba	Be	4Gf	4Gb	4Gd
6187	6802131810	17 50.1N	144 56.1E	978532	978561	4004	276	269	29	305	298
6188	1820	54.2N	144 54.5E	978533	978557	4089	262	278	24	306	302
6194	1930	51.5N	50.4E	978534	978561	3964	274	274	27	301	301
6195	1940	52.5N	48.9E	978535	978570	3744	258	268	35	293	303
6196	1950	53.6N	47.9E	978536	978579	3649	252	265	43	295	308
6197	2000	54.6N	45.9E	978537	978589	3794	262	266	32	294	298
6198	2010	55.6N	44.4E	978538	978598	3854	266	268	31	297	299
6199	2020	56.7N	42.8E	978539	978608	3834	265	269	30	295	298
6200	2030	57.7N	41.3E	978540	978618	3939	272	271	27	299	298
6206	2130	18 03.7N	32.6E	978544	978586	3609	249	255	42	291	297
6207	2140	05.6N	28.5E	978545	978587	3574	247	253	41	292	297
6208	2150	06.5N	28.5E	978546	978588	3574	247	253	41	292	297
6209	2200	06.5N	28.5E	978547	978589	3574	247	253	41	292	297
6210	2210	07.4N	27.1E	978547	978589	3574	247	253	41	292	297
6211	2220	08.3N	25.8E	978548	978588	4124	285	279	40	325	319
6212	2230	09.2N	24.4E	978549	978587	4219	291	283	29	320	312
6213	2240	10.1N	23.0E	978550	978597	4389	303	292	47	350	329
6214	2250	11.0N	21.7E	978551	978596	4159	287	272	45	332	317
6217	2320	13.7N	17.6E	978553	978597	3839	265	268	44	309	312
6218	2330	14.6N	16.2E	978554	978591	4249	293	282	37	330	319
6219	2340	15.5N	14.8E	978555	978593	4394	303	289	38	341	327
6220	2350	16.4N	13.5E	978555	978591	4404	304	291	36	340	327
6221	6802140000	17.3N	12.1E	978556	978599	4389	304	286	33	336	319
6222	0010	18.2N	10.7E	978557	978608	4389	304	286	43	347	326
6223	0020	19.1N	9.6E	978558	978618	4389	304	286	43	347	326
6224	0030	20.0N	08.0E	978559	978611	4389	303	286	52	353	333
6225	0040	20.9N	06.6E	978560	978593	4389	303	286	52	353	333
6226	0050	21.8N	05.3E	978560	978597	4374	302	287	37	339	324
6227	0100	22.7N	03.9E	978561	978608	4164	287	283	47	354	330
6228	0110	23.6N	02.5E	978562	978609	4144	286	273	47	353	320
6229	0120	24.5N	01.2E	978563	978623	4144	286	273	47	353	320
6230	0130	25.4N	57.8E	978563	978601	3549	245	266	58	363	304
6231	0140	26.3N	58.4E	978564	978606	4229	292	278	42	334	320
6232	0150	27.2N	57.1E	978565	978607	4322	298	285	42	340	327
6233	0200	28.1N	55.7E	978566	978597	4304	297	287	31	328	318
6234	0210	29.0N	54.3E	978567	978619	4299	297	285	52	349	337
6235	0220	30.0N	53.0E	978568	978628	4074	281	279	60	341	339
6236	0230	30.9N	51.6E	978569	978631	3934	271	272	62	333	334
6237	0240	31.8N	50.3E	978570	978637	3709	266	265	71	327	337
6238	0250	32.7N	49.0E	978571	978642	3579	266	265	57	303	322
6239	0300	33.6N	47.5E	978571	978623	4004	276	270	52	328	322
6240	0310	34.6N	46.1E	978572	978601	4249	293	273	29	322	302
6241	0320	35.6N	44.8E	978573	978624	3824	264	271	51	315	322
6242	0330	36.5N	43.4E	978574	978616	3939	272	270	39	311	309
6243	0340	37.4N	42.0E	978574	978626	3934	271	271	32	323	323
6244	0350	38.4N	40.6E	978575	978613	4144	286	273	32	323	323
6245	0400	39.3N	39.3E	978576	978608	3724	257	271	32	289	303
6246	0410	40.2N	37.9E	978577	978615	4209	290	275	38	328	313
6247	0420	41.2N	36.6E	978578	978616	4299	297	279	38	335	317
6248	0430	42.1N	35.2E	978579	978619	4344	300	279	40	340	319
6249	0440	43.0N	33.8E	978579	978613	4344	299	280	34	333	314
6250	0450	44.0N	32.5E	978580	978621	4374	302	279	41	343	320
6251	0500	44.9N	31.1E	978581	978608	3674	254	270	27	291	297
6252	0510	45.8N	29.7E	978582	978621	4159	287	280	38	325	318
6253	0520	46.5N	28.0E	978583	978613	4159	287	280	38	325	318
6254	0530	47.4N	26.0E	978584	978613	3994	276	275	29	305	304

N0	DATE	Lat	Lon	r	c	DEP	Bs	Be	dGr	dCb	acG		
5051	6802021320	10	12.6S	157	15.1E	978211	978167	3479	240	245	-44	196	201
5052	1330	10.6S	15.7E	978209	978147	3479	288	268	-43	225	205	205	205
5053	1340	06.7S	15.7E	978209	978143	4559	317	282	-66	251	216	223	223
5054	1350	08.6S	16.0E	978208	978146	4484	309	285	-62	247	225	216	216
5055	1400	04.7S	16.3E	978207	978156	4384	302	280	-51	251	229	229	229
5056	1420	00.8S	16.4E	978205	978206	3348	331	285	1	232	256	256	256
5057	1430	02.8S	17.0E	978203	978205	3509	242	248	21	252	274	284	285
5058	1440	52.8S	17.1E	978203	978235	3509	242	248	37	274	284	285	285
5059	1450	54.9S	17.6E	978202	978239	3579	247	248	37	284	285	285	285
5060													
5061	1500	52.9S	17.9E	978201	978238	3264	225	249	37	262	286	286	286
5062	1510	50.9S	18.0E	978200	978232	3889	268	256	32	300	288	288	288
5063	1520	48.9S	18.1E	978199	978224	3879	258	258	25	293	283	283	283
5064	1530	46.9S	18.2E	978198	978224	3674	255	255	36	290	291	291	291
5065	1540	44.9S	18.3E	978197	978237	3474	240	232	40	292	292	292	292
5066	1550	42.9S	18.4E	978196	978240	3634	251	251	44	295	295	295	295
5067	1600	40.9S	18.5E	978195	978238	3474	240	231	43	283	294	294	294
5068	1610	38.9S	18.6E	978194	978230	3434	237	256	36	273	292	292	292
5069	1620	36.9S	18.7E	978193	978222	4009	277	266	29	306	295	295	295
5070	1630	34.9S	18.7E	978192	978217	4259	294	271	25	319	296	296	296
5071	1640	32.9S	18.8E	978191	978209	3939	272	262	28	301	297	297	297
5072	1650	30.9S	18.8E	978190	978219	3779	261	268	28	290	291	291	291
5073	1700	28.9S	18.9E	978189	978224	3654	252	255	35	287	290	290	290
5074	1710	26.9S	19.0E	978188	978227	3349	231	250	39	270	289	289	289
5075	1720	24.9S	19.0E	978187	978225	3359	246	250	38	284	288	288	288
5076	1730	22.9S	19.1E	978186	978218	3604	249	252	32	281	284	284	284
5077	1740	20.9S	19.2E	978185	978220	3609	249	252	35	284	284	284	284
5078	1750	18.8S	19.2E	978184	978219	3519	238	256	35	286	286	286	286
5079	1800	16.8S	19.3E	978183	978218	3319	231	251	41	277	277	277	277
5080	1810	15.9S	17.7E	978183	978198	3269	227	247	45	292	275	275	275
5081	1820	15.0S	16.0E	978182	978191	3489	241	258	9	250	267	267	267
5082	1830	14.1S	14.4E	978182	978182	4154	287	270	0	287	270	270	270
5089	1940	09.4S	09.0E	978179	978180	4199	290	275	1	291	276	276	276
5090	1950	08.6S	07.5E	978179	978186	3909	270	286	7	277	273	273	273
5091	2000	07.8S	06.0E	978179	978190	3364	232	255	21	253	276	276	276
5092	2010	07.0S	04.6E	978178	978199	3584	243	249	21	264	270	270	270
5093	2020	06.1S	03.2E	978178	978206	3354	231	246	28	259	274	274	274
5094	2030	05.3S	01.8E	978177	978200	3264	225	246	23	248	269	269	269
5095	204E	04.5S	00.4E	978177	978192	3624	250	251	15	265	266	266	266
5096	2050	03.7S	59.0E	978177	978187	3724	258	255	10	268	265	265	265
5097	2060	02.9S	56.1E	978176	978177	3796	262	255	1	263	256	256	256
5098	2110	01.9S	56.1E	978176	978177	3796	262	255	1	263	256	256	256
5099	2120	01.0S	54.0E	978175	978179	3827	267	255	2	266	257	257	257
5100	2130	00.0S	53.0E	978175	978190	3579	249	255	4	262	270	270	270
5101	2140	59.0S	51.4E	978175	978190	3514	242	256	15	257	271	271	271
5102	2150	58.0S	49.9E	978174	978189	3604	249	261	15	264	276	276	276
5103	2200	57.0S	48.3E	978174	978177	3629	250	262	7	253	275	275	275
5104	2210	56.0S	46.2E	978173	978166	4524	312	295	3	316	284	284	284
5105	2220	55.0S	45.2E	978173	978166	4524	312	295	-11	301	284	284	284
5106	2230	54.0S	43.6E	978172	978159	4519	312	297	-13	299	284	284	284
5107	2240	53.0S	42.0E	978172	978167	4374	302	295	-5	297	290	290	290
5108	2250	52.0S	40.4E	978171	978164	4364	301	290	-7	294	283	283	283
5109	2300	51.0S	38.8E	978171	978170	4144	286	283	1	285	282	282	282
5110	2310	50.0S	37.4E	978170	978173	3904	269	275	3	272	278	278	278
5111	2320	49.0S	35.7E	978170	978171	3899	269	269	1	270	270	270	270
5112	2330	48.0S	34.1E	978170	978178	3899	269	263	8	277	271	271	271
5113	2340	47.0S	32.5E	978169	978177	3724	257	253	8	265	261	261	261
5114	2350	46.0S	31.0E	978169	978189	3499	241	237	20	261	257	257	257
5115	6802030000	45.0S	29.4E	978168	978198	2799	193	214	30	223	244	244	244

NO	DATE	LAT	LONG	F	G	DEP	B _a	B _c	4Gf	4Gh	4Gv
5186	6802031150	07 32.05 155	18.5E	978137 978051	3384	235	261	-87	146	174	240
5187		1200	17.0E	978137 978053	3109	215	250	-84	131	166	240
5188		1210	15.5E	978137 978035	3109	215	249	-102	113	147	253
5189		1220	28.35	978136 978028	3054	211	262	-108	103	135	243
5190		1230	27.05	978136 978023	4189	289	287	-113	176	174	246
5191		1240	25.65	11.1E 978135 978009	4747	328	309	-126	202	183	241
5192		1250	23.05	08.2E 978134 978003	4859	346	321	-131	205	190	242
5193		1300	21.05	08.2E 978134 977998	4954	342	326	-136	206	190	242
5194		1310	21.75	06.8E 978133 978001	4854	335	325	-133	202	192	242
5195		1320	19.15	04.1E 978133 978014	4364	301	317	-119	182	198	242
5196		1330	17.85	02.7E 978132 978016	4234	292	318	-116	176	202	242
5197		1340	14.05 154	58.5E 978131 977996	4824	333	338	-135	198	203	242
5200		1420	12.75	57.1E 978130 977995	4874	336	343	-135	201	208	242
5201		1430	11.45	55.6E 978129 977986	4929	349	349	-144	196	205	242
5202		1440	10.15	54.0E 978129 977983	5099	352	356	-126	226	230	242
5203		1450	09.25	53.0E 978128 977988	5319	367	362	-141	226	221	242
5204		1500	07.75	51.2E 978128 977982	5184	358	368	-146	212	222	242
5205		1510	06.65	49.9E 978128 977977	5359	370	374	-151	219	223	242
5206		1520	05.35	47.9E 978127 977970	5579	391	397	-148	221	228	242
5207		1530	04.15	45.9E 978127 977974	5669	391	397	-153	221	234	242
5208		1540	03.45	44.9E 978126 977963	5579	385	392	-164	221	236	242
5209		1550	02.35	44.9E 978126 977964	5809	401	398	-162	239	236	242
5210		1600	00.75	43.4E 978126 977952	6049	417	403	-174	243	229	242
5211		1610	59.55	42.1E 978125 977951	5864	405	407	-174	231	233	242
5212		1620	58.45	40.8E 978125 977943	5864	405	410	-182	225	228	242
5213		1630	57.25	38.2E 978124 977938	5864	405	414	-182	225	228	242
5214		1640	56.05	36.2E 978124 977930	6104	421	420	-198	225	222	242
5215		1650	54.95	34.9E 978124 977918	6344	438	426	-211	227	215	242
5216		1700	53.75	35.6E 978123 977920	6234	430	430	-203	230	225	242
5217		1710	52.55	34.2E 978123 977914	6359	439	434	-209	230	225	242
5218		1720	51.25	32.8E 978122 977908	6444	445	438	-214	231	224	242
5219		1730	50.05	31.4E 978122 977908	6509	449	442	-214	235	228	242
5220		1740	48.85	30.0E 978122 977903	6539	451	444	-219	232	225	242
5221		1750	47.65	28.0E 978121 977903	6449	445	447	-218	227	229	242
5222		1800	46.35	27.2E 978120 977896	6389	441	450	-224	217	226	242
5223		1810	45.05	25.8E 978120 977903	6639	458	456	-217	241	239	242
5224		1820	43.75	24.5E 978120 977888	7004	483	461	-232	251	229	242
5225		1830	42.45	23.1E 978119 977887	7029	485	465	-232	253	233	242
5226		1840	38.35	18.4E 978118 977887	6604	456	461	-231	225	230	242
5227		1850	37.05	16.9E 978117 977885	6604	456	461	-231	225	230	242
5228		1900	35.75	15.3E 978117 977884	7004	483	463	-233	250	230	242
5229		1910	34.45	13.9E 978116 977873	6529	451	463	-243	208	220	242
5230		1920	33.15	12.4E 978116 977879	6584	454	463	-237	217	226	242
5231		1930	31.85	11.0E 978116 977869	6804	469	465	-247	222	218	242
5232		1940	30.55	09.6E 978115 977863	6894	476	468	-252	224	216	242
5233		1950	29.35	08.2E 978115 977861	6699	462	470	-254	208	216	242
5234		2000	28.05	06.9E 978114 977860	6794	464	472	-264	210	218	242
5235		2010	26.75	05.6E 978114 977859	6999	484	476	-265	210	218	242
5236		2020	25.45	04.0E 978114 977851	7129	492	480	-263	229	221	242
5237		2030	24.25	02.6E 978113 977851	7114	491	483	-262	229	221	242
5238		2040	22.95	01.2E 978113 977847	6964	481	486	-266	215	220	242
5239		2050	21.75 153	978112 977848	6909	477	491	-264	213	227	242
5240		2100	20.45	19.3E 978112 977848	7329	506	498	-264	242	234	242
5241		2110	19.15	18.0E 978111 977839	7649	528	506	-272	236	234	242
5242		2120	17.85	16.6E 978111 977837	7894	545	515	-274	276	241	242
5243		2130	16.65	15.3E 978111 977837	7984	550	515	-274	276	241	242
5244		2140	15.35	14.0E 978110 977837	7984	550	515	-274	276	241	242
5245		2150	14.05	12.7E 978110 977837	7984	550	515	-274	276	241	242
5246		2160	12.75	11.4E 978110 977837	7984	550	515	-274	276	241	242
5247		2170	11.45	10.1E 978110 977837	7984	550	515	-274	276	241	242
5248		2180	10.15	8.8E 978110 977837	7984	550	515	-274	276	241	242
5249		2190	8.85	7.5E 978110 977837	7984	550	515	-274	276	241	242
5250		2200	7.55	6.2E 978110 977837	7984	550	515	-274	276	241	242
5251		2210	6.25	4.9E 978110 977837	7984	550	515	-274	276	241	242
5252		2220	4.95	3.6E 978110 977837	7984	550	515	-274	276	241	242
5253		2230	3.65	2.3E 978110 977837	7984	550	515	-274	276	241	242
5254		2240	2.35	1.0E 978110 977837	7984	550	515	-274	276	241	242
5255		2250	1.05	0.0E 978110 977837	7984	550	515	-274	276	241	242

NO	DATE	LAT	LONG	↑	↓	DEP	B. S.	46°	46°	46°	46°
5311	6802040900	04 49.45	150 38.4E	978086	977938	3339	230	219	-148	82	71
5312	0850	47.55	38.0E	978085	977940	3349	230	219	-148	82	71
5313	0900	45.45	37.7E	978084	977944	3289	207	218	-140	87	78
5314	0910	43.65	37.3E	978084	977952	2989	206	210	-132	74	78
5315	0920	41.75	36.9E	978084	977967	2909	201	202	-117	84	85
5316	0930	39.95	36.3E	978083	977964	2864	198	191	-107	72	82
5317	0940	38.15	35.7E	978083	977968	2864	198	191	-107	72	82
5318	0950	36.45	35.2E	978083	977972	2864	198	191	-107	72	82
5319	1000	34.75	34.6E	978082	977976	2864	198	191	-107	72	82
5320	1010	33.05	34.1E	978082	977980	2864	198	191	-107	72	82
5321	1020	31.35	33.6E	978081	977984	2864	198	191	-107	72	82
5322	1030	29.65	33.1E	978081	977988	2864	198	191	-107	72	82
5323	1040	27.95	32.6E	978080	977992	2864	198	191	-107	72	82
5324	1050	26.25	32.1E	978080	977996	2864	198	191	-107	72	82
5325	1100	24.55	31.6E	978079	978000	2864	198	191	-107	72	82
5326	1110	22.85	31.1E	978078	978004	2864	198	191	-107	72	82
5327	1120	21.15	30.6E	978077	978008	2864	198	191	-107	72	82
5328	1130	19.45	30.1E	978076	978012	2864	198	191	-107	72	82
5329	1140	17.75	29.6E	978075	978016	2864	198	191	-107	72	82
5330	1150	16.05	29.1E	978074	978020	2864	198	191	-107	72	82
5331	1200	14.35	28.6E	978073	978024	2864	198	191	-107	72	82
5332	1210	12.65	28.1E	978072	978028	2864	198	191	-107	72	82
5333	1220	10.95	27.6E	978071	978032	2864	198	191	-107	72	82
5334	1230	9.25	27.1E	978070	978036	2864	198	191	-107	72	82
5335	1240	7.55	26.6E	978069	978040	2864	198	191	-107	72	82
5336	1250	5.85	26.1E	978068	978044	2864	198	191	-107	72	82
5337	1300	4.15	25.6E	978067	978048	2864	198	191	-107	72	82
5338	1310	2.45	25.1E	978066	978052	2864	198	191	-107	72	82
5339	1320	0.75	24.6E	978065	978056	2864	198	191	-107	72	82
5340	1330	0.05	24.1E	978064	978060	2864	198	191	-107	72	82
5341	1340	16.65	16.3E	978073	978117	1479	102	107	44	146	151
5342	1350	14.95	15.8E	978072	978121	1479	102	107	44	146	151
5343	1400	13.25	15.3E	978071	978125	1479	102	107	44	146	151
5344	1410	11.55	14.8E	978070	978129	1479	102	107	44	146	151
5345	1420	9.85	14.3E	978069	978133	1479	102	107	44	146	151
5346	1430	8.15	13.8E	978068	978137	1479	102	107	44	146	151
5347	1440	6.45	13.3E	978067	978141	1479	102	107	44	146	151
5348	1450	4.75	12.8E	978066	978145	1479	102	107	44	146	151
5349	1500	3.05	12.3E	978065	978149	1479	102	107	44	146	151
5350	1510	1.35	11.8E	978064	978153	1479	102	107	44	146	151
5351	1520	0.05	11.3E	978063	978157	1479	102	107	44	146	151
5352	1530	16.65	16.3E	978073	978117	1479	102	107	44	146	151
5353	1540	14.95	15.8E	978072	978121	1479	102	107	44	146	151
5354	1550	13.25	15.3E	978071	978125	1479	102	107	44	146	151
5355	1560	11.55	14.8E	978070	978129	1479	102	107	44	146	151
5356	1570	9.85	14.3E	978069	978133	1479	102	107	44	146	151
5357	1580	8.15	13.8E	978068	978137	1479	102	107	44	146	151
5358	1590	6.45	13.3E	978067	978141	1479	102	107	44	146	151
5359	1600	4.75	12.8E	978066	978145	1479	102	107	44	146	151
5360	2010	3.05	12.3E	978065	978149	1479	102	107	44	146	151
5361	2020	1.35	11.8E	978064	978153	1479	102	107	44	146	151
5362	2030	0.05	11.3E	978063	978157	1479	102	107	44	146	151
5363	2040	16.65	16.3E	978073	978117	1479	102	107	44	146	151
5364	2050	14.95	15.8E	978072	978121	1479	102	107	44	146	151
5365	2060	13.25	15.3E	978071	978125	1479	102	107	44	146	151
5366	2070	11.55	14.8E	978070	978129	1479	102	107	44	146	151
5367	2080	9.85	14.3E	978069	978133	1479	102	107	44	146	151
5368	2090	8.15	13.8E	978068	978137	1479	102	107	44	146	151
5369	2100	6.45	13.3E	978067	978141	1479	102	107	44	146	151
5370	2110	4.75	12.8E	978066	978145	1479	102	107	44	146	151
5371	2120	3.05	12.3E	978065	978149	1479	102	107	44	146	151
5372	2130	1.35	11.8E	978064	978153	1479	102	107	44	146	151
5373	2140	0.05	11.3E	978063	978157	1479	102	107	44	146	151
5374	2150	16.65	16.3E	978073	978117	1479	102	107	44	146	151
5375	2160	14.95	15.8E	978072	978121	1479	102	107	44	146	151
5376	2170	13.25	15.3E	978071	978125	1479	102	107	44	146	151
5377	2180	11.55	14.8E	978070	978129	1479	102	107	44	146	151
5378	2190	9.85	14.3E	978069	978133	1479	102	107	44	146	151
5379	2200	8.15	13.8E	978068	978137	1479	102	107	44	146	151
5380	2210	6.45	13.3E	978067	978141	1479	102	107	44	146	151
5381	2220	4.75	12.8E	978066	978145	1479	102	107	44	146	151
5382	2230	3.05	12.3E	978065	978149	1479	102	107	44	146	151
5383	2240	1.35	11.8E	978064	978153	1479	102	107	44	146	151
5384	2250	0.05	11.3E	978063	978157	1479	102	107	44	146	151
5385	2260	16.65	16.3E	978073	978117	1479	102	107	44	146	151
5386	2270	14.95	15.8E	978072	978121	1479	102	107	44	146	151
5387	2280	13.25	15.3E	978071	978125	1479	102	107	44	146	151
5388	2290	11.55	14.8E	978070	978129	1479	102	107	44	146	151
5389	2300	9.85	14.3E	978069	978133	1479	102	107	44	146	151
5390	2310	8.15	13.8E	978068	978137	1479	102	107	44	146	151
5391	2320	6.45	13.3E	978067	978141	1479	102	107	44	146	151
5392	2330	4.75	12.8E	978066	978145	1479	102	107	44	146	151
5393	2340	3.05	12.3E	978065	978149	1479	102	107	44	146	151
5394	2350	1.35	11.8E	978064	978153	1479	102	107	44	146	151
5395	2360	0.05	11.3E	978063	978157	1479	102	107	44	146	151
5396	2370	16.65	16.3E	978073	978117	1479	102	107	44	146	151
5397	2380	14.95	15.8E	978072	978121	1479	102	107	44	146	151
5398	2390	13.25	15.3E	978071	978125	1479	102	107	44	146	151
5399	2400	11.55	14.8E	978070	978129	1479	102	107	44	146	151

Gravity Table 4. The Brisbane Hill.

NO	DATE	LAT	LONG	F	G	NEP	Ba	Be	dCr	dCb	dCt	dcB	dcC
4344	680123	1130	27	26.15	155	10.5E	799143	799217	3559	246	242	74	320
4345		27.95	10.5E	799145	799226	2844	203	228	81	284	309		
4346	1150	29.85	10.5E	799148	799269	1689	117	202	121	238	323		
4347	1200	31.65	10.5E	799150	799215	1104	76	148	165	241	313		
4348	1210	33.35	10.5E	799152	799218	869	60	106	196	256	302		
4349	1220	35.15	10.5E	799154	799219	429	30	70	241	271	311		
4350	1230	36.85	10.5E	799157	799219	424	29	56	247	276	303		
4351	1240	38.55	10.5E	799159	799219	424	29	53	247	276	300		
4352	1250	40.35	10.5E	799160	799219	429	30	56	244	274	300		
4353	1300	42.05	10.5E	799163	799380	424	29	95	217	246	312		
4354	1310	43.95	10.5E	799165	799336	894	62	168	171	233	339		
4355	1320	45.85	10.5E	799168	799287	1339	92	216	119	211	335		
4360	2010	36.75	08.4E	799157	799326	871	60	96	169	229	265		
4361	2020	35.75	06.7E	799155	799320	909	63	103	165	238	268		
4362	2030	34.85	05.1E	799154	799287	1194	82	124	133	215	257		
4363	2040	33.95	03.5E	799152	799251	1749	121	166	98	219	264		
4364	2050	32.95	01.8E	799152	799224	2714	187	209	72	259	281		
4365	2100	32.05	00.2E	799150	799198	3244	224	237	48	272	285		
4366	2110	31.15	58.5E	799149	799165	3909	270	257	16	286	273		
4367	2120	30.35	56.2E	799146	799154	4174	302	246	-22	280	217		
4368	2130	29.45	53.2E	799147	799125	4374	302	289	-22	280	267		
4369	2140	28.55	53.5E	799147	799118	4559	315	300	-29	286	271		
4370	2150	27.75	51.9E	799145	799098	4634	320	306	-47	273	259		
4371	2200	26.85	50.2E	799144	799093	4749	328	313	-51	277	262		
4372	2210	26.05	48.5E	799143	799076	4784	330	316	-67	263	249		
4373	2220	25.15	46.9E	799142	799081	4789	330	318	-61	269	257		
4374	2230	24.45	43.5E	799141	799072	4794	331	320	-72	262	251		
4375	2240	23.35	43.5E	799141	799069	4794	331	322	-72	262	251		
4376	2250	22.65	41.8E	799139	799065	4794	331	324	-74	257	250		
4377	2300	21.85	40.1E	799138	799066	4794	331	324	-72	259	252		
4284	680123	1130	29	06.45	155	30.1E	799268	799231	4824	333	317	-37	296
4285		0140	04.65	30.0E	799267	799226	4824	333	316	-41	292	275	
4286	0150	02.95	30.0E	799264	799224	4824	333	315	-40	293	275		
4287	0200	01.15	29.9E	799262	799227	4824	333	314	-39	293	275		
4288	0210	28.55	29.9E	799261	799226	4809	332	313	-35	297	278		
4289	0220	57.75	29.8E	799258	799228	4809	332	313	-30	302	283		
4290	0230	56.05	29.8E	799255	799232	4784	330	312	-23	307	289		
4291	0240	54.35	29.8E	799253	799234	4664	322	313	-19	303	294		
4292	0250	52.75	29.7E	799252	799233	4539	313	314	-19	294	295		
4293	0300	51.05	29.7E	799249	799238	4444	307	313	-11	296	302		
4294	0310	49.15	29.6E	799247	799247	4204	290	308	0	290	308		
4295	0320	47.35	29.6E	799245	799261	3899	269	297	16	285	313		
4296	0330	45.85	29.5E	799243	799288	3294	227	276	45	272	321		
4297	0340	44.05	29.5E	799240	799320	2414	167	236	80	217	316		
4298	0350	42.35	29.5E	799238	799384	1084	75	156	146	221	302		
4299	0400	40.55	29.4E	799236	799418	414	29	89	182	211	271		
4300	0410	38.85	29.3E	799234	799421	411	28	98	187	215	285		
4301	0420	37.05	29.3E	799231	799412	674	47	97	181	228	278		
4302	0430	35.35	29.2E	799229	799405	584	40	135	176	216	311		
4303	0440	33.85	29.1E	799228	799386	1844	60	141	131	227	292		
4304	0450	31.85	29.0E	799225	799356	1388	96	161	131	227	292		
4305	0500	30.05	29.0E	799223	799344	1939	134	165	121	255	286		
4306	0510	28.25	29.0E	799220	799325	2284	158	166	105	263	271		
4307	0520	26.45	28.9E	799218	799321	2294	158	166	103	261	269		
4308	0530	24.65	28.9E	799216	799323	2424	167	166	107	274	273		
4309	0540	22.85	28.9E	799214	799322	2344	162	167	108	270	275		

Gravity Table 5. The Suiko seamount.

NO	DATE	LAT	LONG	F	G	DEP	B _s	B _e	4Cf	4Cb	4Cg	4Cs
6807280700	42 49.9N 178 00.4E	980434	980441	5780	399							
0710	50.6N 177 58.1E	980435	980432	5700	393							
0720	50.6N 177 58.1E	980435	980436	5610	387							
0730	50.9N 178 00.4E	980436	980437	5610	387							
0740	51.9E 980436	980439	980439	5610	387							
0750	51.9N 178 00.4E	980437	980440	5630	388							
0800	52.4N 178 00.4E	980437	980440	5700	393							
0810	52.4N 178 00.4E	980437	980440	5720	395							
0820	52.4N 178 00.4E	980437	980440	5720	395							
0830	53.9N 178 00.4E	980440	980434	5780	399							
0840	53.9N 178 00.4E	980441	980427	5440	375							
0850	54.2N 178 00.4E	980441	980432	5260	363							
0900	54.6N 178 00.4E	980442	980432	5320	367							
0910	55.0N 178 00.4E	980442	980444	5600	384							
0920	55.0N 178 00.4E	980442	980444	5600	384							
0930	55.3N 178 00.4E	980444	980454	5560	384							
0940	55.3N 178 00.4E	980444	980454	5560	384							
0950	55.8N 178 00.4E	980444	980454	5530	382							
1000	57.2N 178 00.4E	980445	980446	5590	386							
1010	57.7N 178 00.4E	980446	980446	5680	392							
1020	58.2N 178 00.4E	980447	980457	5730	395							
1030	58.7N 178 00.4E	980448	980458	5710	393							
1040	59.1N 178 00.4E	980449	980459	5640	388							
1050	59.4N 178 00.4E	980449	980459	5560	384							
1100	59.8N 178 00.4E	980449	980462	5580	385							
1110	60.0N 178 00.4E	980450	980462	5480	378							
1120	60.2N 178 00.4E	980450	980462	5410	373							
1130	60.4N 178 00.4E	980450	980462	5550	383							
1140	60.6N 178 00.4E	980450	980462	5580	385							
1150	60.8N 178 00.4E	980450	980462	5580	385							
1200	01.0N 178 00.4E	980451	980460	5630	388							
1210	01.6N 178 00.4E	980452	980471	5630	388							
1220	02.1N 178 00.4E	980453	980460	5680	400							
1230	02.7N 178 00.4E	980454	980461	5690	393							
1240	03.2N 178 00.4E	980454	980462	5830	402							
1250	03.8N 178 00.4E	980455	980466	5730	395							
1300	04.3N 178 00.4E	980455	980466	5740	396							
1310	04.9N 178 00.4E	980456	980466	5640	389							
1320	05.4N 178 00.4E	980457	980477	5590	386							
1330	05.9N 178 00.4E	980458	980477	5280	364							
1340	06.4N 178 00.4E	980459	980481	5280	371							
1350	07.2N 178 00.4E	980460	980480	5210	359							
1400	07.8N 178 00.4E	980461	980481	5410	373							
1410	08.3N 178 00.4E	980462	980480	5270	364							
1420	08.8N 178 00.4E	980462	980477	5420	374							
1430	09.3N 178 00.4E	980463	980473	5100	352							
1440	10.0N 178 00.4E	980464	980486	5010	346							
1450	10.6N 178 00.4E	980465	980482	5230	361							
1500	11.3N 178 00.4E	980466	980482	5300	366							
1510	12.0N 178 00.4E	980467	980482	5330	369							
1520	12.6N 178 00.4E	980468	980482	5330	369							
1530	13.3N 178 00.4E	980469	980488	5880	406							
1540	14.0N 178 00.4E	980470	980455	6280	433							
1550	14.6N 178 00.4E	980471	980460	6290	434							
1600	15.3N 178 00.4E	980472	980474	5150	355							
1610	15.9N 178 00.4E	980473	980476	4850	314							
1620	16.6N 178 00.4E	980474	980469	4920	328							
1630	17.3N 178 00.4E	980475	980475	5040	339							
1640	17.9N 178 00.4E	980476	980484	5040	339							
1650	18.3N 178 00.4E	980477	980437	6300	435							

NO	DATE	LAT	LONG	T	G	DEP	Ba	Be	4Gf	4Gb	4Gv
6807290400	44	02.3N	172.27	3.3E	980542	980545	5560	384	3	387	
0410	02.9N	27.4E	980543	980542	5600	386			- 1	385	
0420	03.5N	21.5E	980544	980544	5650	390			0	390	
0430	04.1N	15.7E	980545	980544	5660	391			- 3	390	
0440	04.7N	15.7E	980545	980544	5660	391			- 3	390	
0450	05.3N	12.9E	980547	980545	5700	393			- 2	391	
0500	05.9N	10.0E	980548	980545	5720	395			- 3	392	
0510	06.6N	07.4E	980549	980541	5750	397			- 8	388	
0520	07.4N	04.7E	980550	980543	5800	400			- 7	393	
0530	08.1N	04.7E	980551	980540	5810	400			- 13	389	
0540	08.8N	17.1E	980552	980540	5810	400			- 13	389	
0550	09.6N	56.8E	980553	980537	5820	402			- 16	386	
0640	11.7N	48.4E	980556	980534	5850	404			- 22	382	
0650	12.0N	45.5E	980557	980534	5870	405			- 23	382	
0700	12.4N	42.7E	980557	980533	5900	407			- 24	383	
0710	13.1N	37.1E	980558	980532	5930	409			- 24	383	
0720	13.5N	34.3E	980559	980531	5960	411			- 42	370	
0730	14.1N	31.3E	980560	980518	5970	412			- 42	370	
0740	14.7N	31.3E	980561	980515	5990	413			- 46	366	
0750	15.3N	28.7E	980562	980513	6020	415			- 49	366	
0800	15.9N	25.9E	980563	980509	6060	418			- 54	364	
0810	16.7N	22.6E	980563	980505	6100	421			- 58	363	
0820	17.5N	19.7E	980562	980511	6110	422			- 61	361	
0830	18.2N	16.3E	980562	980508	6130	425			- 61	361	
0840	18.8N	13.2E	980563	980496	6200	428			- 61	361	
0850	19.4N	10.3E	980564	980496	6220	429			- 68	361	
0900	17.0N	07.7E	980565	980491	6240	431			- 74	357	
0910	17.5N	05.2E	980566	980491	6270	433			- 75	358	
0920	18.0N	02.7E	980567	980492	6290	434			- 75	359	
0930	18.5N	00.2E	980568	980491	6310	435			- 77	358	
0940	19.2N	00.2E	980568	980491	6310	435			- 77	358	
0950	20.0N	53.7E	980569	980490	6330	438			- 79	353	
1000	20.7N	50.4E	980569	980489	6370	440			- 80	360	
1010	21.3N	47.8E	980570	980490	6390	438			- 80	358	
1020	22.0N	45.2E	980573	980505	6300	435			- 80	358	
1030	22.6N	42.6E	980574	980521	6050	417			- 53	364	
1040	23.7N	39.4E	980575	980550	5620	388			- 25	363	
1050	24.7N	35.8E	980577	980583	5120	353			6	359	
1110	26.4N	29.8E	980579	980688	3850	266			109	375	
1120	27.0N	27.2E	980580	980750	2820	195			170	365	
1130	27.6N	24.6E	980581	980822	1320	91			241	332	
1140	28.2N	22.0E	980581	980848	1220	84			267	351	
1200	28.6N	20.7E	980583	980867	1200	83			284	367	
1650	24.5N	22.5E	980576	980838	1310	90			262	352	
1700	24.0N	22.4E	980575	980855	1435	99			280	379	
1710	22.4N	21.4E	980573	980851	1550	107			278	385	
1720	20.7N	20.4E	980570	980842	1635	113			272	385	
1730	19.4E	19.4E	980568	980833	1732	120			265	385	
1740	17.7N	18.7E	980566	980822	1876	129			256	385	
1750	16.2N	18.0E	980564	980800	2000	138			236	374	
1800	14.8N	17.3E	980562	980784	2095	144			222	366	
1810	13.2N	16.2E	980559	980773	2088	144			201	356	
1820	11.6N	15.2E	980557	980758	2075	143			201	344	
1830	10.0N	14.1E	980554	980736	2112	146			182	328	
1840	08.7N	13.2E	980552	980739	2480	171			157	328	
1850	07.4N	12.4E	980550	980666	3200	221			116	337	
1900	06.1N	11.5E	980548	980628	3900	269			80	349	
1910	04.8N	10.6E	980546	980600	4350	300			54	354	
1920	03.6N	09.8E	980544	980562	5000	345			28	373	
1930	02.9N	08.9E	980540	980546	5360	368			14	377	
1940	00.9N	07.9E	980540	980545	5395	372			- 1	374	
1950	43 59.5N	07.0E	980538	980537	5430	375			- 1	374	

NO	DATE	LAT	LONG	R	G	DEP	Be	4Gf	4Gb	4Gh	4Gc
6807310800	44	26.0N	170	09.3E	980578	980854	1300	90	276	366	354
		27.5N	10.6E	980577	980876	1230	85	299	384	373	361
	0820	29.0N	12.0E	980577	980890	1180	81	313	394	383	370
	0830	30.5N	13.3E	980586	981020	1145	79	334	414	403	390
	0840	32.1N	14.3E	980588	980945	1100	74	358	438	427	414
	0850	33.7N	14.3E	980590	980878	1165	80	358	418	407	394
		35.3N	14.8E	980592	980921	1225	85	329	414	403	390
	0900	37.0N	14.3E	980594	980890	1280	88	296	384	373	360
	0910	37.0N	14.3E	980597	980884	1350	93	287	380	369	356
	0920	38.6N	19.0E	980595	980894	1240	86	299	385	374	361
	1600	36.5N	18.9E	980597	980886	1320	91	272	354	343	330
	1610	34.5N	18.5E	980601	980848	1460	101	247	348	337	324
	1620	32.5N	18.5E	980604	980830	1740	120	226	346	335	322
	1630	30.5N	18.5E	980607	980822	1825	126	215	341	330	317
	1640	43.2N	18.5E	980610	980812	1890	130	202	332	321	308
	1650	44.8N	18.4E	980618	980822	2000	138	194	332	321	308
	1700	46.5N	18.4E	980625	980759	2170	149	166	318	308	295
	1710	48.1N	18.4E	980628	980742	2340	162	144	318	308	295
	1720	49.8N	18.4E	980631	980726	2510	174	133	356	345	332
	1730	51.5N	18.4E	980634	980710	2680	186	122	351	340	327
	1740	53.2N	18.4E	980637	980694	2850	197	111	346	335	322
	1750	54.9N	18.4E	980640	980678	3020	208	100	341	330	317
		56.6N	18.4E	980643	980662	3190	219	89	336	325	312
	1800	58.3N	18.4E	980646	980646	3360	227	78	331	320	307
	1810	60.0N	18.4E	980649	980630	3530	235	67	326	315	302
	1820	61.7N	18.4E	980652	980614	3700	243	56	321	310	297
	1830	63.4N	18.4E	980655	980598	3870	251	45	316	305	292
	1840	65.1N	18.4E	980658	980582	4040	259	34	311	300	287
		66.8N	18.4E	980661	980566	4210	267	23	306	295	282
	1900	68.5N	18.4E	980664	980550	4380	275	12	301	290	277
	1910	70.2N	18.4E	980667	980534	4550	283	1	296	285	272
	1920	71.9N	18.4E	980670	980518	4720	291	0	291	280	267
	1930	73.6N	18.4E	980673	980502	4890	299	0	286	275	262
	1940	75.3N	18.4E	980676	980486	5060	307	0	281	270	257
	1950	77.0N	18.4E	980679	980470	5230	315	0	276	265	252
		78.7N	18.4E	980682	980454	5400	323	0	271	260	247
	2000	80.4N	18.4E	980685	980438	5570	331	0	266	255	242
	2010	82.1N	18.4E	980688	980422	5740	339	0	261	250	237
	2020	83.8N	18.4E	980691	980406	5910	347	0	256	245	232
	2030	85.5N	18.4E	980694	980390	6080	355	0	251	240	227
	2040	87.2N	18.4E	980697	980374	6250	363	0	246	235	222
	2050	88.9N	18.4E	980700	980358	6420	371	0	241	230	217
		90.6N	18.4E	980703	980342	6590	379	0	236	225	212
	2100	92.3N	18.4E	980706	980326	6760	387	0	231	220	207
	2110	94.0N	18.4E	980709	980310	6930	395	0	226	215	202
	2120	95.7N	18.4E	980712	980294	7100	403	0	221	210	197
	2130	97.4N	18.4E	980715	980278	7270	411	0	216	205	192
	2140	99.1N	18.4E	980718	980262	7440	419	0	211	200	187
	2150	100.8N	18.4E	980721	980246	7610	427	0	206	195	182
		102.5N	18.4E	980724	980230	7780	435	0	201	190	177
	2200	104.2N	18.4E	980727	980214	7950	443	0	196	185	172
	2210	105.9N	18.4E	980730	980198	8120	451	0	191	180	167
	2220	107.6N	18.4E	980733	980182	8290	459	0	186	175	162
	2230	109.3N	18.4E	980736	980166	8460	467	0	181	170	157
	2240	111.0N	18.4E	980739	980150	8630	475	0	176	165	152
	2250	112.7N	18.4E	980742	980134	8800	483	0	171	160	147
		114.4N	18.4E	980745	980118	8970	491	0	166	155	142
	2300	116.1N	18.4E	980748	980102	9140	499	0	161	150	137
	2310	117.8N	18.4E	980751	980086	9310	507	0	156	145	132
	2320	119.5N	18.4E	980754	980070	9480	515	0	151	140	127
	2330	121.2N	18.4E	980757	980054	9650	523	0	146	135	122
	2340	122.9N	18.4E	980760	980038	9820	531	0	141	130	117
	2350	124.6N	18.4E	980763	980022	9990	539	0	136	125	112
		126.3N	18.4E	980766	980006	10160	547	0	131	120	107
	6808010000	13.0N	47.2E	980559	980514	5830	402	0	357	346	333
	0010	14.7N	48.4E	980558	980507	5830	402	0	351	340	328
	0020	16.3N	49.5E	980557	980501	5830	402	0	345	334	325
	0030	18.0N	50.7E	980556	980501	5830	402	0	339	328	322
	0040	19.7N	51.7E	980556	980504	5760	397	0	333	322	316
	0050	21.4N	52.7E	980557	980507	5550	383	0	327	316	310

NO	DATE	Lat	Lon	t	g	dep	B _a	Be	dGr	dCb	dGb
6808021800	44	11.0N	170 42.5E	980556	980556	3560	246		110	356	
	1810	12.1N	43.1E	980558	980551	3450	238		93	339	
	1820	13.1N	43.8E	980559	980627	3270	226		83	331	
	1830	14.2N	44.4E	980560	980627	3600	248		67	315	
	1840	15.3N	45.0E	980562	980602	4300	297		24	330	
	1850	16.3N	45.7E	980563	980577	5300	366		2	390	
	1900	17.4N	46.3E	980565	980556	5900	407		-9	398	
	1910	18.4N	47.0E	980567	980531	6230	430		-34	386	
	1920	19.8N	47.7E	980569	980521	6280	433		-48	395	
	1930	21.0N	48.4E	980571	980511	6280	433		-60	373	
	1940	22.2N	49.1E	980573	980504	6340	437		-69	368	
	1950	23.4N	49.8E	980575	980504	6360	439		-71	368	
	2000	24.6N	50.5E	980577	980496	6370	440		-81	359	
	2010	25.7N	51.2E	980579	980497	6370	440		-78	362	
	2020	26.8N	51.9E	980581	980494	6340	437		-79	358	
6808030000	2030	27.9N	52.6E	980583	980494	6340	437		-77	361	
	2040	29.0N	53.3E	980585	980494	6330	437		-74	364	
	2050	30.1N	54.0E	980587	980497	6350	438		-71	367	
	2100	31.2N	54.7E	980589	980493	6370	440		-73	367	
	2110	32.3N	55.4E	980591	980493	6380	440		-75	367	
	2120	33.4N	56.1E	980593	980493	6370	440		-75	367	
	2130	34.5N	56.8E	980595	980493	6370	440		-75	367	
	2140	35.6N	57.5E	980597	980493	6370	440		-75	367	
	2150	36.7N	58.2E	980599	980493	6370	440		-75	367	
	2200	37.8N	58.9E	980601	980493	6370	440		-75	367	
	2210	38.9N	59.6E	980603	980493	6370	440		-75	367	
	2220	39.0N	60.3E	980605	980493	6370	440		-75	367	
	2230	40.1N	61.0E	980607	980493	6370	440		-75	367	
	2240	41.2N	61.7E	980609	980493	6370	440		-75	367	
	2250	42.3N	62.4E	980611	980493	6370	440		-75	367	
6808030000	2300	43.4N	63.1E	980613	980493	6370	440		-75	367	
	2310	44.5N	63.8E	980615	980493	6370	440		-75	367	
	2320	45.6N	64.5E	980617	980493	6370	440		-75	367	
	2330	46.7N	65.2E	980619	980493	6370	440		-75	367	
	2340	47.8N	65.9E	980621	980493	6370	440		-75	367	
	2350	48.9N	66.6E	980623	980493	6370	440		-75	367	
	2400	49.0N	67.3E	980625	980493	6370	440		-75	367	
	2410	50.1N	68.0E	980627	980493	6370	440		-75	367	
	2420	51.2N	68.7E	980629	980493	6370	440		-75	367	
	2430	52.3N	69.4E	980631	980493	6370	440		-75	367	
	2440	53.4N	70.1E	980633	980493	6370	440		-75	367	
	2450	54.5N	70.8E	980635	980493	6370	440		-75	367	
	2460	55.6N	71.5E	980637	980493	6370	440		-75	367	
	2470	56.7N	72.2E	980639	980493	6370	440		-75	367	
	2480	57.8N	72.9E	980641	980493	6370	440		-75	367	
6808030000	2500	58.9N	73.6E	980643	980493	6370	440		-75	367	
	2510	59.0N	74.3E	980645	980493	6370	440		-75	367	
	2520	60.1N	75.0E	980647	980493	6370	440		-75	367	
	2530	61.2N	75.7E	980649	980493	6370	440		-75	367	
	2540	62.3N	76.4E	980651	980493	6370	440		-75	367	
	2550	63.4N	77.1E	980653	980493	6370	440		-75	367	
	2600	64.5N	77.8E	980655	980493	6370	440		-75	367	
	2610	65.6N	78.5E	980657	980493	6370	440		-75	367	
	2620	66.7N	79.2E	980659	980493	6370	440		-75	367	
	2630	67.8N	79.9E	980661	980493	6370	440		-75	367	
	2640	68.9N	80.6E	980663	980493	6370	440		-75	367	
	2650	69.0N	81.3E	980665	980493	6370	440		-75	367	
	2660	70.1N	82.0E	980667	980493	6370	440		-75	367	
	2670	71.2N	82.7E	980669	980493	6370	440		-75	367	
	2680	72.3N	83.4E	980671	980493	6370	440		-75	367	

NO	DATE	LAT	LDN	r	G	DEP	Ba	Be	dGf	dGb	dGd
6808042300	44	34.8N	171	28.8E	980592	980556	6200	428	-36	392	-67
2310		34.8N		26.2E	980592	980552	6210	428	-40	388	-66
2320		34.8N		23.4E	980592	980548	6220	431	-48	382	-61
2330		34.8N		20.6E	980592	980544	6230	431	-51	381	-56
2340		34.9N		18.9E	980592	980541	6240	432	-49	385	-53
2350		35.0N		16.9E	980592	980538	6250	434	-54	381	-49
6808050010	35.0N	11.9E	980592	980538	6310	435			-54	381	-53
0020		35.0N		09.8E	980592	980532	6320	436	-60	376	-49
0030		35.0N		07.7E	980592	980530	6330	436	-62	374	-49
0040		35.1N		05.7E	980592	980528	6340	437	-63	372	-49
0050		35.1N		03.4E	980592	980527	6340	437	-63	372	-49
0100		35.2N		01.2E	980592	980523	6350	438	-69	369	-49
0110		35.2N		59.0E	980592	980523	6380	440	-69	371	-49
0120		35.2N		56.7E	980592	980521	6400	442	-71	371	-49
0130		35.2N		54.5E	980592	980523	6410	442	-59	383	-49
0140		35.3N		52.3E	980592	980537	6230	430	-55	375	-49
0150		35.3N		50.2E	980592	980542			-50		-49
0200		35.4N		48.0E	980592	980554	5720	395	-38	357	-11
0210		35.4N		45.7E	980592	980561	5610	387	-31	356	-11
0220		35.5N		43.4E	980593	980583	5350	369	-10	359	-19
0230		35.5N		41.1E	980593	980600	4980	364	7	351	-19
0240		35.6N		38.8E	980593	980622	4680	323	29	352	-19
0250		35.6N		36.5E	980593	980647	4400	304	54	358	-19
0300		35.7N		34.2E	980593	980691	3740	258	98	356	-20
0310		35.7N		31.9E	980593	980731	3130	216	138	354	-17
0320		35.7N		30.4E	980593	980782	1900	131	189	320	-15
0330		35.8N		28.8E	980593	980830	1340	92	237	329	-22
0340		35.8N		27.0E	980593	980851	1340	92	258	350	-17
0350		35.8N		25.6E	980593	980870	1310	90	277	367	-23
0400		35.8N		20.2E	980593	980886	1280	88	293	381	-23
0410		35.8N		18.5E	980593	980901	1180	81	309	390	-31
0420		35.8N		16.5E	980592	980901	1180	81	316	399	-31
0430		35.4N		14.5E	980592	980908	1200	83	316	399	-44
0440		35.6N		12.5E	980592	980905	1230	85	303	388	-55
0500		36.0N		09.0E	980593	980890	1300	90	297	387	-44
0510		37.5N		09.7E	980596	980876	1350	93	280	373	-55
0530		40.6N		11.5E	980601	980866	1380	95	265	360	-57
0540		40.6N		12.5E	980601	980874	1380	95	272	367	-54
0550		40.5N		15.9E	980601	980873	1370	95	270	365	-54
0600		40.5N		18.2E	980601	980871	1380	95	265	359	-55
0610		40.3N		20.7E	980600	980865	1360	94	253	351	-61
0620		40.1N		23.2E	980600	980853	1420	98	231	351	-76
0630		39.8N		25.7E	980599	980850	1740	120	141	352	-80
0640		39.8N		28.2E	980599	980770	2050	141	132	350	-86
0650		39.8N		30.7E	980599	980740	2050	210	141	351	-86
0700		39.8N		33.2E	980599	980701	4030	278	102	380	-86
0710		39.8N		35.6E	980599	980658	4550	314	59	373	-80
0720		39.8N		38.0E	980599	980628	4650	321	29	350	-81
0730		39.8N		40.4E	980599	980602	4970	343	3	347	-58
0740		39.8N		42.8E	980599	980580	5330	368	-19	349	-12
0750		39.8N		45.3E	980599	980556	5750	397	-34	363	-30
0800		39.8N		47.7E	980599	980545	5980	413	-45	368	-34
0810		39.8N		50.3E	980599	980541	6100	421	-45	363	-22
0820		39.8N		52.9E	980599	980530	6410	442	-69	343	-23
0830		39.8N		55.5E	980599	980524	6410	442	-75	367	-34
0900		39.4N		59.5E	980598	980525	6370	440	-73	367	-23
6808060800	44	43.0N	171	07.5E	980604	980537	6300	435	-67	368	-67
0810		42.7N		10.7E	980603	980537	6300	435	-66	369	-66
0820		42.7N		13.9E	980603	980542	6280	433	-61	372	-61
0830		42.0N		17.1E	980602	980546	6250	431	-56	375	-56
0840		41.5N		20.4E	980602	980544	6250	430	-56	372	-53
0850		41.0N		23.6E	980601	980548	6210	428	-53	375	-49
0900		40.5N		26.8E	980601	980552	6170	426	-49	377	-49
0910		40.0N		30.1E	980601	980557	6120	422	-43	379	-49
0920		40.2N		33.4E	980600	980561	6080	420	-39	381	-39
0930		39.8N		40.0E	980599	980563	6010	415	-36	379	-36
0940		39.5N		42.5E	980599	980567	5980	413	-32	381	-32
0950		39.5N		45.0E	980599	980571	5950	411	-28	383	-28
1000		39.5N		47.5E	980599	980571	5920	408	-28	380	-28
1010		39.5N		50.0E	980599	980580	5930	409	-19	390	-19
1020		39.5N		52.5E	980597	980582	5930	409	-15	394	-15
1030		36.1N	172	00.2E	980593	980582	5910	408	-11	397	-11
1040		32.1N		00.5E	980587	980568	5910	408	-19	389	-19
1050		30.0N		00.6E	980584	980586	5900	407	-20	387	-20
1100		28.8N	171	59.2E	980582	980565	5890	406	-17	389	-17
1110		27.5N		57.9E	980580	980565	5890	406	-15	391	-15
1120		26.5N		56.5E	980578	980556	5870	405	-22	383	-22
1130		25.5N		55.1E	980578	980551	5820	402	-17	385	-17
1140		24.5N		53.8E	980578	980541	5840	403	-17	386	-17
1150		23.7N		51.0E	980578	980581	5840	403	-23	382	-23
1200		25.7N		48.3E	980578	980556	5870	405	-23	383	-23
1210		25.5N		45.7E	980578	980547	5890	406	-45	378	-45
1220		25.4N		43.2E	980577	980546	5930	409	-31	378	-31
1230		25.3N		40.7E	980577	980533	6000	414	-44	370	-44
1240		25.2N		38.2E	980577	980522	6000	414	-55	359	-55
1250		25.2N		35.7E	980577	980522	6000	414	-57	358	-57
1300		25.2N		33.2E	980577	980523	6080	420	-54	366	-54
1310		25.2N		30.7E	980578	980523	6120	422	-55	367	-55
1320		25.2N		28.2E	980578	980517	6150	424	-61	363	-61
1330		25.2N		25.7E	980578	980502	6170	426	-76	350	-76
1340		25.2N		23.2E	980577	980497	6200	428	-80	348	-80
1350		25.0N		20.7E	980577	980492	6220	429	-85	344	-85
1400		25.0N		18.2E	980577	980496	6240	431	-80	350	-80
1410		25.0N		15.7E	980577	980491	6260	432	-80	347	-80
1420		25.0N		13.2E	980577	980491	6270	433	-86	342	-86
1430		24.4N	170	54.3E	980575	980499	6340	437	-86	351	-86
1440		24.4N		51.7E	980575	980495	6360	439	-80	359	-80
1450		24.4N		49.2E	980575	980494	6260	432	-81	351	-81
1460		24.0N		46.7E	980575	980517	6020	415	-58	357	-58
1470		23.7N		44.2E	980575	980563	5150	355	-12	343	-12
1480		23.7N		41.7E	980575	980505	4220	291	-30	321	-30
1490		23.7N		39.2E	980575	980666	3200	228	-91	319	-91
1500		23.7N		36.7E	980575	980705	1940	134	-130	265	-130
1510		23.7N		34.2E	980575	980705	1740	128	-207	335	-207
1520		23.7N		31.7E	980575	980705	1540	122	-216	312	-216
1530		23.7N		29.2E	980575	980705	1340	116	-225	305	-225
1540		23.7N		26.7E	980575	980705	1140	110	-234	298	-234
1550		23.7N		24.2E	980575	980705	940	104	-243	291	-243
1560		23.7N		21.7E	980575	980705	740	98	-252	284	-252
1570		23.7N		19.2E	980575	980705	540	92	-261	277	-261
1580		23.7N		16.7E	980575	980705	340	86	-270	270	-270
1590		23.7N		14.2E	980575	980705	140	80	-279	263	-279
1600		23.7N		11.7E	980575	980705	-140	74	-288	256	-288
1610		23.7N		9.2E	980575	980705	-340	68	-297	249	-297
1620		23.7N		6.7E	980575	980705	-540	62	-306	242	-306
1630		23.7N		4.2E	980575	980705	-740	56	-315	235	-315
1640		23.7N		1.7E	980575	980705	-940	50	-324	228	-324

NO	DATE	LAT	LONG	r	C	DEP	B _s	B _e	ΔG	ΔG _v	ΔG _b
6808060100	0110	27.0N	169 01.7E	980580	980632	4500	311		52	363	
	0120	27.3N	169 59.0E	980580	980593	4960	342		13	355	
	0130	27.7N	169 56.3E	980581	980566	5360	370		-15	355	
	0140	28.0N	169 53.5E	980581	980547	5650	390		-34	356	
	0150	28.3N	170 50.5E	980582	980527	5830	402		-55	347	
	0200	28.6N	170 47.3E	980583	980520	5830	402		-59	343	
	0210	28.9N	170 44.2E	980584	980515	5600	386		-69	317	
	0220	29.2N	170 41.3E	980584	980507	6000	414		-77	337	
	0230	29.5N	170 38.4E	980584	980504	5940	410		-80	330	
	0240	29.8N	170 35.5E	980584	980501	5810	401		-83	318	
	0250	30.1N	170 32.6E	980585	980503	5770	398		-82	316	
	0310	30.4N	170 29.7E	980585	980504	5760	397		-81	316	
	0320	30.8N	170 26.8E	980586	980510	5770	398		-76	322	
	0330	31.1N	170 23.9E	980586	980507	5770	398		-77	321	
	0340	31.4N	170 21.0E	980586	980507	5800	400		-79	321	
6808070100	0110	47.0N	168 41.4E	980610	980581	5750	397		-26	370	
	0120	47.3N	168 39.3E	980610	980584	5740	396		-26	370	
	0130	47.7N	168 37.1E	980611	980587	5730	395		-24	371	
	0140	48.1N	168 35.0E	980611	980587	5720	395		-24	371	
	0150	48.5N	168 32.9E	980612	980592	5710	394		-24	374	
	0200	48.8N	168 30.7E	980612	980595	5730	395		-17	378	
	0210	49.2N	168 28.6E	980613	980600	5720	395		-13	382	
	0220	49.6N	168 26.5E	980613	980603	5730	395		-10	385	
	0230	50.0N	168 24.4E	980614	980606	5720	395		-9	386	
	0240	50.4N	168 22.3E	980614	980612	5710	394		-2	392	
	0250	50.8N	168 20.2E	980615	980615	5700	393		0	393	
	0310	51.1N	168 17.9E	980616	980617	5700	393		1	394	
	0320	51.5N	168 15.8E	980617	980620	5600	386		3	389	
	0330	51.9N	168 13.7E	980618	980624	5600	392		6	398	
	0340	52.4N	168 11.6E	980618	980624	5680	392		6	398	
6808080100	0110	52.8N	168 09.5E	980619	980610	5700	393		-12	378	
	0120	53.2N	168 07.4E	980619	980607	5650	390		-7	381	
	0130	53.6N	168 05.3E	980620	980613	5630	388		-4	386	
	0140	54.0N	168 03.2E	980620	980616	5650	390		-3	386	
	0150	54.4N	168 01.1E	980621	980618	5630	387		-1	388	
	0200	54.8N	168 59.0E	980622	980623	5610	388		1	388	
	0210	55.3N	168 56.9E	980622	980627	5660	391		5	396	
	0220	55.8N	168 54.8E	980623	980631	5640	389		8	397	
	0230	56.3N	168 52.7E	980623	980635	5670	391		12	403	
	0240	56.8N	168 50.6E	980624	980637	5650	390		13	402	
	0250	57.3N	168 48.5E	980625	980636	5650	390		12	403	
	0310	57.8N	168 46.4E	980626	980636	5650	390		12	403	
	0320	58.3N	168 44.3E	980627	980639	5660	391		12	403	
	0330	58.8N	168 42.2E	980628	980648	5670	391		20	411	
	0340	59.3N	168 40.1E	980628	980652	5680	388		22	410	
6808090100	0110	43.2N	168 31.7E	980604	980626	5630	388		23	413	
	0120	43.6N	168 29.6E	980604	980626	5630	388		23	413	
	0130	44.0N	168 27.5E	980605	980631	5630	388		23	413	
	0140	44.4N	168 25.4E	980606	980636	5630	388		23	413	
	0150	44.8N	168 23.3E	980607	980641	5630	388		23	413	
	0200	45.2N	168 21.2E	980608	980646	5630	388		23	413	
	0210	45.6N	168 19.1E	980609	980651	5630	388		23	413	
	0220	46.0N	168 17.0E	980610	980656	5630	388		23	413	
	0230	46.4N	168 14.9E	980611	980661	5630	388		23	413	
	0240	46.8N	168 12.8E	980612	980666	5630	388		23	413	
	0250	47.2N	168 10.7E	980613	980671	5630	388		23	413	
	0310	47.6N	168 08.6E	980614	980676	5630	388		23	413	
	0320	48.0N	168 06.5E	980615	980681	5630	388		23	413	
	0330	48.4N	168 04.4E	980616	980686	5630	388		23	413	
	0340	48.8N	168 02.3E	980617	980691	5630	388		23	413	

Gravity Table 6. The Shatsky rise.

NO	DATE	LAT	LONG	F	G	DEP	Ba	Be	dGr	dGb	dGv
6807212000	38	00.2N	150.57.4E	980004	980002	5800	400	400	-	398	398
2010	00.1N	151.00.5E	980004	980002	5820	402	402	400	-	400	400
2020	00.1N	151.03.5E	980004	980003	5830	402	402	400	-	401	401
2030	00.0N	06.6E	980004	980002	5870	384	385	400	-	398	398
2040	00.0N	09.8E	980004	980001	5810	401	401	400	-	398	398
2050	00.0N	12.9E	980004	980006	5810	401	401	400	-	399	399
2100	00.0N	16.1E	980004	980002	5810	401	401	400	-	399	399
2110	00.0N	17.1E	980004	980003	5810	401	401	400	-	400	400
2120	00.0N	22.0E	980004	980002	5820	402	402	400	-	400	400
2130	00.0N	25.0E	980004	980007	5800	400	400	400	-	403	403
2140	00.0N	27.7E	980004	980006	5760	397	397	400	-	399	399
2150	00.0N	30.5E	980004	980006	5800	400	400	400	-	402	402
2200	00.0N	33.2E	980004	980003	5800	400	400	400	-	399	399
2210	00.0N	36.1E	980004	980003	5800	400	400	400	-	398	398
2220	00.0N	39.9E	980004	980002	5800	400	400	400	-	398	398
2230	00.0N	41.9E	980004	980001	5800	400	400	400	-	397	397
2240	00.0N	44.6E	980004	980002	5800	400	400	400	-	398	398
2250	00.0N	47.3E	980004	980002	5720	395	395	400	-	393	393
2300	00.0N	50.0E	980004	980000	5810	401	401	400	-	397	397
2310	00.0N	52.8E	980004	980003	5810	401	401	400	-	400	400
2320	00.0N	55.5E	980004	980000	5800	400	400	400	-	406	406
2330	00.0N	58.2E	980004	980011	5750	397	397	400	-	390	390
2340	00.0N	61.0E	980004	980011	5750	397	397	400	-	401	401
2350	00.0N	64.6E	980004	980006	5780	399	399	400	-	405	405
6807220000	00.0N	07.8E	980004	980010	5780	399	399	400	-	401	401
0010	00.0N	11.1E	980004	980006	5780	399	399	400	-	401	401
0020	00.1N	14.3E	980004	980010	5760	397	397	400	-	403	403
0030	00.1N	17.6E	980004	980012	5760	397	397	400	-	403	403
0040	00.1N	20.9E	980004	980010	5760	397	397	400	-	399	399
0050	00.2N	24.1E	980004	980017	5680	392	390	400	-	403	403
0100	00.2N	27.3E	980004	980016	5670	391	389	400	-	401	401
0110	00.2N	30.6E	980004	980018	5690	393	390	400	-	404	404
0120	00.3N	33.8E	980004	980017	5680	392	390	400	-	403	403
0130	00.3N	37.1E	980004	980018	5710	394	391	400	-	408	408
0140	00.3N	40.3E	980004	980018	5730	395	391	400	-	409	409
0150	00.4N	43.6E	980004	980017	5700	393	391	400	-	406	406
0200	00.4N	46.8E	980004	980017	5700	393	392	400	-	405	405
0210	00.4N	50.0E	980005	980018	5730	395	392	400	-	408	408
0220	00.5N	53.1E	980005	980019	5750	397	393	400	-	411	411
0230	00.5N	56.3E	980006	980016	5750	397	394	400	-	407	407
0240	00.5N	59.5E	980006	980017	5770	398	394	400	-	409	409
0250	00.6N	62.6E	980006	980019	5740	394	394	400	-	407	407
0300	00.6N	65.8E	980006	980019	5780	399	395	400	-	412	412
0310	00.6N	69.1E	980006	980019	5780	399	394	400	-	413	413
0320	00.7N	72.4E	980006	980020	5730	395	394	400	-	409	409
0330	00.7N	75.7E	980006	980022	5700	393	394	400	-	410	410
0340	00.7N	79.0E	980006	980021	5720	395	394	400	-	409	409
0350	00.7N	82.3E	980006	980020	5720	395	394	400	-	409	409
0400	00.7N	85.6E	980006	980022	5710	394	394	400	-	410	410
0410	00.7N	88.9E	980006	980026	5750	397	395	400	-	417	417
0430	00.8N	92.2E	980006	980023	5790	400	397	400	-	417	417
0450	00.9N	95.5E	980006	980022	5780	399	397	400	-	415	415
0470	00.9N	98.8E	980006	980023	5800	400	398	400	-	417	417
0500	01.0N	102.1E	980006	980023	5810	401	398	400	-	418	418
0520	01.0N	105.4E	980006	980025	5800	400	399	400	-	419	419
0530	00.8N	51.8E	980006	980023	5810	401	399	400	-	418	418
0540	00.8N	55.1E	980006	980021	5800	400	399	400	-	415	415
0550	01.0N	58.4E	980006	980022	5820	402	399	400	-	417	417
	01.1N	61.7E	980006	980021	5820	402	399	400	-	418	418
	01.1N	65.0E	980006	980021	5820	402	399	400	-	418	418
	01.1N	68.3E	980006	980021	5820	402	399	400	-	418	418
	01.1N	71.6E	980006	980021	5820	402	399	400	-	418	418
	01.1N	74.9E	980006	980021	5820	402	399	400	-	418	418
	01.1N	78.2E	980006	980021	5820	402	399	400	-	418	418
	01.1N	81.5E	980006	980021	5820	402	399	400	-	418	418
	01.1N	84.8E	980006	980021	5820	402	399	400	-	418	418
	01.1N	88.1E	980006	980021	5820	402	399	400	-	418	418
	01.1N	91.4E	980006	980021	5820	402	399	400	-	418	418
	01.1N	94.7E	980006	980021	5820	402	399	400	-	418	418
	01.1N	98.0E	980006	980021	5820	402	399	400	-	418	418
	01.1N	101.3E	980006	980021	5820	402	399	400	-	418	418
	01.1N	104.6E	980006	980021	5820	402	399	400	-	418	418
	01.1N	107.9E	980006	980021	5820	402	399	400	-	418	418
	01.1N	111.2E	980006	980021	5820	402	399	400	-	418	418
	01.1N	114.5E	980006	980021	5820	402	399	400	-	418	418
	01.1N	117.8E	980006	980021	5820	402	399	400	-	418	418
	01.1N	121.1E	980006	980021	5820	402	399	400	-	418	418
	01.1N	124.4E	980006	980021	5820	402	399	400	-	418	418
	01.1N	127.7E	980006	980021	5820	402	399	400	-	418	418
	01.1N	131.0E	980006	980021	5820	402	399	400	-	418	418
	01.1N	134.3E	980006	980021	5820	402	399	400	-	418	418
	01.1N	137.6E	980006	980021	5820	402	399	400	-	418	418
	01.1N	140.9E	980006	980021	5820	402	399	400	-	418	418
	01.1N	144.2E	980006	980021	5820	402	399	400	-	418	418
	01.1N	147.5E	980006	980021	5820	402	399	400	-	418	418
	01.1N	150.8E	980006	980021	5820	402	399	400	-	418	418
	01.1N	154.1E	980006	980021	5820	402	399	400	-	418	418
	01.1N	157.4E	980006	980021	5820	402	399	400	-	418	418
	01.1N	160.7E	980006	980021	5820	402	399	400	-	418	418
	01.1N	164.0E	980006	980021	5820	402	399	400	-	418	418
	01.1N	167.3E	980006	980021	5820	402	399	400	-	418	418
	01.1N	170.6E	980006	980021	5820	402	399	400	-	418	418
	01.1N	173.9E	980006	980021	5820	402	399	400	-	418	418
	01.1N	177.2E	980006	980021	5820	402	399	400	-	418	418
	01.1N	180.5E	980006	980021	5820	402	399	400	-	418	418
	01.1N	183.8E	980006	980021	5820	402	399	400	-	418	418
	01.1N	187.1E	980006	980021	5820	402	399	400	-	418	418
	01.1N	190.4E	980006	980021	5820	402	399	400	-	418	418
	01.1N	193.7E	980006	980021	5820	402	399	400	-	418	418
	01.1N	197.0E	980006	980021	5820	402	399	400	-	418	418
	01.1N	200.3E	980006	980021	5820	402	399	400	-	418	418
	01.1N	203.6E	980006	980021	5820	402	399	400	-	418	418
	01.1N	206.9E	980006	980021	5820	402	399	400	-	418	418
	01.1N	210.2E	980006	980021	5820	402	399	400	-	418	418
	01.1N	213.5E	980006	980021	5820	402	399	400	-	418	418
	01.1N	216.8E	980006	980021	5820	402	399	400	-	418	418
	01.1N	220.1E	980006	980021	5820	402	399	400	-	418	418
	01.1N	223.4E	980006	980021	5820	402	399	400	-	418	418
	01.1N	226.7E	980006	980021	5820	402	399	400	-	418	418
	01.1N	230.0E	980006	980021	5820	402	399	400	-	418	418
	01.1N	233.3E	980006	980021	5820	402	399	400	-	418	418
	01.1N	236.6E	980006	98002							

[illegible]

NO	DATE	LAT	LONG	r	G	DEP	Ba	Be	dGf	dGb	dGh
6807240400	38	03.0N	163.2E	980008	980024	4330	299	303	16	315	319
	0410	03.0N	23.2E	980008	980024	4370	302	305	15	317	320
	0420	03.0N	25.5E	980008	980023	4400	304	307	15	319	322
	0430	03.0N	26.6E	980008	980023	4430	306	308	12	318	320
	0440	03.0N	27.7E	980008	980022	4440	306	311	14	320	325
	0450	03.0N	28.9E	980008	980020	4500	311	313	12	323	325
	0500	03.0N	30.0E	980008	980018	4510	311	315	10	321	325
	0510	03.0N	31.1E	980008	980019	4570	311	318	11	326	329
	0520	03.0N	32.2E	980008	980018	4620	319	322	10	333	332
	0530	03.0N	33.3E	980008	980017	4730	326	326	9	335	335
0540	03.0N	34.5E	980008	980018	4820	333	329	10	343	339	
0550	03.0N	35.6E	980008	980019	4850	335	332	11	346	343	
0600	03.0N	36.7E	980008	980015	4860	335	333	7	342	340	
0610	03.0N	37.9E	980008	980018	4870	336	335	10	346	345	
0620	03.0N	39.0E	980008	980019	4890	337	335	11	348	346	
0630	03.0N	40.2E	980008	980021	4900	338	336	11	351	349	
0640	03.0N	41.4E	980008	980025	4920	339	335	17	356	352	
0650	03.0N	42.5E	980008	980023	4860	335	332	15	350	347	
0710	03.0N	46.7E	980008	980032	4430	306	331	24	330	355	
0720	03.0N	49.6E	980008	980026	5040	348	338	18	366	356	
0730	03.0N	52.6E	980008	980027	5100	352	343	18	370	361	
0740	03.0N	55.6E	980008	980027	5130	354	346	19	373	365	
0750	03.0N	58.5E	980008	980029	5070	350	347	21	371	368	
0800	03.1N	01.5E	980008	980035	5000	345	346	27	372	373	
0810	03.1N	04.6E	980008	980040	4950	342	348	31	378	379	
0820	03.1N	07.8E	980008	980039	5030	347	348	31	378	379	
0830	03.2N	10.9E	980008	980031	5110	353	350	23	376	373	
0840	03.3N	14.0E	980008	980026	5150	355	351	18	373	369	
0850	03.3N	17.1E	980008	980028	5140	355	351	20	375	371	
0900	03.4N	20.2E	980008	980028	5080	351	351	20	371	371	
0910	03.5N	23.3E	980009	980027	5060	349	351	18	367	369	
0920	03.7N	26.5E	980009	980026	5100	352	352	17	369	369	
0930	03.8N	29.6E	980010	980029	5100	352	352	19	371	371	
0940	03.9N	32.7E	980010	980027	5140	355	353	17	372	370	
0950	04.1N	35.9E	980010	980027	5200	359	354	17	376	371	
1000	04.2N	39.0E	980010	980030	5250	362	353	20	382	373	
1010	04.4N	42.0E	980010	980037	5050	348	350	27	375	377	
1020	04.5N	45.0E	980011	980042	4860	335	348	31	366	379	
1030	04.7N	48.0E	980011	980047	4910	339	348	36	375	384	
1040	04.9N	51.0E	980011	980047	4920	339	350	36	375	386	
1050	05.0N	54.0E	980011	980044	5200	359	355	29	388	384	
1100	05.2N	57.0E	980011	980032	5300	366	360	21	387	381	
1110	05.2N	60.0E	980011	980027	5320	367	363	16	383	379	
1120	05.3N	03.0E	980011	980023	5370	371	365	12	383	377	
1130	05.3N	06.0E	980011	980023	5380	372	366	12	384	378	
1140	05.3N	09.0E	980012	980022	5380	371	367	10	381	377	
1150	05.4N	12.0E	980012	980026	5400	373	368	14	387	382	
1200	05.4N	15.0E	980013	980027	5390	372	368	14	386	382	
1210	05.5N	18.0E	980013	980022	5390	372	368	13	386	381	
1220	05.6N	21.0E	980013	980026	5400	373	368	14	387	382	
1230	05.7N	24.0E	980013	980027	5400	373	368	16	389	384	
1240	05.7N	27.1E	980013	980029	5410	373	368	16	389	384	
1250	05.9N	29.2E	980013	980026	5420	374	366	13	387	379	
1700	08.0N	33.3E	980016	980047	5400	373	359	31	404	390	
1710	08.0N	36.3E	980016	980048	5400	373	349	32	405	381	
1720	07.9N	39.2E	980016	980057	4250	293	334	41	334	375	
1730	07.9N	42.2E	980016	980060	3680	254	343	44	298	375	
1740	07.9N	45.1E	980016	980049	5230	361	345	33	394	378	
1750	07.8N	48.1E	980016	980037	5470	377	358	21	398	379	
6808091830	38	26.7N	166.0E	980044	980033	5490	379	379	-11	368	368
	1810	26.7N	02.0E	980044	980032	5490	379	379	-12	367	367
	1820	26.7N	05.0E	980044	980026	5490	379	379	-18	361	361
	1900	26.7N	58.0E	980044	980018	5480	378	378	-26	352	352
	1910	26.7N	55.0E	980044	980021	5470	377	377	-23	354	354
	1920	26.6N	53.7E	980044	980021	5480	378	378	-23	355	355
	1930	26.6N	51.5E	980044	980017	5480	378	378	-27	351	351
	1940	26.5N	48.7E	980043	980013	5500	380	380	-30	347	347
	1950	26.4N	46.0E	980043	980011	5510	380	380	-30	350	350
	2000	26.3N	43.2E	980042	980018	5520	381	381	-24	357	357
6807250000	02.0N	37.0E	980007	980045	5230	361	355	38	399	393	
	01.8N	40.0E	980007	980045	5060	349	355	38	387	393	
	01.6N	43.0E	980007	980045	5140	355	355	38	387	393	
	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	
	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	
	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	
	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	
	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	
	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	
	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	00.0E	

NO	DATE	LAT	LDN	r	G	DEP	Ba	Be	4Gf	4Gb	4Gd	4Gc
6808092200	38 20.2N 165 14.8E	980032	980049	3660	253	280	16	269	296	296	296	255
	2210 19.4N 12.6E	980033	980037	4250	293	290	5	298	295	295	295	247
	2220 18.6N 10.3E	980031	980027	4450	307	300	-4	303	296	296	296	244
	2230 17.8N 10.1E	980030	980020	4680	323	310	-10	313	300	300	300	239
	2240 17.0N 05.9E	980029	980012	4820	319	310	-17	322	310	310	310	232
	2250 16.3N 05.7E	980028	980008	4930	340	326	-20	320	306	306	306	235
	2300 15.5N 01.4E	980027	980010	5050	348	332	-17	331	315	315	315	240
	2310 14.9N 164 980026	980015	5060	349	335	-11	338	324	312	312	312	240
	2320 14.4N 56.3E	980026	980022	4990	344	335	-4	340	331	331	331	238
	2330 13.8N 53.8E	980025	980027	4620	319	320	2	321	322	322	322	238
6808100000	2340 13.2N 51.5E	980024	980027	4880	310	313	281	323	305	305	305	240
	2350 12.5N 49.3E	980023	980029	4050	279	299	6	285	305	305	305	259
	0000 11.9N 47.0E	980022	980029	4100	283	304	7	290	311	311	311	285
	0010 11.3N 44.7E	980021	980020	4610	319	313	-1	318	312	312	312	285
	0020 10.8N 42.4E	980020	980008	4650	321	321	-12	309	309	309	309	263
	0030 10.2N 40.1E	980019	980003	4730	326	329	-16	310	313	313	313	258
	0040 09.6N 37.8E	980018	979997	5050	348	336	-21	327	315	315	315	248
	0050 09.1N 35.5E	980018	979980	5170	357	342	-38	319	304	304	304	251
	0100 08.5N 33.2E	980017	979989	5160	356	345	-28	328	317	317	317	258
	0110 07.9N 30.6E	980016	979986	5130	354	346	-29	324	318	318	318	260
6808110000	0120 07.7N 26.3E	980014	979987	5090	351	345	-27	324	318	318	318	260
	0130 07.1N 24.0E	980013	979988	5080	345	345	-25	320	320	320	320	262
	0140 06.2N 21.7E	980012	979987	5100	352	345	-25	327	320	320	320	262
	0150 05.1N 19.4E	980011	979987	5160	356	345	-24	332	321	321	321	257
	0200 04.5N 17.1E	980010	979992	5140	355	343	-18	333	325	325	325	260
	0210 04.0N 14.8E	980009	979997	5000	345	338	-12	335	326	326	326	260
	0230 03.4N 12.5E	980008	979991	4530	333	332	-17	332	335	335	335	263
	0240 03.0N 07.9E	980007	979993	4630	342	342	-21	321	321	321	321	263
	0250 02.2N 07.9E	980007	980006	4700	324	331	-1	323	332	332	332	272
	0300 01.6N 05.6E	980007	980001	4980	344	337	-6	338	331	331	331	264
6808120000	0310 01.0N 03.3E	980006	979995	5030	347	340	-11	336	329	329	329	277
	0320 00.5N 01.0E	980005	979990	5070	350	342	-15	335	327	327	327	277
	0330 59.3N 56.4E	980004	979987	5130	352	343	-17	335	326	326	326	277
	0340 59.3N 56.4E	980004	979987	4950	342	342	-21	321	321	321	272	
	0350 58.8N 54.1E	980003	979981	5090	351	341	-21	330	320	320	272	
	0400 58.2N 51.8E	980003	979982	5010	346	340	-19	327	321	321	282	
	0410 57.6N 49.2E	980003	979978	4830	340	337	-23	319	314	314	282	
	0420 57.1N 47.5E	980002	979981	4830	333	334	-19	314	315	315	275	
	0430 56.5N 44.9E	980000	979981	4850	335	332	-19	314	313	313	275	
	0440 55.9N 42.6E	979999	979981	4730	326	331	-18	308	313	313	274	
6808130000	0450 55.4N 40.3E	979998	979978	4940	341	331	-20	321	311	311	274	
	0500 54.8N 38.0E	979997	979978	4900	338	330	-19	319	317	317	282	
	0510 54.5N 35.7E	979997	979978	4870	336	328	-17	317	309	309	282	
	0520 54.2N 33.1E	979996	979979	4850	335	327	-16	316	308	308	282	
	0530 53.9N 31.0E	979995	979979	4870	331	317	-15	315	307	307	282	
	0540 53.6N 28.7E	979995	979980	4480	309	311	-18	297	299	299	280	
	0550 53.3N 26.3E	979994	979982	4430	306	307	-12	294	295	295	280	
	0600 53.0N 24.0E	979994	979988	4390	303	303	-6	297	297	297	280	
	0610 52.6N 21.6E	979993	979985	4340	299	299	-8	291	291	291	288	
	0620 52.3N 19.1E	979993	979989	4250	293	294	-4	289	290	290	288	
6808140000	0630 52.0N 16.7E	979992	979987	4190	289	290	-5	284	285	285	279	
	0640 51.6N 14.3E	979992	979982	4110	284	285	-10	274	283	283	279	
	0650 51.3N 11.9E	979991	979981	4030	279	281	-10	269	271	271	279	
	0700 51.0N 09.5E	979991	979983	4100	283	277	-8	275	269	269	267	
	0710 50.7N 07.1E	979990	979990	3960	273	270	0	273	270	270	257	
	0720 50.4N 04.7E	979989	979995	3700	255	259	6	261	265	265	254	
	0730 49.2N 02.7E	979988	980003	3360	232	249	15	247	264	264	240	
	0740 48.6N 00.5E	979988	980004	3400	235	243	16	251	259	259	235	
	0750 48.1N 162 58.2E	979987	980001	3370	233	240	14	247	254	254	225	

NO	DATE	Lat	Lon	t	g	NEP	Be	dcl	dcb	dcl	dcb	acg
6808101800	1810	05.9N 162	39.0E	799926 799950	2900	200	208	24	224	232	24	232
	1820	05.9N	39.1E	799926 799951	2810	194	206	25	219	231	25	231
	1830	05.9N	39.2E	799926 799952	2810	194	206	25	219	231	25	231
	1840	05.9N	39.3E	799926 799953	2810	194	206	25	219	231	25	231
	1850	05.9N	39.4E	799926 799954	2810	194	206	25	219	231	25	231
	1900	05.9N	39.5E	799926 799955	2810	194	206	25	219	231	25	231
	1910	05.9N	39.6E	799926 799956	2810	194	206	25	219	231	25	231
	1920	05.9N	39.7E	799926 799957	2810	194	206	25	219	231	25	231
	1930	05.9N	39.8E	799926 799958	2810	194	206	25	219	231	25	231
	1940	05.9N	39.9E	799926 799959	2810	194	206	25	219	231	25	231
6808110000	2000	05.9N	40.0E	799926 799960	2930	202	212	19	222	231	19	231
	2010	05.9N	40.1E	799926 799961	2930	202	212	19	222	231	19	231
	2020	05.9N	40.2E	799926 799962	2930	202	212	19	222	231	19	231
	2030	05.9N	40.3E	799926 799963	2930	202	212	19	222	231	19	231
	2040	05.9N	40.4E	799926 799964	2930	202	212	19	222	231	19	231
	2050	05.9N	40.5E	799926 799965	2930	202	212	19	222	231	19	231
	2100	05.9N	40.6E	799926 799966	2930	202	212	19	222	231	19	231
	2110	05.9N	40.7E	799926 799967	2930	202	212	19	222	231	19	231
	2120	05.9N	40.8E	799926 799968	2930	202	212	19	222	231	19	231
	2130	05.9N	40.9E	799926 799969	2930	202	212	19	222	231	19	231
6808120000	2200	05.9N	41.0E	799926 799970	2930	202	212	19	222	231	19	231
	2210	05.9N	41.1E	799926 799971	2930	202	212	19	222	231	19	231
	2220	05.9N	41.2E	799926 799972	2930	202	212	19	222	231	19	231
	2230	05.9N	41.3E	799926 799973	2930	202	212	19	222	231	19	231
	2240	05.9N	41.4E	799926 799974	2930	202	212	19	222	231	19	231
	2250	05.9N	41.5E	799926 799975	2930	202	212	19	222	231	19	231
	2300	05.9N	41.6E	799926 799976	2930	202	212	19	222	231	19	231
	2310	05.9N	41.7E	799926 799977	2930	202	212	19	222	231	19	231
	2320	05.9N	41.8E	799926 799978	2930	202	212	19	222	231	19	231
	2330	05.9N	41.9E	799926 799979	2930	202	212	19	222	231	19	231
6808130000	2400	05.9N	42.0E	799926 799980	2930	202	212	19	222	231	19	231
	2410	05.9N	42.1E	799926 799981	2930	202	212	19	222	231	19	231
	2420	05.9N	42.2E	799926 799982	2930	202	212	19	222	231	19	231
	2430	05.9N	42.3E	799926 799983	2930	202	212	19	222	231	19	231
	2440	05.9N	42.4E	799926 799984	2930	202	212	19	222	231	19	231
	2450	05.9N	42.5E	799926 799985	2930	202	212	19	222	231	19	231
	2500	05.9N	42.6E	799926 799986	2930	202	212	19	222	231	19	231
	2510	05.9N	42.7E	799926 799987	2930	202	212	19	222	231	19	231
	2520	05.9N	42.8E	799926 799988	2930	202	212	19	222	231	19	231
	2530	05.9N	42.9E	799926 799989	2930	202	212	19	222	231	19	231

Gravity Table 7. The Bismark plateau.

NO	DATE	LAT	LONG	F	G	DEP	B _a	B _b	Be	4C ₁	4C ₂	4C ₃	4C ₄
6008111400	159	36 50.7N	159 32.9E	9798004	9798897	4680	323	320	-17	306	303	290	290
1410	1410	36 44.4N	159 32.9E	9798003	9798896	4680	322	318	-17	306	301	294	294
1420	1420	36 40.4N	159 32.9E	9798002	9798895	4680	318	314	-14	304	302	297	297
1430	1430	36 40.4N	159 32.9E	9798001	9798894	4680	314	310	-12	302	301	297	297
1440	1440	36 40.4N	159 32.9E	9798000	9798893	4680	310	306	-14	298	296	299	299
1450	1450	36 40.4N	159 32.9E	9797999	9798892	4680	306	302	-14	294	293	299	299
1500	1500	36 40.4N	159 32.9E	9797998	9798891	4680	302	300	-8	297	295	300	300
1510	1510	36 40.4N	159 32.9E	9797997	9798890	4680	297	296	-9	288	287	307	307
1520	1520	36 40.4N	159 32.9E	9797996	9798889	4680	293	292	-9	284	283	311	311
1530	1530	36 40.4N	159 32.9E	9797995	9798888	4680	289	288	-8	283	281	305	305
1540	1540	36 40.4N	159 32.9E	9797994	9798887	4680	284	283	-6	283	281	305	305
1550	1550	36 40.4N	159 32.9E	9797993	9798886	4680	279	278	-6	283	281	305	305
1600	1600	36 40.4N	159 32.9E	9797992	9798885	4680	274	273	-4	270	273	302	302
1610	1610	36 40.4N	159 32.9E	9797991	9798884	4680	270	270	-4	270	273	302	302
1620	1620	36 40.4N	159 32.9E	9797990	9798883	4680	265	266	-1	261	271	306	306
1630	1630	36 40.4N	159 32.9E	9797989	9798882	4680	261	263	-1	260	264	306	306
1640	1640	36 40.4N	159 32.9E	9797988	9798881	4680	257	261	-3	254	258	306	306
1650	1650	36 40.4N	159 32.9E	9797987	9798880	4680	257	259	-3	254	256	304	304
1700	1700	36 40.4N	159 32.9E	9797986	9798879	4680	257	257	-3	254	254	309	309
1710	1710	36 40.4N	159 32.9E	9797985	9798878	4680	257	257	-3	254	254	309	309
1720	1720	36 40.4N	159 32.9E	9797984	9798877	4680	257	257	-3	254	254	309	309
1730	1730	36 40.4N	159 32.9E	9797983	9798876	4680	257	257	-3	254	254	309	309
1740	1740	36 40.4N	159 32.9E	9797982	9798875	4680	257	257	-3	254	254	309	309
1750	1750	36 40.4N	159 32.9E	9797981	9798874	4680	257	257	-3	254	254	309	309
1800	1800	36 40.4N	159 32.9E	9797980	9798873	4680	257	257	-3	254	254	309	309
1810	1810	36 40.4N	159 32.9E	9797979	9798872	4680	257	257	-3	254	254	309	309
1820	1820	36 40.4N	159 32.9E	9797978	9798871	4680	257	257	-3	254	254	309	309
1830	1830	36 40.4N	159 32.9E	9797977	9798870	4680	257	257	-3	254	254	309	309
1840	1840	36 40.4N	159 32.9E	9797976	9798869	4680	257	257	-3	254	254	309	309
1850	1850	36 40.4N	159 32.9E	9797975	9798868	4680	257	257	-3	254	254	309	309
1900	1900	36 40.4N	159 32.9E	9797974	9798867	4680	257	257	-3	254	254	309	309
1910	1910	36 40.4N	159 32.9E	9797973	9798866	4680	257	257	-3	254	254	309	309
1920	1920	36 40.4N	159 32.9E	9797972	9798865	4680	257	257	-3	254	254	309	309
1930	1930	36 40.4N	159 32.9E	9797971	9798864	4680	257	257	-3	254	254	309	309
1940	1940	36 40.4N	159 32.9E	9797970	9798863	4680	257	257	-3	254	254	309	309
1950	1950	36 40.4N	159 32.9E	9797969	9798862	4680	257	257	-3	254	254	309	309
2000	2000	36 40.4N	159 32.9E	9797968	9798861	4680	257	257	-3	254	254	309	309
2010	2010	36 40.4N	159 32.9E	9797967	9798860	4680	257	257	-3	254	254	309	309
2020	2020	36 40.4N	159 32.9E	9797966	9798859	4680	257	257	-3	254	254	309	309
2030	2030	36 40.4N	159 32.9E	9797965	9798858	4680	257	257	-3	254	254	309	309
2040	2040	36 40.4N	159 32.9E	9797964	9798857	4680	257	257	-3	254	254	309	309

DATE	NO	LAT	LON	F	C	DEP	Ba	Be	4Gr	4Gh	4Gv	NO	DATE	LAT	LON	F	C	DEP	Ba	Be	4Gr	4Gh	4Gv															
1046	671111	1130	01	04.5N	144	29.3E	978051	978045	4269	294	292	-	6	288	286	1106	671111	122210	49.0S	145	05.4E	978050	978091	1934	133	150	41	174	191									
1047	107111	1130	01	02.7N	140	30.3E	978051	978045	4269	292	292	294	-	288	286	1107	107111	222210	48.0S	145	06.9E	978050	978119	1964	137	148	69	206	174									
1048	1140	00.5N	141	00.8N	141	31.0E	978051	978056	4204	290	287	-	5	295	292	1108	1140	2230	49.4S	145	08.3E	978050	978095	1966	130	145	45	175	185									
1049	1150	00.5N	141	00.8N	141	31.0E	978051	978056	4134	290	282	12	287	294	294	1109	1150	2230	50.5S	145	10.8E	978050	978082	1968	133	135	32	145	168									
1050	1200	57.0N	54.0E	978050	978077	3684	254	277	27	281	304	1110	1200	57.0N	54.0E	978050	978077	3684	254	277	27	281	304	1110	1200	57.0N	54.0E	978050	978077	3684	254	277	27	281	304			
1051	1210	54.9N	34.5E	978050	978060	3999	276	278	10	286	288	1111	1210	54.9N	34.5E	978050	978060	3999	276	278	10	286	288	1111	1210	54.9N	34.5E	978050	978060	3999	276	278	10	286	288			
1052	1220	50.9N	35.1E	978050	978047	4079	282	280	-	277	277	1112	1220	50.9N	35.1E	978050	978047	4079	282	280	-	277	277	1112	1220	50.9N	35.1E	978050	978047	4079	282	280	-	277	277			
1053	1230	50.9N	35.1E	978050	978047	4074	281	281	-	278	278	1113	1230	50.9N	35.1E	978050	978047	4074	281	281	-	278	278	1113	1230	50.9N	35.1E	978050	978047	4074	281	281	-	278	278			
1054	1240	48.7N	35.1E	978050	978052	4054	280	280	2	282	282	1114	1240	48.7N	35.1E	978050	978052	4054	280	280	2	282	282	1114	1240	48.7N	35.1E	978050	978052	4054	280	280	2	282	282			
1055	1250	46.7N	35.6E	978050	978046	4059	280	280	-	276	276	1115	1250	46.7N	35.6E	978050	978046	4059	280	280	-	276	276	1115	1250	46.7N	35.6E	978050	978046	4059	280	280	-	276	276			
1056	1300	44.6N	37.1E	978050	978044	4059	280	279	-	6	274	273	1116	1300	44.6N	37.1E	978050	978044	4059	280	279	-	6	274	273	1116	1300	44.6N	37.1E	978050	978044	4059	280	279	-	6	274	273
1057	1310	42.6N	37.6E	978050	978048	4049	279	278	-	6	277	277	1117	1310	42.6N	37.6E	978050	978048	4049	279	278	-	6	277	277	1117	1310	42.6N	37.6E	978050	978048	4049	279	278	-	6	277	277
1058	1320	40.5N	38.1E	978050	978044	3994	275	275	-	6	267	267	1118	1320	40.5N	38.1E	978050	978044	3994	275	275	-	6	267	267	1118	1320	40.5N	38.1E	978050	978044	3994	275	275	-	6	267	267
1059	1330	38.1N	39.1E	978050	978044	3994	275	275	-	6	267	267	1119	1330	38.1N	39.1E	978050	978044	3994	275	275	-	6	267	267	1119	1330	38.1N	39.1E	978050	978044	3994	275	275	-	6	267	267
1060	1340	36.6N	39.1E	978050	978051	3924	271	269	1	272	270	1120	1340	36.6N	39.1E	978050	978051	3924	271	269	1	272	270	1120	1340	36.6N	39.1E	978050	978051	3924	271	269	1	272	270			
1061	1350	34.6N	39.3E	978050	978049	3744	258	264	-	1	257	263	1121	1350	34.6N	39.3E	978050	978049	3744	258	264	-	1	257	263	1121	1350	34.6N	39.3E	978050	978049	3744	258	264	-	1	257	263
1062	1400	32.6N	40.0E	978050	978040	3679	254	259	-	9	245	250	1122	1400	32.6N	40.0E	978050	978040	3679	254	259	-	9	245	250	1122	1400	32.6N	40.0E	978050	978040	3679	254	259	-	9	245	250
1063	1410	30.6N	40.5E	978050	978053	3599	248	255	1	249	256	1123	1410	30.6N	40.5E	978050	978053	3599	248	255	1	249	256	1123	1410	30.6N	40.5E	978050	978053	3599	248	255	1	249	256			
1064	1420	28.3N	41.0E	978049	978054	3599	248	255	1	249	256	1124	1420	28.3N	41.0E	978049	978054	3599	248	255	1	249	256	1124	1420	28.3N	41.0E	978049	978054	3599	248	255	1	249	256			
1065	1430	26.3N	41.3E	978049	978054	3569	246	251	5	251	256	1125	1430	26.3N	41.3E	978049	978054	3569	246	251	5	251	256	1125	1430	26.3N	41.3E	978049	978054	3569	246	251	5	251	256			
1066	1440	24.4N	42.0E	978049	978053	3529	243	249	4	247	253	1126	1440	24.4N	42.0E	978049	978053	3529	243	249	4	247	253	1126	1440	24.4N	42.0E	978049	978053	3529	243	249	4	247	253			
1067	1450	22.4N	43.5E	978049	978053	3459	239	248	3	240	249	1127	1450	22.4N	43.5E	978049	978053	3459	239	248	3	240	249	1127	1450	22.4N	43.5E	978049	978053	3459	239	248	3	240	249			
1068	1500	20.4N	45.0E	978049	978052	3514	242	248	3	245	251	1128	1500	20.4N	45.0E	978049	978052	3514	242	248	3	245	251	1128	1500	20.4N	45.0E	978049	978052	3514	242	248	3	245	251			
1069	1510	18.4N	43.5E	978049	978045	3559	244	250	-	8	240	246	1129	1510	18.4N	43.5E	978049	978045	3559	244	250	-	8	240	246	1129	1510	18.4N	43.5E	978049	978045	3559	244	250	-	8	240	246
1070	1520	16.3N	44.0E	978049	978041	3614	249	253	-	8	241	245	1130	1520	16.3N	44.0E	978049	978041	3614	249	253	-	8	241	245	1130	1520	16.3N	44.0E	978049	978041	3614	249	253	-	8	241	245
1071	1530	14.3N	44.5E	978049	978038	3674	254	255	-	11	247	251	1131	1530	14.3N	44.5E	978049	978038	3674	254	255	-	11	247	251	1131	1530	14.3N	44.5E	978049	978038	3674	254	255	-	11	247	251
1072	1540	12.3N	45.0E	978049	978037	3704	256	258	-	12	244	246	1132	1540	12.3N	45.0E	978049	978037	3704	256	258	-	12	244	246	1132	1540	12.3N	45.0E	978049	978037	3704	256	258	-	12	244	246
1073	1550	10.3N	45.5E	978049	978040	3719	257	259	-	8	249	251	1133	1550	10.3N	45.5E	978049	978040	3719	257	259	-	8	249	251	1133	1550	10.3N	45.5E	978049	978040	3719	257	259	-	8	249	251
1074	1600	08.3N	46.0E	978049	978047	3749	259	260	-	12	247	248	1134	1600	08.3N	46.0E	978049	978047	3749	259	260	-	12	247	248	1134	1600	08.3N	46.0E	978049	978047	3749	259	260	-	12	247	248
1075	1610	06.3N	46.5E	978049	978038	3784	259	262	-	11	247	251	1135	1610	06.3N	46.5E	978049	978038	3784	259	262	-	11	247	251	1135	1610	06.3N	46.5E	978049	978038	3784	259	262	-	11	247	251
1076	1620	04.3N	47.1E	978049	978039	3794	261	264	-	10	251	254	1136	1620	04.3N	47.1E	978049	978039	3794	261	264	-	10	251	254	1136	1620	04.3N	47.1E	978049	978039	3794	261	264	-	10	251	254
1077	1630	02.4N	47.5E	978049	978040	3829	264	265	-	9	255	258	1137	1630	02.4N	47.5E	978049	978040	3829	264	265	-	9	255	258	1137	1630	02.4N	47.5E	978049	978040	3829	264	265	-	9	255	258
1078	1640	00.7S	48.1E	978049	978040	3819	264	267	-	9	255	258	1138	1640	00.7S	48.1E	978049	978040	3819	264	267	-	9	255	258	1138	1640	00.7S	48.1E	978049	978040	3819	264	267	-	9	255	258
1079	1650	03.1S	48.7E	978049	978037	3854	266	269	-	12	254	257	1139	1650	03.1S	48.7E	978049	978037	3854	266	269	-	12	254	257	1139	1650	03.1S	48.7E	978049	978037	3854	266	269	-	12	254	257
1080	1700	03.4S	49.2E	978049	978040	3939	272	271	9	263	262	1140	1700	03.4S	49.2E	978049	978040	3939	272	271	9	263	262	1140	1700	03.4S	49.2E	978049	978040	3939	272	271	9	263	262			
1081	1710	05.4S	49.7E	978049	978038	3954	273	275	-	11	262	262	1141	1710	05.4S	49.7E	978049	978038	3954	273	275	-	11	262	262	1141	1710	05.4S	49.7E	978049	978038	3954	273	275	-	11	262	262
1082	1720	08.3S	50.2E	978049	978035	3964	274	276	-	14	260	262	1142	1720	08.3S	50.2E	978049	978035	3964	274	276	-	14	260	262	1142	1720	08.3S	50.2E	978049	978035	3964	274	276	-	14	260	262
1083	1730	10.3S	50.8E	978049	978033	4049	279	278	-	16	263	262</																										

NO	DATE	LAT	LONG	P	C	B ₁	B ₂	ΔC ₁	ΔC ₂	ΔC ₃	ΔC ₄
1166	6711150910	02 36.15	145 53.32E	788060	788116	1229	85	91	56	141	147
1167	0920	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1168	0930	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1169	0940	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1170	0950	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1171	1000	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1172	1010	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1173	1020	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1174	1030	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1175	1040	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1176	1050	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1177	1100	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1178	1110	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1179	1120	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1180	1130	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1181	1140	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1182	1150	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1183	1200	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1184	1210	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1185	1220	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1186	1230	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1187	1240	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1188	1250	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1189	1300	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1190	1310	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1191	1320	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1192	1330	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1193	1340	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1194	1350	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1195	1400	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1196	1410	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1197	1420	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1198	1430	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1199	1440	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1200	1450	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1201	1500	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1202	1510	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1203	1520	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1204	1530	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1205	1540	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1206	1550	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1207	1600	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1208	1610	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1209	1620	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1210	1630	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1211	1640	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1212	1650	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1213	1700	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1214	1710	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1215	1720	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1216	1730	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1217	1740	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1218	1750	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1219	1800	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1220	1810	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1221	1820	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1222	1830	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1223	1840	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1224	1850	36.15	53.32E	788060	788116	1229	85	91	56	141	147
1225	1900	36.15	53.32E	788060	788116	1229	85	91	56	141	147

NO	DATE	LAT	LONG	F	G	DEP	Ba	Bc	dGr	dGb	dGr	dGb	dGr	dGb									
1286	6711160610	06 04.45	147 55.8E	778107	778035	1334	92	103	-72	20	31	1346	6711161820	07 17.95	149 44.5E	778132	778114	4764	329	345	-18	311	327
1287	0620	05.35	57.7E	778107	778044	1349	93	105	-63	30	42	1347	1830	1830	48.3E	778132	778114	4764	329	345	-18	311	327
1288	0630	06.30	57.7E	778107	778044	1349	93	105	-63	30	42	1347	1830	1830	48.3E	778132	778114	4764	329	345	-18	311	327
1289	0640	06.40	57.7E	778107	778044	1349	93	105	-63	30	42	1347	1830	1830	48.3E	778132	778114	4764	329	345	-18	311	327
1290	0650	06.50	57.7E	778107	778044	1349	93	105	-63	30	42	1347	1830	1830	48.3E	778132	778114	4764	329	345	-18	311	327
1291	0700	07.00	09.75	05.0E	778108	778026	1859	128	136	-82	46	54	2030	2030	55.8E	778135	778129	4919	339	336	-6	323	330
1292	0710	11.05	06.9E	778109	778028	1989	137	143	-81	56	62	1352	2040	2040	55.8E	778135	778118	4894	338	336	-6	323	330
1293	0720	12.35	08.9E	778109	778025	2014	139	147	-84	55	63	1353	2050	2050	55.8E	778135	778118	4894	338	336	-6	323	330
1294	0730	13.65	10.8E	778110	778022	2014	139	147	-84	55	63	1353	2050	2050	55.8E	778135	778118	4894	338	336	-6	323	330
1295	0740	14.95	12.7E	778110	778022	2014	139	147	-84	55	63	1353	2050	2050	55.8E	778135	778118	4894	338	336	-6	323	330
1296	0750	16.25	14.7E	778110	778027	1939	134	148	-78	58	70	1355	2110	2110	50.8E	778137	778106	4869	336	334	-31	305	303
1297	0800	17.55	16.6E	778111	778014	1899	131	159	-97	34	62	1356	2120	2120	03.6E	778137	778097	4909	339	334	-40	299	294
1298	0810	18.85	18.5E	778111	777989	2179	150	162	-122	28	60	1357	2130	2130	07.5E	778138	778103	4929	340	335	-35	305	300
1299	0820	20.15	20.5E	778112	777966	2799	153	216	-146	47	70	1359	2150	2150	09.0E	778138	778095	4939	341	335	-43	298	292
1300	0830	21.45	22.4E	778112	777937	3704	156	233	-175	81	78	1360	2200	2200	10.5E	778139	778090	4964	343	335	-49	294	286
1301	0840	22.75	24.3E	778113	777912	4239	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1302	0850	24.05	26.2E	778113	777882	4509	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1303	0900	25.35	28.0E	778113	777887	4739	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1304	0910	26.65	30.0E	778114	777881	4889	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1305	0920	27.95	31.9E	778114	777878	5014	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1306	0930	29.05	33.7E	778115	777876	5159	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1307	0940	30.35	35.5E	778115	777872	5284	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1308	0950	31.65	37.2E	778115	777868	5409	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1309	1000	32.95	39.0E	778116	777863	5499	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1310	1010	34.05	41.4E	778116	777858	5504	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1311	1020	35.35	43.7E	778117	777887	5444	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1312	1030	36.75	45.9E	778117	777890	5009	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1313	1040	38.05	48.1E	778119	777893	4849	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1314	1050	39.35	50.4E	778119	777908	4639	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1315	1100	40.65	52.6E	778119	777913	4374	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1316	1110	41.95	54.9E	778120	777924	4364	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1317	1120	43.25	57.1E	778120	777928	4469	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1318	1130	44.55	59.4E	778121	777937	4314	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1319	1140	45.85	61.7E	778121	777944	4339	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1320	1150	47.15	64.0E	778122	777960	4094	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1321	1200	48.45	66.3E	778122	777971	3634	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1322	1210	49.75	68.6E	778122	777972	3594	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1323	1220	51.05	70.9E	778123	777984	3704	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1324	1230	52.35	73.2E	778123	777984	3704	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1325	1240	53.65	75.5E	778123	777983	3954	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1326	1250	54.95	77.8E	778124	777974	4564	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1327	1300	56.25	80.1E	778124	777974	4564	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1328	1310	57.55	82.4E	778125	777973	5309	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1329	1320	58.85	84.7E	778125	777973	5624	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1330	1330	60.15	87.0E	778125	777973	6050	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1331	1340	61.45	89.3E	778126	777975	6509	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1332	1350	62.75	91.6E	778126	777975	6509	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1333	1400	64.05	93.9E	778127	777970	6524	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1334	1410	65.35	96.2E	778127	777970	6524	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1335	1420	66.65	98.5E	778127	777970	6524	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1336	1430	67.95	100.8E	778127	777970	6524	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1337	1440	69.25	103.1E	778128	778004	6554	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1338	1450	70.55	105.4E	778128	778004	6554	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1339	1500	71.85	107.7E	778129	778025	6479	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1340	1510	73.15	110.0E	778129	778036	6269	161	241	-201	90	80	1361	2210	2210	14.2E	778139	778090	4984	344	335	-49	294	286
1341	1520	74.45	112.3E	778130	778038	6059	161	241	-201	90	80	1361	2210	2210									

NO	DATE	LAT	LONG	F	G	DEP	Ba	Be	4Cf	4Cb	4Cv	4Cv
5446	6802052010	03 47.55	150 02.3E	978072	978166	2029	138	138	94	232	232	232
5447	6802052020	03 48.25	149 00.7E	978071	978155	2024	139	146	84	232	230	230
5448	6802052030	04 48.85	149 59.1E	978071	978146	2294	158	155	75	233	230	230
5449	6802052040	04 49.15	149 57.0E	978071	978136	2294	158	155	75	233	230	230
5450	6802052050	04 49.15	149 56.0E	978070	978148	2044	141	150	78	219	226	226
5451	2100	40.75	54.4E	978070	978148	1874	129	148	78	207	226	226
5452	2110	39.45	52.9E	978070	978150	2389	164	161	80	244	241	241
5453	2120	38.05	51.4E	978070	978147	2434	167	168	77	244	245	245
5454	2130	36.75	49.9E	978069	978145	2534	174	170	76	250	246	246
5455	2140	35.45	48.4E	978069	978141	2444	168	168	72	240	240	240
5456	2150	34.05	46.9E	978069	978137	2404	151	164	68	219	232	232
5457	2200	32.75	45.4E	978069	978130	2404	165	167	61	226	228	228
5458	2210	31.45	43.9E	978069	978126	2439	168	171	57	225	228	228
5459	2220	30.15	42.5E	978068	978128	2534	174	175	60	234	235	235
5460	2230	28.85	41.0E	978068	978128	2614	180	177	60	240	237	237
5461	2240	27.55	39.5E	978068	978123	2579	177	177	55	232	231	231
5462	2250	26.25	38.1E	978067	978123	2404	165	172	56	221	228	228
5463	2300	24.95	36.6E	978067	978123	2419	166	170	56	222	226	226
5464	2310	23.65	35.2E	978067	978123	2414	166	169	56	222	225	225
5465	2320	22.35	33.7E	978067	978123	2409	166	169	56	222	225	225
5466	2330	21.05	32.3E	978067	978115	2409	166	168	48	214	216	216
5467	2340	19.75	30.8E	978066	978115	2259	155	161	51	206	212	212
5468	2350	18.45	29.4E	978066	978113	2264	162	164	49	205	211	211
5469	0010	17.15	28.0E	978066	978113	2344	161	164	53	214	217	217
5470	0020	15.85	26.6E	978066	978112	2344	161	164	46	207	210	210
5471	0030	14.55	25.1E	978066	978116	2334	161	163	53	214	216	216
5472	0040	13.25	23.7E	978066	978116	2259	155	161	51	206	212	212
5473	0050	11.95	22.3E	978066	978113	2294	158	160	38	192	198	198
5474	0100	10.65	20.9E	978065	978109	2204	152	158	44	196	202	202
5475	0110	09.35	19.3E	978065	978109	2204	152	158	44	196	202	202
5476	0120	08.05	17.9E	978064	978114	2229	153	158	50	203	208	208
5477	0130	06.75	16.5E	978064	978116	2224	153	157	52	205	209	209
5478	0140	05.45	15.1E	978064	978126	2214	152	158	62	214	220	220
5479	0150	04.15	13.7E	978064	978119	2274	156	159	55	211	214	214
5480	0200	02.85	12.4E	978064	978117	2284	157	158	53	210	211	211
5481	0210	01.55	11.0E	978063	978128	2184	150	152	65	215	217	217
5482	0220	00.25	09.6E	978063	978130	2194	151	153	67	218	220	220
5483	0230	59.25	08.1E	978063	978123	2284	151	162	60	217	222	222
5484	0240	57.95	06.7E	978063	978123	2284	151	162	60	217	222	222
5485	0250	56.65	05.2E	978063	978117	2254	176	167	54	230	221	221
5486	0300	55.35	03.8E	978062	978114	2224	163	164	52	205	216	216
5487	0310	54.05	02.3E	978062	978109	2259	162	165	47	209	212	212
5488	0320	52.75	00.9E	978062	978108	2394	165	167	46	211	213	213
5489	0330	51.45	59.4E	978062	978104	2419	166	168	42	208	210	210
5490	0340	50.15	58.0E	978062	978110	2414	166	168	48	214	216	216
5491	0350	48.85	56.6E	978061	978112	2374	163	167	51	214	218	218
5492	0400	47.55	55.1E	978061	978111	2379	164	167	50	214	217	217
5493	0410	46.25	53.7E	978061	978115	2244	164	165	58	212	221	221
5494	0420	44.95	52.3E	978061	978113	2294	168	163	52	210	215	215
5495	0430	43.65	50.8E	978061	978113	2294	168	163	52	210	215	215
5496	0440	42.35	49.4E	978061	978122	2319	160	165	61	221	226	226
5497	0450	41.05	47.9E	978060	978107	2374	163	168	47	210	215	215
5498	0500	39.75	46.5E	978060	978113	2444	168	171	53	221	224	224
5499	0510	38.45	45.0E	978060	978105	2534	174	175	45	219	220	220
5500	0520	37.15	43.6E	978060	978104	2539	177	177	44	221	221	221
5501	0530	35.85	42.3E	978060	978095	2539	175	177	35	210	212	212
5502	0540	34.55	40.9E	978059	978106	2549	175	177	47	222	224	224
5503	0550	33.25	39.5E	978059	978104	2559	176	177	47	222	224	224
5504	0600	31.95	38.2E	978059	978104	2514	173	174	45	218	219	219
5505		30.65	36.8E	978059	978108	2354	162	172	49	211	221	221