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MONTHLY SEISMOLOGICAL BULLETIN.

JANUARY, 1961.

Latitude:  $35^{\circ} 19' 15''$ S. Longitude:  $148^{\circ} 59' 55''$ E. Height: 700 M.

Instruments: three-component Benioff variable reluctance seismographs.

$T_s = 1$  sec.

$T_g = 0.25$  sec. (short periods VNE)

$T_g = 16$  sec. (long period vertical  $V_1$ )

$T_g = 70$  sec. (long period horizontals  $N_1E_1$ )

One N-S component Wood-Anderson Seismograph,  $T_s = 0.8$  sec.

Mt. Stromlo quartz clocks provide accurate time marks and 50 c/s for drum drive.

Abbreviations: R - rarefaction; C = compression; H = origin.

Epicentre locations are those given by USCGS.

| No. | Date. | Phase  | Component  | Time   | Remarks.  |
|-----|-------|--|--|--|---|
| 1   | 1     | eP   | V  | 13 14 52.0   | 12.9S 167.2E h: 87km.<br>New Hebrides Is. region.                     |
| 2   | 1     | eP   | V  | 14 02 43.5   | 19.4S 121.0E h: 77km.<br>Near north coast of Luzon<br>P.I.            |
| 3   | 1     | iP   | VE   | 16 44 20.5   | C 18.3S 178.2W h: 663km.<br>Fiji Is. region.                          |
| 4   | 1     | eP   | VE   | 19 45 48.5   | 54.1S 7.4E h: 91km.<br>Bouvet Is. region.                             |
| 5   | 1     | iP<br>e  | VE<br>$V_1$  | 20 27 11.5<br>37 32  | C 49.5S 125.5E h: 59km.<br>South of Australis                         |
| 6   | 1     | eP   | VE   | 22 17 12.0   | R 29.0S 177.1W h: 115km.<br>Kermadec Is. region.                      |
| L1  | 2     | e  | V  | 04 43 17   | Regional (Victoria, Aust.)  |
| L2  | 2     | eP<br>iS   | V<br>V   | 05 14 13.0<br>25.0   | Local   |
| L3  | 2     | e<br>i   | V<br>V   | 08 36 14.5<br>20.0   | Local   |
| 7   | 2     | iP<br>ipP<br>i<br>ePP<br>iPPP<br>iS<br>isS<br>iSSS<br>eL<br>iScP | $VEV_1N_1E_1$<br>$V_1N_1E_1$<br>$V_1$<br>$V_1$<br>$V_1$<br>$N_1$<br>$E_1$<br>V<br>$N_1$<br>C | 10 17 35.0<br>57.0<br>18 00.0<br>23<br>41<br>22 12.5<br>44<br>23 54.0<br>23.9<br>24 23.5 | C 12.4S 166.4E h: 161km.<br>Santa Cruz Is. region.<br>h: 0.01 (Canb.) |
| 8   | 2     | i  | V  | 10 47 11.5   |   |
| 9   | 2     | iP   | V  | 12 57 28.0   | 5.3N 127.4E h: 66km.<br>Near Mindanao, P.I.                           |
| 10  | 2     | iP<br>i  | V<br>V   | 20 57 50.0<br>58 14.5  | 6.8S 150.3E h: 62km.<br>New Britain region.                           |
| 11  | 2     | iP   | V  | 22 07 56.5   | C   |
| 12  | 2     | iP<br>i(pP)  | V<br>V   | 23 12 58.5<br>13 19.0  | 10.2S 160.7E h: 117km<br>Solomon Is.                                  |



| No. | Date | Phase           | Component                      | Time       | Remarks.   |
|-----|------|-----------------|--------------------------------|------------|--|
| 13  | 3    | ePKP            | V                              | 08 30 30.0 | 1.1N 29.2W h: 25km.<br>Mid-Atlantic Ocean                            |
| L4  | 3    | i               | V                              | 08 31 04.5 | Local  |
| 14  | 3    | i               | V                              | 11 10 24.5 |  |
| 15  | 3    | iP              | V                              | 11 47 20.0 | 6.8S 129.3E h: 72km.<br>Banda Sea.                                   |
| 16  | 3    | iP              | V                              | 19 33 34.0 | C 6.4S 130.4E h:100km.<br>Banda Sea                                  |
|     |      | eP              | V                              | 34.5       |  |
|     |      | i(s)            | V                              | 38 51.0    |  |
| 17  | 3    | eP              | V                              | 20 12 32.0 | 7.3S 123.0E h: 154km.<br>Banda Sea                                   |
| 18  | 3    | iP              | V                              | 22 34 43.0 |  |
| 19  | 4    | iP              | VE                             | 01 58 04.0 | C 5.5N 122.5E h: 633km.<br>Celebes Sea                               |
|     |      | iPcP            | V                              | 59 21.5    |  |
|     |      | iScP            | V                              | 02 02 19.0 |  |
| L5  | 4    | e               | V                              | 05 33 (54) | Regional   |
|     |      | eS              | V                              | 39 21.0    |  |
| 20  | 4    | e               | V                              | 07 46 17.0 |  |
| 21  | 4    | iP              | V                              | 11 37 11.0 | 6.9S 121.7E h: 25km.<br>Flores Sea                                   |
| 22  | 4    | eP              | VE                             | 13 31 32.0 | R 17.4S 178.9W h: 591km.<br>Fiji Is.                                 |
| L6  | 4    | e               | V                              | 16 30 40   | Regional   |
| 23  | 4    | iP              | VE                             | 19 23 02.0 | R 5.5S 128.7E h: 173km.<br>Banda Sea                                 |
| L7  | 4    | e               | V                              | 21 14 (08) | Regional   |
| 24  | 5    | eP              | V                              | 03 08 09.0 |  |
|     |      | i               | V                              | 20.0       |  |
| 25  | 5    | iP              | V                              | 05 47 03.0 | 20.1S 174.0W h: 25km.<br>Tonga Is.                                   |
| 26  | 5    | eP              | V                              | 14 19 36.0 | C 51.6N 176.3W h:37km.<br>Andreanof Is. Aleutian Is.                 |
|     |      | epP             | V <sub>1</sub>                 | 51.0       |  |
|     |      | ipP             | V                              | 52.5       |  |
|     |      | eSKS            | N <sub>1</sub>                 | 30 06      |  |
|     |      | iS              | EE <sub>1</sub>                | 37.5       |  |
|     |      | eSS             | E <sub>1</sub>                 | 36 48.0    |  |
|     |      | e(PSPS)         | V                              | 37 54.5    |  |
|     |      | e               | E <sub>1</sub>                 | 43 47      |  |
|     |      | eL <sub>r</sub> | V <sub>1</sub>                 | 48.9       |  |
|     |      | M               | V <sub>1</sub>                 | 53.7       |  |
|     |      | M               | E <sub>1</sub>                 | 56.2       |  |
| 27  | 5    | eP              | V                              | 15 21 52.5 | 45.7N 149.3E h: 19km.<br>Kurile Is.                                  |
|     |      | i               | VN                             | 53.0       |  |
| 28  | 5    | iP              | VN <sub>1</sub> N <sub>1</sub> | 16 00 14.0 | C 4.1S 143.0E h:108km.<br>New Guinea<br><br>Mag. 6-1/4 - 1/2 (Canb). |
|     |      | i               | V <sub>1</sub>                 | 19.0       |  |
|     |      | i               | V <sub>1</sub>                 | 21.5       |  |
|     |      | i               | V                              | 33.5       |  |
|     |      | i(pP)           | V                              | 45.5       |  |
|     |      | i(sP)           | V                              | 57.5       |  |
|     |      | iPP             | V <sub>1</sub> N <sub>1</sub>  | 01 32.0    |  |
|     |      | i(PcP)          | E                              | 03 03.5    |  |
|     |      | iS              | N <sub>1</sub> E <sub>1</sub>  | 05 12.0    |  |
|     |      | i               | N <sub>1</sub>                 | 20.0       |  |
|     |      | e(L)            | N <sub>1</sub>                 | 06 15      |  |
|     |      | e               | V <sub>1</sub>                 | 30         |  |
|     |      | e               | N                              | 10 49      |  |
|     |      | M               | E <sub>1</sub>                 | 13.0       |  |
|     |      | M               | V <sub>1</sub> N <sub>1</sub>  | 14.3       |  |

| No. | Date | Phase  | Component                                       | Time       |   | Remarks.                    |
|-----|------|--------|---|------------|---|-----------------------------|
| 29  | 5    | iP     | VNEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 18 02 53.5 | R | 21.2S 169.3E h:123km.       |
|     |      | i      | V   | 55.0       |   | Loyalty Is. region.         |
|     |      | i      | V   | 56.0       |   |                             |
|     |      | i      | N   | 03 04.0    |   |                             |
|     |      | e(S)   | N <sub>1</sub>                                  | 06 54      |   |                             |
|     |      | iS     | N <sub>1</sub>                                  | 07 06.0    |   |                             |
|     |      | iS     | E <sub>1</sub>                                  | 07.0       |   |                             |
|     |      | iS     | N   | 08 0       |   |                             |
| 30  | 5    | iP     | VNEV <sub>1</sub>                               | 18 19 39.5 | R | 21.0S 169.1E h: 124km.      |
|     |      | eS     | N <sub>1</sub>                                  | 23 50      |   | Loyalty Is, region.         |
|     |      | eS     | VN  | 52         |   |                             |
|     |      | i      | N <sub>1</sub>                                  | 57         |   | confused in previous *quake |
| 31  | 5    | iP     | V   | 19 05 40.0 | R |                             |
| 32  | 5    | eP     | V   | 20 13 50   |   | 11.5N 143.5E h:25km.        |
|     |      |        |   |            |   | Mariana Is. region.         |
| 33  | 6    | eP     | VE  | 00 08 01.5 |   | 32.4S 178.6W h:166km.       |
|     |      | eL     | V <sub>1</sub> N <sub>1</sub> E <sub>1</sub>    | 11 21      |   | Kermadec Is. region.        |
| 34  | 6    | e(P)   | V   | 00 59 22.0 |   |                             |
| 35  | 6    | eP     | VN  | 01 22 03.0 |   |                             |
| 36  | 6    | eP     | V   | 01 32 28.0 | C | 42.5N 143.4E h:21km.        |
|     |      |        |   |            |   | Hokkaido, Japan.            |
| L8  | 6    | e      | V   | 02 06 06   |   | Local                       |
| 37  | 6    | eP     | V   | 06 34 45.5 |   | 51.8N 176.2W h:48km.        |
|     |      |        |   |            |   | Andreanof Is, Alautian Is.  |
| 38  | 6    | iP     | V   | 07 18 42.5 | R | 53.3N 159.7E h: 24km.       |
|     |      |        |   |            |   | Kamchatka                   |
| 39  | 6    | e(P)   | V   | 12 18 25   |   |                             |
| L9  | 6    | eP     | V   | 13 44 42.5 |   | Local                       |
|     |      | iS     | V   | 54.0       |   |                             |
| L10 | 7    | e      | V   | 05 35 22   |   | Regional                    |
| 40  | 7    | i(P)   | V   | 11 35 27.0 |   | 24.3S 179.4E h:584km.       |
|     |      |        |   |            |   | South of Fiji Is.           |
| 41  | 7    | iP     | VN  | 18 29 40.5 |   | 57.2S 25.3W h: 94km.        |
|     |      | ipP    | V   | 30 04.5    |   | Sandwich Is.                |
| 42  | 7    | e      | V   | 21 46 51   |   |                             |
| 43  | 8    | eP     | V   | 03 04 22   |   | 3.5N 129.6E h:117km.        |
|     |      | i(PcP) | V   | 06 19      |   | Halmahera region.           |
|     |      | e      | E <sub>1</sub>                                  | 22.2       |   |                             |
| 44  | 8    | iP     | VN  | 04 44 30.0 | C |                             |
| L11 | 8    | i      | VNE   | 05 34 30.0 |   | Regional                    |
| 45  | 8    | eP     | VV <sub>1</sub>                                 | 07 34 10.5 | C |                             |
|     |      | e      | E <sub>1</sub>                                  | 11.5       |   |                             |
| 46  | 8    | iP     | VNEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 07 36 33.0 | C |                             |
|     |      | i      | N   | 54.0       |   |                             |
|     |      | eS     | N <sub>1</sub>                                  | 40 47      |   |                             |
|     |      | eL     | V <sub>1</sub>                                  | 43.3       |   |                             |
| 47  | 8    | iP     | VE  | 10 06 17.5 |   | 25.9S 179.6E h:538km.       |
|     |      | i      | V   | 45.5       |   | Kermadec Is. region.        |
|     |      | iScP   | V   | 12 12.5    |   |                             |
| 48  | 8    | e      | VNE   | 20 50 58   |   | short period movement,      |
|     |      | i max  | V   | 52 03      |   | similar to a <u>T</u> Wave. |



| No. | Date | Phase | Component                                    | Time       | Remarks.                                       |
|-----|------|-------|--|------------|--|
| L12 | 8    | eP    | VN   | 21 07 41.0 | Local  |
|     |      | i(S)  | V  | 47.5       |  |
|     |      | eS    | E  | 48.5       |  |
| 49  | 9    | iP    | VE   | 08 00 31.5 | 28.2S 176.8W h: 25km.<br>Kermadec Is. region.  |
| 50  | 9    | (iP)  | E <sub>1</sub>                               | 10 18 16.0 | 21.3S 169.1E h: 82km.                          |
|     |      | iP    | VV <sub>1</sub>                              | 17.0       | Loyalty Is.                                    |
|     |      | eS    | V <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 22 31.0    |  |
| 51  | 9    | ePKP  | V  | 11 26 44   | 17.7N 61.1W h: 25km.<br>Leeward Is.            |
| 52  | 9    | iPKP  | V  | 11 30 55.5 | C 17.6N 61.0W h: 52km.<br>Leeward Is.          |
| 53  | 9    | iP    | VN   | 12 21 26.5 | R  |
| 54  | 9    | iP    | V  | 12 32 49.0 | C  |
| 55  | 9    | iP    | V  | 13 38 16.5 | C  |
| 56  | 9    | ePKP  | V  | 19 41 51.0 | 17.8N 61.0W h: 31km.<br>Leeward Is.            |
| 57  | 9    | iP    | V  | 19 44 43.0 |  |
| 58  | 10   | e     | V  | 00 13 26   |  |
| 59  | 10   | iP    | VNE  | 07 36 57.0 | C  |
| 60  | 10   | eP    | V  | 09 19 34.0 | R 5.9S 130.0E h: 84km.                         |
|     |      | i     | VN   | 34.5       | Banda Sea                                      |
| 61  | 10   | eP    | VN   | 11 29 30.5 |  |
|     |      | i     | VN   | 33.0       |  |
|     |      | e     | VNE  | 32 58      |  |
|     |      | eT    | V  | 46 (07)    |  |
|     |      | T max | V  | 47 33      |  |
| 62  | 10   | eP    | VV <sub>1</sub>                              | 14 34 54.5 | C 49.9N 156.2E h; 29km                         |
|     |      | iPcP  | V  | 58.0       | Kurile Is. region.                             |
|     |      | iPP   | V  | 38 11.5    |  |
|     |      | eSKS  | N <sub>1</sub>                               | 45 14      |  |
|     |      | eS    | E <sub>1</sub>                               | 21         |  |
|     |      | eScS  | V <sub>1</sub>                               | 26         |  |
|     |      | M     | V <sub>1</sub>                               | 15 08.7    |  |
|     |      | M     | E <sub>1</sub>                               | 10.2       |  |
| 63  | 10   | e     | V  | 14 53 07   |  |
| L13 | 11   | iP    | V  | 04 14 02.5 | Regional                                       |
|     |      | i     | V  | 05.0       |  |
|     |      | i     | V  | 25.5       |  |
| 64  | 11   | eP    | V  | 12 13 19   | 51.8N 171.0W h: 47km.<br>Fox Is., Aleutian Is. |
| 65  | 11   | eP    | V  | 16 36 57   | 54.7S 162.9E h: 27km.                          |
|     |      | eT    | VNE  | 56 (07)    | Macquarie Is.                                  |
| 66  | 11   | eP    | V  | 21 41 26   | 52.3S 160.3E h: 25km.                          |
|     |      | i     | N  | 28         | Near Macquarie Is.                             |
|     |      | i     | V <sub>1</sub>                               | 30.0       |  |
|     |      | eS    | E <sub>1</sub>                               | 44 54      |  |
|     |      | eL    | N <sub>1</sub> E <sub>1</sub>                | 45 10      |  |
|     |      | eSS   | V <sub>1</sub>                               | 19         |  |
|     |      | eT    | V  | 57 (36)    |  |
|     |      | T max | V  | 59 07      |  |
|     |      | T max | N  | 25         |  |
| 67  | 12   | eP    | V  | 05 21 13.5 | 20.3S 169.0E h: 100km.                         |
|     |      | ipP   | V  | 23.5       | New Hebrides Is.                               |



| No.  | Date | Phase  | Component                                      | Time       | Remarks.  |
|------|------|--------|--|------------|---|
| ★ 68 | 13   | eP     | V  | 19 30 51.0 | 46.5S 34.1E h: 60km.<br>Near Prince Edward Is.      |
| 69   | 14   | eP     | V  | 00 39 (30) | 52.9S 160.8E h: 25km.<br>near Macquarie Is.         |
|      |      | i      | V  | 48.0       |   |
|      |      | eT     | VNE  | 56 02      |   |
|      |      | iT max | E  | 57 10      |   |
| 70   | 14   | iP     | V  | 05 38 48.0 | 5.4S 152.9E h: 81km.<br>New Ireland region.         |
| 71   | 14   | e      | V  | 07 50 08.5 |   |
| 72   | 14   | eP     | V  | 10 09 12.5 |   |
| 73   | 14   | i(P)   | V  | 11 27 24.5 |   |
| ● 74 | 14   | i      | V  | 16 39 34.5 |   |
| 75   | 15   | eP     | V  | 01 07 20.0 | 53.6S 139.6E h: 25km.<br>South of Australia         |
|      |      | eS     | E <sub>1</sub>                                 | 11 04      |   |
|      |      | eL     | V <sub>1</sub> N <sub>1</sub>                  | 12.5       |   |
| 76   | 15   | iP     | V  | 06 15 58.5 | R   |
| L14  | 15   | eP     | V  | 07 39 55.5 | Local   |
|      |      | eS     | E  | 40 02.0    |   |
|      |      | iS     | V  | 02.5       |   |
| 77   | 15   | iP     | VNE  | 07 59 21.0 | C   |
| 78   | 15   | e      | V  | 10 17 57.0 |   |
|      |      | eT     | VE   | 34.4       |   |
|      |      | iTmax  | VN   | 35 57      |   |
| ● 79 | 15   | iP     | V  | 12 04 44.5 | 39.5N 143.3E h: 75km.<br>Near east coast of Honshu  |
|      |      | iPcP   | V  | 52.0       |   |
| ● 80 | 15   | eP     | V  | 16 49 42.5 | C<br>20.4S 169.5E h: 182km.<br>Loyalty Is. region.  |
|      |      | i      | V <sub>1</sub>                                 | 44.5       |   |
|      |      | i      | N <sub>1</sub> E <sub>1</sub>                  | 46.5       |   |
|      |      | i(pP)  | VEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 50 10.0    |   |
|      |      | iPP    | N <sub>1</sub>                                 | 24.0       |   |
|      |      | eS     | N <sub>1</sub>                                 | 53 47      |   |
|      |      | e      | N <sub>1</sub> E <sub>1</sub>                  | 54 31.0    |   |
|      |      | i(sS)  | N <sub>1</sub> E <sub>1</sub>                  | 45.0       |   |
|      |      | ePcS   | V  | 56 53.0    |   |
| 81   | 15   | i      | V  | 20 06 00.0 |   |
| L15  | 15   | iP     | VE   | 20 41 10.2 | Local   |
| ● 82 | 15   | iP     | VE   | 20 41 57.5 | 5.2S 110.0E h: 565km.<br>Java Sea                   |
|      |      | iPcP   | V  | 43 20.5    |   |
|      |      | iScP   | V  | 46 20.5    |   |
| ● 83 | 16   | (eP)   | V  | 04 20 20.0 |   |
|      |      | i      | VE   | 22.0       |   |
| ● 84 | 16   | eP     | VV <sub>1</sub>                                | 07 31 30.0 | 36.0N 141.1E h: 131km.<br>Near east coast of Honshu |
|      |      | i      | V  | 38.0       |   |
|      |      | iSP    | V <sub>1</sub>                                 | 32 28.5    |   |
|      |      | iPP    | V  | 34 20.5    |   |
|      |      | iS     | E <sub>1</sub> N <sub>1</sub>                  | 40 47.5    |   |
|      |      | eS     | V <sub>1</sub>                                 | 48.5       |   |
|      |      | iScS   | V <sub>1</sub>                                 | 41 16.0    |   |
|      |      | i      | V <sub>1</sub> E <sub>1</sub>                  | 41         |   |
|      |      | e(SS)  | N <sub>1</sub>                                 | 45 14.5    |   |
|      |      | M      | V <sub>1</sub>                                 | 08 03.8    |   |
|      |      | M      | E <sub>1</sub>                                 | 04.8       |   |
| L16  | 16   | eP     | V  | 07 41 45.5 | Regional  |
|      |      | iS     | V  | 42 07.0    |   |
| 85   | 16   | e      | V  | 08 11 11   |   |



| No. | Date | Phase | Component                       | Time       | Remarks.  |
|-----|------|-------|---------------------------------|------------|---|
| 86  | 16   | e(P)  | V                               | 08 59 28   | 35.0N 141.3E h:188km.<br>Near east coast of Honshu. |
| 87  | 16   | eP    | V                               | 11 30 57.5 | 35.7N 140.6E h: 157km.                              |
| 88  | 16   | eP    | V                               | 11 52 32   | 35.2N 141.0E h: 149km.                              |
| 89  | 16   | iP    | V                               | 12 23 47.0 | 36.2N 141.7E h:105km.                               |
|     |      | i     | VV <sub>1</sub>                 | 58.0       | Honshu, Japan.                                      |
|     |      | iPcP  | V                               | 24 06.5    |   |
|     |      | eS    | N <sub>1</sub> E <sub>1</sub>   | 33 06      |   |
|     |      | M     | V <sub>1</sub> E <sub>1</sub>   | 56.4       |   |
| 90  | 16   | eP    | V                               | 13 20 29   | 35.6N 140.8E h: 144km.                              |
| 91  | 16   | eP    | V                               | 14 15 16.0 | 36.3N 141.2E h: 127km.                              |
| 92  | 16   | eP    | V                               | 15 52 32.5 | 36.4N 140.6E h: 147km.                              |
|     |      | i     | V                               | 48.0       |   |
|     |      | i     | V                               | 53.5       |   |
|     |      | eS    | N <sub>1</sub>                  | 16 01 48   |   |
|     |      | eS    | E <sub>1</sub>                  | 50.0       |   |
|     |      | e(sS) | E <sub>1</sub>                  | 02 50.5    |   |
|     |      | eL    | N <sub>1</sub>                  | 17.5       |   |
|     |      | eL    | V <sub>1</sub>                  | 18.1       |   |
| L17 | 16   | iP    | VE                              | 16 22 06.0 | Local.Snowy Mts.area, N.S,W.                        |
|     |      | i     | V                               | 07.5       |   |
|     |      | i(S)  | V                               | 17.5       |   |
|     |      | eS    | VE                              | 18.5       |   |
| 93  | 17   | e     | V                               | 01 41 55   |   |
|     |      | eL    | E <sub>1</sub>                  | 45 21      |   |
|     |      | e     | V <sub>1</sub>                  | 46.3       |   |
|     |      | eT    | VNE                             | 58         |   |
|     |      | T max | V                               | 59 44      |   |
| 94  | 17   | iP    | V                               | 02 19 15.0 | R   |
| 95  | 17   | iP    | VN                              | 05 50 35.5 | R   |
|     |      | i     | VN                              | 51 08.5    |   |
| L18 | 17   | iP    | V                               | 06 04 20.5 | Local   |
|     |      | e(S)  | V                               | 32.5       |   |
|     |      | e(S)  | N                               | 34.0       |   |
| 96  | 17   | iP    | V                               | 06 52 52.1 | C 36.2N 141.6E h:99km.<br>Honshu                    |
| 97  | 17   | e(P)  | V                               | 17 59 06   |   |
|     |      | e(L)  | E <sub>1</sub>                  | 18 02 40   |   |
|     |      | eT    | VNE                             | 15         |   |
|     |      | T max | VN                              | 16 51      |   |
| 98  | 17   | eP    | V                               | 23 10 28.0 | 21.4S 169.3E h:84km.                                |
|     |      | ipP   | V                               | 39.0       | Loyalty Is. region.                                 |
|     |      | isP   | E <sub>1</sub>                  | 44.0       |   |
|     |      | i(sS) | E <sub>1</sub>                  | 14 45.0    | Probably normal depth.                              |
|     |      | M     | V <sub>1</sub> E <sub>1</sub>   | 30.9       |   |
| L19 | 18   | eP    | V                               | 07 33 10.0 | Regional  |
|     |      | i(S)  | VN                              | 32.0       |   |
| 99  | 19   | eS    | N <sub>1</sub> E <sub>1</sub>   | 04 31 22   | 14.4S 166.7E h:26km.                                |
|     |      | eL    | E <sub>1</sub>                  | 31.6       | New Hebrides Is. region.                            |
| 100 | 19   | (eP)  | V                               | 05 59 31.0 | 21.5S 170.3E h:100km.                               |
|     |      | i     | VEV <sub>1</sub> E <sub>1</sub> | 32.5       | Loyalty Is.   |
|     |      | eS    | N <sub>1</sub>                  | 06 03 50   |   |
|     |      | iS    | E <sub>1</sub>                  | 51.5       |   |
|     |      | e     | V <sub>1</sub>                  | 56.5       |   |
|     |      | eL    | N <sub>1</sub> E <sub>1</sub>   | 05.3       |   |



| No. | Date | Phase           | Component       | Time       | Remarks.  |
|-----|------|-----------------|-----------------|------------|---|
| 101 | 19   | iP              | VE              | 17 34 55.0 | 49.7N 155.8E h:31km.<br>Kurile Is.  |
|     |      | ipP             | V               | 35 07.0    |   |
|     |      | isP             | V               | 16.0       |   |
| 102 | 20   | e(P)            | V               | 02 31 33.5 |   |
|     |      | i               | V               | 47.5       |   |
| L20 | 20   | iP              | VN              | 03 55 08.0 | Local   |
|     |      | iS              | VNE             | 11.5       |   |
| 103 | 20   | iP              | V               | 05 31 43.0 |   |
| 104 | 20   | i(P)            | V               | 18 48 07.0 |   |
|     |      | eL              | N <sub>1</sub>  | 51 33      |   |
|     |      | e(T)            | V <sub>1</sub>  | 19 03 04   |   |
| 105 | 20   | eP              | V               | 21 10 48.0 |   |
| 106 | 20   | e(P)            | V               | 21 43 16   |   |
|     |      | e(T)            | V               | 59 (21)    |   |
| 107 | 20   | e               | V               | 22 16 48   | short period movement,<br>similar to a T wave.                              |
| 108 | 20   | eP              | V               | 22 46 11.0 | 38.1N 141.2E h:52km.<br>Near east coast of Honshu                           |
|     |      | i               | V               | 20.0       |   |
| 109 | 21   | e               | V               | 00 23 37   |   |
|     |      | eT              | V               | 39 50      |   |
| 110 | 21   | e               | V               | 15 29 (11) | short period movement,<br>similar to a T wave.                              |
| L21 | 21   | e               | V               | 20 08 (24) | Regional  |
| 111 | 21   | e               | V               | 21 23 (44) | short period movement   |
| 112 | 22   | e               | V               | 03 08 45   |   |
| 113 | 22   | eP              | V               | 03 29 57.0 | 11.9S 166.2E h: 25km.<br>Santa Cruz Is. region.<br>Mag. 6-1/2 - 3/4 (Canb.) |
|     |      | i               | VN              | 58.0       |   |
|     |      | ipP             | V <sub>1</sub>  | 30 06      |   |
|     |      | isP             | NV <sub>1</sub> | 10.0       |   |
|     |      | i(PP)           | V <sub>1</sub>  | 59         |   |
|     |      | i(S)            | NN <sub>1</sub> | 34 31.5    |   |
|     |      | i(sS)           | N <sub>1</sub>  | 49.5       |   |
|     |      | i               | E <sub>1</sub>  | 35 13      |   |
|     |      | i               | V <sub>1</sub>  | 14.0       |   |
|     |      | i(L)            | N               | 36 51      |   |
|     |      | M               | E <sub>1</sub>  | 44.9       |   |
|     |      | M               | N <sub>1</sub>  | 45.7       |   |
|     |      | M               | V <sub>1</sub>  | 45.8       |   |
| 114 | 22   | eP              | V               | 03 37 42   |   |
| L22 | 22   | e               | V               | 10 12 (36) | Regional  |
|     |      | eS              | E               | 58         |   |
| 115 | 22   | eP              | V               | 12 53 06   |   |
| L23 | 22   | eP <sub>n</sub> | V               | 14 45 32.5 | Regional. South Aust.?  |
|     |      | i               | VNE             | 33.5       |   |
|     |      | i               | N               | 43.5       |   |
|     |      | iS <sub>n</sub> | V               | 46 41.5    |   |
|     |      | iS              | N               | 42.5       |   |
| 116 | 22   | iP              | VE              | 16 15 55.0 | C 28.5S 174.8W h: 68km.<br>Kermadec Is. region.                             |
|     |      | i               | V               | 16 05.0    |   |
| 117 | 22   | iP              | V               | 17 11 00.0 |   |
| L24 | 22   | eP              | V               | 18 41 31.5 | Regional. South Australia?  |
|     |      | i               | VN              | 33.5       |   |
|     |      | i(S)            | V               | 42 47.5    |   |
|     |      | iS              | NE              | 48.5       |   |



| No. | Date | Phase  | Component   | Time  |   | Remarks.   |
|-----|------|--|---|---|---|--|
| 118 | 22   | eP<br>eL   | V<br>N <sub>1</sub>   | 19 10 42.5<br>23.5  | C | 12.3S 166.1E h:35km.<br>Santa Cruz Is.                           |
| 119 | 22   | iP   | VN  | 19 31 43.5  |   | 10.9N 124.6E h:185km.<br>Leyte, P.I.                             |
| 120 | 23   | iP<br>ipP  | VN<br>V   | 05 00 22.5<br>37.5  | R | 42.9N 145.3E h:46km.<br>Hokkaido, Japan.                         |
| 121 | 23   | e  | V   | 09 24 (03)  |   |  |
| 122 | 24   | iP   | V   | 01 08 23.0  | C |  |
| 123 | 24   | iP<br>i<br>i<br>iPP<br>i<br>iPPP<br>eS<br>iS<br>eL | VNEV <sub>1</sub> E <sub>1</sub><br>V <sub>1</sub><br>E <sub>1</sub><br>V <sub>1</sub><br>E <sub>1</sub><br>V <sub>1</sub><br>E <sub>1</sub><br>N <sub>1</sub> E <sub>1</sub><br>N <sub>1</sub> | 07 30 19.5<br>47.5<br>49.0<br>31 04.0<br>06.0<br>18.0<br>34 41.5<br>44.0<br>35 25 | R | 15.6S 167.6E h:198km.<br>New Hebrides Is. region.                |
| 124 | 24   | iP<br>i<br>eL<br>e(T)                              | VN<br>V <sub>1</sub><br>N <sub>1</sub> E <sub>1</sub><br>V  | 08 08 00.5<br>03.0<br>13 30<br>31 47  | R | 61.1S 152.1E h: 25km.<br>Antarctic Ocean, South of<br>Australia. |
| 125 | 24   | iP   | VN  | 15 43 55.0  | C |  |
| 126 | 24   | iP   | V   | 23 51 18.0  | C | 20.0S 177.1W h:211km.<br>Tonga Is. region.                       |
| 127 | 25   | iP   | VNe   | 01 03 10.0  | C | 4.9S 102.7E h:135km.<br>Near west coast of Sumatra.              |
| 128 | 25   | iP<br>i<br>M<br>M                                  | VNE<br>E <sub>1</sub><br>V <sub>1</sub><br>N <sub>1</sub>   | 05 27 03.0<br>36 45.5<br>37.3<br>39.4   | C | 14.1S 165.4E h:195km.<br>New Hebrides Is. region.                |
| 129 | 25   | i  | V   | 07 09 16.0  |   |  |
| 125 | 25   | e  | V   | 11 06 (46)  |   |  |
| 130 | 25   | iP<br>i<br>iPcP                                    | VNEV <sub>1</sub> E <sub>1</sub><br>EV <sub>1</sub><br>V  | 17 28 45.5<br>48.0<br>30 27.5   | C | 1.2N 121.3E h:56km.<br>Celebes                                   |
| 131 | 25   | i(P)   | V   | 19 13 32.0  |   |  |
| 132 | 25   | iP   | V   | 19 16 52.0  | C | 49.8N 156.0E h:98km.<br>Kurile Is.                               |
| 133 | 26   | iP   | V   | 01 58 26.0  | R | 15.3N 93.7E h:67km.<br>South of Burma.                           |
| 134 | 26   | i  | V   | 05 34 14.0  |   |  |
| 135 | 26   | eP   | V   | 06 06 55.0  |   | 13.9S 165.7E h:50km.<br>New Hebrides Is.                         |
| 136 | 26   | eP<br>i<br>i<br>i<br>i<br>e                        | VV <sub>1</sub><br>VNE<br>V <sub>1</sub><br>V <sub>1</sub><br>E <sub>1</sub><br>E <sub>1</sub>  | 13 17 20.5<br>21.5<br>28.5<br>31.0<br>48.5<br>23 34                               |   | 21.3S 169.5E h:77km.<br>Loyalty Is. region.                      |
| 137 | 26   | i(P)   | V   | 13 39 35.0  |   |  |



| No. | Date           | Phase | Component                     | Time       | Remarks.   |
|-----|----------------|-------|-------------------------------|------------|--|
| 138 | 26             | eP    | V <sub>1</sub> E <sub>1</sub> | 16 18 18.0 | R 21.4S 169.5E h: 119km.<br>Loyalty Is.  |
|     |                | i     | V                             | 20.5       |  |
|     |                | i     | N                             | 22.5       |  |
|     |                | i     | E <sub>1</sub>                | 22 24.0    |  |
|     |                | eS    | N <sub>1</sub>                | 28.0       |  |
|     |                | eS    | VNEV <sub>1</sub>             | 33.0       |  |
|     |                | i     | N <sub>1</sub>                | 34.0       |  |
|     |                | M     | V <sub>1</sub>                | 32.1       |  |
| M   | E <sub>1</sub> | 36.8  |                               |            |  |
| 139 | 26             | eP    | VN                            | 18 53 59.5 | 20.7S 169.5E h:106km.<br>Loyalty Is. region.   |
|     |                | eP    | E                             | 54 00.5    |  |
|     |                | i     | VV <sub>1</sub>               | 08.5       |  |
|     |                | i     | E <sub>1</sub>                | 10.0       |  |
|     |                | eS    | N <sub>1</sub> E <sub>1</sub> | 58 10.0    |  |
|     |                | e     | N <sub>1</sub>                | 17.0       |  |
|     |                | eL    | E <sub>1</sub>                | 59.4       |  |
| 140 | 27             | eP    | V                             | 00 04 07.5 |  |
| 141 | 27             | iP    | VN                            | 00 58 17.5 | 6.4S 154.7E h:23km.<br>Solomon Is.   |
|     |                | e(L)  | V <sub>1</sub>                | 01 08 16   |  |
| 142 | 27             | e(P)  | V                             | 03 16 36.0 | 21.9S 168.8E h:239km.<br>Loyalty Is.   |
|     |                | i     | V                             | 48.5       |  |
| 143 | 27             | i     | V                             | 14 25 11.0 |  |
| 144 | 27             | eP    | V                             | 14 51 52.0 | C 21.4S 169.5E h:64km.<br>Loyalty Is. region.  |
|     |                | eP    | NE                            | 53.0       |  |
|     |                | eS    | V <sub>1</sub> N <sub>1</sub> | 56 06      |  |
|     |                | i     | E <sub>1</sub>                | 09         |  |
| 145 | 27             | eP    | V                             | 15 10 54.0 | 21.2S 169.4E h:68km.   |
|     |                | i     | VNE                           | 55.5       |  |
|     |                | ipP   | E <sub>1</sub>                | 11 10.5    |  |
|     |                | i(S)  | E <sub>1</sub>                | 15 03.5    |  |
|     |                | eS    | N <sub>1</sub>                | 08         |  |
|     |                | eL    | N <sub>1</sub>                | 16.8       |  |
| 146 | 27             | iP    | V                             | 15 17 19.5 |  |
| L26 | 27             | e(P)  | V                             | 23 39 10.5 | Local  |
|     |                | e(S)  | V                             | 24.5       |  |
| 147 | 28             | eL    | V                             | 04 17.4    | 13.6S 76.6W h: 35km.<br>Near coast of Peru.  |
| 148 | 28             | iP    | VNE                           | 05 17 37.0 | R H: 05 12 23 (Canb.)  |
|     |                | ipP   | N                             | 43.0       |  |
|     |                | isP   | N                             | 47.0       |  |
|     |                | iS    | E <sub>1</sub>                | 21 50.5    |  |
| 149 | 28             | e     | V                             | 07 04 04   |  |
| 150 | 28             | e     | V                             | 07 20 (32) | short period movement,<br>similar to a T wave.   |
| 151 | 28             | eP    | V                             | 11 21 00.5 |  |
| 152 | 28             | iP    | VNE                           | 14 17 53.0 | 45.0S 105.8W h:144km.<br>South Pacific Ocean, about<br>1200 miles south of Easter<br>Is. |
|     |                | eL    | N <sub>1</sub>                | 32.3       |  |
| 153 | 28             | e     | V                             | 14 27 37   |  |
| 154 | 28             | iP    | V                             | 14 40 27   | 13.8S 165.8E h:128km.<br>New Hebrides Is. region.  |
| 155 | 28             | e(P)  | V                             | 17 39 24.5 |  |



|     |      |       |                |            |  | No. 10. |
|-----|------|-------|----------------|------------|--|---------|
| No. | Date | Phase | Component      | Time       | Remarks.                                       |         |
| 156 | 28   | eP    | E              | 19 48 04.5 | 21.3S 169.5E h:50km.                           |         |
|     |      | i     | V              | 05.0       | Loyalty Is. region.                            |         |
|     |      | i     | V              | 08.0       |  |         |
|     |      | eS    | N <sub>1</sub> | 52 12      |  |         |
|     |      | i     | E <sub>1</sub> | 15.5       |  |         |
|     |      | i     | V <sub>1</sub> | 19.0       |  |         |
|     |      | M     | E <sub>1</sub> | 54.8       |  |         |
| 157 | 28   | eP    | V              | 23 25 26.0 |  |         |
| 158 | 29   | iP    | VN             | 00 25 17.0 | 5.8S 131.8E h:47km. Aroe Is.                   |         |
| 159 | 29   | eP    | V              | 00 32 (06) |  |         |
| 160 | 29   | eP    | V              | 00 56 03.5 | 14.0S 165.9E h:123km. New Hebrides Is. region. |         |
| 161 | 29   | eP    | V              | 03 22 37.0 |  |         |
| L27 | 29   | eP    | V              | 05 54 10.0 | Regional                                       |         |
|     |      | eP    | NE             | 18.5       |  |         |
|     |      | i(S)  | E              | 43.5       |  |         |
|     |      | i(L)  | VN             | 55 07.5    |  |         |
| L28 | 29   | e     | V              | 12 32 11   | Regional                                       |         |
| L29 | 29   | eP    | V              | 13 23 03   | Regional                                       |         |
|     |      | e(L)  | E              | 51.0       |  |         |
|     |      | e     | N              | 52.5       |  |         |
| L30 | 29   | e     | V              | 14 46 01   | Regional                                       |         |
|     |      | e     | VE             | 47 03      |  |         |
| 162 | 29   | iP    | V              | 20 39 54.5 | 15.7S 177.5W h:446km. Tonga Is. region.        |         |
| 163 | 30   | e     | V              | 00 14 11   |  |         |
| 164 | 30   | iP    | VN             | 11 26 10.5 | R  |         |
| 165 | 30   | i     | V              | 17 22 34.5 |  |         |
| 166 | 30   | i     | V              | 23 04 12.0 |  |         |
| 167 | 31   | eS    | E <sub>1</sub> | 01 14 16   | 55.8N 153.9W h:26km.                           |         |
|     |      | eL    | N <sub>1</sub> | 38.1       | Near Kodiak Is., Alaska                        |         |
|     |      | eL    | V <sub>1</sub> | 41.3       |  |         |
| L31 | 31   | e     | V              | 01 53 18.5 | Regional                                       |         |
|     |      | i     | VN             | 40.5       |  |         |
| 168 | 31   | eP    | V              | 06 18 23.5 | 17.1S 166.8E h:60km.                           |         |
|     |      | i     | V              | 33.5       | New Hebrides Is.                               |         |
|     |      | iS    | E <sub>1</sub> | 22 36      |  |         |
|     |      | eSSS  | E <sub>1</sub> | 23 48      |  |         |
| 169 | 31   | e     | V              | 07 50 40   |  |         |
| L32 | 31   | e     | VE             | 12 14 24   | Regional                                       |         |
| 170 | 31   | iP    | V              | 13 29 37.0 | C  |         |

Seismograms read by  
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MONTHLY SEISMOLOGICAL BULLETIN.

FEBRUARY 1961.

Latitude: 35° 19' 15"S. Longitude: 148° 59' 55"E. Height: 700 M.

Instruments: three-component Benioff variable reluctance seismographs.

$T_s = 1$  sec.

$T_g = 0.25$  sec. (short periods VNE)

$T_g = 16$  sec. (long period vertical  $V_1$ )

$T_g = 70$  sec. (long period horizontals  $N_1E_1$ )

One N-S component Wood-Anderson Seismograph,  $T_s = 0.8$  sec.

Mt. Stromlo quartz clocks provide accurate time marks and 50 c/s for drum drive.

Abbreviations: R-rarefaction; C - compression; H - origin.

Epicentre locations are those given by USCGS.

| No. | Date | Phase | Component                      | Time       |   | Remarks.  |
|-----|------|-------|--------------------------------|------------|---|---|
| L1  | 1    | eP    | V                              | 10 07 36.5 |   | Regional  |
|     |      | iS    | VNE                            | 08 25      |   |   |
| 1   | 1    | iP    | VNE                            | 20 15 11.0 | R | 18.0S 178.4W<br>h: 599 km Fiji Is.                                |
| 2   | 2    | iP    | V                              | 00 50 31.8 | R | 7.3N 127.3E h:157km.<br>Near south coast of<br>Mindanao, P.I.     |
| 3   | 2    | iP    | V                              | 05 20 10.5 | R |   |
| 4   | 2    | iP    | VN                             | 11 22 09.0 | R | 13.6N 145.3E h:131km.<br>Mariana Is.                              |
|     |      | i     | N                              | 23 43.0    |   |   |
| L2  | 3    | i     | V                              | 02 13 36.5 |   | Local   |
| 5   | 3    | iP    | VN                             | 02 36 15.0 |   | 3.4N 97.1E h: 15km.<br>Near coast of Sumatra.                     |
| 6   | 3    | e     | V                              | 11 35 04   |   | short period movement,<br>similar to a T wave.                    |
| 7   | 3    | iP    | V                              | 12 38 01.0 |   | 36.9S 176.8E h:300km.<br>Off north coast of North<br>Island, N.Z. |
| 8   | 3    | eP    | V                              | 13 43 01.5 |   | 36.4N 141.0E h:103km.<br>Honshu, Japan.                           |
| L3  | 3    | iP    | V                              | 14 38 00.0 |   | Regional  |
|     |      | i(S)  | VE                             | 39 00.5    |   |   |
|     |      | i     | VE                             | 11.5       |   |   |
| 9   | 3    | iP    | VN                             | 17 08 41.0 | C |   |
| 10  | 4    | E     | V                              | 03 02 26   |   |   |
| L4  | 4    | i     | V                              | 03 21 43.0 |   | Local   |
| 11  | 4    | iP    | VV <sub>1</sub> E <sub>1</sub> | 09 03 36.5 | C | 24.7N 95.3E h:162km.<br>Northern Burma                            |
|     |      | i     | NE                             | 37.5       |   |   |
|     |      | i     | V                              | 39.5       |   |   |
|     |      | i     | V                              | 48.5       |   |   |
|     |      | i     | V                              | 04 14.0    |   |   |
| 12  | 4    | eP    | V                              | 15 36 06   | R | 17.DS 176.8W h:57km.<br>Fiji Is. region.                          |
|     |      | e(L)  | N <sub>1</sub>                 | 44.4       |   |   |
| 13  | 4    | i     | V                              | 17 52 23.0 | C |   |



| No. | Date | Phase   | Component  | Time   | Remarks.   |
|-----|------|---|--|--|--|
| 14  | 4    | iP<br>(i)<br>eS<br>e<br>eL<br>eL                      | V<br>E <sub>1</sub><br>N <sub>1</sub> E <sub>1</sub><br>E <sub>1</sub><br>N <sub>1</sub><br>V <sub>1</sub>   | 19 19 51.5<br>26 11<br>28 26<br>42 07<br>44.7<br>45.3                                    | C 24.0N 122.7E h:14km.<br>Off coast of Formosa                     |
| L5  | 5    | i<br>i  | V<br>V   | 03 53 33.0<br>34.5   | Local  |
| 15  | 5    | iP  | VNE  | 07 45 55.0   | 17.7S 173.4W h:590km.<br>Fiji Is.                                  |
| 16  | 5    | i(P)<br>i   | V<br>VN  | 11 15 48.5<br>54.0   |  |
| 17  | 5    | eP<br>e(S)<br>eL<br>eL                                | V<br>E <sub>1</sub><br>E <sub>1</sub><br>V <sub>1</sub>  | 13 00 28<br>08 30<br>16.9<br>17.4  | 38.4S 77.6E h:60km.<br>Northeast of Kerguelen<br>Is.               |
| 18  | 6    | iP  | VN   | 07 31 33.5   |  |
| 19  | 6    | eP  | V  | 18 27 32.5   | 44.8N 149.1E h:25km.<br>Kurile Is.                                 |
| 20  | 6    | eP<br>i<br>i<br>iS                                    | V<br>V<br>VN<br>EE <sub>1</sub>  | 19 35 12.5<br>13.5<br>45.5<br>39 48  | 4.8S 154.2E h:470km.<br>Solomon Is. region                         |
| 21  | 6    | iP  | V  | 20 17 20.5   | C 10.6S 161.9E h:124km.<br>Solomon Is. region.                     |
| 22  | 6    | iP<br>ePL<br>i<br>i<br>i<br>eS<br>iS<br>eL<br>eL<br>M | VNV <sub>1</sub> N <sub>1</sub><br>V <sub>1</sub><br>V<br>E <sub>1</sub><br>V <sub>1</sub> N <sub>1</sub><br>N <sub>1</sub><br>N <sub>1</sub><br>E <sub>1</sub><br>V <sub>1</sub><br>V <sub>1</sub> N <sub>1</sub> | 21 51 11.5<br>16<br>23.0<br>38.5<br>52 03.5<br>55 54<br>56 00<br>57.5<br>59.2<br>22 02.3 | C 6.8S 155.3E h:59km.<br>Solomon Is.<br><br>Mag. 6½ (Canb.)        |
| 23  | 6    | iP  | V  | 22 03 36.0   | 6.4S 155.0E h:25km.<br>Solomon Is. Obscured<br>by previous 'quake. |
| L6  | 6    | e(P)<br>i(S)<br>i(L)                                  | V<br>V<br>V  | 23 19 27.0<br>30.5<br>32.0   | Local  |
| 24  | 7    | e<br>i max  | V<br>V   | 00 29 (42)<br>31 19  | short period movement,<br>similar to a T wave.                     |
| 25  | 7    | eP<br>eL  | V<br>V <sub>1</sub>  | 01 49 34<br>02 00 42   | 11.6S 166.0E h:55km.<br>Santa Cruz Is.                             |
| 26  | 7    | eP  | V  | 03 03 43.5   | 11.7S 166.1E h:54km.<br>Santa Cruz Is.                             |
| 27  | 7    | iP  | VE   | 03 53 06.5   | R 23.6S 179.7W h:521km.<br>South of Fiji Is. region                |
| 28  | 7    | eP  | V  | 04 05 43   | 11.8S 166.2E h:55km.<br>Santa Cruz Is.                             |
| 29  | 7    | iP  | VE   | 05 20 50.0   | C 4.1S 103.3E h:82km.<br>Sumatra                                   |
| 30  | 7    | eP  | V  | 06 08 04.5   | 11.6S 166.2E h:77km.<br>Santa Cruz Is.                             |
| 31  | 7    | i(P)  | V  | 09 08 25.0   |  |



| No. | Date | Phase  | Component                     | Time       | Remarks.                                       |
|-----|------|--------|-------------------------------|------------|--|
| L7  | 7    | e      | V                             | 12 32 (30) | Regional                                       |
| L8  | 7    | e      | V                             | 19 48 06   | Regional                                       |
| 32  | 7    | e      | V                             | 21 13 43   |  |
| 33  | 8    | (eP)   | V                             | 02 42 02.0 | 15.3S 167.5E h:162km.                          |
|     |      | iP     | VN                            | 02.5       | New Hebrides Is. region.                       |
|     |      | i(pP)  | V                             | 31.5       |  |
|     |      | i(PPP) | V                             | 43 08.5    |  |
|     |      | iPcP   | V                             | 45 27.5    |  |
| 34  | 8    | iP     | VE                            | 04 40 03.0 | C 26.1S 178.8W h:431.km<br>Kermadec Is. region |
| L9  | 8    | iP     | VNE                           | 08 11 16.5 | Local  |
|     |      | i(S)   | V                             | 18.0       |  |
| 35  | 8    | iP     | V                             | 08 21 59.0 |  |
| 36  | 8    | eP     | V                             | 09 52 20   |  |
|     |      | i      | N                             | 32.5       |  |
|     |      | i      | V                             | 36.0       |  |
| 37  | 8    | iP     | VE                            | 17 56 35.0 | C 20.4S 178.1W h:543km.<br>Tonga Is.           |
|     |      | i      | VNE                           | 36.0       |  |
|     |      | iP     | V                             | 58 07.0    |  |
|     |      | iScP   | V                             | 18 02 02.5 |  |
| L10 | 8    | e      | V                             | 18 10 45.5 | Local  |
|     |      | i      | N                             | 49.5       |  |
| L11 | 8    | iP     | VNE                           | 18 56 51.0 | Local  |
|     |      | eS     | NE                            | 53.5       |  |
| 38  | 9    | eP     | V                             | 02 14 18.0 | C 28.2S 177.4W h:37km.<br>Kermadec Is. region  |
|     |      | iP     | VE                            | 18.5       |  |
|     |      | i      | VN                            | 21.0       |  |
|     |      | eS     | E <sub>1</sub>                | 19 07      |  |
|     |      | eL     | N <sub>1</sub>                | 20 57      |  |
|     |      | iPcS   | V                             | 21 04.5    |  |
|     |      | eL     | E <sub>1</sub>                | 21.9       |  |
|     |      | eL     | V <sub>1</sub>                | 22.1       |  |
|     |      | M      | V <sub>1</sub>                | 24.8       |  |
| 39  | 9    | iP     | V                             | 20 29 17.0 | 9.9S 111.3E h:73km.<br>Off south coast of Java |
|     |      | eL     | V <sub>1</sub>                | 43.5       |  |
|     |      | M      | N <sub>1</sub> E <sub>1</sub> | 44.9       |  |
|     |      | M      | V <sub>1</sub> E <sub>1</sub> | 59.5       |  |
| L12 | 9    | iP     | VN                            | 22 43 40.0 | Local  |
|     |      | e(S)   | V                             | 55.5       |  |
|     |      | i      | N                             | 57.0       |  |
| 40  | 10   | e      | N                             | 03 15 56   |  |
| 41  | 10   | i(P)   | N                             | 12 05 29.5 |  |
| 42  | 10   | iP     | NE                            | 13 26 40.0 | 2.9S 127.6E h:78km.<br>Ceram Sea               |
|     |      | i      | N                             | 51.5       |  |
|     |      | eL     | N <sub>1</sub>                | 43.2       |  |
| 43  | 10   | eP     | N                             | 17 06 32.5 | 3.5N 126.1E h:25km.<br>East of Celebes Sea     |
| 44  | 11   | eP     | V                             | 01 09 53.0 |  |
|     |      | i      | V                             | 54.5       |  |
| 45  | 11   | i(P)   | V                             | 01 34 21.5 |  |
| 46  | 11   | e      | V                             | 02 44 42.0 | 22.9N 144.2E h:60km.<br>Mariana Is. region.    |
|     |      | i      | V                             | 45.0       |  |
| L13 | 11   | iP     | V                             | 06 05 11.0 | Local  |
|     |      | iS     | VN                            | 14.0       |  |

| No. | Date | Phase   | Component  | Time   | Remarks.   |
|-----|------|---|--|--|--|
| 47  | 11   | iP  | VN   | 06 22 28.0   | C 28.8N 139.5E h:358km.<br>North of Bonin Is. region     |
| 48  | 11   | i(P)<br>i   | V<br>V   | 08 52 01.5<br>43.0   |  |
| 49  | 11   | iP  | VN   | 12 32 02.5   | C 5.2N 126.3E h:200km<br>Near coast of Mindanao,<br>P.I. |
| 50  | 11   | eP<br>i   | V<br>V   | 14 20 06.5<br>22.5   |  |
| 51  | 11   | iP<br>i   | VE<br>V  | 16 52 49.0<br>52.0   | R 19.8S 176.2W h:261km.<br>Fiji Is.                      |
| 52  | 11   | iP<br>i<br>i<br>ipP<br>isP<br>iPP<br>iPPP<br>iPcP<br>eL<br>iPcS<br>eL<br>M<br>M | VEV <sub>1</sub><br>NV <sub>1</sub> E <sub>1</sub><br>N<br>V <sub>1</sub><br>N<br>E<br>V <sub>1</sub><br>E <sub>1</sub><br>N <sub>1</sub><br>V<br>V <sub>1</sub><br>E <sub>1</sub><br>V <sub>1</sub> | 21 07 08.5<br>10.0<br>12.0<br>25.5<br>35.0<br>08 07.0<br>17.0<br>10 07.5<br>13.6<br>13 53.0<br>14 57<br>15.4<br>17.1 | C 28.2S 177.5W H:41km.<br>Kermadec Is.                   |
| 53  | 12   | iP  | V  | 01 31 27.5   |  |
| 54  | 12   | eP  | V  | 03 03 50.5   |  |
| 55  | 12   | iP  | V  | 06 48 51.5   | R  |
| 56  | 12   | e   | V  | 10 00 36   |  |
| 57  | 12   | eP  | V  | 11 37 49.5   |  |
| 58  | 12   | iP  | VNE  | 12 16 16.5   | R 15.0S 175.2W h:281km.<br>Samoa Is. region              |
| 59  | 12   | iP<br>i<br>iScP   | VNEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub><br>V <sub>1</sub><br>V   | 13 02 42.5<br>52.0<br>08 10.0  | C 13.1S 171.8E h:598km.<br>New Hebrides Is. region       |
| 60  | 12   | i   | V  | 14 07 57.0   |  |
| 61  | 12   | iP  | VN   | 15 28 16.5   | 4.1S 127.3E h:111km.<br>Banda Sea                        |
| 62  | 12   | (e)<br>e  | V<br>V   | 20 23 37.5<br>41.5   |  |
| 63  | 12   | iP<br>ipP<br>eS<br>e<br>M<br>M<br>M   | VN<br>V<br>EN <sub>1</sub> E <sub>1</sub><br>N <sub>1</sub><br>E <sub>1</sub><br>N <sub>1</sub><br>E <sub>1</sub>  | 22 05 47.0<br>06 10.5<br>15 43<br>20 39<br>28.6<br>33.3<br>39.3  | R 43.7N 147.6E h:45km.<br>Kurile Is.                     |
| 64  | 12   | e   | V  | 22 24 43   |  |
| 65  | 12   | iP<br>iPcP  | VNE<br>V   | 23 38 39.0<br>50.0   | 44.0N 147.7E h:23km.<br>Kurile Is.                       |
| 66  | 13   | eP  | VN   | 02 43 20.0   | 43.5N 148.1E h:60km.<br>Kurile Is.                       |
| 67  | 13   | e   | V  | 03 58 (30)   | 10.6S 161.4E h:71km,<br>Solomon Is. region.              |



| No. | Date | Phase  | Component        | Time       | Remarks.                                     |
|-----|------|--------|------------------|------------|--|
| 68  | 13   | eP     | V                | 06 52 42.5 | 17.08 173.7W h:43km.<br>Tonga Is. region     |
|     |      | eL     | N <sub>1</sub>   | 07 01 22   |  |
|     |      | M      | V <sub>1</sub>   | 08.7       |  |
|     |      | M      | E <sub>1</sub>   | 11.0       |  |
| 69  | 13   | iP     | V                | 09 19 16.0 | 43.8N 147.0E h:25km.<br>Kurile Is.           |
| 70  | 13   | iP     | VN               | 13 51 58.0 | C 6.9S 155.7E h:25km.<br>Solomon Is.         |
| L14 | 13   | e      | V                | 16 13 59   | Local  |
|     |      | e      | V                | 14 12.0    |  |
|     |      | i      | VN               | 15.0       |  |
| 71  | 13   | iP     | VNE              | 16 24 13.5 | C 5.1S 128.7E h:66km.<br>Banda Sea           |
|     |      | i      | V                | 20.5       |  |
|     |      | i      | V                | 25 07.5    |  |
| 72  | 13   | iP     | VV <sub>1</sub>  | 16 39 25.5 | C 43.7N 149.6E h:25km.<br>Kurile Is.         |
|     |      | i      | N                | 26.5       |  |
|     |      | iPcP   | V                | 34.5       |  |
|     |      | isP    | VN               | 38.0       |  |
|     |      | i      | N                | 39.0       |  |
| L15 | 13   | iP     | VN               | 19 23 44.5 | Local  |
|     |      | iS     | VE               | 24 01.5    |  |
| L16 | 13   | eP     | V                | 19 33 49.0 | Local  |
|     |      | eS     | V                | 34 07.0    |  |
| 73  | 13   | iP     | V                | 21 23 42.5 | C 43.6N 147.8E h:51km.<br>Kurile Is.         |
| 74  | 13   | iP     | VN               | 22 49 17.0 | C 43.6N 148.1E h:40km.                       |
| 75  | 14   | iP     | VN               | 00 27 38.0 | R 43.7N 147.5E h:92km.                       |
| 76  | 14   | iP     | VN               | 03 03 10.0 | C 44.2N 147.8E h:98km.                       |
| 77  | 14   | eP     | V                | 03 27 30.5 | C 43.8N 147.4E h:25km.                       |
| 78  | 14   | iP     | VNV <sub>1</sub> | 03 34 06.5 | R 43.8N 147.9E h: 20km.                      |
| 79  | 14   | eP     | V                | 10 08 10   | 14.8S 167.5E h:190km.<br>New Hebrides Is.    |
| 80  | 14   | (eP)   | E                | 15 58 08.5 | 15.4S 175.1W h:25km.<br>Samoa Is. region     |
|     |      | i      | V                | 11.0       |  |
| 81  | 15   | e      | V                | 00 07 57   |  |
| 82  | 15   | iP     | VNE              | 02 14 29.5 | R 22.3S 171.6E h:64km.<br>Loyalty Is. region |
|     |      | i(S)   | E <sub>1</sub>   | 18 46.5    |  |
| L17 | 15   | e      | V                | 03 25 49.5 | Regional                                     |
|     |      | e      | V                | 51.5       |  |
| 83  | 15   | eP     | V                | 06 33 14.0 | C  |
| 84  | 15   | iP     | V                | 10 57 17.0 | 43.7N 147.4E h:60km.<br>Kurile Is.           |
|     |      | i      | N                | 17.5       |  |
|     |      | i(FcP) | V <sub>1</sub>   | 23.5       |  |
|     |      | i      | V <sub>1</sub>   | 30.5       |  |
|     |      | i      | V <sub>1</sub>   | 34.0       |  |
|     |      | iS     | E <sub>1</sub>   | 11 07 13.5 |  |
|     |      | M      | E <sub>1</sub>   | 30.9       |  |
| 85  | 15   | iP     | V                | 11 41 50.0 | C 30.8N 84.4E h:66km.<br>Tibet.              |
| 86  | 15   | i      | V                | 12 09 55.0 | C  |
| 87  | 15   | iP     | V                | 16 37 46.0 |  |

| No. | Date | Phase  | Component                        | Time       | Remarks.  |
|-----|------|--------|----------------------------------|------------|---|
| L18 | 15   | i      | VN                               | 18 24 38.0 | Local   |
|     |      | e(S)   | V                                | 54.5       |   |
|     |      | e(S)   | NE                               | 55.0       |   |
|     |      | i      | V                                | 57.0       |   |
| 88  | 16   | eP     | VN                               | 14 06 52.5 | 43.2N 148.0E h:71km.  |
|     |      | e      | V                                | 07 03.5    | Kurile Is   |
|     |      | i(PcP) | V                                | 06.0       |   |
| 89  | 16   | iP     | VN                               | 16 17 23.0 | 8.4S 111.3E h:189km.<br>Java.   |
| 90  | 16   | i      | V                                | 20 06 11.0 |   |
| 91  | 16   | iP     | V                                | 20 40 41.5 | C 33.7S 57.8E h:100km,<br>Indian Ocean, south of<br>Mascarene Is.           |
| 92  | 17   | iPKP   | V                                | 06 30 50.0 | 6.5N 73.5W h:25km.<br>Columbia  |
| 93  | 17   | iP     | V                                | 07 47 47.5 |   |
| 94  | 17   | iP     | VN                               | 15 44 20.5 | C 5.0S 129.7E h:254km.<br>Banda Sea   |
|     |      | i      | V                                | 45 47.0    |   |
|     |      | i      | V                                | 50 16.0    |   |
| 95  | 18   | iP     | VNEV <sub>1</sub> E <sub>1</sub> | 12 10 42.5 | R 22.6S 171.3E h:38km.<br>Loyalty Is. region                                |
|     |      | eS     | E <sub>1</sub>                   | 14 56.5    |   |
|     |      | i      | E <sub>1</sub>                   | 15 03.0    |   |
| 96  | 18   | eP     | V                                | 20 08 40.0 | R 4.3N 126.6E h:74km.<br>Off coast of Mindanao,<br>P.I.                     |
|     |      | i      | N                                | 41.0       |   |
| 97  | 19   | eP     | V                                | 07 16 29   | 23.1S 171.9E h:25km.<br>East of Loyalth Is.<br>region.                      |
| 98  | 19   | e      | VN                               | 10 05 41   | short period movement,<br>similar to a T Wave.                              |
| 99  | 19   | i(P)   | V                                | 15 06 24.5 |   |
| L19 | 20   | i(S)   | VN                               | 06 49 27.0 | Local   |
|     |      | iL     | V                                | 28.5       |   |
| 100 | 20   | eP     | VN                               | 14 23 34.5 | 5.0S 153.4E h:107km.<br>New Ireland region                                  |
|     |      | i      | VN                               | 49.0       |   |
| 101 | 20   | i      | V                                | 18 55 24.5 |   |
|     |      | e      | V                                | 55.0       |   |
| 102 | 20   | iP     | VN                               | 18 57 19.0 | R 5.0N 96.0E h:139 km.<br>Near north coast of<br>Sumatra                    |
|     |      | i      | V                                | 21.0       |   |
|     |      | i      | V                                | 27.5       |   |
| 103 | 20   | iP     | V                                | 19 13 56.0 |   |
| 104 | 21   | e      | VN                               | 01 32 49   | short period movement,<br>similar to a T wave.                              |
|     |      | i      | N                                | 34 20      |   |
|     |      | i max  | V                                | 26         |   |
|     |      | i max  | N                                | 29         |   |
| 105 | 21   | i      | V                                | 13 05 56.5 |   |
| 106 | 21   | eP     | V                                | 19 17 41   | 48.8S 106.2E h:52km.<br>Indian Ocean, 1000 Miles<br>southwest of Australia. |
| L20 | 21   | eP     | VN                               | 19 55 56.0 | Local   |
|     |      | eS     | E                                | 56 08.5    |   |
|     |      | i(S)   | N                                | 09.0       |   |
|     |      | i      | E                                | 13.0       |   |



| No. | Date | Phase  | Component  | Time   | Remarks.  |
|-----|------|--|--|--|---|
| 107 | 21   | iP<br>e  | VNE<br>V   | 23 36 18.0<br>48.5   | C 0.1S 123.2E h:183km.<br>Celebes   |
| 108 | 22   | iP   | V  | 15 52 46.5   | C 0 99.1E h:36km.<br>Near coast of Sumatra  |
| 109 | 22   | iP<br>i<br>i<br>i<br>i(sF)<br>i<br>eS<br>eL<br>M | V<br>VE<br>E<br>N<br>V <sub>1</sub><br>E <sub>1</sub><br>E <sub>1</sub><br>N <sub>1</sub><br>E <sub>1</sub>                            | 21 59 33.5<br>34.5<br>35.5<br>37.0<br>22 00 14.0<br>46<br>04 26.5<br>06 21<br>08.9 | C 28.4S 177.2W h:78km.<br>Kermadec Is. region                                     |
| 110 | 23   | eL   | EE <sub>1</sub>  | 03 19 00   | 4.4S 134.1E h:60km.<br>Offcoast of New Guinea                                     |
| 111 | 23   | eP   | VN   | 04 27 54.5   | 38.2N 142.7E h:119km.<br>Off/coast of Honshu.<br>east                             |
| 112 | 23   | iP   | V  | 04 57 33.5   | C 2.4S 119.9E h:25km.<br>Celebes  |
| 113 | 23   | e(P)   | V  | 05 39 43.0   |   |
| 114 | 24   | iP<br>i  | V<br>V   | 01 33 32.5<br>53.5   | R 12.6S 163.9E h:33km.<br>Solomon Is. region.                                     |
| 115 | 24   | eP<br>i  | V<br>VN  | 03 14 (53)<br>15 17.5  | 26.1N 125.4E h:25km.<br>Ryukyu Is.  |
| 116 | 24   | e  | V  | 03 39 17.5   |   |
| 117 | 24   | eP<br>i  | V<br>V   | 05 35 40.5<br>42.0   |   |
| 118 | 24   | iP   | V  | 18 03 12.5   |   |
| 119 | 25   | i(P)   | V  | 00 01 08.0   |   |
| 120 | 25   | iP   | V  | 00 56 09.5   | C 19.2S 177.4W h:611km.<br>Fiji Is. region.                                       |
| 121 | 25   | iP<br>i  | VNEV <sub>1</sub> E <sub>1</sub><br>V  | 05 00 56.0<br>06 25.0  | R 21.7S 179.6W h:603km.<br>Fiji Is. region  |
| 122 | 25   | iP<br>i<br>ePP                                   | V<br>VN<br>V   | 08 29 53.5<br>54.0<br>31 25.0  | R 23.4S 179.9W h:576km.<br>South of Fiji Is. region.                              |
| L21 | 25   | e  | VN   | 11 00 06   | Regional  |
| 123 | 25   | iP<br>eL   | VV <sub>1</sub><br>V <sub>1</sub>  | 15 09 17.5 A<br>23.9   | C 15.4S 175.8W h:62km.<br>Samoa Is. region  |
| 124 | 25   | iP   | VN   | 18 56 59.5   |   |
| 125 | 26   | eP   | V  | 00 39 21.5   | 9.8S 160.1E h: 172km.<br>Solomon Is. region.                                      |
| 126 | 26   | iP   | V  | 03 19 18.0   |   |
| 127 | 26   | iB<br>eL<br>eL                                   | VV <sub>1</sub><br>E <sub>1</sub><br>V <sub>1</sub>  | 06 00 51.0<br>25.1<br>29.8   | R 32.7S 111.2W h:29km.<br>Easter Is. region.                                      |
| 128 | 26   | iP<br>eP<br>i<br>ipP<br>isP<br>iPP<br>eS<br>iScS | VV <sub>1</sub><br>NN <sub>1</sub><br>V<br>VN<br>V<br>V <sub>1</sub><br>V <sub>1</sub> N <sub>1</sub> E <sub>1</sub><br>N <sub>1</sub> | 18 21 51.5<br>52.0<br>54.5<br>22 06.0<br>10.5<br>24 23.0<br>30 56<br>31 55         | C 31.4N 131.2E h:54km.<br>Near coast of Kyushu,<br>Japan.<br>Mag. 7-7-1/4 (Canb.) |



| No. | Date    | Phase  | Component                                    | Time       | Remarks.                         |
|-----|---------|--------|--|------------|----------------------------------|
| 128 | (contd) | iScS   | V <sub>1</sub> E <sub>1</sub>                | 32 00      |                                  |
|     |         | eSS    | E <sub>1</sub>                               | 35 18      |                                  |
|     |         | e(SSS) | N <sub>1</sub> E <sub>1</sub>                | 38 22      |                                  |
|     |         | M      | E <sub>1</sub>                               | 50.1       |                                  |
|     |         | M      | V <sub>1</sub> N <sub>1</sub>                | 51.6       |                                  |
|     |         | M      | E <sub>1</sub>                               | 52.2       |                                  |
| 129 | 26      | e(P)   | V  | 18 50 07   | Obscured by previous 'quake      |
| 130 | 26      | iP     | VNE  | 19 10 52.0 | R                                |
|     |         | i      | V  | 12 21.0    |                                  |
| 131 | 26      | i      | V  | 20 40 18.5 |                                  |
| 132 | 26      | eP     | VN   | 21 10 54.5 | 16.0N 121.6E h:32km.             |
|     |         | i      | VN   | 59.0       | Luzon, P.I.                      |
| 133 | 27      | iP     | V  | 00 53 07.5 | C                                |
| 134 | 27      | ePKP   | V  | 01 26 48.5 | 6.7N 73.0W h: 200km.<br>Colombia |
| 135 | 27      | iP     | V  | 01 29 59.5 | C                                |
| 136 | 27      | e(P)   | V  | 03 02 27   |                                  |
| 137 | 27      | iP     | V  | 12 39 27.5 |                                  |
| 138 | 27      | e      | V  | 15 57 (34) |                                  |
| 139 | 27      | eP     | V  | 16 54 (58) | 4.2S 135.3E h:100km.             |
|     |         | iPP    | VN   | 56 18.5    | Near coast of New Guinea         |
| L22 | 27      | e(P)   | VN   | 17 06 15.0 | Local                            |
|     |         | i(P)   | N  | 15.5       |                                  |
|     |         | e(S)   | VN   | 33.0       |                                  |
| 140 | 27      | e      | V  | 17 06 44   |                                  |
|     |         | i      | E <sub>1</sub>                               | 45         |                                  |
| 145 | 27      | e      | VNE  | 17 13 (08) | short period movement            |
|     |         | i      | V  | 31.5       |                                  |
| 146 | 27      | e      | V  | 18 01      | short period movement            |
|     |         | i max  | V  | 02 46.5    |                                  |
|     |         | i max  | N  | 51.0       |                                  |
|     |         | i max  | E  | 59.0       |                                  |
| 147 | 28      | e      | V  | 07 37 (03) |                                  |
|     |         | i      | V  | 19.0       |                                  |
|     |         | e(T)   | V  | 52 55      |                                  |
|     |         | iT max | E  | 54 17.5    |                                  |
|     |         | iT max | N  | 18.5       |                                  |
| 148 | 28      | eL     | V <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 07 40.8    |                                  |
| 149 | 28      | iP     | VN   | 19 09 27.0 | C                                |
| 150 | 28      | i      | V  | 23 06 37.5 |                                  |
|     |         | i      | V  | 07 11.5    |                                  |

Seismograms read by  
Jennifer Clay.

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MONTHLY SEISMOLOGICAL BULLETIN.

MARCH 1961.

Latitude:  $35^{\circ} 19' 15''$ S. Longitude:  $148^{\circ} 59' 55''$ E Height: 700 M.

Insutrments: three-component Benioff variable reluctance seismographs.

$T_g = 1$  sec.

$T_g = 0.25$  sec. (short periods VNE)

$T_g = 16$  sec. (long period vertical  $V_1$ )

$T_g = 70$  sec. (long period horizontals  $N_1E_1$ )

One N-S component Wood-Anderson Seismograph,  $T_g = 0.8$  sec.

Mt. Stromlo quartz clocks provide accurate time marks and 50 c/s for drum drive.

Abbreviations: R = rarefaction; C = compression; H = origin.

Epicentre locations are those given by USCGS.

| No. | Date | Phase | Component | Time       |   | Remarks.                                      |
|-----|------|-------|-----------|------------|---|---|
| 1   | 1    | iP    | VN        | 00 32 09.0 | R | 13.2N 143.2E h: 221km.<br>Mariana Is. region. |
| 2   | 1    | iP    | VN        | 06 05 55.0 |   |   |
| 3   | 1    | eP    | V         | 06 47 41.0 |   | 18.7S 177.9W h:513km.<br>Fiji Is. region.     |
| L1  | 1    | e     | VN        | 09 33 (31) |   | Regional.                                     |
| 4   | 1    | eL    | $E_1$     | 09 36.6    |   |   |
| L2  | 1    | eP    | V         | 09 49 (25) |   | Regional                                      |
|     |      | e     | N         | 35         |   |   |
|     |      | i(S)  | V         | 50 12.5    |   |   |
|     |      | i max | E         | 37         |   |   |
| L3  | 1    | e(P)  | VN        | 10 03 48.5 |   | Local   |
|     |      | e(S)  | VN        | 04 07.0    |   |   |
| 5   | 1    | e     | V         | 11 48 (59) |   |   |
| 6   | 1    | iP    | V         | 13 22 13.5 | C | 8.0S 107.4E h:33km.<br>Near coast of Java     |
| 7   | 1    | iP    | VN        | 13 54 08.0 | R | 7.5S 130.0E h:25km.<br>Banda Sea              |
|     |      | iPP   | V         | 55 15.0    |   |   |
|     |      | i     | V         | 56 19.5    |   |   |
|     |      | eL    | $E_1$     | 14 03.4    |   |   |
| 8   | 1    | i(P)  | V         | 14 13 14.0 |   | 2.8N 126.5E h:61km.<br>Molucca Passage        |
| 9   | 1    | e     | VE        | 15 13 33   |   |   |
| 10  | 1    | iP    | VN        | 15 38 43.5 | R |   |
| 11  | 2    | e     | V         | 08 45 16   |   |   |
| 12  | 2    | iP    | V         | 14 35 09.5 |   | 18.6S 179.8W h:693km.<br>Fiji Is. region.     |
| L4  | 2    | iP    | V         | 22 27 02.5 |   | Local   |
|     |      | iS    | VNE       | 11.0       |   |   |
| 13  | 3    | e     | V         | 03 24 30.5 |   | 17.4S 168.0E h:42km.<br>New Hebrides Is.      |
| 14  | 3    | i     | V         | 04 25 10.0 |   |   |
| 15  | 3    | i(P)  | V         | 08 23 16.0 |   | 31.8S 178.0W h:63km.<br>Kermadec Is. region.  |



| No. | Date | Phase | Component                     | Time       |    | Remarks.  |
|-----|------|-------|-------------------------------|------------|----|---|
| 52  | 12   | iP    | VE                            | 23 27 49.5 |    | 28.4S 176.0W h:113km.<br>Tonga Is. region.      |
|     |      | i     | V                             | 28 01.0    |    |   |
|     |      | e(PP) | E <sub>1</sub>                | 50.5       |    |   |
|     |      | eL    | E <sub>1</sub>                | 36.7       |    |   |
| 53  | 13   | e     | V                             | 04 43 46   |    | 5.2S 135.4E h:229km.<br>Aroe Is. region.        |
|     |      | eL    | EE <sub>1</sub>               | 55 15      |    |   |
| 54  | 13   | iP    | V                             | 04 57 22.0 | C  | 5.2S 153.3E h:25km.<br>New Britain.             |
| 55  | 13   | iP    | VE                            | 07 48 49.5 | C  | 25.4S 179.5W h:449km.<br>Tonga Is. region.      |
| 56  | 13   | eP    | V                             | 10 13 04.0 |    | 5.5S 146.7E h:75km.<br>New Britain region       |
|     |      | i     | V                             | 05.0       |    |   |
| 57  | 13   | e     | V                             | 15 49 23   |    |   |
| 58  | 13   | iP    | VN                            | 20 48 07.0 | R  | 56.2S 27.2W h:56 km.<br>Sandwich Is.            |
| 59  | 13   | eP    | V                             | 21 22 19.0 |    | 16.9S 178.1W h:600km.<br>Fiji Is. region.       |
| 60  | 14   | eP    | V                             | 01 18 50.5 |    | 16.9S 176.5W h:60km,<br>Tonga Is. region.       |
|     |      | eL    | N <sub>1</sub>                | 28.6       |    |   |
| L11 | 14   | (e)   | V                             | 06 38 23.5 |    | Regional  |
|     |      | e     | V                             | 40.0       |    |   |
|     |      | i(S)  | V                             | 41.0       |    |   |
| 61  | 14   | iP    | V                             | 13 54 49.0 | C  | 22.0S 172.1E h:25km.<br>New Hebrides Is. region |
|     |      | i     | V                             | 50.0       |    |   |
| 62  | 14   | iP    | V                             | 15 31 32.5 | C  |   |
| 63  | 15   | iP    | V                             | 01 30 40.0 |    |   |
| L12 | 15   | e(P)  | V                             | 05 09 40.5 |    | Local   |
|     |      | e(S)  | N                             | 50.5       |    |   |
|     |      | i(S)  | N                             | 52.0       |    |   |
| 64  | 15   | iP    | VN                            | 10 21 21.0 | C  | 3.3S 150.7E h:21km.<br>New Ireland region.      |
|     |      | ipP   | VV <sub>1</sub>               | 26.5       |    |   |
|     |      | isP   | VN <sub>1</sub>               | 29.5       |    |   |
|     |      | e     | V <sub>1</sub>                | 22 21      |    |   |
|     |      | ePP   | N <sub>1</sub>                | 31.5       |    |   |
|     |      | (e)   | N <sub>1</sub>                | 26 12      |    |   |
|     |      | eS    | N <sub>1</sub>                | 31.5       |    |   |
|     |      | eS    | E <sub>1</sub>                | 32.5       |    |   |
|     |      | e     | N <sub>1</sub>                | 38.5       |    |   |
|     |      | eL    | E <sub>1</sub>                | 28.6       |    |   |
|     |      | eL    | N <sub>1</sub>                | 30.5       |    |   |
|     |      | M     | V <sub>1</sub> N <sub>1</sub> | 34.2       |    |   |
|     |      | 65    | 15                            | iP         | VN |   |
| 66  | 15   | iP    | VN                            | 20 57 20.0 | R  |   |
| 67  | 15   | eP    | V                             | 23 17 (47) |    |   |
| 68  | 16   | eP    | VN                            | 02 55 46.5 | C  |   |
| 69  | 16   | iP    | VNE                           | 04 35 56.0 | R  | 24.9S 179.9E h:536km.<br>Kermadec Is. region.   |
|     |      | ipP   | V                             | 37 27.5    |    |   |
| L13 | 16   | eP    | VN                            | 05 27 55.0 |    | Local   |
|     |      | i(S)  | V                             | 28 08.5    |    |   |
|     |      | eS    | E                             | 09.0       |    |   |
| 70  | 16   | iP    | VNE                           | 07 24 15.0 |    | 6.6S 106.5E h:135km,<br>Soenda Strait.          |



| No. | Date | Phase  | Component  | Time   |   | Remarks.   |
|-----|------|--|--|--|---|--|
| 71  | 16   | iP<br>i  | V<br>V   | 07 59 54.0<br>08 00 05.5   | C | 19.0S 172.7W h:25km.<br>Tonga Is.                      |
| 72  | 16   | iP<br>ipP<br>isP<br>isP<br>i<br>is<br>eS<br>iL<br>i  | VNEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub><br>VV <sub>1</sub><br>V<br>N<br>V<br>E <sub>1</sub><br>E<br>E <sub>1</sub><br>V                                  | 11 26 19.0<br>38.0<br>49.5<br>52.0<br>30 38.5<br>31 32.5<br>34.0<br>33 09<br>23.0              | R | 6.4S 130.7E h:77km.<br>Banda Sea                       |
| 73  | 16   | iP<br>i<br>i<br>iPP<br>i<br>is<br>eS<br>i<br>eL<br>M | VNEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub><br>N<br>V<br>VN<br>V<br>N <sub>1</sub><br>E <sub>1</sub><br>V<br>N <sub>1</sub><br>N <sub>1</sub> E <sub>1</sub> | 13 52 33.0<br>52.0<br>53.5<br>54 09.0<br>16.0<br>58 21.5<br>23.0<br>14 00 33.5<br>01.0<br>06.5 | C | 8.2S 122.0E h:74km.<br>Flores Is.                      |
| 74  | 16   | iP<br>eS   | VNEV <sub>1</sub><br>NN <sub>1</sub>   | 18 28 18.5<br>34 04  | R | 8.1S 122.0E h:43km.<br>Flores Is.                      |
| 75  | 16   | iP   | V  | 19 24 33.5   | R |  |
| 76  | 17   | iP<br>ipP<br>iPP                                     | V<br>V<br>V  | 04 58 10.0<br>35.0<br>59 34.5  | R | 8.3S 122.1E h:93km.<br>Flores Is.                      |
| 77  | 17   | eP   | V  | 06 16 49   |   | 8.4S 121.3E h:60km.<br>Near Flores Is.                 |
| 78  | 17   | eP   | V  | 06 38 29   |   |  |
| 79  | 17   | eP<br>eL   | V<br>E <sub>1</sub>  | 14 13 17.0<br>22.0   |   | 23.8S 175.9W h:120km.<br>Tonga Is. region              |
| 80  | 17   | iP<br>eL<br>eL                                       | V<br>N <sub>1</sub><br>E <sub>1</sub>  | 20 17 07.0<br>24.6<br>26.2   |   | 24.3S 175.6W h:79km.<br>Tonga Is. region               |
| 81  | 17   | e  | V  | 22 27 27   |   |  |
| 82  | 17   | eP   | V  | 22 51 23   |   | 34.1N 141.0E h:120km.<br>Off south coast of<br>Honshu. |
| 83  | 18   | eP<br>i<br>i   | VV <sub>1</sub><br>V<br>V  | 02 15 45.5<br>16 19.0<br>17 10.0   | R | 8.2S 122.0E h:85km.<br>Flores Is.                      |
| 84  | 18   | e  | V  | 03 48 (12)   |   |  |
| 85  | 18   | iP   | VN   | 04 34 03.0   | R |  |
| L14 | 18   | eP<br>iP<br>is                                       | V<br>V<br>VN   | 05 07 50.0<br>53.0<br>08 27.0  |   | Regional   |
| 86  | 18   | iP   | V  | 07 53 55.5   |   | 4.8S 153.8E h:157km,<br>New Britain region.            |
| L15 | 18   | e(P)<br>i<br>eS                                      | V<br>V<br>V  | 08 10 28.5<br>30.0<br>37.0   |   | Local  |
| 87  | 18   | e  | V  | 08 33 19   |   | 24.3S 174.2W h:25km,<br>Tonga Is. region               |



| No. | Date | Phase | Component                                     | Time       | Remarks.  |
|-----|------|-------|---|------------|---|
| 88  | 18   | iP    | V   | 09 35 24.0 | 20.6S 175.5W h:667km.<br>Tonga Is. region.                      |
| 89  | 18   | iP    | V   | 09 46 03.0 | 23.9S 178.4W h:385km.<br>Kermadec Is. region                    |
| 90  | 18   | eF    | V   | 13 23 23   | 16.8S 174.2W h:25km.<br>Tonga Is. region                        |
| 91  | 18   | iP    | VN  | 14 59 10.0 | 49.9S 163.3E h:38km.<br>South of New Zealand.<br>Mag 7. (Canb.) |
|     |      | i     | VV <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 12.0       |   |
|     |      | i     | VNE   | 16.5       |   |
|     |      | iS    | N <sub>1</sub>                                | 15 02 30.5 |   |
|     |      | i(L)  | N <sub>1</sub>                                | 33         |   |
|     |      | i(S)  | N <sub>1</sub>                                | 44         |   |
|     |      | iPcP  | V   | 03 43.0    |   |
|     |      | eT    | V   | 12 (20)    |   |
|     |      | T max | V   | 16 38      |   |
| 92  | 18   | e(T)  | V   | 17 03 (31) |   |
| 93  | 18   | iP    | V   | 17 48 10.0 | R 7.6N 126.9E h:63km.<br>Off east coast of<br>Mindanao, P.I.    |
| 94  | 18   | e     | V   | 18 23 16   |   |
|     |      | e(T)  | V   | 39 (30)    |   |
| 95  | 18   | e(T)  | V   | 18 31 33   |   |
| 96  | 18   | eP    | V   | 18 35 14   |   |
|     |      | i     | V   | 29.5       |   |
|     |      | e(T)  | V   | 39 (30)    |   |
|     |      | e(T)  | V   | 52 44      |   |
| 97  | 18   | e(T)  | V   | 19 02 (05) |   |
| 98  | 18   | iP    | VN  | 20 17 31.5 | 25.4N 122.6E h:25km,<br>Off north coast of<br>Formosa           |
| 99  | 19   | e(T)  | VN  | 00 38 (27) |   |
| 100 | 19   | iP    | V   | 05 08 01.0 | C 6.4S 105.5E h:120km,<br>Soenda Strait                         |
|     |      | i     | VNE   | 02.0       |   |
| 101 | 19   | iP    | V   | 07 20 22.5 | C 16.0S 163.2E h:90km.<br>New Hebrides Is.                      |
|     |      | i     | NE  | 25.0       |   |
|     |      | ipF   | VN  | 31.5       |   |
|     |      | iS    | E <sub>1</sub>                                | 24 57.0    |   |
| 102 | 19   | e     | V   | 07 27 27.5 |   |
| 103 | 19   | iP    | VN  | 07 59 25.0 | 2.3N 127.4E h:83km.<br>Molucca Passage                          |
|     |      | ipF   | VN  | 40.0       |   |
| 104 | 19   | e     | V   | 09 30 (12) | 37.2N 140.7E h:115km.<br>Honshu, Japan.                         |
| 105 | 19   | iP    | VN  | 12 11 13.0 | 16.4S 167.3E h:16km.<br>New Hebrides Is.<br>Mag. 5-3/4 (Canb.)  |
|     |      | i     | VNE   | 15.0       |   |
|     |      | isP   | V   | 23.0       |   |
|     |      | eS    | N <sub>1</sub>                                | 15 38      |   |
|     |      | isS   | E <sub>1</sub>                                | 51         |   |
|     |      |       |   |            |   |
| 106 | 19   | iP    | VE  | 12 54 25.5 | 8.1S 121.9E h:25km.<br>Flores Is.                               |
|     |      | i(PF) | N   | 55 48.5    |   |
|     |      | iPcP  | V   | 56 48.5    |   |
| 107 | 19   | iP    | V   | 13 32 36.5 | C   |



| No. | Date | Phase  | Component                     | Time       |     | Remarks.   |
|-----|------|--------|-------------------------------|------------|-----|--|
| 108 | 19   | iP     | V                             | 17 11 20.5 | C   |  |
| 109 | 19   | iP     | VN                            | 18 05 40.0 | R   |  |
|     |      | i      | V                             | 07 53.0    |     |  |
| L16 | 19   | iP     | VN                            | 18 10 57.0 |     | Local  |
|     |      | eS     | N                             | 11 04.5    |     |  |
|     |      | eS     | E                             | 05.0       |     |  |
| 110 | 19   | e(T)   | VNE                           | 20 30 (05) |     |  |
| 111 | 19   | eP     | V                             | 20 40 26   |     | 24.1S 176.1W h:39km.                                   |
|     |      | e(T)   | VNE                           | 46 (12)    |     | Tonga Is. region                                       |
| 112 | 19   | e(T)   | V                             | 21 01 (47) |     |  |
|     |      | i max  | V                             | 03 12      |     |  |
|     |      | i max  | V                             | 04 28      |     |  |
| 113 | 20   | e      | V                             | 02 27 12.5 |     | 21.6N 145.8E h:101km.<br>Mariana Is.                   |
| 114 | 20   | e      | V                             | 06 12 30   |     |  |
|     |      | e(T)   | V                             | 30 (40)    |     |  |
| 115 | 20   | iPKP   | V                             | 06 35 18.0 | K R | 11.5N 86.3W h:122km.<br>Off west coast of<br>Nicaragua |
| 116 | 20   | e(T)   | V                             | 07 29 24   |     |  |
| 117 | 20   | e(T)   | V                             | 07 43 (23) |     |  |
| 118 | 20   | e(T)   | V                             | 08 36 44   |     |  |
| 119 | 20   | iP     | VE                            | 11 15 13.5 | R   |  |
| 120 | 20   | iP     | V                             | 11 39 13.0 |     | 16.4N 121.5E h:30km.<br>Luzon, P.I.                    |
| 121 | 20   | iP     | V                             | 11 50 22.5 | R   | 46.3N 142.7E h:354km.<br>Sakhalin Is.                  |
| 122 | 20   | iP     | V                             | 15 44 54.5 | R   |  |
| 123 | 20   | iP     | V                             | 16 00 00.0 | C   | 18.4S 175.2W h:175km.<br>Tonga Is.                     |
|     |      | i      | V <sub>1</sub>                | 42.0       |     |  |
|     |      | ipP    | VV <sub>1</sub>               | 45.5       |     |  |
|     |      | isP    | V <sub>1</sub>                | 01 09.0    |     |  |
|     |      | i      | V                             | 11.0       |     |  |
|     |      | iPP    | E <sub>1</sub>                | 33         |     |  |
|     |      | iPP    | E                             | 34.0       |     |  |
|     |      | iPP    | V <sub>1</sub>                | 34.5       |     |  |
|     |      | iPPP   | V <sub>1</sub>                | 02 04      |     |  |
|     |      | i(PcP) | V <sub>1</sub>                | 27.5       |     |  |
|     |      | iS     | V <sub>1</sub> N <sub>1</sub> | 05 21      |     |  |
|     |      | iS     | N <sub>1</sub>                | 22.0       |     |  |
|     |      | iSS    | N <sub>1</sub>                | 03 14      |     |  |
|     |      | i      | E <sub>1</sub>                | 21         |     |  |
|     |      | iScS   | N <sub>1</sub> E <sub>1</sub> | 10 00.5    |     |  |
|     |      | eScS   | NE                            | 01.5       |     |  |
| 124 | 20   | e(P)   | V <sub>1</sub>                | 23 49 11   |     | 24.2S 175.9W h:25km,<br>Tonga Is. region               |
|     |      | iPP    | E <sub>1</sub>                | 50 25      |     | Mag. 6½ (Canb.)  |
| 125 | 21   | iP     | VNE                           | 09 23 03.5 | K R | 21.8S 179.9W h:595km.<br>South of Fiji Is.             |
| 126 | 21   | eP     | V                             | 19 59 53.5 |     | 22.8S 171.4E h:19km,<br>Loyalty Is. region             |
|     |      | i      | V                             | 55.0       |     |  |
|     |      | iPP    | V                             | 20 20 16.5 |     |  |
|     |      | eS     | E <sub>1</sub>                | 03 (59)    |     |  |
| 127 | 22   | eP     | VN                            | 04 19 48.5 |     | 9.0S 157.9E h:41km.<br>Solomon Is.                     |

| No. | Date | Phase | Component      | Time       |   | Remarks.  |
|-----|------|-------|----------------|------------|---|---|
| 128 | 22   | e     | V              | 04 23 44   |   |   |
| L17 | 22   | i     | V              | 05 47 34.0 |   | Local   |
| L18 | 22   | i     | V              | 05 56 13   |   | Regional  |
| 129 | 22   | iP    | V              | 08 17 50.0 |   |   |
| 130 | 22   | iP    | VNE            | 14 02 56.5 | C | 18.0S 178.3W h:610km.<br>Fiji Is.                         |
| 131 | 22   | iP    | V              | 21 33 57.5 |   | 24.6S 179.3E h:517km.<br>South of Fiji Is.                |
|     |      | iPP   | VN             | 35 25.0    |   |   |
|     |      | eS    | E              | 38 07.0    |   |   |
| 132 | 22   | iP    | VN             | 22 10 03.5 | C |   |
| 133 | 23   | iP    | VNE            | 01 55 35.5 | R | 1.0S 120.2E h:10km.<br>Celebes                            |
|     |      | ipP   | V              | 41.0       |   |   |
| 134 | 23   | e(P)  | V              | 04 42 09.0 | C |   |
| 135 | 23   | e     | V              | 21 02 25   |   | 6.5S 154.7E h:143km.<br>Solomon Is.                       |
| 136 | 23   | i     | V              | 23 30 45.0 | C |   |
| 137 | 23   | eP    | V              | 23 32 20.5 |   |   |
|     |      | i     | VE             | 21.5       |   |   |
| 138 | 24   | iP    | VN             | 06 55 46.0 | R |   |
| 139 | 24   | eP    | V              | 23 08 32.0 |   | 35.3N 140.9E h:102km.<br>Near east coast of<br>Honshu     |
|     |      | i     | V              | 38.5       |   |   |
| 140 | 24   | iP    | VN             | 23 43 47.5 | C | 2.6S 141.9E h:118km.<br>Near north coast of New<br>Guinea |
|     |      | eL    | E <sub>1</sub> | 55.5       |   |   |
| 141 | 25   | iP    | V              | 14 21 29.0 |   | 17.5S 179.0W h:688km.<br>Fiji Is.                         |
| 142 | 25   | iP    | V              | 21 10 14.0 |   | 37.1S 51.6E h:137km.<br>Indian Ocean                      |
| 143 | 26   | iP    | V              | 01 31 46.5 |   | 16.2N 121.2E h:70km.<br>Luzon. P.I.                       |
| 144 | 26   | iP    | V              | 14 37 40.5 | R | 5.7N 126.4E h:147km.<br>Mindanao, P.I.                    |
|     |      | i     | V              | 39 31.0    |   |   |
|     |      | iPPP  | V              | 40 32.5    |   |   |
|     |      | iScP  | V              | 42 59.0    |   |   |
|     |      | eSS   | E <sub>1</sub> | 47 49      |   |   |
| 145 | 26   | e     | V              | 20 35 28.5 |   | 3.1S 146.2E h:25km.<br>Bismarck Sea                       |
|     |      | eL    | E <sub>1</sub> | 42.8       |   |   |
| 146 | 27   | eP    | V              | 04 30 04.0 | C | 4.8S 125.1E h:43km.<br>Banda Sea                          |
| 147 | 27   | iP    | VE             | 16 34 46.5 | C | 30.7S 179.3E h:514km.<br>Kermadec Is.                     |
|     |      | i     | V              | 35 12.0    |   |   |
|     |      | i     | V              | 44.0       |   |   |
| 148 | 27   | e     | V              | 19 59 57.5 |   |   |
| L19 | 28   | e     | V              | 05 08 (08) |   | Regional  |



| No. | Date | Phase  | Component                                       | Time       |     | Remarks.   |
|-----|------|--------|---|------------|-----|--|
| 149 | 28   | iP     | VNEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 09 43 47.0 | K R | 0.2N 123.6E h:83km.<br>Northern Celebes                |
|     |      | ipP    | N <sub>1</sub>                                  | 44 15.0    |     |  |
|     |      | i      | N <sub>1</sub>                                  | 21.5       |     |  |
|     |      | iPPP   | V <sub>1</sub>                                  | 46 12.0    |     |  |
|     |      | i      | N <sub>1</sub>                                  | 20.0       |     |  |
|     |      | i(PcS) | V   | 49 20.0    |     |  |
|     |      | i      | V   | 33.5       |     |  |
|     |      | iS     | N <sub>1</sub> E <sub>1</sub>                   | 50 00.0    |     |  |
|     |      | i      | N <sub>1</sub>                                  | 08.5       |     |  |
|     |      | i      | N   | 11.0       |     |  |
|     |      | i      | V <sub>1</sub>                                  | 13.0       |     |  |
|     |      | i(ss)  | N <sub>1</sub>                                  | 50.0       |     |  |
|     |      | iSS    | E <sub>1</sub>                                  | 53 03      |     |  |
|     |      | iSS    | N <sub>1</sub>                                  | 11.5       |     |  |
|     |      | i      | N <sub>1</sub>                                  | 27.0       |     |  |
|     |      | e      | N   | 30         |     |  |
|     |      | iScS   | E   | 33.0       |     |  |
|     |      | i      | N   | 38.0       |     |  |
|     |      | i      | V <sub>1</sub>                                  | 52.5       |     |  |
| 150 | 28   | iP     | VN  | 09 54 07.5 | C   |  |
| 151 | 28   | iP     | VN  | 09 58 12.0 | C   |  |
| 152 | 28   | iP     | VN  | 10 01 23.5 | C   |  |
| 153 | 28   | iP     | VN  | 10 23 02.0 | C   |  |
| 154 | 28   | eP     | VN  | 10 37 34.5 |     |  |
|     |      | i      | VN  | 38 06.0    |     |  |
| 155 | 28   | iP     | V   | 10 46 26.0 |     |  |
|     |      | i      | V   | 54.0       |     |  |
| 156 | 28   | iP     | VNE   | 11 33 25.5 | R   |  |
| 157 | 28   | iP     | V   | 11 55 39.0 |     |  |
| 158 | 28   | eP     | V   | 12 00 53.0 | R   |  |
| 159 | 28   | iP     | V   | 12 42 18.5 | A C | 51.7N 176.2W h:60km,<br>Andreanof Is. Aleutian<br>Is.  |
|     |      | iPcP   | V   | 20.0       |     |  |
|     |      | eSKS   | N <sub>1</sub>                                  | 52 47.5    |     |  |
|     |      | eS     | E   | 53 18.5    |     |  |
|     |      | iS     | E <sub>1</sub>                                  | 20.0       |     |  |
| 160 | 28   | i      | V   | 12 59 37.5 |     |  |
| 161 | 28   | iP     | VNE   | 13 20 50.0 | C   | 0.6S 122.9E h:60km.<br>Celebes                         |
| 162 | 28   | e(P)   | V   | 13 49 02   |     |  |
| 163 | 28   | e      | V   | 14 23 41   |     |  |
| 164 | 28   | e(P)   | V   | 14 34 02   |     |  |
| 165 | 28   | iP     | VN  | 15 31 26.5 |     | 2.2N 125.8E h:280km.<br>Celebes region                 |
|     |      | i      | V   | 56.0       |     |  |
|     |      | iPP    | V   | 32 06.0    |     |  |
| 166 | 28   | iP     | VN  | 18 00 14.0 | R   |  |
| 167 | 28   | iP     | VN  | 20 33 27.5 |     |  |
| 168 | 28   | eP     | V   | 21 01 40   |     | 8.7S 121.9E h:76km.<br>Flores Is.                      |
| 169 | 28   | e      | V   | 21 31 16.5 |     |  |
| 170 | 28   | e(P)   | V   | 21 59 33.0 |     |  |
| 171 | 29   | i(P)   | V   | 00 02 49.5 |     |  |
| 172 | 29   | eP     | V   | 06 54 34.5 |     | 33.5N 140.9E h:116km.<br>Near east coast of<br>Honshu. |

| No. | Date | Phase | Component                     | Time       |   | Remarks.             |
|-----|------|-------|-------------------------------|------------|---|----------------------|
| L20 | 29   | iP    | V                             | 07 58 31.5 |   | Regional             |
|     |      | iS    | VN                            | 53.5       |   |                      |
| 173 | 29   | iP    | VNE                           | 09 42 51.5 |   | 0.2N 123.9E h:84km,  |
|     |      | ipP   | V                             | 43 19.5    |   | Northern Celebes     |
|     |      | iPcP  | V                             | 44 44.0    |   |                      |
| 174 | 29   | eP    | V                             | 10 16 30.0 |   |                      |
| 175 | 29   | eP    | VN                            | 10 32 00.5 |   |                      |
| 176 | 29   | iP    | V                             | 12 29 31.5 |   |                      |
|     |      | i     | N                             | 32.0       |   |                      |
|     |      | i     | V                             | 30 04.0    |   |                      |
| 177 | 30   | iP    | VNE                           | 01 30 02.5 | C | 0.3N 123.9E h:159km. |
|     |      | ipP   | V                             | 32.5       |   | Northern Celebes     |
|     |      | iPcP  | V                             | 31 54.0    |   |                      |
| 178 | 30   | i     | V                             | 07 03 47.0 |   |                      |
| 179 | 30   | iP    | VV <sub>1</sub>               | 08 57 15.0 | R | 15.2S 172.8W h:25km. |
|     |      | ipP   | V                             | 25.5       |   | Samoa Is. region     |
|     |      | eS    | E <sub>1</sub>                | 09 03 11   |   |                      |
|     |      | eL    | N <sub>1</sub>                | 06.5       |   | Mag. 6 (Canb.)       |
|     |      | eSSS  | N <sub>1</sub>                | 06 47      |   |                      |
|     |      | M     | V <sub>1</sub> E <sub>1</sub> | 13.2       |   |                      |
| 180 | 30   | e     | V                             | 14 57 03.5 |   |                      |
| L21 | 31   | eP    | VN                            | 02 00 41.5 |   | Local                |
|     |      | iS    | VNE                           | 57.0       |   |                      |
|     |      | iS    | N                             | 58.0       |   |                      |
| L22 | 31   | iP    | VN                            | 02 05 52.5 |   | Local                |
|     |      | iS    | E                             | 06 08.0    |   |                      |
|     |      | iS    | V                             | 08.5       |   |                      |
| 181 | 31   | i     | V                             | 09 51 36.0 |   |                      |
|     |      | i     | V                             | 52 03.5    |   |                      |
| 182 | 31   | iP    | VN                            | 16 14 58.0 | R |                      |
| L23 | 31   | eP    | V                             | 18 07 27.5 |   | Local                |
|     |      | iP    | VN                            | 28.0       |   |                      |
|     |      | iS    | E                             | 43.0       |   |                      |
|     |      | iS    | N                             | 43.5       |   |                      |
| 183 | 31   | iP    | V                             | 18 57 31.5 | C |                      |
| L24 | 31   | eP    | VN                            | 19 23 47.5 |   | Local                |
|     |      | eS    | E                             | 24 03.5    |   |                      |
|     |      | i     | VN                            | 04.0       |   |                      |

Seismograms read by  
Jennifer Clay.

J. C. Jaeger,  
Professor of Geophysics.



*All Copies*

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MONTHLY SEISMOLOGICAL BULLETIN.

APRIL, 1961.

Latitude: 35° 19' 15"S Longitude: 148° 59' 55"E. Height: 700 M  
Instruments: three-component Benioff variable reluctance seismographs.

$T_s = 1$  sec.

$T_g = 0.25$  sec. (short periods VNE)

$T_g = 16$  sec. (long period vertical  $V_1$ )

$T_g = 70$  sec. (long period horizontals  $N_1E_1$ )

One N-S component Wood-Anderson Seismograph,  $T_s = 0.8$  sec.

Mt. Stromlo quartz clocks provide accurate time marks and 50 c/s for drum drive.

Abbreviations: R - rarefaction; C - compression;

Epicentre locations are those given by U.S.C.G.S.

| No. | Date | Phase | Component | Time       | Remarks.  |
|-----|------|-------|-----------|------------|---|
| L1  | 1    | eP    | VN        | 11 55 30.5 | Regional  |
|     |      | eS    | NE        | 46.0       |   |
|     |      | eS    | V         | 46.5       |   |
|     |      | i     | V         | 48.5       |   |
| 1   | 1    | eP    | V         | 15 32 11.5 | 39.6N 77.7E h:21km.<br>Sinkiang Province, China   |
|     |      | e     | V         | 34 49.5    |   |
|     |      | eSKS  | $N_1$     | 42 48      |   |
|     |      | iSKS  | $E_1$     | 49.0       |   |
| 2   | 2    | iP    | V         | 06 13 50.0 |   |
| 3   | 2    | iP    | V         | 09 29 31.5 | R   |
| 4   | 2    | iP    | V         | 10 18 12.5 |   |
| 5   | 2    | iP    | V         | 12 31 41.5 |   |
| 6   | 2    | eP    | V         | 13 10 06.5 | 1.6S 100.6E h:25km.<br>Near coast of Sumatra.     |
| 7   | 2    | iP    | V         | 17 26 36.0 | C 0.5S 123.2E h:139km.<br>Celebes.                |
|     |      | eP    | N         | 36.5       |   |
|     |      | ipP   | V         | 27 05.0    |   |
| 8   | 2    | iP    | V         | 18 54 35.0 | 0.3S 133.1E h: 85km.<br>Near coast of New Guinea  |
| 9   | 2    | e(P)  | VN        | 22 23 30.0 |   |
|     |      | e     | $V_1$     | 29 20      |   |
| 10  | 3    | i     | V         | 00 54 16.5 |   |
| 11  | 3    | i     | V         | 02 09 31.0 |   |
| 12  | 3    | iP    | V         | 07 14 08.5 | 0.1N 124.3E h: 25km.<br>Northern Celebes.         |
| L2  | 3    | e     | V         | 13 47 40.5 | Regional  |
| 13  | 3    | iP    | V         | 14 51 04.0 | R   |
| 14  | 4    | iP    | VNE       | 05 06 05.0 | R 2.4S 138.2E h:99km.<br>Near coast of New Guinea |
| L3  | 4    | eP    | V         | 05 38 43.5 | Local   |
|     |      | iP    | V         | 44.5       |   |
|     |      | iS    | VN        | 57.5       |   |
|     |      | i     | V         | 58.0       |   |
| 15  | 4    | eP    | V         | 07 54 09.0 | C 19.6S 177.1W h:276km.<br>Fiji Is, region.       |
|     |      | iP    | VE        | 10.0       |   |



| No. | Year | Waves  | $V_1 N_1 E_1$   | Time   | Category | Location   |
|-----|------|--|---|--|----------|--|
| 16  | 4    |  | $V_1 N_1 E_1$   | 10.7   |          | 40.1N 77.8E h:16km.<br>Sinkiang Province, China  |
| 17  | 4    | eP<br>i  | VN<br>VN  | 10 41 06.0<br>19.0   |          | 5.9S 149.4E h: 124km.<br>New Britain region      |
| 18  | 4    | e  | V   | 13 52 21.0   |          |  |
| 19  | 5    | iP   | VE  | 00 35 42.0   | C        |  |
| 20  | 5    | i  | VN  | 00 51 26.5   |          |  |
| L4  | 5    | iP<br>iS   | VNE<br>VN   | 06 21 03.0<br>06.0   |          | Local  |
| 21  | 5    | e  | V   | 11 37 05.5   |          |  |
| 22  | 5    | eP<br>i<br>ipP<br>eS<br>eL<br>eT<br>T max<br>T max | VN<br>VNV <sub>1</sub><br>V<br>E <sub>1</sub><br>E <sub>1</sub><br>VN<br>V<br>N | 21 34 21.0<br>24.5<br>43.0<br>37 (50)<br>38 07<br>49.8<br>51 45.5<br>52 04.5 |          | 52.2S 160.0E h:47km.<br>Macquarie Is. region.    |
| 23  | 6    | eP<br>e(T)<br>(T) max                              | NE<br>N<br>N  | 07 17 01<br>29.9<br>36 10  |          |  |
| 24  | 6    | eP   | NE  | 14 15 16.5   |          | 2.2N 97.2E h:25km.<br>Near coast of Sumatra      |
| 25  | 6    | eP   | NE  | 15 38 43.0   |          | 20.3S 169.4E h:121km.<br>Loyalty Is. region.     |
| 26  | 6    | eP<br>e(T)<br>(T) max                              | N<br>N<br>N   | 20 39 52.0<br>55.8<br>57 10.5  |          |  |
| 27  | 6    | iP   | NE  | 22 36 49.5   | C        | 1.9N 96.5E h: 25km.<br>Near coast of Sumatra.    |
| 28  | 7    | iP   | VN  | 02 05 19.5   | R        |  |
| 29  | 7    | iP   | VN  | 08 43 44.0   | C        |  |
| 30  | 7    | eP   | V   | 10 16 54.5   | R        | 0.3S 97.0E h:25km.<br>Near coast of Sumatra.     |
| 31  | 7    | iP   | VN  | 12 49 55.0   | R        |  |
| 32  | 7    | iP   | V   | 17 43 23.5   | R        | 19.5S 177.1W h:355km.<br>Fiji Is. region.        |
| 33  | 8    | e<br>i   | V<br>V  | 04 56 (45)<br>57.0   |          | Possibly 2.2S 79.2W<br>Ecuador.                  |
| 34  | 8    | eP   | V   | 11 57 41.0   |          | 10.0N 122.1E h:62km.<br>Negros, P.I.             |
| 35  | 8    | iP<br>eP<br>ipP<br>eS<br>eL                        | V<br>NEV <sub>1</sub> E <sub>1</sub><br>V<br>N <sub>1</sub><br>E <sub>1</sub>   | 16 05 00.5<br>00.5<br>31.0<br>09 08<br>11.2                                  | C        | 18.2S 168.6E h:120km.<br>New Hebrides Is. region |
| 36  | 8    | iP   | VN  | 16 09 36.5   |          |  |
| 37  | 8    | e<br>eL  | E <sub>1</sub><br>V <sub>1</sub>  | 18 31.6<br>45.2  |          | 38.2S 72.7W h:60km.<br>Chile                     |
| 38  | 8    | iP   | VN  | 19 30 12.0 A   | C        | 37.6N 140.3E h:189km.<br>Honshu, Japan.          |



| No. | Date | Phase | Component                                    | Time       | Remarks.                                    |  |
|-----|------|-------|--|------------|---|--|
| 39  | 8    | iP    | VN   | 21 45 26.0 | 14.8N 145.1E h:105km.<br>Mariana Is. region |  |
|     |      | i     | VN   | 28.0       |   |  |
|     |      | ipP   | VN   | 46 00.5    |   |  |
|     |      | isP   | V  | 14.5       |   |  |
|     |      | iPcP  | V  | 46.0       |   |  |
|     |      | iPcS  | V  | 50 43.5    |   |  |
| 40  | 8    | iP    | V  | 23 13 00.0 | R   |  |
| 41  | 9    | eP    | VN   | 00 38 36.5 | 14.6N 145.3E h:118km.<br>Mariana Is. region |  |
| 42  | 9    | iP    | VNE  | 00 56 13.5 |   |  |
|     |      | i     | V  | 34.0       |   |  |
| 43  | 9    | e     | V  | 02 01 08.0 |   |  |
| 44  | 9    | iP    | V  | 07 44 53.0 | C   |  |
| 45  | 9    | e     | V  | 08 53 40   | 17.4S 176.7W h:55km.<br>Fiji Is. region     |  |
| 46  | 9    | iP    | VNE  | 09 26 25.5 | R   | 26.0S 178.4E h:655km.<br>South of Fiji Is.       |
|     |      | i     | VN   | 29.5       |   |  |
|     |      | iScP  | V  | 32 08.0    |   |  |
| 47  | 9    | iP    | V  | 13 31 00.0 |   | 29.7N 138.2E h:352km.<br>South of Honshu, Japan. |
| 48  | 9    | e     | V  | 14 29 27   |   |  |
| 49  | 9    | iP    | VNV <sub>1</sub>                             | 15 45 46.5 | C   | 24.1N 122.2E h:13km.<br>Near coast of Formosa    |
|     |      | ipP   | V <sub>1</sub>                               | 53.0       |   |  |
|     |      | isP   | V <sub>1</sub>                               | 58.0       |   |  |
|     |      | eS    | V <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 54 23.5    |   |  |
|     |      | i     | E <sub>1</sub>                               | 26.0       |   |  |
|     |      | isS   | E <sub>1</sub>                               | 32.5       |   |  |
|     |      | ePS   | V <sub>1</sub>                               | 50         |   |  |
|     |      | eScS  | N <sub>1</sub>                               | 40.5       |   |  |
| 50  | 9    | i     | V  | 17 19 43.0 |   |  |
|     |      | i     | VN   | 20 16.5    |   |  |
| 51  | 10   | eP    | V  | 01 14 41.5 |   |  |
| 52  | 10   | eP    | V  | 07 07 57   |   | 24.1N 122.3E h:22km.<br>Near coast of Formosa    |
| L5  | 10   | eP    | VNE  | 14 11 42.0 |   | Regional   |
|     |      | i(S)  | V  | 12 39.5    |   |  |
|     |      | i(L)  | N  | 48.0       |   |  |
|     |      | i     | V  | 50.0       |   |  |
| 53  | 10   | iP    | V  | 17 46 22.0 | C   | 17.5S 178.8W h:618km.<br>Fiji Is. region         |
| 54  | 10   | eP    | V  | 19 47 34   |   | 0.2S 132.9E h:36km.<br>Near coast of New Guinea  |
|     |      | i     | V  | 36.0       |   |  |
|     |      | eL    | V <sub>1</sub>                               | 20 04.1    |   |  |
| 55  | 11   | i     | V  | 00 33 50.5 |   |  |
| L6  | 11   | eP    | V  | 00 35 (56) |   | Regional   |
|     |      | i     | VE   | 36 19.5    |   |  |
|     |      | i     | V  | 42.0       |   |  |
|     |      | i(S)  | N  | 49.5       |   |  |
|     |      | i     | V  | 51.0       |   |  |
|     |      | i     | V  | 57.5       |   |  |
| L7  | 11   | i     | V  | 07 32 32.5 |   | Regional   |
| L8  | 11   | e     | V  | 08 44 (23) |   | Regional?  |
| 56  | 11   | e     | V  | 15 50 11.0 |   |  |



| No. | Date | Phase   | Component   | Time   | Remarks.  |
|-----|------|---|---|--|---|
| 57  | 11   | iP<br>ipP   | V<br>VN   | 16 16 29.5<br>40.0   | 22.4S 169.9E h:58km.<br>Loyalty Is.                         |
| 58  | 11   | iP  | V   | 16 49 53.0   | C   |
| 59  | 11   | iP  | VN  | 18 40 00.0   | 8.8S 117.4E h:182km.<br>Near south coast of<br>Soembawa Is. |
| 60  | 12   | eP  | V   | 03 12 27.5   | 30.8S 178.6W h:190km.<br>Kermadec Is. region.               |
| 61  | 12   | iP<br>i<br>i  | VNE<br>VN<br>V  | 07 55 02.5<br>34.5<br>56 53.5  | C   |
| 62  | 12   | eP  | V   | 09 00 49.5   | 8.2S 119.7E h:242km.<br>Near Flores Is.                     |
| 63  | 12   | iP  | VN  | 11 12 48.0   |   |
| 64  | 12   | iP  | VN  | 11 34 51.5   |   |
| L9  | 12   | eP<br>iP<br>eS<br>eS                                | V<br>VN<br>V<br>VN  | 12 59 13.0<br>14.0<br>26.0<br>26.5                                     | Local   |
| L10 | 12   | eP<br>eS  | VN<br>VN  | 14 39 44.5<br>59.0   | Local   |
| 65  | 12   | i   | V   | 15 46 34.0   |   |
| 66  | 12   | iP<br>ipP<br>isP<br>i(PcP)<br>i(PP)<br>iPPP<br>iScP | VNEV <sub>1</sub><br>VN<br>VNEV <sub>1</sub><br>VN<br>N<br>V<br>V                     | 17 25 44.5<br>26 13.0<br>20.0<br>27 27.0<br>29.0<br>28 16.5<br>31 12.0 | R<br>0.3N 123.8E h:122km.<br>Northern Celebes.              |
| 67  | 12   | iP  | VN  | 17 40 13.5   | C<br>48.1N 154.7E h:42km.<br>Kurile Is.                     |
| 68  | 12   | iP  | V   | 18 01 56.5   | 23.2N 142.4E h:64km.<br>Mariana Is. region                  |
| 69  | 12   | iP  | V   | 19 17 00.0   | R   |
| L11 | 12   | eP<br>iS  | VN<br>VNE   | 22 16 01.0<br>09.5   | Local   |
| 70  | 12   | ePKP  | V   | 22 39 24.0   | 13.1N 88.9W h:122km.<br>El Salvador                         |
| 71  | 13   | i   | V   | 01 39 23.5   |   |
| L12 | 13   | e<br>i  | N<br>V  | 02 35 53.0<br>36 07.5  | Local   |
| 72  | 13   | iP  | VN  | 15 36 35.0   | C<br>27.0N 128.3E h:197km.<br>Ryukyu Is.                    |
| 73  | 13   | eP<br>i<br>eL<br>M                                  | V<br>V <sub>1</sub><br>N <sub>1</sub><br>V <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 16 48 22.0<br>25.0<br>17 22.3<br>37.0                                  | 40.1N 77.8E h:19km.<br>Sinkiang, China                      |
| 74  | 14   | eP  | V   | 04 08 16   | 31.1S 178.5W h:60km.<br>Kermadec Is.                        |
| 75  | 14   | e   | V   | 08 33 15.5   |   |
| 76  | 14   | iP  | V   | 12 49 25.0   | 10.2N 143.6E h:25km.<br>Mariana Is.                         |



| No.  | Date | Phase                    | Component                       | Time                                |   | Remarks.   |
|------|------|--------------------------|---------------------------------|-------------------------------------|---|--|
| 77   | 14   | iP                       | V                               | 19 06 52.5                          |   | 5.7S 103.0E h:26km.<br>Off south coast of Sumatra.           |
| • 78 | 15   | i                        | V                               | <del>00 16 37.0</del>               |   |  |
| 79   | 15   | iP                       | V                               | 01 23 41.5                          | C | 13.2S 166.9E h:229km.<br>New Hebrides Is.                    |
| 80   | 15   | eP                       | V                               | 09 41 56.5                          |   | 32.2S 178.9W h:131km<br>Kerapadee Is. region.                |
| 81   | 15   | iP                       | VN                              | 10 47 26.5                          |   | 14.9N 119.3E h:115km,<br>Off west coast of Luzon             |
| 82   | 15   | eP                       | V                               | 17 34 11.0                          | C | (P.I.)<br><br>Note: Times for 16-17th April are only approx. |
| 83   | 16   | e                        | V                               | 08 04 42                            |   |  |
| • 84 | 16   | eP                       | V                               | <del>11 53 33</del>                 |   | 53.5N 158.7E h:27km.<br>Kamchatka                            |
| 85   | 16   | iP                       | V                               | 12 12 12                            |   | 3.5S 149.5E h:109km.<br>New Ireland region.                  |
| 86   | 16   | iP<br>i                  | V<br>V                          | 16 54 17<br>28                      | R |  |
| 87   | 16   | i                        | V                               | 18 09 23                            |   |  |
| L13  | 16   | eP<br>i(S)               | V<br>V                          | 23 14 53<br>15 43                   |   | Regional   |
| 88   | 16   | iP                       | VN                              | 23 19 36                            |   | 3.4S 135.6E h:64km.<br>Near south coast of New Guinea.       |
| 89   | 17   | iP                       | V                               | 07 52 14                            | C | 16.0S 175.3W h: 289km,<br>Tonga Is.                          |
| L14  | 17   | e(P)<br>e(S)             | V<br>V                          | 08 57 04<br>19                      |   | Local  |
| • 90 | 17   | iPKP<br>i                | V<br>V                          | 16 41 01<br>10                      |   | 3.9N 31.5W h:25km.<br>Mid-Atlantic Ocean                     |
| 91   | 17   | iP                       | V                               | 20 53 54                            | R | 21.3S 178.6W h:549km.<br>Tonga Is. region                    |
| 92   | 18   | iP                       | V                               | 09 42 35.0                          | C |  |
| 93   | 18   | iP<br>i                  | V<br>N                          | 13 50 41.0<br>57 39.5               | C | 6.3S 131.5E h:67km.<br>Banda Sea                             |
| 94   | 18   | iP                       | V                               | 22 14 03.0                          |   | 1.5S 99.5E h:39km.<br>Off coast of Sumatra                   |
| 95   | 19   | eP<br>i<br>i             | V<br>V<br>V                     | 03 50 12.5<br>51 04.5<br>56 34.0    |   | 8.7S 123.6E h:25km.<br>Sawoe Sea                             |
| 96   | 19   | iP                       | V                               | 04 43 21.5                          | C |  |
| 97   | 19   | iP<br>i<br>i(pP)<br>e(S) | V<br>VNE<br>N<br>N <sub>1</sub> | 07 44 24.0<br>32.5<br>55.0<br>48 47 | R | 18.2S 168.2E h:98km.<br>New Hebrides Is.                     |
| 98   | 19   | iP                       | V                               | 12 33 51.5                          |   |  |
| 99   | 19   | iP                       | VN                              | 13 04 47.0                          | C |  |
| 100  | 19   | eP<br>i                  | V<br>VN                         | 16 24 32.5<br>33.5                  |   | 44.2N 148.0E h:51km.<br>Kurile Is.                           |

| No. | Date | Phase | Component                                    | Time       | Remarks.   |
|-----|------|-------|--|------------|--|
| 101 | 19   | eP    | V  | 18 27 07.0 | 55.1N 163.6E h:21km.<br>Kamchatka.                   |
| 102 | 19   | i     | V  | 20 32 15.5 | 44.6N 150.2E h:27km.<br>Kurile Is.                   |
| L15 | 19   | e     | V  | 21 16 51   | Regional   |
| 103 | 20   | iP    | VN   | 00 21 42.0 | C 5.6S 128.7E h:285km.<br>Banda Sea                  |
|     |      | i     | V  | 22 23.5    |  |
|     |      | ipP   | V  | 43.0       |  |
| L16 | 20   | e     | VN   | 05 52 05   | Regional   |
| 104 | 20   | iP    | V  | 07 43 55.0 |  |
| 105 | 20   | e     | V  | 08 23 50.0 |  |
| 106 | 20   | iP    | VN   | 15 25 45.5 | R  |
| L17 | 20   | e     | VNE  | 19 12 57   | Regional   |
| 107 | 20   | eP    | V  | 19 25 08.5 | 32.9S 178.8W h:58km.<br>Kermadec Is. region          |
|     |      | e     | E <sub>1</sub>                               | 30 11      |  |
|     |      | M     | E <sub>1</sub>                               | 35.8       |  |
| 108 | 20   | eP    | V  | 21 46 33.0 | 15.2S 173.7W h:25km.<br>South of Samoa Is.           |
|     |      | ipP   | V  | 48.0       |  |
|     |      | isP   | V  | 52.5       |  |
| 109 | 21   | eP    | VN   | 02 57 15.0 | C 6.9S 129.0E h:113km.<br>Banda Sea.                 |
| L18 | 21   | e(S)  | VN   | 04 31 09.5 | Regional?  |
| 110 | 21   | eP    | V  | 21 40 02.5 | 51.7N 173.9W h:36km.<br>Andranof Is. Aleutian<br>Is. |
| 111 | 22   | eP    | V  | 00 36 48   |  |
|     |      | i     | V  | 51.5       |  |
|     |      | e(S)  | E <sub>1</sub>                               | 42 56      |  |
|     |      | eL    | E <sub>1</sub>                               | 44.1       |  |
| 112 | 22   | iP    | VN   | 19 05 41.5 | C 3.5S 150.1E h:91km.<br>New Britain region          |
|     |      | i     | VN   | 47.0       |  |
|     |      | i     | N  | 09 32.5    |  |
|     |      | M     | V <sub>1</sub>                               | 18.7       |  |
| 113 | 23   | iP    | VN   | 05 24 54.0 | R 26.2N 129.8E h:110km.<br>Ryukyu Is.                |
|     |      | i     | VN   | 25 04.0    |  |
| 114 | 23   | iP    | V  | 09 13 52.0 | 44.6N 150.2E h:44km.<br>Kurile Is.                   |
|     |      | i     | V  | 14 07.0    |  |
|     |      | i(pP) | V  | 09.5       |  |
|     |      | iS    | N <sub>1</sub> E <sub>1</sub>                | 23 54.5    |  |
| 115 | 25   | iP    | VNE  | 02 39 25.5 | C 0.7S 124.1E h:200km.<br>Northern Celebes region    |
|     |      | i     | N  | 34.0       |  |
|     |      | i     | N  | 57.0       |  |
|     |      | iPcP  | V  | 41 16.5    |  |
| 116 | 25   | iP    | V  | 11 22 24.0 | 32.7S 178.5W h:45km.<br>Kermadec Is. region          |
|     |      | eL    | N <sub>1</sub>                               | 23.4       |  |
|     |      | M     | V <sub>1</sub>                               | 33.4       |  |
| 117 | 26   | iP    | VNE  | 02 29 53.5 | C 5.6S 105.6E h:93km<br>Southern Sumatra.            |
| 118 | 26   | eL    | V <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 06 38.1    | 5.7S 151.1E h:34km.<br>New Britain                   |
| 119 | 26   | eP    | V  | 07 28 23.0 | 21.8S 179.5W h:622km.<br>Fiji Is. region             |
|     |      | i     | VNE  | 23.5       |  |
|     |      | i(PF) | V  | 30 00.0    |  |



| No. | Date | Phase                      | Component  | Time   | Remarks.  |
|-----|------|----------------------------|--|--|---|
| 120 | 26   | eP<br>eL                   | V<br>N <sub>1</sub>  | 07 51 09.5<br>08 20.1                          | 44.6N 149.9E h:20km.<br>Kurile Is.  |
| 121 | 26   | iP<br>iPcP                 | VNE<br>V   | 17 01 13.0<br>03 04.5                          | C<br>0.2N 124.1E h:135km.<br>Northern Celebes.                                |
| 122 | 26   | e(P)                       | V  | 21 01 20.0                                     |   |
| 123 | 27   | iP                         | VNE  | 00 31 05.5                                     | R<br>25.3S 180 h:504km,<br>South of Fiji Is.                                  |
| 124 | 27   | eP<br>i<br>i               | V<br>V<br>VN   | 20 09 17.0<br>29.5<br>41.5                     |   |
| L19 | 28   | eP<br>eS                   | VN<br>E  | 13 41 10.5<br>22.0                             | Local   |
| 125 | 28   | eP<br>i                    | VN<br>VE   | 20 42 21.0<br>21.5                             | R<br>17.7S 173.7W h:595km,<br>Fiji Is.  |
| 126 | 28   | eP                         | VN   | 22 22 06.5                                     | C   |
| L20 | 28   | eP<br>eS                   | V<br>VN  | 23 09 43.5<br>10 19.5                          | Regional  |
| 127 | 29   | eP                         | VN   | 06 49 01.5                                     | C<br>49.8S 126.8E h:119km,<br>About 1100 miles south<br>of Western Australia. |
| 128 | 29   | ePKP                       | V  | 09 48 49                                       | 71.3N 7.4W h:14km.<br>Jan Mayen Is. region.                                   |
| 129 | 29   | eP                         | V  | 10 58 27.5                                     | C<br>41.8N 104.5E h:25km.<br>Outer Mongolia                                   |
| 130 | 29   | i(P)                       | V  | 13 24 46.0                                     |   |
| 131 | 29   | iP                         | V  | 20 01 45.5                                     |   |
| 132 | 29   | iP                         | VN   | 22 46 52.0                                     | R<br>2.9S 130.0E h:77km.<br>Ceram Sea   |
| 133 | 30   | eP                         | V  | 00 16 11.5                                     | 49.6S 117.0E h:25km.<br>About 950 miles south<br>of Western Australia.        |
| 134 | 30   | iP                         | VNE  | 04 50 33.5                                     | C   |
| 135 | 30   | iP                         | V  | 05 14 30.0                                     |   |
| L21 | 30   | e                          | V  | 10 05 41.0                                     |   |
| 136 | 30   | eP<br>e                    | V<br>E <sub>1</sub>  | 11 27 44.5<br>37 21                            | 44.6N 149.7E h:70km.<br>Kurile Is.  |
| 137 | 30   | e(P)<br>ipP<br>i<br>e<br>M | V<br>VE<br>V <sub>1</sub><br>N <sub>1</sub><br>V <sub>1</sub> E <sub>1</sub> | 14 55 33.5<br>37.5<br>38.0<br>15 04 24<br>12.7 | 15.3S 174.4W h:25km.<br>Samoa Is. region                                      |

Seismograms read by  
Jennifer Clay.

J.C. Jaeger,  
Professor of Geophysics.



*All Copied*

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MONTHLY SEISMOLOGICAL BULLETIN.

JUNE 1961.

Latitude: 35° 19' 15" S. Longitude: 148° 59' 55"E. Height: 700M.

Instruments: three-component Benioff variable reluctance seismographs

$T_g = 1$  sec.

$T_g = 0.25$  sec. (short periods VNE)

$T_g = 16$  sec. (long period vertical  $V_1$ )

$T_g = 70$  sec. (long period horizontals  $N_1E_1$ )

One N-S component Wood-Anderson Seismograph,  $T_g = 0.8$  sec.

Mt. Stromlo quartz clocks provide accurate time marks and 50 c/s for drum drive.

Abbreviations: R = rarefaction; C = compression; H = origin.

Epicentre locations are those given by USCGS.

| No. | Date | Phase           | Component | Time       | Remarks.  |
|-----|------|-----------------|-----------|------------|---|
| 1   | 1    | iP              | VNE       | 00 36 57.0 | C   |
| L1  | 1    | eP              | V         | 09 36 52.5 | 38.4S 144.2E h:28km.                            |
|     |      | iP              | VN        | 37 02.0    | Bass Strait.                                    |
|     |      | i               | VE        | 27.5       | Mag - 4-3/4 (Canb.)                             |
|     |      | i(S)            | V         | 45.5       |   |
|     |      | iS              | N         | 46.0       |   |
|     |      | i               | N         | 52.5       |   |
|     |      | i               | NE        | 38 10.0    |   |
| L2  | 1    | eP              | V         | 09 54 (23) | Bass Strait?                                    |
|     |      | e(S)            | V         | 55 17.5    | Mag 4. (Canb.)                                  |
|     |      | eS              | E         | 21.0       |   |
|     |      | eS              | V         | 23.5       |   |
| 2   | 1    | eP              | V         | 11 26 33.5 | 3.8S 129.4E h:220km.<br>Ceram Is.               |
| L3  | 1    | eP              | V         | 13 21 06.0 | 38.3S 144.2E h:29km.                            |
|     |      | e(S)            | VN        | 22 03.5    | Bass Strait<br>Mag. 4-1/4 (Canb.)               |
| 3   | 1    | iP              | VNE       | 13 40 23.5 | R 0.0, 123.2E h:312km.<br>Northern Celebes      |
| L4  | 1    | e               | V         | 17 12 50   | Regional?                                       |
| 4   | 1    | eP              | V         | 18 55 09.0 | C 6.7N 123.1E h:87km.<br>Celebes Sea            |
| L5  | 1    | e               | N         | 22 43 (45) | Regional?                                       |
| 5   | 1    | e               | V         | 23 48 42.5 | 10.6N 39.3E h:51km.<br>Ethiopia.                |
|     |      | iPS             | $V_1E_1$  | 58 23      |   |
|     |      | eSS             | $E_1$     | 00 04 30   | Mag. 6-3/4 (Canb.)                              |
|     |      | eSSS            | $E_1$     | 08 50      |   |
|     |      | eL <sub>q</sub> | $E_1$     | 17 34      |   |
|     |      | eL <sub>r</sub> | $E_1$     | 21 30      |   |
|     |      | M               | $V_1E_1$  | 32.9       |   |
| 6   | 2    | eP              | V         | 04 42 57.0 | 5.5S 146.4E h:32km.<br>Near coast of N. Guinea. |
| 7   | 2    | iPKP            | V         | 05 08 53.2 | R 9.8N 40.0E h:41km.<br>Ethiopia                |
|     |      | ePS             | $E_1$     | 20 08      |   |
|     |      | eSSP            | $E_1$     | 26 44      | Mag. 6-1/2 (Canb.)                              |
|     |      | M               | $E_1$     | 57.3       |   |
| 8   | 2    | e               | V         | 17 39 (42) |   |



| No. | Date | Phase                                  | Component                                   | Time   |   | Remarks.   |
|-----|------|--|---|--|---|--|
| 9   | 2    | eP                                     | VN  | 18 19 07.5   |   | 21.3N 145.9E h:42km.<br>Mariana Is. region.              |
| 10  | 3    | waves                                  | V <sub>1</sub> E <sub>1</sub>               | 02 01  |   | 56.1N 164.8E h:29km.<br>Off east coast of Kamch<br>atka. |
| 11  | 3    | eP<br>ipP                              | VNE<br>V                                    | 03 23 48.0<br>57.0                                       |   | 17.7S 167.6E h:31km.<br>New Hebrides Is.                 |
| 12  | 3    | eP<br>ipP<br>isP                       | V<br>V<br>V                                 | 03 45 36.5<br>46.0<br>48.0                               | R | 17.9S 167.9E h:39km.<br>New Hebrides Is.                 |
| 13  | 3    | e                                      | V   | 05 04 05.0   |   |  |
| 14  | 3    | eP<br>i<br>ePPP<br>eL                  | VV <sub>1</sub><br>V<br>V<br>E <sub>1</sub> | 06 01 31.5<br>46.5<br>02 46.5<br>11.2                    | C | 4.3S 151.1E h:18km.<br>New Britain region                |
| 15  | 3    | eP                                     | V   | 09 20 53.5   |   | 4.3S 150.9E h:25km.<br>New Britain region.               |
| 16  | 3    | i                                      | V   | 15 41 05.0   |   |  |
| 17  | 3    | iP<br>i<br>iPP<br>iPcP<br>iPPP<br>iPcS | VN<br>VN<br>V<br>V<br>V<br>V                | 17 51 13.5<br>14.0<br>53 10.5<br>19.0<br>37.0<br>56 45.0 | R | 0.3N 123.8E h:88km.<br>Northern Celebes                  |
| 18  | 3    | iP<br>ipP                              | V<br>VN                                     | 21 56 25.0<br>33.5                                       | C | 17.6S 167.6E h:25km.<br>New Hebrides Is.                 |
| 19  | 3    | e                                      | VN  | 22 02 03.5   |   |  |
| 20  | 4    | iP<br>i                                | VNE<br>V                                    | 03 57 46.0<br>59 12.0                                    | R |  |
| 21  | 4    | eP                                     | V   | 07 46 18.5   |   | 33.8N 81.8E h:46km.<br>Tibet.                            |
| 22  | 4    | eP                                     | V   | 07 56 59.0   |   | 34.2N 82.2E h:30km.<br>Tibet                             |
| 23  | 4    | e(P)<br>eL                             | V<br>E <sub>1</sub>                         | 08 52 14.0<br>09 05.1                                    |   | 8.7S 124.2E h:18km.<br>Flores Is.                        |
| 24  | 5    | i(P)                                   | V   | 03 51 10.0   | C | 20.0S 178.6W h:631km.<br>Fiji Is. region.                |
| 25  | 5    | e(P)                                   | V   | 17 36 11   |   | 5.5S 153.5E h:110 km.<br>New Britain.                    |
| L6  | 6    | e                                      | V   | 06 32 37   |   | Regional?  |
| 26  | 6    | e(P)                                   | V   | 08 19 12.5   |   | 15.5S 173.6W h:117km.<br>Tonga Is. region.               |
| 27  | 6    | e(P)                                   | V   | 17 39 21.5   |   |  |
| 28  | 7    | iP                                     | VN  | 01 28 01.5   | R |  |
| 29  | 7    | e(P)                                   | V   | 03 27 07.5   |   |  |
| L7  | 7    | e                                      | V   | 12 51 (05)   |   | Regional?  |
| 30  | 7    | iPKP                                   | V   | 14 34 45.5   |   | 5.4S 11.6W h:17km.<br>Ascension Is. region.              |
| 31  | 7    | eP                                     | V   | 15 43 58.0   |   | 10.7S 166.3E h:209km.<br>Santa Cruz Is.                  |

| No. | Date | Phase           | Component                     | Time       |   | Remarks.                                       |
|-----|------|-----------------|-------------------------------|------------|---|--|
| 32  | 7    | eP              | V                             | 19 25 35.5 |   | 1.0S 134.1E h:59km.<br>Western New Guinea      |
| 33  | 7    | iP              | V                             | 23 24 44.5 |   |  |
| 34  | 8    | iP              | V                             | 04 05 12.0 | C |  |
| L8  | 8    | i(P)            | V                             | 07 11 39.5 |   | Regional                                       |
|     |      | i(S)            | VN                            | 12 01.5    |   |  |
| 35  | 8    | iP              | V                             | 09 40 09.0 |   | 10.0S 161.2E h:100km,<br>Solomon Is.           |
| 36  | 8    | iP              | VN                            | 15 51 10.5 | R | 8.1S 121.7E h:25km.<br>Flores Sea              |
|     |      | i               | N                             | 52 27.5    |   |  |
|     |      | i               | V                             | 28.5       |   |  |
|     |      | i(PP)           | V                             | 42.5       |   |  |
|     |      | eS              | N                             | 56 52.5    |   |  |
|     |      | M               | N <sub>1</sub> E <sub>1</sub> | 16 04.9    |   |  |
| L9  | 9    | eP              | V                             | 02 05 (50) |   | Regional                                       |
|     |      | eS              | VE                            | 06 18.5    |   |  |
| 37  | 9    | iP              | VN                            | 15 28 22.0 | R | 5.5N 95.8E h:100km.<br>near coast of Sumatra   |
| 38  | 9    | eP              | VN                            | 15 53 33.5 |   | 30.0N 140.1E h:170km.<br>South of Honshu       |
| 39  | 9    | iP              | V                             | 18 58 32.5 | C | 10.7S 165.4E h:115km.<br>Santa Cruz Is.        |
| 40  | 9    | eP              | V                             | 21 35 15   |   |  |
| 41  | 9    | eP              | V                             | 22 13 01.0 |   | 7.6S 122.3E h:25km.<br>Flores Sea              |
|     |      | ipP             | V                             | 11.0       |   |  |
|     |      | isP             | V                             | 14.0       |   |  |
|     |      | iPcP            | V                             | 15 23.0    |   |  |
| 42  | 10   | iP              | V                             | 08 54 36.5 | C | 5.2S 129.1E h:78km.<br>Banda Sea               |
| L10 | 10   | iP              | VE                            | 16 00 43.5 |   | South Australia                                |
|     |      | i               | V                             | 57.0       |   |  |
|     |      | i(S)            | VN                            | 02 45.5    |   |  |
| L11 | 11   | eP              | VE                            | 00 26 (50) |   | Regional or T wave?                            |
|     |      | e(S)            | E                             | 27 18      |   |  |
| 43  | 11   | i(P)            | V                             | 03 36 13.0 |   |  |
| 44  | 11   | ePKP            | V                             | 05 29 01   |   | 28.9N 54.6E h:38km.<br>Southern Iran           |
|     |      | iPP             | V                             | 31.5       |   |  |
|     |      | ePPS            | V                             | 40 08      |   |  |
|     |      | eSSS            | E <sub>1</sub>                | 49 10      |   |  |
|     |      | eL <sub>q</sub> | N <sub>1</sub>                | 56.7       |   |  |
|     |      | eL <sub>r</sub> | V <sub>1</sub>                | 06 02.2    |   |  |
|     |      | M               | V <sub>1</sub>                | 15.7       |   |  |
| 45  | 11   | e               | V                             | 10 46 (06) |   |  |
| L12 | 11   | e               | V                             | 11 02 (15) |   | Regional?                                      |
|     |      | i max           | V                             | 03 38      |   |  |
| 46  | 11   | iP              | V                             | 14 53 21.5 | C | 24.3S 178.9E h:603km.<br>Kermadec Is. region.  |
| 47  | 11   | iP              | V                             | 22 10 13.0 | C | 22.1N 141.8E h:100km.<br>Volcano Is. region.   |
|     |      | i               | N                             | 13.5       |   |  |
| 48  | 11   | iP              | V                             | 22 28 31.0 | R |  |
|     |      | i               | NE                            | 31.5       |   |  |
| 49  | 12   | iP              | V                             | 07 02 46.0 |   | 9.2S 110.4E h:44km.<br>off South coast of Java |



| No. | Date | Phase | Component        | Time       |   | Remarks.  |
|-----|------|-------|------------------|------------|---|---|
| 50  | 12   | iP    | VNE              | 07 39 36.0 | R | 49.6S 163.8E h:34km.<br>south west of South<br>Island, N.Z.   |
|     |      | i     | VN               | 39.0       |   |   |
|     |      | ipP   | V                | 49.5       |   |   |
|     |      | iPP   | V                | 51.0       |   |   |
|     |      | isP   | V                | 56.0       |   |   |
|     |      | eS    | V <sub>1</sub>   | 43 05      |   |   |
|     |      | i(S)  | E <sub>1</sub>   | 09         |   |   |
|     |      | e(SS) | N <sub>1</sub>   | 23         |   |   |
|     |      | eT    | V                | 54.3       |   |   |
|     |      | T max | V                | 56 34.5    |   |   |
|     |      | T max | N                | 36.5       |   |   |
| 51  | 12   | i(P)  | VN               | 07 42 43.5 |   |   |
| 52  | 12   | iP    | V                | 10 09 26.0 | R | 21.5N 106.0E h:55km.<br>North Viet-Nam                        |
|     |      | i     | V                | 29.0       |   |   |
| L13 | 12   | e     | VN               | 12 00 28   |   | Regional?   |
| 53  | 12   | e(P)  | V                | 17 59 22.5 |   | 6.9S 155.0E h:110km.<br>Solomon Is.                           |
| L14 | 12   | e     | V                | 20 31 59.5 |   | Regional  |
| 54  | 13   | i(P)  | V                | 12 03 50.5 |   | 0.0, 121.5E h:20km.<br>Celebes.                               |
|     |      | i     | VN               | 53.0       |   |   |
| 55  | 13   | iP    | VE               | 13 21 50.5 | R | 32.8S 179.9E h:262km.<br>Kermadec Is.                         |
| 56  | 13   | iP    | VNE              | 21 44 23.0 | R | 21.4S 176.4W h:146km.<br>Tonga Is. region.                    |
|     |      | i     | E                | 25.0       |   |   |
|     |      | i     | N                | 28.5       |   |   |
|     |      | eS    | NEN <sub>1</sub> | 49 31.0    |   |   |
|     |      | iPcS  | V                | 50 35.5    |   |   |
| 57  | 13   | e     | V                | 22 18 (29) |   | 9.7S 164.7E h:25km.<br>Solomon Is. region.                    |
| 58  | 14   | iP    | V                | 00 53 10.0 | C | 24.5N 95.0E h:52km.<br>Northern Burma                         |
| L15 | 14   | eP    | V                | 05 28 12   |   | Regional  |
|     |      | eS    | E                | 54.0       |   |   |
|     |      | i(S)  | V                | 57.5       |   |   |
| 59  | 14   | i(P)  | V                | 09 17 57   |   | 20.1N 121.5E h:25km.<br>off north coast of<br>Luzon, P.I.     |
| 60  | 15   | iP    | V                | 07 01 36.5 |   | 2.4S 138.9E h:52km.<br>near north coast of<br>New Guinea.     |
| 61  | 15   | iP    | V                | 10 44 04.5 | C |   |
| 62  | 15   | iP    | V                | 23 36 55.5 |   | 45.4N 151.3E h:38km.<br>Kurile Is.                            |
| 63  | 16   | iP    | V                | 06 30 24.0 | C |   |
| 64  | 16   | iPKP  | V                | 10 51 04.0 | R | 8.8N 73.4W h:120km.<br>Northern Colombia                      |
|     |      | i     | V                | 06.0       |   |   |
|     |      | i     | V                | 10.0       |   |   |
|     |      | ipPKP | V                | 34.5       |   |   |
|     |      | i     | V                | 54 22.5    |   |   |
| 65  | 16   | iP    | V                | 16 19 10.5 | C | 11.1N 125.0E h:63km.<br>Near north coast of<br>Mindanao, P.I. |
| 66  | 17   | iP    | V                | 05 05 47.0 | C | 20.5S 175.3W h:31km.<br>Tonga Is.                             |

| No. | Date | Phase  | Component                     | Time       | Remarks.   |
|-----|------|--------|-------------------------------|------------|--|
| L16 | 17   | iP     | VN                            | 05 32 08.0 | Local  |
|     |      | iS     | VN                            | 12.5       |  |
| 67  | 17   | iP     | V                             | 09 39 44.0 | 29.0S 178.6W h:253km.                                |
|     |      | i      | V                             | 44.5       | Kermadec Is.   |
| 68  | 17   | iP     | V                             | 14 41 23.5 | 9.9N 126.0E h:25km.                                  |
|     |      | ipP    | V                             | 37.5       | Mindanao, P.I.                                       |
|     |      | isP    | V                             | 42.0       |  |
| 69  | 17   | iP     | V                             | 15 30 45.5 | 3.7S 138.2E h:139km.                                 |
|     |      | i      | VN                            | 46.0       | Central New Guinea                                   |
|     |      | i(ScS) | N                             | 40 51.5    |  |
| 70  | 17   | eP     | V                             | 21 55 04.0 | 20.8S 178.9W h:627km,<br>Fiji Is. region             |
| 71  | 18   | iP     | VNE                           | 03 19 54.5 | C 5.9S 113.0E h:641.km,                              |
|     |      | iScP   | VNEV <sub>1</sub>             | 24 20.0    | Java Sea   |
|     |      | eS     | NE                            | 25 45.5    |  |
| L17 | 18   | e(S)   | VN                            | 04 36 02.5 | Local  |
| 72  | 18   | iP     | VNE                           | 13 29 46.0 | C 0.2N 123.9E h:91km.                                |
|     |      | e(S)   | N <sub>1</sub>                | 36.6       | Celebes.   |
| 73  | 18   | iP     | VEV <sub>1</sub>              | 14 00 17.5 | C 31.3S 179.3E h:434km,                              |
|     |      | iPP    | V                             | 01 33.0    | Kermadec Is. region.                                 |
|     |      | i(pP)  | V                             | 35.5       |  |
|     |      | iPPP   | V                             | 44.5       |  |
|     |      | eS     | VN                            | 04 17      |  |
|     |      | i(ScP) | VE                            | 06 29.5    |  |
|     |      | eScS   | N                             | 10 18.0    |  |
| 74  | 18   | e      | V                             | 16 20 48   | 20.0S 119.3E h:13km.                                 |
|     |      | e      | V                             | 25 55      | near coast of Western<br>Australia.                  |
| 75  | 18   | e(P)   | V                             | 22 22 18   | 56.7S 141.6W h:92km.<br>South Pacific Ocean          |
| 76  | 19   | iP     | V                             | 00 53 10.0 | R 22.5S 178.9W h:477km.<br>Tonga Is. region.         |
| 77  | 19   | i      | V                             | 01 42 43.0 |  |
| 78  | 19   | eP     | V                             | 01 54 47.5 | 12.6N 121.9E h:120km<br>Luxon, P.I.                  |
| 79  | 19   | eP     | V                             | 02 32 (17) | 12.5N 122.2E h:20km.<br>near coast(south)of<br>Luxon |
| 80  | 19   | iP     | VN                            | 04 36 07.0 | R  |
| 81  | 19   | iP     | V                             | 06 34 21.0 | C 24.2S 179.6E h:591km.<br>South of Fiji Is.         |
| 82  | 19   | i(P)   | V                             | 17 18 11.0 | 36.6N 71.0E h:151km.<br>Hindu Kush                   |
| L18 | 20   | e(P)   | V                             | 07 52 33.5 | Regional   |
|     |      | e(S)   | V                             | 53 14.0    |  |
| 83  | 20   | eP     | V                             | 14 31 58.0 | 21.8S 169.3E h:64km.                                 |
|     |      | i      | VNE                           | 59.5       | Loyalty Is.  |
|     |      | i      | V                             | 32 04.5    |  |
|     |      | eS     | V <sub>1</sub> N <sub>1</sub> | 36 07      |  |
| 84  | 20   | eP     | V                             | 16 38 09.5 | 10.5S 164.9E h:50km.<br>Santa Cruz Is.               |



| No. | Date | Phase  | Component                                       | Time        |     | Remarks  |
|-----|------|--------|---|-------------|-----|--|
| 85  | 21   | e      | V   | 06 58 (54)  |     |  |
| 86  | 21   | eP     | VN  | 07 39 25.0  |     | 7.7 S 146.7 E<br>25 km. Eastern New Guinea.                      |
|     |      | i      | V   | 29.5        |     |  |
|     |      | eL     | E <sub>1</sub>                                  | 47.2        |     |  |
| 87  | 21   | iP     | VNE   | 09 12 18.5  | R   | 8.4 N 124.4 E h:615 km<br>Near north coast of Mindanao, P.I.     |
| 88  | 21   | eP     | V   | 16 43 56.0  | R   | 5.9 S 128.5 E h:389 km<br>Banda Sea                              |
|     |      | i      | VN  | 56.5        |     |  |
|     |      | ipP    | V   | 45 06.0     |     |  |
|     |      | iScP   | V   | 49 31.5     |     |  |
| 89  | 21   | iP     | VNEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 20 33 05.0  | A C | 7.6 S 110.0E h:163 km<br>Near N. Coast of Java.                  |
|     |      | i      | VV <sub>1</sub>                                 | 29.5        |     |  |
|     |      | ipP    | E <sub>1</sub>                                  | 47.0        |     |  |
|     |      | i(PcS) | V   | 38 24.5     |     |  |
| 90  | 22   | i(P)   | V   | 01 13 12.0  |     |  |
| 91  | 22   | i      | V   | 03 28 40.5  |     | 17.9 S 168.9 E h:67 km<br>New Hebrides Is.                       |
| L19 | 22   | e      | VN  | 05 25 (55)  |     | Regional   |
|     |      | i      | V   | 27 24.5     |     |  |
| 92  | 22   | i(P)   | V   | 05.38 44.0  |     | Obscured by Quarry Blast<br>21.3S 170.3E h:55 km.<br>Loyalty Is. |
| L20 | 23   | e      | V   | 05 08 (21)  |     | Regional   |
|     |      | e(S)   | V   | 09 (01)     |     |  |
| L21 | 23   | i(P)   | V   | 06 47 06.0  |     | Local  |
|     |      | i(S)   | V   | 20.5        |     |  |
| 93  | 23   | iP     | VN  | 10 14 36.0  | R   | 18.5N 145.2E h:256 km.<br>Mariana Is.                            |
| 94  | 23   | e      | V   | 19 44 48.5  |     |  |
| 95  | 24   | e      | V   | 01 57 04    |     |  |
| 96  | 24   | iP     | V   | 03 07 04.5  |     | 20.1S 177.4W h:542 km.<br>Tonga Is. region                       |
| 97  | 24   | eP     | V   | 09 46 13.0  |     | 4.1N 97.5E h:188 km.<br>Sumatra                                  |
|     |      | i      | V   | 16.0        |     |  |
|     |      | eL     | E <sub>1</sub>                                  | 10 08       |     |  |
| L22 | 24   | e      | V   | 1506 (34.5) |     | Local  |
|     |      | e      | V   | (52.5)      |     |  |
| 98  | 24   | iP     | VN  | 16 09 10.0  | R   | 2.1N 126.9E h:60 km.<br>Molucca Passage                          |
| 99  | 24   | iP     | VN  | 16 25 24.5  | R   | 4.6S 144.9E h:212 km.<br>Near N. Coast of New Guinea.            |
|     |      | iPP    | V   | 26 38.5     |     |  |
|     |      | i      | V   | 27 08.5     |     |  |
| 100 | 24   | iP     | VN  | 19 41 40.5  | R   | 2.9S 130.4 h:19 km.<br>Ceram Sea                                 |
|     |      | i      | V   | 45.5        |     |  |
|     |      | i      | V   | 42 03.0     |     |  |
| 101 | 24   | iP     | V   | 23 17 28.5  |     |  |
| L23 | 25   | e(P)   | V   | 04 55 02.0  |     | Local  |
|     |      | e(S)   | V   | 08.5        |     |  |
| 102 | 25   | iP     | V   | 09 13 02.5  |     | 19.4S 177.9W h:489 km.<br>Fiji Is.                               |

| No.  | Date | Phase | Component                     | Time       | Remarks  |
|------|------|-------|-------------------------------|------------|--|
| 103  | 25   | e     | V                             | 16 31 58   | 18.9N 121.3E h:143 km.<br>Near N.Coast of Luzon,<br>P.I. |
| 104  | 25   | eP    | VN                            | 16.56 22.5 | K R<br>21.7N 143.1E h:13 km<br>North of Mariana Is.      |
|      |      | i     | VN                            | 24.5       |  |
|      |      | i(pP) | VN                            | 28.0       |  |
|      |      | ePP   | V                             | 58 34.5    |  |
|      |      | ePPP  | V                             | 59 51      |  |
|      |      | eS    | N                             | 17 04 25.0 |  |
| 105  | 26   | e     | V                             | 02 47 33.0 |  |
| 106  | 26   | eP    | V                             | 07 07 59.0 | 21.3S 170.1E h:89 km.<br>Loyalty Is.                     |
|      |      | i(pP) | VN                            | 08 06.5    |  |
|      |      | i(sP) | V                             | 15.0       |  |
|      |      | i     | VN                            | 26.5       |  |
|      |      | iPP   | VN                            | 35.5       |  |
|      |      | i     | E <sub>1</sub>                | 10 44.0    |  |
|      |      | eS    | N <sub>1</sub>                | 12 12.0    |  |
|      |      | iS    | E <sub>1</sub>                | 13.0       |  |
|      |      | i     | N <sub>1</sub>                | 30.0       |  |
|      |      | eL    | N <sub>1</sub>                | 12.8       |  |
|      |      | eL    | V <sub>1</sub>                | 14.1       |  |
| 107  | 26   | eP    | V                             | 15 00 23   | 52.4N 174.5E h:60 km.<br>Near Is. Alutian Is.            |
|      |      | eL    | E <sub>1</sub>                | 31.3       |  |
| 108  | 27   | eP    | V                             | 07 15 41.5 | 27.8N 99.4E h:33 km.<br>Yunan Province, China.           |
|      |      | i     | V                             | 46.0       |  |
|      |      | iPcP  | V                             | 47.0       |  |
|      |      | iS    | N <sub>1</sub> E <sub>1</sub> | 25 42.5    |  |
| 109  | 27   | eP    | V                             | 08 05 23   | 54.6N 157.7E h:19 km.<br>Kamchatka                       |
|      |      | i     | V                             | 06 27.5    |  |
| 110  | 27   | eP    | V                             | 10 46 44.0 | C 28.5S 176.1W h:25 km.<br>Kermadec Is.                  |
| 111  | 27   | e     | V                             | 14 41 47.0 |  |
| 112  | 28   | e     | V                             | 03 57 33   |  |
| L 24 | 28   | e(P)  | V                             | 04 30 27.0 | Local  |
|      |      | i(S)  | N                             | 46.0       |  |
|      |      | i(S)  | V                             | 46.5       |  |
| 113  | 28   | eP    | V                             | 04 33 58.5 | 31.2N 104.0E h:34 km<br>Szechwan Province,<br>China.     |
| 114  | 28   | e     | V                             | 06 23 44   |  |
| 115  | 28   | iP    | VN                            | 11 21 48.0 | R  |
| 116  | 28   | iP    | V                             | 12 18 41.0 | C  |
| 117  | 28   | (eP)  | V                             | 13 24 34.0 | 4.7S 102.7E h:142 km.<br>Near coast of Sumatra.          |
|      |      | i     | V                             | 42.5       |  |
| 118  | 28   | e     | V                             | 13 38 09.0 |  |
| 119  | 28   | i     | V                             | 14 42 02.5 |  |
| L25  | 28   | i     | V                             | 14 54 38.5 | Local  |
| 120  | 29   | iP    | VN                            | 01 19 31.0 |  |
| 121  | 29   | iP    | VNE                           | 03 23 00.5 | 6.5N 125.7E h:229 km.<br>Mindanao P.I.                   |



| No. | Date | Phase | Component                     | Time       | Remarks                                      |
|-----|------|-------|-------------------------------|------------|--|
| L26 | 29   | eP    | V                             | 08 21 40.5 | Local  |
|     |      | eS    | E                             | 51.5       |  |
| 122 | 29   | eP    | V                             | 09 28 31.0 | 13.8S 166.0E h:37 km.<br>New Hebrides Is.    |
|     |      | i     | VNV <sub>1</sub>              | 36.0       |  |
|     |      | iPP   | V                             | 29 16.5    |  |
|     |      | iPcP  | V <sub>1</sub>                | 32 02.5    |  |
|     |      | eS    | N <sub>1</sub> E <sub>1</sub> | 33 09.0    |  |
|     |      | isS   | E <sub>1</sub>                | 37.5       |  |
|     |      | eL    | N <sub>1</sub>                | 34.4       |  |
|     |      | M     | V <sub>1</sub>                | 38.8       |  |
| 123 | 29   | iP    | VNE                           | 10 29 22.5 | C 22.6S 179.1E h:654 km.<br>Fiji Is. Region. |
| L27 | 30   | e     | V                             | 04 13 (34) | Regional                                     |
|     |      | i     | V                             | 39.0       |  |
| 124 | 30   | iP    | VNE                           | 04.24 43.0 | R 20.4S 176.0W h: 170 km.<br>Tonga Is.       |
| 125 | 30   | eP    | V                             | 06 32 04.5 |  |
| 126 | 30   | eP    | V                             | 14 33 42.0 |  |
|     |      | i     | VN                            | 42.5       |  |
| 127 | 30   | iP    | VN                            | 18 57 43.5 | C 6.7S 129.4E h: 179 km.<br>Banda Sea.       |
|     |      | i     | V                             | 58 14.5    |  |
| 128 | 30   | i(P)  | V                             | 19 51 18.0 |  |

Seismograms read by Jennifer Clay.

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302

MONTHLY SEISMOLOGICAL BULLETIN.

JULY 1961.

Latitude:  $35^{\circ} 19' 15''$ S. Longitude:  $148^{\circ} 59' 55''$ E. Height: 700M.

Instruments: three-component Benioff variable reluctance seismographs.

$T_s = 1$  sec.

$T_g = 0.25$  sec. (short periods VNE)

$T_g = 16$  sec. (long period vertical  $V_1$ )

$T_g = 70$  sec. (long period horizontals  $N_1E_1$ )

One N-S component Wood-Anderson Seismograph,  $T_s = 0.8$  sec.

Mt. Stromlo quartz clocks provide accurate time marks and 50 c/s for drum drive.

Abbreviations: R = rarefaction; C = compression; H = origin.

Epicentre locations are those given by USCGS.

| No. | Date | Phase  | Component                                    | Time       | Remarks.   |
|-----|------|--------|--|------------|--|
| 1   | 1    | i      | V  | 03 00 14.0 |  |
| 2   | 1    | i(P)   | V  | 08 10 43.0 | 29.8N 140.5E h:181km.<br>Bonin Is. region.                   |
| 3   | 1    | iP     | V  | 11 39 06.0 | C 17.6S 178.7W h:600km.<br>Fiji Is. region                   |
| 4   | 1    | iP     | V  | 18 56 55.0 | R 17.9S 178.4W h:601km.<br>Fiji Is.                          |
|     |      | i      | V  | 58.5       |  |
| 5   | 2    | iP     | V  | 11 50 30.0 | 19.2S 174.8W h:144km.<br>Tonga Is.                           |
| 6   | 2    | eP     | V  | 16 53 01.0 | 13.9S 166.1E h:33km.<br>New Hebrides Is.                     |
| L1  | 3    | e      | V  | 05 30 18   | Regional   |
| 7   | 4    | iP     | V  | 02 25 00.5 | 17.9S 167.4E h:56km.<br>New Hebrides Is.                     |
|     |      | ipP    | V  | 15.0       |  |
|     |      | iPP    | V  | 42.0       |  |
| 8   | 4    | iP     | VV <sub>1</sub>                              | 06 19 52.5 | 17.9N 146.4E h:145km.<br>Mariana Is.                         |
|     |      | i      | VN   | 53.0       |  |
|     |      | i(pP)  | VV <sub>1</sub>                              | 20 15.0    |  |
|     |      | i      | V  | 21 20.0    |  |
|     |      | i      | V  | 22 41.0    |  |
| 9   | 4    | eP     | V  | 08 27 35.5 | 43.2S 168.8E h:213km.<br>Near coast of South<br>Island, N.Z. |
|     |      | i      | V  | 44.0       |  |
|     |      | e(T)   | VNE  | 43 01      |  |
|     |      | T(max) | VN   | 44 09      |  |
| 10  | 4    | iP     | VNE  | 18 15 12.0 | C  |
| 11  | 4    | eP     | V  | 19 22 27.0 | 55.8S 147.4E h:39km.<br>Macquarie Is. region.                |
|     |      | i      | VN   | 29.5       |  |
|     |      | i      | V  | 32.0       |  |
|     |      | i      | V  | 36.5       | Mag. 6 (Canb.)   |
|     |      | iS     | E <sub>1</sub>                               | 26 22.0    |  |
|     |      | i      | N <sub>1</sub>                               | 41.5       |  |
|     |      | eL     | N <sub>1</sub>                               | 26.8       |  |
|     |      | eL     | V <sub>1</sub>                               | 27.6       |  |
|     |      | M      | V <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 29.7       |  |
| 12  | 4    | eP     | VN   | 20 03 06.0 | 55.4S 147.8E h:122km.<br>Macquarie Is. region.               |



| No. | Date | Phase  | Component                                       | Time       | Remarks.  |
|-----|------|--------|---|------------|---|
| 13  | 5    | eP     | V   | 02 33 54.5 | 58.2S 150.4E h:25km.<br>South west of Macquarie Is.<br>Mag. 6 (Canb.) |
|     |      | i      | V <sub>1</sub>                                  | 57.0       |   |
|     |      | eS     | E <sub>1</sub>                                  | 38 10.0    |   |
|     |      | eL     | N <sub>1</sub>                                  | 38.9       |   |
|     |      | eL     | V <sub>1</sub>                                  | 39.4       |   |
|     |      | M      | E <sub>1</sub>                                  | 42.1       |   |
| 14  | 5    | ePKP   | V   | 05 22 07.5 | 15.1N 60.4W h:91km.<br>Windward Is.                                   |
|     |      |        |   |            |   |
| 15  | 5    | e(P)   | V   | 06 54 08.5 |   |
|     |      | i      | V   | 14.0       |   |
| 16  | 6    | iP     | V   | 18 41 11.5 | 7.0S 120.4E h:598km.<br>Flores Sea.                                   |
| 17  | 6    | iP     | VNEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 22 14 37.0 | R<br>20.0S 169.0E h:47km.<br>New Hebrides Is.                         |
|     |      | i      | VN  | 38.0       |   |
|     |      | ipP    | VNE   | 46.0       |   |
|     |      | isP    | NE  | 56.5       |   |
|     |      | i(P)   | V <sub>1</sub> N <sub>1</sub>                   | 15 06.5    |   |
|     |      | i(PPP) | N <sub>1</sub>                                  | 23.0       |   |
|     |      | eS     | N <sub>1</sub>                                  | 18 41.5    |   |
|     |      | i(S)   | N <sub>1</sub>                                  | 46.0       |   |
|     |      | isS    | V <sub>1</sub>                                  | 57.0       |   |
|     |      | M      | V <sub>1</sub>                                  | 23.6       |   |
|     |      | 18     | 6   | i(P)       |   |
| 19  | 7    | eP     | V   | 03 26 43.0 | 14.1S 167.2E h:201km.<br>New Hebrides Is.                             |
|     |      |        |   |            |   |
| 20  | 7    | eP     | V   | 07 47 46.5 | 9.4S 155.2E h:174km.<br>D'Entrecasteaux Is.region                     |
|     |      | eL     | V <sub>1</sub>                                  | 56.1       |   |
| L2  | 7    | eP     | V   | 09 53 03.0 | Local   |
|     |      | iP     | V   | 03.5       |   |
|     |      | iS     | V   | 21.5       |   |
|     |      | eS     | N   | 22.0       |   |
| 21  | 7    | iP     | V   | 12 38 47.0 | C<br>20.2S 169.6E h:25km.<br>Loyalty Is.                              |
|     |      | i      | V   | 48.5       |   |
|     |      | i(sP)  | V   | 59.0       |   |
|     |      | iPP    |   | 39 20.5    |   |
|     |      | i      | V   | 40.0       |   |
| 22  | 7    | eP     | VV <sub>1</sub>                                 | 13 16 44.0 | 5.7S 149.7E h:57km.<br>New Britain                                    |
|     |      | ipP    | VN  | 17 01.0    |   |
|     |      | eS     | N <sub>1</sub>                                  | 21 38.0    |   |
|     |      | i      | E <sub>1</sub>                                  | 41.5       |   |
|     |      | isS    | V <sub>1</sub> N <sub>1</sub>                   | 59         |   |
|     |      | iPcS   | VV <sub>1</sub> E <sub>1</sub>                  | 23 36.5    |   |
|     |      | e      | E <sub>1</sub>                                  | 24 44.0    |   |
|     |      | eScS   | N   | 27 28.5    |   |
|     |      | M      | V <sub>1</sub> N <sub>1</sub>                   | 29.0       |   |
| L3  | 7    | iP     | V   | 13 43 02.5 | Local   |
|     |      | iS     | V   | 21.0       |   |
|     |      | eS     | N   | 22.0       |   |
| 23  | 7    | iP     | VE  | 14 46 55.5 | C<br>20.4S 169.2E h:100km.<br>Loyalty Is. region.                     |
| 24  | 7    | e      | V   | 15 45 54.5 | 53.5N 159.9E h:20km.<br>Near east coast of<br>Kamchatka.              |
| 25  | 7    | e      | V   | 20 35 37   |   |

| No. | Date | Phase | Component                                      | Time       | Remarks.                                    |
|-----|------|-------|--|------------|---|
| 26  | 7    | eP    | V  | 22 24 36.5 | 20.1S 169.2E h:89km.<br>Loyalty Is. region. |
|     |      | i     | EV <sub>1</sub>                                | 48.0       |   |
|     |      | i     | V <sub>1</sub>                                 | 25 10.5    |   |
|     |      | eS    | N <sub>1</sub>                                 | 28 49.5    |   |
|     |      | eL    | N <sub>1</sub>                                 | 29.3       |   |
|     |      | eL    | V <sub>1</sub>                                 | 31.2       |   |
| 27  | 7    | iP    | V  | 22 55 32.5 |   |
|     |      | i     | V  | 46.0       |   |
| 28  | 8    | eP    | V  | 02 40 25.5 | 20.0S 168.3E h:52km.<br>Loyalty Is.         |
|     |      | i     | N  | 41 24.0    |   |
|     |      | eS    | N <sub>1</sub>                                 | 44 36.0    |   |
|     |      | iS    | EE <sub>1</sub>                                | 38.0       |   |
|     |      | iS    | V <sub>1</sub>                                 | 40.5       |   |
|     |      | i     | N <sub>1</sub>                                 | 42.5       |   |
|     |      | eL    | E <sub>1</sub>                                 | 46.1       |   |
|     |      | M     | V <sub>1</sub>                                 | 49.1       |   |
| 29  | 8    | iP    | V  | 03 30 28.0 | 20.6 169.1E h:25km.<br>Loyalty Is. region.  |
| 30  | 8    | eP    | V  | 11 25 23.0 | 18.5N 145.4E h:193km.<br>Mariana Is.        |
| 31  | 8    | e(P)  | V  | 15 13 42.5 |   |
| 32  | 8    | eP    | N  | 15 39 44.5 | R 20.1S 169.8E h:44km.<br>Loyalty Is.       |
|     |      | iP    | VEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 45.0       |   |
|     |      | isP   | V <sub>1</sub>                                 | 40 06.0    |   |
|     |      | i     | V <sub>1</sub>                                 | 41 43.5    |   |
|     |      | i     | V <sub>1</sub>                                 | 43 02.0    |   |
|     |      | iPcP  | V <sub>1</sub>                                 | 24.0       |   |
|     |      | eS    | NEN <sub>1</sub> E <sub>1</sub>                | 56         |   |
|     |      | i     | VV <sub>1</sub>                                | 44 00.0    |   |
|     |      | i     | N <sub>1</sub>                                 | 03.0       |   |
|     |      | e     | N <sub>1</sub>                                 | 38         |   |
|     |      | M     | V <sub>1</sub> N <sub>1</sub>                  | 48.0       |   |
| 33  | 8    | iP    | V  | 15 45 20.0 |   |
|     |      | i     | NE   | 22.0       |   |
|     |      | iS    | EE <sub>1</sub>                                | 49 32.0    |   |
|     |      | i     | N <sub>1</sub>                                 | 37         |   |
| 34  | 8    | iP    | V  | 16 39 11.0 |   |
|     |      | i     | V  | 18.5       |   |
| 35  | 8    | eP    | VE   | 21 19 03.5 | R 20.2S 169.0E h:56km.<br>Loyalty Is.       |
|     |      | eS    | N <sub>1</sub>                                 | 23 18.0    |   |
|     |      | eS    | V <sub>1</sub> E <sub>1</sub>                  | 20.0       |   |
|     |      | M     | V <sub>1</sub>                                 | 27.5       |   |
|     |      | i     | V <sub>1</sub>                                 | 33 28.5    |   |
| 36  | 8    | iP    | V  | 21 53 49.5 | R 20.2S 169.0E h:68km.<br>Loyalty Is.       |
|     |      | i     | V  | 54.5       |   |
|     |      | i     | VNE  | 56.0       |   |
|     |      | eS    | N <sub>1</sub>                                 | 57 58      |   |
|     |      | i     | NN <sub>1</sub>                                | 58 08.0    |   |
|     |      | M     | N <sub>1</sub>                                 | 22 02.3    |   |
| 37  | 8    | eP    | V  | 22 20 04.5 | 20.4S 174.4W h:25km.<br>Tonga Is. region.   |
|     |      | ipP   | V  | 10.0       |   |
| 38  | 9    | iP    | VN   | 01 48 35.0 | C   |
| 39  | 10   | iP    | V  | 03 36 36.0 | C   |
|     |      | eP    | NE   | 36.5       |   |
| 40  | 10   | e(P)  | V  | 04 50 09.0 |   |
| 41  | 10   | e     | V  | 12 05 59   |   |



| No. | Date | Phase  | Component      | Time         | Remarks.  |
|-----|------|--------|----------------|--------------|---|
| 42  | 10   | iP     | V              | 18 55 16.5   |   |
| 43  | 10   | eP     | V              | 21 13 52.0   |   |
| L4  | 10   | eP     | VN             | 23 06 12.0   | Local   |
|     |      | iS     | VNE            | 18.0         |   |
| L5  | 10   | e      | V              | 04 02 28.5   | Regional  |
| 44  | 11   | iP     | VE             | 05 51 36.0   | 27.3S 177.1W h:58km.<br>Kermadec Is. region.          |
| 45  | 11   | eP     | V              | 08 09 04.5   | R   |
|     |      | i      | VN             | 05.0         |   |
| 46  | 11   | e      | V              | 08 15 11.0   |   |
| 47  | 11   | iP     | V              | 09 42 43.0   | 8.3N 93.3E h:163km.<br>Nicobar Is. region.            |
|     |      | eS     | N <sub>1</sub> | 51 45        |   |
|     |      | eL     | N <sub>1</sub> | 10 04.1      |   |
|     |      | M      | E <sub>1</sub> | 14.0         |   |
| 48  | 11   | eP     | V              | 11 29 38.5   | 21.0S 177.7W h:598km.<br>Tonga Is. region.            |
| 49  | 11   | eP     | V              | 16 33 22.0   | C 21.5S 175.7W h:90km.<br>Tonga Is.                   |
| 50  | 11   | iP     | VNE            | 18 42 09.0   | R 6.7S 125.8E h:579km                                 |
|     |      | iPcP   | V              | 44 23.5      | Banda Sea   |
|     |      | isP    | V              | 54.0         |   |
|     |      | iScP   | V              | 47 19.5      |   |
| 51  | 12   | iP     | VN             | 04 55 25.5   | R 3.3N 127.9E h:92km.<br>Molucca Passage              |
|     |      | i      | V              | 28.0         |   |
|     |      | iPcP   | V              | 57 13.5      |   |
| 52  | 12   | eP     | V              | 13 39 44.0   | C   |
| 53  | 12   | iP     | VNE            | 14 42 02.0   | C 22.8S 171.3E h:65km.<br>Loyalty Is. region.         |
| 54  | 12   | iP     | VN             | 20 49 42.5   |   |
| 55  | 13   | eP     | V              | 01 28 42     | 5.9S 147.4E h:54km.<br>New Britain region.            |
| L5  | 13   | e      | V              | 02 07 36.0   | Local   |
|     |      | e      | NE             | 52.0         |   |
| 56  | 13   | e(P)   | V              | 10 38 08     | 5.5S 150.8E h:25km.<br>New Britain.                   |
| 57  | 13   | iP     | VE             | 13 51 46.0   | C 21.3S 175.7W h:29km.<br>Tonga Is.                   |
| 58  | 13   | eP     | VE             | 15 01 53.0   | 20.5S 169.0E h:67km.<br>Loyalty Is.                   |
| 59  | 13   | iP     | V              | 21 58 01.0   | 22.8N 122.7E h:100km.<br>Off east coast of<br>Formosa |
|     |      | i(pP)  | V              | 19.5         |   |
|     |      | i(PcP) | V              | 47.0         |   |
| 60  | 13   | iP     | VE             | 22 15 19.0   | R 25.2S 179.7E h:526km.<br>Kermadec Is. region.       |
| 61  | 14   | i(P)   | V              | 00 16 25.0   | C 14.6N 120.9E h: 170km.<br>Luzon, P.I.               |
| 62  | 14   | eP     | V              | 03 42 26.0   | C 14.7S 177.2W h: 100km.<br>Fiji Is. region.          |
| L6  | 14   | e      | V              | 04 02 (57.5) | Regional  |
|     |      | e(S)   | VE             | 03 16.0      |   |

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| No. | Date | Phase | Component      | Time       |   | Regional   |
|-----|------|-------|----------------|------------|---|--|
| 63  | 14   | iP    | V              | 04 28 18.5 | C | 17.8S 178.2W h:540km.<br>Fiji Is.                  |
| 64  | 15   | iP    | V              | 00 27 23.5 |   | 13.1N 120.4E h:52km.                               |
|     |      | i     | V              | 25.0       |   | Luzon, P.I.  |
| 65  | 15   | eP    | V              | 06 08 53.0 |   | 20.1S 169.1E h:25km.<br>Loyalty Is.                |
| 66  | 15   | e(P)  | V              | 08 02 21.5 |   | 57.8S 148.5E h:60km.<br>South west of Macquarie Is |
| 67  | 15   | iP    | VNE            | 12 01 06.5 |   | 3.3S 131.4E h:100km.<br>Ceram.                     |
| 68  | 15   | iP    | VN             | 14 02 24.0 | R | 6.8S 116.9E h:565 km.                              |
|     |      | iPcP  | V              | 04 12.0    |   | Java Sea   |
|     |      | isP   | V              | 05 03.0    |   |  |
| 69  | 15   | iP    | V              | 20 39 11.5 | C | 20.3S 178.2W h:511km.<br>Fiji Is. region.          |
| 70  | 16   | iP    | V              | 01 58 00.0 | C | 4.3S 131.5E h:138km.<br>Banda Sea                  |
| 71  | 16   | iP    | V              | 05 29 16.0 |   | 19.0S 175.4W h:200km.<br>Tonga Is.                 |
| 72  | 16   | eP    | V              | 06 54 02.5 |   | 18.6S 175.7W h:172km.                              |
|     |      | isP   | V              | 55 01.0    |   | Tonga Is.  |
|     |      | i     | V              | 56 02.5    |   |  |
| 73  | 16   | iP    | VN             | 13 06 57.5 | C |  |
| 74  | 16   | iP    | VN             | 14 06 43.0 | R | 22.7S 171.2E h:56km.                               |
|     |      | i(pP) | E              | 58.0       |   | Loyalty Is. region.                                |
|     |      | iS    | E <sub>1</sub> | 11 00      |   |  |
|     |      | e     | V <sub>1</sub> | 06.5       |   |  |
| 75  | 16   | iP    | V              | 20 06 09.0 | C | 34.3S 178.5W h:191km.<br>Kermadec Is. region.      |
| 76  | 16   | iP    | VN             | 23 09 25.0 | C | 18.0S 178.3W h:591km.<br>Fiji Is. region.          |
| 77  | 17   | iP    | V              | 15 11 21.5 |   | 2.6S 141.9E h:60km.<br>Near coast of New Guinea.   |
| 78  | 17   | i(P)  | V              | 15 39 28.5 |   | 2.4S 141.5E h:64km.<br>New Britain.                |
| 79  | 17   | eP    | V              | 16 31 36.0 |   | 35.7N 141.2E h:75km.<br>Near east coast of Honshu  |
| L7  | 18   | eP    | V              | 00 29 36.5 |   | Regional   |
|     |      | e(S)  | N              | 30 10.0    |   |  |
| L8  | 18   | i(P)  | V              | 00 34 25.5 |   | Regional   |
|     |      | i(S)  | V              | 58.5       |   |  |
| L9  | 18   | eP    | V              | 00 47 07.0 |   | Regional   |
|     |      | iP    | VE             | 08.0       |   |  |
|     |      | iS    | VN             | 39.0       |   |  |
| L10 | 18   | iP    | V              | 00 53 28.5 |   | Regional   |
|     |      | e(S)  | V              | 58.5       |   |  |
| L11 | 18   | eP    | V              | 00 57 (03) |   | Regional   |
|     |      | eS    | V              | 34.0       |   |  |
| L12 | 18   | eP    | V              | 01 07 29.5 |   | Regional   |
|     |      | iP    | VE             | 33.5       |   |  |
|     |      | eS    | V              | 08 02.5    |   |  |
|     |      | iS    | N              | 05.5       |   |  |



| No. | Date | Phase | Component                       | Time       |   | Regional.  |
|-----|------|-------|---------------------------------|------------|---|--|
| 80  | 18   | e     | V                               | 05 21 16   |   |  |
| 81  | 18   | iP    | V                               | 07 23 07.0 | R | 27.8S 176.8W h:60km.<br>Tonga Is. region.                        |
| 82  | 18   | iP    | V                               | 10 18 42.5 | R |  |
| 83  | 18   | iP    | VN                              | 13 10 18.5 | R | 5.9S 128.5E h:25km.<br>Banda Sea                                 |
|     |      | i     | V                               | 21.5       |   |  |
|     |      | i     | V                               | 49.5       |   |  |
| 84  | 18   | iP    | VNV <sub>1</sub> N <sub>1</sub> | 14 14 29.5 | R | 29.4N 131.6E h:21km.<br>Northern Ryukyu Is.                      |
|     |      | ipP   | VNV <sub>1</sub> N <sub>1</sub> | 32.0       |   |  |
|     |      | iPP   | V <sub>1</sub> N <sub>1</sub>   | 16 59.0    |   |  |
|     |      | ePPP  | V <sub>1</sub>                  | 18 44.5    |   |  |
|     |      | iPcS  | V <sub>1</sub>                  | 19 05.0    |   |  |
|     |      | e     | N <sub>1</sub>                  | 22 54      |   |  |
|     |      | iPS   | <del>E<sub>1</sub></del>        | 23 49.0    |   |  |
|     |      | M     | V <sub>1</sub> N <sub>1</sub>   | 43.3       |   |  |
| 85  | 18   | iP    | VN                              | 14 44 53.5 | R | 29.9N 131.2E h:72km.<br>Northern Ryukyu Is.<br>in coda of No.84. |
| 86  | 18   | eP    | V                               | 15 27 06.0 | R | 29.5N 131.3E h:35km.<br>Northern Ryukyu Is.                      |
| 87  | 19   | iP    | V                               | 04 03 21.0 | C | 58.8S 25.3W h:39km.<br>Sandwich Is.                              |
| L13 | 19   | e     | V                               | 05 23 43   |   | Regional. Tasmania.  |
| L14 | 19   | e     | VNE                             | 06 26 35.0 |   | Regional   |
| 88  | 19   | eP    | V                               | 06 44 13.0 |   | 29.6N 131.7E h:27km.<br>Northern Ryukyu Is.                      |
| 89  | 19   | iP    | V                               | 12 09 37.0 |   | 29.6N 131.5E h:31km.<br>Northern Ryukyu Is.                      |
| 90  | 19   | iP    | VE                              | 18 07 28.5 |   | 19.8S 173.9W h:66km.<br>Samoa Is. region.                        |
|     |      | ipP   | V                               | 39.0       |   |  |
| 91  | 19   | iP    | V                               | 18 32 01.5 | C | 23.5S 179.9E h:531km.<br>Fiji Is. region.                        |
| 92  | 19   | iP    | VN                              | 22 12 10.0 | R |  |
| L15 | 20   | eP    | VE                              | 00 36 29.5 |   | Regional   |
|     |      | eP    | N                               | 30.5       |   |  |
|     |      | i     | V                               | 32.0       |   |  |
|     |      | i(S)  | V                               | 52.0       |   |  |
|     |      | eS    | NE                              | 52.5       |   |  |
| 93  | 20   | iP    | V                               | 02 12 45.0 | C |  |
|     |      | i     | VNE                             | 45.5       |   |  |
|     |      | e     | V                               | 13 18.0    |   |  |
|     |      | i     | V                               | 14 28.0    |   |  |
| 94  | 20   | iP    | V                               | 02 24 59.0 |   |  |
| L16 | 20   | eP    | V                               | 04 48 03.5 |   | Regional   |
|     |      | eS    | V                               | 25.5       |   |  |
| 95  | 20   | eP    | V                               | 06 56 58.5 |   |  |
| 96  | 20   | i     | V                               | 09 13 32.0 |   | 28.4N 133.6E h:25km.<br>Northern Ryukyu Is.                      |
|     |      | i     | V                               | 14 09.0    |   |  |
| 97  | 20   | iP    | VNE                             | 15 16 25.5 | R | 17.5S 178.7W h:570km.<br>Fiji Is.                                |

| No. | Date | Phase  | Component  | Time  | Remarks.   |
|-----|------|--|--|---|--|
| 98  | 20   | eP   | V  | 20 03 57.0  | 31.8S 177.2W h:44km.<br>Kermadec Is.   |
| 99  | 20   | iP<br>i  | V<br>VN  | 20 18 32.0<br>32.5  | C  |
| 100 | 20   | iP   | V  | 23 05 38.5  | C  |
| 101 | 21   | iP   | V  | 01 15 41.0  | C 22.2S 171.6E h:117km.<br>Loyalty Is. region.                                   |
| 102 | 21   | i(P)   | V  | 07 50 10.0  | C 11.3S 166.0E h:93km.<br>Santa Cruz Is.   |
| 103 | 21   | iP<br>e  | V<br>N <sub>1</sub>  | 13 12 27.5<br>16 50   | C 19.4S 169.2E h:167km.<br>New Hebrides Is.                                      |
| L17 | 21   | e  | V  | 16 14 09  | Regional   |
| 104 | 21   | e  | V  | 17 18 17.0  |  |
| 105 | 21   | iP   | V  | 19 01 45.5  | C 29.6N 131.6E h:16km.<br>Northern Ryukyu Is.                                    |
| 106 | 22   | eP   | V  | 03 30 30.5  |  |
| 107 | 22   | eP   | V  | 10 04 54.5  | 7.4S 107.9E h:142km.<br>Java   |
| 108 | 22   | eP   | V  | 10 34 50.5  | 20.2S 174.0W h:25km.<br>Tonga Is.  |
| 109 | 22   | eP<br>eL   | V<br>V <sub>1</sub>  | 14 01 10.0<br>07 39   | C  |
| L18 | 22   | e  | V  | 15 46 44  | Regional?  |
| 110 | 22   | iP<br>i  | V<br>VN  | 18 03 27.0<br>28.0  |  |
| 111 | 22   | eP<br>i<br>i<br>iS<br>eL<br>eL                             | V<br>VN<br>V<br>E <sub>1</sub><br>V <sub>1</sub><br>N <sub>1</sub>   | 18 16 57.0<br>17 01.0<br>03.0<br>20 39.0<br>22.1<br>22.2  | 54.0S 141.2E h:84km.<br>South of Tasmania.                                       |
| L19 | 23   | eP<br>e(S)<br>iS   | V<br>VN<br>VNE   | 11 04 23.0<br>41.5<br>42.0  | Local  |
| 112 | 23   | eP<br>i<br>ipP<br>i<br>e(PcP)<br>eS<br>e<br>iSS<br>eL<br>M | V<br>VNE<br>VNE<br>VV <sub>1</sub><br>V<br>N <sub>1</sub><br>EV <sub>1</sub><br>V <sub>1</sub><br>N <sub>1</sub><br>V <sub>1</sub> | 14 08 53.0<br>56.0<br>09 04.0<br>11 30.0<br>12 26.0<br>13 12.0<br>20.0<br>14 04.0<br>16.0<br>18.8 | 18.5S 168.2E h:44km.<br>New Hebrides Is.   |
| 113 | 23   | iP<br>ipP<br>isP   | V<br>V<br>V  | 14 21 46.5<br>56.0<br>22 00.0   | C 18.4S 168.1E h:48km.<br>New Hebrides Is.                                       |
| 114 | 23   | eP   | V  | 14 51 05.0  | 6.9N 123.5W h:89km.<br>Pacific Ocean, about<br>2000 miles NW of Galapagos<br>Is. |
| 115 | 23   | iP   | V  | 15 34 08.5  | 18.3S 168.2E h:44km.<br>New Hebrides Is.   |



| No. | Date | Phase   | Component   | Time   |   | Remarks                                     |
|-----|------|---|---|--|---|---|
| 116 | 23   | iP<br>eS<br>e<br>M<br>e(T)                              | VV <sub>1</sub><br>N <sub>1</sub><br>V <sub>1</sub><br>V <sub>1</sub><br>V <sub>1</sub>   | 15 35 31.0<br>39 51<br>56.5<br>45.3<br>53 38   | C | 18.5S 168.0E h:107km.<br>New Hebrides Is.   |
| L20 | 23   | iP<br>i<br>eS   | VNE<br>V<br>V   | 21 50 40.0<br>41.0<br>46.0   |   | Local                                       |
| L21 | 23   | eP<br>iS  | V<br>VN   | 21 51 28.5<br>51.5   |   | Regional                                    |
| L22 | 23   | e   | V   | 21 54 50.0   |   | Local                                       |
| 117 | 23   | iP<br>i<br>i<br>ipP<br>iS<br>iS<br>i<br>i(sS)<br>M<br>M | VV <sub>1</sub> N <sub>1</sub> E <sub>1</sub><br>E<br>E<br>N<br>N <sub>1</sub><br>E<br>N<br>V<br>N <sub>1</sub><br>V <sub>1</sub> | 21 56 23.0<br>23.5<br>24.5<br>33.5<br>22 00 39.5<br>41.5<br>49.0<br>50.5<br>05.0<br>06.8 | R | 18.3S 168.3E h:44km.<br>New Hebrides Is.    |
| 118 | 23   | eP  | VN  | 22 07 10.0   |   | 18.4S 168.3E h:37km.<br>Confused by No.117  |
| 119 | 23   | iP  | V   | 22 20 45.5   | C | In coda of No.117                           |
| 120 | 23   | eP<br>i   | V<br>V  | 22 46 16.0<br>27.0   | R | 18.1S 167.9E h:139km.<br>In coda of No.117. |
| 121 | 23   | iP  | VN  | 23 27 21.0   |   | 18.6S 168.0E h:53km.<br>In coda of No.117   |
| 122 | 23   | iP  | VNE   | 23 51 33.0   | C | 18.4S 167.8E h:25km.<br>In coda of No.117   |
| 123 | 24   | iP<br>ipP   | V<br>V  | 00 40 08.0<br>17.5   | C | 18.1S 168.2E h:58km.<br>New Hebrides Is.    |
| 124 | 24   | eP<br>i<br>ipP<br>iScP<br>iPcS                          | V<br>V<br>V<br>V<br>V   | 01 36 29.5<br>55.0<br>38 10.0<br>41 52.5<br>42 45.0                                      |   | 21.1S 179.3W h:642km.<br>Fiji Is. region.   |
| 125 | 24   | iP<br>ipP<br>i  | V<br>V<br>V   | 01 51 43.5<br>57.0<br>52 06.5  | C | 18.0S 167.9E h:43km.<br>New Hebrides Is.    |
| 126 | 24   | iP<br>i   | VN<br>V   | 02 04 10.5<br>42.5   | R | 18.2S 168.4E h:23km.<br>New Hebrides Is.    |
| L23 | 24   | iP<br>iS  | V<br>V  | 02 05 52.5<br>06 05.5  |   | Local                                       |
| 127 | 24   | eP<br>ipP   | V<br>V  | 02 58 18.5<br>28.5   |   |   |
| 128 | 24   | iP  | V   | 03 02 11.0   | C |   |
| 129 | 24   | eP  | V   | 03 12 14   |   |   |
| 130 | 24   | i(P)  | V   | 03 20 13.5   | C |   |
| 131 | 24   | eP<br>ipP<br>i  | V<br>V<br>V   | 03 46 15.5<br>26.5<br>38.0   | R |   |

| No. | Date | Phase  | Component      | Time       | Remarks  |
|-----|------|--------|----------------|------------|--|
| 132 | 24   | e      | V              | 04 22 21   |  |
|     |      | ipP    | V              | 33.0       |  |
|     |      | i      | V              | 49.0       |  |
| 133 | 24   | iP     | V              | 08 55 54.0 | C 0, 124.1E h:159km.                               |
|     |      | eP     | NE             | 55.0       | Northern Celebes region.                           |
| 134 | 24   | i(P)   | V              | 09 24 35.0 | C  |
| 135 | 24   | eP     | V              | 09 54 50.0 |  |
|     |      | i      | V              | 55 13.5    |  |
| 136 | 24   | iP     | VN             | 09 59 22.5 | C  |
| 137 | 24   | eP     | V              | 13 18 11.0 |  |
| 138 | 24   | iP     | V              | 14 58 22.5 | C  |
| 139 | 24   | eP     | V              | 15 37 50   |  |
| 140 | 24   | eP     | V              | 16 16 27   |  |
|     |      | e(T)   | V              | 34 (31)    |  |
| 141 | 24   | iP     | V              | 18 16 46.0 | C 3.9S 130.8E h:118km.                             |
|     |      | i      | V              | 53.0       | Ceram Is. region.                                  |
|     |      | i(pP)  | V              | 17 01.5    |  |
|     |      | i      | V              | 04.0       |  |
| 142 | 24   | iP     | V              | 20 11 26.5 |  |
| 143 | 25   | iP     | VNE            | 01 35 44.0 | C 18.3S 168.3E h:99km.                             |
|     |      | i      | V              | 36 05.5    | New Hebrides Is.                                   |
| 144 | 25   | eP     | V              | 02 31 39.0 |  |
| 145 | 25   | i      | V              | 02 53 39.0 |  |
| 146 | 25   | i(PKP) | V              | 03 06 03.0 | Possibly 8.8S 71.3W<br>h:642km. Western Brazil.    |
| L24 | 25   | eP     | V              | 03 59 46.0 | Local  |
|     |      | eS     | V              | 04 00 04.5 |  |
| 147 | 25   | iP     | VE             | 08 55 51.0 | C 18.4S 167.7E h:25km.                             |
|     |      | ipP    | V              | 59.0       | New Hebrides Is.                                   |
|     |      | i      | V              | 56 23.5    |  |
|     |      | i      | V              | 44.5       |  |
| 148 | 25   | eP     | V              | 10 08 38   | 18.3S 175.7W h:238km.<br>Tonga Is.                 |
| 149 | 25   | eP     | V              | 11 13 30   | 18.3S 168.2E h:25km.<br>New Hebrides Is.           |
| 150 | 25   | iP     | V              | 12 11 08.0 | C 21.0N 123.6E h:61km.                             |
|     |      | iPcP   | V              | 47.5       | Off east coast of Formosa                          |
| L25 | 25   | eP     | VN             | 13 41 (15) | Local  |
|     |      | eS     | VE             | 21.5       |  |
| L26 | 25   | eP     | V              | 13 42 (01) | Local  |
|     |      | eS     | VE             | 08.0       |  |
| 151 | 25   | iP     | V              | 18 04 37.5 | C 8.7S 110.5E h:245km.<br>Near south coast of Java |
| 152 | 25   | eP     | V              | 18 47 14.0 | R 0.0, 124.7E h:43km.                              |
|     |      | iP     | VNE            | 14.5       | Northern Celebes                                   |
|     |      | ipP    | V              | 24.5       |  |
|     |      | isP    | E              | 30.5       |  |
|     |      | i(PP)  | N              | 48 52.0    |  |
|     |      | iPcS   | V              | 52 58.5    |  |
|     |      | eS     | N <sub>1</sub> | 53 28.0    |  |
|     |      | iS     | E <sub>1</sub> | 28.5       |  |
| 153 | 25 e | V      |                | 20 04 25   |  |



| No. | Date | Phase   | Component      | Time       | Remarks.                |
|-----|------|---------|----------------|------------|-------------------------|
| 154 | 26   | eP      | VNE            | 03 02 33.0 | R 7.5S 123.0E h:196km.  |
|     |      | iScP    | V              | 08 41.0    | Banda Sea               |
|     |      | e       | VN             | 09 25      |                         |
| L27 | 26   | i       | VE             | 03 04 21.5 | Local                   |
| L28 | 26   | iP      | VN             | 08 06 16.0 | Local                   |
|     |      | iP      | NE             | 16.5       |                         |
|     |      | i       | VE             | 17.5       |                         |
|     |      | iS      | VNE            | 23.5       |                         |
| L29 | 26   | iP      | VN             | 09 03 18.0 | Local                   |
|     |      | iS      | E              | 25.0       |                         |
|     |      | iS      | VN             | 25.5       |                         |
| L30 | 26   | e(P)    | N              | 09 08 23.0 | Local                   |
|     |      | eS      | VE             | 29.5       |                         |
|     |      | e       | N              | 30.0       |                         |
| 155 | 26   | iP      | V              | 09 23 57.0 | R 37.1S 177.3E h:100km  |
|     |      | i       | VNE            | 58.0       | North Is, N.Z.,         |
|     |      | i(PP)   | V              | 24 29.0    |                         |
|     |      | eS      | N <sub>1</sub> | 28 03      |                         |
|     |      | iSSS    | E <sub>1</sub> | 29 05.0    |                         |
|     |      | i       | V              | 31 00.0    |                         |
|     |      | e(T)    | V              | 43 (07)    |                         |
| L31 | 26   | eP      | VN             | 11 09 05.0 | Local                   |
|     |      | iS      | VE             | 12.0       |                         |
|     |      | iS      | N              | 12.5       |                         |
| 156 | 27   | iF      | V              | 02 12 31.5 | C 30.4S 178.7W h:482km. |
|     |      |         |                |            | Kermadec Is.            |
| 157 | 27   | iP      | V              | 08 33 45.0 | 17.7S 178.1W h:562km.   |
|     |      |         |                |            | Fiji Is. region         |
| 158 | 27   | eP      | V              | 10 35 25.5 | 17.9S 167.8E h:60km.    |
|     |      |         |                |            | New Hebrides Is.        |
| 159 | 27   | iP      | V              | 11 38 51.0 | R 19.1S 169.3E h:158km. |
|     |      | i       | VN             | 53.0       | New Hebrides Is.        |
| 160 | 28   | iP      | VN             | 00 09 26.0 | C 4.5N 125.6E h:89km.   |
|     |      |         |                |            | North of Celebes        |
| 161 | 28   | eP      | V              | 00 44 50.0 | 27.0N 126.6E h:136km.   |
|     |      |         |                |            | Ryukyu Is.              |
| 162 | 28   | iPKP    | V              | 01 24 11.5 | C 2.2S 77.1W h:136km.   |
|     |      | i       | V              | 18.5       | Ecuador                 |
|     |      | i(SKSP) | V              | 34 05.0    |                         |
| L32 | 28   | i(S)    | V              | 01 58 48.5 | Local                   |
| 163 | 28   | iP      | V              | 04 45 44.0 | C                       |
|     |      | ipP     | V              | 56.5       |                         |
| 164 | 28   | eP      | V9             | 05 00 05.5 | 18.5S 167.9E h:50km.    |
|     |      |         |                |            | New Hebrides Is.        |
| 165 | 28   | eP      | V              | 06 16 48.0 | 18.6S 167.7E h:41km.    |
|     |      | i       | VN             | 49.0       | New Hebrides Is.        |
|     |      | i       | VE             | 54.0       |                         |
|     |      | eS      | N <sub>1</sub> | 21 04      |                         |
|     |      | i       | N <sub>1</sub> | 12.0       |                         |
|     |      | M       | N <sub>1</sub> | 26.4       |                         |
| 166 | 28   | eP      | V              | 13 23 30.5 | 0.6S 122.4E h:35km.     |
|     |      | i       | V              | 31.5       | Celebes                 |
|     |      | i       | VN             | 36.5       |                         |
| L33 | 28   | e       | V              | 13 48 27   | Regional                |

| No. | Date | Phase | Component | Time       | Remarks.  |
|-----|------|-------|-----------|------------|---|
| 167 | 28   | eP    | V         | 15 31 42   | 43.4N 146.1E h:34km.<br>Kurile Is.                        |
| 168 | 28   | iP    | VE        | 17 22 05.5 | R 20.5S 169.9E h:147km.<br>Loyalty Is.                    |
| L34 | 29   | e     | V         | 10 55 09   | Regional  |
| 169 | 29   | eP    | V         | 16 33 47.0 | 23.9S 176.1W h:23km.                                      |
|     |      | iPcP  | V         | ✓ 36 38.5  | Tonga Is. region.   |
| 170 | 29   | i     | V         | 17 32 28.5 |   |
| 171 | 29   | iP    | VNE       | 17 47 13.0 | C   |
| 172 | 29   | eP    | V         | 22 49 11.0 |   |
| 173 | 29   | e     | V         | 23 33 23   |   |
| 174 | 30   | e     | V         | 02 40 10.5 | 3.8S 103.4E h:146km.                                      |
|     |      | i     | V         | 18.0       | Sumatra   |
| 175 | 30   | eP    | V         | 08 14 01.0 | 7.0S 146.1E h:44km.<br>Near north coast of New<br>Guinea. |
| 176 | 30   | eP    | V         | 10 04 18.0 |   |
|     |      | i     | VN        | 13.5       |   |
| 177 | 30   | iP    | VN        | 11 11 13.0 | R 11.1N 124.7E h:49km.<br>Leyte, P.I.                     |
| 178 | 30   | eP    | V         | 14 11 32.5 | 18.1S 168.7E h:48km.                                      |
|     |      | i     | N         | 33.5       | New Hebrides Is.  |
|     |      | ipP   | V         | 45.5       |   |
| 179 | 30   | eP    | V         | 15 43 13.0 | 20.6S 174.1W h:25km.<br>Tonga Is.                         |
| 180 | 30   | eP    | V         | 17 49 08.5 | 3.8S 130.9E h:29km.<br>Ceram Is. region.                  |
| 181 | 31   | iP    | VNE       | 00 24 19.5 | R 5.3S 107.2E h:244km.                                    |
|     |      | iPcP  | V         | ✓ 25 43.0  | Off north coast of Java                                   |
| 182 | 31   | e     | V         | 05 13 18.5 |   |
| 183 | 31   | iP    | VN        | 06 55 46.5 | R   |
|     |      | e     | V         | 58 20.5    |   |
| 184 | 31   | iP    | VNE       | 08 35 54.0 | C 18.6S 168.0E h:193km.<br>New Hebrides Is.               |
| 185 | 31   | e     | V         | 08 53 05.0 |   |
| 186 | 31   | eP    | V         | 16 32 30.0 | C   |
| 187 | 31   | e     | V         | 19 16 03.5 | 9.7S 117.6E h:32km.<br>Flores.                            |
| 188 | 31   | iP    | V         | 23 02 24.0 |   |

Seismograms read by  
Jennifer Clay.

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MONTHLY SEISMOLOGICAL BULLETIN.

AUGUST, 1961.

Latitude:  $35^{\circ} 19' 15''\text{S}$  Longitude:  $148^{\circ} 59' 55''\text{E}$  Height: 700M

Instruments: three-component Benioff variable reluctance seismographs.

$T_s = 1$  sec.

$T_g = 0.25$  sec. (short periods VNE)

$T_g = 16$  sec. (long period vertical  $V_1$ )

$T_g = 70$  sec. (long period horizontals  $N_1E_1$ )

One N-S component Wood-Anderson Seismograph,  $T_s = 0.8$  sec.

Mt. Stromlo quartz clocks provide accurate time marks and 50 c/s for drum drive.

Abbreviations: R = rarefaction; C = compression; H = origin.

Epicentre locations are those given by USCGS.

| No. | Date | Phase   | Component   | Time  | Remarks.   |
|-----|------|---|---|---|--|
| 1   | 1    | e   | V   | 01 00 17  |  |
| 2   | 1    | eP<br>ipP<br>i                                      | V<br>V<br>V   | 01 23 22.0<br>29.0<br>52.5  | 14.2S 166.7E h:26km.<br>New Hebrides Is. region  |
| 3   | 1    | iP<br>ipP<br>i<br>i<br>i<br>i<br>eS<br>i<br>eL<br>M | VNEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub><br>VN<br>N <sub>1</sub><br>N <sub>1</sub><br>E <sub>1</sub><br>N <sub>1</sub><br>N <sub>1</sub><br>E <sub>1</sub><br>E <sub>1</sub><br>E <sub>1</sub><br>V <sub>1</sub> | 05 45 39.0<br>44.0<br>46.0<br>46 03.5<br>17.0<br>49 40.0<br>50 17.0<br>23.5<br>51.9<br>57.5 | C<br>9.8S 160.5E h:50km.<br>Solomon Is. region.  |
| 4   | 1    | eP<br>iPcP<br>ipP<br>iS                             | V<br>V<br>VV <sub>1</sub><br>E <sub>1</sub>   | 07 34 03.0<br>04.5<br>13.0<br>44 46.0   | 56.8S 25.1W h:44km.<br>Sandwich Is. region.      |
| 5   | 1    | iP<br>ipP<br>i<br>i(sP)<br>eS                       | V<br>V<br>V<br>V<br>E <sub>1</sub>  | 09 47 28.0<br>38.5<br>41.0<br>42.0<br>58 10   | 57.1S 26.1W h:31km.<br>Sandwich Is.              |
| 6   | 1    | iP  | V   | 15 03 44.5  | 17.8S 167.7E h:25km.<br>New Hebrides Is. region. |
| 7   | 1    | iP  | VN  | 16 24 05.0  | 25.0S 179.6E h:530km.<br>South of Fiji Is.       |
| 8   | 1    | iP<br>e(T)  | VN<br>V   | 19 07 21.0<br>22 46   |  |
| 9   | 1    | eP  | V   | 19 32 33.0  | 10.1S 160.8E h:59km.<br>Solomon Is. region.      |
| 10  | 1    | eP  | VN  | 20 36 44.5  |  |
| 11  | 1    | eP<br>i   | VN<br>V   | 22 16 48.5<br>17 06.0   | 18.0S 167.6E h:214km.                            |
| 12  | 2    | i(P)  | VN  | 01 25 00.5  |  |



| No. | Date | Phase                | Component                       | Time                                     | Remarks.   |
|-----|------|----------------------|---------------------------------|--|--|
| 13  | 2    | iP                   | V                               | 02 09 07.5                               | 18.9S 168.0E h:18km.<br>New Hebrides Is. region. |
| 14  | 2    | eP<br>eFP            | V<br>VN                         | 02 44 17<br>47 56.5                      | 56.7S 24.8W h:25km.<br>Sandwich Is.              |
| 15  | 2    | iP                   | V                               | 04 12 09.5                               | 57.6S 26.6W h:67km.<br>Sandwich Is.              |
| L1  | 2    | i<br>e               | V<br>N                          | 05 56 40.5<br>51.5                       | Local  |
| 16  | 2    | i                    | V                               | 07 56 21.0                               |  |
| 17  | 2    | eP<br>i              | V<br>V                          | 23 44 38.5<br>39.0                       | 20.4S 177.6W h:325km.<br>Fiji Is. region.        |
| 18  | 3    | iPKP<br>iPKS         | V<br>V                          | 03 27 27.0<br>30 56.5                    | 18.2N 66.2W h:141km.<br>Puerto Rico.             |
| 19  | 3    | iP                   | V                               | 04 55 37.0                               |  |
| 20  | 3    | iP                   | VN                              | 06 30 40.5                               |  |
| 21  | 3    | iP<br>i<br>i<br>(iS) | VN<br>VN<br>V<br>V <sub>1</sub> | 06 58 44.0<br>47.0<br>48.0<br>07 04 25.0 | C 3.5S 130.8E h:22km.<br>Ceram.                  |
| 22  | 3    | iP                   | V                               | 07 38 57.0                               | R 4.4S 131.6E h:30km.<br>Banda Sea               |
| 23  | 3    | eP<br>i              | V<br>V                          | 15 24 38.0<br>41.5                       | 28.9S 177.2W h:46km.<br>Kermadec Is. region.     |
| 24  | 3    | eP                   | V                               | 16 39 54.0                               | 21.1S 177.0W h:346km.<br>Tonga Is. region.       |
| L2  | 3    | e<br>i(S)            | V<br>V                          | 22 22 26<br>59.5                         | Regional   |
| 25  | 3    | iP<br>eL             | VN<br>E <sub>1</sub>            | 23 42 13.5<br>24 00.8                    | 12.1N 143.8E h:20km.<br>Mariana Is. region.      |
| 26  | 4    | iP<br>i              | V<br>N                          | 06 08 38.0<br>38.5                       | C  |
| L3  | 4    | eP<br>iS             | V<br>V                          | 12 48 (26)<br>46.0                       | Local  |
| 27  | 4    | eP<br>i              | V<br>VNE                        | 18 24 29.0<br>30.5                       | C 19.9S 169.7E h:119km.<br>Loyalty Is. region.   |
| 28  | 4    | eP<br>e(pP)          | V<br>V                          | 23 05 04.0<br>16.0                       | C 45.3N 151.1E h:20km.<br>Kurile Is.             |
| 29  | 4    | eP<br>i<br>iPcP      | V<br>V<br>V                     | 23 37 44.0<br>45.5<br>40 42.0            | R 25.4S 179.7W h:495km.<br>South of Fiji Is.     |
| 30  | 5    | eP                   | V                               | 01 13 26                                 | 13.7S 166.0E h:40km.<br>New Hebrides Is. region. |
| 31  | 5    | eP<br>i(pP)          | V<br>V                          | 06 49 10.0<br>22.5                       | 28.2S 176.7W h:66km.<br>Kermadec Is. region.     |
| 32  | 5    | eP                   | V                               | 08 23 20.0                               | 19.2S 176.0W h:229km.<br>Tonga Is. region.       |
| 33  | 6    | i                    | V                               | 01 54 49.0                               | C  |
| 34  | 6    | e                    | V                               | 02 16 33                                 |  |
| 35  | 6    | eP                   | V                               | 03 31 09.0                               | 26.7N 141.8E h:36km.<br>Bonin Is. region.        |
| 36  | 6    | e                    | V                               | 08 32 03                                 |  |



| No. | Date | Phase  | Component   | Time  | Remarks.  |
|-----|------|--|---|---|---|
| 37  | 6    | eP<br>i  | VN<br>VN  | 10 42 13.0<br>15.5  | 2.7S 122.0E h:69km.<br>Celebes                  |
| 38  | 6    | eP   | V   | 14 30 46.0  |   |
| 39  | 6    | eP   | V   | 17 13 43.0  | 3.2S 139.6E h:79km.<br>Near coast of New Guinea |
| 40  | 6    | eP   | V   | 18 14 (39)  |   |
| 41  | 7    | eP   | V   | 01 57 40  |   |
| L4  | 7    | iP<br>eS<br>i  | VE<br>N<br>V  | 02 08 22.5<br>34.0<br>37.0  | Local   |
| 42  | 7    | eP<br>ipP<br>isP<br>iPP<br>eS<br>eSS<br>eL <sub>r</sub><br>M | V<br>VNE<br>V<br>V<br>V <sub>1</sub><br>V <sub>1</sub><br>E <sub>1</sub><br>E <sub>1</sub>                    | 04 30 04.0<br>08.0<br>10.0<br>31 47.0<br>36 19<br>39 15<br>41.5<br>45.9 | 2.7S 121.6E h:18km.<br>Celebes                  |
| 43  | 7    | iP   | V   | 07 30 45.0  | C   |
| 44  | 7    | eP   | V   | 09 05 42.0  |   |
| 45  | 7    | eP<br>iPcP   | VNE<br>V  | 10 51 14.0<br>53 06.0   | 0.3N 124.0E h:76km.<br>Celebes                  |
| 46  | 7    | eP<br>eS<br>eL<br>M  | VE<br>E <sub>1</sub><br>E <sub>1</sub><br>E <sub>1</sub>  | 12 28 32.0<br>33 27<br>36.5<br>39.7                                     | 28.1S 176.5W h:39km.<br>Kermadec Is. region.    |
| 47  | 7    | iP   | V   | 14 29 37.0  |   |
| 48  | 7    | iP<br>i  | V<br>VN   | 14 34 47.5<br>35 12.5   | 5.8S 130.1E h:25km.<br>Banda Sea                |
| 49  | 7    | e  | V   | 15 55 15  |   |
| 50  | 7    | eP<br>eS<br>eL<br>eL<br>M<br>M<br>e(T)                       | V<br>E <sub>1</sub><br>E <sub>1</sub><br>V <sub>1</sub><br>E <sub>1</sub><br>V <sub>1</sub><br>V <sub>1</sub> | 16 17 22.0<br>22 02<br>22.9<br>23.6<br>24.5<br>25.4<br>42 03            | 61.1S 160.4E h:49km.<br>North of Balleny Is.    |
| 51  | 7    | iP   | VE  | 17 03 53.0  | R 27.5S 177.1W h:60km.<br>Kermadec Is. region.  |
| 52  | 7    | iP   | VE  | 20 05 23.5  |   |
| 53  | 8    | eP<br>eL<br>M  | V<br>V <sub>1</sub><br>V <sub>1</sub> E <sub>1</sub>  | 00 25 00.5<br>33.2<br>35.3  | 28.1S 176.5W h:51km.<br>Kermadec Is. region.    |
| 54  | 8    | iP<br>iPcP   | VNE<br>V  | 09 14 13.0<br>16 31.5   | C 6.8S 125.9E h:437km.<br>Banda Sea             |
| 55  | 8    | eP<br>eSKS<br>eS<br>is                                       | V<br>N <sub>1</sub><br>N <sub>1</sub><br>E <sub>1</sub>   | 12 31 35.5<br>42 08<br>43<br>48   | 50.9N 170.7W h:24km.                            |
| 56  | 8    | eP   | V   | 16 45 03.0  | 9.7S 160.4E h:63km.<br>Solomon Is. region.      |
| 57  | 9    | i  | VN  | 01 30 54.0  |   |



| No.. | Date | Phase | Component                                      | Time       | Remarks.  |
|------|------|-------|--|------------|---|
| L5   | 9    | e     | V  | 01 56 (47) | Regional  |
|      |      | e(S)  | V  | 57 22.5    |   |
|      |      | i(S)  | V  | 25.0       |   |
| 58   | 9    | eP    | V  | 05 59 23   | 18.7S 167.6E h:21km.<br>New Hebrides Is. region       |
| 59   | 9    | iP    | VN   | 16 07 47.0 | C<br>19.1S 168.7E h:69km.<br>New Hebrides Is. region. |
|      |      | iVNE  | VNE  | 48.5       |   |
|      |      | ipP   | VEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 58.0       |   |
|      |      | isP   | V  | 08 04.0    |   |
|      |      | i     | V  | 11.0       |   |
|      |      | iS    | E <sub>1</sub>                                 | 12 01.0    |   |
|      |      | eS    | N <sub>1</sub>                                 | 06.0       |   |
|      |      | e     | V <sub>1</sub>                                 | 10.0       |   |
|      |      | isS   | E <sub>1</sub>                                 | 29.5       |   |
|      |      | eL    | E <sub>1</sub>                                 | 12.8       |   |
|      |      | eL    | V <sub>1</sub>                                 | 13.4       |   |
| L6   | 10   | e     | VE   | 05 41 32.5 |   |
|      |      | e     | V  | 44.5       |   |
|      |      | e     | E  | 49.0       |   |
| 60   | 10   | e(P)  | V  | 05 44 16.5 | C<br>20.8S 178.0W h:377km<br>Fiji Is. region.         |
| 61   | 10   | eP    | V  | 06 43 04.0 |   |
|      |      | i     | VNE  | 05.5       |   |
| 62   | 10   | iP    | V  | 07 38 56.5 | 20.1S 174.5W h:100km.<br>Tonga Is. region.            |
| 63   | 10   | eP    | V  | 12 14 50.5 | 37.2N 136.9E h:51km.<br>Near west coast of Honshu.    |
| 64   | 10   | eP    | V  | 17 28 15   | 9.6S 159.7E h:44km.<br>Solomon Is. region.            |
| L7   | 11   | e(P)  | V  | 01 47 26.5 | Regional  |
|      |      | e(S)  | V  | 48.5       |   |
| 65   | 11   | e     | V  | 09 13 50.5 | 17.8S 167.8E h:48kmm<br>New Hebrides Is.              |
| 66   | 11   | iP    | VNV <sub>1</sub> E <sub>1</sub>                | 10 30 12.0 | R<br>18.5S 168.2E h:25km.<br>New Hebrides Is.         |
|      |      | i     | VNE  | 13.0       |   |
|      |      | i     | N  | 18.5       |   |
|      |      | ipP   | V  | 20.0       |   |
|      |      | i(sP) | V  | 30.5       |   |
|      |      | eS    | N <sub>1</sub>                                 | 34 35      |   |
| 67   | 11   | iP    | VNE  | 11 12 21.5 | R<br>0.2N 124.0E h:143km.<br>Northern Celebes         |
|      |      | ipP   | V <sub>1</sub>                                 | 55.0       |   |
|      |      | iPP   | NV <sub>1</sub>                                | 14 03.0    |   |
|      |      | iPcP  | V  | 13.0       |   |
|      |      | eScP  | V  | 17 50.5    |   |
|      |      | eS    | N  | 18 32.5    |   |
| L8   | 11   | eP    | VE   | 13 59 40.5 | Local   |
|      |      | eS    | NE   | 59.0       |   |
| 68   | 11   | iP    | VNV <sub>1</sub>                               | 16 03 30.5 | C<br>42.9N 145.1E h:71km,<br>Eastern Hokkaido         |
|      |      | iPcP  | V <sub>1</sub>                                 | 41.0       |   |
|      |      | ipP   | VV <sub>1</sub>                                | 45.5       |   |
|      |      | isP   | V <sub>1</sub>                                 | 04 00.0    |   |
|      |      | iS    | E <sub>1</sub>                                 | 13 20.5    |   |
|      |      | eS    | N <sub>1</sub>                                 | 21.5       |   |
|      |      | eS    | NE   | 23.0       |   |
|      |      | eScS  | NV <sub>1</sub>                                | 43         |   |
|      |      | eSS   | N <sub>1</sub>                                 | 18 32      |   |
|      |      | eSSS  | N <sub>1</sub>                                 | 21 50      |   |
|      |      | M     | V <sub>1</sub> N <sub>1</sub>                  | 32.7       |   |



| No. | Date | Phase | Component                                       | Time       |   | Remarks.  |
|-----|------|-------|---|------------|---|---|
| 69  | 11   | iP    | VNEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 22 45 06.0 | R | 2.8S 122.1E h:20km.                                 |
|     |      | ipP   | VNEV <sub>1</sub>                               | 11.0       |   | Eastern Celebes                                     |
|     |      | isP   | N   | 15.0       |   |   |
|     |      | ePP   | N   | 46 44      |   |   |
|     |      | eS    | N <sub>1</sub>                                  | 51 17.5    |   |   |
|     |      | eL    | N <sub>1</sub>                                  | 59.5       |   |   |
|     |      | M     | V <sub>1</sub>                                  | 23 05.5    |   |   |
| 70  | 11   | eP    | V   | 23 45 47.5 | C | 42.8N 145.1E h:72km.<br>Eastern Hokkaido            |
| 71  | 12   | e     | V   | 00 01 19.0 |   |   |
| 72  | 12   | e     | V   | 04 58 07.0 |   |   |
| 73  | 12   | i(P)  | V   | 12 12 13.0 |   |   |
| 74  | 12   | e     | V   | 17 15 36   |   |   |
| L9  | 12   | e     | V   | 18 01 54.0 |   | Regional  |
| 75  | 13   | iP    | VNE   | 02 39 42.5 | R | 5.6S 130.3E h:39km.                                 |
|     |      | i     | V   | 40 14.5    |   | Banda Sea   |
|     |      | i(PF) | N   | 51.5       |   |   |
| 76  | 13   | e     | V   | 05 34 05.5 |   | short period movement                               |
| 77  | 13   | eP    | V   | 06 11 42.5 |   | 25.3N 121.5E h:25km.<br>Near north coast of Formosa |
| 78  | 13   | eP    | V   | 12 52 23.0 |   | 7.7S 127.5E h:160km.<br>Banda Sea                   |
| 79  | 13   | e     | V   | 12 59 (40) |   |   |
| 80  | 14   | e(T)  | V   | 00 56 47   |   |   |
| 81  | 14   | iP    | VN  | 13 42 28.0 | R |   |
| 82  | 14   | eP    | VE  | 18 57 20.5 |   | 24.2S 175.7W h:21km.                                |
|     |      | iPP   | V   | 58 34.5    |   | Tonga Is. region.                                   |
|     |      | iPPP  | V   | 54.0       |   |   |
|     |      | eL    | V <sub>1</sub> E <sub>1</sub>                   | 19 06.4    |   |   |
|     |      | M     | E <sub>1</sub>                                  | 08.3       |   |   |
|     |      | M     | V <sub>1</sub>                                  | 09.0       |   |   |
| L10 | 14   | e     | V   | 20 00 21.0 |   | Regional  |
|     |      | eS    | N   | 50.0       |   |   |
| 83  | 14   | eP    | VNE   | 23 33 50.5 |   | 20.3S 169.4E h:97km.                                |
|     |      | ipP   | V <sub>1</sub>                                  | 34 07      |   | New Hebrides Is. region.                            |
|     |      | i     | N <sub>1</sub>                                  | 35 26.0    |   |   |
|     |      | eS    | NEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub>  | 38 02.0    |   |   |
|     |      | i     | N <sub>1</sub>                                  | 09.0       |   |   |
|     |      | eL    | E <sub>1</sub>                                  | 39.7       |   |   |
|     |      | M     | E <sub>1</sub>                                  | 40.8       |   |   |
| 84  | 15   | e     | V   | 17 57 (07) |   | 14.9S 167.7E h:198 km.<br>New Hebrides Is.          |
| 85  | 15   | eP    | VN  | 19 14 56.0 |   | 32.8N 142.4E h:39km.                                |
|     |      | i     | V   | 57.0       |   | South of Honshu, Japan.                             |
| 86  | 15   | iP    | V   | 19 49 15.5 |   | 23.3S 180.0 h:595km.<br>South of Fiji Is.           |
| 87  | 16   | i(P)  | V   | 01 07 40.0 |   |   |
| 88  | 16   | iP    | V   | 03 39 38.0 | R | 31.8S 177.9W h:70km.                                |
|     |      | e     | V   | 42 54.0    |   | Kermadec Is.  |
| 89  | 16   | iP    | VN  | 13 11 59.5 | R |   |
| 90  | 16   | i     | V   | 18 15 57.5 |   |   |
| 91  | 16   | e     | V   | 19 24 19   |   | 31.7S 178.0W h:51km.<br>Kermadec Is.                |



| No. | Date | Phase  | Component   | Time  |   | Remarks.   |
|-----|------|--|---|---|---|--|
| 92  | 16   | eP<br>i  | VN<br>V   | 22 31 12.0<br>25.5  | C | 11.0N 124.8E h:305km.<br>Philippine Is.          |
| L11 | 17   | eP<br>eS   | V<br>V  | 05 30 19.0<br>38.0  |   | Local  |
| 93  | 17   | eP   | V   | 07 02 06  |   | 33.0N 142.2E h:123km.<br>South of Honshu, Japan. |
| 94  | 17   | eP   | V   | 13 00 37.0  | C | 31.7S 178.7W h:25km.<br>Kermadec Is.             |
| 95  | 17   | eP<br>ipP  | V<br>V  | 17 54 39.5<br>44.0  |   | 18.6S 168.8E h:25km.<br>New Hebrides Is.         |
| 96  | 17   | eP<br>ipP<br>isP<br>iS<br>e(ScS)<br>eSP<br>i(SPP)<br>isS   | V<br>V <sub>1</sub><br>V <sub>1</sub><br>EN <sub>1</sub> E <sub>1</sub><br>N <sub>1</sub><br>N <sub>1</sub><br>E <sub>1</sub><br>E <sub>1</sub>   | 21 28 31.0<br>29 08.0<br>24.5<br>38 31.0<br>50.5<br>39 21<br>38<br>52   |   | 46.3N 149.3E h:186km.<br>Kurile Is.              |
| 97  | 17   | e  | V   | 21 47 06  |   |  |
| 98  | 18   | ipP  | V   | 03 37 58.0  | C |  |
| 99  | 18   | eP   | V   | 05 39 52.5  | C | 28.0N 139.9E h:400km.<br>Bonin Is. region.       |
| L12 | 19   | e  | V   | 03 19 55  |   | South Australia                                  |
| 100 | 19   | ipPKP<br>ipP<br>i<br>i<br>iSKS<br>iSKS<br>i<br>e<br>e<br>i<br>i<br>i<br>i<br>i<br>iPKKP<br>eSKP<br>eSPP<br>isSP<br>i | VNEV <sub>1</sub><br>V <sub>1</sub><br>N <sub>1</sub><br>VV <sub>1</sub><br>V<br>E <sub>1</sub><br>N <sub>1</sub><br>EN <sub>1</sub><br>NEN <sub>1</sub> E <sub>1</sub><br>V<br>V<br>V<br>VV <sub>1</sub><br>E <sub>1</sub><br>V <sub>1</sub><br>N <sub>1</sub><br>N <sub>1</sub><br>V <sub>1</sub><br>N <sub>1</sub> | 05 27 34.5<br>29 15.0<br>40.0<br>30 13.5<br>33 31.5<br>32.5<br>33.5<br>36<br>35 05.5<br>13.0<br>22.0<br>37 34.5<br>44.5<br>55.5<br>59.0<br>38 06.5<br>39 21.0<br>41 45.0<br>42 09.5 | R | 10.7S 71.0W h:649km.<br>Peru-Brazil border       |
| 101 | 19   | eP<br>i<br>ipP   | V<br>NV <sub>1</sub><br>V   | 05 44 56.5<br>57.0<br>47 39.0   | C | 36.0N 136.5E h:17km.<br>Off west coast of Honshu |
| L13 | 19   | e(s)   | V   | 09 51 52.5  |   | Local  |
| 102 | 20   | ipP<br>epP<br>i<br>eS<br>eS<br>eL<br>M   | VE <sub>1</sub><br>V<br>N<br>E <sub>1</sub><br>EN <sub>1</sub><br>N <sub>1</sub><br>V <sub>1</sub>  | 01 35 36.5<br>42.0<br>59.0<br>39 58<br>40 02<br>43.0<br>44.7  |   | 17.8S 169.0E h:36km.<br>New Hebrides Is.         |
| 103 | 20   | ipP<br>ePPP<br>iS<br>iScP<br>i   | VNEV <sub>1</sub> E <sub>1</sub><br>EE <sub>1</sub><br>NEN <sub>1</sub> E <sub>1</sub><br>EE <sub>1</sub><br>V  | 05 10 11.0<br>12 26.0<br>14 55.5<br>15 24.5<br>31.0   | R | 17.8S 178.8W h:592km.<br>Fiji Is.                |



| No. | Date | Phase                  | Component                             | Time                                  | Remarks.   |
|-----|------|------------------------|---------------------------------------|---------------------------------------|--|
| 104 | 20   | eP                     | V                                     | 08 47 54.0                            |  |
| 105 | 20   | eP                     | V                                     | 10 25 57.0                            | 6.8S 155.4E h:72km.<br>Solomon Is.                         |
| 106 | 20   | eP<br>i                | V<br>V                                | 13 08 39.0<br>55.0                    | C  |
| 107 | 20   | e                      | V                                     | 13 40 23.0                            |  |
| 108 | 21   | iP<br>ipP<br>eS        | VE<br>V<br>N                          | 02 12 15.0<br>13 44.5<br>16 37.0      | 22.7S 179.2W h:554km.<br>Fiji Is. region.                  |
| 109 | 21   | iP                     | VN                                    | 15 12 36.0                            | C  |
| 110 | 21   | iP<br>iP<br>i<br>i(sP) | V<br>E<br>N<br>N                      | 16 13 59.5<br>14 00.0<br>06.0<br>26.0 | R 17.8S 174.4W h:74km.<br>Tonga Is.                        |
| L14 | 21   | iP<br>iS               | VN<br>VNE                             | 16 27 21.5<br>29.0                    | Local  |
| 111 | 21   | eP                     | V                                     | 17 12 27.0                            | C 40.9N 138.9E h:49km.<br>Off coast of northern<br>Honshu  |
| 112 | 22   | iP                     | V                                     | 03 09 14.0                            | 17.7S 168.5E h:77km.<br>New Hebrides Is.                   |
| 113 | 22   | eP                     | V                                     | 09 05 08.0                            | 13.4S 166.7E h:63km.<br>New Hebrides Is.                   |
| 114 | 23   | eP                     | V                                     | 14 46 13.5                            | 5.6N 126.3E h:25km.<br>Off south coast of<br>Mindanao P.I. |
| 115 | 24   | eP                     | V                                     | 05 04 20                              | 42.9N 145.3E h:44km.<br>Eastern Hokkaido                   |
| L15 | 24   | e<br>eP<br>iS          | V<br>V<br>VE                          | 14 02 (56.5)<br>57.0<br>03 06.0       | Local  |
| L16 | 24   | e(S)                   | V                                     | 14 09 03.5                            | Local  |
| L17 | 24   | e<br>e(S)              | V<br>V                                | 14 59 (57.5)<br>15 00 06.0            | Local  |
| 116 | 24   | eP<br>eL<br>i          | V<br>V <sub>1</sub><br>V <sub>1</sub> | 21 03 44<br>10.8<br>11 09.0           | 21.3S 173.1E h:258km.<br>Loyalty Is. region.               |
| 117 | 24   | eP                     | V                                     | 22 52 51.0                            | 43.0N 145.0E h:18km.<br>Eastern Hokkaido                   |
| 118 | 25   | eP                     | V                                     | 05 58 28.5                            | 0.7S 148.2E h:25km.<br>Admiralty Is. region.               |
| 119 | 25   | i(P)<br>isP<br>iPcP    | V<br>V<br>V                           | 21 33 18.0<br>34 20.0<br>35 39.5      | 8.1S 122.8E h:191km.<br>Flores Sea                         |
| 120 | 26   | i(P)                   | V                                     | 02 50 36.0                            | R 20.1S 168.9E h:125km.<br>Loyalty Is.                     |
| 121 | 26   | iP<br>i                | V<br>V                                | 05 04 19.5<br>26.0                    |  |
| 122 | 26   | eP                     | V                                     | 05 14 49.5                            |  |
| 123 | 26   | e(P)                   | V                                     | 06 46 06.5                            |  |
| 124 | 26   | eP                     | V                                     | 18 08 10.5                            | C 13.9S 166.2E h:66km.<br>New Hebrides Is.                 |



| No. | Date | Phase | Component       | Time       |   | Remarks.   |
|-----|------|-------|-----------------|------------|---|--|
| 125 | 26   | iP    | V               | 18 54 50.0 |   | 18.0N 146.4E h:53km.<br>Mariana Is.              |
| 126 | 27   | eP    | V               | 00 02 18.5 |   |  |
| 127 | 27   | iP    | V               | 06 49 31.0 |   | 18.5S 178.2W h:488km.<br>Fiji Is.                |
| L18 | 27   | e     | V               | 08 23 32.0 |   | Local  |
|     |      | i(S)  | VN              | 43.5       |   |  |
| 128 | 27   | eP    | V               | 16 57 03.0 | C | 18.3N 146.6E h:27km.<br>Mariana Is.              |
|     |      | i     | VN              | 04.0       |   |  |
|     |      | i     | N               | 06.5       |   |  |
|     |      | ipP   | E               | 11.5       |   |  |
|     |      | i     | VV <sub>1</sub> | 34.0       |   |  |
|     |      | iPcP  | V <sub>1</sub>  | 58 14.0    |   |  |
|     |      | iPP   | E <sub>1</sub>  | 59 09.0    |   |  |
|     |      | iPPP  | E <sub>1</sub>  | 17 00 18.5 |   |  |
|     |      | iS    | E <sub>1</sub>  | 04 28.5    |   |  |
|     |      | iScS  | EE <sub>1</sub> | 06 52.5    |   |  |
|     |      | eL    | E <sub>1</sub>  | 10.1       |   |  |
|     |      | eL    | N <sub>1</sub>  | 11.9       |   |  |
|     |      | M     | E <sub>1</sub>  | 13.2       |   |  |
| 129 | 27   | iP    | VN              | 17 09 58.0 | R | 2.2N 128.6E h:263km.<br>Halmahera                |
|     |      | ipP   | V               | 10 48.0    |   |  |
|     |      | ePP   | V               | 11 37.5    |   |  |
|     |      | eScP  | V               | 15 11.5    |   |  |
| 130 | 27   | eP    | V               | 17 32 30.0 |   | 18.0N 144.7E h:109km.<br>Mariana Is.             |
| 131 | 27   | eP    | V               | 18 07 15   |   | 17.9N 146.4E h:74km.<br>Mariana Is.              |
| L19 | 27   | e     | V               | 19 09 51.0 |   | Local  |
| 132 | 27   | ePKP  | V               | 22 28 06   |   | 35.9N 23.7E h:69km.<br>Near west coast of Greece |
|     |      | ePKS  | V               | 31 33      |   |  |
| 133 | 28   | iP    | VNE             | 07 46 40.5 | R | 12.7S 169.6E h:662km.<br>Santa Cruz Is.          |
|     |      | i     | V               | 53.5       |   |  |
|     |      | iPcP  | V               | 49 26.0    |   |  |
|     |      | iScP  | V               | 52 09.0    |   |  |
| 134 | 28   | iP    | VNE             | 09 50 10.0 | R | 18.6S 178.0W h:574km.<br>Fiji Is.                |
|     |      | iPcP  | V               | 52 36.0    |   |  |
| 135 | 28   | eP    | V               | 20 38 24.0 | C | 22.9S 113.4W h:56km.<br>Easter Is. region.       |
| 136 | 28   | e(P)  | V               | 23 15 15   |   |  |
| 137 | 29   | iP    | VN              | 10 51 15.0 | R | 7.2S 128.3E h:166km.<br>Banda Sea.               |
| 138 | 29   | iP    | V               | 17 37 19.0 | C | 7.0S 125.2E h:551km.<br>Banda Sea                |
|     |      | i     | N               | 19.5       |   |  |
|     |      | ipP   | VN              | 38 51.5    |   |  |
| 139 | 29   | e     | V               | 18 40 56.5 |   |  |
| 140 | 29   | iP    | VNE             | 21 39 18.5 | R | 15.4S 168.1E h:25km.<br>New Hebrides Is.         |
| 141 | 30   | iP    | VE              | 02 25 51.5 | R |  |
| 142 | 30   | ePKP  | V               | 03 55 10   |   | 7.0N 33.2W h:69km.<br>North Atlantic Ocean       |
| L20 | 30   | e(P)  | V               | 07 51 53.5 |   | Local  |
|     |      | e(S)  | V               | 59.0       |   |  |



| Nq. | Date | Phase  | Component                     | Time       | Remarks.                                    |
|-----|------|--------|-------------------------------|------------|---|
| 143 | 30   | eP     | V                             | 19 16 02.5 | 21.0S 170.2E h:46km.<br>Loyalty Is. region. |
|     |      | e(T)   | V                             | 30.1       |   |
| 144 | 31   | eP     | VE                            | 00 28 53.0 | 28.1S 176.7W h:56km.<br>Kermadec Is.        |
|     |      | eL     | V <sub>1</sub>                | 37 57      |   |
| 145 | 31   | iP     | V                             | 01 48 01.0 |   |
| 146 | 31   | ePKP   | V                             | 02 06 24.0 | 10.6S 70.9W h:626km.<br>Peru-Brazil border  |
|     |      | i      | VNE                           | 24.5       |   |
|     |      | ePP    | N                             | 07 59.0    |   |
|     |      | ipPKP  | V                             | 08 44.5    |   |
|     |      | i      | V                             | 09 04.5    |   |
|     |      | i      | V                             | 37.0       |   |
|     |      | eSKS   | E <sub>1</sub>                | 12 25      |   |
|     |      |        |                               |            |   |
| 147 | 31   | iPKP   | VV <sub>1</sub>               | 02 14 53.0 | 10.4S 70.1W h:629km.<br>Peru-Brazil border  |
|     |      | i      | V <sub>1</sub>                | 55.0       |   |
|     |      | i      | NE                            | 59.0       |   |
|     |      | iPP    | VV <sub>1</sub>               | 16 36.0    |   |
|     |      | ipPKP  | V                             | 17 20.0    |   |
|     |      | i      | VV <sub>1</sub>               | 38.0       |   |
|     |      | i(pPP) | E <sub>1</sub>                | 18 31.5    |   |
|     |      | iSKS   | N <sub>1</sub> E <sub>1</sub> | 20 59.0    |   |
|     |      | eSKS   | NE                            | 21 00.5    |   |
|     |      | e      | N <sub>1</sub>                | 22 28.0    |   |
|     |      | i      | E <sub>1</sub>                | 29.0       |   |
|     |      | eSKP   | V <sub>1</sub> N <sub>1</sub> | 25 24.0    |   |
|     |      | iSS    | E <sub>1</sub>                | 32 00.0    |   |
|     |      | e      | N <sub>1</sub>                | 33 00      |   |
| 148 | 31   | V      | V                             | 02 25 03.5 |   |
| 149 | 31   | eP     | V                             | 03 36 46   | 15.2S 177.4W h:439km.<br>Fiji Is. region.   |
| 150 | 31   | eP     | V                             | 04 04 10.5 | 15.3S 172.8W h:25km.<br>Samoa Is. region.   |
| 151 | 31   | eP     | V                             | 23 31 14.5 | 3.2S 139.4E h:108km.<br>Western New Guinea. |

Seismograms read by  
Jennifer Clay.

J.C. Jaeger,  
Professor of Geophysics.



*all copied*

Department of Geophysics  
 Australian National University  
 CANBERRA, A.C.T., AUSTRALIA.

MONTHLY SEISMOLOGICAL BULLETIN

MAY, 1961.

Latitude: 35° 19' 15"S Longitude: 148° 59' 55"E Height: 700 M  
 Instruments: three-component Benioff variable reluctance seismographs.

$T_s = 1$  sec.  
 $T_g = 0.25$  sec. (short periods VNE)  
 $T_g = 16$  sec. (long period vertical  $V_1$ )  
 $T_g = 70$  sec. (long period horizontals  $N_1E_1$ )  
 One N-S component Wood-Anderson Seismograph,  $T_s = 0.8$  sec.

Mt. Stromlo quartz clocks provide accurate time marks and 50 c/s for drum drive.

Abbreviations: R - rarefaction; C - compression; H - origin,  
 Epicentre locations are those given by U.S.C.G.S.

| No. | Date | Phase                                   | Component                                       | Time   | Remarks                                      |
|-----|------|---|---|--|--|
| 1   | 1    | iP                                      | V   | 03 52 10.0   | 18.7S 174.3W h: 25 km<br>Tonga Is. region    |
| L1  | 1    | e<br>e(S)                               | VN<br>VE  | 08 23 50<br>24 19.5  | Regional                                     |
| 2   | 1    | iP                                      | VN  | 11 14 16.5 C   | 2.8N 127.5E h: 135 km<br>Molucca Passage     |
| 3   | 2    | eP                                      | V   | 00 53 59.0   |  |
| L2  | 2    | eP<br>eS                                | V<br>N  | 01 09 25<br>57   | Regional                                     |
| L3  | 2    | i(P)<br>eS                              | V   | 01 13 15.0<br>47.0   | Regional                                     |
| 4   | 2    | eP<br>iP                                | V<br>VNE  | 01 36 38.0 R<br>38.5   | 17.3S 178.7W h: 608 km<br>Fiji Is. region    |
| 5   | 2    | e(P)                                    | V   | 18 58 21   | 15.2S 173.1W h: 71 km<br>Samoa Is. region    |
| 6   | 2    | eP                                      | V   | 19 44 22.0   | 27.8S 176.4W h: 53 km<br>Kermadec Is. region |
| 7   | 2    | iP<br>M                                 | VE<br>$V_1E_1$                                  | 19 45 45.0<br>56.5   | 27.5S 176.7W h: 77 km<br>Kermadec Is. region |
| 8   | 2    | iP                                      | VE  | 20 06 00.0   |  |
| 9   | 2    | eP                                      | V   | 20 55 11   |  |
| 10  | 2    | iP<br>iPP<br>iPPP<br>i<br>eS<br>iL<br>M | VEV<br>V<br>V<br>N<br>E<br>$V_1N_1$<br>$V_1E_1$ | 22 50 55.0 C<br>52 02.5<br>19.0<br>28.0<br>55 56.5<br>57 54<br>23 02.7 | 27.8S 176.5W h: 47 km<br>Kermadec Is. region |
| 11  | 2    | iP<br>i                                 | V<br>V  | 23 30 10.0 R<br>20.0   | 27.7S 176.4W h: 84 km<br>Kermadec Is. region |
| 12  | 2    | iP                                      | V   | 23 34 14.0   |  |
| 13  | 3    | iPKP<br>ipPKP                           | V<br>V  | 00 45 59.0 R<br>46 07.0  | 1.0N 26.4W h: 25 km<br>Mid-Atlantic Ocean    |
| 14  | 3    | i                                       | V   | 08 18 01.5   |  |
| 15  | 3    | eP                                      | V   | 17 00 22.0   | 27.8S 176.1W h: 49 km<br>Kermadec Is. region |
| 16  | 3    | eP                                      | VN  | 19 55 21.5   |  |



|    |   |  |  |   |   |  |
|----|---|--|--|---|---|--|
| 17 | 4 | iP                                       | V  | 03 39 04.0  | R | 17.9S 178.5W h: 601 km<br>Fiji Is. region                              |
| 18 | 4 | i(P)<br>i<br>i                           | V<br>N<br>V  | 15 33 12.0<br>18.0<br>19.0  |   | 0.6S 98.8E h: 41 km<br>Near coast of Sumatra                           |
| 19 | 4 | eP                                       | V  | 17 54 44.0  |   | 5.0N 127.6E h: 25 km<br>Off coast of Mindanao, P.I.                    |
| L4 | 4 | iP<br>iS                                 | VN<br>VN   | 23 37 48.0<br>55.0  |   | Local  |
| L5 | 5 | e(P)<br>i(S)<br>i<br>i<br>i max<br>i max | V<br>V<br>VN<br>V<br>V<br>N  | 04 05 (00)<br>06 41.5<br>50.0<br>54.5<br>07 23<br>30.5              |   | short period movement,<br>possibly regional                            |
| 20 | 5 | iP                                       | V  | 06 45 15.0  | R | 27.7S 176.4W h: 84 km<br>Kermadec Is. region                           |
| L6 | 5 | e(S)                                     | VNE  | 08 17 39.5  |   | Local  |
| 21 | 5 | eP                                       | V  | 08 50 27.0  |   | 27.3S 176.4W h: 42 km<br>Kermadec Is. region                           |
| 22 | 5 | iP<br>e<br>eL<br>M<br>M                  | V<br>E <sub>1</sub><br>N <sub>1</sub><br>E <sub>1</sub><br>V <sub>1</sub>  | 13 49 30.0<br>54 39<br>56 21.0<br>14 00.9<br>01.2                   |   | 27.8S 176.1W h: 84 km<br>Kermadec Is. region                           |
| 23 | 5 | eP                                       | V  | 15 35 02.5  |   | 27.3S 176.1W h: 60 km<br>Kermadec Is. region                           |
| 24 | 5 | i(P)                                     | V  | 16 12 28.5  |   |  |
| 25 | 5 | e<br>e(T)<br>(T) max<br>(T) max          | V<br>VN<br>V<br>NE   | 22 08 12<br>24 08<br>25 04<br>13                                    |   |  |
| 26 | 6 | iPKP                                     | V  | 16 24 16.0  |   | 37.4N 11.2E h: 30 km<br>Mediterranean Sea, off<br>the coast of Tunisia |
| 27 | 6 | iP                                       | V  | 21 24 59.5<br>25 54.0   |   | 6.3N 126.4E h: 93 km<br>Near coast of Mindanao,<br>P.I.                |
| 28 | 6 | i  | V  | 21 32 55.0  | R |  |
| 29 | 6 | iP<br>i                                  | VN<br>VN   | 22 41 13.0<br>15.0  |   | 6.3N 126.3E h: 110 km<br>Near coast of Mindanao,<br>P.I.               |
| 30 | 6 | eP<br>i<br>i<br>i(pP)<br>eS<br>eL<br>M   | V<br>V <sub>1</sub><br>V <sub>1</sub><br>E<br>N <sub>1</sub><br>V <sub>1</sub><br>V <sub>1</sub><br>V <sub>1</sub> | 23 18 44.0<br>47.0<br>51.5<br>19 11.5<br>22 55.5<br>24.4<br>27.4    |   | 17.2S 167.9E h: 96 km<br>New Hebrides Is. region                       |
| 31 | 6 | eP<br>i<br>eT<br>T max                   | V<br>N<br>V<br>N   | 23 45 18.0<br>20.5<br>00 01 07<br>02 34.5                           |   | 51.5S 161.3E h: 21 km<br>Macquarie Is. region                          |
| L8 | 7 | iP<br>iS                                 | VN<br>VN   | 00 31 29.5<br>35.5  |   | Local  |
| 32 | 7 | iP<br>isP<br>ePP<br>eS<br>i<br>M<br>M    | VN<br>NN <sub>1</sub><br>V <sub>1</sub><br>EN <sub>1</sub><br>V <sub>1</sub><br>N <sub>1</sub><br>V <sub>1</sub>   | 00 31 39.0<br>32 28.5<br>47.0<br>36 30.5<br>37 07.0<br>42.5<br>42.8 |   | 6.1S 154.4E h: 123 km<br>Solomon Is. region                            |



|     |    |  |  |  |  |
|-----|----|--|--|--|--|
| 33  | 7  | iP<br>iPcP<br>iPcS<br>e                    | V<br>V<br>V<br>N <sub>1</sub>  | 04 40 12.0<br>42 00.0<br>45 46.5<br>54.5                       | R 8.6S 111.4E h: 113 km<br>Near coast of Java            |
| 34  | 7  | iP   | V  | 07 51 29.0   | 31.8S 179.9W h: 374 km<br>Kermadec Is. region            |
| 35  | 7  | iP<br>i<br>i<br>i(sP)<br>eS<br>ePS<br>ePPS | VN<br>V <sub>1</sub><br>E <sub>1</sub><br>E <sub>1</sub><br>E <sub>1</sub><br>N <sub>1</sub><br>N <sub>1</sub> | 10 31 04.0<br>24.5<br>35.5<br>46.5<br>37 46<br>38 13.5<br>21.0 | C 5.8N 126.8E h: 89 km<br>Off coast of Mindanao,<br>P.I. |
| 36  | 7  | iP   | VE   | 15 02 34.5   | R  |
| 37  | 7  | eP   | V  | 20 29 23.5   |  |
| 38  | 7  | iP   | VN   | 22 50 41.0   | R  |
| 39  | 8  | iP   | V  | 21 41 10.5   |  |
| 40  | 8  | iP<br>isP                                  | VNE<br>VN  | 22 59 58.5<br>23 00 35.0                                       | R 0.2N 123.5E h: 88 km<br>Northern Celebes               |
| 41  | 9  | eP   | V  | 08 22 15.5   | 27.7S 176.4W h: 84 km<br>Kermadec Is. region             |
| 42  | 9  | iP   | V  | 11 12 25.0   | 6.2S 154.5E h: 110 km<br>Solomon Is. region              |
| 43  | 9  | i  | V  | 11 44 36.5   |  |
| L9  | 9  | e  | VNE  | 11 53 53   | Regional   |
| 44  | 9  | eP   | V  | 11 57 28   | 7.0S 106.8E h: 81 km<br>Near coast of Java               |
| 45  | 9  | iP   | VN   | 13 32 07.0   | 4.1S 137.7E h: 194 km<br>New Guinea                      |
| 46  | 9  | e  | V  | 13 53 49   |  |
| 47  | 10 | iP   | VNE  | 06 20 56.0   |  |
| 48  | 10 | iP<br>ipP                                  | V<br>V   | 10 12 45.0<br>57.0   | 15.8S 172.3W h: 52 km<br>Samoa Is. region                |
| L10 | 11 | e  | V  | 03 45 02.5   | Regional   |
| 49  | 11 | iP   | VNE  | 05 32 37.5   | 19.1S 178.0W h: 486 km<br>Fiji Is. region                |
| 50  | 11 | (eP)<br>i                                  | V<br>V   | 07 17 40<br>45.5   | 6.4S 146.5E h: 122 km<br>Near coast of New Guinea        |
| L11 | 11 | e  | V  | 08 10 13.0   | Local  |
| 51  | 11 | eL   | V <sub>1</sub> N <sub>1</sub> E <sub>1</sub>   | 09 24  | 37.2S 73.6W h: 47 km<br>Near coast of southern<br>Chile  |
| L12 | 12 | iP<br>iP<br>iS                             | V<br>V<br>V  | 01 35 03.0<br>06.5<br>16.5                                     | Local  |
| 52  | 12 | iP   | V  | 02 53 55.0   |  |
| 53  | 12 | eP   | V  | 03 50 09   | 0.0 97.9E h: 81 km<br>Near coast of Sumatra              |
| 54  | 12 | iP<br>eL                                   | V<br>N <sub>1</sub> E <sub>1</sub>   | 04 50 41.0<br>58   | 27.7S 176.2W h: 60 km.<br>Kermadec Is. region            |
| 55  | 12 | iP   | V  | 05 42 31.0   |  |
| 56  | 12 | iP   | V  | 06 31 51.5   | 11.7S 167.3E h: 100 km.<br>Solomon Is. region            |
| 57  | 12 | eP   | V  | 07 30 17.0   | 28.2S 176.2W h: 21 km<br>Kermadec Is. region             |
| 58  | 12 | eP   | V  | 16 56 07.5   | 11.5N 141.5E h: 136 km<br>Mariana Is. region             |



|     |    |        |                                |              |                                  |
|-----|----|--------|--------------------------------|--------------|----------------------------------|
| 59  | 12 | iP     | V                              | 21 32 12.5   | 19.3S 179.1E h: 600 km           |
|     |    |        |                                |              | Fiji Is.                         |
| 60  | 13 | eP     | V                              | 13 48 00.0   | 27.8S 176.2W h: 32 km            |
|     |    | i      | V                              | 02.5         | Kermadec Is. region              |
| 61  | 13 | e(P)   | V                              | 14 23 37.0   |                                  |
| 62  | 13 | iP     | V                              | 14 24 55.5 R | 27.9S 176.0W h: 25 km            |
|     |    | isP    | V                              | 25 09.0      | Kermadec Is. region              |
|     |    | (eS)   | E <sub>1</sub>                 | 29 56        |                                  |
|     |    | i(sS)  | E <sub>1</sub>                 | 30 06        |                                  |
|     |    | eL     | N <sub>1</sub>                 | 31.8         |                                  |
| 63  | 13 | iP     | VNE                            | 14 58 53.5 R | 17.5S 178.8W h: 556 km           |
|     |    | i      | VN                             | 56.0         | Fiji Is. region                  |
|     |    | i      | N                              | 59 00.5      |                                  |
|     |    | i      | N                              | 20.0         |                                  |
|     |    | iPP    | N                              | 15 00 32.5   |                                  |
|     |    | i(pP)  | V                              | 42.5         |                                  |
|     |    | i      | V                              | 01 10.5      |                                  |
|     |    | iPcP   | N                              | 13.0         |                                  |
|     |    | eS     | NN <sub>1</sub> E <sub>1</sub> | 03 38.0      |                                  |
|     |    | eS     | E <sub>1</sub>                 | 39.5         |                                  |
|     |    | eSS    | E <sub>1</sub>                 | 06 38.5      |                                  |
| 64  | 13 | eP     | V                              | 16 01 34.5 R | 43.4N 147.8E h: 31 km            |
|     |    | i(PcP) | V                              | 46.0         | Off north east coast of Hokkaido |
| 65  | 13 | eP     | V                              | 17 08 10.0   |                                  |
| L13 | 13 | eP     | V                              | 19 14 32.5   | Local                            |
|     |    | eS     | V                              | 40.5         |                                  |
| 66  | 13 | iP     | V                              | 19 29 57.0 R | 25.3N 122.6E h: 261 km           |
|     |    |        |                                |              | Off north coast of Formosa       |
| 67  | 14 | eP     | V                              | 00 17 32.5   | 39.6S 176.8E h: 40 km            |
|     |    | ipP    | V                              | 46.5         | North Island, New Zealand        |
| 68  | 14 | iP     | V                              | 02 49 34.5 C | 27.9S 176.3W h: 47 km            |
|     |    |        |                                |              | Kermadec Is. region              |
| 69  | 14 | eP     | V                              | 03 13 07.5   |                                  |
| 70  | 14 | e(P)   | V                              | 05 08 04.0   |                                  |
| 71  | 14 | iP     | V                              | 10 31 52.5 C | 7.1S 128.0E h: 60 km             |
|     |    |        |                                |              | Banda Sea                        |
| 72  | 14 | eP     | V                              | 12 30 34.5   | 6.3S 146.2E h: 79 km             |
|     |    |        |                                |              | New Guinea                       |
| 73  | 14 | eP     | V                              | 13 27 16.5   | 16.7S 173.9W h: 95 km            |
|     |    |        |                                |              | Tonga Is.                        |
| 74  | 14 | e      | V                              | 13 44 (55)   |                                  |
|     |    | i      | V                              | 45 05.5      |                                  |
| L14 | 15 | eP     | V                              | 10 43 39.0   | Local                            |
|     |    | iP     | V                              | 39.5         |                                  |
|     |    | iS     | VE                             | 46.5         |                                  |
| 75  | 15 | eP     | V                              | 11 20 39.5   | 7.1S 122.3E h: 248 km            |
|     |    |        |                                |              | Flores Sea                       |
| 76  | 15 | iP     | V                              | 15 47 12.0 C |                                  |
| 77  | 15 | iP     | VE                             | 19 17 35.0 C | 15.3S 166.6E h: 58 km            |
|     |    | ipP    | N                              | 56.0         | Santa Cruz Is.                   |
|     |    | isP    | N                              | 18 07.5      |                                  |
| 78  | 15 | eP     | V                              | 19 54 38.5   | 15.4S 166.4E h: 107 km           |
|     |    | i      | V                              | 49.5         | New Hebrides Is. region          |
| 79  | 15 | iP     | V                              | 20 59 41.0 R | 20.0S 177.2W h: 89 km            |
|     |    | i      | E                              | 41.5         | Tonga Is. region                 |
|     |    | ipP    | V                              | 21 00 12.5   |                                  |
|     |    | isP    | V                              | 26.0         |                                  |
|     |    | ePP    | V                              | 01 00.5      |                                  |
| L15 | 16 | eP     | V                              | 06 23 14.0   | Local                            |
|     |    | eS     | V                              | 35.0         |                                  |



|     |    |        |                |              |                            |
|-----|----|--------|----------------|--------------|----------------------------|
| L16 | 16 | eP     | V              | 06 54 01.0   | H: 06 52 54 (Canb.)        |
|     |    | iP     | V              | 02.5         | Mag. 5 $\frac{1}{4}$       |
|     |    | iP     | VN             | 11.0         |                            |
|     |    | iPP    | V              | 12.0         |                            |
|     |    | i      | N              | 33.5         |                            |
|     |    | iS     | V              | 53.0         |                            |
|     |    | i      | V              | 55 04.0      |                            |
|     |    | i      | N              | 05.5         |                            |
|     |    | iSS    | E              | 09.0         |                            |
|     |    | i(SSS) | V <sub>1</sub> | 22.0         |                            |
| L17 | 16 | e      | V              | 09 05 15.5   | Regional                   |
| L18 | 16 | e      | V              | 16 59 53     | Regional                   |
| 80  | 16 | eP     | V              | 17 33 43.0   | 27.9S 176.4W h: 53 km      |
|     |    | i(pP)  | V              | 56.5         | Kermadec Is. region        |
| 81  | 16 | iP     | V              | 21 56 21.5   | 30.ON 132.OE h: 25 km      |
|     |    | iPcP   | V              | 50.0         | Ryukyu Is.                 |
|     |    | i      | V              | 57 00.5      |                            |
| 82  | 16 | e(P)   | V              | 22 41 45.0   |                            |
| 83  | 17 | eP     | N              | 01 01 19.5   | 14.3S 170.4E h: 137 km     |
|     |    |        |                |              | New Hebrides Is.           |
| 84  | 17 | eP     | V              | 04 33 36.0   | 12.6N 143.2E h: 27 km      |
|     |    |        |                |              | South of Guam, Mariana Is. |
| L19 | 17 | e      | V              | 07 45 25     | Regional                   |
| 85  | 17 | iP     | V              | 15 33 15.5 C |                            |
| 86  | 17 | eP     | V              | 19 42 22.5 R | 52.ON 173.9E h: 21 km      |
|     |    | ePP    | V              | 46 12        | Near Is., Aleutian Is.     |
|     |    | eS     | E <sub>1</sub> | 53 19.5      |                            |
|     |    | ePPS   | E <sub>1</sub> | 55 09        |                            |
|     |    | eSS    | N <sub>1</sub> | 59 35        |                            |
| 87  | 17 | e      | V              | 19 57 08     |                            |
| L20 | 18 | e(S)   | V              | 06 31 43     | Regional                   |
| 88  | 18 | eT     | V              | 20 25 (28)   |                            |
| 89  | 18 | iP     | VN             | 20 46 08.5 C | 4.6N 125.7E h: 126 km      |
|     |    | ipP    | N              | 48.5         | Near south coast of Min-   |
|     |    | i      | V              | 50.5         | danao, P.I.                |
|     |    | isP    | N              | 47 01.0      |                            |
|     |    | i      | V              | 03.0         |                            |
|     |    | iPcP   | N              | 48 09.0      |                            |
| 90  | 19 | iP     | VN             | 00 58 31.5 C | 3.8N 125.7E h: 77 km       |
|     |    | isP    | VN             | 59 07.5      | Off south coast of         |
|     |    | iPcP   | N              | 01 00 12.5   | Mindanao, P.I.             |
| 91  | 19 | eP     | V              | 01 49 35.0   | 22.4S 179.0W h: 615 km     |
|     |    |        |                |              | Tonga Is. region           |
| 92  | 19 | iP     | V              | 02 26 52.0 R | 22.5S 179.2E h: 600 km     |
|     |    | i      | N              | 53.0         | Fiji Is. region            |
| 93  | 19 | e      | V              | 03 45 48.0   | Short period movement      |
| 94  | 19 | eP     | V              | 03 49 59     | 15.8S 172.8W h: 25 km      |
|     |    |        |                |              | Tonga Is.                  |
| 95  | 19 | eP     | V              | 16 48 03     | 24.1N 123.4E h: 71 km      |
|     |    |        |                |              | Ryukyu Is.                 |
| L21 | 20 | eP     | V              | 00 33 37.0   | Depth charge?              |
|     |    | iP     | VN             | 39.5         |                            |
|     |    | iS     | VN             | 34 10.0      |                            |
| 96  | 20 | eP     | V              | 12 22 42.0   |                            |
| 97  | 20 | eP     | V              | 16 52 (03)   |                            |
|     |    | i      | VN             | 14.0         |                            |
| 98  | 21 | eP     | V              | 06 35 44.0   | 22.7S 177.5W h: 77 km      |
|     |    |        |                |              | Fiji Is. region            |



|     |    |  |  |  |  |
|-----|----|--|--|--|--|
| 99  | 21 | eP   | V  | 08 50 27.0   | 17.3S 174.7W h: 60 km<br>Tonga Is.         |
| 100 | 21 | eP   | VN   | 10 24 17.5   | 23.7N 123.5E h: 63 km<br>Ryukyu Is.        |
| 101 | 21 | iP<br>e                                      | VN<br>V  | 12 49 48.0<br>55 41.5  |  |
| 102 | 21 | eP   | V  | 18 20 09.0   | 18.8S 173.6W h: 60 km<br>Tonga Is.         |
| L22 | 21 | e  | V  | 20 22 15.5   | Regional                                   |
| 103 | 21 | iP   | VNV <sub>1</sub>   | 21 17 50.5 C   | 2.0N 127.0E h: 103 km<br>Molucca Passage   |
| 104 | 21 | i(P)   | V  | 21 24 54.5   |  |
| L23 | 21 | iP   | VNE  | 21 40 30.0 C   | 34.3S 150.4E h: 27 km<br>Robertson, N.S.W. |
| 105 | 21 | e  | V  | 22 19 40   | short period movement                      |
| L24 | 21 | iP<br>iS                                     | V<br>V   | 22 33 00.5<br>19.0   | Aftershock                                 |
| L25 | 21 | eP<br>iS                                     | V<br>N   | 22 57 41.0<br>58 00.0  | Aftershock                                 |
| L26 | 21 | e<br>eS                                      | V<br>V   | 23 00 19.5<br>37.5   | Aftershock                                 |
| L27 | 21 | e<br>eS                                      | V<br>V   | 23 02 14.5<br>34.0   | Aftershock                                 |
| L28 | 21 | eP<br>iS                                     | V<br>V   | 23 18 36.5<br>55.0   | Aftershock                                 |
| L29 | 22 | eP<br>eS                                     | V<br>VN  | 00 06 00.5<br>19.0   | Aftershock                                 |
| L30 | 22 | iS   | V  | 02 53 37.5   | Aftershock                                 |
| L31 | 22 | eP<br>eS                                     | V<br>V   | 03 08 17.0<br>36.0   | Aftershock                                 |
| L32 | 22 | eP<br>eS                                     | V<br>V   | 03 26 16.0<br>34.5   | Aftershock                                 |
| L33 | 22 | iP<br>iS                                     | V<br>V   | 04 23 59.0<br>17.5   | Aftershock                                 |
| L34 | 22 | eP<br>eS                                     | V<br>V   | 04 48 12.5<br>31.0   | Aftershock                                 |
| L35 | 22 | eP<br>eS                                     | V<br>V   | 06 17 02.0<br>20.0   | Aftershock                                 |
| L36 | 22 | (eP)<br>iS                                   | V<br>V   | 10 59 33.5<br>52.5   | Aftershock                                 |
| 106 | 22 | eP   | V  | 11 43 09   | 2.8S 121.9E h: 50 km<br>Celebes            |
| L37 | 22 | eP<br>iS                                     | E<br>VE  | 11 43 10.5<br>29.0   | Aftershock of L23                          |
| L38 | 22 | eP<br>eS                                     | V<br>V   | 12 01 56.6<br>02 15.5  | Aftershock                                 |
| L39 | 22 | e(P)<br>e(S)                                 | V<br>V   | 13 17 32.5<br>49.0   | Local                                      |
| 107 | 22 | eP<br>i<br>ePP<br>e(S)<br>e(SS)<br>e(L)<br>M | VE<br>V <sup>E</sup> <sub>1</sub><br>V <sup>1</sup> <sub>1</sub><br>N <sub>1</sub><br>N <sub>1</sub><br>N <sub>1</sub><br>N <sub>1</sub><br>N <sub>1</sub> | 13 51 22.0<br>23.0<br>52 44.0<br>57 00<br>59 19<br>39<br>14 03.9 | 21.3S 174.4W h: 97 km<br>Tonga Is.         |
| 108 | 22 | eP   | V  | 14 33 (09)   |  |
| L40 | 22 | eP<br>eS                                     | V<br>V   | 17 04 51.0<br>05 10.0  | Aftershock of L23                          |



|     |    |         |                               |       |         |                         |
|-----|----|---------|-------------------------------|-------|---------|-------------------------|
| 109 | 22 | eP      | VE <sub>1</sub>               | 17 38 | 53.5    | 22.8S 176.1W h: 35 km   |
|     |    | i       | VNEV <sub>1</sub>             |       | 55.0    | Tonga Is. region        |
|     |    | i(pP)   | V                             | 39    | 13.5    |                         |
|     |    | i(pF)   | E                             |       | 14.0    |                         |
|     |    | e       | E <sub>1</sub>                | 40    | 13.0    |                         |
|     |    | i       | V <sub>1</sub>                |       | 15.0    |                         |
|     |    | i       | E <sub>1</sub>                |       | 17.0    |                         |
|     |    | iPcP    | V                             | 41    | 28.5    |                         |
|     |    | eS      | N <sub>1</sub>                | 44    | 05      |                         |
|     |    | iS      | E <sub>1</sub>                |       | 06      |                         |
|     |    | isS     | E <sub>1</sub>                |       | 35.5    |                         |
|     |    | iFcS    | V                             | 45    | 23.5    |                         |
|     |    | iPcS    | V <sub>1</sub>                |       | 25.0    |                         |
|     |    | eL      | N <sub>1</sub>                | 46.2  |         |                         |
|     |    | eL      | V <sub>1</sub> E <sub>1</sub> | 46.9  |         |                         |
|     |    | e(ScS)  | N <sub>1</sub>                | 49    | 20.5    |                         |
| L41 | 22 | eP      | VE                            | 19 54 | 54.0    | Aftershock of L23       |
|     |    | eS      | V                             |       | 55 12.5 |                         |
| 110 | 22 | eP      | V                             | 23 52 | 49.0    | 22.6S 177.0W h: 526 km  |
|     |    | i       | V                             |       | 53 05.5 | Tonga Is. region        |
| 111 | 23 | ePKP    | V                             | 03 04 | 23.0    | 36.4N 28.3E h: 49 km    |
|     |    | i(pPKP) | V                             |       | 31.0    | Dodecanese Is.          |
|     |    | i       | VN                            |       | 32.5    |                         |
|     |    | ePP     | V                             | 06    | 53      |                         |
|     |    | iPKS    | VV <sub>1</sub>               | 07    | 55.0    |                         |
|     |    | i       | E <sub>1</sub>                | 08    | 12.0    |                         |
|     |    | ePPP    | E <sub>1</sub>                | 09    | 49      |                         |
|     |    | e(SKS)  | E <sub>1</sub>                | 11    | 11      |                         |
|     |    | eL      | E <sub>1</sub>                |       | 51.1    |                         |
|     |    | eL      | V <sub>1</sub>                |       | 54.5    |                         |
| 112 | 23 | ePKP    | V                             | 03 59 | 19.0 C  | 9.8N 84.0W h: 136 km    |
|     |    |         |                               |       |         | Costa Rica              |
| 113 | 23 | e       | V                             | 05 29 | 48      |                         |
| 114 | 23 | e       | V                             | 06 00 | 10      |                         |
| L42 | 23 | eP      | V                             | 09 53 | 10.5    | Aftershock of L23       |
|     |    | eS      | V                             |       | 29.5    |                         |
| L43 | 23 | e       | V                             | 12 39 | 42      | Regional                |
| 115 | 23 | eP      | V                             | 16 24 | 16.0    |                         |
| 116 | 23 | iPKP    | V                             | 17 03 | 49.0    | 12.6N 87.3W h: 138 km   |
|     |    |         |                               |       |         | Near coast of Nicaragua |
| L44 | 23 | (eP)    | V                             | 17 16 | 23.5    | Aftershock of L23       |
|     |    | eS      | N                             |       | 42.0    |                         |
| L45 | 23 | eP      | V                             | 19 24 | 49.5    | Aftershock              |
|     |    | iS      | NE                            | 25    | 08.0    |                         |
| L46 | 24 | eP      | V                             | 02 54 | 38.5    | Aftershock              |
|     |    | iS      | V                             |       | 57.0    |                         |
| L47 | 24 | eP      | V                             | 16 27 | 10.0    | Aftershock              |
|     |    | eS      | V                             |       | 28.5    |                         |
| 117 | 24 | eP      | V                             | 17 25 | 24.0    | 8.2S 121.8E h: 36 km    |
|     |    | ePP     | V                             |       | 26 51   | Flores Sea              |
|     |    | eL      | N <sub>1</sub>                |       | 38.2    |                         |
| 118 | 24 | i       | V                             | 17 44 | 49.0    |                         |
| 119 | 25 | eP      | V                             | 09 29 | 29.0    | 31.3N 139.9E h: 171 km  |
|     |    |         |                               |       |         | South of Honahu         |
| 120 | 25 | eP      | V                             | 13 48 | 28.5    |                         |
| 121 | 25 | eP      | V                             | 17 40 | 20.5    | 22.7S 176.1W h: 25 km   |
|     |    |         |                               |       |         | Tonga Is.               |
| 122 | 25 | eP      | V                             | 19 42 | 09.0    | 4.2S 103.3E h: 93 km    |
|     |    |         |                               |       |         | Sumatra                 |
| 123 | 25 | iP      | V                             | 21 14 | 00.5 C  | 14.8S 177.4W h: 417 km  |
|     |    |         |                               |       |         | Fiji Is. region         |



|     |    |                  |               |                                 |   |
|-----|----|------------------|---------------|---------------------------------|---|
| 124 | 25 | e                | VN            | 22 54 03                        |   |
| L48 | 26 | e                | N             | 02 14 03.5                      | Regional  |
| 125 | 26 | eP<br>i<br>ipP   | V<br>V<br>V   | 06 12 03.5<br>13.5<br>31.5      | 18.6S 169.1E h: 132 km<br>New Hebrides Is. region       |
| 126 | 26 | iP               | V             | 12 42 07.5 C                    |   |
| L49 | 26 | i                | VE            | 23 39 20.5                      | Local   |
| 127 | 27 | eP               | V             | 07 29 51                        | 41.0N 142.1E h: 156 km<br>Near north coast of Honshu    |
| L50 | 27 | e(P)<br>e(S)     | V<br>VN       | 08 35 02.5<br>21.0              | Aftershock of L23                                       |
| L51 | 27 | iP<br>iS         | VN<br>VNE     | 09 18 38.0<br>44.5              | Local   |
| L52 | 27 | iP<br>iS         | VN<br>VN      | 09 28 36.0<br>42.0              | Local   |
| 128 | 27 | iP<br>ipP        | V<br>V        | 17 02 19.5 C<br>30.5            | 0.8N 98.5E h: 39 km<br>Near coast of northern Sumatra   |
| 129 | 27 | eP<br>i          | V<br>V        | 17 36 32.0 C<br>46.5            | 1.2N 98.4E h: 36 km<br>Near north west coast of Sumatra |
| 130 | 27 | i(P)             | V             | 18 24 44.5                      |   |
| L53 | 27 | (e)<br>e(S)      | V<br>VN       | 19 03 06.5<br>22.5              | Local   |
| 131 | 27 | iP               | V             | 22 48 20.5                      | 15.8N 119.2E h: 92 km<br>Near coast of Luzon, P.I.      |
| 132 | 28 | iP<br>e(pP)<br>i | VN<br>V<br>V  | 02 36 31.5 C<br>48.5<br>37 13.5 | 4.9S 145.0E h: 59 km<br>Near north coast of New Guinea  |
| 133 | 28 | iP<br>i<br>i     | VNE<br>V<br>V | 04 09 00.0 R<br>10.5<br>15.5    | 5.4S 102.4E h: 74 km<br>Off coast of southern Sumatra   |
| 134 | 28 | eP               | VN            | 07 35 53.5                      |   |
| 135 | 28 | iP               | V             | 10 53 32.0 C                    | 5.1S 144.8E h: 25 km<br>Near north coast of New Guinea  |
| L54 | 28 | e(S)             | V             | 11 36 26.5                      | Regional  |
| L55 | 28 | e                | V             | 11 58 33                        | Regional  |
| 136 | 28 | eP               | V             | 12 47 30                        | 27.7S 176.8W h: 90 km<br>South of Fiji Is.              |
| 137 | 28 | eP               | V             | 13 36 50                        | 8.2S 119.2E h: 25 km<br>Flores Is. region               |
| 138 | 28 | e                | V             | 19 34 13                        | 26.0S 179.7E h: 219 km<br>South of Fiji Is.             |
| 139 | 29 | eP               | V             | 10 40 03.5                      | 27.7N 141.7E h: 25 km<br>Bonin Is.                      |
| L56 | 29 | iP<br>i(S)<br>eS | V<br>V<br>NE  | 15 44 02.5<br>20.5<br>21.0      | Aftershock of L23                                       |
| L40 | 29 | eP               | V             | 17 56 18                        | 2.5N 128.4E h: 25 km<br>Halmahera region                |
| 141 | 31 | e(P)             | V             | 02 51 49                        |   |
| 142 | 31 | eP<br>i          | VN<br>VN      | 05 17 21.5<br>49.0              |   |
| L57 | 31 | eP<br>eS         | V<br>N        | 11 36 00.0<br>18.5              | Aftershock of L23                                       |

|     |    |     |                |            |                                       |
|-----|----|-----|----------------|------------|---------------------------------------|
| 143 | 31 | iP  | VE             | 13 28 14.0 |                                       |
| 144 | 31 | iP  | VN             | 14 51 49.5 | 48.9N 154.5E h: 50 km<br>Kurile Is.   |
| 145 | 31 | eP  | V              | 19 22 04.5 | 5.3S 151.6E h: 56 km                  |
|     |    | e   | V <sub>1</sub> | 15.0       | New Britain                           |
|     |    | e   | V <sub>1</sub> | 20.0       |                                       |
|     |    | eS  | N <sub>1</sub> | 26 59      |                                       |
|     |    | eSS | E <sub>1</sub> | 28 46      |                                       |
|     |    | i   | E <sub>1</sub> | 29 35.5    |                                       |
| 146 | 31 | eP  | V              | 21 10 42.5 | 12.8N 143.5E h: 138 km<br>Mariana Is. |

Seismograms read by  
Jennifer Clay

J. C. JAEGER,  
Professor of Geophysics.

Omitted from page 2

|    |   |    |    |            |       |
|----|---|----|----|------------|-------|
| L7 | 6 | e  | V  | 20 52 45.0 | Local |
|    |   | iS | VN | 51.0       |       |



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Department of Geophysics.  
 Australian National University,  
 CANBERRA, A.C.T., AUSTRALIA.

MONTHLY SEISMOLOGICAL BULLETIN.

SEPTEMBER, 1961.

Latitude: 35° 19' 15"S. Longitude: 148° 59' 55"E. Height: 700 M.

Instruments: three-component Benioff variable reluctance seismographs.

$T_s = 1$  sec.

$T_g = 0.25$  sec. (short periods VNE)

$T_g = 16$  sec. (long period vertical  $V_1$ )

$T_g = 70$  sec. (long period horizontals  $N_1E_1$ )

One N-S component Wood-Anderson Seismograph,  $T_s = 0.8$  sec.

Mount Stromlo quartz clocks provide accurate time marks and 50c/s for drum drive.

Abbreviations: R = rarefaction; C = compression; h = origin.

Epicentre locations are those given by USCGS.

| No. | Date | Phase | Component                      | Time       |   | Remarks.                                      |
|-----|------|-------|--------------------------------|------------|---|---|
|     |      | iP    | VV <sub>1</sub> N <sub>1</sub> | 00 22 03.5 | C | 59.3S 27.3W h:131km.                          |
|     |      | iPcP  | V                              | 09.5       |   | Sandwich Is. region.                          |
|     |      | ipP   | V <sub>1</sub>                 | 36.0       |   |   |
|     |      | ipP   | VNE                            | 38.0       |   |   |
|     |      | i(sP) | V <sub>1</sub>                 | 56.0       |   |   |
|     |      | iPP   | V <sub>1</sub>                 | 25 26.0    |   |   |
|     |      | i     | V <sub>1</sub>                 | 30.5       |   |   |
|     |      | ipPP  | NV <sub>1</sub>                | 58.5       |   |   |
|     |      | iPPP  | V <sub>1</sub>                 | 27 30.0    |   |   |
|     |      | eSKS  | N <sub>1</sub> E <sub>1</sub>  | 32 16.0    |   |   |
|     |      | iS    | E                              | 23.5       |   |   |
|     |      | e     | N <sub>1</sub> E <sub>1</sub>  | 38 05      |   |   |
|     |      | eLq   | E <sub>1</sub>                 | 44.5       |   |   |
|     |      | eLr   | N <sub>1</sub>                 | 50.6       |   |   |
| 2   | 1    | e(P)  | V                              | 00 40 03.5 |   |   |
|     |      | i     | V                              | 08.5       |   |   |
|     |      | e     | V                              | 47 51      |   |   |
| 3   | 1    | e     | V                              | 01 07 14.5 |   |   |
| 4   | 1    | iP    | V                              | 14 51 21.0 |   |   |
| 5   | 1    | iP    | V                              | 16 31 05.5 |   | 17.1S 179.1W h:568km.<br>Fiji Is. region.     |
| 6   | 1    | iP    | V                              | 16 43 15.5 | C | 16.4S 176.6W h:437km.<br>Fiji Is. region.     |
| 7   | 1    | iP    | VE                             | 18 47 29.0 |   | 18.0S 178.3W h:619km.<br>Fiji Is. region.     |
| 8   | 2    | eP    | VN                             | 03 51 27.0 |   | 56.6S 147.1E h:41km.<br>West of Macquarie Is. |
|     |      | i     | VN                             | 32.5       |   |   |
|     |      | eS    | N <sub>1</sub> E <sub>1</sub>  | 55 35      |   |   |
| 9   | 2    | eP    | V                              | 06 25 08   |   | 28.6S 176.5W h:23km.<br>Kermadec Is. region.  |
| 10  | 2    | eP    | V                              | 18 01 22.5 |   | 6.0S 105.9E h:127km.<br>Soenda Strait         |
| L1  | 3    | e     | V                              | 07 23 11.5 |   | Regional                                      |
| 11  | 3    | eP    | V                              | 14 11 14   |   |   |



| No. | Date | Phase | Component                      | Time       |   | Remarks.  |
|-----|------|-------|--------------------------------|------------|---|---|
| L2  | 3    | eP    | E                              | 16 46 24.5 |   | Local   |
|     |      | eS    | N                              | 42.5       |   |   |
| 12  | 4    | iP    | V                              | 10 02 16.0 | C | 51.4N 178.1W h:35km.<br>Andreanof Is. Aleutian<br>Is. |
| 13  | 4    | iP    | V                              | 16 16 57.0 | C | 1.3N 127.7E h:156km.<br>Halmahera                     |
|     |      | i     | VN                             | 57.5       |   |   |
|     |      | e(PP) | V                              | 18 39.0    |   |   |
| 14  | 4    | iP    | VNE                            | 18 48 22.0 | C | 18.4S 175.7W h:450km.<br>Fiji Is. region.             |
| 15  | 4    | iP    | VE                             | 22 40 08.0 |   | 20.2S 175.8W h:181km.<br>Tonga Is. region.            |
| 16  | 5    | e     | V                              | 00 54 03.0 |   | 16.2S 172.6W h:49km.<br>Samoa Is. region.             |
| L3  | 5    | e     | V                              | 02 36 12.5 |   | Regional  |
|     |      | e     | N                              | 48.5       |   |   |
| 17  | 5    | eP    | V                              | 11 53 30.0 |   | 59.8N 150.6W h:44km.<br>Kenai Peninsular              |
| L4  | 6    | eP    | V                              | 00 52 19.0 |   | Local   |
|     |      | iS    | VE                             | 28.0       |   |   |
| 18  | 6    | e     | V                              | 01 18 (33) |   |   |
| 19  | 6    | iP    | VN                             | 07 03 38.5 |   | 6.0S 149.5E h:61km.<br>New Britain.                   |
| L5  | 6    | e     | V                              | 07 15 42.5 |   | Regional  |
|     |      | eS    | V                              | 16 30.5    |   |   |
| 20  | 6    | iP    | V                              | 08 22 22.0 | C | 2.8N 125.8E h:58km.<br>Molucca Passage                |
|     |      | isP   | VN                             | 43.5       |   |   |
|     |      | iPP   | V                              | 24 08.0    |   |   |
| 21  | 6    | i(P)  | VN                             | 10 13 41.0 | C | 6.1S 130.4E h:208km.<br>Banda Sea.                    |
| 22  | 6    | iP    | V                              | 21 09 10.0 |   |   |
| 23  | 7    | iP    | V                              | 06 55 47.5 |   |   |
| 24  | 8    | eP    | V                              | 06 38 48.0 |   |   |
| 25  | 8    | eP    | VN                             | 08 57 06.0 | C |   |
|     |      | i     | V                              | 33.0       |   |   |
| 26  | 8    | iP    | VN                             | 11 39 14.0 | C | 56.1S 27.3W h:125km.<br>Sandwich Is. region           |
|     |      | iPcP  | EE <sub>1</sub>                | 16.5       |   |   |
|     |      | i     | N                              | 17.0       |   |   |
|     |      | i     | E                              | 23.5       |   |   |
|     |      | i     | E <sub>1</sub>                 | 25.5       |   |   |
|     |      | i     | V <sub>1</sub>                 | 39.0       |   |   |
|     |      | iPP   | VV <sub>1</sub> N <sub>1</sub> | 42 45.5    |   |   |
|     |      | isPP  | V <sub>1</sub>                 | 43 19      |   |   |
|     |      | eSKS  | NN <sub>1</sub>                | 49 33      |   |   |
|     |      | eS    | VE <sub>1</sub>                | 53.0       |   |   |
|     |      | iS    | E <sub>1</sub>                 | 53.5       |   |   |
|     |      | i     | E <sub>1</sub>                 | 50 32      |   |   |
|     |      | i(sS) | E <sub>1</sub>                 | 54         |   |   |
|     |      | eLr   | N <sub>1</sub>                 | 12 08.3    |   |   |
| 27  | 8    | iP    | V                              | 11 56 54.0 |   |   |
| 28  | 8    | eP    | V                              | 14 10 48   |   |   |



| No. | Date | Phase                  | Component   | Time                                     | Remarks.  |
|-----|------|------------------------|---|--|---|
| 29  | 8    | iP<br>ipP              | V<br>VN   | 17 38 18.0<br>50.5                       | 0.4S 123.3E h:169km.<br>Celebes                                   |
| L6  | 9    | iP<br>iS               | VN<br>V   | 05 18 58.5<br>19 02.3                    | Local   |
| L7  | 9    | iP<br>i<br>iS          | VNE<br>VNE<br>VNE                                       | 10 04 31.0<br>32.0<br>38.0               | Local   |
| 30  | 9    | eP                     | V   | 15 29 49.5                               | C 10.6S 164.4E h:79km.<br>Santa Cruz Is.                          |
| 31  | 10   | eP                     | V   | 02 56 52.0                               | 31.3S 178.1W h:50km.<br>Kermadec Is. region.                      |
| 32  | 10   | iP<br>i                | V<br>V  | 05 13 51.5<br>59.5                       | .   |
| 33  | 10   | e(P)                   | V   | 11 48 27                                 | 8.2S 121.7E h:21km.<br>Flores                                     |
| 34  | 10   | e                      | V   | 14 52 18                                 | 19.3S 175.8W h:219km.<br>Tonga Is. region.                        |
| 35  | 10   | i(pP)                  | V   | 18 15 37.5                               | 27.6S 177.8W. h:152km.<br>Kermadec Is. region.                    |
| 36  | 10   | iP<br>i                | V<br>V  | 18 22 03.5<br>16.0                       | 17.8S 178.5W h:619km.<br>Fiji Is. region.                         |
| 37  | 11   | eP                     | V   | 02 59 47.6                               | 51.3N 179.7W h:15km.<br>Andreanof Is. Aleutian<br>Is.             |
| 38  | 11   | iP<br>i(pP)            | VN<br>V   | 11 45 03.0<br>25.0                       | R 1.1N 120.3E h:81km.<br>Northern Celebes                         |
| 39  | 11   | iP<br>eL               | VN<br>N <sub>1</sub>                                    | 20 04 41.0<br>15.6                       | C 4.1S 134.3E h:19km.<br>Aroe Is.                                 |
| 40  | 11   | e(PKP)<br>i            | V<br>V  | 22 34 22.5<br>25.0                       | Possibly 10.8N 62.4W<br>h:134km. Off north coast<br>of Venezuela. |
| 41  | 12   | iP                     | V   | 00 23 13.5                               | 18.1S 177.9W h:548km.<br>Fiji Is.                                 |
| 42  | 12   | eP                     | V   | 01 19 36.5                               | 18.3S 169.1E h:208km.<br>New Hebrides Is.                         |
| L8  | 12   | eP<br>eS               | V<br>E  | 07 12 02.5<br>13 18.0                    | Regional  |
| L9  | 12   | iP<br>iS               | V<br>NE   | 07 15 05.5<br>16 21.5                    | Regional  |
| 43  | 12   | eP                     | V   | 08 08 54                                 | 15.1S 173.6W h:87km.<br>Tonga Is. region.                         |
| 44  | 12   | i(P)                   | V   | 08 33 16.0                               |   |
| 45  | 12   | eP                     | V   | 12 04 34                                 | 23.0S 176.2W h:39km.<br>Tonga Is. region.                         |
| 46  | 12   | iP<br>eSKS<br>iS<br>eL | V<br>E <sub>1</sub><br>E <sub>1</sub><br>E <sub>1</sub> | 19 41 44.0<br>52 14.5<br>18.0<br>20 04.3 | 59.4S 29.2W h:25km.<br>Sandwich Is.                               |
| 47  | 13   | eP<br>i                | V<br>VN   | 03 11 37.5<br>52.0                       | 5.6S 144.8E h:100km.<br>New Guinea                                |



| No. | Date | Phase | Component      | Time       | Remarks.  |
|-----|------|-------|----------------|------------|---|
| L10 | 13   | e     | V              | 06 25 (13) | Regional  |
|     |      | e(S)  | VN             | 26 00.0    |   |
| 48  | 13   | eP    | V              | 14 12 25.0 | 9.3S 112.9E h:93km.<br>10.0S 113.1E h:104km.<br>South of Java |
| 49  | 13   | i     | V              | 15 33 01.0 |   |
| 50  | 13   | eP    | V              | 21 32 31.5 | 41.6S 73.2W h:154km.<br>Southern Chile                        |
| 51  | 13   | iP    | V              | 22 12 16.0 | C   |
| 52  | 14   | e(P)  | NE             | 06 03 05.5 |   |
|     |      | i     | V              | 06.0       |   |
| 53  | 14   | iP    | V              | 18 50 09.5 | 23.6S 179.9W h:521km.<br>South of Fiji Is.                    |
| 54  | 14   | iP    | V              | 22 45 37.0 | R 19.8S 173.6W h:25km.<br>Tonga Is.                           |
| 55  | 15   | iPKP  | V              | 02 05 15.0 | C 35.1N 33.9E h:25km.<br>Cyprus                               |
| L11 | 15   | iP    | VN             | 05 10 21.5 | C Regional  |
|     |      | iP    | VE             | 22.0       |   |
|     |      | iP    | VE             | 26.0       |   |
|     |      | i     | E              | 27.0       |   |
|     |      | iS    | N              | 51.5       |   |
|     |      | eS    | E              | 53.0       |   |
| 56  | 15   | eP    | V              | 10 12 16.0 | 10.1S 160.7E h:66km.<br>Solomon Is.                           |
| 57  | 15   | iP    | V              | 17 10 34.0 |   |
| 58  | 15   | e(P)  | V              | 21 31 15.5 | C 10.7S 112.7E h:100km.<br>South Of Java.                     |
|     |      | e     | V              | 45.0       |   |
| L12 | 15   | eP    | V              | 22 40 59.0 | Local   |
|     |      | iS    | VE             | 41 12.5    |   |
|     |      | i     | V              | 16.0       |   |
| 59  | 16   | iP    | V              | 12 19 46.5 | C 28.3N 138.6E h:388km.<br>South of Honshu                    |
| 60  | 17   | eP    | V              | 01 18 43.0 | 4.1S 129.7E h:46km.<br>Banda Sea                              |
|     |      | iPcP  | V              | 21 10.5    |   |
| 61  | 17   | iP    | V              | 06 13 41.0 | C 19.3S 169.5E h:263km.<br>New Hebrides Is.                   |
| 62  | 17   | eP    | V              | 08 52 29.5 | 23.9N 122.2E h:35km.<br>Off coast of Formosa.                 |
| 63  | 17   | iP    | V              | 17 20 25.0 | C 3.6S 143.4E h:44km.<br>Near north coast of<br>New Guinea.   |
| L13 | 17   | eP    | V              | 22 39 55.5 | Local   |
|     |      | iP    | VNE            | 56.5       |   |
|     |      | i     | V              | 40 14.0    |   |
|     |      | iS    | VNE            | 15.0       |   |
| 64  | 17   | iP    | V              | 23 23 05.5 | C 5.9S 147.4E h:45km.<br>Near east coast of<br>New Guinea     |
|     |      | ipP   | V <sub>1</sub> | 18.0       |   |
|     |      | eL    | N <sub>1</sub> | 36.6       |   |
|     |      | eLr   | V <sub>1</sub> | 37.7       |   |
| 65  | 18   | eP    | VNE            | 00 13 38.0 |   |
|     |      | eT    | V              | 29.2       |   |
|     |      | T max | V              | 30 13      |   |



| No. | Date | Phase | Component        | Time       | Remarks.                |
|-----|------|-------|------------------|------------|-------------------------|
| 66  | 18   | iP    | V                | 09 27 39.0 |                         |
| L14 | 18   | e     | V                | 09 43 (38) | Regional?               |
| L15 | 18   | e(P)  | V                | 15 40 06.0 | Regional                |
|     |      | e(S)  | V                | 54.0       |                         |
| 67  | 18   | eP    | V                | 15 43 05.5 | 21.0S 173.6E h:28km.    |
|     |      | eS    | N <sub>1</sub>   | 47 35      | Loyalty Is. region.     |
|     |      | i     | E <sub>1</sub>   | 48 15.0    |                         |
|     |      | eSS   | N <sub>1</sub>   | 45         |                         |
|     |      | eL    | E <sub>1</sub>   | 49.7       |                         |
|     |      | M     | N <sub>1</sub>   | 52.7       |                         |
| 68  | 18   | i(P)  | V                | 15 49 41.5 |                         |
| L16 | 19   | i(P)  | V                | 00 58 08.5 | Regional                |
| 69  | 19   | ePKP  | V                | 02 43 30.0 | 20.3S 63.2W h:609km.    |
|     |      | ePP   | V <sub>1</sub>   | 44 49.0    | Southern Bolivia        |
|     |      | eSP   | V <sub>1</sub>   | 53 37      |                         |
| 70  | 19   | i     | V                | 02 54 01.0 |                         |
|     |      | i     | V                | 04.0       |                         |
| 71  | 19   | eP    | V                | 06 18 47   | 14.8N 146.8E h:61km.    |
|     |      |       |                  |            | Mariana Is.             |
| 72  | 19   | e     | V                | 06 35 54.5 |                         |
| 73  | 19   | iP    | VN               | 09 26 53.5 | R 2.4N 126.3E h:84km.   |
|     |      | i(pP) | V                | 27 07.0    | Molucca Passage         |
|     |      | i     | V                | 37.5       |                         |
|     |      | eS    | N                | 33 14.5    |                         |
| 74  | 19   | e     | V                | 09 42 06   |                         |
| 75  | 19   | iP    | VNE              | 13 52 22.5 | R 1.2N 125.5E h:54km.   |
|     |      | eS    | N                | 58 39      | Molucca Passage         |
| 76  | 19   | iP    | VE               | 18 31 00.5 | R 21.6S 179.4W h:639km. |
|     |      | ΔScP  | V                | 36 27.0    | Fiji Is. region.        |
| L17 | 19   | eP    | V                | 19 33 48   | Local                   |
| 77  | 19   | iP    | VN               | 21 47 15.0 | R 60.1S 22.9W h:56km.   |
|     |      | iPcP  | V                | 17.0       | Sandwich Is. region     |
| 78  | 19   | eP    | V                | 22 36 34.5 | 18.8S 173.4W h:25km.    |
|     |      |       |                  |            | Tonga Is.               |
| 79  | 20   | e(P)  | V                | 04 02 43.0 |                         |
| L18 | 20   | i(P)  | VN               | 05 50 44.5 | Local                   |
| 80  | 20   | i(P)  | V                | 07 34 39.5 | C                       |
| L19 | 20   | eP    | V                | 11 03 06.5 | Regional                |
|     |      | i(S)  | VE               | 04 21.0    |                         |
| 81  | 20   | iP    | VV <sub>1</sub>  | 19 09 58.0 | C 3.6S 150.9E h:30km.   |
|     |      | i     | VNN <sub>1</sub> | 10 01.0    | New Britain             |
|     |      | i     | N                | 05.0       |                         |
|     |      | iPP   | VNN <sub>1</sub> | 11 07.0    | Mag. 6½(Canb.)          |
|     |      | iPcP  | V                | 12 56.0    |                         |
|     |      | eS    | N <sub>1</sub>   | 19 15 08   |                         |
|     |      | i     | E <sub>1</sub>   | 10.0       |                         |
|     |      | eSS   | N <sub>1</sub>   | 17 00.0    |                         |
|     |      | iSSS  | E <sub>1</sub>   | 23.5       |                         |
|     |      | eL    | V <sub>1</sub>   | 19.2       |                         |
| 82  | 22   | e(P)  | V                | 07 35 43.0 |                         |
| 83  | 22   | iP    | VN               | 15 21 31.5 | 3.9S 131.4E h:79km.     |
|     |      |       |                  |            | Off east coast of Ceram |



| No. | Date | Phase   | Component  | Time   |   | Remarks.  |
|-----|------|---|--|--|---|---|
| 84  | 22   | eP  | V  | 18 45 05.0   |   |   |
| 85  | 22   | eP<br>i   | V<br>VN  | 20 15 11.5<br>14.5   | C | 55.2S 146.0E h:78km.<br>West of Macquarie Is.                           |
| 86  | 23   | eP<br>i   | V<br>V   | 03 10 29.5<br>34.5   |   |   |
| 87  | 23   | iP  | V  | 08 22 23.5   | B | 28.5S 177.2W h:20km.<br>Kermadec Is.                                    |
| 88  | 23   | e(P)  | V  | 19 24 31.5   |   |   |
| L20 | 24   | eP<br>eS  | V<br>V   | 01 46 20.5<br>50.5   |   | Regional  |
| 89  | 24   | eP  | V  | 17 05 34.0   |   | 56.5S 26.2W h:25km.<br>Sandwich Is.                                     |
| 90  | 24   | eP  | V  | 21 52 00.0   |   |   |
| 91  | 25   | e   | V  | 01 57 08.0   |   |   |
| 92  | 25   | i(P)  | V  | 07 25 35.0   |   |   |
| 93  | 25   | e(P)  | V  | 10 56 21.0   |   |   |
| 94  | 25   | iP  | V  | 14 54 49.5   | C | 4.4N 122.7E h:598km.<br>Celebes Sea                                     |
| 95  | 25   | eP  | V  | 15 59 28.0   |   | 18.2S 177.9W h:667km.<br>Fiji Is.                                       |
| L21 | 26   | e   | V  | 01 59 56.5   |   | Regional  |
| 96  | 27   | eP  | V  | 00 53 30.0   |   | 15.4S 175.1W h:295km.<br>Fiji Is. region.                               |
| 97  | 27   | iP<br>iPP<br>iS<br>iS<br>iScP<br>iPcS <sub>s</sub><br>isS<br>iScS | VNEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub><br>E <sub>1</sub><br>N <sub>1</sub><br>VNE <sub>1</sub><br>VV <sub>1</sub><br>V<br>E<br>E <sub>1</sub> | 06 40 03.0<br>41 39.0<br>44 47.5<br>48.5<br>45 23.0<br>46 12.0<br>47 32.0<br>49 26.0 | B | 17.4S 178.7W h:576km.<br>Fiji Is.<br>E: 06 34 07 h: 0.08<br>(Riverview) |
| 98  | 27   | iP<br>i<br>iPcP   | VN<br>V<br>V   | 10 54 57.5<br>55 29.0<br>56 48.5   | B | 0.8S 123.8E h:226km.<br>Celebes region                                  |
| L22 | 27   | eP<br>iP<br>iS  | V<br>VNE<br>VE   | 11 32 54.0<br>55.0<br>33 01.0  |   | Local   |
| L23 | 27   | eP<br>eS  | V<br>V   | 11 54 39.5<br>45.5   |   | Local   |
| 99  | 27   | iP<br>eS<br>eSS<br>eL<br>eL                                       | VN<br>N <sub>1</sub> E <sub>1</sub><br>E <sub>1</sub><br>E <sub>1</sub><br>N <sub>1</sub>  | 12 20 09.5<br>30 31<br>36 18.0<br>50.5<br>54.7                                       | C | 59.4S 24.2W h:110km.<br>Sandwich Is.                                    |
| L24 | 27   | iP<br>iP<br>iS  | V<br>VE<br>V   | 12 25 44.5<br>45.5<br>51.5   |   | Local   |
| L25 | 27   | eP<br>iP<br>iS  | VN<br>VN<br>VNE  | 13 42 40.0<br>41.0<br>47.0   |   | Local   |
| L26 | 27   | eP<br>eS  | V<br>V   | 19 00 21.5<br>33.0   |   | Local   |



| No. | Date | Phase  | Component   | Time   |   | Remarks.   |
|-----|------|--|---|--|---|--|
| 100 | 27   | eP   | V   | 21 17 37.0   | R | 26.7N 125.0E h:17km.<br>Ryukyu Is.                     |
| 101 | 27   | i(P)   | V   | 22 29 33.5   |   |  |
| 102 | 28   | iP<br>eS   | VNEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub><br>E <sub>1</sub>   | 01 33 14.0<br>40 30  | C | 3.9S 102.0E h:78km.<br>Sumatra                         |
| 103 | 28   | eP<br>i<br>iPcP  | V<br>VV <sub>1</sub><br>V   | 03 35 24.5<br>27.0<br>51.0   |   | 30.5N 141.3E h:125km.<br>South of Honshu               |
| 104 | 28   | e  | V   | 04 29 45   |   | 30.0N 141.1E h:75km.<br>South of Honshu                |
| L27 | 28   | iP<br>eS   | VNE<br>VNE  | 06 16 52.5<br>17 06.0  | R | Local  |
| L28 | 28   | iP<br>iP<br>eS   | VE<br>VNE<br>VN   | 06 38 06.0<br>07.0<br>25.0   | C | Local  |
| 105 | 28   | eP   | V   | 17 43 06.5   |   | 5.5S 152.2E h:113km.<br>New Britain.                   |
| 106 | 28   | e(P)   | V   | 21 52 32.5   |   |  |
| 107 | 29   | i  | VE  | 05 34 19.0   |   |  |
| 108 | 29   | iP   | VE  | 05 40 44.5   |   | 30.2S 177.7W h:58km.<br>Kermadec Is.                   |
| 109 | 29   | iP   | VN  | 08 56 38.5   | C | 13.8N 94.0E h:133km.<br>Andaman Is.                    |
| 110 | 29   | iP   | V   | 11 29 27.0   |   | 23.6S 179.6W h:589km.<br>Fiji Is. region.              |
| 111 | 29   | eP   | V   | 12 34 17.5   |   |  |
| 112 | 29   | eP   | V   | 17 02 32.0   |   | 42.9N 145.4E h:37km.<br>Near east coast of<br>Hokkaido |
| 113 | 29   | iP<br>i<br>ipP<br>isP<br>iPP<br>i<br>iS<br>eSS<br>eScS | V<br>VN<br>NE<br>VN<br>VV <sub>1</sub><br>E <sub>1</sub><br>NN <sub>1</sub> E <sub>1</sub><br>E <sub>1</sub><br>V | 19 14 08.0<br>10.5<br>30.5<br>50.0<br>15 52.0<br>16 20.0<br>20 33.0<br>23 39<br>49.0 | C | 0.5N 122.4E h:110km.<br>Northern Celebes               |
| 114 | 29   | eP<br>ipP  | V<br>V  | 22 48 58<br>49 21.5  |   | 28.2N 87.9E h:76km.<br>Southern Tibet.                 |
| 115 | 30   | iP   | V   | 01 09 13.5   | R |  |
| 116 | 30   | eP   | V   | 03 26 01   |   |  |
| L29 | 30   | e  | V   | 08 34 25.5   |   | Regional   |

Seismograms read by  
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Department of Geophysics  
 Australian National University  
 CANBERRA, A.C.T. AUSTRALIA

MONTHLY SEISMOLOGICAL BULLETIN

OCTOBER, 1961

Latitude: 35° 19' 15"S. Longitude: 148° 59' 55"E Height: 700 M.

Instruments: Three-component Benioff variable reluctance seismographs.

- $T_g = 1$  sec.
- $T_g = 0.25$  sec. (short periods VNE)
- $T_g = 16$  sec. (long period vertical  $V_1$ )
- $T_g = 70$  sec. (long period horizontals  $N_1E_1$ )
- One N-S component Wood-Anderson Seismograph,  $T_g = 0.8$  sec.

Mount Stromlo quartz clocks provide accurate time marks and 50 c/s for drum drive.

Abbreviations: R = rarefaction. C = compression.

Epicentre locations are those given by USCGS.

| No. | Date | Phase | Component | Time       |   | Remarks                   |
|-----|------|-------|-----------|------------|---|---------------------------|
| 1   | 1    | e(P)  | V         | 02 40 45.5 |   |                           |
| 2   | 2    | eP    | VE        | 05 59 04   |   | 33.9S 179.6E h:30 km      |
|     |      | i     | $V_1$     | 05.5       |   | Off coast of North Is.    |
|     |      | eL    | $N_1$     | 06.04 17   |   | New Zealand               |
| 3   | 2    | eP    | V         | 06 13 05.5 |   | 33.8S 179.6E h:50 km.     |
|     |      |       |           |            |   | Off coast of North Is.,   |
|     |      |       |           |            |   | New Zealand.              |
| 4   | 2    | iP    | VN        | 06 30 02.5 | C | 7.6S 107.0E h:85 km.      |
|     |      | i     | E         | 03.0       |   | Near coast of Java.       |
| 5   | 2    | iP    | $VV_1$    | 07.08 05.0 | C | 33.8S 179.5E h:57 km.     |
|     |      | i     | V         | 08.0       |   | Off coast of North Is.    |
|     |      | eS    | $N_1$     | 12 38      |   | New Zealand.              |
|     |      | i     | $E_1$     | 45         |   |                           |
| 6   | 2    | ePKP  | V         | 07 41 08   |   | 37.2N 22.2E h: 72 km.     |
|     |      |       |           |            |   | Near coast of Greece.     |
| 7   | 2    | iP    | V         | 09 43 50.5 | C |                           |
| 8   | 2    | eP    | VN        | 11 59 25.5 |   | 1.5S 138.3E h: 41 km.     |
|     |      |       |           |            |   | Near coast of New Guinea. |
| L1  | 2    | eP    | VN        | 19 34 48.0 |   | Local                     |
|     |      | iS    | V         | 56.5       |   |                           |
| 9   | 3    | eP    | VN        | 06 08 56.0 |   | 17.6S 167.5E h:33 km.     |
|     |      |       |           |            |   | New Hebrides Is. region.  |
| 10  | 3    | i(P)  | V         | 07 34 18.0 |   |                           |
| 11  | 3    | e     | V         | 16 52 06   |   |                           |
| 12  | 3    | eP    | V         | 18 32 19   |   | 20.5S 170.7E h:39 km.     |
|     |      |       |           |            |   | Loyalty Is. region        |
| 13  | 3    | e     | V         | 19 05 26.5 |   |                           |
| 14  | 3    | i     | V         | 20 38 35.0 |   |                           |
| 15  | 3    | iP    | V         | 22 27 24.5 |   | 31.4S 179.6W h:372 km.    |
|     |      |       |           |            |   | Kermadec Is. region       |



| No. | Date | Phase | Component       | Time       | Remarks  |
|-----|------|-------|-----------------|------------|--|
| 16  | 4    | eP    | VV <sub>1</sub> | 02 29 02.0 | 13.2S 166.5E h:66km<br>New Hebrides region                           |
|     |      | i     | V               | 06.5       |  |
|     |      | eS    | E <sub>1</sub>  | 33 36      |  |
|     |      | M     | V <sub>1</sub>  | 40.7       |  |
| 17  | 4    | iP    | V               | 03 29 23.0 | R 28.5S 176.7W h:100km<br>Kermadec Is. region                        |
|     |      | i     | V               | 34.5       |  |
| 18  | 4    | eP    | V               | 04 22 15.0 | C 19.1S 176.7W h:211 km.<br>Fiji Is. region                          |
| 19  | 4    | iP    | V               | 07 13 59.0 | 21.2S 177.8W h:475 km.<br>Fiji Is. region                            |
| 20  | 4    | eP    | V               | 19 08 16.5 |  |
| L2  | 4    | iP    | VN              | 22 52 27.5 | Local  |
|     |      | iP    | VE              | 30.0       |  |
|     |      | iS    | VNE             | 38.5       |  |
| L3  | 5    | eP    | V               | 05 07 14.0 | Regional   |
|     |      | iP    | VNE             | 16.0       |  |
|     |      | i     | V               | 19.0       |  |
|     |      | eS    | N               | 46.0       |  |
| 21  | 5    | iP    | V               | 15 48 35.5 | 1.2S 125.6E h:186 km.<br>Molucca Passage                             |
| 22  | 5    | iP    | V               | 18.13 51.5 | C 19.4S 169.0E h:58 km<br>Loyalty Is. region                         |
|     |      | i     | VNE             | 52.0       |  |
|     |      | ipP   | V               | 14 05.5    |  |
| 23  | 5    | (e)   | V               | 19 37 (04) | 18.6N 146.9E h:47 km.<br>Mariana Is. region                          |
|     |      | i     | V               | 15.5       |  |
| 24  | 5    | i(P)  | V               | 21 47 51.0 |  |
| 25  | 5    | e     | V               | 22 45 (21) | 24.ON 121.9E h:56 km.<br>near coast of Formosa                       |
|     |      | i     | V               | 35.5       |  |
|     |      | i     | V               | 46.5       |  |
| 26  | 6    | iP    | V               | 06 00 50.0 | C  |
| 27  | 6    | e(P)  | V               | 06 52 38.0 | 10.1S 163.0E h:50 km.<br>Solomon Is. region                          |
| 28  | 6    | i     | V               | 07 53 38.5 |  |
| 29  | 6    | i     | V               | 09 41 46.5 |  |
| 30  | 6    | iP    | V               | 19 44 32.5 | R 15.4S 167.8E h: 161 km<br>New Hebrides Is. region                  |
|     |      | i     | V               | 33.5       |  |
| 31  | 7    | iP    | V               | 08 28 05.5 | R 56.3S 26.9W h:99 km.<br>Sandwich Is.                               |
| 32  | 7    | iP    | V               | 19 37 23.5 | R 56.2S 27.3W h:76 km.<br>Sandwich Is. region                        |
| 33  | 8    | iP    | VN              | 01 00 12.5 | R 3.8S 128.5E h: 178 km.<br>Ceram                                    |
|     |      | ipP   | V               | 54.0       |  |
| 34  | 8    | iP    | V               | 14 13 37.5 | C  |
| L4  | 8    | i(P)  | VN              | 19 47 38.5 | Local  |
|     |      | i(S)  | V               | 44.5       |  |
| 35  | 8    | ePcP  | V               | 23 51 11.0 | 1.6N 127.3E h: 102 km,<br>Halmahera                                  |
|     |      | iScP  | V               | 54 50.0    |  |
|     |      | eS    | NE              | 55 26.5    |  |
|     |      | eScS  | N               | 59 06.0    |  |
| 36  | 9    | e     | V               | 01 43 37.5 | P lost during servicing<br>21.9S 175.5W h: 48 km<br>Tonga Is. region |



| No. | Date | Phase | Component      | Time       |   | Remarks   |
|-----|------|-------|----------------|------------|---|---|
| 37  | 9    | e     | V              | 06 28 09   |   |   |
| L5  | 9    | e     | VN             | 07 23 49.5 |   | Local   |
|     |      | i     | VE             | 56.0       |   |   |
|     |      | i     | VE             | 58.5       |   |   |
| 38  | 9    | iP    | VN             | 10 33 38.5 | R | 5.9S 147.7E h: 71 km<br>New Britain region            |
| 39  | 9    | iP    | V              | 10 48 53.0 | C | 6.7S 128.9E h:21 km.<br>Banda Sea                     |
| 40  | 9    | eP    | V              | 22 22 10.0 |   |   |
| L6  | 9    | iP    | VN             | 23 44 20.0 |   | Gippsland, Victoria.                                  |
|     |      | iS    | N              | 45 06.0    |   |   |
|     |      | i     | N              | 18.0       |   |   |
| L7  | 10   | iP    | V              | 00 00 37.5 |   | Gippsland, Victoria                                   |
|     |      | i(S)  | V              | 01 15.0    |   |   |
|     |      | iS    | N              | 16.0       |   |   |
| L8  | 10   | (iP)  | V              | 00 04 09.0 |   | Gippsland, Vic.                                       |
|     |      | i(S)  | V              | 46.5       |   |   |
|     |      | i(S)  | N              | 47.5       |   |   |
| 41  | 10   | iP    | VNE            | 03 50 02.5 | C | 22.9S 180.0 h:576 km.<br>South of Fiji Is.            |
|     |      | iPP   | VE             | 51 34.0    |   |   |
|     |      | eS    | E              | 54 20.5    |   |   |
| 42  | 10   | eP    | V              | 04 06 54.5 | C |   |
|     |      | i     | VN             | 55.0       |   |   |
|     |      | i     | V              | 07 34.0    |   |   |
| 43  | 10   | i     | V              | 04 13 00.0 |   |   |
| 44  | 10   | i(P)  | V              | 07 41 12.0 |   |   |
| 45  | 10   | iP    | VN             | 08 31 51.5 |   | 5.4S 154.3E h:154 km.<br>Solomon Is. region           |
|     |      | i     | VN             | 55.5       |   |   |
| L9  | 10   | eP    | V              | 08 46 45.5 |   | Gippsland, Victoria.                                  |
|     |      | e     | N              | 47 18.0    |   |   |
|     |      | eS    | E              | 27.5       |   |   |
|     |      | eS    | N              | 30.0       |   |   |
| 46  | 10   | iP    | V              | 11 31 30.5 |   | 7.8S 123.5E h:100 km.<br>Flores Sea.                  |
| L10 | 10   | eP    | V              | 13 37 08.5 |   | Gippsland, Vic  |
|     |      | eS    | N              | 55.0       |   |   |
| 47  | 10   | eP    | V              | 17 31 24.5 | R | 4.7S 138.2E h:36 km.<br>New Guinea                    |
|     |      | iPPP  | N              | 32 52.0    |   |   |
|     |      | i(S)  | E <sub>1</sub> | 36 26.5    |   |   |
|     |      | e     | N <sub>1</sub> | 35.0       |   |   |
|     |      | eScP  | E              | 37 52.5    |   |   |
|     |      | i     | N              | 39 18.0    |   |   |
|     |      | M     | E <sub>1</sub> | 43.3       |   |   |
| 48  | 10   | iP    | VE             | 18 51 01.5 | C | 16.1S 176.3W h:361 km.<br>Fiji Is. region             |
| L11 | 10   | e(S)  | V              | 20 53 27   |   | Gippsland, Vic.                                       |
| 49  | 11   | eP    | V              | 00 35 47.0 |   | 28.8S 175.9W h:88 km.<br>Kermadec Is.                 |
| L12 | 11   | iP    | VN             | 02 57 18.0 |   | Local   |
|     |      | iS    | V              | 24.5       |   |   |
| 50  | 11   | iP    | VN             | 04 09 20.0 | C | 2.5S 140.9E h: 18 km.<br>Near coast of New<br>Guinea. |
|     |      | i     | V              | 22.0       |   |   |



| No. | Date | Phase  | Component                        | Time       | Remarks                          |
|-----|------|--------|----------------------------------|------------|----------------------------------|
| 51  | 11   | e      | V                                | 05 25 11   |                                  |
| 52  | 11   | eP     | V                                | 09 34 08.5 | 11.6S 166.3E h:52 km.            |
|     |      | i      | V                                | 20.0       | Santa Cruz Is.                   |
| 53  | 11   | iP     | V                                | 16 09 32.0 | C 24.5S 179.8E h:560 km.         |
|     |      |        |                                  |            | South of Fiji Is.                |
| 54  | 12   | iP     | VNE                              | 03 51 04.5 | R 5.4N 126.0E h:124 km.          |
|     |      | ipP    | V                                | 35.5       | Talaud Is.                       |
| 55  | 12   | i(P)   | V                                | 06 08 09.5 | C 2.9S 144.9E h:25 km.           |
|     |      | i      | N                                | 11.0       | Near coast of New Guinea         |
|     |      | i      | V                                | 11.5       |                                  |
|     |      | eL     | N <sub>1</sub>                   | 19.6       |                                  |
| 56  | 12   | i(PKP) | V                                | 14 13 05.0 | R 19.1N 66.0W h:63 km.           |
|     |      | i      | V                                | 24.0       | North of Puerto Rico             |
| 57  | 12   | i(P)   | VN                               | 20 16 19.5 | C                                |
| 58  | 12   | (eP)   | V                                | 22 03 05   | 60.7S 153.8E h:25 km.            |
|     |      | i      | V                                | 07.0       | South of Macquarie Is.           |
|     |      | e(T)   | VNE                              | 22 26      |                                  |
| L13 | 12   | e      | V                                | 22 49 09   | Regional                         |
|     |      | e(S)   | VN                               | 49.5       |                                  |
| 59  | 13   | e      | V                                | 01 14 28   |                                  |
| 60  | 13   | iP     | VN                               | 02 30 12.5 | C 6.3N 126.8E h: 60 km.          |
|     |      | eScP   | V                                | 35 23.5    | Off S.E. coast of Mindanao, P.I. |
| 61  | 13   | eP     | V                                | 05 11 54.0 | 55.9S 27.2W h: 67 km.            |
|     |      | i      | VN                               | 55.0       | Sandwich Is.                     |
|     |      | iPcP   | V                                | 56.5       |                                  |
|     |      | ePP    | NV <sub>1</sub>                  | 15 27.0    |                                  |
| L14 | 13   | e      | V                                | 06 48 15.5 | Regional                         |
|     |      | i(S)   | V                                | 49 20.0    |                                  |
| 62  | 13   | iP     | V                                | 10 59 18.0 | R 60.3S 34.3W h: 44 km.          |
|     |      |        |                                  |            | Sandwich Is. region.             |
| 63  | 13   | e      | V                                | 14 40 12   |                                  |
| 64  | 13   | iP     | VE                               | 17 34 40.0 | 22.0S 176.9W h: 155 km.          |
|     |      | i      | VE                               | 41.0       | Tonga Is. region                 |
|     |      | ePP    | V                                | 35 53.5    |                                  |
|     |      | iPcP   | V                                | 37 24.5    |                                  |
|     |      | eScP   | V                                | 40 50.0    |                                  |
| 65  | 14   | iP     | VNEV <sub>1</sub> E <sub>1</sub> | 16 19 00.0 | R 19.1S 168.4E h: 28 km.         |
|     |      | ipP    | V                                | 06.5       |                                  |
| 66  | 15   | iP     | V                                | 17 17 10.0 | C 4.1S 102.3E h:66 km.           |
|     |      |        |                                  |            | Near S.W. coast of Sumatra.      |
| 67  | 15   | eP     | VN                               | 21 25 10.0 | C 6.9S 125.4E h: 558 km.         |
|     |      |        |                                  |            | Banda Sea.                       |
| 68  | 16   | eP     | V                                | 03 34 11.5 | 19.9S 176.1W h: 224 km.          |
|     |      |        |                                  |            | Tonga Is. region                 |
| 69  | 16   | e      | V                                | 08 00 54   |                                  |
| 70  | 16   | eP     | V                                | 10 06 47.5 | 18 8S 168.4E h: 28 km.           |
|     |      |        |                                  |            | New Hebrides Is.                 |
| 71  | 16   | e      | V                                | 18 05 32   | 5.6S 147.2E h: 190 km.           |
|     |      |        |                                  |            | Bismarck Sea.                    |
| 72  | 17   | eP     | V                                | 03 34 41.5 | 2.9S 141.0E h:37 km.             |
|     |      |        |                                  |            | Near north coast of New Guinea.  |



| No. | Date | Phase  | Component   | Time   | Remarks   |
|-----|------|--|---|--|---|
| 73  | 17   | eP<br>e(S)<br>eL   | V<br>E <sub>1</sub><br>E <sub>1</sub>   | 04 40 12.5<br>50 54<br>05 02.2   | 55.8S 0.5E h: 25 km.<br>Bouvet Is. region                 |
| 74  | 18   | iP   | V   | 01 43 40.0   | 18.0S 168.6E h: 117 km.<br>New Hebrides Is.               |
| 75  | 18   | iP<br>(ipP)<br>iPcP  | VE<br>N<br>V  | 02 55 51.0<br>56 00.5<br>59 04.0   | C<br>29.9S 177.6W h: 65 km.<br>Kermadec Is.               |
| L15 | 18   | eP<br>i<br>iS  | V<br>V<br>V   | 03 06 22.5<br>23.0<br>29.0   | Local   |
| 76  | 18   | iP   | V   | 07 37 39.0   | 17.4S 178.6W h: 576 km.<br>Fiji Is. region.               |
| 77  | 18   | e  | V   | 13 20 04.5   |   |
| 78  | 18   | eP<br>e<br><br>eSKS<br>i(S)<br>e<br>eSS<br>eSSP<br>eL<br>M | V<br>E <sub>1</sub><br><br>N <sub>1</sub><br>E <sub>1</sub><br>V <sub>1</sub><br>V <sub>1</sub><br>E <sub>1</sub><br>V <sub>1</sub><br>E <sub>1</sub> | 17 05 30<br>16 00<br><br>10<br>17 00<br>22 07<br>23 30<br>47<br>37.6<br>44.2 | 36.7S 72.6W h: 67 km.<br>Near coast of southern<br>Chile. |
| 79  | 18   | e  | V   | 20 39 05.5   |   |
| 80  | 19   | l  | V   | 01 00 20.5   |   |
| 81  | 19   | iP   | VN  | 06 44 29.5   |   |
| 82  | 19   | eP<br>iS<br>M  | VN<br>E <sub>1</sub><br>E <sub>1</sub>  | 09 16 58.5<br>20 45.0<br>23.9  | 55.2S 146.0E h: 86 km.<br>West of Macquarie Is.           |
| 83  | 19   | eP   | V   | 11 08 39   | 43.0N 139.2E h: 242 km.<br>Sea of Japan.                  |
| 84  | 19   | i  | V   | 11 49 11.0   |   |
| 85  | 19   | eP   | V   | 13 37 14.0   | C<br>21.6S 170.1E h: 75 km.<br>New Hebrides Is.           |
| 86  | 19   | iP<br>ipP<br>isP<br>iPP<br>iS<br>e<br>M                    | VN<br>VN<br>VN<br>N<br>EE <sub>1</sub><br>NN <sub>1</sub><br>E <sub>1</sub>   | 19 31 05.0<br>09.0<br>12.0<br>32.0<br>34 53.0<br>35 08<br>38.0               | R<br>55.3S 146.4E h: 50 km.<br>South of Australia.        |
| L16 | 19   | eP<br>iS   | VE<br>N   | 22 04 19.5<br>43.0   | Regional  |
| L17 | 19   | eP<br>iP<br>iS   | V<br>VNE<br>N   | 23 25 57.5<br>58.0<br>26 22.0  | Regional  |
| 87  | 20   | iP   | VN  | 03 55 47.0   | C<br>9.4S 160.4E h: 21 km.<br>Solomon Is. region          |
| 88  | 20   | iP   | VN  | 08 08 41.0   | C   |
| 89  | 20   | eP   | V   | 08 13 46.0   | 7.9S 117.9E h: 25 km.<br>Flores Sea.                      |
| L18 | 20   | eP<br>eS   | VN<br>VNE   | 18 46 03.5<br>07.5   | Local   |





| No. | Date | Phase  | Component                                    | Time       | Remarks   |
|-----|------|--------|--|------------|---|
| 103 | 23   | e      | V  | 10 00 28.5 |   |
| 104 | 23   | eP     | VN   | 14 47 43.0 | 3.5N 126.4E h: 25 km.<br>Molucca Passage                        |
|     |      | i(pP)  | V  | 47.5       |   |
|     |      | i(sP)  | V  | 49.5       |   |
|     |      | i      | V <sub>1</sub>                               | 51.0       |   |
|     |      | i      | V <sub>1</sub>                               | 55.5       |   |
|     |      | ePP    | N <sub>1</sub>                               | 49 27.0    |   |
|     |      | iPPP   | N  | 50 10.5    |   |
|     |      | e(PS)  | E <sub>1</sub>                               | 54 33      |   |
|     |      | iScS   | E <sub>1</sub>                               | 57 39.5    |   |
|     |      | e      | N <sub>1</sub>                               | 46.5       |   |
|     |      | i(SSS) | E <sub>1</sub>                               | 58 32.5    |   |
|     |      | M      | V <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 15 08.8    |   |
| 105 | 23   | e(P)   | V  | 14 55 41.0 |   |
| 106 | 23   | eP     | V  | 15 00 37.5 | 3.5N 126.6E h: 32 km.<br>Molucca Passage<br>Confused by No. 104 |
|     |      | i(PP)  | V  | 02 20.5    |   |
|     |      | i(PcP) | V  | 29.5       |   |
| 107 | 23   | iP     | V  | 17 19 13.0 | R 16.8S 173.6W h: 49 km.<br>Tonga Is.                           |
|     |      | i(pP)  | V  | 20.5       |   |
| 108 | 23   | eP     | V  | 17 53 24.0 | 3.3N 125.9E h: 102 km.<br>Molucca Passage.                      |
| 109 | 23   | iP     | V  | 19 26 47.5 |   |
| 110 | 23   | eP     | V  | 20 46 34.0 | 3.4N 126.5E h: 23km.<br>Molucca Passage                         |
| 111 | 24   | eP     | V  | 01 27 (40) |   |
|     |      | i      | V  | 42.0       | 4.0S 127.1E h: 25 km.<br>Molucca Passage                        |
| 112 | 24   | iP     | V  | 05 27 36.5 |   |
| 113 | 24   | eP     | V  | 07 37 20.5 | R 45.0N 146.4E h: 82 km.<br>Off N. Coast of Hokkaido            |
|     |      | i      | VN   | 21.0       |   |
|     |      | e      | V  | 57.0       |   |
| 114 | 24   | eP     | V  | 07 42 45.0 | C 16.5S 178.3E h: 40 km.<br>Fiji Is.                            |
| 115 | 24   | iP     | VN   | 15 37 59.5 |   |
|     |      | ipP    | V  | 38 31.0    | R 0.3N 123.9E h: 130 km.<br>Northern Celebes                    |
|     |      | isP    | V  | 50.0       |   |
| 116 | 24   | e(P)   | V  | 18 17 18   | V 28.5  |
|     |      | i      | V  | 28.5       |   |
| L22 | 25   | (e)    | V  | 04 06 (14) | Regional  |
|     |      | eS     | V  | 40.0       |   |
| 117 | 25   | iP     | V  | 14 27 18.5 | C 20.3S 174.1W h: 25 km.<br>Tonga Is.                           |
|     |      | ipP    | V  | 26.0       |   |
|     |      | eL     | V <sub>1</sub>                               | 40.5       |   |
|     |      | M      | V <sub>1</sub> E <sub>1</sub>                | 44.7       |   |
| 118 | 25   | eP     | V  | 22 45 10.0 | 20.3S 173.2W h: 25 km.<br>Tonga Is.                             |
| 119 | 26   | iP     | VN   | 00 44 48.5 |   |
|     |      | i(pP)  | V  | 55.5       | C 3.1S 147.4E h: 14 km.<br>Bismarck Sea<br>Mag. 6½              |
|     |      | ePP    | V  | 45 49.0    |   |
|     |      | i(S)   | V  | 49 49.0    |   |
|     |      | i      | V  | 53 40.5    |   |
|     |      | M      | N <sub>1</sub>                               | 58.1       |   |
| L23 | 26   | eP     | V  | 09 18 17.5 |   |
|     |      | i(S)   | V  | 35.5       |   |
|     |      | i(S)   | N  | 36.0       |   |



| No. | Date | Phase  | Component                     | Time       | Remarks  |  |
|-----|------|--------|-------------------------------|------------|--|--|
| 120 | 26   | iP     | V                             | 11 16 34.0 | 17.9S 167.7E h: 124 km.<br>New Hebrides Is.                        |  |
| L24 | 26   | eP     | V                             | 13 22 26.5 | Regional   |  |
|     |      | i(S)   | V                             | 23 07.0    |  |  |
| 121 | 26   | eP     | V                             | 15 36 59.0 | 0.4S 98.6E h: 18 km.<br>Off W. coast of<br>Sumatra.<br><br>Mag. 6½ |  |
|     |      | ipP    | V                             | 37 08.5    |  |  |
|     |      | ePPP   | V                             | 40 37.5    |  |  |
|     |      | eS     | E <sub>1</sub>                | 44 59      |  |  |
|     |      | eS     | N <sub>1</sub>                | 45 02      |  |  |
|     |      | M      | V <sub>1</sub> E <sub>1</sub> | 16 03.3    |  |  |
| 122 | 26   | e(P)   | V                             | 15 46 54.5 |  |  |
| 123 | 26   | iP     | V                             | 16 15 38.5 | 0.1S 98.6E h: 87 km,<br>Off W.coast of Sumatra.                    |  |
| 124 | 26   | iP     | V                             | 19 38 29.5 | 0.3S 98.5E h: 58 km,<br>Off W.coast of Sumatra.                    |  |
|     |      | ipP    | V                             | 38.5       |  |  |
|     |      | i(PcP) | V                             | 39 13.5    |  |  |
| 125 | 26   | i(P)   | V                             | 22 18 25.5 | R  |  |
| 126 | 27   | eP     | V                             | 02 42 27   | 17.9S 167.7E h: 17 km.<br>New Hebrides Is.                         |  |
| 127 | 27   | i(P)   | V                             | 09 52 38.5 | R  |  |
| 128 | 27   | e(P)   | V                             | 10 39 31.5 | 4.7S 104.7E h: 20 km.<br>Sumatra.                                  |  |
|     |      | i      | V                             | 34.5       |  |  |
|     |      | ipP    | V                             | 37.5       |  |  |
| L25 | 27   | e      | V                             | 12 10 34.0 | Regional   |  |
| L26 | 27   | e      | V                             | 12 28 (50) | Regional   |  |
|     |      | eS     | E                             | 29 26.0    |  |  |
| 129 | 28   | iP     | VNE                           | 01 40 54.0 | C 17.7S 178.9W h: 605km.<br>Fiji Is.                               |  |
| 130 | 28   | eP     | E                             | 06 06 27   | 11.6S 166.4E h: 34 km.<br>Santa Cruz Is.                           |  |
|     |      | i      | V                             | 28.0       |  |  |
|     |      | eL     | V <sub>1</sub>                | 19.7       |  |  |
| 131 | 28   | eP     | V                             | 06 25 18.0 | 18.7S 168.9E h: 25 km.<br>New Hebrides Is.                         |  |
|     |      |        |                               | 19.5       |  |  |
| 132 | 28   | iP     | VE                            | 06 54 00.5 | C 18.9S 178.1W h: 631 km.<br>Fiji Is.                              |  |
| 133 | 28   | eP     | V                             | 09 29 34.5 | 20.3S 174.1W h: 76 km.<br>Tonga Is.                                |  |
| 134 | 28   | e(PKP) | V                             | 11 05 21.5 | Probably 33.7N 48.5E<br>h: 34 km. Iran.                            |  |
| 135 | 28   | iP     | VN                            | 14 50 40.0 | R  |  |
| 136 | 28   | e      | V                             | 14 54 05.0 | R  |  |
| 137 | 28   | iP     | V                             | 18 25 04.5 | R  |  |
| 138 | 28   | eP     | V                             | 22 50 04.5 | 13.9S 166.0E h: 89 km.<br>New Hebrides Is.                         |  |
|     |      | e      | V <sub>1</sub>                | 07.0       |  |  |
|     |      | i      | V <sub>1</sub>                | 42.0       |  |  |
|     |      | iPcP   | V <sub>1</sub>                | 53 32.0    |  |  |
|     |      | eS     | E <sub>1</sub>                | 54 20      |  |  |
|     |      | e      | E <sub>1</sub>                | 42         |  |  |
|     |      | M      | E <sub>1</sub>                | 23 00.9    |  |  |
|     |      | M      | V <sub>1</sub>                | 01.2       |  |  |
| 139 | 29   | e(F)   | V                             | 00 01 40   |  |  |
| 140 | 29   | eP     | V                             | 00 49 08.0 |  |  |
| L27 | 29   | eP     | VN                            | 11 27 08.0 | Local  |  |
|     |      | iP     | VE                            | 09.0       |  |  |
|     |      | eS     | VN                            | 14.5       |  |  |

| No. | Date | Phase | Component | Time       | Remarks  |
|-----|------|-------|-----------|------------|--|
| L28 | 29   | iP    | V         | 20 18 04.5 | Local  |
|     |      | iP    | V         | 05.5       |  |
|     |      | iS    | VNE       | 11.5       |  |
|     |      | i     | V         | 12.0       |  |
| L29 | 30   | e     | N         | 03 51 20   | Regional   |
| 141 | 30   | e     | V         | 13 31 25.5 |  |
|     |      | e     | V         | 33 40      |  |
| 142 | 30   | eP    | V         | 17 40 43.0 | 28.5S 178.1W h: 219 km.<br>Kermadec Is.          |
|     |      | i     | V         | 41 35.5    |  |
| 143 | 30   | eP    | V         | 21 26 10.0 | 28.9N 141.8E h:31 km.<br>South of Honsha         |
|     |      | i     | V         | 13.0       |  |
|     |      | ipP   | VN        | 15.5       |  |
| 144 | 30   | e(P)  | V         | 22 46 51.0 | 29.3N 141.8E h:80 km.<br>South of Honsha.        |
| 145 | 31   | eP    | V         | 01 57 12.5 | 51.9N 176.1E h:35 km.<br>Rat Is. Aleutian Is.    |
| 146 | 31   | iP    | V         | 03 28 31.5 | C 5.0S 104.1E h: 27 km.<br>Nr. coast of Sumatra. |
| 147 | 31   | iP    | V         | 03 51 31.0 | C 31.2S 178.3W h:232km.<br>Kermadec Is.          |
| 148 | 31   | iP    | V         | 08 48 29.0 | C 22.2N 143.0E h:264km.<br>Mariana Is. region.   |
| L30 | 31   | iP    | V         | 21 10 16.0 | Local  |
|     |      | iS    | VN        | 20.5       |  |

Seismograms read by Jennifer Clay.

J. C. Jaeger,  
Professor of Geophysics



All Copied

Department of Geophysics,  
Australian National University,  
CANBERRA, A.C.T., AUSTRALIA.

MONTHLY SEISMOLOGICAL BULLETIN.

November, 1961.

Latitude: 35° 19' 15"S. Longitude: 148° 59' 55"E. Height: 700 M

Instruments: three-component Benioff variable reluctance seismographs

$T_s = 1$  sec.

$T_g = 0.25$  sec. (short periods VNE)

$T_g = 16$  sec. (long period vertical  $V_1$ )

$T_g = 70$  sec. (long period horizontals  $N_1E_1$ )

One N-S component Wood-Anderson Seismograph,  $T_s = 0.8$  sec.

Mt. Stromlo quartz clocks provide accurate time marks and 50 c/s for drum drive.

Abbreviations: R - rarefaction; C = compression; H = origin.

Epicentre locations are those given by USCGS.

| No. | Date | Phase  | Component | Time       |   | Remarks.                                 |
|-----|------|--------|-----------|------------|---|--|
| 1   | 1    | i      | V         | 00 40 44.5 |   |  |
| 2   | 1    | iP     | VE        | 10 48 15.5 | R | 18.0S 178.5E h:631km<br>Fiji Is. Region. |
| 3   | 1    | iP     | VE        | 20 16 37.0 | R | 17.9S 178.4W h:629km<br>Fiji Is.         |
| L1  | 1    | i(S)   | V         | 20 48 31.5 |   | Regional                                 |
| L2  | 2    | (e)    | V         | 02 15 04   |   | Regional                                 |
|     |      | eS     | E         | 30.0       |   |  |
|     |      | e      | VE        | 32.5       |   |  |
| 4   | 2    | iP     | VNE       | 05 28 38.5 | R | 17.9S 178.5W h:598km<br>Fiji Is.         |
|     |      | i      | V         | 55.5       |   |  |
| 5   | 2    | iP     | V         | 17 24 04.0 |   |  |
| 6   | 2    | ePKP   | V         | 23 23 36.5 |   | 17.2N 62.7W h:29km.<br>Leeward Is.       |
| 7   | 3    | iP     | V         | 04 09 48.5 |   | 13.4S 167.8E h:75km.<br>Santa Cruz Is.   |
| 8   | 3    | iP     | V         | 04 51 19.0 |   |  |
| 9   | 3    | iP     | V         | 05 20 55.5 | R |  |
| L3  | 3    | (e)    | V         | 06 13 07.5 |   | Local                                    |
|     |      | i(S)   | V         | 14.0       |   |  |
| 10  | 3    | i(P)   | V         | 16 49 04.0 |   |  |
| 11  | 3    | e      | V         | 21 12 53   |   | 20.0S 173.8W h:25km.<br>Tonga Is.        |
| 12  | 3    | eP     | V         | 22 20 44.0 |   | 22.5S 170.2E h:91km.                     |
|     |      | i      | V         | 53.5       |   | Loyalty Is. region.                      |
| 13  | 3    | iP     | V         | 22 31 28.5 |   | 5.1S 131.2E h:63km.<br>Banda Sea         |
| 14  | 4    | iP     | VN        | 03 11 04.0 |   | 2.9S 137.2E h:51km.                      |
|     |      | ipP    | V         | 18.5       |   | Near north coast of New                  |
|     |      | i      | V         | 35.5       |   | Guinea.                                  |
|     |      | i(PPP) | V         | 12 34.5    |   |  |
|     |      | e      | $N_1$     | 23 04      |   |  |



| No. | Date | Phase  | Component                                    | Time       | Remarks.   |
|-----|------|--------|--|------------|--|
| 15  | 4    | eP     | V  | 03 51 05.5 | 50.0N 155.5E h:32km<br>Kurile Is.                                      |
| L4  | 4    | iP     | V  | 04 52 18.0 | Regional   |
|     |      | i(S)   | V  | 37.0       |  |
| L5  | 4    | i(P)   | V  | 04 54 19.5 | Regional   |
|     |      | eS     | V  | 41.0       |  |
| 16  | 4    | eP     | V  | 13 17 47.0 | 32.1N 92.2E h:25km.<br>Eastern Tibet                                   |
| 17  | 4    | i(P)   | V  | 23 43 04.0 |  |
| 18  | 5    | iP     | VNE  | 00 25 55.5 | R 11.6S 166.4E h:67km.<br>Santa Cruz Is.                               |
|     |      | ipP    | V  | 26 08.5    |  |
| 19  | 5    | i      | VN   | 01 00 20.0 |  |
| 20  | 5    | iP     | V  | 10 13 56.0 | R 13.0S 166.4E h:39km.<br>New Hebrides Is.                             |
| 21  | 5    | eP     | V  | 10 48 41.5 | 45.7N 147.9E h:142km<br>Kurile Is.                                     |
| L6  | 5    | eP     | V  | 14 26 03.5 | Local  |
|     |      | eS     | V  | 22.0       |  |
| 22  | 5    | eP     | VNE  | 24 00 32.5 | 49.4S 163.3E h:35km.<br>About 300km north west<br>of Auckland Is. N.Z. |
|     |      | i      | VN   | 33.5       |  |
|     |      | e      | E  | 44.5       |  |
|     |      | i(PP)  | V  | 50.5       |  |
|     |      | i(PPP) | N  | 57.5       |  |
|     |      | eSS    | V <sub>1</sub>                               | 04 10.5    |  |
|     |      | eT     | VNE  | 15         |  |
|     |      | T max  | E  | 17 14.5    |  |
|     |      | T max  | V  | 52.0       |  |
|     |      | T max  | N  | 18 21.5    |  |
| L7  | 6    | e(S)   | V  | 01 46 36.5 | Regional   |
| L8  | 6    | (e)    | V  | 02 33 07.0 | Local  |
|     |      | e(S)   | V  | 21.0       |  |
| 23  | 6    | eP     | VNE  | 05 34 02.0 | R 13.3S 166.0E h:210km<br>Santa Cruz Is. region                        |
|     |      | i(S)   | V  | 38 15.0    |  |
|     |      | e      | N <sub>1</sub>                               | 38.0       |  |
|     |      | M      | V <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 44.4       |  |
| 24  | 6    | eP     | V  | 10 17 04.5 | 6.5S 129.2E h:125km.<br>Banda Sea                                      |
| 25  | 6    | eP     | V  | 13 15 55.5 | 6.0S 146.9E h:25km.<br>New Britain                                     |
| 26  | 6    | eP     | VN   | 13 43 49.0 | R 17.5N 145.3E h:251km<br>Mariana Is.                                  |
| 27  | 7    | eP     | V  | 01 21 58.0 | 11.6N 126.1E h:47km.<br>Samar, P.I.                                    |
|     |      | ipP    | V  | 22 12.5    |  |
|     |      | i      | V  | 23 42.0    |  |
|     |      | ePP    | V  | 55.0       |  |
| 28  | 7    | iP     | V  | 12 21 16.5 | R 26.9S 176.3W h:54km.<br>South of Tonga Is.                           |
| 29  | 7    | iP     | V  | 21 05 28.5 | R  |
| 30  | 7    | iP     | V  | 21 15 21.0 | R 34.3S 179.2W h:39km.<br>South of Kermadec Is.                        |
| 31  | 7    | iP     | VN   | 23 16 57.0 | R  |



| No. | Date | Phase                                  | Component   | Time  |   | Remarks.  |
|-----|------|--|---|---|---|---|
| 32  | 8    | e                                      | V   | 08 30 50.5  |   |   |
| 33  | 8    | i                                      | V   | 11 08 33.0  | C |   |
| 34  | 8    | iP                                     | V   | 15 19 23.0  | C |   |
| 35  | 8    | eL                                     | VNE   | 19.6  |   | 3.9S 136.2E h:54km.<br>New Guinea                         |
| 36  | 9    | iP<br>ipP<br>eL<br>M                   | VN<br>VNE<br>N <sub>1</sub><br>N <sub>1</sub>                           | 01 14 18.0<br>28.5<br>19.8<br>23.2                                  | C | 22.0S 170.1E h:33km.<br>Loyalty Is.<br>Mag. 5-3/4 (Canb.) |
| 37  | 9    | eP                                     | V   | 17 56 48.0  |   |   |
| 38  | 9    | iP<br>i<br>i<br>ipP<br>i<br>iPP<br>isS | VNE<br>N<br>V<br>V<br>VN<br>V<br>V                                      | 18 43 54.0<br>57.0<br>44 03.5<br>11.0<br>39.0<br>45 17.5<br>49 51.0 | R | 5.9S 129.8E h:87km.<br>Banda Sea                          |
| 39  | 9    | iP                                     | V   | 23 13 44.5  | C | 15.8S 174.9W h:289km<br>Tonga Is. region                  |
| L9  | 10   | iP<br>eS                               | V<br>V  | 04 21 52.5<br>22 11.0   |   | Local   |
| 40  | 10   | eP<br>i<br>i<br>eL                     | V<br>V<br>V<br>E <sub>1</sub>   | 07 36 48<br>53.5<br>59.5<br>49.3                                    |   | 2.5S 138.3E h:52km<br>Near north coast of<br>New Guinea   |
| 41  | 10   | iP<br>i<br>ipP<br>iPcP<br>isP<br>eS    | VNEV <sub>1</sub> E <sub>1</sub><br>V<br>E<br>V<br>V<br>NN <sub>1</sub> | 18 06 48.0<br>51.0<br>08 23.0<br>09 14.0<br>30.0<br>11 30.5         | R | 17.5S 178.8W h:586km<br>Fiji Is.                          |
| L10 | 10   | (e)<br>eS                              | V<br>N  | 19 51 38<br>52 14.5   |   | Regional  |
| 42  | 11   | iP                                     | V   | 04 36 37.5  | R |   |
| L11 | 11   | e<br>e(S)                              | V<br>V  | 08 32 32.0<br>33 12.5   |   | Regional  |
| 43  | 11   | e                                      | V   | 08 54 26.5  |   | 2.3S 138.2E h:54km.<br>New Guinea                         |
| L12 | 11   | e(P)<br>e(S)                           | V<br>E  | 10 27 01<br>28 26.5   |   | Regional  |
| L13 | 11   | e(P)<br>i(S)                           | V<br>V  | 14 41 14.0<br>54.5  |   | Regional  |
| 44  | 11   | iP                                     | VN  | 16 14 19.0  |   |   |
| 45  | 12   | iP                                     | V   | 08 32 45.5  |   | 16.9S 66.9E h:34km.<br>Mascarene Is. region               |
| 46  | 12   | iP<br>eS<br>eT<br>T max                | VNE<br>N<br>VNE<br>E  | 10 19 15.0<br>22 16<br>32<br>35 55.0                                | C | 45.5S 167.3E h:19km<br>Near coast of South<br>Is., N.Z.   |
| 47  | 12   | iP                                     | VE  | 18 17 46.0  | C | 23.2S 180.0 h:556km<br>South of Fiji/Is.                  |
| 48  | 12   | iP                                     | V   | 18 46 13.0  | C | region<br>0.1N 126.1E h:165km<br>Molucca Passage          |
| 49  | 13   | eP                                     | V   | 07 46 39.0  |   | 3.8S 136.3E h:34km.                                       |

| No.                  | Date | Phase           | Component                     | Time       | Remarks.   |
|----------------------|------|-----------------|-------------------------------|------------|--|
| 49 <u>continued.</u> |      |                 |                               |            |  |
|                      |      | i(pP)           | V                             | 45.5       | Near north coast of New Guinea                         |
|                      |      | i               | V                             | 47 33.0    |  |
|                      |      | M               | V <sub>1</sub>                | 08 02.1    |  |
| 50                   | 13   | iP              | VE                            | 19 51 23.5 | R 30.4S 177.7W h:23km. Kermadec Is.                    |
| 51                   | 14   | eL              | VNE                           | 01 14.9    |  |
| 52                   | 14   | iP              | V                             | 09 56 24.0 |  |
| 53                   | 14   | iP              | V                             | 12 44 24.5 | 33.9S 179.6W h:51km. Off coast of North Is. N.Z.       |
| 54                   | 14   | i               | V                             | 13 26 21.5 |  |
| 55                   | 14   | iP              | V                             | 15 26 03.5 | 21.9S 179.0W h:590km Fiji Is. region                   |
| 56                   | 14   | iP              | VE                            | 17 23 03.0 | C 5.7S 104.3E h:16km. Near coast of Sumatra            |
|                      |      | iPcP            | V                             | 24 20.0    |  |
| 57                   | 15   | e               | V                             | 04 31 47.5 | 4.1S 105.0E h:126km. Sumatra                           |
| 58                   | 15   | iP              | VV <sub>1</sub>               | 07 29 08.0 | C 43.1N 145.1E h:43km. Near coast of Hokkaido          |
|                      |      | iPcP            | V                             | 18.0       |  |
|                      |      | ipP             | VN                            | 21.5       |  |
|                      |      | eS              | N <sub>1</sub> E <sub>1</sub> | 38 58.0    |  |
|                      |      | eSS             | N <sub>1</sub>                | 44 04      |  |
|                      |      | eL <sub>r</sub> | V <sub>1</sub>                | 52.4       |  |
|                      |      | M               | N <sub>1</sub>                | 57.8       |  |
| 59                   | 15   | e(P)            | V                             | 10 23 55.5 |  |
|                      |      | eT              | V                             | 38 55      |  |
|                      |      | T max           | E                             | 39 58.5    |  |
|                      |      | T max           | N                             | 40 10.0    |  |
|                      |      | T max           | V                             | 11.0       |  |
| 60                   | 15   | eP              | V                             | 13 49 02.5 | 15.3S 173.3W h:34km Samoa Is. region                   |
| L14                  | 15   | e(S)            | V                             | 22 49 23.5 | Regional   |
| 61                   | 16   | i(P)            | V                             | 07 31 53.5 | C 18.6N 68.9W h:147km Near coast of Dominican Republic |
| 62                   | 16   | ePKP            | V                             | 08 39 11   |  |
|                      |      | iSKP            | V                             | 42 35.0    |  |
| 63                   | 16   | eP              | V                             | 13 38 14.5 |  |
| 64                   | 16   | iP              | V                             | 14 27 35.0 | R  |
| 65                   | 16   | eP              | V                             | 16 09 25   | 20.2S 172.9E h:32km Loyalty Is. region                 |
|                      |      | eS              | N <sub>1</sub>                | 14 05      |  |
|                      |      | eL              | N <sub>1</sub>                | 14.9       |  |
|                      |      | M               | N <sub>1</sub>                | 17.5       |  |
| 66                   | 17   | iP              | VN                            | 01 01 36.5 |  |
| 67                   | 17   | eP              | VNE                           | 08 19 46.5 | R 17.7S 178.6W h:598km Fiji Is.                        |
|                      |      | i               | V                             | 49.0       |  |
|                      |      | i(PcP)          | V                             | 22 19.5    |  |
| 68                   | 17   | iP              | V                             | 09 28 54.0 |  |
| 69                   | 17   | i               | V                             | 10 37 41.0 |  |
| 70                   | 17   | iP              | VE                            | 19 01 30.0 | R 19.6S 175.5W h:220km Tonga Is. region                |
|                      |      | i               | V                             | 35.0       |  |



| No. | Date | Phase  | Component   | Time   | Remarks:                                      |
|-----|------|--|---|--|---|
| 71  | 18   | eP<br>isP  | V<br>E  | 06 10 06.0<br>20.5   | R 0.9S 126.9E h:38km.<br>Halmahera region     |
| 72  | 18   | iP<br>i<br>i<br>i(PcP)<br>eL                         | V<br>V<br>E<br>V<br>V <sub>1</sub>  | 11 23 09.0<br>13.5<br>23.0<br>24 23.5<br>32.4                                    | R 27.0S 176.3W h:61km.<br>Kernadec Is. region |
| 73  | 18   | iP<br>i<br>i<br>i                                    | V<br>V<br>V<br>V  | 11 54 33.0<br>34.5<br>33.0<br>39.4   | C 21.4S 175.8W h:14km<br>Tonga Is. region     |
| L15 | 18   | (e)<br>e<br>i<br>is                                  | V<br>N<br>V<br>VNE  | 20 05 (53)<br>54.0<br>57.0<br>53.0   | Local   |
| 74  | 18   | eP<br>i<br>i(sP)<br>i(PcP)                           | V<br>V<br>V<br>V  | 22 20 25<br>33.0<br>47.0<br>52.0   | 23.7N 121.8E h:60km<br>Near coast of Formosa  |
| L16 | 19   | e<br>i<br>i(S)<br>i                                  | V<br>V<br>V<br>VNE  | 15 24 41.5<br>49.0<br>25 13.5<br>27.5  | Regional                                      |
| 75  | 19   | iP<br>isP<br>i(P)<br>iPcP<br>iScP<br>eS<br>is<br>eSS | VNEV <sub>1</sub> N <sub>1</sub><br>V<br>V<br>V<br>V<br>N <sub>1</sub><br>E <sub>1</sub><br>N <sub>1</sub>              | 23 29 39.0<br>30 31.0<br>31 26.0<br>27.5<br>35 00.5<br>47.0<br>48.5<br>38 55     | R 0.8N 124.3E h:157km<br>Northern Celebes.    |
| 76  | 20   | eP<br>i<br>i(P)<br>iPcP<br>eS<br>is<br>i<br>eL<br>M  | V<br>V<br>V <sub>1</sub><br>V<br>N <sub>1</sub><br>E <sub>1</sub><br>E <sub>1</sub><br>E <sub>1</sub><br>N <sub>1</sub> | 11 40 23.5<br>25.0<br>50 15.0<br>53 16.0<br>31.0<br>33.0<br>36.5<br>55.1<br>53.8 | C 21.8S 169.9E h:33km<br>Loyalty Is. region   |
| 77  | 20   | iP   | V   | 12 23 53.0   |   |
| 78  | 20   | eP   | V   | 13 03 18.0   |   |
| 79  | 20   | (eP)<br>i  | V<br>V  | 14 47 50.5<br>52.5   |   |
| 80  | 20   | iP<br>ipP  | V<br>V  | 18 56 41.5<br>50.5   | R 21.7S 170.0E h:24km<br>Loyalty Is. region   |
| 81  | 20   | iP   | V   | 19 14 13.0   | C 5.0S 144.4E h:65km.<br>New Guinea           |
| 82  | 20   | i(P)   | V   | 23 17 29.5   | 23.3N 133.9E h:525km<br>South of Honshu       |
| 83  | 21   | iP   | V   | 04 11 19.5   |   |
| 84  | 21   | iP<br>eP<br>ipP<br>isP<br>iPcP<br>iPP                | V<br>NE<br>N<br>E<br>V<br>V   | 11 14 35.5<br>36.0<br>53.0<br>15 07.0<br>16 22.0<br>58.5                         | 0.9N 122.5E h:85km<br>Northern Celebes        |

| No. | Date | Phase | Component                        | Time       |   | Remarks.                  |
|-----|------|-------|----------------------------------|------------|---|---------------------------|
| L17 | 21   | (e)   | V                                | 02 04 52.0 |   | Local                     |
|     |      | iP    | VE                               | 54.5       |   |                           |
|     |      | eS    | VNE                              | 05 08.5    |   |                           |
| L18 | 22   | e     | V                                | 02 40 13.0 |   | Regional                  |
|     |      | i     | V                                | 57.0       |   |                           |
| 85  | 22   | i     | V                                | 02 45 09.0 |   |                           |
| 86  | 22   | iP    | V                                | 02 50 28.0 | R | 21.6S 169.9E h:74km       |
|     |      | i(pP) | V                                | 45.0       |   | New Hebrides Is.          |
| 87  | 22   | iP    | V                                | 03 33 12.5 |   | 20.9S 170.3E h:144km      |
|     |      |       |                                  |            |   | New Hebrides Is.          |
| 88  | 22   | iP    | V                                | 10 41 14.5 | C | 21.4S 170.2E h:52km       |
|     |      | ipP   | V                                | 24.5       |   | Loyalty Is.               |
|     |      | i     | V                                | 27.0       |   |                           |
|     |      | iPP   | V                                | 50.0       |   |                           |
| 89  | 22   | iP    | V                                | 11 11 42.5 | C | 21.5S 169.8E h:41km       |
|     |      | eP    | EV <sub>1</sub>                  | 43.0       |   | Loyalty Is.               |
|     |      | i     | VNEV <sub>1</sub> E <sub>1</sub> | 47.5       |   |                           |
|     |      | isP   | V                                | 59.0       |   |                           |
|     |      | iPcP  | V <sub>1</sub>                   | 15 29.5    |   |                           |
|     |      | eS    | E <sub>1</sub>                   | 48.0       |   |                           |
|     |      | i     | E <sub>1</sub>                   | 52.0       |   |                           |
| 90  | 22   | eP    | V                                | 20 45 28.0 | C | 26.8S 176.6W h:77km       |
|     |      | eL    | V <sub>1</sub> N <sub>1</sub>    | 54.5       |   | Kermadec Is. region       |
| L19 | 22   | iP    | VNE                              | 21 56 07.0 |   | Local                     |
|     |      | i     | VNE                              | 08.0       |   |                           |
|     |      | iS    | VNE                              | 28.5       |   |                           |
|     |      | i     | E                                | 35.0       |   |                           |
| 91  | 22   | e     | V                                | 22 16 07.5 |   |                           |
| 92  | 22   | iP    | V                                | 22 38 42.5 | C | 8.8S 110.5E h:188km       |
|     |      |       |                                  |            |   | Near south coast of Java. |
| L20 | 23   | iP    | VN                               | 01 17 53.0 | R | felt at Orange, N.S.W.    |
|     |      | iS    | VE                               | 18 15.5    |   |                           |
|     |      | i     | E                                | 17.0       |   |                           |
|     |      | i     | E                                | 18.0       |   |                           |
| 93  | 23   | iP    | VE                               | 06 00 35.5 | R | 32.2S 178.8W h:112km      |
|     |      |       |                                  |            |   | Kermadec Is.              |
| L21 | 23   | i     | VN                               | 07 01 14.5 |   | Regional                  |
| L22 | 24   | eP    | V                                | 11 42 10.5 |   | Local                     |
|     |      | iP    | VNE                              | 11.5       |   |                           |
|     |      | i(S)  | VN                               | 29.5       |   |                           |
| L23 | 25   | eP    | V                                | 02 07 38.0 | C | Local                     |
|     |      | eS    | VE                               | 44.5       |   |                           |
| 94  | 25   | iP    | V                                | 06 24 08.5 | R | 18.0S 178.4W h:593km      |
|     |      |       |                                  |            |   | Fiji Is.                  |
| 95  | 25   | iP    | VN                               | 14 17 19.5 | C | 6.3S 154.8E h:83km        |
|     |      | i     | N                                | 33.0       |   | Solomon Is.               |
|     |      | ipP   | V                                | 38.0       |   |                           |
|     |      | i     | N                                | 42.0       |   |                           |
|     |      | i(PF) | V                                | 18 14.0    |   |                           |
|     |      | i     | N                                | 20 04.0    |   |                           |
|     |      | iPcP  | N                                | 24.0       |   |                           |
|     |      | eL    | V <sub>1</sub>                   | 25.7       |   |                           |



| No. | Date | Phase  | Component                                       | Time       |   | Remarks.  |
|-----|------|--------|---|------------|---|---|
| L24 | 25   | eS     | V   | 19 54 50.0 |   | Local   |
| 96  | 25   | eP     | V   | 20 31 09.5 | C | 36.4N 141.4E h:64km<br>Near E Coast of Honshu                 |
| 97  | 25   | eP     | V   | 23 01 29.5 | C | 22.3S 175.5W h:25km<br>Tonga Is.                              |
| 98  | 26   | e      | V   | 18 18 23.5 |   | 5.6S 146.3E h:52km<br>Near north coast of New Guinea          |
| 99  | 26   | i(pP)  | V   | 19 09 48.5 |   | 9.3S 150.0E h:109km.<br>Off east coast of Territory of Papua. |
| 100 | 26   | e(P)   | V   | 19 57 04.5 |   |   |
| 101 | 26   | e      | V   | 20 49 14.0 |   |   |
| 102 | 26   | e      | V   | 22 14 30.5 |   |   |
| L25 | 26   | eP     | V   | 22 54 04.5 |   | Local   |
|     |      | iP     | VNE   | 05.0       |   |   |
|     |      | iS     | VNE   | 11.0       |   |   |
| 103 | 27   | eP     | V   | 02 06 56.5 |   | 56.4S 28.2W h:163km.<br>Sandwich Is.                          |
| 104 | 27   | eP     | V   | 06 08 11   |   | 31.6N 131.1E h:25km.<br>Near south coast of Kyushu            |
| L26 | 27   | e      | V   | 07 25 (40) |   | Regional  |
| 105 | 27   | iP     | V   | 16 57 18.0 |   | 1.0S 126.9E h:44km.<br>South of Halmahera                     |
| 106 | 27   | iP     | VN  | 17 18 12.0 |   | 0.6S 127.1E h:25km<br>Halmahera region.                       |
|     |      | i      | VNEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 13.0       |   |   |
|     |      | i      | E   | 17.0       |   |   |
|     |      | i      | E   | 23.5       |   |   |
|     |      | iPP    | V <sub>1</sub>                                  | 19 47.5    |   |   |
|     |      | i      | V <sub>1</sub>                                  | 48.5       |   |   |
|     |      | i(PcP) | V   | 20 22.5    |   |   |
|     |      | eS     | N <sub>1</sub> E <sub>1</sub>                   | 24 18.0    |   |   |
|     |      | e      | N <sub>1</sub> E <sub>1</sub>                   | 27.6       |   |   |
|     |      | M      | N <sub>1</sub>                                  | 38.5       |   |   |
| 107 | 27   | iP     | V   | 17 55 31.0 | C | 1.9S 127.0E h:25km<br>South of Halmahera                      |
| 108 | 27   | iP     | V   | 19 21 33.5 |   |   |
| 109 | 27   | eP     | V   | 23 35 14.5 | C | 60.6S 156.9E h:46km<br>Balleny Is. region                     |
|     |      | eS     | E <sub>1</sub>                                  | 40 42      |   |   |
|     |      | eL     | E <sub>1</sub>                                  | 41.5       |   |   |
| 110 | 28   | eP     | V   | 00 43 13.0 |   | 19.1S 177.5W h:530km<br>Fiji Is.                              |
| 111 | 28   | iP     | VN  | 02 47 55.0 |   | 0.2S 128.0E h:62km<br>Halmahera                               |
| 112 | 28   | iP     | V   | 04 13 30.0 | C |   |
| 113 | 28   | eP     | V   | 05 09 24.0 |   | 0.6S 127.4E h:68km<br>South of Halmahera                      |
| 114 | 28   | eP     | V   | 08 54 15.5 | R | 5.9S 130.1E h:117km<br>Ceram                                  |
| 115 | 28   | i(P)   | V   | 17 55 39.5 | C |   |

| No. | Date | Phase | Component        | Time       | Remarks.   |
|-----|------|-------|------------------|------------|--|
| 116 | 28   | eP    | V                | 18 39 28.5 | 56.9S 143.5E h:51km<br>South of Tasmania               |
|     |      | i     | VN               | 32.0       |  |
|     |      | ePP   | E                | 53.5       |  |
|     |      | ePPP  | E                | 40 08.0    |  |
|     |      | e(S)  | E <sub>1</sub>   | 43 30      |  |
|     |      | i(sS) | E <sub>1</sub>   | 41.5       |  |
|     |      | eL    | V <sub>1</sub>   | 45.1       |  |
| L27 | 28   | e     | V                | 19 20 39   | Regional   |
|     |      | e     | V                | 21 14      |  |
| 117 | 28   | e     | N                | 23 01 14.0 | 14.8S 167.3E h:146km<br>New Hebrides Is.               |
| 118 | 29   | eP    | V                | 00 15 49.0 | C  |
| L28 | 29   | i(P)  | V                | 01 47 52.0 | Regional   |
|     |      | i(S)  | VN               | 48 14.0    |  |
| 119 | 29   | eP    | VN               | 05 26 07.5 |  |
| 120 | 29   | e(P)  | V                | 05 43 20.0 |  |
| 121 | 29   | eL    | E <sub>1</sub>   | 10 12.7    | 38.3S 19.4W h:25km.<br>South Atlantic Ocean            |
| 122 | 29   | iP    | V                | 11 01 24.0 | 7.1S 130.8E h:52km<br>Banda Sea                        |
|     |      | isP   | V                | 44.5       |  |
| 123 | 29   | eP    | VE               | 22 00 48.5 | R 23.1S 170.9E h:29km.<br>South east of Loyalty<br>Is. |
|     |      | i     | VNV <sub>1</sub> | 49.5       |  |
|     |      | eS    | E <sub>1</sub>   | 04 57      |  |
|     |      | i     | E <sub>1</sub>   | 05 06.0    |  |
|     |      | eL    | V <sub>1</sub>   | 08.6       |  |
| 124 | 29   | iP    | V                | 22 20 54.0 | 18.0S 168.3E h:52km<br>New Hebrides Is.                |
|     |      | i     | VNE              | 55.0       |  |
|     |      | i     | VN               | 21 19.0    |  |
| 125 | 29   | e     | V                | 23 21 13   | 38.0S 177.7E h:68km.<br>North Is., New Zealand         |
| 126 | 30   | iP    | VN               | 16 54 03.0 | C 3.3S 127.2E h:75km<br>Ceram Sea                      |
| 127 | 30   | i(P)  | V                | 18 32 40.5 | 18.2S 168.0E h:68km.<br>New Hebrides Is.               |
|     |      | i     | V                | 52.0       |  |
| 128 | 30   | e(P)  | V                | 20 09 26.5 | 18.6S 179.0W h:431km<br>Fiji Is.                       |
|     |      | i     | V                | 33.5       |  |
| 129 | 30   | iP    | VN               | 21 51 13.5 | R 2.3N 126.8E h:55km<br>Molucca Passage.               |

Seismograms read by  
Jennifer Clay.

J.C. Jaeger,  
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*all copied*

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MONTHLY SEISMOLOGICAL BULLETIN.

DECEMBER, 1961.

Latitude: 35° 19' 15"S. Longitude: 148° 59' 55"E. Height: 700M.

Instruments: three-component Benioff variable reluctance seismographs

$T_s = 1$  sec.

$T_g = 0.25$  sec. (short periods VNE)

$T_g = 16$  sec. (long period vertical  $V_1$ )

$T_g = 70$  sec. (long period horizontals  $N_1E_1$ )

One N-S component Wood-Anderson Seismograph,  $T_s = 0.8$  sec.

Mt. Stromlo quartz clocks provide accurate time marks and 50 c/s for drum drive.

Abbreviations: R - rarefaction; C - compression; H - origin.

Epicentre locations are those given by USCGS.

| No. | Date | Phase   | Component  | Time   | Remarks.  |
|-----|------|---|--|--|---|
| 1   | 1    | iP  | VN   | 07 01 06.0   | C 3.6S 152.5E h:342km<br>New Ireland region.    |
| 2   | 1    | eP<br>i                                       | V<br>V   | 08 07 48.0<br>08 22.5  | 8.7N 122.0E h:36km<br>Off coast of Negros, P.I. |
| 3   | 1    | iP<br>isP<br>iPP<br>i(PcP)<br>iScP            | VNE<br>N<br>V<br>V<br>V  | 09 22 43.0<br>23 11.0<br>51.5<br>25 20.0<br>28 53.0                            | R 6.0S 130.8E h:85km.<br>Banda Sea              |
| 4   | 1    | iP  | V  | 15 09 46.0   | C   |
| 5   | 1    | eP<br>i                                       | V<br>V   | 20 22 16.0<br>42.0   | 27.7N 141.5E h:25km.<br>Volcano Is. region.     |
| 6   | 1    | iP<br>iPcP<br>i<br>isP<br>i<br>iPP<br>iS<br>i | VNV <sub>1</sub><br>V <sub>1</sub><br>V <sub>1</sub><br>V <sub>1</sub><br>V<br>V<br>E <sub>1</sub><br>E <sub>1</sub> | 21 23 28.0<br>55.0<br>24 01.0<br>38.0<br>25 10.0<br>53.0<br>32 00.0<br>33 08.0 | R 26.5N 124.9E h:206km<br>East China Sea        |
| L1  | 2    | eP<br>iS                                      | V<br>VE  | 03 35 44.0<br>51.0   | Local   |
| 7   | 2    | eP  | VN   | 05 50 53.0   |   |
| 8   | 2    | iP  | VN   | 07 28 59.5   | C   |
| 9   | 2    | iP  | VV <sub>1</sub>  | 13 00 02.0   | C 36.5N 8.6E h:62km.<br>Northern Tunisia        |
| 10  | 2    | eP  | V  | 14 11 14.5   | 16.9S 168.2E h:219km.<br>New Hebrides Is.       |
| 11  | 2    | iP  | V  | 18 33 00.5   |   |
| 12  | 2    | iP  | V  | 19 39 52.5   | 3.3S 138.8E h:145km.<br>New Guinea.             |
| 13  | 3    | e   | V  | 02 07 18.0   |   |
| 14  | 3    | e   | V  | 04 02 51.0   |   |
| L2  | 3    | eP<br>iS                                      | V<br>V   | 04 24 05.0<br>28.5   | Regional  |

| No. | Date | Phase  | Component  | Time  | Remarks.  |
|-----|------|--|--|---|---|
| 15  | 3    | iP<br>i(sP)  | VN<br>V  | 08 50 55.5<br>51 28.0   | R 25.0N 122.9E h:91km.<br>Off coast of Formosa      |
| 16  | 3    | i  | V  | 09 11 29.5  |   |
| 17  | 3    | e  | V  | 10 47 14  |   |
| 18  | 3    | iP   | V  | 11 46 04.0  |   |
| 19  | 3    | eP   | V  | 12 16 34.0  | 5.7S 113.8E h:633km.<br>Java Sea.                   |
| 20  | 3    | iP<br>eS<br>eL   | VN<br>E <sub>1</sub><br>E <sub>1</sub>   | 16 20 19.0 K<br>25 05<br>25.5   | R 11.6S 166.1E h:122km.<br>Santa Cruz Is.           |
| 21  | 3    | iP   | V  | 20 06 34.0  | R 43.6N 134.9E h:420km.<br>Near Vladivostock, USSR. |
| 22  | 3    | iP   | VN   | 21 09 38.0  | C 4.1S 142.3E h:88km<br>New Guinea                  |
| 23  | 3    | i  | V  | 21 32 55.5  |   |
| 24  | 4    | iP<br>i  | VN<br>V  | 01 01 13.0<br>18.0  | R   |
| 25  | 4    | eP   | V  | 05 39 26.0  | 5.2S 151.6E h:59km.<br>New Britain                  |
| L3  | 4    | eP<br>eS   | V<br>V   | 09 42 27.0<br>45.5  | Local   |
| 26  | 4    | eP<br>iPcP   | V<br>V   | 12 50 47.0<br>50.5  | 33.2N 95.3E h:45km.<br>Tibet                        |
| L4  | 4    | eP<br>iP<br>iS   | V<br>V<br>VNE  | 03 26 51.0<br>52.0<br>58.0  | Local   |
| L5  | 5    | eP<br>i<br>e(S)<br>i   | V<br>V<br>VE<br>VE   | 04 02 52.5<br>56.0<br>03 21.5<br>23.5   | Regional  |
| 27  | 5    | iP   | V  | 07 12 59.0  |   |
| 28  | 5    | eP<br>i<br>i<br>i<br>ipP<br>eL <sub>g</sub><br>isS<br>eSSS<br>M<br>M | VN<br>VN<br>VN<br>VE<br>V <sub>1</sub> E <sub>1</sub><br>N <sub>1</sub> E <sub>1</sub><br>VE<br>E <sub>1</sub><br>E <sub>1</sub><br>E <sub>1</sub> | 13 05 00.0<br>03.0<br>05.0<br>08.5<br>12.0<br>08 12<br>25.5<br>50.5<br>10.7<br>14.7 | 50.8S 139.8E h:64km.<br>South west of Tasmania.     |
| 29  | 5    | eP   | V  | 13 07 47.0  | 16.0S 168.1E h:145km.<br>New Hebrides Is.           |
| 30  | 5    | iP   | V  | 22 44 53.5  | C 21.0S 178.4W h:532km.<br>New Hebrides Is.region.  |
| L6  | 6    | e(S)   | V  | 01 36 46.0  | Local   |
| 31  | 6    | eP<br>i  | V<br>V   | 05 59 58.0<br>06 00 27.0  | 13.7N 93.6E h:53km.<br>Andaman Is.                  |
| 32  | 6    | eP   | VN   | 06 30 37.5  |   |



| No. | Date | Phase  | Component      | Time       | Remarks.   |
|-----|------|--------|----------------|------------|--|
| 33  | 6    | eP     | V              | 13 42 17.0 | R 23.5S 176.0W h:18km.<br>Tonga Is. region.                |
|     |      | i      | V              | 43 08.5    |  |
|     |      | iPcP   | V              | 45 05.0    |  |
|     |      | eL     | N <sub>1</sub> | 50.2       |  |
|     |      | eL     | V <sub>1</sub> | 51.8       |  |
| 34  | 6    | eP     | V              | 15 48.00.0 | 8.2S 117.4E h:64km.<br>Flores Sea                          |
|     |      | ipP    | V              | 15.0       |  |
|     |      | isP    | V              | 22.0       |  |
| 35  | 6    | eP     | V              | 16 52 06.0 | C 49.4N 155.2E h:22km.<br>Kurile Is.                       |
|     |      | i      | V              | 52.0       |  |
|     |      | eS     | N <sub>1</sub> | 17 02.6    |  |
|     |      | eL     | N <sub>1</sub> | 21.0       |  |
| L7  | 6    | iP     | V              | 19 38 59.5 | Local  |
|     |      | iS     | V              | 39 05.0    |  |
| 36  | 7    | eP     | V              | 00 24 57.5 | 23.4S 175.9W h:45km.<br>Tonga Is. region.                  |
| 37  | 7    | e      | V              | 06 01 40.0 |  |
| 38  | 7    | eP     | V              | 14 30 33.5 | 22.9S 175.9W h:27km.<br>Tonga Is.                          |
| L8  | 7    | e(S)   | V              | 23 42 46.0 | Local  |
| 39  | 8    | iP     | V              | 06 14 18.5 | C 3.0S 136.9E h:64km.<br>Northwest New Guinea.             |
|     |      | ipP    | VN             | 34.5       |  |
|     |      | eL     | NE             | 25         |  |
| 40  | 8    | eP     | VN             | 09 43 10.0 | R 1.8S 139.4E h:55km.<br>near north coast of New<br>Guinea |
|     |      | e      | N <sub>1</sub> | 56.3       |  |
| 41  | 8    | eP     | V              | 10 32 45.5 | 30.5N 86.7E h:45km.<br>Tibet.                              |
| 42  | 8    | i(P)   | V              | 22 08 21.5 |  |
| L9  | 9    | (eP)   | V              | 00 11 26.0 | Local  |
|     |      | eP     | V              | 27.0       |  |
|     |      | iS     | V              | 33.0       |  |
| L10 | 9    | eP     | V              | 04 21 12.5 | Local  |
|     |      | iP     | V              | 13.0       |  |
|     |      | iS     | V              | 19.5       |  |
| 43  | 9    | eP     | V              | 04 31 26.0 | 35.9S 179.3W h:60km.<br>North east of New<br>Zealand.      |
|     |      | i(pP)  | V              | 44.5       |  |
| 44  | 9    | iP     | V              | 06 47 33.5 |  |
| 45  | 9    | iP     | V              | 10 26 29.0 | 7.5S 108.3E h:295km.<br>Java                               |
| 46  | 9    | eP     | V              | 10 59 49.0 |  |
| 47  | 9    | eP     | V              | 11 31 13.0 | 43.7S 75.2W h:34km.<br>Near coast of southern<br>Chile     |
|     |      | i      | V <sub>1</sub> | 17.0       |  |
|     |      | i(ScS) | E <sub>1</sub> | 42 27      |  |
|     |      | ePS    | N <sub>1</sub> | 43 26      |  |
|     |      | eL     | N <sub>1</sub> | 56.3       |  |
|     |      | eL     | V <sub>1</sub> | 12 00.0    |  |
| 48  | 9    | eP     | V              | 16 44 29.5 | 8.9S 105.6E h:35km.<br>South of Java                       |
|     |      | ipP    | V              | 38.5       |  |

| No. | Date | Phase           | Component                       | Time         | Remarks.  |                                      |
|-----|------|-----------------|---------------------------------|--------------|---|--------------------------------------|
| 49  | 9    | iP              | VEV <sub>1</sub> E <sub>1</sub> | 19 55 08.0   | C 21.7S 179.9E h:620km.<br>Fiji Is.                               |                                      |
|     |      | i               | VN                              | 08.5         |   |                                      |
|     |      | i               | V <sub>1</sub> E <sub>1</sub>   | 10.0         |   |                                      |
|     |      | i               | V                               | 12.5         |   |                                      |
|     |      | i               | N                               | 16.0         |   |                                      |
|     |      | iPP             | VV <sub>1</sub>                 | 56 43.0      |   |                                      |
|     |      | i               | V                               | 51.0         |   |                                      |
|     |      | iS              | NN <sub>1</sub> E <sub>1</sub>  | 59 28.5      |   |                                      |
|     |      | iScP            | V                               | 20 00 41.0   |   |                                      |
|     |      | eL <sub>q</sub> | E <sub>1</sub>                  | 02.5         |   |                                      |
|     |      | iSSS            | E <sub>1</sub>                  | 02 51.5      |   |                                      |
| 50  | 9    | eP              | V                               | 22 44 (56)   |   | 6.0S 149.3E h:123km.<br>New Britain. |
| L11 | 10   | eP              | E                               | 01 45 50.5   |   | Regional                             |
|     |      | eP              | VN                              | 51.0         |   |                                      |
|     |      | i(S)            | V                               | 46 21.5      |   |                                      |
|     |      | e(S)            | N                               | 24.0         |   |                                      |
| L12 | 10   | eP              | V                               | 11 15 18.0   | Local   |                                      |
|     |      | eS              | VE                              | 24.0         |   |                                      |
|     |      | i               | N                               | 25.0         |   |                                      |
| L13 | 10   | (eP)            | V                               | 11 17 37.0   | Local   |                                      |
|     |      | iS              | V                               | 43.0         |   |                                      |
|     |      | eS              | NE                              | 43.5         |   |                                      |
| L14 | 11   | e               | V                               | 02 45 45     | Regional  |                                      |
| L15 | 11   | (eP)            | V                               | 03 00 26     | Regional  |                                      |
|     |      | iP              | VNE                             | 28.0         |   |                                      |
|     |      | i(S)            | V                               | 58.5         |   |                                      |
| L16 | 11   | eP              | V                               | 03 20 14.5   | Regional  |                                      |
|     |      | iP              | V                               | 17.5         |   |                                      |
|     |      | eS              | V                               | 46.0         |   |                                      |
| L17 | 11   | eP              | V                               | 05 34 (36.5) | Local   |                                      |
|     |      | eS              | V                               | 54.5         |   |                                      |
| 51  | 11   | iP              | V                               | 10 04 06.0   | 23.4N 94.8E h:86km.<br>Burma.                                     |                                      |
| L18 | 11   | e               | V                               | 18 36 34.0   | Regional  |                                      |
| L19 | 12   | iP              | V                               | 01 47 52.5   | Regional  |                                      |
|     |      | iS              | V                               | 48 15.0      |   |                                      |
| 52  | 12   | iP              | VN                              | 04 02 17.0   | R 4.3S 127.2E h:65km.<br>Banda Sea                                |                                      |
|     |      | e(L)            | E <sub>1</sub>                  | 10 38        |   |                                      |
|     |      | eL              | E <sub>1</sub>                  | 12.5         |   |                                      |
|     |      | M               | E <sub>1</sub>                  | 16.1         |   |                                      |
| 53  | 12   | i(PKP)          | V                               | 11 37 49.0   | 11.8N 59.8W h:36km.<br>Windward Is. region.                       |                                      |
| 54  | 12   | eP              | V                               | 17 32 49.0   | 21.7N 146.0E h:24km.<br>Northern Mariana Is. region               |                                      |
|     |      | i               | V                               | 33 26.5      |   |                                      |
|     |      | eS              | E <sub>1</sub>                  | 40 36        |   |                                      |
| 55  | 12   | eP              | V                               | 23 18 17.0   | 43.5N 146.2E h:44km.<br>Near east coast of<br>Hokkaido            |                                      |
|     |      | i(pP)           | V                               | 30.5         |   |                                      |
|     |      | i(sP)           | V                               | 35.5         |   |                                      |
| 56  | 13   | iP              | V                               | 11 36 06.5   | 50.9S 73.0W h:82km.<br>Southern Chile - Argentin-<br>tina border. |                                      |



| No. | Date | Phase  | Component                       | Time       |   | Remarks.  |
|-----|------|--------|---------------------------------|------------|---|---|
| 57  | 13   | iP     | V                               | 16 55 03.5 | C | 18.9S 168.4E h:30km.  |
|     |      | ipP    | VN                              | 09.5       |   | New Hebrides Is.  |
|     |      | i      | V <sub>1</sub>                  | 17.0       |   |   |
|     |      | i(PPP) | V                               | 55.5       |   |   |
|     |      | iS     | E <sub>1</sub>                  | 59 13      |   |   |
|     |      | esS    | E <sub>1</sub>                  | 23.5       |   |   |
|     |      | e      | V <sub>1</sub> E <sub>1</sub>   | 30.5       |   |   |
|     |      | eSS    | E <sub>1</sub>                  | 17 00 14   |   |   |
|     |      | i      | V <sub>1</sub>                  | 21.5       |   |   |
|     |      | iScS   | V <sub>1</sub>                  | 06 14      |   |   |
| 58  | 13   | i(P)   | V                               | 20 08 04.5 |   | 9.9N 125.8E h:69km.<br>Near north coast of<br>Mindanao, P.I.  |
| 59  | 14   | i(P)   | V                               | 04 47 15.5 |   |   |
| L20 | 14   | e      | V                               | 04 53 (13) |   | Regional?   |
| 60  | 14   | iP     | V                               | 06 43 13.5 |   |   |
| 61  | 14   | iP     | V                               | 07 16 57.0 | C | 3.1S 140.9E h:44km.<br>Near north coast of New<br>Guinea      |
|     |      | i      | VNV <sub>1</sub> N <sub>1</sub> | 57.5       |   |   |
|     |      | iPP    | V <sub>1</sub>                  | 18 08.0    |   |   |
|     |      | i      | N <sub>1</sub>                  | 11.0       |   |   |
|     |      | iPPP   | E <sub>1</sub>                  | 23.0       |   |   |
|     |      | e      | N <sub>1</sub>                  | 21 53      |   |   |
|     |      | iS     | E <sub>1</sub>                  | 22 16.0    |   |   |
|     |      | isS    | N <sub>1</sub>                  | 28.0       |   |   |
|     |      | iScP   | V                               | 23 16.5    |   |   |
|     |      | i(SS)  | E <sub>1</sub>                  | 24 12.0    |   |   |
|     |      | iSSS   | E <sub>1</sub>                  | 33.0       |   |   |
|     |      | M      | E <sub>1</sub>                  | 30.5       |   |   |
|     |      | M      | V <sub>1</sub> N <sub>1</sub>   | 32.2       |   |   |
| 62  | 14   | eP     | V                               | 12 21 56.0 |   | 7.8S 120.5E h:62km.<br>Flores S <sub>e</sub> a                |
| L21 | 14   | iP     | V                               | 23 23 44.5 |   | Regional  |
|     |      | eP     | N                               | 45.5       |   |   |
|     |      | i(S)   | VN                              | 24 17.5    |   |   |
|     |      | i(S)   | V                               | 20.5       |   |   |
|     |      | i      | NE                              | 21.5       |   |   |
| 63  | 14   | eP     | V                               | 23 31 10.0 |   | 26.1S 179.3E h:497km.<br>South of Fiji Is.                    |
|     |      | i      | V                               | 15.5       |   |   |
| 64  | 15   | iP     | VN                              | 12 42 22.0 | R | 5.5S 147.2E h:181km.<br>Near north coast of New<br>Guinea     |
|     |      | ipP    | V                               | 59.5       |   |   |
| 65  | 15   | iP     | V                               | 19 43 53.5 | C | 0.9N 126.2E h:47km.<br>Molucca Passage                        |
|     |      | i      | VN                              | 55.0       |   |   |
|     |      | i(PcP) | V                               | 45 35.5    |   |   |
| 66  | 16   | eP     | V                               | 01 46 05.0 |   | 9.7N 125.6E h:163km.<br>Near north coast of<br>Mindanao, P.I. |
|     |      | i      | V                               | 10.0       |   |   |
|     |      | i      | V                               | 31.5       |   |   |
| 67  | 16   | i(P)   | V                               | 10 05 53.0 |   | 23.9S 175.4W h:25km.<br>Tonga Is. region.                     |
|     |      | eL     | E <sub>1</sub>                  | 16.0       |   |   |
| 68  | 16   | iP     | V                               | 20 40 53.5 | C | 28.5S 179.4W h:421 km.<br>"ermadec Is.                        |
|     |      | ipP    | V                               | 42 12.5    |   |   |
| 69  | 17   | i      | V                               | 05 10 52.5 |   |   |
| 70  | 17   | i      | V                               | 16 15 37.5 | C |   |
| 71  | 17   | iP     | V                               | 22 12 30.0 |   |   |

| No. | Date           | Phase | Component                       | Time       | Remarks.   |
|-----|----------------|-------|---------------------------------|------------|--|
| 72  | 17             | iP    | V                               | 22 16 57.0 | R 54.5S 143.9E h:45km.<br>South of Tasmania.           |
|     |                | i     | VNV <sub>1</sub> N <sub>1</sub> | 58.0       |  |
|     |                | ipP   | V                               | 17 07.0    |  |
|     |                | esP   | E                               | 10.0       |  |
|     |                | i     | V <sub>1</sub>                  | 22.0       |  |
|     |                | eS    | VV <sub>1</sub>                 | 20 30.5    |  |
|     |                | isS   | E <sub>1</sub>                  | 41.0       |  |
|     |                | iSS   | V <sub>1</sub>                  | 59.0       |  |
|     |                | ipcP  | V <sub>1</sub>                  | 21 14.0    |  |
|     |                | eL    | N <sub>1</sub>                  | 21.5       |  |
|     |                | M     | V <sub>1</sub> N <sub>1</sub>   | 23.5       |  |
|     |                | iScS  | E <sub>1</sub>                  | 28 16.0    |  |
|     |                | 73    | 17                              | iP         |  |
| i   | V              |       |                                 | 27 38.5    |  |
| 74  | 17             | i     | VN                              | 22 56 00.5 |  |
| 75  | 18             | e     | V                               | 03 16 35.5 |  |
| 76  | 18             | e     | V                               | 13 34 04   |  |
| L21 | 18             | eP    | V                               | 16 44 42.0 | Local  |
|     |                | iP    | VNE                             | 42.5       |  |
|     |                | iS    | VNE                             | 49.0       |  |
| 77  | 18             | iP    | VN                              | 16 54 18.5 | C 26.4N 96.3E h:85km.<br>Burma-India border.           |
|     |                |       |                                 |            |  |
| L22 | 18             | eP    | VNE                             | 20 29 40.0 | Local  |
|     |                | iS    | VNE                             | 47.0       |  |
| L23 | 20             | eP    | V                               | 01 03 58.0 | Regional   |
|     |                | e     | N                               | 04 08.0    |  |
|     |                | i     | V                               | 29.5       |  |
| 78  | 20             | iP    | V                               | 01 52 59.5 | C 30N 118.4E h:17km.<br>Near east coast of<br>Borneo   |
|     |                | i     | V                               | 53 09.5    |  |
|     |                | ipcP  | V                               | 54 28.5    |  |
| 79  | 20             | ipKP  | VV <sub>1</sub>                 | 13 44 23.0 | R 4.6N 75.6W h:176km<br>West-central Colombia          |
|     |                | i     | V <sub>1</sub>                  | 24.5       |  |
|     |                | ipKP  | V <sub>1</sub>                  | 45 10.5    |  |
|     |                | i     | V                               | 47 28.5    |  |
|     |                | i     | V                               | 52 32.5    |  |
|     |                | eSS   | N <sub>1</sub>                  | 14 03 40   |  |
| eL  | N <sub>1</sub> | 19.3  |                                 |            |  |
| 80  | 20             | e(P)  | V                               | 14 35 16.0 |  |
| 81  | 20             | eP    | V                               | 23 53 24.0 | 15.8S 169.1E h:36km.<br>New Hebrides Is.               |
| 82  | 21             | eP    | V                               | 00 52 59.0 | 6.6N 126.6E h:25km.<br>Near coast of Mindanao,<br>P.I. |
|     |                | isP   | VN                              | 53 13.0    |  |
| 83  | 21             | iP    | VN                              | 07 18 09.5 | C  |
| 84  | 21             | iP    | V                               | 13 37 06.0 | C 7.5S 129.2E h:201km.<br>Banda Sea                    |
|     |                | i     | V                               | 38 06.0    |  |
|     |                | i     | V                               | 32.0       |  |
|     |                | i     | V                               | 44.5       |  |
| 85  | 21             | e     | V                               | 19 42 11.0 |  |
| L24 | 21             | e     | V                               | 21 28 10.5 |  |
| 86  | 21             | eP    | VN                              | 23 43 51.0 |  |
|     |                | i     | V                               | 57.0       |  |
| 87  | 22             | iP    | V                               | 01 44 29.5 | C 6.4S 128.9E h:38km.<br>Banda Sea.                    |



| No. | Date | Phase  | Component                     | Time       | Remarks.  |
|-----|------|--------|-------------------------------|------------|---|
| 88  | 22   | eP     | V                             | 10 40 21.5 | 2.8S 136.7E h:38km.<br>New Guinea                   |
|     |      | i      | V                             | 28.5       |   |
|     |      | ePP    | V                             | 41 30      |   |
|     |      | eL     | N <sub>1</sub>                | 55 03      |   |
| 89  | 22   | iP     | V                             | 15 10 34.0 | C   |
| 90  | 22   | iP     | V                             | 22 16 38.0 | 14.7S 167.3E h:74km.<br>New Hebrides Is.            |
| L25 | 22   | eP     | VN                            | 22 38 28.5 | Local   |
|     |      | i      | V                             | 29.0       |   |
|     |      | e(S)   | V                             | 38.5       |   |
|     |      | i(S)   | VNE                           | 39.5       |   |
| 91  | 22   | iP     | V                             | 22 55 33.0 | C 18.6N 145.6E h:155km.<br>Mariana Is.              |
|     |      | i      | VE                            | 35.5       |   |
|     |      | i      | V                             | 41.0       |   |
|     |      | ipP    | VN                            | 56 09.0    |   |
| 92  | 22   | iP     | V                             | 23 53 30.5 | C 16.4N 120.4E h:33km.<br>Near coast of Luzon, P.I. |
| 93  | 23   | iP     | V                             | 03 55 15.5 | C   |
| 94  | 23   | eP     | V                             | 16 30 25.0 |   |
|     |      | i      | N                             | 26.0       |   |
|     |      | i      | VN                            | 32.0       |   |
| L26 | 24   | i      | V                             | 00 31 22.0 | Regional  |
| 95  | 24   | eP     | V                             | 02 46 41.5 | 3.4S 140.3E h:29km.<br>New Guinea                   |
|     |      | i(PcP) | V                             | 49 31.0    |   |
|     |      | i      | V                             | 50 17.5    |   |
|     |      | eS     | N <sub>1</sub>                | 52 02      |   |
|     |      | eL     | V <sub>1</sub> E <sub>1</sub> | 54.3       |   |
|     |      | M      | E <sub>1</sub>                | 58.3       |   |
|     |      | M      | V <sub>1</sub> N <sub>1</sub> | 03 00.7    |   |
| 96  | 24   | eP     | V                             | 07 26 23   | 29.5N 80.9E h:20km.<br>Nepal.                       |
| 97  | 24   | iP     | V                             | 09 26 00.0 | 20.4S 173.6W h:45km.<br>Tonga Is.                   |
| 98  | 24   | Waves  | V <sub>1</sub> E <sub>1</sub> | 15 30      |   |
| 99  | 25   | iP     | VNEV <sub>1</sub>             | 08 08 10.0 | C 3.7S 127.7E h:47km.<br>Ceram                      |
|     |      | ipP    | VNE                           | 19.5       |   |
|     |      | ePP    | N                             | 09 37.0    |   |
|     |      | i      | V                             | 42.5       |   |
|     |      | i(PcP) | V                             | 10 36.0    |   |
| 100 | 25   | iP     | VN                            | 08 20 44.5 | C 1.1S 126.7E h:25km.<br>Spice Is.                  |
|     |      | ipP    | V                             | 22 27.0    |   |
| 101 | 25   | iP     | VN                            | 08 35 19.0 | R   |
|     |      | i      | V                             | 31.0       |   |
| 102 | 25   | iP     | V                             | 09 10 56.5 | C   |
|     |      |        |                               |            |   |
| 103 | 25   | iP     | VNE                           | 09 16 18.0 | C 3.7S 127.7E h:54km.<br>Ceram Sea                  |
|     |      | i      | VN                            | 17 15.0    |   |
| 104 | 25   | iP     | VNE                           | 09 21 22.5 | C 3.8S 127.5E h:42km.<br>Ceram Sea                  |
|     |      | ipP    | V                             | 32.5       |   |
|     |      | i      | VN                            | 22 05.5    |   |
| 105 | 25   | iP     | VN                            | 09 28 36.5 | C 3.7S 127.3E h:27km.<br>Ceram Sea                  |
|     |      | ipP    | V                             | 45.5       |   |
|     |      | i      | V                             | 29 53.0    |   |
| 106 | 25   | e(P)   | V                             | 12 29 21.5 |   |



| No. | Date | Phase  | Component                     | Time       |   | Remarks.  |
|-----|------|--------|-------------------------------|------------|---|---|
| 107 | 25   | iP     | VE                            | 14 02 35.5 | R | 20.4S 173.7W h:64km.<br>Tonga Is.                         |
|     |      | i      | N                             | 45.5       |   |   |
|     |      | i(pP)  | N                             | 54.0       |   |   |
|     |      | i      | V                             | 03 22.0    |   |   |
|     |      | i      | N                             | 29.0       |   |   |
| 108 | 25   | e(P)   | V                             | 15 55 44.5 |   |   |
| 109 | 25   | iP     | V                             | 22 32 58.0 | R | 8.9S 110.2E h:155km.<br>Off coast of Java                 |
| 110 | 26   | iP     | VNE                           | 04 32 33.0 | R | 5.5S 110.7E h:566km.<br>Java Sea                          |
|     |      | iPcP   | V                             | 33 59.0    |   |   |
|     |      | ipP    | N                             | 34 19.5    |   |   |
| 111 | 26   | eP     | V                             | 06 29 36   |   | 44.2S 38.1E h:22km.<br>Prince Edward Is. region           |
| 112 | 26   | iP     | V                             | 06 42 27.0 | C |   |
| 113 | 27   | eP     | V                             | 02 32 25.0 |   | 2.7S 141.3E h:22km.<br>Near north coast of New<br>Guinea  |
|     |      | i      | V                             | 38.5       |   |   |
| 114 | 27   | iP     | V                             | 07 24 02.0 |   | 18.7S 177.5W h:616km.<br>Fiji Is.                         |
| 115 | 27   | iP     | V                             | 23 24 22.5 |   | 5.7S 148.9E h:155km.<br>New Britain region                |
| 116 | 27   | iP     | VNE                           | 23 52 53.5 | C | 41.2S 175.7E h:57km.<br>Near coast of North Is.<br>N.Z.   |
|     |      | i      | VNE                           | 53.5       |   |   |
|     |      | ipP    | V                             | 53 06      |   |   |
|     |      | iPPF   | V <sub>1</sub> N <sub>1</sub> | 34         |   |   |
|     |      | e(S)   | N <sub>1</sub>                | 56 58      |   |   |
|     |      | i(ss)  | E <sub>1</sub>                | 57 05.5    |   |   |
|     |      | eL     | N <sub>1</sub>                | 57.2       |   |   |
|     |      | M      | N <sub>1</sub>                | 24 00.4    |   |   |
|     |      | M      | E <sub>1</sub>                | 03.4       |   |   |
|     |      | eT     | V <sub>1</sub>                | 08         |   |   |
|     |      | T max  | V                             | 12 01      |   |   |
| L27 | 23   | (e)    | V                             | 07 36 40   |   | Regional  |
|     |      | e      | V                             | 53.5       |   |   |
|     |      | e(S)   | E                             | 38 31.5    |   |   |
|     |      | i      | V                             | 34.0       |   |   |
| 117 | 28   | iP     | V                             | 18 23 53.0 |   | 17.7S 178.6W h:592km.<br>Fiji Is.                         |
| 118 | 28   | i(P)   | V                             | 20 56 28.0 |   |   |
| 119 | 29   | iP     | V                             | 00 01 39.5 |   | 12.4S 166.3E h:100km.<br>Santa Cruz Is. region.           |
|     |      | isP    | VN                            | 02 08.0    |   |   |
|     |      | eS     | N <sub>1</sub>                | 06 16      |   |   |
| 120 | 29   | iP     | VN                            | 20 06 35.0 | C | 6.3S 154.5E h:44km.<br>Solomon Is.                        |
| 121 | 30   | eP     | V                             | 00 52 26   |   | 52.3N 177.7E h:52km.<br>Rat Is., Aleutian Is.             |
|     |      | i      | V                             | 23.0       |   |   |
|     |      | iPcP   | V                             | 29.0       |   |   |
|     |      | i      | V                             | 54 25.0    |   |   |
|     |      | e(ScS) | N <sub>1</sub>                | 01 03 31   |   |   |
|     |      | M      | E <sub>1</sub>                | 20.9       |   |   |
| 122 | 30   | eP     | V                             | 03 48 58.0 |   | 7.2S 148.0E h:73km.<br>Near north coast of<br>New Guinea. |
| 123 | 30   | i      | V                             | 05 46 07.5 |   |   |
| 124 | 30   | iP     | VN                            | 03 41 34.0 | C |   |



| No. | Date | Phase | Component                                       | Time       | Remarks.  |
|-----|------|-------|---|------------|---|
| 125 | 30   | eP    | V   | 09 06 11.5 | 22.9S 175.2W h:41km.<br>Tonga Is.                         |
|     |      | ipP   | V   | 24.0       |   |
|     |      | e(FP) | V   | 07 32.0    |   |
| L28 | 30   | e     | V   | 10 41 06.0 | Regional  |
| 126 | 30   | e     | V   | 13 03 47   |   |
|     |      | i     | V   | 51.0       |   |
| 127 | 30   | eP    | V   | 15 37 20   | 16.0S 170.0E h:65km.<br>New Hebrides Is.                  |
| 128 | 30   | e     | V   | 15 50 49   |   |
| 129 | 30   | iP    | VN  | 18 27 06.0 | C 8.7N 126.3E h:119km.<br>Near coast of Mindanao,<br>P.I. |
| 130 | 30   | e     | V   | 22 12 27   |   |
| 131 | 31   | e     | V   | 05 34 13.5 |   |
| L29 | 31   | e     | V   | 12 49 25.0 | Local   |
|     |      | i     | V   | 28.5       |   |
|     |      | i(S)  | V   | 36.5       |   |
| 132 | 31   | iP    | VNEV <sub>1</sub> N <sub>1</sub> E <sub>1</sub> | 13 53 40.0 | C 16.N 127.3E h:140km.<br>Halmahera                       |
|     |      | i     | V   | 55 32.5    |   |
| 133 | 31   | iP    | VN  | 14 17 42.5 |   |
|     |      | e     | V   | 18 21.0    |   |
| 134 | 31   | eP    | V   | 16 16 18.0 | 7.8S 106.8E h:66km.<br>Near coast of Java.                |

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