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DEPARTMENT OF  
MINERALS AND ENERGY



BUREAU OF MINERAL RESOURCES,  
GEOLOGY AND GEOPHYSICS

Record 1973/4

017727

PORT MORESBY GEOPHYSICAL OBSERVATORY,  
ANNUAL REPORT  
1971

by

I.D. Ripper and B. Gaull



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ANNUAL REPORT

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I.D. Ripper and B. Gaul1

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## SUMMARY

Standard observatory programs in geomagnetism, seismology, and ionospheric recording at Port Moresby were continued through 1971. The networks of seismograph and accelerograph stations were expanded by the addition of seismographs at Kavieng and Pomio, and accelerographs at Lae, Rabaul, Frieda River, and Star Mountains. The rapid-run magnetograph was withdrawn from operation in October.

The level of seismicity in 1971 was high, and three magnitude M8 earthquakes occurred in the New Guinea-Solomon Islands region. Several others were felt with Modified Mercalli intensities of VII or more.

## 1. INTRODUCTION

The Bureau of Mineral Resources, Geology & Geophysics (BMR) opened a geophysical observatory at Port Moresby in 1957 (Observatory Staff, 1965). The program of investigations was restricted initially to geomagnetic and seismological work at Port Moresby, but it has been enlarged subsequently. Appendix I is a summary of principal events in the history of the observatory; detailed annual accounts of operations to 1970 may be found in BMR Records by several authors.

This report describes the activities during the year 1971. In addition to geomagnetic, ionospheric, and seismological work at Port Moresby, networks of seismograph and accelerograph stations were maintained, the latter in conjunction with other government and private agencies.

Although scientific results and investigations will be reported separately, a brief discussion of regional seismicity, and a list of all well recorded earthquakes, are given herein.

## 2. STAFF AND VISITORS

Tables 1 and 2 give details of staff during 1971. Until June Papua New Guineans worked at the Observatory as casual employees. On 1 July all PNG employees, except one who was ineligible, were admitted into the Papua New Guinea Public Service, with seniority back-dated to the dates of initial employment. The number of man-days spent by staff on official visits to other Papua New Guinea centres were: Lae 5; Goroka 7; Ramu 5; Talasea 4; Wabag 10; Wewak 2; Frieda River 3; Vanimo 1; Rabaul 8; Momote 5; Kavieng 7; Pomio 10; Hoskins 1; survey of southeast Papua New Guinea airstrips (for Regional Structural Surveys Group) 5; (total 73). The Observer-in-Charge visited Canberra HQ for the annual planning meeting in August.

Table 3 lists visitors to the Observatory during 1971.

## 3. SEISMOLOGY

Table 4 lists the co-ordinates, and Plate 1 shows the positions, of the seismograph stations operated by the observatory in Papua New Guinea during 1971; the instruments used are also listed in the Table. It had been planned to install a seismograph at Talasea, but although the buildings were completed early in the year instruments were not immediately available; later in the year most of the instruments were needed at Pomio (see below). Thus no recordings were made at Talasea in 1971.

### Recording stations

Port Moresby (PMG). Routine recording on the Port Moresby World Wide Standardised Seismograph (WWSS) continued and regular calibration checks were made. The supplementary Willmore, Sprengnether, and Wood

Anderson seismographs continued to operate: as stand-by instruments to the WWSS; for strong ground motion recording; and for magnitude determinations. A tape-recording seismograph was operated for the Department of Terrestrial Magnetism (Carnegie Institution of Washington).

Konedobu (KDB). This station operated whenever instruments were available in the office laboratory. Recordings were used for immediate visual monitoring of earthquake activity; results were not reported in the seismic bulletins.

Goroka (GKA). The ER230 pen recorder was moved into the new Science building of the Teachers' College, and the seismometer moved to a new pit on 28 January. The recorder was returned to Port Moresby in February and March for overhaul. Considerable record was lost in May when the seismometer became open-circuited, and in October and November when the timing was uncertain and the seismometer jammed. The station closed on 25 November for two months as there was no station operator available during the college vacation.

Laetech (LAT). The station was operated by personnel of the Institute of Technology in Lae. Breakdowns of the NCD2 power supply and timing unit caused minor record loss.

Momote (MOM). The Momote station on Manus Island was operated by personnel of the Commonwealth Bureau of Meteorology. Generally the station performance was good. A loss of sensitivity in the vertical component in April was corrected by the operator. The Wood-Anderson suspension broke in the middle of a record (28 June), and after replacement of the suspension, proper operation could not be restored for the rest of the year owing to drifting of the trace. Some vertical-component record was lost in July, when the recording drum jammed. This was repaired on 26 July, but further jamming caused record losses until the fault was repaired by the operator in September. A timing fault caused some record loss in August.

Wabag (WAB). An inadequate power supply was the main source of malfunction during the year. This was brought about by (a) Honda generator failure, (b) battery breakdown, and (c) mains power failure. The station observer, D. Kepalan, visited Port Moresby during May and June for a refresher course and he was relieved by R. Lamond. The station was closed for one month from 15 December when an EMI power-supply failure could not be repaired and a spare was unavailable. The observer took his annual leave at this time.

Kavieng (KAV). Installation of the station began on 29 July at the Tigrak Agricultural Station, but the condition of the ER230 pen recorder (which had been stored at Kavieng pending installation) had deteriorated, so the recorder was returned to Port Moresby. After renovation the recorder was reinstalled and the station began operation on 24 August; records were changed by a local resident.

Pomio (PNB). The Pomio (west New Britain) seismograph was installed on 6 August to provide a temporary station close to the aftershocks after the large north Solomon Sea earthquakes of 14 and 26 July. Records were changed by a local resident. Apart from a short period in November when the EMI power unit developed a fault, the station operated reliably.

### Accelerograph network

Information on the MO2 accelerographs operating in Papua New Guinea is listed in Table 5, and the instrument sites are shown in Plate 1. During the year, observatory personnel installed accelerographs at Lae (Commonwealth Department of Works yard and the Forest Department, Division of Botany building), at Frieda River, and at Rabaul observatory. Advice was given on the installation of accelerographs, one at Star Mountains and a second at Frieda River.

In March, the Ramu Intake accelerograph was returned to Port Moresby for overhaul, as it had not triggered at the Intake site. The block mirrors were out of alignment and the block (163) was replaced by block 425. After cleaning, and removal of the green disc which obscured the baseline mirror, block 163 was installed in the Rabaul Sulphur Creek instrument (with the north and vertical trace positions reversed). The removed block (165) had been operating with only the north trace visible.

The 13 earthquakes which triggered accelerographs in 1971 are listed in Table 6.

### Collection and distribution of data

Analyses of all seismograms were carried out at the observatory office, Port Moresby. Records were airmailed daily from the seismograph stations. P-wave arrival times were telegraphed to the United States Environmental Research Laboratories, ERL (previously CGS and NOS). Weekly bulletins listed all seismic analyses. Phase data were transcribed onto card punch forms, which were sent to BMR Canberra for processing and for the preparation of a consolidated magnetic tape for the International Seismological Centre (ISC) in Edinburgh.

Table 7 lists the monthly number of seismic events recorded by each station. About 13 700 P arrivals were recorded by the network, compared with 9200 in 1970 and 7600 in 1969. The increase was due primarily to the large number of aftershocks which followed the major earthquakes in the north Solomon Sea region in July.

Felt effects and ERL hypocentres were entered on the storage and retrieval computer file held at the computer centre, Port Moresby. Accelerograms were forwarded to BMR Canberra for digitization and analysis (Denham & Small, 1971).

The eight earthquakes for which intensity questionnaires were distributed are listed in Table 8.

### 1971 seismicity, New Guinea and Solomon Islands

Earthquakes in the New Guinea-Solomon Islands region for which ERL used 15 or more stations to compute the hypocentres are listed in Table 9. Plate 2 shows the epicentres of all events with magnitude M6 and over. In Table 9 the body wave magnitudes are those published by ERL, Richter magnitudes ML are derived from stations of the observatory network and the Rabaul Volcanological Observatory, and surface wave magnitudes MS are derived from ERL, Pasadena, and Berkeley bulletins. Magnitudes have been converted to unified values (M) on the surface wave magnitude scale to conform with the recommendations of the IASPEI committee on magnitudes.

Three major earthquakes occurred in the New Guinea region during 1971. The first, of magnitude M8.0, occurred on 10 January in West Irian, and damage reports of the earthquake were sketchy. In Papua New Guinea, near the West Irian border, the earthquake was felt at intensity MM7. Two M8 earthquakes occurred about 100 km apart in the north Solomon Sea on 14 and 26 July. On southern New Ireland and the eastern part of the Gazelle Peninsula intensities of at least MM8 were experienced during both earthquakes. Tsunamis were generated by both earthquakes, and damage occurred in Rabaul Harbour, southern New Ireland (Metlik plantation), and southeast New Britain (Wide Bay area) (Everingham, in prep., b).

Other notable seismic events were:

| Date<br>1971 | Magnitude<br>(M) | Region                                                     | Maximum<br>Intensity (MM) |
|--------------|------------------|------------------------------------------------------------|---------------------------|
| 25 Jan       | 6.3              | D'Entrecasteaux Islands                                    | 5                         |
| 12 Feb       | 6.0              | 70 km northwest of Lae                                     | 7                         |
| 13 Mar       | 6.5              | Goroka                                                     | 6                         |
| 10 Jul       | 5.5              | Mount Hagen                                                | 6                         |
| 19 Jul       | 6.0              | 15 km east of Hoskins                                      | 8                         |
| 23 Aug       | 6.0              | Bismarck Sea, 50 km south<br>of Bismarck Seismic Lineation | 5                         |
| 25 Sep       | 6.9              | Finschhafen                                                | 7                         |
| 28 Oct       | 6.6              | North Solomon Sea                                          | 6                         |

Torrential rain apparently caused a landslide near Tifalmin (West Sepik) on 20 March, in which 7 people were killed; however, shaking from the West Irian earthquake on 10 January could have contributed.

#### 4. GEOMAGNETISM

##### Normal-run magnetograph

The La Cour 15 mm/hr magnetograph continued to record variations in geomagnetic horizontal intensity, vertical intensity, and declination at Port Moresby.

Seventy-seven hours' record was lost owing to: the clutch being disengaged (58 hours); the power cable being accidentally cut by Posts and Telegraphs and burnt by a grass fire (13 hours); operator mistakes (6 hours).

Control observations. A set of absolute observations was made once a week. The QHM magnetometers used for H control observations were intercompared with standard QHM's in May, August, and December. The results of the intercomparisons are shown in Table 10. The BMZ 68 was dismantled and cleaned in October to eliminate occasional spurious readings. The preliminary instrument corrections used in the calculation of all preliminary results are shown in Table 11.

Temperature coefficients. Coefficients of 10 gammas/ $^{\circ}$ C and 0 gammas/ $^{\circ}$ C were applied to H and Z magnetogram ordinates respectively throughout the year. The temperature ranged from 28.6 $^{\circ}$ C to 31.6 $^{\circ}$ C.

Scale values. H and Z scale values were measured weekly and D was measured monthly using coil currents of 6 mA and 10 mA. Adopted scale values and standard deviations are shown in Table 12.

Baseline values. The H baseline values continued to drift downward, requiring one-gamma steps in adopted values about every five days. On 9 February, the trace was recentred by rotation of the torsion head, resulting in a change in adopted baseline value of 63 gammas. The D baseline value showed only small fluctuations about the mean. The Z baseline value increased by about one gamma per month in the second half of the year.

##### Rapid-run magnetograph

The La Cour 180 mm/hr magnetograph operated until 11 October when it was dismantled for despatch to Canberra, where it was intended to be used in a co-operative Australian-USSR conjugate-point project. Requests for results from this instrument had been rare and it was considered that cessation of recording would be of no consequence. Record loss in all components amounted to three days, owing to: a faulty translational mechanism (2 days); an operator mistake (one day). In addition, four days of H were lost when the magnet flipped and the fibre unwound. Four scale-value tests were carried out, and the adopted scale values are shown in Table 12.

##### Data reduction and distribution

Adopted scale and baseline values were sent with the 35-mm magnetogram copies to World Data Centre A, and with the magnetograms to BMR Observatory Group Canberra for the Mean Hourly Value derivation program.

Recorded solar flare effects, sudden commencements, sudden impulses, storms, and pulsations were reported monthly to the Data Centre and to other international agencies.

Monthly mean values (1971) of H, D, Z and the K-index at Port Moresby are listed in Table 13; H continued to decrease steadily at a rate of about 25 gammas/yr, while Z continued to increase in magnitude at about 30 gammas/yr; D continued its easterly trend of 1'/yr. Table 14 gives the annual mean values for the 11-year period 1961-1971 of all components.

## 5. IONOSPHERICS

The performance of the ionosonde improved in 1971, and there were only minor record losses in the period January to October; however, breakdowns in the power supply and variable-frequency oscillator caused major record losses in November and December (35 days).

Ionospheric characteristics scaled during 1971 were fmin, fEs, fbEs, fof2, (M3000)F2, fx(I), and (M3000)I.

## 6. REPORTS, PAPERS, AND PROJECTS

First drafts of reports were completed on: the Madang earthquake sequence of October and November 1970 (Everingham, in prep., a); the north Solomon Sea earthquake sequence of July, 1971 (Everingham, in prep., b); a discussion of earthquake magnitude scales (McGregor & Ripper, in prep.); and the 1970 Port Moresby annual report (Ripper & Smith, 1972).

Research continued on focal mechanisms of New Guinea earthquakes, historical New Guinea earthquakes, west Australian seismicity, tsunamis in the New Guinea region, and earthquake risk in major Papua New Guinea centres.

## 7. NOTES ON OPERATIONS

- |                  |                                                                                                                                                                                                                                         |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>January</u>   | Talasea seismic station was officially handed over by Commonwealth Department of Works (12th).                                                                                                                                          |
| <u>June</u>      | <p>(a) The Australian Broadcasting Commission commenced broadcasting hourly time pips supplied via land line from an NCD2 timing unit at the Observatory office (28th).</p> <p>(b) A Sprengnether pen recorder was received (30th).</p> |
| <u>September</u> | A visual seismic pen recorder was improvised, using a photo-drum and a spare Sprengnether pen unit.                                                                                                                                     |
| <u>October</u>   | I.B. Everingham obtained the loan of historical earthquake felt reports from Riverview Observatory.                                                                                                                                     |

8. ACKNOWLEDGEMENTS

The co-operation of the Commonwealth Bureau of Meteorology and Departments of Works and Civil Aviation, the Institute of Technology, the Goroka Teachers' College, the Rabaul Observatory, the Division of District Administration, the Department of Forests, Kennecott Pacific Pty Ltd, and Carpentaria Exploration Company in the operation and maintenance of the seismic and accelerograph network is gladly acknowledged.

9. REFERENCES

- DENHAM, D., & SMALL, G.R., 1971 - Strong motion data centre: Bureau of Mineral Resources, Canberra. Bull. N.Z. Soc. Equake Engng, 4(1).
- EVERINGHAM, I.B., in prep., a - Seismological report on the Madang earthquake (31 October, 1970) and aftershocks. Bur. Miner. Resour. Aust. Rep.
- EVERINGHAM, I.B., in prep., b - On aftershocks, isoseismals and fault plane solutions of the major north Solomon Sea earthquakes of July 14 and 26 1971. Bur. Miner. Resour. Aust. Rec.
- MCGREGOR, P.M., & RIPPER, I.D., in prep. - Notes on Earthquake Magnitude Scales. Bur. Miner. Resour. Aust. Rec.
- OBSERVATORY STAFF, 1965 - Port Moresby Geophysical Observatory Annual Report 1962. Bur. Miner. Resour. Aust. Rec. 1965/45 (unpubl.).
- RIPPER, I.D., & SMITH, R.S., 1972 - Port Moresby Geophysical Observatory Annual Report 1970. Bur. Miner. Resour. Aust. Rec. 1972/90 (unpubl.).

## APPENDIX I

### PRINCIPAL EVENTS, PORT MORESBY GEOPHYSICAL OBSERVATORY, 1957-1971

|                       |                                                                                              |
|-----------------------|----------------------------------------------------------------------------------------------|
| 1957 Mar.             | Regular absolute observations (D, H, Z) commenced.                                           |
| 1957 Dec.             | PMG seismograph recording commenced.                                                         |
| 1958 Mar.             | Normal-run geomagnetic recording commenced.                                                  |
| 1959 Oct. - 1971 Oct. | Rapid-run geomagnetic recording.                                                             |
| 1961 May              | Ionospheric recording commenced.                                                             |
| 1962 - 1963           | Regional magnetic survey.                                                                    |
| 1962 - Jul.           | WWSS system installed at PMG.                                                                |
| 1964 Jan.             | Gravity calibration range established in Port Moresby.                                       |
| 1964 Nov. - 1966 Dec. | TPN LP-Z seismograph operation.                                                              |
| 1964 Dec. - 1965 Dec. | POP LP-Z seismograph operation.                                                              |
| 1965 Dec. - 1967 Mar. | KRG LP-Z seismograph operation.                                                              |
| 1966 Feb. - 1966 Oct. | DNG LP-Z seismograph operation.                                                              |
| 1966 Jul.             | DTM wideband high dynamic range seismograph installed at PMG.                                |
| 1966 Nov - 1967 May   | LAE LP-Z seismograph operation.                                                              |
| 1967 Jan. - 1967 May  | TPN SP-Z seismograph operation.                                                              |
| 1967 May              | LAE seismograph converted to SP-Z.                                                           |
| 1967 Jul. - 1970 Mar. | GRK SP-Z seismograph operation.                                                              |
| 1967 Aug.             | 2 MO2 accelerographs, property of CRA, installed at Kieta and subsequently moved to Panguna. |
| 1967 Oct.             | Ramu (Yonki) MO2 CDW accelerograph installed.                                                |
| 1968 Apr.             | Rabaul (Sulphur Creek) MO2 CDW accelerograph installed.                                      |
| 1968 Sep.             | WEW aftershock station operation.                                                            |
| 1968 Oct. - 1968 Dec. | WEK aftershock station operation.                                                            |
| 1968 Oct.             | Wewak MO2 CDW accelerograph installed.                                                       |
| 1968 Dec.             | WAB SP seismograph operation commenced.                                                      |

1969 Apr. - 1969 Jun. Regional magnetic survey.

1969 Jul. Ramu (Intake) MO2 CDW accelerograph installed.

1969 Oct. MOM SP seismograph operation commenced.

1970 Mar. GKA SP seismograph operation commenced (in lieu of GRK).

1970 May LAT SP seismograph operation commenced (in lieu of LAE).

1970 Nov. MAD aftershock station operation.

1971 May Frieda River A MO2 accelerograph, property of Carpentaria Explorations, installed.

1971 Jul. Lae (CDW yard) MO2 accelerograph installed.

1971 Aug. PNB aftershock station installed.

1971 Aug. KAV SP seismograph operation commenced.

1971 Aug. Rabaul (Observatory) MO2 accelerograph installed.

1971 Aug. Frieda River B MO2 accelerograph, property of Carpentaria Explorations, installed.

1971 Aug. Star Mountains (No. 1) MO2 accelerograph, property of Kennecott, installed.

1971 Sep. Star Mountains (No. 2) MO2 accelerograph, property of Kennecott, installed.

1971 Nov. Lae (Botany Building) MO2 CDW accelerograph installed.

TABLE 1

OBSERVATORY STAFF, 1971

| Officer         | Designation                               |
|-----------------|-------------------------------------------|
| I.B. Everingham | Observer-in-Charge                        |
| I.D. Ripper     | Geophysicist Class 2                      |
| R.S. Smith      | Geophysicist Class 1 (until 2 April)      |
| B. Gaull        | Geophysicist Class 1 (from 24 June)       |
| Mrs W. Byrne    | Technical Officer Grade 2                 |
| P.M. Ryan       | Technical Officer Grade 2                 |
| J.T. Vote       | Technical Officer Grade 1                 |
| Mrs A. Dawe     | Stenographer                              |
| P. Rupa         | Clerk Class 3 (from 1 July)               |
| R. Lamond       | Technical Assistant Grade 1 (from 1 July) |
| A. Tom          | Technical Assistant Grade 1 (from 1 July) |
| D. Kepalan      | Observer, Wabag (from 1 July)             |
| F. Sevese       | Clerical Assistant Grade 1 (from 1 July)  |
| A. Kaila        | Gardener (from 1 July)                    |

TABLE 2

ASSOCIATED PERSONNEL 1971

| Officer          | Designation                                                                                           |
|------------------|-------------------------------------------------------------------------------------------------------|
| P. Rupa          | ) Until 1 July when accepted into Papua New Guinea Public Service as permanent officers (see Table 1) |
| A. Tom           |                                                                                                       |
| R. Lamond        |                                                                                                       |
| D. Kepalan       |                                                                                                       |
| F. Sevese        |                                                                                                       |
| A. Kaila         |                                                                                                       |
| J. Wui           | Gardener                                                                                              |
| W. Tovirika      | Student (until 20 January)                                                                            |
| R. Paine         | Trainee 15 September - 20 October                                                                     |
| J. Gibson        | Trainee 15 September - 20 October                                                                     |
| S. Geno          | Student (from 22 November)                                                                            |
| P. Derimo        | Trainee (until 26 February)                                                                           |
| Miss J. McGregor | Stenographer (September)                                                                              |
| Miss P. Phelan   | Stenographer (September-October)                                                                      |

TABLE 3VISITORS TO THE PORT MORESBY GEOPHYSICAL OBSERVATORY, 1971

| Visitor      | Organization                        | Month     |
|--------------|-------------------------------------|-----------|
| R. Hill      | CSIRO                               | February  |
| I. Nixon     | Soil Mechanics Ltd                  | February  |
| K. Lodwick   | Union Oil                           | March     |
| C. Carpenter | Bruce White Wolfe Barry<br>Partners | March     |
| K. Vale      | BMR                                 | March     |
| J. Casey     | BMR                                 | March     |
| J. Smith     | Carpentaria Exploration             | March     |
| J. Roe       | Dijiton                             | March     |
| E. Geiger    | Dijiton                             | March     |
| J. Furnell   | Union Oil                           | April     |
| J. Bovard    | Kennecott                           | April     |
| J. McAlpine  | CSIRO                               | April     |
| B. Cook      | CSIRO                               | April     |
| J. Goodspeed | CSIRO                               | April     |
| C. Browitt   | I.G.S.                              | June      |
| R. Chapman   | C.R.A.                              | August    |
| R. Michin    | University of W.A.                  | September |
| N. Donovan   | Dawes & Moore                       | October   |
| L. Williams  | BMR                                 | October   |
| J. White     | BMR                                 | October   |

TABLE 4

## PORT MORESBY GEOPHYSICAL OBSERVATORY SEISMOGRAPH NETWORK, 1971

STATION DETAILS

| Station      | Code | Lat (S)     | Long (E)     | Elevation (m) | Foundation    |
|--------------|------|-------------|--------------|---------------|---------------|
| Port Moresby | PMG  | 09° 24' 33" | 147° 09' 14" | 67            | Eocene cherts |
| Goroka       | GKA  | 06° 03' 30" | 145° 23' 30" | 1634          | Alluvium      |
| Kavieng (a)  | KAV  | 02° 34'     | 150° 50'     | 4             | Coral         |
| Lae Tech     | LAT  | 06° 39' 10" | 147° 00' 00" | 72            | Alluvium      |
| Momote       | MOM  | 02° 04' 28" | 147° 24' 41" | 10            | Coral         |
| Pomio (b)    | PNB  | 05° 31' 30" | 151° 30' 30" | 3             | Coral         |
| Wabag        | WAB  | 05° 29' 41" | 143° 43' 42" | 2032          | Clay          |

(a) From 24 August, situated in the servants' quarters, Tigak Agricultural Station

(b) From 6 August, situated beneath the house 100 m east of the District Office

# STATION INSTRUMENTS

| Station | Seismometer    | Component | Ts(s) | Tg(s) | Magnification                 | Recorder   |
|---------|----------------|-----------|-------|-------|-------------------------------|------------|
| PMG     | W.W.S.S.       | Z, N, E   | 1.0   | 0.15  | 25 000 at 1 s                 | Photo drum |
|         |                | Z         | 15.0  | 100   | 1500 at 15 s                  | Photo drum |
|         |                | N, E      | 15.0  | 100   | 1500 at 15 s<br>until 28 July | Photo drum |
|         |                |           |       |       | 375 at 15 s<br>from 29 July   |            |
|         | Willmore       | Z         | 0.7   | 0.3   | 30 000                        | Photo drum |
|         | Wood Anderson  | N, E      | 0.8   | -     | 2042                          | Photo drum |
|         | Sprengnether   | N, E      | 15.0  | 14    |                               | Photo drum |
| GKA     | Wilson Lamison | Z         | 1.0   | -     | -                             | Pen drum   |
| KAV     | Willmore       |           | 0.7   | -     | -                             | Pen drum   |
| LAT     | Willmore       |           | 0.7   | 0.3   | -                             | Photo drum |
|         | Wood Anderson  | E         | 0.8   | -     | 2042                          |            |
| MOM     | Willmore       | Z         | 0.7   | 0.3   | -                             | Photo drum |
|         | Wood Anderson  | E         | 0.8   | -     | 2042                          |            |
| PNB     | Willmore       | Z         | 1.0   | -     | -                             | Pen drum   |
| WAB     | Willmore       | Z         | 0.7   | 1.3   | -                             | Photo drum |
|         | Wood Anderson  | N         | 0.8   | -     | 2042                          |            |

TABLE 5

## ACCELEROGRAPHS OPERATING IN PAPUA NEW GUINEA, 1971

| Place                                 | Installed | Owner                       | Operator | Block No.            | Foundation                       | Remarks                                                      |
|---------------------------------------|-----------|-----------------------------|----------|----------------------|----------------------------------|--------------------------------------------------------------|
| Panguna, Bougainville                 | 1968      | CRA                         | CRA      | 39                   | Unconsolidated                   |                                                              |
| Panguna, Bougainville                 | 1968      | CRA                         | CRA      | 43                   | Hard rock                        |                                                              |
| Frieda River A                        | 20.5.71   | Carpentaria<br>Explorations | CE/BMR   | 416                  | Alluvium                         |                                                              |
| Frieda River B                        | 2.8.71    | CE                          | CE/BMR   | 453                  | Hard rock                        |                                                              |
| Lae, Botany Building                  | 30.11.71  | CDW                         | BMR      | 475                  | Alluvium                         |                                                              |
| Lae, CDW Yard                         | 16.7.71   | BMR                         | BMR      | 1118A                | Alluvium                         |                                                              |
| Lae Base, Institute<br>of Technology  | 1968      | IT                          | IT       |                      | Alluvium, base of<br>water tower |                                                              |
| Lae Tower, Institute<br>of Technology | 1968      | IT                          | IT       |                      | Alluvium, top of<br>water tower  |                                                              |
| Rabaul Observatory                    | 5.8.71    | BMR                         | BMR      | 1467A                | Basalt                           |                                                              |
| Rabaul Sulphur Creek                  | 10.4.68   | CDW                         | BMR      | 165/163<br>(16.7.71) | Unconsolidated                   | 165 NS trace only<br>163 NS and Z trace<br>position reversed |
| Ramu Intake                           | 2.7.69    | CDW                         | CDW/BMR  | 163/425<br>(16.7.71) | Hard rock                        |                                                              |

Table 5 Cont'd

| Place                           | Installed         | Owner     | Operator | Block No. | Foundation         | Remarks |
|---------------------------------|-------------------|-----------|----------|-----------|--------------------|---------|
| Ramu, Yonki                     | 7.10.67           | CDW       | CDW/BMR  | 44        | Alluvium           |         |
| Star Mountains<br>Base Camp 1   | August<br>1971    | Kennecott | K/BMR    | 1428      | Landslide material |         |
| Star Mountains,<br>Hong Kong, 2 | September<br>1971 | Kennecott | K/BMR    | 1454      | Quartz Porphyry    |         |
| Wewak                           | 25.10.68          | CDW       | CDW/BMR  | 162       | Weathered coral    |         |

TABLE 6

## PAPUA NEW GUINEA ACCELEROGRAPH TRIGGERINGS, 1971

| Earthquake data |    |    |    |      |         |         |          |     | Accelerograph                                       | Intensity (MM)<br>at site |
|-----------------|----|----|----|------|---------|---------|----------|-----|-----------------------------------------------------|---------------------------|
| MN              | DY | HR | MN | SEC  | DPH(km) | LAT(°S) | LONG(°E) | M   |                                                     |                           |
| 01              | 21 | 06 | 17 | 30.8 | 55      | 6.8     | 147.5    | 5.8 | Lae Base                                            | 3-4                       |
| 02              | 12 | 19 | 06 | 53.6 | 113     | 6.2     | 146.5    | 6.0 | Ramu Yonki                                          | 6                         |
|                 |    |    |    |      |         |         |          |     | Lae Base                                            | 4-5                       |
| 02              | 13 | 22 | 09 | 39.4 | 101     | 6.0     | 146.2    | 5.5 | Ramu Yonki                                          | 5                         |
|                 |    |    |    |      |         |         |          |     | Lae Base                                            | 4                         |
| 03              | 13 | 19 | 12 | 25.0 | 118     | 5.7     | 145.4    | 6.5 | Ramu Yonki                                          | 4                         |
| 07              | 10 | 11 | 56 | 26.1 | 68      | 5.9     | 144.4    | 5.5 | Ramu Yonki                                          | 4                         |
| 07              | 14 | 06 | 11 | 29.1 | 47      | 5.5     | 153.9    | 8.0 | Rabaul SC<br>(Block 165 EW)<br>(max amplitude only) | 8                         |
|                 |    |    |    |      |         |         |          |     | Panguna                                             | 5-6                       |
| 07              | 19 | 14 | 48 | 42.0 | 74      | 4.9     | 144.5    | 5.6 | Ramu Yonki                                          | 4                         |
| 07              | 26 | 01 | 23 | 21.3 | 48      | 4.9     | 153.2    | 8.0 | Rabaul SC<br>(Block 163)                            | 7                         |
| 07              | 26 | 01 | 53 | 45.1 | 33      | 4.7     | 155.3    | 5.7 | Panguna                                             | 4-5                       |
|                 |    |    |    |      |         |         |          |     | Rabaul SC<br>(Block 163)                            | 6                         |
| 08              | 07 | 15 | 02 | 58.9 | 24      | 3.9     | 152.0    | 5.0 | Rabaul Obs                                          | 5                         |
| 09              | 14 | 05 | 20 | 29.3 | 33      | 6.5     | 151.5    | 6.6 | Rabaul Obs                                          | 5                         |

TABEL 6 (Contd)

| <u>MN</u> | <u>DY</u> | <u>HR</u> | <u>MN</u> | <u>SEC</u> | <u>DPH(km)</u> | <u>LAT(°S)</u> | <u>LONG (°E)</u> | <u>M</u> | <u>Accelerographs</u> | <u>Intensity (MM)<br/>at site</u> |
|-----------|-----------|-----------|-----------|------------|----------------|----------------|------------------|----------|-----------------------|-----------------------------------|
| 09        | 25        | 04        | 36        | 14.0       | 115            | 6.5            | 146.6            | 6.9      | Lae CDW               | 7                                 |
|           |           |           |           |            |                |                |                  |          | Lae Base              | 7                                 |
|           |           |           |           |            |                |                |                  |          | Ramu Yonki*           | 5-6                               |
| 10        | 01        | 05        | 16        | 56.2       | 45             | 4.3            | 152.9            | 5.4      | Rabaul Obs            | 6                                 |
| 10        | 14        | 13        | 08        | 05.0       | 25             | 4.3            | 152.5            | 5.1      | Rabaul Obs            | 4                                 |
| 10        | 28        | 15        | 13        | 37.8       | 120            | 5.5            | 153.9            | 6.4      | Rabaul Obs            | 5                                 |

\* Accelerogram u/s

TABLE 7NUMBER OF SEISMIC EVENTS RECORDED BY EACH STATION, 1971

|           | PMG  | GKA | LAT  | MOM  | WAB  | PNB | KAV |
|-----------|------|-----|------|------|------|-----|-----|
| January   | 601  | 187 | 198  | 222  | 180  |     |     |
| February  | 268  | 0*  | 232  | 123  | 200  |     |     |
| March     | 214  | 1*  | 174  | 45   | 154  |     |     |
| April     | 242  | 32  | 168  | 53   | 190  |     |     |
| May       | 172  | 2*  | 115  | 79   | 59   |     |     |
| June      | 153  | 47  | 112  | 85   | 61   |     |     |
| July      | 1231 | 71  | 633  | 261  | 539  |     |     |
| August    | 809  | 30  | 346  | 251  | 415  | 177 | 35* |
| September | 511  | 50  | 218  | 137  | 321  | 48  | 137 |
| October   | 576  | 0*  | 228  | 155  | 271  | 25  | 68  |
| November  | 410  | 6*  | 225  | 117  | 175  | 5   | 83  |
| December  | 315  | 0*  | 172  | 78   | 71*  | 39  | 58  |
| TOTAL     | 5502 | 426 | 2821 | 1606 | 2642 | 294 | 381 |

\* Intermittent operation

TABLE 8  
EARTHQUAKES FOR WHICH INTENSITY QUESTIONNAIRES  
WERE DISTRIBUTED, 1971

| MN | DY | HR | MN | SEC  | DPH<br>(km) | LAT<br>°<br>S | LONG<br>°<br>E | M   | MAX MM |
|----|----|----|----|------|-------------|---------------|----------------|-----|--------|
| 02 | 12 | 19 | 06 | 53.6 | 113         | 96.2          | 146.5          | 6.0 | 7      |
| 06 | 27 | 02 | 37 | 20.8 | 058         | 05.9          | 144.4          | 5.0 | 5      |
| 07 | 10 | 11 | 56 | 26.1 | 068         | 05.9          | 144.4          | 5.5 | 6      |
| 07 | 14 | 06 | 11 | 29.1 | 047         | 05.5          | 153.9          | 8.0 | 8      |
| 07 | 19 | 15 | 37 | 46.1 | 033         | 05.5          | 150.6          | 6.0 | 8      |
| 07 | 26 | 01 | 23 | 21.3 | 048         | 04.9          | 153.2          | 8.0 | 8      |
| 08 | 03 | 04 | 41 | 38.4 | 041         | 07.3          | 144.8          | 4.9 | 5      |
| 09 | 25 | 04 | 36 | 14.0 | 115         | 06.5          | 146.6          | 6.9 | 7      |

TABLE 9

## EARTHQUAKES IN THE NEW GUINEA-SOLOMON ISLANDS REGION, 1971

0-12°S 130-163°E, No. STATIONS  $\geq 15$ 

(ERL Hypocentres)

| MN | DY | HR | MI | SEC  | DPH | LAT  | LONG  | MB<br>(ERL) | ML  | MS  | M   | No<br>STNS | PDE |
|----|----|----|----|------|-----|------|-------|-------------|-----|-----|-----|------------|-----|
| 01 | 01 | 07 | 57 | 58.8 | 017 | 04.0 | 141.2 | 5.5         | 7.0 | 5.8 | 6.1 | 058        | 02  |
|    | 01 | 17 | 58 | 36.6 | 054 | 05.1 | 145.5 |             | 5.0 |     | 4.8 | 015        | 05  |
|    | 02 | 13 | 38 | 55.1 | 069 | 04.6 | 153.3 | 4.9         |     |     | 4.8 | 016        | 06  |
|    | 03 | 06 | 23 | 55.0 | 038 | 11.0 | 162.6 | 4.8         |     |     | 4.8 | 035        | 04  |
|    | 04 | 13 | 57 | 30.6 | 018 | 03.3 | 143.0 | 5.2         | 6.0 | 5.4 | 5.5 | 043        | 04  |
|    | 05 | 05 | 26 | 16.2 | 035 | 10.8 | 162.0 | 5.0         |     |     | 4.9 | 023        | 03  |
|    | 10 | 07 | 17 | 03.7 | 033 | 03.1 | 139.7 | 7.3         | 7.7 | 8.0 | 8.0 | 113        | 04  |
|    | 10 | 07 | 43 | 47.1 | 033 | 03.0 | 139.7 | 5.9         |     |     | 6.0 | 032        | 03  |
|    | 10 | 07 | 53 | 52.6 | 033 | 03.0 | 139.7 | 5.6         |     |     | 5.6 | 019        | 03  |
|    | 10 | 08 | 44 | 32.6 | 021 | 03.2 | 139.7 | 5.5         | 6.0 |     | 5.7 | 048        | 04  |
|    | 10 | 08 | 46 | 42.9 | 033 | 03.2 | 140.0 | 5.2         |     |     | 5.1 | 015        | 06  |
|    | 10 | 09 | 07 | 05.9 | 023 | 03.2 | 139.9 | 5.5         |     |     | 5.5 | 019        | 04  |
|    | 10 | 09 | 50 | 23.6 | 033 | 02.7 | 139.5 | 5.4         |     |     | 5.4 | 033        | 08  |
|    | 10 | 09 | 54 | 50.0 | 033 | 02.7 | 139.5 | 5.4         |     |     | 5.5 | 037        | 08  |
|    | 10 | 10 | 03 | 10.0 | 033 | 03.2 | 139.7 | 5.1         | 4.6 |     | 4.9 | 019        | 08  |
|    | 10 | 10 | 04 | 06.6 | 033 | 03.3 | 140.1 | 5.4         |     |     | 5.5 | 030        | 08  |
|    | 10 | 10 | 20 | 40.4 | 033 | 02.8 | 139.3 | 5.1         |     |     | 4.9 | 019        | 12  |
|    | 10 | 10 | 25 | 57.6 | 033 | 03.0 | 139.7 | 5.1         |     |     | 4.9 | 020        | 07  |
|    | 10 | 10 | 45 | 06.8 | 036 | 03.0 | 139.6 | 6.1         |     |     | 6.6 | 047        | 03  |
|    | 10 | 11 | 13 | 07.1 | 033 | 03.1 | 139.6 | 5.4         |     |     | 5.4 | 026        | 03  |
|    | 10 | 14 | 20 | 47.7 | 023 | 3.3  | 139.8 | 5.2         |     |     | 5.1 | 016        | 04  |
|    | 10 | 14 | 26 | 41.9 | 033 | 03.2 | 139.9 | 5.2         |     |     | 5.1 | 015        | 04  |
|    | 10 | 14 | 29 | 56.3 | 028 | 03.2 | 139.8 | 5.8         | 6.0 | 5.9 | 5.9 | 043        | 03  |
|    | 10 | 14 | 37 | 21.3 | 033 | 02.9 | 139.6 | 5.2         |     |     | 5.1 | 026        | 04  |
|    | 10 | 15 | 03 | 35.0 | 033 | 02.9 | 139.5 | 5.1         |     |     | 5.0 | 016        | 05  |
|    | 10 | 16 | 07 | 45.9 | 033 | 03.1 | 139.8 | 5.7         | 5.9 | 5.7 | 5.7 | 046        | 03  |
|    | 10 | 16 | 24 | 18.1 | 033 | 03.1 | 139.8 | 5.6         |     |     | 5.7 | 039        | 03  |
|    | 10 | 16 | 38 | 36.0 | 027 | 03.4 | 140.0 | 5.5         | 6.3 | 5.9 | 5.9 | 046        | 04  |
|    | 10 | 16 | 54 | 19.6 | 033 | 03.3 | 140.0 | 5.3         |     |     | 5.3 | 024        | 04  |
|    | 10 | 17 | 11 | 47.6 | 026 | 03.4 | 140.1 | 5.2         |     |     | 5.1 | 025        | 05  |
|    | 10 | 17 | 20 | 35.1 | 033 | 03.3 | 139.6 | 5.3         | 6.0 |     | 5.6 | 024        | 04  |
|    | 10 | 18 | 11 | 01.9 | 033 | 03.1 | 139.8 | 5.2         |     |     | 5.1 | 023        | 04  |
|    | 10 | 18 | 19 | 38.1 | 033 | 02.7 | 139.3 | 5.4         |     |     | 5.4 | 022        | 05  |

TABLE 9 (cont'd)

| MN | DY | HR | MI | SEC  | DPH | LAT  | LONG  | MB<br>(ERL) | ML  | MS  | M   | No<br>STNS | PDE |
|----|----|----|----|------|-----|------|-------|-------------|-----|-----|-----|------------|-----|
| 01 | 10 | 19 | 05 | 23.3 | 033 | 03.1 | 139.6 | 5.0         | 5.8 |     | 5.3 | 026        | 04  |
|    | 10 | 19 | 13 | 36.8 | 033 | 03.2 | 139.8 | 5.8         |     | 515 | 5.8 | 054        | 03  |
|    | 10 | 19 | 23 | 10.1 | 033 | 03.2 | 139.7 | 5.1         |     |     | 5.0 | 018        | 04  |
|    | 10 | 19 | 34 | 22.3 | 039 | 03.1 | 139.7 | 5.7         |     |     | 6.1 | 051        | 03  |
|    | 10 | 20 | 04 | 01.9 | 033 | 03.1 | 139.7 | 5.2         |     |     | 5.1 | 023        | 04  |
|    | 10 | 21 | 11 | 21.3 | 033 | 02.7 | 139.4 | 5.1         |     |     | 5.0 | 017        | 06  |
|    | 10 | 21 | 48 | 08.5 | 033 | 03.0 | 139.7 | 5.2         |     |     | 5.1 | 015        | 06  |
|    | 10 | 22 | 14 | 37.4 | 030 | 03.2 | 139.9 | 6.1         | 6.0 | 5.7 | 6.1 | 057        | 04  |
|    | 10 | 23 | 24 | 46.7 | 033 | 03.3 | 139.8 | 5.6         |     |     | 5.9 | 041        | 04  |
|    | 11 | 00 | 20 | 24.9 | 033 | 03.1 | 139.8 | 5.1         |     |     | 5.0 | 022        | 12  |
|    | 11 | 00 | 44 | 55.2 | 013 | 03.1 | 139.8 | 5.1         |     |     | 5.0 | 015        | 03  |
|    | 11 | 07 | 35 | 33.7 | 033 | 03.4 | 139.9 | 5.2         |     |     | 5.1 | 018        | 04  |
|    | 11 | 07 | 47 | 16.6 | 022 | 03.2 | 139.8 | 5.6         | 6.1 |     | 5.9 | 038        | 03  |
|    | 11 | 09 | 34 | 09.0 | 033 | 03.1 | 139.7 | 5.1         |     |     | 5.0 | 017        | 06  |
|    | 11 | 11 | 08 | 17.4 | 033 | 03.1 | 139.7 | 5.1         | 5.5 |     | 5.0 | 020        | 06  |
|    | 11 | 15 | 49 | 16.2 | 033 | 03.1 | 139.9 | 5.3         | 5.4 |     | 5.3 | 022        | 04  |
|    | 11 | 18 | 31 | 24.6 | 021 | 02.9 | 139.5 | 5.2         |     |     | 5.1 | 021        | 03  |
|    | 11 | 21 | 33 | 01.7 | 033 | 03.3 | 139.9 | 4.8         |     |     | 4.7 | 015        | 09  |
|    | 12 | 14 | 57 | 11.6 | 033 | 03.2 | 140.0 | 5.8         | 6.1 | 5.6 | 5.7 | 042        | 04  |
|    | 12 | 15 | 45 | 34.4 | 033 | 03.2 | 139.8 | 5.3         | 6.2 |     | 5.5 | 032        | 03  |
|    | 12 | 21 | 28 | 14.6 | 033 | 03.2 | 139.6 | 5.2         |     |     | 5.1 | 019        | 04  |
|    | 13 | 03 | 57 | 38.8 | 033 | 03.1 | 139.6 | 5.2         | 5.8 |     | 5.3 | 029        | 04  |
|    | 13 | 09 | 44 | 14.2 | 034 | 02.7 | 139.4 | 5.1         |     |     | 5.0 | 024        | 07  |
|    | 13 | 10 | 22 | 46.9 | 033 | 03.1 | 139.6 | 5.5         | 6.0 |     | 5.6 | 040        | 05  |
|    | 14 | 10 | 23 | 45.5 | 033 | 02.9 | 139.4 | 5.2         | 5.8 | 5.4 | 5.4 | 035        | 07  |
|    | 14 | 18 | 07 | 22.1 | 033 | 03.0 | 139.7 | 5.4         |     | 5.6 | 5.6 | 059        | 08  |
|    | 14 | 22 | 46 | 30.8 | 033 | 03.0 | 139.7 | 5.0         |     |     | 5.0 | 028        | 07  |
|    | 15 | 07 | 28 | 38.4 | 033 | 03.0 | 139.5 | 6.0         |     |     | 5.5 | 017        | 08  |
|    | 15 | 13 | 04 | 30.1 | 033 | 03.0 | 139.8 |             |     |     | 4.8 | 017        | 08  |
|    | 15 | 22 | 16 | 55.5 | 033 | 03.0 | 139.5 | 5.1         |     |     | 5.0 | 021        | 07  |
|    | 16 | 04 | 36 | 06.9 | 033 | 03.0 | 139.8 | 5.0         |     |     | 5.0 | 026        | 08  |
|    | 16 | 05 | 25 | 27.9 | 033 | 03.4 | 139.4 | 4.9         |     |     | 4.8 | 016        | 08  |
|    | 16 | 09 | 50 | 21.5 | 033 | 03.1 | 139.7 | 5.3         |     |     | 5.3 | 020        | 08  |
|    | 16 | 16 | 28 | 25.4 | 033 | 03.1 | 139.7 | 5.1         |     |     | 5.0 | 025        | 09  |
|    | 17 | 00 | 33 | 10.9 | 033 | 02.9 | 139.7 |             |     |     | 4.8 | 018        | 07  |
|    | 17 | 01 | 42 | 03.6 | 033 | 03.2 | 139.5 | 5.2         |     |     | 5.1 | 017        | 07  |
|    | 17 | 13 | 18 | 01.2 | 033 | 03.3 | 139.8 | 5.1         |     |     | 5.0 | 029        | 08  |
|    | 17 | 19 | 26 | 37.0 | 033 | 03.2 | 139.8 | 4.9         |     |     | 4.9 | 022        | 07  |
|    | 18 | 05 | 21 | 47.2 | 033 | 03.3 | 139.7 | 5.1         |     |     | 5.0 | 020        | 09  |
|    | 18 | 20 | 16 | 13.1 | 033 | 03.4 | 139.9 | 5.0         |     | 4.6 | 4.8 | 026        | 10  |

TABLE 9 (cont'd)

| MN | DY | HR | MI | SEC  | DPH | LAT  | LONG  | MB<br>(ERL) | ML  | MS  | M   | No<br>STNS | PDE |
|----|----|----|----|------|-----|------|-------|-------------|-----|-----|-----|------------|-----|
| 01 | 20 | 22 | 42 | 34.5 | 033 | 03.2 | 139.8 | 5.2         |     |     | 5.1 | 025        | 10  |
|    | 21 | 06 | 17 | 30.8 | 055 | 06.8 | 147.5 | 5.6         | 5.9 |     | 5.8 | 066        | 07  |
|    | 22 | 19 | 59 | 46.1 | 057 | 05.8 | 151.3 | 5.3         | 5.8 |     | 5.4 | 042        | 09  |
|    | 23 | 06 | 28 | 59.7 | 033 | 03.4 | 139.9 | 5.0         |     |     | 4.9 | 019        | 10  |
|    | 25 | 00 | 18 | 26.1 | 038 | 09.6 | 151.4 | 5.8         | 6.4 | 6.3 | 6.3 | 107        | 09  |
|    | 25 | 07 | 06 | 39.7 | 040 | 03.2 | 139.8 | 5.0         |     |     | 4.9 | 021        | 09  |
|    | 26 | 10 | 57 | 32.3 | 042 | 05.6 | 152.1 | 5.3         | 5.3 |     | 5.2 | 015        | 09  |
|    | 29 | 03 | 16 | 04.7 | 033 | 03.1 | 139.7 | 5.4         | 5.6 |     | 5.4 | 037        | 09  |
|    | 29 | 05 | 19 | 45.4 | 401 | 03.9 | 154.0 | 4.8         | 5.7 |     | 5.2 | 025        | 11  |
|    | 29 | 09 | 57 | 51.8 | 207 | 05.5 | 147.1 | 4.9         | 5.0 |     | 4.9 | 015        | 12  |
|    | 31 | 00 | 00 | 13.7 | 076 | 06.6 | 154.9 | 5.1         |     |     | 4.9 | 026        | 09  |
|    | 31 | 05 | 42 | 22.7 | 033 | 02.8 | 139.3 | 5.8         |     |     | 5.5 | 015        | 16  |
| 02 | 01 | 03 | 51 | 45.4 | 110 | 05.1 | 151.7 | 5.0         | 5.5 |     | 5.1 | 022        | 09  |
|    | 01 | 14 | 56 | 23.1 | 103 | 06.2 | 154.6 | 5.4         |     |     | 5.5 | 054        | 10  |
|    | 07 | 22 | 16 | 28.4 | 100 | 04.5 | 153.3 | 4.5         |     |     | 4.5 | 024        | 10  |
|    | 10 | 19 | 25 | 05.0 | 141 | 05.0 | 151.8 | 4.9         | 5.2 |     | 4.8 | 015        | 14  |
|    | 12 | 19 | 06 | 53.6 | 113 | 06.2 | 146.5 | 5.7         | 6.1 |     | 6.0 | 067        | 12  |
|    | 13 | 22 | 09 | 39.4 | 101 | 06.0 | 146.2 | 5.4         | 5.8 |     | 5.5 | 055        | 12  |
|    | 14 | 07 | 56 | 46.9 | 033 | 03.3 | 140.0 | 5.1         |     |     | 5.0 | 019        | 16  |
|    | 18 | 14 | 26 | 56.0 | 166 | 05.8 | 148.5 |             | 4.7 |     | 4.5 | 015        | 15  |
|    | 19 | 20 | 29 | 20.2 | 040 | 03.5 | 140.0 | 5.2         |     |     | 5.1 | 017        | 16  |
|    | 23 | 00 | 38 | 48.2 | 033 | 03.1 | 139.6 | 5.3         | 5.8 |     | 5.4 | 025        | 19  |
|    | 26 | 04 | 55 | 50.0 | 090 | 10.4 | 161.3 | 5.9         | 6.7 |     | 6.5 | 137        | 16  |
|    | 28 | 16 | 41 | 37.2 | 118 | 05.8 | 145.6 | 4.8         | 5.6 |     | 5.2 | 040        | 16  |
| 03 | 02 | 11 | 34 | 50.1 | 044 | 06.3 | 154.3 | 5.2         | 5.7 |     | 5.3 | 028        | 16  |
|    | 04 | 23 | 12 | 01.0 | 056 | 02.7 | 139.3 | 4.5         |     |     | 4.5 | 016        | 16  |
|    | 06 | 06 | 38 | 10.0 | 060 | 06.7 | 154.5 | 5.0         | 6.1 |     | 5.0 | 017        | 18  |
|    | 08 | 14 | 11 | 46.2 | 015 | 02.9 | 139.4 | 5.2         |     | 5.4 | 5.2 | 025        | 18  |
|    | 13 | 19 | 12 | 25.0 | 118 | 05.7 | 145.4 | 6.3         | 6.2 |     | 6.5 | 078        | 18  |
|    | 14 | 13 | 02 | 43.6 | 033 | 03.0 | 139.5 | 5.3         |     |     | 5.3 | 030        | 19  |
|    | 17 | 03 | 13 | 59.7 | 033 | 03.2 | 139.8 | 5.6         |     |     | 5.8 | 059        | 19  |
|    | 23 | 08 | 07 | 32.4 | 033 | 02.7 | 139.3 | 4.8         |     |     | 4.5 | 015        | 25  |
|    | 24 | 02 | 26 | 14.7 | 071 | 05.3 | 151.5 | 5.6         |     |     | 6.1 | 113        | 22  |
|    | 25 | 13 | 00 | 04.0 | 283 | 04.0 | 153.7 | 4.5         | 5.5 |     | 4.9 | 016        | 25  |
|    | 30 | 07 | 39 | 30.2 | 176 | 08.5 | 158.6 | 4.5         |     |     | 4.5 | 015        | 27  |
|    | 31 | 20 | 38 | 55.1 | 078 | 06.0 | 148.1 | 4.7         | 4.8 |     | 4.5 | 015        | 27  |

TABLE 9 (cont'd)

| MN | DY | HR | MI | SEC  | DPH | LAT  | LONG  | MB<br>(ERL) | ML  | MS  | M   | No<br>STNS | PDE |
|----|----|----|----|------|-----|------|-------|-------------|-----|-----|-----|------------|-----|
| 04 | 02 | 19 | 15 | 21.7 | 041 | 06.9 | 154.5 | 5.2         | 5.6 |     | 5.3 | 043        | 24  |
|    | 15 | 08 | 50 | 34.5 | 041 | 11.1 | 162.4 | 4.9         |     |     | 5.0 | 037        | 28  |
|    | 17 | 01 | 41 | 20.1 | 072 | 06.3 | 154.7 | 5.7         | 5.9 |     | 5.8 | 078        | 27  |
|    | 18 | 07 | 53 | 45.0 | 085 | 06.5 | 150.5 | 5.4         |     |     | 5.3 | 020        | 29  |
|    | 19 | 21 | 57 | 20.5 | 062 | 05.4 | 153.7 | 4.5         | 5.1 |     | 4.5 | 016        | 29  |
|    | 20 | 00 | 07 | 07.9 | 036 | 04.8 | 145.8 | 5.1         | 5.7 |     | 5.2 | 026        | 29  |
|    | 21 | 12 | 11 | 55.8 | 045 | 03.3 | 140.2 | 5.0         |     |     | 4.8 | 019        | 31  |
|    | 22 | 06 | 35 | 07.7 | 050 | 06.5 | 154.4 | 5.1         | 5.6 |     | 5.1 | 029        | 29  |
|    | 23 | 12 | 02 | 06.7 | 075 | 06.4 | 154.7 | 4.8         | 6.0 |     | 5.2 | 017        | 29  |
|    | 23 | 12 | 32 | 46.0 | 067 | 06.3 | 154.7 | 5.3         | 6.7 |     | 6.0 | 080        | 29  |
|    | 24 | 15 | 00 | 25.3 | 021 | 01.0 | 146.4 | 4.9         | 5.5 |     | 5.1 | 032        | 33  |
|    | 25 | 21 | 41 | 18.0 | 037 | 02.7 | 139.3 | 5.0         | 5.2 |     | 5.1 | 031        | 29  |
|    | 26 | 05 | 16 | 02.5 | 109 | 04.8 | 152.0 | 4.9         | 5.2 |     | 4.8 | 019        | 29  |
|    | 27 | 03 | 20 | 30.1 | 059 | 03.6 | 140.0 | 5.0         |     |     | 4.9 | 023        | 31  |
|    | 30 | 03 | 55 | 13.0 | 034 | 07.3 | 150.1 | 5.2         | 5.3 |     | 5.1 | 027        | 31  |
| 05 | 03 | 10 | 49 | 26.9 | 045 | 11.1 | 161.6 | 4.6         | 6.8 | 5.7 | 5.7 | 025        | 36  |
|    | 04 | 00 | 56 | 20.9 | 052 | 06.5 | 147.9 | 4.6         | 4.8 |     | 4.5 | 015        | 32  |
|    | 05 | 04 | 27 | 18.5 | 026 | 03.3 | 140.0 | 5.1         |     |     | 5.0 | 022        | 32  |
|    | 08 | 08 | 30 | 05.8 | 054 | 05.5 | 153.3 | 4.4         | 5.0 |     | 4.7 | 023        | 33  |
|    | 12 | 02 | 48 | 44.4 | 038 | 06.3 | 151.8 | 5.3         | 5.4 |     | 5.2 | 039        | 33  |
|    | 13 | 03 | 02 | 02.5 | 048 | 02.7 | 139.3 | 5.0         |     |     | 4.9 | 016        | 37  |
|    | 16 | 20 | 47 | 35.5 | 020 | 05.8 | 152.2 | 5.1         | 5.2 |     | 5.0 | 018        | 38  |
|    | 17 | 10 | 15 | 52.9 | 151 | 06.3 | 130.2 | 5.4         |     |     | 5.3 | 026        | 38  |
|    | 17 | 11 | 49 | 39.9 | 147 | 06.9 | 156.3 | 4.9         | 6.1 |     | 5.5 | 045        | 34  |
|    | 18 | 04 | 56 | 53.1 | 124 | 04.2 | 142.2 | 5.1         |     |     | 5.0 | 016        | 39  |
|    | 18 | 11 | 43 | 40.0 | 033 | 03.3 | 139.6 | 5.0         |     |     | 4.9 | 021        | 40  |
|    | 23 | 04 | 50 | 11.6 | 388 | 05.0 | 149.6 | 4.8         | 4.9 |     | 4.7 | 016        | 36  |
|    | 24 | 03 | 13 | 37.4 | 033 | 03.5 | 139.8 | 5.6         |     |     | 5.5 | 017        | 42  |
|    | 24 | 04 | 24 | 24.3 | 077 | 07.0 | 155.7 | 4.8         | 5.5 |     | 5.0 | 015        | 40  |
|    | 24 | 04 | 45 | 03.6 | 058 | 05.3 | 152.9 | 4.9         | 5.0 |     | 4.9 | 026        | 36  |
| 06 | 03 | 01 | 48 | 23.8 | 048 | 07.4 | 156.2 | 4.7         | 6.1 |     | 5.2 | 015        | 41  |
|    | 04 | 17 | 17 | 08.5 | 063 | 05.9 | 150.4 | 3.6         | 5.5 |     | 5.1 | 028        | 45  |
|    | 10 | 16 | 11 | 57.8 | 031 | 06.3 | 153.0 | 4.9         | 5.0 |     | 4.9 | 020        | 45  |
|    | 22 | 11 | 23 | 06.1 | 020 | 09.8 | 160.3 | 5.4         |     |     | 5.5 | 048        | 44  |
|    | 27 | 17 | 50 | 50.7 | 033 | 03.5 | 145.5 | 5.4         | 5.5 |     | 5.3 | 044        | 48  |
|    | 27 | 20 | 50 | 22.6 | 017 | 03.5 | 145.5 | 4.9         | 5.5 |     | 5.0 | 017        | 48  |

TABLE 9 (cont'd)

| MN | DY | HR | MI | SEC  | DPH | LAT  | LONG  | MB<br>(ERL) | ML  | MS  | M   | No<br>STNS | PDE |
|----|----|----|----|------|-----|------|-------|-------------|-----|-----|-----|------------|-----|
| 07 | 01 | 01 | 56 | 47.0 | 048 | 07.5 | 156.3 | 4.9         | 6.1 |     | 5.2 | 016        | 48  |
|    | 01 | 20 | 51 | 44.2 | 224 | 05.5 | 147.1 | 4.9         | 5.1 |     | 4.9 | 020        | 46  |
|    | 03 | 20 | 11 | 01.7 | 040 | 04.2 | 135.8 | 5.1         |     |     | 5.0 | 018        | 47  |
|    | 08 | 04 | 46 | 46.3 | 053 | 10.0 | 160.9 | 5.4         | 6.1 |     | 5.6 | 050        | 47  |
|    | 09 | 09 | 49 | 43.3 | 062 | 05.9 | 154.4 | 5.3         | 5.5 |     | 5.4 | 060        | 47  |
|    | 10 | 05 | 23 | 51.6 | 059 | 06.0 | 154.6 | 5.8         | 5.1 |     | 5.9 | 067        | 47  |
|    | 10 | 11 | 56 | 26.1 | 068 | 05.9 | 144.4 | 5.4         | 5.9 |     | 5.5 | 041        | 48  |
|    | 10 | 17 | 44 | 59.5 | 119 | 06.5 | 146.8 | 5.2         | 5.3 |     | 5.1 | 025        | 47  |
|    | 12 | 13 | 02 | 02.0 | 033 | 06.4 | 148.7 | 5.1         | 4.7 | 5.6 | 5.3 | 033        | 49  |
|    | 13 | 00 | 33 | 38.4 | 043 | 06.7 | 149.0 | 4.5         | 4.3 |     | 4.5 | 015        | 48  |
|    | 14 | 06 | 11 | 29.1 | 047 | 05.5 | 153.9 |             |     | 7.9 | 8.0 | 115        | 49  |
|    | 14 | 07 | 16 | 53.6 | 033 | 05.8 | 153.2 | 4.9         | 5.8 |     | 5.3 | 019        | 51  |
|    | 14 | 07 | 37 | 15.9 | 033 | 04.8 | 153.6 | 5.6         | 5.8 | 6.8 | 6.0 | 063        | 51  |
|    | 14 | 07 | 41 | 09.3 | 033 | 05.5 | 153.8 | 5.7         | 6.5 | 7.2 | 6.8 | 027        | 49  |
|    | 14 | 08 | 42 | 30.1 | 033 | 05.6 | 153.8 | 5.0         | 6.5 |     | 5.9 | 040        | 49  |
|    | 14 | 09 | 04 | 10.2 | 033 | 05.1 | 153.8 | 5.1         | 6.2 |     | 5.9 | 040        | 49  |
|    | 14 | 09 | 32 | 25.0 | 033 | 05.8 | 154.2 | 4.7         |     |     | 4.7 | 024        | 49  |
|    | 14 | 10 | 09 | 10.5 | 033 | 05.8 | 153.8 | 4.8         | 5.3 |     | 4.8 | 022        | 55  |
|    | 14 | 11 | 29 | 47.2 | 033 | 05.2 | 153.4 | 4.9         | 5.7 |     | 5.3 | 039        | 49  |
|    | 14 | 11 | 43 | 29.9 | 033 | 04.9 | 153.2 | 5.1         | 5.5 |     | 5.3 | 029        | 53  |
|    | 14 | 12 | 27 | 31.9 | 033 | 04.5 | 153.0 | 5.1         | 5.5 |     | 5.3 | 043        | 5.3 |
|    | 14 | 12 | 30 | 15.6 | 033 | 05.7 | 154.1 | 5.5         | 5.6 |     | 5.5 | 053        | 53  |
|    | 14 | 13 | 08 | 08.4 | 033 | 05.5 | 153.5 | 4.8         | 5.6 |     | 5.1 | 030        | 51  |
|    | 14 | 15 | 47 | 06.4 | 033 | 05.3 | 153.2 | 4.9         | 5.2 |     | 5.0 | 032        | 53  |
|    | 14 | 16 | 37 | 58.1 | 033 | 05.2 | 153.1 | 5.3         |     |     | 5.3 | 034        | 57  |
|    | 14 | 17 | 38 | 49.3 | 033 | 05.2 | 153.3 | 5.2         | 6.4 | 6.3 | 6.2 | 052        | 49  |
|    | 14 | 18 | 27 | 02.9 | 033 | 05.0 | 153.4 | 5.1         | 4.8 |     | 4.8 | 036        | 64  |
|    | 14 | 18 | 27 | 43.7 | 033 | 05.2 | 153.3 | 5.6         | 6.1 | 6.5 | 6.1 | 040        | 64  |
|    | 14 | 19 | 33 | 27.7 | 033 | 05.8 | 154.0 | 4.9         | 5.0 | 6.3 | 6.0 | 064        | 51  |
|    | 14 | 20 | 01 | 42.7 | 033 | 05.7 | 154.2 | 5.0         | 5.5 |     | 5.1 | 041        | 53  |
|    | 14 | 20 | 24 | 54.0 | 033 | 05.7 | 153.3 | 4.7         | 5.5 |     | 5.0 | 042        | 55  |
|    | 15 | 00 | 11 | 41.2 | 033 | 05.6 | 153.4 | 4.9         |     |     | 4.8 | 018        | 53  |
|    | 15 | 02 | 21 | 18.7 | 037 | 04.8 | 153.3 | 4.4         |     |     | 4.4 | 015        | 61  |
|    | 15 | 02 | 41 | 00.4 | 033 | 05.7 | 154.0 | 5.1         | 5.7 |     | 5.2 | 041        | 55  |
|    | 15 | 11 | 27 | 46.8 | 033 | 05.3 | 153.6 | 5.7         |     |     | 5.5 | 022        | 55  |
|    | 15 | 13 | 56 | 52.9 | 033 | 05.1 | 153.4 | 5.0         | 5.5 | 5.3 | 5.2 | 056        | 53  |
|    | 15 | 16 | 58 | 35.3 | 033 | 04.8 | 153.4 | 5.2         |     |     | 5.1 | 024        | 59  |
|    | 15 | 20 | 13 | 33.6 | 033 | 05.5 | 153.1 | 4.5         |     |     | 4.5 | 019        | 53  |
|    | 15 | 20 | 21 | 58.7 | 033 | 05.4 | 152.9 | 4.9         |     |     | 4.8 | 015        | 57  |

TABLE 9 (cont'd)

| MN | DY | HR | MI | SEC  | DPH | LAT  | LONG  | MB<br>(ERL) | ML  | MS  | M   | No<br>STNS | PDE |
|----|----|----|----|------|-----|------|-------|-------------|-----|-----|-----|------------|-----|
| 07 | 15 | 21 | 18 | 51.4 | 033 | 05.2 | 153.8 | 4.6         | 5.4 |     | 4.9 | 016        | 66  |
|    | 15 | 23 | 00 | 47.4 | 033 | 05.4 | 152.5 | 5.1         | 5.4 |     | 5.1 | 041        | 55  |
|    | 16 | 01 | 58 | 37.4 | 033 | 04.9 | 153.4 | 5.0         |     |     | 4.9 | 020        | 55  |
|    | 16 | 02 | 50 | 59.4 | 033 | 05.9 | 153.4 | 4.8         | 5.3 |     | 4.9 | 031        | 55  |
|    | 16 | 07 | 42 | 59.6 | 033 | 04.0 | 152.8 | 4.6         |     |     | 4.5 | 015        | 61  |
|    | 16 | 07 | 47 | 38.6 | 040 | 05.8 | 153.3 | 5.1         | 5.8 | 5.2 | 5.2 | 064        | 53  |
|    | 16 | 13 | 19 | 32.1 | 041 | 05.7 | 153.3 | 5.1         | 5.5 | 4.8 | 5.1 | 060        | 61  |
|    | 16 | 14 | 05 | 37.1 | 036 | 05.6 | 153.3 | 4.9         | 5.3 |     | 5.0 | 043        | 59  |
|    | 16 | 21 | 44 | 24.0 | 046 | 05.4 | 153.6 | 4.7         | 5.1 | 4.9 | 4.9 | 023        | 59  |
|    | 17 | 02 | 44 | 31.6 | 033 | 05.3 | 153.1 | 4.6         | 5.1 | 4.8 | 4.8 | 022        | 57  |
|    | 17 | 03 | 13 | 01.4 | 033 | 05.6 | 153.1 | 4.6         | 5.3 |     | 4.8 | 023        | 59  |
|    | 17 | 06 | 38 | 20.0 | 033 | 05.1 | 153.2 | 4.8         | 5.6 | 5.5 | 5.3 | 037        | 57  |
|    | 17 | 06 | 50 | 44.7 | 033 | 05.2 | 154.6 | 5.0         | 5.4 |     | 5.0 | 020        | 61  |
|    | 17 | 08 | 46 | 17.4 | 063 | 04.8 | 153.4 | 4.9         |     |     | 5.0 | 037        | 59  |
|    | 17 | 11 | 24 | 48.3 | 033 | 05.0 | 153.3 | 4.6         | 5.5 |     | 5.0 | 032        | 61  |
|    | 17 | 14 | 17 | 18.0 | 046 | 06.2 | 154.0 | 4.7         |     |     | 4.7 | 015        | 57  |
|    | 17 | 16 | 38 | 25.7 | 075 | 05.6 | 151.6 | 4.8         | 5.3 |     | 4.9 | 021        | 61  |
|    | 17 | 20 | 21 | 39.9 | 039 | 06.1 | 154.0 | 5.2         | 5.4 |     | 5.0 | 017        | 59  |
|    | 17 | 20 | 43 | 37.6 | 056 | 05.6 | 153.2 | 4.5         |     |     | 4.5 | 015        | 61  |
|    | 18 | 09 | 27 | 03.8 | 033 | 05.1 | 153.3 | 5.4         |     |     | 5.1 | 024        | 59  |
|    | 18 | 14 | 27 | 27.0 | 055 | 05.2 | 153.5 | 4.6         |     |     | 4.6 | 018        | 64  |
|    | 18 | 14 | 31 | 17.5 | 046 | 04.8 | 153.3 | 5.7         | 6.7 | 6.6 | 6.6 | 119        | 55  |
|    | 19 | 00 | 14 | 45.3 | 042 | 05.7 | 153.8 | 5.8         | 6.7 | 7.1 | 7.0 | 102        | 61  |
|    | 19 | 01 | 00 | 09.2 | 033 | 05.6 | 153.8 | 4.7         | 5.4 |     | 4.9 | 023        | 59  |
|    | 19 | 02 | 01 | 50.2 | 033 | 05.6 | 153.9 | 5.1         | 5.9 |     | 5.3 | 035        | 59  |
|    | 19 | 05 | 55 | 32.8 | 050 | 05.1 | 153.3 |             | 5.4 | 5.4 | 5.0 | 037        | 59  |
|    | 19 | 08 | 23 | 06.6 | 048 | 05.7 | 153.7 | 5.2         | 5.4 | 5.0 | 5.0 | 028        | 59  |
|    | 19 | 11 | 35 | 35.0 | 048 | 05.2 | 152.9 | 4.8         |     |     | 4.7 | 015        | 59  |
|    | 19 | 14 | 48 | 42.3 | 074 | 04.9 | 144.5 | 5.5         | 6.0 |     | 5.7 | 081        | 57  |
|    | 19 | 15 | 37 | 46.1 | 033 | 05.5 | 150.6 | 5.3         | 6.1 | 6.2 | 6.0 | 066        | 61  |
|    | 20 | 06 | 46 | 26.8 | 040 | 05.9 | 153.8 | 5.2         | 5.2 |     | 5.0 | 036        | 59  |
|    | 20 | 15 | 02 | 40.7 | 031 | 05.7 | 153.3 | 4.3         |     |     | 4.5 | 018        | 59  |
|    | 20 | 15 | 44 | 18.5 | 061 | 05.7 | 153.2 | 4.9         |     |     | 4.7 | 016        | 59  |
|    | 20 | 19 | 04 | 01.9 | 043 | 05.7 | 153.3 | 4.5         |     |     | 4.5 | 021        | 59  |
|    | 21 | 12 | 03 | 27.3 | 027 | 05.9 | 154.0 | 5.5         | 6.2 | 5.9 | 5.8 | 044        | 48  |
|    | 21 | 13 | 02 | 43.7 | 031 | 06.1 | 154.1 |             | 5.4 |     | 5.0 | 015        | 52  |
|    | 21 | 18 | 56 | 04.2 | 047 | 05.6 | 153.9 | 5.0         | 5.5 |     | 5.0 | 030        | 52  |
|    | 22 | 10 | 25 | 21.9 | 046 | 05.6 | 153.8 | 4.9         | 5.3 |     | 5.0 | 029        | 52  |
|    | 22 | 19 | 55 | 18.7 | 037 | 05.5 | 153.0 | 4.6         |     |     | 4.6 | 019        | 52  |

TABLE 9 (cont'd)

| MN | DY | HR | MI | SEC  | DPH | LAT  | LONG  | MB<br>(ERL) | ML  | MS  | M   | No<br>STNS | PDE |
|----|----|----|----|------|-----|------|-------|-------------|-----|-----|-----|------------|-----|
| 07 | 22 | 23 | 10 | 06.4 | 033 | 05.5 | 153.0 | 4.6         | 5.0 |     | 4.9 | 022        | 52  |
|    | 22 | 23 | 55 | 25.0 | 061 | 04.7 | 153.1 | 5.2         | 5.7 |     | 5.3 | 037        | 56  |
|    | 23 | 15 | 27 | 13.9 | 113 | 05.2 | 154.1 | 5.5         | 5.2 |     | 5.2 | 016        | 58  |
|    | 24 | 12 | 51 | 50.2 | 060 | 04.7 | 153.3 | 5.1         |     |     | 5.0 | 016        | 52  |
|    | 25 | 09 | 09 | 59.5 | 064 | 04.7 | 153.3 | 4.6         | 5.4 |     | 5.0 | 025        | 52  |
|    | 25 | 16 | 44 | 36.5 | 049 | 05.6 | 153.0 | 5.0         | 5.8 |     | 5.3 | 044        | 52  |
|    | 25 | 18 | 19 | 28.2 | 033 | 05.5 | 153.2 | 4.1         |     |     | 4.5 | 020        | 60  |
|    | 25 | 22 | 24 | 26.0 | 035 | 05.2 | 153.5 | 4.9         | 5.6 |     | 5.1 | 043        | 58  |
|    | 26 | 01 | 23 | 21.3 | 048 | 04.9 | 153.2 | 6.3         |     | 7.9 | 8.0 | 121        | 56  |
|    | 26 | 01 | 53 | 45.1 | 033 | 04.7 | 153.3 | 5.6         |     |     | 5.7 | 035        | 66  |
|    | 26 | 02 | 19 | 21.4 | 033 | 05.5 | 151.7 | 5.8         |     |     | 5.9 | 031        | 62  |
|    | 26 | 02 | 24 | 57.0 | 033 | 05.2 | 152.2 | 6.4         |     |     | 6.6 | 051        | 54  |
|    | 26 | 02 | 29 | 38.2 | 033 | 05.7 | 151.9 | 6.2         |     |     | 6.3 | 030        | 63  |
|    | 26 | 03 | 17 | 14.7 | 033 | 05.6 | 151.7 | 5.1         |     |     | 5.0 | 033        | 54  |
|    | 26 | 03 | 26 | 27.7 | 033 | 05.8 | 151.7 | 5.3         | 6.0 |     | 5.6 | 033        | 54  |
|    | 26 | 03 | 41 | 03.7 | 033 | 05.0 | 152.8 | 4.8         | 5.6 |     | 5.0 | 034        | 56  |
|    | 26 | 04 | 45 | 21.4 | 033 | 05.4 | 152.9 | 4.9         |     |     | 4.9 | 026        | 54  |
|    | 26 | 06 | 53 | 02.4 | 033 | 05.6 | 151.7 | 5.3         |     |     | 5.3 | 033        | 58  |
|    | 26 | 06 | 57 | 42.0 | 033 | 05.1 | 152.9 | 4.8         |     |     | 4.8 | 033        | 54  |
|    | 26 | 06 | 59 | 28.3 | 033 | 05.5 | 152.1 | 5.7         | 6.6 | 5.9 | 6.0 | 062        | 54  |
|    | 26 | 07 | 13 | 52.1 | 033 | 05.6 | 152.4 | 5.2         |     |     | 5.1 | 026        | 64  |
|    | 26 | 08 | 01 | 05.0 | 119 | 05.9 | 130.3 | 5.4         |     |     | 5.4 | 026        | 52  |
|    | 26 | 09 | 07 | 07.3 | 033 | 05.1 | 152.6 | 5.1         |     |     | 5.0 | 021        | 56  |
|    | 26 | 09 | 34 | 51.5 | 033 | 05.7 | 151.6 | 5.3         |     | 5.8 | 5.6 | 058        | 60  |
|    | 26 | 09 | 37 | 12.2 | 033 | 05.9 | 151.6 | 5.4         |     | 5.5 | 5.5 | 035        | 63  |
|    | 26 | 10 | 56 | 40.6 | 033 | 05.0 | 153.2 | 5.1         |     |     | 5.0 | 033        | 56  |
|    | 26 | 12 | 04 | 59.1 | 033 | 05.4 | 151.4 | 5.6         |     |     | 5.9 | 050        | 58  |
|    | 26 | 12 | 56 | 42.8 | 033 | 05.9 | 151.7 | 5.1         |     |     | 5.0 | 030        | 54  |
|    | 26 | 14 | 49 | 44.0 | 043 | 04.8 | 153.2 | 4.8         | 5.4 |     | 5.2 | 035        | 56  |
|    | 26 | 15 | 30 | 43.7 | 033 | 05.6 | 151.4 | 5.0         |     |     | 4.8 | 022        | 60  |
|    | 26 | 15 | 35 | 37.8 | 033 | 05.6 | 151.4 | 5.4         | 6.3 | 6.2 | 6.0 | 070        | 54  |
|    | 26 | 16 | 45 | 00.0 | 033 | 06.0 | 151.5 | 5.5         | 5.7 | 5.4 | 5.7 | 054        | 54  |
|    | 26 | 17 | 15 | 45.2 | 033 | 05.7 | 152.3 | 5.2         | 5.3 | 5.3 | 5.2 | 046        | 56  |
|    | 26 | 17 | 22 | 58.8 | 033 | 05.7 | 152.4 | 5.1         |     |     | 5.0 | 021        | 58  |
|    | 26 | 17 | 49 | 59.7 | 033 | 05.2 | 153.1 | 5.3         | 6.0 | 5.4 | 5.6 | 053        | 52  |
|    | 26 | 18 | 00 | 35.7 | 033 | 05.4 | 153.9 | 4.5         | 5.2 |     | 4.8 | 025        | 60  |
|    | 26 | 19 | 00 | 13.1 | 033 | 05.8 | 151.5 | 4.9         | 5.4 |     | 4.8 | 018        | 65  |
|    | 26 | 19 | 15 | 31.4 | 033 | 05.9 | 151.3 | 5.6         | 6.6 | 6.2 | 6.2 | 080        | 58  |
|    | 26 | 20 | 19 | 28.6 | 033 | 05.3 | 153.1 | 4.6         | 5.2 |     | 4.7 | 021        | 56  |
|    | 26 | 21 | 00 | 41.0 | 066 | 04.4 | 153.0 | 5.1         |     |     | 5.0 | 015        | 56  |

TABLE 9 (cont'd)

| MN | DY | HR | MI | SEC  | DPH | LAT' | LONG  | MB<br>(ERL) | ML  | MS  | M   | No<br>STNS | PDE |
|----|----|----|----|------|-----|------|-------|-------------|-----|-----|-----|------------|-----|
| 07 | 26 | 23 | 33 | 32.1 | 042 | 05.5 | 152.5 | 4.9         |     |     | 4.9 | 030        | 56  |
|    | 27 | 00 | 06 | 58.4 | 045 | 05.4 | 153.3 | 4.7         |     |     | 4.6 | 015        | 52  |
|    | 27 | 00 | 22 | 25.3 | 033 | 05.4 | 152.4 | 5.4         | 6.0 | 5.3 | 5.6 | 044        | 54  |
|    | 27 | 02 | 03 | 20.4 | 055 | 04.9 | 153.3 | 5.8         | 5.7 |     | 5.5 | 031        | 54  |
|    | 27 | 03 | 16 | 45.5 | 047 | 05.6 | 152.2 | 5.3         |     |     | 5.1 | 016        | 52  |
|    | 27 | 04 | 04 | 07.3 | 054 | 05.6 | 151.5 | 5.1         | 5.7 |     | 5.2 | 038        | 54  |
|    | 27 | 05 | 33 | 58.7 | 033 | 06.0 | 151.6 | 5.0         | 5.2 |     | 4.9 | 033        | 56  |
|    | 27 | 06 | 31 | 45.4 | 033 | 05.9 | 151.8 | 5.4         |     |     | 5.4 | 038        | 54  |
|    | 27 | 07 | 35 | 41.1 | 040 | 05.9 | 151.6 | 5.4         | 5.6 | 5.4 | 5.5 | 050        | 52  |
|    | 27 | 07 | 49 | 13.8 | 053 | 05.6 | 152.0 | 4.7         |     |     | 4.7 | 022        | 52  |
|    | 27 | 09 | 07 | 57.9 | 044 | 05.5 | 152.7 | 4.8         |     |     | 4.6 | 019        | 56  |
|    | 27 | 09 | 18 | 35.0 | 033 | 05.4 | 152.7 | 5.3         | 5.5 |     | 5.2 | 023        | 56  |
|    | 27 | 11 | 21 | 06.1 | 044 | 05.4 | 153.0 | 4.4         |     |     | 4.5 | 018        | 52  |
|    | 27 | 11 | 30 | 25.8 | 041 | 05.8 | 152.1 | 5.4         |     |     | 5.4 | 028        | 54  |
|    | 27 | 12 | 42 | 54.9 | 033 | 06.0 | 151.8 | 5.0         |     |     | 4.8 | 016        | 64  |
|    | 27 | 13 | 18 | 42.9 | 033 | 05.8 | 151.8 | 5.0         | 5.1 |     | 4.9 | 026        | 63  |
|    | 27 | 13 | 31 | 46.8 | 033 | 05.0 | 152.8 | 4.7         |     |     | 4.5 | 018        | 60  |
|    | 27 | 14 | 02 | 25.3 | 053 | 05.1 | 152.9 | 4.6         | 5.5 |     | 5.0 | 029        | 65  |
|    | 27 | 14 | 56 | 49.0 | 033 | 05.7 | 152.0 | 5.0         | 5.4 |     | 5.0 | 025        | 52  |
|    | 27 | 16 | 03 | 13.7 | 054 | 05.5 | 153.0 | 4.4         |     |     | 4.4 | 015        | 52  |
|    | 27 | 18 | 08 | 41.2 | 046 | 05.6 | 151.4 | 5.4         | 6.1 | 5.3 | 5.5 | 037        | 52  |
|    | 27 | 20 | 47 | 56.5 | 043 | 05.2 | 153.0 | 5.5         | 6.2 | 6.4 | 6.1 | 062        | 56  |
|    | 27 | 21 | 51 | 19.8 | 033 | 05.0 | 152.9 | 5.0         |     |     | 4.9 | 015        | 52  |
|    | 27 | 23 | 27 | 36.0 | 033 | 05.1 | 152.9 | 5.2         | 5.0 |     | 4.9 | 015        | 58  |
|    | 27 | 23 | 35 | 21.5 | 033 | 06.3 | 151.2 | 5.2         | 5.7 | 5.8 | 5.6 | 039        | 54  |
|    | 28 | 00 | 15 | 55.2 | 053 | 06.0 | 151.6 | 4.9         | 4.8 |     | 4.8 | 023        | 60  |
|    | 28 | 01 | 10 | 24.1 | 033 | 05.1 | 152.9 | 6.0         | 6.5 | 6.5 | 6.5 | 088        | 54  |
|    | 28 | 02 | 47 | 23.7 | 061 | 05.1 | 152.7 | 5.1         | 5.6 |     | 5.2 | 032        | 56  |
|    | 28 | 03 | 56 | 19.3 | 043 | 05.1 | 153.0 | 4.9         |     |     | 4.7 | 016        | 62  |
|    | 28 | 04 | 16 | 20.8 | 033 | 05.1 | 153.0 | 4.9         |     |     | 4.7 | 018        | 56  |
|    | 28 | 07 | 48 | 21.2 | 051 | 04.9 | 151.3 | 5.1         | 5.6 |     | 5.1 | 019        | 58  |
|    | 28 | 07 | 48 | 58.2 | 033 | 05.8 | 151.7 | 5.2         |     | 5.2 | 5.2 | 022        | 65  |
|    | 28 | 08 | 58 | 12.6 | 045 | 04.9 | 153.0 | 4.8         |     |     | 4.5 | 016        | 56  |
|    | 28 | 09 | 50 | 11.6 | 033 | 04.7 | 151.7 | 4.7         |     |     | 4.5 | 015        | 56  |
|    | 28 | 09 | 57 | 03.8 | 039 | 05.6 | 152.4 | 5.2         |     | 5.1 | 5.2 | 047        | 56  |
|    | 28 | 10 | 17 | 29.4 | 033 | 05.6 | 152.5 | 5.7         | 5.7 |     | 5.7 | 049        | 52  |
|    | 28 | 11 | 02 | 51.2 | 056 | 05.4 | 153.0 | 4.6         |     |     | 4.5 | 018        | 60  |
|    | 28 | 13 | 14 | 20.2 | 052 | 05.3 | 153.0 | 4.8         |     |     | 4.8 | 022        | 58  |
|    | 28 | 14 | 02 | 52.4 | 037 | 05.9 | 151.4 | 5.0         | 5.7 |     | 5.2 | 035        | 56  |
|    | 28 | 15 | 18 | 23.2 | 033 | 05.6 | 152.5 | 5.0         | 5.2 |     | 5.0 | 028        | 52  |
|    | 28 | 23 | 24 | 36.3 | 043 | 05.9 | 151.7 | 4.9         |     |     | 4.7 | 021        | 60  |

TABLE 9 (cont'd)

| MN | DY | HR | MI | SEC  | DPH | LAT  | LONG  | MB<br>(ERL) | ML  | MS  | M   | No<br>STNS | PDE |
|----|----|----|----|------|-----|------|-------|-------------|-----|-----|-----|------------|-----|
| 07 | 29 | 03 | 40 | 57.9 | 043 | 05.4 | 153.1 | 4.3         |     |     | 4.5 | 018        | 58  |
|    | 29 | 04 | 51 | 35.6 | 040 | 05.8 | 152.3 | 5.0         |     |     | 4.9 | 028        | 60  |
|    | 29 | 08 | 57 | 48.3 | 033 | 05.5 | 152.4 | 5.2         | 5.6 |     | 5.2 | 039        | 56  |
|    | 29 | 10 | 18 | 38.2 | 044 | 05.3 | 153.0 | 4.9         | 5.4 |     | 5.0 | 036        | 56  |
|    | 29 | 12 | 46 | 49.9 | 033 | 05.5 | 152.8 | 4.9         |     |     | 4.8 | 023        | 52  |
|    | 29 | 13 | 12 | 54.6 | 051 | 04.9 | 153.5 | 4.4         |     |     | 4.6 | 022        | 58  |
|    | 29 | 13 | 26 | 02.5 | 033 | 05.3 | 152.5 | 5.1         | 5.3 |     | 5.0 | 021        | 52  |
|    | 29 | 14 | 01 | 18.1 | 070 | 04.6 | 153.1 | 5.2         |     |     | 5.1 | 029        | 56  |
|    | 29 | 14 | 45 | 38.6 | 060 | 05.8 | 151.5 | 5.3         | 5.1 |     | 5.2 | 020        | 56  |
|    | 29 | 16 | 20 | 24.6 | 059 | 05.4 | 153.1 | 4.9         |     |     | 4.8 | 017        | 60  |
|    | 29 | 21 | 24 | 15.9 | 033 | 05.8 | 152.3 | 4.8         |     |     | 4.7 | 015        | 54  |
|    | 30 | 06 | 18 | 12.0 | 042 | 04.5 | 152.9 | 5.7         | 5.8 | 5.6 | 5.8 | 107        | 56  |
|    | 30 | 13 | 23 | 58.3 | 033 | 06.0 | 151.5 | 5.3         | 5.7 | 5.6 | 5.5 | 043        | 56  |
|    | 30 | 15 | 54 | 52.4 | 033 | 05.6 | 152.5 | 4.9         |     |     | 4.6 | 015        | 52  |
|    | 30 | 18 | 30 | 06.6 | 036 | 05.7 | 153.8 | 5.1         | 5.5 | 5.4 | 5.4 | 037        | 56  |
|    | 30 | 19 | 22 | 26.7 | 039 | 05.9 | 153.7 | 5.0         |     |     | 4.8 | 018        | 58  |
|    | 30 | 20 | 46 | 15.3 | 029 | 05.5 | 152.8 | 4.7         |     |     | 4.6 | 018        | 66  |
|    | 30 | 20 | 47 | 01.6 | 033 | 05.3 | 153.3 | 5.5         |     |     | 5.3 | 022        | 60  |
|    | 30 | 22 | 53 | 18.7 | 058 | 05.4 | 152.5 | 5.2         |     |     | 5.1 | 023        | 56  |
|    | 31 | 15 | 18 | 00.8 | 037 | 05.5 | 152.5 | 5.3         | 5.3 |     | 5.2 | 033        | 56  |
|    | 31 | 18 | 05 | 50.0 | 036 | 06.0 | 152.0 | 5.0         |     |     | 4.9 | 019        | 56  |
|    | 31 | 18 | 48 | 19.0 | 050 | 05.5 | 152.8 | 4.7         |     |     | 4.5 | 017        | 56  |
|    | 31 | 19 | 05 | 12.0 | 029 | 06.0 | 151.9 | 5.1         |     |     | 5.0 | 015        | 62  |
|    | 31 | 20 | 02 | 49.3 | 033 | 05.8 | 153.4 | 4.8         |     |     | 4.8 | 020        | 52  |
|    | 31 | 23 | 15 | 51.5 | 030 | 06.0 | 152.0 | 5.0         | 5.3 |     | 5.0 | 027        | 58  |
| 08 | 01 | 01 | 03 | 07.3 | 018 | 06.0 | 151.8 | 4.9         | 5.2 |     | 4.7 | 017        | 58  |
|    | 01 | 08 | 21 | 22.9 | 060 | 09.7 | 159.7 | 4.7         |     |     | 4.7 | 024        | 56  |
|    | 01 | 16 | 03 | 39.2 | 033 | 06.2 | 151.4 | 5.0         | 4.8 |     | 4.9 | 028        | 58  |
|    | 01 | 16 | 40 | 10.7 | 026 | 05.7 | 152.5 | 5.3         | 4.9 |     | 5.0 | 026        | 56  |
|    | 01 | 21 | 49 | 46.3 | 038 | 05.3 | 152.7 | 5.0         | 5.2 | 5.3 | 5.1 | 044        | 56  |
|    | 02 | 00 | 19 | 54.2 | 036 | 05.6 | 152.6 | 5.6         | 5.5 | 5.7 | 5.7 | 044        | 56  |
|    | 02 | 10 | 26 | 18.0 | 036 | 05.4 | 152.7 | 4.8         |     |     | 4.8 | 019        | 58  |
|    | 02 | 11 | 28 | 14.4 | 054 | 05.1 | 153.3 | 4.6         |     |     | 4.6 | 018        | 56  |
|    | 02 | 12 | 56 | 45.7 | 033 | 06.3 | 151.7 | 4.9         | 5.0 |     | 4.8 | 018        | 63  |
|    | 02 | 19 | 04 | 11.5 | 031 | 05.7 | 153.5 | 4.6         |     |     | 4.5 | 017        | 56  |
|    | 02 | 20 | 10 | 04.3 | 039 | 06.3 | 151.4 | 4.9         |     |     | 4.8 | 022        | 58  |
|    | 03 | 04 | 41 | 38.4 | 041 | 07.3 | 144.8 | 5.0         | 5.0 |     | 4.9 | 019        | 56  |
|    | 03 | 08 | 45 | 50.6 | 038 | 06.2 | 151.4 | 5.0         | 5.3 |     | 4.9 | 021        | 60  |
|    | 06 | 10 | 02 | 52.7 | 027 | 06.2 | 154.1 | 5.1         |     | 4.9 | 5.0 | 029        | 58  |
|    | 06 | 13 | 59 | 11.6 | 039 | 05.5 | 152.9 | 4.7         |     |     | 4.4 | 020        | 58  |
|    | 06 | 15 | 02 | 53.3 | 047 | 05.7 | 153.4 | 4.4         |     |     | 4.1 | 018        | 63  |

TABLE 9 (cont'd)

| MM | DY | HR | MI | SEC  | DPH | LAT  | LONG  | MB<br>(ERL) | ML  | MS  | M   | No<br>STNS | PDE |
|----|----|----|----|------|-----|------|-------|-------------|-----|-----|-----|------------|-----|
| 08 | 06 | 18 | 43 | 29.2 | 068 | 04.5 | 153.2 | 4.5         | 5.6 |     | 5.0 | 029        | 62  |
|    | 07 | 19 | 46 | 28.4 | 025 | 05.8 | 152.3 | 4.9         |     |     | 4.8 | 017        | 56  |
|    | 08 | 20 | 12 | 51.0 | 101 | 05.6 | 154.3 | 4.5         |     |     | 4.5 | 018        | 60  |
|    | 09 | 06 | 36 | 02.5 | 056 | 05.2 | 152.1 | 5.0         |     |     | 4.9 | 023        | 63  |
|    | 09 | 12 | 12 | 01.7 | 063 | 05.9 | 154.3 | 6.0         | 6.3 | 6.5 | 6.4 | 064        | 60  |
|    | 09 | 12 | 47 | 29.4 | 014 | 06.8 | 144.2 | 5.1         | 5.0 |     | 4.9 | 016        | 56  |
|    | 09 | 20 | 01 | 38.2 | 024 | 05.8 | 152.2 | 5.9         | 6.2 | 6.2 | 6.2 | 063        | 62  |
|    | 09 | 21 | 48 | 10.6 | 033 | 05.2 | 152.4 | 4.9         |     |     | 4.7 | 019        | 65  |
|    | 09 | 22 | 31 | 46.1 | 035 | 05.7 | 152.2 | 5.3         | 5.0 |     | 5.0 | 026        | 60  |
|    | 09 | 22 | 45 | 31.3 | 017 | 05.8 | 152.1 | 5.2         | 5.3 |     | 5.1 | 028        | 62  |
|    | 10 | 04 | 23 | 13.9 | 033 | 05.8 | 152.3 | 5.4         | 6.1 |     | 5.5 | 015        | 62  |
|    | 10 | 04 | 23 | 56.0 | 033 | 05.7 | 152.1 | 5.9         | 6.3 | 5.4 | 5.9 | 048        | 62  |
|    | 10 | 11 | 33 | 49.1 | 026 | 05.7 | 152.2 | 4.9         | 5.2 |     | 4.8 | 020        | 62  |
|    | 10 | 14 | 37 | 54.0 | 038 | 05.3 | 153.5 | 5.2         | 6.1 | 5.7 | 5.6 | 039        | 58  |
|    | 12 | 17 | 05 | 45.7 | 080 | 08.5 | 159.8 | 5.1         |     |     | 5.0 | 021        | 60  |
|    | 13 | 16 | 48 | 46.5 | 021 | 06.1 | 154.1 | 6.0         | 6.0 | 6.2 | 6.2 | 052        | 62  |
|    | 13 | 20 | 29 | 17.3 | 030 | 06.2 | 154.1 | 5.3         |     | 6.2 | 5.7 | 022        | 63  |
|    | 13 | 21 | 19 | 47.0 | 019 | 05.7 | 152.9 | 4.8         |     |     | 4.5 | 017        | 62  |
|    | 13 | 22 | 12 | 22.0 | 035 | 05.5 | 152.8 | 4.8         |     |     | 4.5 | 020        | 62  |
|    | 14 | 18 | 51 | 43.5 | 048 | 05.4 | 152.8 | 4.7         |     |     | 4.4 | 016        | 68  |
|    | 15 | 02 | 56 | 39.0 | 058 | 05.5 | 153.7 | 4.7         |     |     | 4.4 | 017        | 68  |
|    | 15 | 13 | 01 | 47.0 | 019 | 06.0 | 151.8 | 5.3         | 5.8 |     | 5.3 | 022        | 65  |
|    | 16 | 02 | 20 | 20.7 | 115 | 05.6 | 154.3 | 4.3         |     |     | 4.0 | 015        | 65  |
|    | 16 | 10 | 27 | 41.4 | 040 | 06.0 | 154.1 | 4.7         |     |     | 4.6 | 023        | 66  |
|    | 18 | 00 | 08 | 16.8 | 074 | 04.7 | 153.5 | 4.9         | 5.4 |     | 5.0 | 028        | 65  |
|    | 18 | 10 | 40 | 30.7 | 054 | 06.1 | 154.5 | 5.2         |     |     | 5.1 | 045        | 68  |
|    | 19 | 13 | 08 | 23.9 | 056 | 05.4 | 153.6 | 4.7         |     |     | 4.7 | 029        | 67  |
|    | 20 | 23 | 03 | 42.0 | 039 | 05.8 | 153.3 | 4.4         |     |     | 4.5 | 020        | 67  |
|    | 21 | 18 | 59 | 50.4 | 033 | 05.6 | 142.3 | 4.9         |     |     | 4.7 | 022        | 69  |
|    | 21 | 20 | 37 | 46.8 | 075 | 04.6 | 153.1 | 4.8         |     |     | 4.7 | 024        | 68  |
|    | 23 | 04 | 08 | 02.0 | 033 | 04.0 | 146.1 | 5.2         | 6.3 | 6.3 | 6.0 | 060        | 69  |
|    | 24 | 13 | 29 | 12.8 | 036 | 05.5 | 152.9 | 5.2         | 5.2 | 5.2 | 5.2 | 059        | 69  |
|    | 25 | 23 | 46 | 46.4 | 055 | 05.0 | 153.2 | 4.9         |     |     | 4.8 | 019        | 67  |
|    | 26 | 01 | 57 | 50.4 | 042 | 05.6 | 152.9 | 4.9         |     |     | 4.8 | 025        | 67  |
|    | 26 | 03 | 10 | 41.4 | 023 | 05.7 | 153.0 | 4.9         |     |     | 4.8 | 024        | 67  |
|    | 28 | 10 | 54 | 08.0 | 040 | 05.1 | 152.8 | 4.5         |     |     | 4.5 | 019        | 69  |
|    | 28 | 21 | 39 | 09.7 | 045 | 05.9 | 151.6 | 4.6         | 5.5 |     | 4.5 | 016        | 67  |
| 09 | 01 | 12 | 30 | 11.2 | 064 | 05.5 | 151.7 | 5.2         | 6.1 |     | 5.5 | 044        | 68  |
|    | 01 | 20 | 17 | 37.4 | 034 | 05.5 | 152.9 | 5.2         | 5.9 |     | 5.4 | 043        | 68  |
|    | 01 | 22 | 46 | 37.3 | 019 | 05.6 | 152.8 | 4.8         | 5.5 |     | 4.9 | 032        | 68  |

TABLE 9 (cont'd)

| MN | DY | HR | MI | SEC  | DPH | LAT  | LONG  | MB<br>(ERL) | ML  | MS  | M   | No<br>STNS | PDE |
|----|----|----|----|------|-----|------|-------|-------------|-----|-----|-----|------------|-----|
| 09 | 01 | 23 | 03 | 47.3 | 036 | 05.7 | 152.8 | 4.8         | 5.3 |     | 4.9 | 023        | 68  |
|    | 03 | 15 | 51 | 07.0 | 059 | 04.8 | 153.3 | 4.6         |     |     | 4.5 | 015        | 69  |
|    | 04 | 16 | 46 | 43.0 | 047 | 02.6 | 139.4 | 5.4         | 6.2 |     | 5.7 | 037        | 69  |
|    | 05 | 03 | 00 | 12.7 | 045 | 05.2 | 153.0 | 5.1         | 5.6 |     | 5.2 | 029        | 70  |
|    | 05 | 04 | 35 | 35.4 | 056 | 05.3 | 153.0 | 4.5         |     |     | 4.5 | 016        | 69  |
|    | 06 | 02 | 20 | 19.2 | 052 | 10.2 | 161.2 | 4.8         |     |     | 4.7 | 019        | 70  |
|    | 06 | 23 | 35 | 32.1 | 116 | 05.8 | 146.7 | 5.2         | 5.6 |     | 5.2 | 033        | 68  |
|    | 08 | 10 | 29 | 37.3 | 023 | 01.9 | 138.9 | 5.0         |     |     | 4.9 | 026        | 70  |
|    | 08 | 22 | 08 | 55.6 | 033 | 06.5 | 130.6 | 5.5         |     |     | 5.5 | 037        | 68  |
|    | 09 | 09 | 12 | 52.4 | 032 | 05.8 | 153.5 | 4.3         | 5.2 |     | 4.4 | 015        | 71  |
|    | 11 | 02 | 37 | 16.9 | 056 | 07.4 | 156.0 | 4.5         | 6.3 |     | 5.0 | 020        | 70  |
|    | 12 | 03 | 05 | 58.4 | 044 | 05.7 | 153.1 | 4.9         | 5.2 |     | 4.7 | 017        | 71  |
|    | 12 | 20 | 54 | 45.2 | 090 | 06.5 | 147.5 | 5.1         | 4.8 |     | 4.8 | 019        | 70  |
|    | 14 | 03 | 03 | 39.2 | 046 | 07.4 | 156.0 | 5.7         |     | 5.9 | 6.0 | 082        | 71  |
|    | 14 | 05 | 20 | 29.3 | 033 | 06.5 | 151.5 | 6.1         | 6.4 | 6.7 | 6.6 | 122        | 72  |
|    | 14 | 09 | 30 | 03.3 | 033 | 06.6 | 151.7 | 5.0         | 5.6 |     | 5.0 | 023        | 72  |
|    | 14 | 12 | 22 | 42.7 | 033 | 06.5 | 151.7 | 5.0         | 4.8 |     | 5.0 | 034        | 72  |
|    | 16 | 06 | 22 | 37.6 | 115 | 05.9 | 130.7 | 6.2         |     |     | 6.8 | 088        | 70  |
|    | 21 | 14 | 10 | 49.4 | 054 | 03.2 | 139.7 | 5.3         |     |     | 5.4 | 038        | 74  |
|    | 21 | 16 | 27 | 45.1 | 026 | 05.9 | 152.6 | 5.1         | 5.5 |     | 5.0 | 024        | 75  |
|    | 22 | 11 | 28 | 39.7 | 021 | 06.6 | 144.1 | 4.6         |     |     | 4.5 | 015        | 75  |
|    | 22 | 13 | 38 | 33.7 | 034 | 04.0 | 154.1 | 5.1         | 5.3 |     | 5.0 | 025        | 73  |
|    | 22 | 21 | 03 | 10.7 | 383 | 04.6 | 154.2 | 4.4         | 6.1 |     | 5.0 | 017        | 77  |
|    | 25 | 04 | 36 | 14.0 | 115 | 06.5 | 146.6 | 6.3         | 6.7 | 5.9 | 6.9 | 136        | 73  |
|    | 25 | 18 | 01 | 31.9 | 033 | 03.3 | 139.7 | 5.1         |     |     | 5.1 | 035        | 74  |
|    | 25 | 19 | 36 | 30.2 | 083 | 04.9 | 144.5 | 5.1         | 5.6 |     | 5.2 | 017        | 75  |
|    | 27 | 02 | 21 | 19.4 | 058 | 07.9 | 159.4 | 5.0         |     |     | 5.0 | 021        | 75  |
|    | 27 | 14 | 56 | 10.9 | 103 | 05.7 | 145.4 | 5.4         | 5.4 |     | 5.4 | 055        | 74  |
|    | 27 | 22 | 20 | 03.2 | 033 | 03.2 | 148.1 | 5.5         | 5.8 | 6.1 | 6.1 | 058        | 76  |
|    | 28 | 19 | 45 | 15.8 | 033 | 09.0 | 157.4 | 5.5         | 5.7 | 5.1 | 5.6 | 072        | 75  |
|    | 28 | 22 | 22 | 52.9 | 043 | 05.4 | 152.8 | 4.8         | 5.6 | 5.1 | 5.1 | 041        | 74  |
|    | 29 | 13 | 50 | 02.5 | 016 | 02.9 | 142.0 | 5.5         | 6.2 | 5.3 | 5.5 | 032        | 74  |
|    | 29 | 21 | 11 | 20.3 | 071 | 08.1 | 147.8 |             | 5.3 |     | 4.9 | 015        | 75  |
|    | 30 | 11 | 15 | 54.8 | 033 | 05.6 | 131.3 | 5.3         |     |     | 5.2 | 021        | 76  |
| 10 | 01 | 05 | 16 | 56.2 | 045 | 04.3 | 152.9 | 5.4         |     | 5.1 | 5.4 | 058        | 74  |
|    | 03 | 08 | 36 | 04.8 | 058 | 06.6 | 155.0 | 5.9         | 6.9 | 5.6 | 6.0 | 096        | 75  |
|    | 03 | 11 | 49 | 54.8 | 050 | 05.7 | 153.2 | 5.1         | 5.0 |     | 5.0 | 027        | 75  |
|    | 04 | 01 | 30 | 34.1 | 074 | 05.8 | 154.2 | 5.7         | 6.7 |     | 6.2 | 096        | 76  |
|    | 06 | 03 | 54 | 56.0 | 115 | 05.2 | 154.1 | 4.4         | 5.8 |     | 5.0 | 023        | 75  |
|    | 08 | 14 | 15 | 35.9 | 018 | 06.9 | 144.3 | 5.6         | 5.0 |     | 5.5 | 056        | 76  |
|    | 09 | 02 | 36 | 34.4 | 026 | 06.8 | 144.4 | 4.9         | 4.1 |     | 4.5 | 019        | 77  |

TABLE 9 (cont'd)

| MN | DY | HR | MI | SEC  | DPH | LAT  | LONG  | MB<br>(ERL) | ML  | MS  | M   | No<br>STNS | PDE |
|----|----|----|----|------|-----|------|-------|-------------|-----|-----|-----|------------|-----|
| 10 | 13 | 15 | 05 | 05.0 | 049 | 06.0 | 151.5 | 4.4         | 6.1 |     | 5.0 | 015        | 78  |
|    | 14 | 12 | 58 | 45.5 | 017 | 04.4 | 152.5 | 5.1         |     |     | 5.0 | 015        | 81  |
|    | 16 | 05 | 15 | 25.0 | 076 | 06.0 | 154.5 | 5.7         | 6.3 |     | 6.1 | 084        | 80  |
|    | 17 | 05 | 49 | 11.6 | 064 | 06.1 | 154.6 | 4.6         | 6.0 |     | 5.1 | 027        | 80  |
|    | 17 | 07 | 43 | 25.3 | 073 | 04.6 | 152.6 | 4.7         | 5.0 |     | 5.1 | 032        | 80  |
|    | 20 | 03 | 59 | 58.6 | 116 | 05.4 | 154.3 | 5.8         | 5.3 |     | 5.1 | 017        | 83  |
|    | 20 | 13 | 36 | 09.0 | 033 | 03.3 | 139.9 | 5.4         |     |     | 5.5 | 036        | 82  |
|    | 20 | 14 | 25 | 55.1 | 131 | 04.3 | 152.5 | 4.9         |     |     | 5.0 | 052        | 83  |
|    | 21 | 08 | 30 | 23.5 | 109 | 10.2 | 161.2 | 5.4         | 5.2 |     | 5.3 | 028        | 80  |
|    | 23 | 20 | 38 | 36.7 | 033 | 03.8 | 134.3 | 5.6         |     |     | 5.6 | 027        | 79  |
|    | 27 | 05 | 06 | 01.7 | 033 | 05.8 | 154.2 | 5.0         | 6.1 |     | 5.0 | 015        | 84  |
|    | 28 | 00 | 54 | 25.5 | 081 | 04.6 | 153.0 | 5.1         | 5.7 |     | 5.3 | 034        | 80  |
|    | 28 | 10 | 02 | 08.6 | 055 | 05.7 | 153.8 | 5.2         | 5.7 |     | 5.2 | 017        | 83  |
|    | 28 | 10 | 09 | 47.8 | 042 | 05.6 | 152.0 | 5.0         |     |     | 5.0 | 022        | 80  |
|    | 28 | 15 | 13 | 37.8 | 120 | 05.5 | 153.9 | 5.7         | 7.4 | 6.5 | 6.6 | 086        | 82  |
|    | 28 | 19 | 47 | 13.8 | 127 | 05.0 | 153.8 | 4.2         |     |     | 4.0 | 018        | 80  |
|    | 28 | 21 | 07 | 51.2 | 119 | 05.5 | 154.3 | 5.0         | 5.6 |     | 5.1 | 034        | 80  |
|    | 28 | 22 | 57 | 52.2 | 057 | 06.0 | 151.7 | 4.9         | 6.3 |     | 5.0 | 022        | 80  |
|    | 30 | 06 | 00 | 30.6 | 125 | 05.5 | 154.3 | 5.1         | 6.1 |     | 5.1 | 016        | 81  |
|    | 31 | 14 | 55 | 13.8 | 120 | 05.5 | 154.3 | 5.0         | 5.9 |     | 5.1 | 018        | 82  |
| 11 | 02 | 08 | 34 | 47.0 | 057 | 02.9 | 139.4 | 5.1         |     |     | 5.1 | 026        | 81  |
|    | 02 | 23 | 29 | 52.2 | 113 | 05.0 | 153.9 | 5.0         |     |     | 5.1 | 033        | 80  |
|    | 10 | 06 | 12 | 15.6 | 032 | 03.8 | 151.6 | 4.9         |     | 4.9 | 4.8 | 019        | 84  |
|    | 10 | 10 | 22 | 42.4 | 049 | 05.3 | 152.6 | 5.2         | 5.9 | 5.4 | 5.4 | 052        | 81  |
|    | 10 | 10 | 57 | 42.2 | 060 | 05.3 | 152.6 | 5.1         |     |     | 5.0 | 023        | 82  |
|    | 11 | 11 | 16 | 52.3 | 017 | 02.8 | 136.5 | 5.7         |     | 5.1 | 5.7 | 044        | 83  |
|    | 11 | 13 | 52 | 45.5 | 094 | 04.7 | 153.5 | 4.8         | 5.9 |     | 5.6 | 057        | 82  |
|    | 13 | 11 | 07 | 46.6 | 040 | 06.3 | 152.0 | 5.0         | 5.6 |     | 5.0 | 025        | 83  |
|    | 15 | 00 | 22 | 47.3 | 059 | 05.1 | 153.4 | 4.9         | 5.8 |     | 5.3 | 037        | 84  |
|    | 16 | 04 | 09 | 22.3 | 084 | 06.2 | 147.6 | 5.2         | 5.9 |     | 5.4 | 027        | 87  |
|    | 17 | 10 | 52 | 05.1 | 084 | 05.1 | 151.6 | 4.5         | 5.4 |     | 4.9 | 026        | 88  |
|    | 17 | 18 | 45 | 53.3 | 036 | 05.9 | 151.7 | 5.2         | 5.7 |     | 5.2 | 018        | 88  |
|    | 19 | 23 | 31 | 24.7 | 047 | 05.8 | 153.6 | 4.8         |     |     | 4.8 | 024        | 88  |
|    | 20 | 11 | 31 | 37.4 | 030 | 05.5 | 153.0 | 4.8         | 5.2 |     | 4.9 | 019        | 91  |
|    | 20 | 13 | 34 | 40.7 | 110 | 03.2 | 139.7 | 4.6         |     |     | 4.5 | 017        | 89  |
|    | 21 | 23 | 32 | 49.2 | 112 | 05.6 | 154.4 | 5.0         | 6.4 |     | 5.1 | 021        | 85  |
|    | 23 | 10 | 11 | 44.1 | 050 | 06.4 | 151.0 | 4.7         | 5.0 |     | 4.7 | 029        | 85  |
|    | 25 | 12 | 21 | 17.8 | 019 | 06.4 | 150.8 | 4.6         | 5.9 |     | 5.0 | 021        | 86  |
|    | 25 | 20 | 25 | 35.5 | 039 | 04.3 | 152.4 | 4.5         |     |     | 4.0 | 018        | 91  |
|    | 25 | 21 | 46 | 55.3 | 038 | 06.3 | 152.3 | 4.8         | 5.4 |     | 4.8 | 025        | 85  |
|    | 30 | 13 | 04 | 05.8 | 123 | 05.6 | 154.3 | 4.8         |     |     | 4.5 | 015        | 89  |

TABLE 9 (cont'd)

| MN | DY | HR | MI | SEC  | DPH | LAT  | LONG  | MB<br>(ERL) | ML  | MS  | M   | No<br>STNS | PDE |
|----|----|----|----|------|-----|------|-------|-------------|-----|-----|-----|------------|-----|
| 12 | 02 | 15 | 26 | 19.0 | 148 | 05.6 | 149.7 | 5.1         | 5.5 |     | 5.1 | 030        | 87  |
|    | 02 | 18 | 41 | 48.5 | 057 | 05.5 | 152.1 | 5.3         | 5.5 |     | 5.3 | 034        | 87  |
|    | 04 | 02 | 25 | 51.5 | 078 | 06.0 | 154.5 | 6.0         | 6.6 | 6.0 | 6.6 | 087        | 87  |
|    | 04 | 10 | 17 | 00.3 | 157 | 05.5 | 149.7 | 4.5         | 4.9 |     | 4.3 | 019        | 89  |
|    | 04 | 15 | 36 | 33.1 | 087 | 05.9 | 154.5 | 4.9         | 6.3 |     | 5.5 | 033        | 87  |
|    | 04 | 18 | 53 | 21.4 | 055 | 06.7 | 154.4 | 4.9         | 6.1 |     | 5.0 | 015        | 89  |
|    | 04 | 22 | 39 | 14.9 | 120 | 05.5 | 154.3 | 5.1         |     |     | 5.1 | 034        | 87  |
|    | 05 | 07 | 34 | 02.5 | 069 | 03.2 | 139.7 | 5.1         |     |     | 5.1 | 029        | 87  |
|    | 06 | 23 | 48 | 34.2 | 033 | 03.1 | 142.7 | 5.1         |     |     | 5.0 | 015        | 88  |
|    | 08 | 04 | 36 | 30.6 | 033 | 02.8 | 138.9 | 5.1         |     |     | 5.0 | 017        | 90  |
|    | 08 | 22 | 49 | 36.9 | 022 | 01.2 | 149.7 | 4.6         |     |     | 4.3 | 017        | 88  |
|    | 09 | 18 | 55 | 27.2 | 047 | 05.8 | 152.1 | 5.2         | 5.7 |     | 5.3 | 026        | 89  |
|    | 10 | 04 | 56 | 41.9 | 014 | 06.6 | 150.3 | 5.2         | 6.0 |     | 5.4 | 031        | 90  |
|    | 11 | 07 | 25 | 19.2 | 065 | 06.1 | 154.5 | 5.9         | 6.6 | 6.6 | 6.5 | 075        | 90  |
|    | 14 | 12 | 34 | 54.6 | 030 | 06.5 | 151.6 | 4.9         | 5.6 |     | 5.0 | 019        | 91  |
|    | 21 | 10 | 37 | 51.9 | 099 | 06.5 | 154.8 | 4.8         | 6.2 |     | 4.8 | 016        | 92  |
|    | 21 | 13 | 46 | 32.6 | 043 | 05.9 | 152.1 | 5.2         | 5.0 | 4.9 | 021 | 94         |     |
|    | 23 | 23 | 47 | 47.6 | 115 | 05.8 | 154.3 | 4.8         | 5.9 |     | 5.0 | 019        | 91  |
|    | 24 | 22 | 21 | 42.8 | 050 | 04.9 | 153.5 | 5.2         | 5.4 |     | 5.1 | 040        | 91  |
|    | 26 | 15 | 50 | 57.1 | 056 | 06.3 | 154.8 | 5.6         | 6.5 | 6.0 | 6.1 | 073        | 92  |
|    | 27 | 20 | 50 | 20.9 | 046 | 06.4 | 154.9 | 4.8         | 5.9 |     | 5.0 | 025        | 92  |
|    | 29 | 03 | 27 | 00.5 | 125 | 04.9 | 151.6 | 4.8         | 5.2 |     | 4.8 | 024        | 92  |
|    | 30 | 15 | 39 | 37.4 | 109 | 047  | 151.9 | 6.0         | 6.3 | 5.6 | 6.3 | 110        | 92  |

MB(ERL) ERL body wave magnitude as published by ERL

ML Richter magnitude derived from Papua New Guinea stations

MS Surface wave magnitude obtained from teleseismic station bulletins and ERL

M Weighted unified magnitude on the surface wave scale

TABLE 10

QHM comparisons at Port Moresby, 1971

| Date    | Result                                                                                                                           | Method                    |
|---------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Mar     | (493) = (187) - 112.9 )<br>= (188) - 96.9 )<br>= (189) - 72.9 )                                                                  | Simultaneous observations |
| Aug     | (460, 461, 462) = (493) - 2.1                                                                                                    | Simultaneous observations |
| Dec     | (188) = (187) - 114.0 )<br>= (189) - 75.0 )<br>= (493) - 5.5 )<br>(460) = (187) - 112.6 )<br>= (189) - 73.5 )<br>= (493) - 4.0 ) | Baseline values           |
| Jan-Nov | (493) = (187) - 112.5 )<br>= (189) - 72.8 )                                                                                      | Baseline values           |

Differences are in gammas at Port Moresby  
(H = 0.362 Oe)

TABLE 11PRELIMINARY MAGNETOMETER CORRECTIONS

| 1971      | QHM gammas |            |            |            | DECL<br>339 | HMZ<br>68 |
|-----------|------------|------------|------------|------------|-------------|-----------|
|           | QHM<br>187 | QHM<br>188 | QHM<br>189 | QHM<br>493 | Minutes     | gammas    |
| January   | -112       | -96        | -72        | -          | 0           | 0         |
| February  | -113       | -97        | -73        | -          | 0           | 0         |
| March     | -113       | -97        | -73        | 0          | 0           | 0         |
| April     | -113       | -          | -74        | 0          | 0           | 0         |
| May       | -114       | -          | -74        | 0          | 0           | 0         |
| June      | -114       | -          | -74        | 0          | 0           | 0         |
| July      | -115       | -          | -75        | 0          | 0           | 0         |
| August    | -115       | -          | -75        | 0          | 0           | 0         |
| September | -115       | -          | -75        | 0          | 0           | 0         |
| October   | -116       | -          | -76        | 0          | 0           | 0         |
| November  | -116       | -          | -76        | 0          | 0           | 0         |
| December  | -116       | 0          | -77        | -          | 0           | 0         |

TABLE 12

MAGNETOGRAPH PARAMETERS, 1971

| Component                |   | Date   | Scale<br>value | Standard<br>Scale<br>value | deviation<br>Baseline<br>value |
|--------------------------|---|--------|----------------|----------------------------|--------------------------------|
| Normal run<br>(15 mm/hr) | D | Jan 01 | 0.445          | 0.002                      | 0.16                           |
|                          |   | May 01 | 0.450          |                            |                                |
|                          |   | Nov 01 | 0.445          |                            |                                |
|                          | H | 1971   | 2.75           | 0.02                       | 1.2                            |
|                          | Z | Jan 01 | 2.80           | 0.03                       | 2.0                            |
|                          |   | May 01 | 2.85           |                            |                                |
| Rapid run<br>(180 mm/hr) | D | 1971   | 0.055          | -                          | -                              |
|                          | H | 1971   | 1.48           | -                          | -                              |
|                          | Z | 1971   | 1.53           | -                          | -                              |

The H scale value for normal run is So; "a" factor = 0.003

D values in minutes and minutes/mm.

H and Z values in gammas and gammas/mm.

Note: The rapid run magnetograph was withdrawn on 11 October.

TABLE 13PRELIMINARY MONTHLY MEAN GEOMAGNETIC VALUESAND K-INDEX

| 1971        | D (E)     | H<br>(gamma) | Z<br>(gamma) | F      | K    |
|-------------|-----------|--------------|--------------|--------|------|
| January     | 06° 13.3' | 36 185       | -23 178      | 42 972 | 1.86 |
| February    | 13.4      | 178          | 172          | 963    | 1.89 |
| March       | 13.7      | 187          | 175          | 972    | 1.79 |
| April       | 13.7      | 177          | 175          | 964    | 2.05 |
| May         | 13.9      | 175          | 180          | 965    | 1.79 |
| June        | 14.0      | 179          | 183          | 970    | 1.70 |
| July        | 14.0      | 178          | 185          | 970    | 1.68 |
| August      | 14.3      | 180          | 191          | 975    | 1.69 |
| September   | 14.1      | 174          | 194          | 971    | 2.18 |
| October     | 14.5      | 177          | 198          | 976    | 1.89 |
| November    | 14.5      | 181          | 203          | 982    | 1.99 |
| December    | 14.5      | 167          | 210          | 974    | 1.93 |
| Annual Mean | 06° 14.0  | 36 178       | -23 187      | 42 971 | 1.87 |

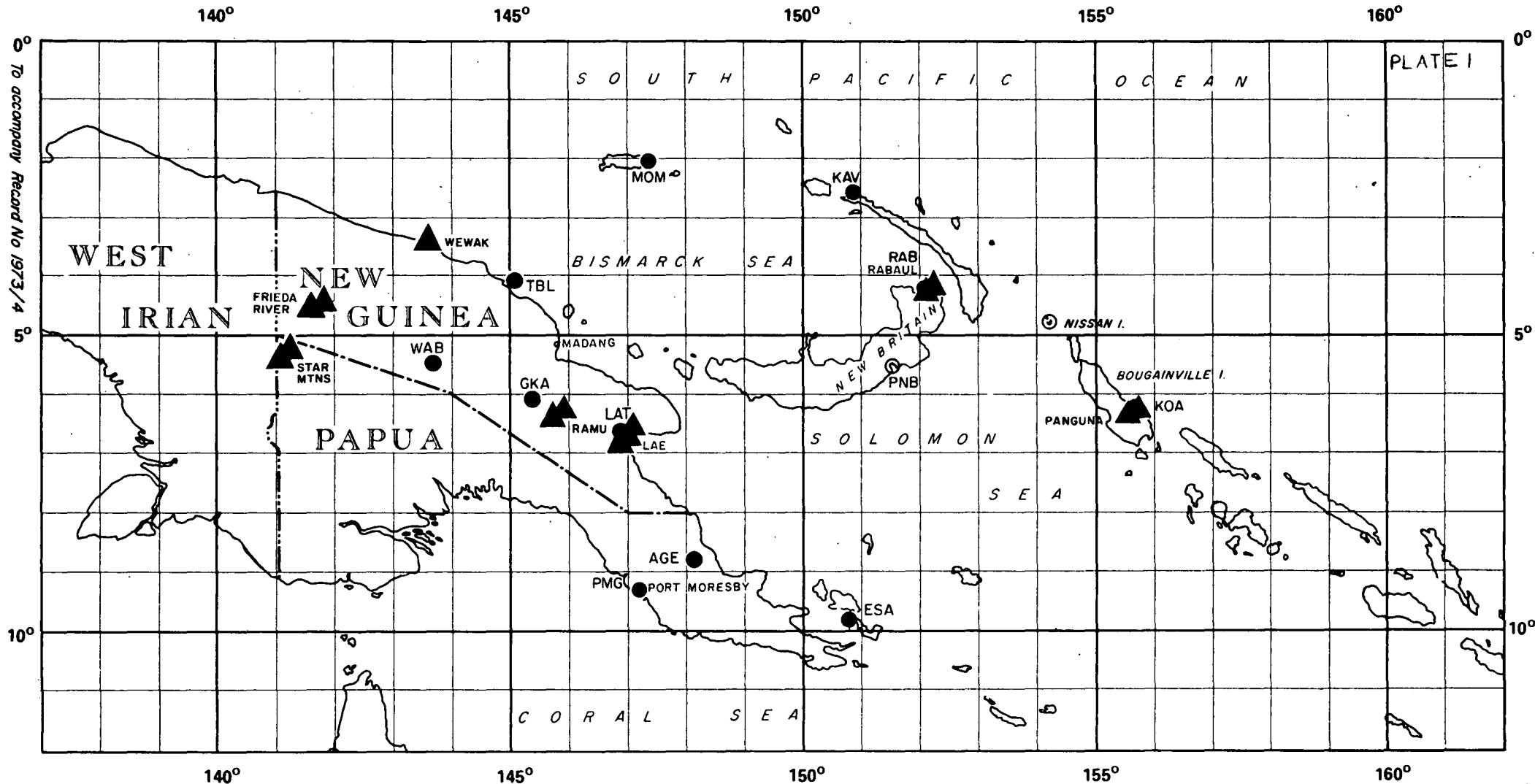
TABLE 14  
GEOMAGNETIC ANNUAL MEAN VALUES

1961 - 1971

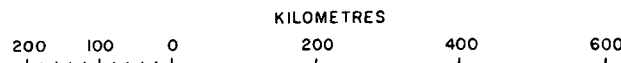
| Year                     | D       | I         | H      | X      | Y      | Z        | F      | Notes |
|--------------------------|---------|-----------|--------|--------|--------|----------|--------|-------|
| 1961                     | 6° 03.4 | -32 07.6' | 36 427 | 36 224 | 3 843  | - 22 874 | 43 013 | 1B    |
| 1962                     | 05.1    | 11.0      | 402    | 197    | 859    | 909      | 011    | 1B    |
| 1963                     | 06.3    | 14.1      | 379    | 173    | 869    | 940      | 008    | 2B    |
| 1964                     | 07.5    | 16.7      | 359    | 151    | 879    | 966      | 005    | 2B    |
| 1965                     | 08.9    | 19.7      | 339    | 130    | 892    | 998      | 005    | 2B    |
| 1966                     | 09.9    | 23.8      | 315    | 105    | 900    | - 23 043 | 009    | 2B    |
| 1967                     | 10.5    | 26.2      | 284    | 073    | 903    | 059      | 42 991 | 2B    |
| 1968                     | 11.4    | 30.2      | 256    | 045    | 909    | 100      | 990    | 2B    |
| 1969                     | 12.3    | 33.8      | 233    | 021    | 916    | 139      | 991    | 2B    |
| 1970                     | 13.0    | 36.6      | 200    | 35 987 | 921    | 160      | 975    | 2C    |
| 1971                     | 14.0    | 39.3      | 178    | 964    | 928    | 187      | 971    | 2C    |
| Mean<br>annual<br>change | + 1.06' | - 03.17'  | - 24.9 | - 26.0 | + 08.5 | - 31.3   | - 04.2 |       |

NOTES: 1. Final value  
2. Preliminary value

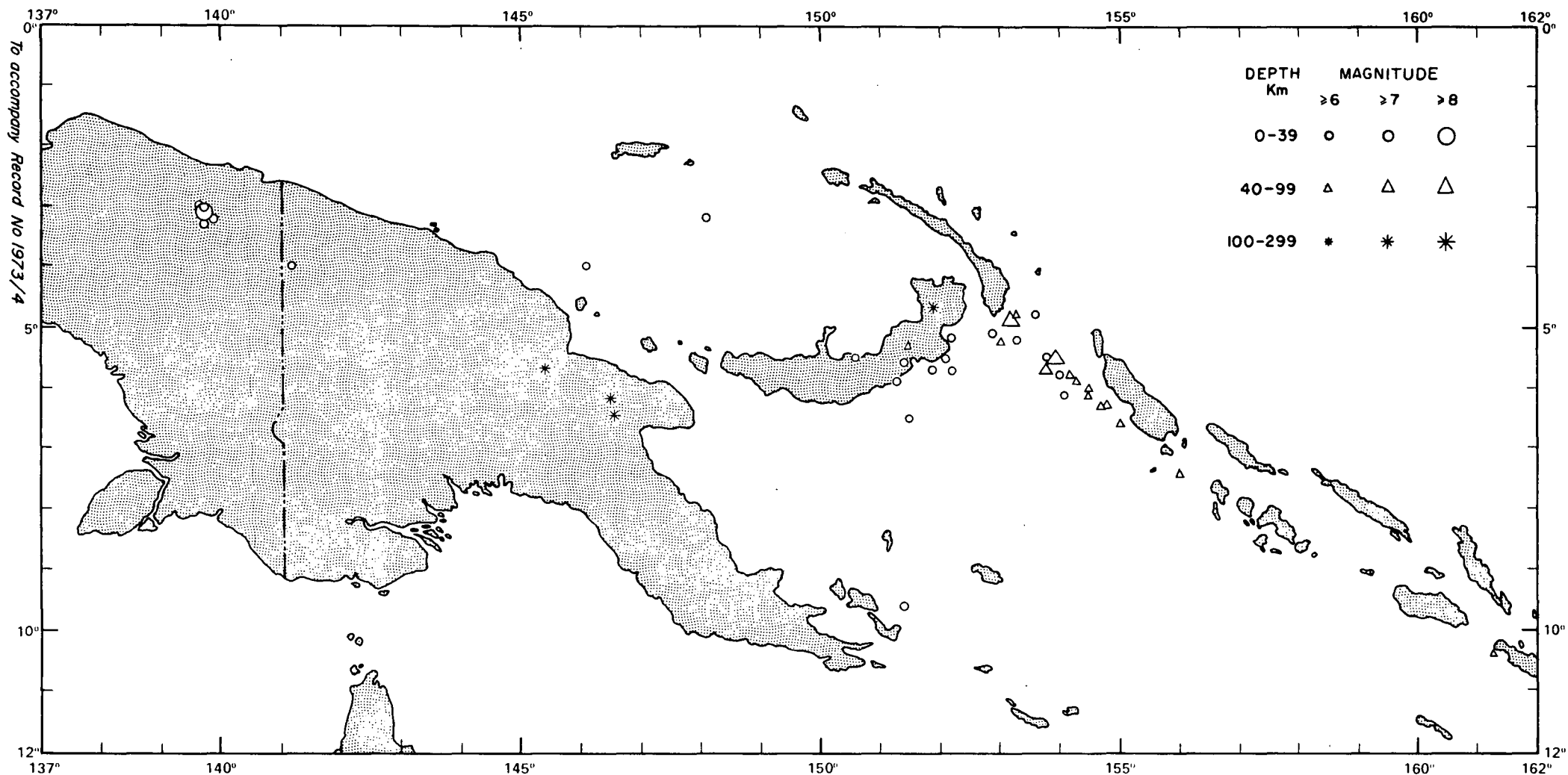
B. Mean of hourly values, 5IQ days  
C. Mean of daily values, 10Q days



PAPUA NEW GUINEA SEISMOGRAPH AND  
ACCELEROGRAPH LOCATIONS, 1971



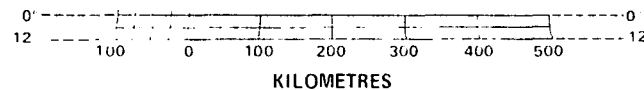
- TEMPORARY SEISMOGRAPH
- PERMANENT SEISMOGRAPH
- ▲ ACCELEROGRAPH



(Based on PNG/B0 43A)

# NEW GUINEA-SOLOMON ISLANDS REGION

## 1971 EARTHQUAKES WITH MAGNITUDE M6 AND ABOVE



SCALE 1:10 000 000 AT EQUATOR