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No.63/1.

Jan Feb March April - Dec 1963 Jan - June

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN.

TOOLANGI

Reference 423
Jan - June 1963.

...ngitude: 145° 29' 26" E. Height: 604m.

...ed Silurian Sediments.

...iable Reluctance Seismometers, 3 components
...smometer periods: 1 sec.

...riod recorder
...vanometer period: 0.2 sec. nominal

Long period recorder
Galvanometer period: 14 sec.

Date 1963	Phase		Time (G.M.T.)	Per.	A_N	A_E	A_Z	Δ	Remarks
JANUARY			h. m. s.	s.				km	
1	eSKP	Z	04 27 40						USCGS: 6.9N 73.1W h = 151km
1	eP	NEZ	12 23 50½						USCGS: 6.8S 155.9E h = 165km
	ipP	Z	24 18½						
	iPP	NE	24 57						
	iX	N	25 45						
	iX	E	26 08½						
	iPcP	Z	26 37						
	eScP	Z	30 07½						
	eL	E	34.0 ..						
1	eP	Z	13 58 02						USCGS: 20.8N 144.6E h = 43km
1	eP	NEZ	16 34 46			+	-		USCGS: 20.0S 175.4W h = 130km
	iX	N Z	34 52						
	iX	NEZ	34 59						
	i(sP)	N Z	35 23						
	iPcP	Z	37 00						
	e X	N	37 56						
1	eP	NEZ	19 44 46						USCGS: 40.2S 81.3E h = 33km
	iX	Z	45 12						
	eL	NEZ	59.5 ..						
1	ePP	Z	23 57(25)						USCGS: 56.6N 157.7W h = 50km
	eX	EZ	58 00						
2	iP	NEZ	05 42 07½						USCGS: 17.4S 178.6W h = 540km
	eX	EZ	42 17						
2	eP	NEZ	15 02 54						USCGS: 4.1S 135.2E h = 33km
	iX	Z	03 32						
	iPPP	Z	04 27						
	iX	Z	06 46						
	iX	Z	07 08½						
	iS	N	08 29						
	iX	N	10 16						
	iX	Z	10 24						
	iL	NE	12 06						
2	iP	NEZ	16 06 22½						USCGS: 52.9S 118.2W h = 33km
	epP	Z	06 31½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JANUARY (cont'd)			h. m. s.	s.				km	
2	eP	NEZ	18 06 32						USCGS: 4.3S 135.2E h = 33km
	ePP	Z	07 49						
	iX	Z	14 39						
	iX	NE	15 50						
	iScS	Z	16 51½						
	eL	NEZ	18 35½						
2	iP	NEZ	18 37 17½						USCGS: 10.7S 160.0E h = 39km
	ipP	Z	37 28						
3	iP	EZ	02 00 39½						
	iS	Z	00 55½						
3	iP	NEZ	03 15 59½						USCGS: 29.7N 130.1E h = 33km
	ePcP	Z	16 30						
	iX	E	17 20½						
3	iP	NEZ	09 46 12½						USCGS: 5.3S 151.5E h = 74km
	iX	Z	46 24½						
	ipP	E	46 33½						
	iX	Z	47 10						
	iPP	N	47 26½						
	iPcP	N Z	49 13½						
	iX	Z	49 36						
	eX	Z	50 29						
	eS	N	51 28						
3	eP	Z	19 19 14						USCGS: 5.9S 155.0E h = 99km
4	eP	Z	05 39 17						USCGS: 4.7S 153.2E h = 162km
4	iP	NEZ	05 53 27						USCGS: 29.7N 142.2E h = 33km
	eX	Z	54 15						
4	iP	EZ	06 46 43½						
4	eX	Z	06 50 05						USCGS: 32.6S 178.6W h = 44km
4	iP	NEZ	08 30 39						
4	eP	NEZ	12 23 12						USCGS: 4.7S 154.0E h = 69km
	iX	N Z	23 47½						
	iX	Z	24 06						
	iPP	EZ	24 31						
	eX	Z	26 46½						
5	iP	NEZ	00 28 19						USCGS: 3.2N 127.0E h = 33km
	ipP	NEZ	28 28						
	iX	E	28 46						
	iX	N Z	29 33½						
	iPP	N Z	30 09½						
	iX	NE	31 26½						
5	iP	NEZ	00 34 50½						
5	iP	N Z	03 41 37½						USCGS: 3.4N 125.3E h = 126km
	esP	Z	42 14						
	iPP	N	43 35						
5	i(pP)	EZ	13 10 50						USCGS: 17.8S 167.9E h = 33km
	iX	N Z	11 04						
5	iP	NEZ	13 23 21¾		-	+	+		USCGS: 10.0S 124.0E h = 33km
	epP	N	23 32						
	iX	NE	24 20						
	iPP	E	24 30½						
	iX	NE	25 08½						
	iPcP	Z	25 52						
	eS	E	28 39						
	iX	Z	29 29½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JANUARY (cont'd)			h. m. s.	s.				km	
6	iP	N Z	03 27 17¾		-		+		USCGS: 6.0N 125.3E h = 143km
	iX	Z	27 35						
	ipP	N	27 52						
	iPP	Z	29 08						
	eX	N	29 16½						
6	iP	NEZ	04 48 35						
	iS	E	48 49½						
6	eP	NEZ	15 31 15						USCGS: 4.9S 153.8E h = 131km
6	iP	NEZ	19 53 47½		+	-	-		USCGS: 8.9S 123.8E h = 33km
	eX	N Z	54 50						
	iPP	NEZ	55 07						
	iPcP	Z	56 21						
	iX	Z	57 02						
	eX	Z	20 00 40						
	iX	NE	00 46½						
	iSS	N	01 17						
7	eP	NEZ	06 31 12						USCGS: 6.4S 154.7E h = 80km
	ipP	Z	31 27½						
	iPcP	Z	33 58						
7	iP	N Z	11 56 11½						USCGS: 0.6N 126.7E h = 42km
	iX	N Z	56 33						
	ePP	NEZ	57 46½						
	i(PPP)	N Z	58 33						
	eS	NE	12 02 33						
	eX	NE	05 48						
7	eP	EZ	18 36(34)						USCGS: 15.9S 173.0W h = 33km
7	eP	NEZ	19 25 33						USCGS: 17.5S 167.7E h = 19km
	eX	N	26 04						
	eX	Z	26 10						
	eS	N	30 14						
	eX	NE	31 45						
	e(PcS)	N	32 16						
	eX	N	34.0 ..						
	eScS	N	36 13						
8	eP	N Z	15 57 40						USCGS: 31.2N 130.2E h = 177km
	ePcP	Z	58 05						
9	iP	NEZ	02 09 00½						USCGS: 28.9S 177.4W h = 71km
	iX	Z	09 35½						
	iX	E	09 41½						
	iPP	Z	10 15½						
9	iP	NEZ	03 22 46		-		+		USCGS: 18.6N 145.4E h = 192km
	iX	Z	22 59½						
	ipP	N	23 30½						
	iPcP	Z	23 45						
	iSP	N	23 54½						
	iX	EZ	24 10½						
9	iP	NEZ	07 00 06						USCGS: 10.3S 124.0E h = 33km
	ipP	Z	00 17½						
	ePPP	Z	01 30½						
9	iP	NEZ	08 00 58						
9	iP	NEZ	21 22 59						USCGS: 4.3S 128.5E h = 174km
	iX	N Z	24 24½						
9	iP	NEZ	21 44 47¾			+	-		USCGS: 16.6S 174.8W h = 270km
	eX	N Z	45 13						
10	iP	NEZ	19 03 39½						USCGS: 13.1N 146.5E h = 61km

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JANUARY (cont'd)			h. m. s.	s.				km	
10	eP	EZ	20 21 41						USCGS: 4.2S 104.6E h = 211km
	eX	Z	22 45½						
11	eP	EZ	01 20 02						USCGS: 37.7N 101.6E h = 33km
11	eP	N Z	12 25 11						USCGS: 45.0S 75.7W h = 33km
	iPcP	NEZ	25 14						
11	iP	NEZ	17 11 40½						USCGS: 29.4S 178.6W h = 225km
	iX	NEZ	11 50½						
	iX	N Z	12 10½						
	iX	Z	12 30						
	iPcP	Z	14 30						
	eX	Z	14 40						
12	iPKP	Z	03 59 33½						USCGS: 4.8N 76.7W h = 102km
12	iP	NEZ	04 29 11						USCGS: 15.1N 120.5E h = 83km
	iX	Z	29 17						
	ipP	EZ	29 24½						
12	iP	NEZ	09 20 46						USCGS: 1.8N 129.3E h = 112km
	iX	N Z	20 56						
	iX	NEZ	21 04						
	ipP	Z	21 17½						
	iX	Z	21 38						
12	iP	NEZ	23 30 27½						USCGS: 7.1N 125.2E h = 84km
	eX	EZ	30 42						
	iX	N Z	31 02						
13	eP	NEZ	04 24(07)						USCGS: 15.7S 174.8W h = 236km
	iX	Z	24 14						
13	iP	NEZ	08 00 56¾		-		+		USCGS: 2.1N 125.4E h = 144km
	ipP	E	01 26						
	isP	Z	01 42½						
	iPP,PcP	Z	02 41½						
13	eP	Z	12 55 48						USCGS: 6.5S 149.3E h = 29km
	eX	Z	56 00						
13	iP	NEZ	13 49 26¾		-		+		USCGS: 14.0S 171.2E h = 634 km
	iX	NEZ	49 35						
	iX	Z	54 40						
13	iP	NEZ	16 25 22		+	-	+		USCGS: 49.7S 163.7E h = 33km
	iX	NEZ	25 25½						
	ipP	N Z	25 31½						
	iPP	N Z	25 40½						
	iPPP	Z	25 50½						
	eX	NEZ	26 17						
	iX	E	27 00						
	iX	Z	27 03						
	iS	NE	28 35						
	eT	NEZ	37.3						
	eT max.	NEZ	42.5						
14	iP	NEZ	06 32 20¼						
	iS	NE	32 37¼						
14	eP	N Z	09 56 42						USCGS: 12.2S 166.6E h = 145km
14	iP	NEZ	11 25 21½						USCGS: 21.2S 169.3E h = 33km
	esP	Z	25 35						
	ePP	EZ	25 55						
	iX	Z	27 17						
	eX	Z	28 19						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JANUARY (cont'd)			h. m. s.	s.				km	
15	eP	NEZ	02 41 38½						USCGS: 13.4N 145.3E h = 38km
	iX	Z	41 50½						
	iX	Z	42 28						
15	iP	NEZ	09 54 03½						USCGS: 10.6S 164.9E h = 89km
	ipP	Z	54 18½						
15	iP	NEZ	13 19 40½						USCGS: 24.9N 122.0E h = 47km
15	iP	NEZ	17 45 59						USCGS: 17.1S 179.6W h = 276km
15	iP	NEZ	19 32 54						USCGS: 20.5S 177.9W h = 496km
	iX	NEZ	33 09½						
	iX	EZ	33 13						
	iX	Z	33 17½						
	iX	EZ	33 41½						
	iX	EZ	33 52						
	ipP	Z	34 17½						
	iPP	NEZ	34 39½						
	iPcP	Z	35 07						
	iS	N	37 53½						
	iScP	EZ	38 04½						
16	eP	Z	03 23 41						USCGS: 54.0S 133.5W h = 33km
	iX	Z	23 50						
16	iP	NEZ	05 00 02						USCGS: 9.7N 93.9E h = 70km
16	eP	NEZ	21 16 08						USCGS: 11.1S 111.6E h = 94km
	iX	NEZ	16 13						
	iX	NEZ	16 18½						
	iX	EZ	17 49						
	iX	N Z	18 58						
	eL	N Z	30.0..						
17	iP	NEZ	05 14 36¾						
	iS	Z	14 52						
17	iP	NEZ	05 55 55½						
	iS	N	56 11						
17	iX	NEZ	07 19 52						
17	iP	NEZ	20 51 46				+		USCGS: 25.6N 125.2E h = 140km
	eX	NEZ	52 08						
18	iP	NEZ	03 22 40						USCGS: 33.1N 135.8E h = 425km
18	eP	NEZ	05 54 13½						USCGS: 32.0S 117.1E h = 35km
	iX	N Z	54 30						
	eX	NEZ	59 39						
	eX	NEZ	06 00 20						
	iX	NE	02 23						
20	iP	NEZ	19 09 04						USCGS: 10.1S 161.5E h = 97km
	ipP	Z	09 28½						
	isP	Z	09 34½						
	iX	N Z	09 59½						
21	iP	N Z	05 54 14						USCGS: 5.5S 149.0E h = 173km
21	eP	EZ	07 13 02						USCGS: 60.5S 27.2W h = 33km
21	iP	NEZ	09 52 58						USCGS: 19.7S 177.4W h = 543km
21	eP	NEZ	10 42 37						USCGS: 3.0S 136.2E h = 57km
	iX	N Z	42 58						
	iPP	NEZ	43 54½						
	iX	E	45 23½						
	iX	N	46 20						

Date 1963	Phase		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JANUARY (cont'd)			h. m. s.	s.				km	
21	iP	NEZ	12 03 05		+		-		USCGS: 2.7S 150.1E h = 50km
	ipP	NEZ	03 15½						
	eX	Z	03 35						
21	iP	NEZ	18 43 06½						USCGS: 18.0S 175.4W h = 64km
	eX	Z	44 06						
21	iP	NEZ	20 09 13½		+		-		
22	iP	NEZ	04 09 39½						
22	eP	NEZ	23 15 16						USCGS: 6.5S 146.6E h = 97km
23	iP	EZ	02 06 31						
24	iP	NEZ	09 36 31½			+	+		USCGS: 6.0S 112.6E h = 493km
	iX	Z	37 08½						
	iX	Z	37 16½						
	iX	Z	38 16½						
	iPP	NEZ	38 27½						
	iX	Z	41 01						
24	iP	Z	10 21 06½						USCGS: 10.1S 160.8E h = 33km
	iX	NEZ	21 11½						
24	iP	NEZ	12 16 53½				+		USCGS: 15.2S 173.6W h = 33km
	iX	NEZ	17 07½						
	iX	EZ	17 23½						
	iX	Z	18 28						
24	iP	NEZ	22 36 12						USCGS: 8.0N 126.8E h = 67km
	eX	NEZ	36 44						
	eX	NEZ	37 12						
	eX	Z	41 31						
	eS	NE	43 12						
	eSS	NE	46 47						
24	eP	NEZ	22 53 03						USCGS: 8.0N 126.6E h = 44km
24	eP	NEZ	23 30 46½						USCGS: 7.7N 126.0E h = 150km
	eX	NEZ	31 15½						
25	iP	NEZ	00 21 37½		+		-		USCGS: 20.3S 169.6E h = 135km
	ipP	Z	22 06						
	i(sP)	NEZ	22 27						
25	eP	EZ	04 19 17						USCGS: 8.0N 127.0E h = 70km
25	iP	NEZ	12 59 21½						USCGS: 21.8N 143.8E h = 190km
	iPcP	NEZ	13 00 10½						
	iX	EZ	00 40						
25	iP	N Z	14 38 36½						USCGS: 4.6S 147.4E h = 33km
25	iP	Z	16 20 09½						USCGS: 21.1S 179.2W h = 603km
25	eP	Z	17 04 04						USCGS: 17.5S 176.2W h = 33km
	iX	Z	04 07						
25	iP	NEZ	20 28 58						USCGS: 19.0S 173.3W h = 129km
	i(pP)	NEZ	29 17						
	i(sP)	Z	29 32½						
26	eP	NEZ	19 19 51						USCGS: 15.7S 172.9W h = 33km
	iX	Z	20 14						
27	iP	NEZ	01 17 28				-		USCGS: 25.6N 128.3E h = 61km
	ipP	Z	17 43						
	isP	Z	17 49½						
	iPcP	Z	18 09						
	iX	N Z	18 18						
27	iP	NEZ	06 14 29						

Date 1963	Phase		Time (G. M. T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JANUARY (cont'd)			h. m. s.	s.				km	
27	iP	NEZ	16 58 59						USCGS: 10.5S 165.0E h = 107km
27	iP	NEZ	18 52 43						USCGS: 5.2S 152.3E h = 72km
	ipP	EZ	53 03						
27	iP	NEZ	19 53 56						
	iX	NEZ	54 16½						
28	eP	NEZ	10 07 28						52.4S 159.6E h = 33km
	iPP	EZ	07 41½						
28	iP	NEZ	10 45 01½		+	+	−		USCGS: 19.0S 169.6E h = 200km
	iX	EZ	45 09½						
	eX	N Z	45 51						
28	iP	NE	12 02 45½						
	iS	EZ	02 59¼						
28	iP	NEZ	12 19 11		−		+		USCGS: 2.6S 149.9E h = 33km
	ipP	NEZ	19 22						
	isP	N Z	19 27						
	iX	Z	19 40						
	iX	EZ	20 00						
	iX	Z	20 17½						
	iPPP	N Z	20 49½						
	iPcP	Z	21 45						
	eS	NE	24 47						
	e(SSS)	NE	27 14						
28	iP	NEZ	13 56 44		+	+	−		USCGS: 19.7S 178.1W h = 587km
	iX	NEZ	56 54½						
	iX	Z	57 48						
	iPP	Z	58 31						
28	iP	EZ	16 13 33½						USCGS: 31.2S 177.7W h = 33km
	iX	NEZ	13 34½						
	ipP	Z	13 43½						
	iX	Z	14 01						
	iPcP	Z	16 32						
	eLq	Z	20 15						
	eL	NEZ	23.3..						
29	iP	NEZ	01 37 44½		+	+	−		USCGS: 21.8S 178.7W h = 120km
29	iP	NEZ	09 33 49½				+		USCGS: 49.7N 154.9E h = 126km
	iPcP	Z	33 57						
	iX	Z	34 05						
	ipP	N Z	34 25½						
	esP	Z	34 33						
29	iP	EZ	17 01 56½						USCGS: 15.2S 173.4W h = 33km
	ipP	EZ	02 13						
29	iP	NEZ	21 16 41½		+		−		USCGS: 12.9N 143.2E h = 144km
	iX	NEZ	16 54½						
	iX	N Z	17 19½						
	iX	Z	18 01						
30	iP	NEZ	06 16 22						USCGS: 00.2N 123.4E h = 33km
	iX	Z	16 48						
30	iP	NEZ	10 22 47						USCGS: 55.6S 28.3W h = 33km
	ipP	NEZ	22 58						
	i(sP)	EZ	23 06						
	iX	N Z	23 28						
	iX	EZ	25 01						
	iX	EZ	26 23½						
	eS	N	33 26						
	eScS	N	33 29						
	esS	NE	33 43						
	eX	N	35 00						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JANUARY (cont'd)		h. m. s.	s.				km	
31	iP N Z	05 17 33½						USCGS: 27.9N 126.3E h = 33km
	iX NEZ	17 36						
	iX EZ	17 54						
	i(PcP) N Z	18 13						
	iX Z	18 24½						
	i(PP) NEZ	20 20½						
	iS NE	26 28						
	e(PS) NE	27 02						
	i(SSS) E	34 11						
31	iP NEZ	16 28 11½						USCGS: 21.5S 178.1W h = 373km
	iX Z	28 29½						
31	iP NEZ	20 38 16						USCGS: 10.6S 165.2E h = 50km
	ipP Z	38 26						

(L.S. PRIOR)
A/CHIEF GEOPHYSICIST

COMMONWEALTH OF AUSTRALIA No. 63/2.

DEPARTMENT OF NATIONAL DEVELOPMENT

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203 Collins Street,
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SEISMOLOGICAL BULLETIN.

TOOLANGI

Latitude: 37° 34' 17" S. Longitude: 145° 29' 26" E. Height: 604m.

Foundation: Metamorphosed Silurian Sediments.

Instruments: Benioff Variable Reluctance Seismometers, 3 components
Seismometer periods: 1 sec.

Short period recorder
Galvanometer period: 0.2 sec. nominal

Long period recorder
Galvanometer period: 14 sec.

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY			h. m. s.	s.				km	
1	eP	EZ	08 55 27						USCGS: 30.6S 178.1W h = 54km
	epP	Z	55 39						
1	iP	NEZ	09 51 12¾		+		−		USCGS: 8.5S 159.1E h = 144km
	iX	Z	51 29½						
	i(pP)	N Z	51 55						
1	iP	NEZ	10 23 43½						USCGS: 3.0S 131.0E h = 33km
	ipP	EZ	23 53½						
1	i(P)	NEZ	21 00 13½						
1	i(P)	NEZ	21 59 57½						
2	iP	NEZ	04 58 05						USCGS: 16.2S 178.0E h = 33km
	eX	N Z	58 34						
2	iP	NEZ	07 57 48½						USCGS: 9.2S 120.2E h = 50km
	iX	N Z	57 56½						
	ipP	EZ	58 12						
2	eP	EZ	10 00 07						
2	iP	NEZ	11 55 38½			−	+		USCGS: 19.7S 174.6W h = 77km
	iX	NE	55 46						
	ipP	Z	55 55½						
2	eP	EZ	16 53 14						USCGS: 20.1N 121.7E h = 33km
3	iP	NEZ	01 53 52			+	−		USCGS: 23.9S 179.7W h = 500km
4	eP	NEZ	01 23 19½						USCGS: 6.3S 149.1E h = 36km
	epP	N Z	23 28						
	esP	Z	23 36						
	eX	Z	25 08½						
	eX	N	25 22						
	eX	N	29 26½						
4	eX	E	01 35 23½						
	eX	N Z	39.0 ..						
4	iP	NEZ	09 23 46½						USCGS: 17.4S 178.8W h = 552km
4	eP	N Z	15 09 54						USCGS: 17.3S 167.9E h = 33km
4	iP	Z	16 26 04						USCGS: 26.1N 124.1E h = 33km

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY (cont'd)			h. m. s.	s.				km	
4	iP	N Z	23 33 43½						USCGS: 48.5N 154.9E h = 85km
	iPcP	Z	33 51						
	ipP	N Z	34 03						
5	iP	NEZ	01 55 31		+		-		USCGS: 0.0 123.8E h = 164km
	iX	Z	55 46½						
	ipP	NEZ	56 03						
	iPP	EZ	57 21						
	iPPP	EZ	57 57½						
5	iP	NEZ	05 13 43						USCGS: 19.2N 147.1E h = 38km
	i(pP)	EZ	13 57½						
	iPcP	NE	14 42½						
5	eP	NEZ	19 35 31						USCGS: 31.9S 179.0W h = 68km
	ipP	NEZ	35 55						
	iPPP	Z	36 50						
	iPcP	Z	38 32						
	iScP	Z	42 04						
5	i(P)	NEZ	21 17 47						
	eL	NEZ	26.0 ..						
6	iP	NEZ	02 02 45½						USCGS: 7.9S 119.9E h = 306km
	iX	EZ	02 49½						
	iPP	NEZ	04 15						
	iPcP	Z	04 59½						
6	eiP	NEZ	02 37 20						USCGS: 6.8S 123.5E h = 637km
	iX	N	37 42½						
	ipP	EZ	39 06						
	iPcP	Z	39 28½						
6	e(P)	Z	03 50 13						
6	iP	NEZ	06 00 23½		+	+	-		USCGS: 18.1S 177.6W h = 500km
	iX	NEZ	00 32½						
	iX	Z	00 41½						
	iX	NEZ	00 51						
	ipP	Z	02 01½						
	eX	EZ	05 33						
6	iP	Z	10 27 09½						USCGS: 3.5S 146.0E h = 33km
	ipP	NEZ	27 18½						
	iPP	N Z	28 29½						
	iX	N Z	28 34						
	ePPP	N	28 45						
	ePcP	N	29 48						
6	iP	NEZ	12 52 00½		-	-	+		USCGS: 22.2S 171.8E h = 101km
	epP	Z	52 23½						
	iSP	NEZ	52 37						
	iPP	NEZ	52 48						
	iX	NEZ	52 54						
6	eP	Z	17 43 31						USCGS: 0.0 124.1E h = 110km
	ipP	Z	43 59						
	isP	Z	44 12						
6	eX	EZ	20 08 28						USCGS: 56.7S 28.8W h = 33km
6	eP	NEZ	20 59 27						USCGS: 17.7S 178.7W h = 459km
7	iP	NEZ	01 30 06¾			+	+	-	
	iX	NEZ	30 15						
	iX	Z	30 37						
	ePcP	Z	32 11						
	iS	NE	35 12½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY (cont'd)			h. m. s.	s				km	
7	eP	NEZ	02 13 48						USCGS: 8.2S 119.4E h = 51km
	ipP	NEZ	13 56						
	iX	N Z	14 22						
	eX	Z	15 07						
	iPcP	Z	16 05½						
7	iP	N Z	03 34 34½						USCGS: 59.6S 147.9E h = 33km
	iX	NEZ	34 39½						
	iX	Z	34 50						
	iPP	NEZ	34 58						
	iX	Z	35 06						
	iX	E	35 40						
	eX	Z	38 53						
7	iP	Z	05 55 24¾						Local.
	iX	NE	55 25						
	iX	Z	55 25½						
	iS	NEZ	55 41¼						
7	iX	EZ	14 02 11						
7	iP	NEZ	15 06 10						USCGS: 1.0N 99.1E h = 33km
7	eP	N Z	15 52 21						USCGS: 15.2S 173.6W h = 33km
	eX	Z	52 46						
7	eP	NEZ	17 14 57						USCGS: 26.5S 176.6W h = 33km
	eX	Z	15 45						
7	iP	NEZ	18 35 47						
8	iP	Z	00 14 13						USCGS: 3.6S 130.4E h = 60km
	eX	N Z	14 22						
	epP	EZ	14 35						
8	iP	Z	02 35 23						USCGS: 26.9S 176.7W h = 190km
	iX	NEZ	35 35						
	ipP	Z	36 10						
8	eX	Z	13 22 05						
8	iP	NEZ	18 23 53¾		+	+	−		USCGS: 12.9S 170.2E h = 628km
	iX	EZ	24 47						
	iX	Z	28 34						
9	iP	NEZ	05 56 23						USCGS: 7.3S 130.3E h = 220km
9	iP	NEZ	08 42 21¾		−		+		USCGS: 15.0S 167.4N h = 127km
	ipP	E	42 46						
	iPcP	Z	45 22½						
9	iP	NEZ	16 17 18½		+		−		USCGS: 43.7N 150.6E h = 33km
	eX	NEZ	17 51½						
9	iX	EZ	16 34 26						
9	iP	NEZ	17 00 21						USCGS: 35.9S 177.9E h = 172km
	iX	EZ	00 27½						
	iX	Z	00 40						
	eL	N	09.3 ..						
9	iP	NEZ	17 13 39						USCGS: 24.0S 179.1E h = 550km
9	iP	EZ	23 08 16						USCGS: 21.7S 176.9W h = 66km
10	iP	NEZ	07 44 34				−		USCGS: 17.3S 177.4W h = 343km
10	iP	NEZ	11 28 59½						USCGS: 14.1S 167.1E h = 132km
	iX	E	29 13						
10	iP	NEZ	21 48 02						USCGS: 44.6N 147.8E h = 67km
11	iP	NEZ	04 41 47½				+		USCGS: 29.8S 179.1E h = 528km
	iX	N Z	42 06½						
	iX	N	42 13½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY (cont'd)			h. m. s.	s.				km	
18	iP	NEZ	15 48 06¼		-		+		USCGS: 1.5N 125.8E h = 41km
	ipP	N Z	48 17½						
	iX	EZ	48 52½						
	iPcP	NEZ	49 57½						
19	i(P)	EZ	01 38 57						USCGS: 22.2S 171.4E h = 105km
19	eP	EZ	12 05 02						
	iX	EZ	05 12						USCGS: 6.2S 128.1E h = 370km
19	eP	NEZ	15 34 42						
	iX	EZ	35 12						
	ipP	EZ	35 49						
	iPP	NEZ	36 11						
	isP	EZ	36 45½						USCGS: 55.3S 28.8W h = 33km
19	eP	Z	16 51 59						
	iX	N Z	52 17½						
	iX	Z	52 24						
	iX	Z	52 30½						
	iX	NEZ	52 42						USCGS: 7.0S 121.2E h = 33km
20	eP	N Z	04 10 17						USCGS: 17.2S 178.2W h = 612km
20	iP	NEZ	06 52 39¾				-		
	iX	Z	52 58½						
20	iP	NEZ	07 45 10						USCGS: 22.3S 170.5E h = 33km
20	eP	Z	08 49 35						
	iX	NEZ	49 38						
	iX	NEZ	49 55						
	iX	N Z	50 07						
	iX	N	51 12½						USCGS: 45.7S 78.7W h = 33km
20	eP	N Z	17 20 21						
	iX	Z	20 31½						USCGS: 24.6N 122.1E h = 33km
20	eP	NEZ	19 51 12						
	ipP	EZ	51 30						USCGS: 33.4N 139.2E h = 168km
21	iP	NEZ	02 44 35½						USCGS: 20.6S 175.1W h = 33km
21	iP	NEZ	13 23 21½				+		
	ipP	N Z	23 34						
	iX	N Z	24 41½						USCGS: 20.5S 173.9W h = 29km
21	iP	NEZ	14 35 53			+	-		
	iX	NEZ	36 09½						
	iX	EZ	36 20						
	iX	Z	37 04						
	e(L)	NE	48.0 ..						USCGS: 17.8S 178.8W h = 550km
22	iP	NEZ	08 05 21¼		-	-	+		
	iX	N Z	05 46						
	iX	N Z	06 05½						
	iX	N Z	06 17						
	eX	Z	09 08						
	iS	NEZ	10 28						USCGS: 1.0S 125.8E h = 285km
22	iP	NEZ	10 14 08½						USCGS: 30.3S 178.6W h = 113km
22	iP	NEZ	11 11 47						
	eX	NEZ	11 57½						
	eX	Z	12 04						
	iX	EZ	14 41½						
22	i(P)	NEZ	18 12 32						
	iX	NEZ	12 38½						USCGS: 18.1N 71.3W h = 50km
22	iPKP2	Z	21 33 26						
	iPKP1	Z	33 35						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY (cont'd)			h. m. s.	s.				km	
23	iP	N Z	06 44 54						USCGS: 36.0S 102.5W 33km
	ipP	N Z	45 03½						
	iX	EZ	45 10½						
23	iP	NEZ	17 25 36						USCGS: 49.4N 158.6E h = 50km
	ipP	Z	25 45½						
23	iP	N Z	20 05 26						
	eX	N Z	05 40						
24	iPKP	Z	13 53 03½						USCGS: 14.6N 91.4W h = 135km
24	i(P)	EZ	17 41 52						
	iX	Z	42 03						
25	iP	NEZ	04 59 30¼				+		USCGS: 15.0N 122.7E h = 58km
	ipP	N Z	59 43						
	iX	EZ	05 00 04½						
25	iP	N Z	09 20 35½						USCGS: 10.4N 121.8E h = 46km
	ipP	Z	20 46						
	iX	Z	21 41½						
25	iP	NEZ	17 21 40¼		-	+	+		USCGS: 24.4N 123.3E h = 33km
	isP	NEZ	21 55½						
	iX	N Z	23 53						
25	eP	NEZ	23 55 05						USCGS: 15.5N 121.3E h = 38km
	iX	NEZ	55 12						
	iX	N Z	55 22						
	iX	N Z	55 34						
	iPcP	EZ	55 55						
	iX	NEZ	56 21						
26	iP	EZ	10 26 02						
26	iP !	NEZ	20 20 02¼		-		+		USCGS: 7.5S 146.2E h = 171km
	ipP	Z	20 36						
	ePP	N Z	21 08						
	iS	NE	24 47						
	isS	N	25 43						
	iSSS	N	27 11						
	eX	N	27 57						
	eX	N	33 10						
	eX	E	33 35						
27	eP	NEZ	04 36 21½						USCGS: 6.0S 149.4E h = 52km
	iX	Z	36 27½						
	iX	N Z	38 26½						
	iS	NE	41 23½						
	iX	NE	41 32½						
27	iP	EZ	05 14 38						
27	iP	N Z	05 30 19						
	iX	EZ	30 37½						
27	eP	EZ	07 42 13						USCGS: 16.2S 173.3W h = 37km
	iX	NEZ	42 15						
	iX	NEZ	42 32½						
27	eP	N Z	20 35 06						USCGS: 4.6S 152.9E h = 100km
	iX	N Z	35 20						
	iX	EZ	35 46						
	iPPP	N Z	36 42						
	eX	N Z	40 31						
27	iP	N Z	23 16 55½						USCGS: 6.2S 149.2E h = 59km
	ipP	N Z	17 20						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY (cont'd)		h. m. s.	s.				km	
28	iP NEZ	01 42 23						
	eX N Z	42 53						
	iX NE	42 56						
28	e(P) Z	05 49 21						
	iX Z	49 28½						

(L.S. PRIOR)
A/CHIEF GEOPHYSICIST.

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY (cont'd)			h. m. s.	s				km	
7	eP	NEZ	02 13 48						USCGS: 8.2S 119.4E h = 51km
	ipP	NEZ	13 56						
	iX	N Z	14 22						
	eX	Z	15 07						
	iPcP	Z	16 05½						
7	iP	N Z	03 34 34½						USCGS: 59.6S 147.9E h = 33km
	iX	NEZ	34 39½						
	iX	Z	34 50						
	iPP	NEZ	34 58						
	iX	Z	35 06						
	iX	E	35 40						
	eX	Z	38 53						
7	iP	Z	05 55 24¾						Local.
	iX	NE	55 25						
	iX	Z	55 25½						
	iS	NEZ	55 41¼						
7	iX	EZ	14 02 11						
7	iP	NEZ	15 06 10						USCGS: 1.0N 99.1E h = 33km
7	eP	N Z	15 52 21						USCGS: 15.2S 173.6W h = 33km
	eX	Z	52 46						
7	eP	NEZ	17 14 57						USCGS: 26.5S 176.6W h = 33km
	eX	Z	15 45						
7	iP	NEZ	18 35 47						
8	iP	Z	00 14 13						USCGS: 3.6S 130.4E h = 60km
	eX	N Z	14 22						
	epP	EZ	14 35						
8	iP	Z	02 35 23						USCGS: 26.9S 176.7W h = 190km
	iX	NEZ	35 35						
	ipP	Z	36 10						
8	eX	Z	13 22 05						
8	iP	NEZ	18 23 53¾		+	+	−		USCGS: 12.9S 170.2E h = 628km
	iX	EZ	24 47						
	iX	Z	28 34						
9	iP	NEZ	05 56 23						USCGS: 7.3S 130.3E h = 220km
9	iP	NEZ	08 42 21¾		−		+		USCGS: 15.0S 167.4N h = 127km
	ipP	E	42 46						
	iPcP	Z	45 22½						
9	iP	NEZ	16 17 18½		+		−		USCGS: 43.7N 150.6E h = 33km
	eX	NEZ	17 51½						
9	iX	EZ	16 34 26						
9	iP	NEZ	17 00 21						USCGS: 35.9S 177.9E h = 172km
	iX	EZ	00 27½						
	iX	Z	00 40						
	eL	N	09.3 ..						
9	iP	NEZ	17 13 39						USCGS: 24.0S 179.1E h = 550km
9	iP	EZ	23 08 16						USCGS: 21.7S 176.9W h = 66km
10	iP	NEZ	07 44 34				−		USCGS: 17.3S 177.4W h = 343km
10	iP	NEZ	11 28 59½						USCGS: 14.1S 167.1E h = 132km
	iX	E	29 13						
10	iP	NEZ	21 48 02						USCGS: 44.6N 147.8E h = 67km
11	iP	NEZ	04 41 47½				+		USCGS: 29.8S 179.1E h = 528km
	iX	N Z	42 06½						
	iX	N	42 13½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY (cont'd)			h. m. s.	s.				km	
12	iX	NEZ	00 36 58½						USCGS: 17.7N 122.3E h = 33km
	iPcP	NEZ	37 10½						
12	iP	NEZ	07 19 42½						USCGS: 21.7S 169.8E h = 30km
12	iP	Z	17 50 08						USCGS: 6.7S 147.1E h = 120km
12	iP	NEZ	18 49 30½				+		
	iX	EZ	49 41						
12	iP	NEZ	23 13 52				-		USCGS: 17.8S 178.6W h = 583km
	iX	Z	14 01½						
	iX	Z	14 28½						
	iX	Z	14 34						
	ipP,PP	Z	15 31						
	iX	N Z	15 45½						
	isP	E	16 41						
	iS	NE	18 57						
13	e(P)	Z	00 19 34						
	iX	EZ	19 35½						
13	iP	NEZ	09 00 45						USCGS: 24.5N 121.8E h = 33km
	iPcP	N Z	01 13½						
	iX	Z	01 26						
	iX	Z	03 01						
	iPP	Z	03 10						
	iS	NE	09 28½						
	eX	Z	10 08						
	eScS	N	10 35½						
	eX	E	11 36						
	eX	NE	13 10						
	eX	E	13 22						
	eSS	N	13 38						
13	eX	NEZ	09 20 10						
13	eP	NEZ	09 41 18						USCGS: 24.8N 121.7E h = 33km
13	iP	NEZ	18 20 10				+		USCGS: 9.9S 160.8E h = 29km
	iX	NEZ	20 13						
	iS	N	25 15						
	iX	N	27 55						
	M	NE	31.3						
13	iP	NEZ	23 55 59						USCGS: 19.6N 143.7E h = 156km
14	iP	NEZ	07 11 09		+		-		USCGS: 7.2S 128.2E h = 197km
	iX	NEZ	11 18						
	ipP	N Z	11 44½						
	isP	NE	12 02						
	iPPP	E	12 51						
	iS	NE	16 24						
14	e(P)	N Z	21 50(54)						
	iX	N Z	51 14						
14	eP	EZ	21 56(49)						USCGS: 22.1S 170.3E h = 33km
14	eP	NEZ	22 05(06)						USCGS: 22.0S 170.1E h = 47km
14	iP	N Z	22 14 19½		-		+		USCGS: 5.0S 144.6E h = 80km
	ipP	NEZ	14 35						
	iPcP	EZ	17 06						
	iX	N Z	17 26						
	eX	NE	17 52						
	iPcS	Z	20 48						
	eSSS	NE	21 53						
	eX	E	22 17						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY (cont'd)			h. m. s.	s.				km	
15	eP	Z	00 12(44)						USCGS: 22.2S 170.3E h = 33km
15	eP	EZ	00 54 50						USCGS: 33.2S 179.2W h = 42km
	ipP	Z	55 04						
15	eP	NEZ	05 45 35						USCGS: 22.0S 170.5E h = 33km
	i(PP)	N Z	46 10						
15	eP	EZ	07 02 05						
15	iP	EZ	07 20 41½						USCGS: 23.5S 180.0W h = 523km
15	iP	NEZ	16 39 37						USCGS: 4.3N 96.3E h = 33km
	iPcP	N Z	40 19						
15	iP	NEZ	18 38 13						USCGS: 15.4S 174.3W h = 140km
16	eP	NEZ	05 52 44½						USCGS: 5.7N 126.5E h = 133km
	iX	NEZ	52 46						
	ipP	EZ	53 15						
	iPP	N Z	54 33½						
16	iP	NEZ	08 37 43½		+	+	−		USCGS: 17.7S 178.6W h = 534km
	iX	N Z	38 14½						
	iX	NEZ	40 54						
	iS	N	42 50						
16	iP	NEZ	10 53 08½		+	−	−		USCGS: 7.0S 117.3E h = 561km
	iX	N Z	53 31½						
	iX	N Z	53 38						
	iX	NEZ	53 56½						
	iPcP	NEZ	54 59½						
	isP	N Z	55 54½						
	iX	Z	57 51½						
	iX	NEZ	58 19						
	eX	Z	58 54						
16	iP	N Z	12 19 45½						USCGS: 0.6S 147.5E h = 33km
16	i(P)	NEZ	13 22 34						
16	iP	NEZ	13 28 30½						USCGS: 19.9S 178.3W h = 562km
16	iP	NEZ	18 01 05½			+	−		USCGS: 17.8S 178.5W h = 564km
16	eP	NEZ	23 43 32						USCGS: 5.0S 144.5E h = 82km
17	eP	Z	02 42 23						USCGS: 24.1N 122.5E h = 33km
	ipP	Z	42 32						
	iX	N Z	42 41½						
17	e(P)	NEZ	04 17 15½						
	iX	N Z	17 19½						
	iX	N Z	17 41						
	iX	Z	17 52						
17	iP	N Z	06 59 53½						USCGS: 4.8S 144.2E h = 35km
	ipP	N Z	07 00 06½						
17	iP	EZ	16 00 09						USCGS: 23.7S 179.9E h = 540km
17	iP	NEZ	17 17 34						USCGS: 17.1S 176.7W h = 70km
	iX	Z	17 40						
17	iP	NEZ	19 32 20¼			+	−		USCGS: 23.9S 179.8W h = 520km
	iX	Z	32 43½						
17	iP	NEZ	22 19 57½						
17	iP	NEZ	23 01 38¼						Local.
	iS	NEZ	01 54						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY (cont'd)		h. m. s.	s.				km	
18	iP NEZ	15 48 06¼		-		+		USCGS: 1.5N 125.8E h = 41km
	ipP N Z	48 17½						
	iX EZ	48 52½						
	iPcP NEZ	49 57½						
19	i(P) EZ	01 38 57						
19	eP EZ	12 05 02						USCGS: 22.2S 171.4E h = 105km
	iX EZ	05 12						
19	eP NEZ	15 34 42						USCGS: 6.2S 128.1E h = 370km
	iX EZ	35 12						
	ipP EZ	35 49						
	iPP NEZ	36 11						
	isP EZ	36 45½						
19	eP Z	16 51 59						USCGS: 55.3S 28.8W h = 33km
	iX N Z	52 17½						
	iX Z	52 24						
	iX Z	52 30½						
	iX NEZ	52 42						
20	eP N Z	04 10 17						USCGS: 7.0S 121.2E h = 33km
20	iP NEZ	06 52 39¾				-		USCGS: 17.2S 178.2W h = 612km
	iX Z	52 58½						
20	iP NEZ	07 45 10						
20	eP Z	08 49 35						USCGS: 22.3S 170.5E h = 33km
	iX NEZ	49 38						
	iX NEZ	49 55						
	iX N Z	50 07						
	iX N	51 12½						
20	eP N Z	17 20 21						USCGS: 45.7S 78.7W h = 33km
	iX Z	20 31½						
20	eP NEZ	19 51 12						USCGS: 24.6N 122.1E h = 33km
	ipP EZ	51 30						
21	iP NEZ	02 44 35½						USCGS: 33.4N 139.2E h = 168km
21	iP NEZ	13 23 21½				+		USCGS: 20.6S 175.1W h = 33km
	ipP N Z	23 34						
	iX N Z	24 41½						
21	iP NEZ	14 35 53			+	-		USCGS: 20.5S 173.9W h = 29km
	iX NEZ	36 09½						
	iX EZ	36 20						
	iX Z	37 04						
	e(L) NE	48.0 ..						
22	iP NEZ	08 05 21¼		-	-	+		USCGS: 17.8S 178.8W h = 550km
	iX N Z	05 46						
	iX N Z	06 05½						
	iX N Z	06 17						
	eX Z	09 08						
	iS NEZ	10 28						
22	iP NEZ	10 14 08½						USCGS: 1.0S 125.8E h = 285km
22	iP NEZ	11 11 47						USCGS: 30.3S 178.6W h = 113km
	eX NEZ	11 57½						
	eX Z	12 04						
	iX EZ	14 41½						
22	i(P) NEZ	18 12 32						
	iX NEZ	12 38½						
22	iPKP$_2$ Z	21 33 26						USCGS: 18.1N 71.3W h = 50km
	iPKP$_1$ Z	33 35						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY (cont'd)			h. m. s.	s.				km	
23	iP	N Z	06 44 54						USCGS: 36.0S 102.5W 33km
	ipP	N Z	45 03½						
	iX	EZ	45 10½						
23	iP	NEZ	17 25 36						USCGS: 49.4N 158.6E h = 50km
	ipP	Z	25 45½						
23	iP	N Z	20 05 26						
	eX	N Z	05 40						
24	iPKP	Z	13 53 03½						USCGS: 14.6N 91.4W h = 135km
24	i(P)	EZ	17 41 52						
	iX	Z	42 03						
25	iP	NEZ	04 59 30¼				+		USCGS: 15.0N 122.7E h = 58km
	ipP	N Z	59 43						
	iX	EZ	05 00 04½						
25	iP	N Z	09 20 35½						USCGS: 10.4N 121.8E h = 46km
	ipP	Z	20 46						
	iX	Z	21 41½						
25	iP	NEZ	17 21 40¼		-	+	+		USCGS: 24.4N 123.3E h = 33km
	isP	NEZ	21 55½						
	iX	N Z	23 53						
25	eP	NEZ	23 55 05						USCGS: 15.5N 121.3E h = 38km
	iX	NEZ	55 12						
	iX	N Z	55 22						
	iX	N Z	55 34						
	iPcP	EZ	55 55						
	iX	NEZ	56 21						
26	iP	EZ	10 26 02						
26	iP !	NEZ	20 20 02¼		-		+		USCGS: 7.5S 146.2E h = 171km
	ipP	Z	20 36						
	ePP	N Z	21 08						
	iS	NE	24 47						
	isS	N	25 43						
	iSSS	N	27 11						
	eX	N	27 57						
	eX	N	33 10						
	eX	E	33 35						
27	eP	NEZ	04 36 21½						USCGS: 6.0S 149.4E h = 52km
	iX	Z	36 27½						
	iX	N Z	38 26½						
	iS	NE	41 23½						
	iX	NE	41 32½						
27	iP	EZ	05 14 38						
27	iP	N Z	05 30 19						
	iX	EZ	30 37½						
27	eP	EZ	07 42 13						USCGS: 16.2S 173.3W h = 37km
	iX	NEZ	42 15						
	iX	NEZ	42 32½						
27	eP	N Z	20 35 06						USCGS: 4.6S 152.9E h = 100km
	iX	N Z	35 20						
	iX	EZ	35 46						
	iPPP	N Z	36 42						
	eX	N Z	40 31						
27	iP	N Z	23 16 55½						USCGS: 6.2S 149.2E h = 59km
	ipP	N Z	17 20						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY (cont'd)		h. m. s.	s.				km	
28	iP NEZ	01 42 23						
	eX N Z	42 53						
	iX NE	42 56						
28	e(P) Z	05 49 21						
	iX Z	49 28½						

(L.S. PRIOR)
A/CHIEF GEOPHYSICIST.

TOOLANGI March '63

No.63/3.

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN

TOOLANGI

Latitude: 37° 34' 17" S. Longitude: 145° 29' 26" E. Height: 604m.

Foundation: Metamorphosed Silurian Sediments.

Instruments: Benioff Variable Reluctance Seismometers, 3 components
Seismometer periods; 1 sec.

Short period recorder
Galvanometer period: 0.2 sec.nominal

Long period recorder
Galvanometer period: 14 sec.

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MARCH			h. m. s.	s.				km	
1	iP	NEZ	04 46 00½						USCGS: 18.2S 177.9W h = 568km
	iX	NE	53 11½						
	iX	Z	53 16½						
	iX	N	54 29						
1	eP	Z	10 57 55						USCGS: 41.2N 142.9E h = 41km
1	e(P)	E	22 14(40)						Regional.
	iX	NE	14 51						
	iS	NEZ	15 38						
2	iP	N Z	01 41 20						USCGS: 6.5S 131.4E h = 33km
	ipP	NEZ	41 33						
2	iP	NEZ	05 45 45½						
	iX	Z	45 54						
2	eP	N Z	16 15 49						USCGS: 10.1N 126.1E h = 92km
	iX	N Z	15 57						
	ipP	Z	16 10						
2	eP	Z	21 57 17						USCGS: 7.1S 128.5E h = 47km
2	iP	NEZ	22 23 50½						USCGS: 17.1S 175.0W h = 240km
	iX	Z	24 04						
4	eP	EZ	05 15 32						USCGS: 16.1S 178.5E h = 33km
4	iP	NEZ	13 49 25						USCGS: 24.2N 121.7E h = 33km
	ipP	EZ	49 35						
	iX	EZ	49 43						
	iPcP	EZ	49 57½						
	iX	N Z	50 10½						
	ePPP	EZ	53 25						
	eS	N Z	58 13						
	eScS	NE	59 20						
4	eP	Z	15 32 56						
	iX	EZ	33 03½						
4	iP	NEZ	15 59 33						Approximately 03N 122E
	i(pP)	NEZ	59 46½						
	e(PP)	N Z	16 01 16						
	eX	Z	02 14						
4	iP	NEZ	19 09 50						USCGS: 19.3S 169.5E h = 43km
	ipP	NEZ	10 06½						
	eX	N Z	10 19						
	iX	N Z	11 14						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MARCH (cont'd)			h. m. s.	s.				km	
5	eP	N Z	02 12 40						
	eX	N Z	12 51						
5	iX	NEZ	05 03 31½						USCGS: 11.5N 140.6E h = 33km
5	iPKP	Z	07 23 51						USCGS: 4.5S 81.6W h = 33km
5	iP	NEZ	09 18 45¾				-		USCGS: 17.5S 178.6W h = 512km
	iX	Z	19 04½						
	iX	Z	19 30						
5	iX	EZ	09 46 48						USCGS: 9.8S 155.2E h = 60km
6	iP	NEZ	09 00 42¾						
	iS	NEZ	00 53½						
7	iP	NEZ	01 57 31						USCGS: 3.9S 131.1E h = 33km
	iX	N Z	57 38						
	i(pP)	NEZ	57 44½						
	iX	EZ	57 52						
	iX	Z	59 05						
7	iP	N Z	03 46 55						USCGS: 15.1S 168.2E h = 33km
7	iP	NEZ	05 34 20½						USCGS: 27.0S 113.5W h = 33km
	iX	Z	34 38						
	eX	NE	44 39						
	eX	E	50 22						
	eL	NEZ	06 00.3 ..						
7	iP	N Z	12 29 24½						USCGS: 44.3S 75.3W h = 45km
	iPcP	NEZ	29 28½						
	ipP	NEZ	29 36						
	isP	N Z	29 42						
7	iP	NEZ	15 15 32						
8	iP	NEZ	02 50 21						USCGS: 19.2S 169.7E h = 33km
	ipP	NEZ	50 33½						
	iX	N Z	50 38½						
	iPP	Z	51 08						
	eX	EZ	51 37						
	eX	EZ	59.0..						
8	iP	NEZ	03 30 44						USCGS: 19.2S 169.6E h = 49km
	ipP	Z	31 03½						
	iX	Z	31 41						
	iX	Z	32 25						
	iX	Z	34 21½						
	eX	N Z	39.0 ..						
8	iP	NEZ	03 38 52						USCGS: 19.3S 169.6E h = 33km
	iX	Z	39 08						
	eX	Z	39 12½						
	iX	Z	39 28½						
	iPP	N	39 45						
	eX	N Z	40 18						
	iX	Z	40 39						
	eX	NE	44 14						
	eX	Z	47.0 ..						
8	iP	EZ	11 40 31						
8	iP	EZ	14 06 32						USCGS: 21.8S 176.5W h = 137km
8	iP	NEZ	16 10 26						USCGS: 21.3S 170.2E h = 108km
	epP	N Z	10 48						
8	iP	EZ	18 32 58						
	iX	Z	33 08						
	iX	Z	34 10						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MARCH (cont'd)			h. m. s.	s.				km	
9	iP	NEZ	05 35 43						USCGS: 8.9N 126.3E h = 87km
9	iP	NEZ	16 30 31						USCGS: 3.2S 147.0E h = 33km
	iX	Z	30 36½						
	isP	Z	30 45						
	iX	Z	31 02						
	iX	Z	32 17½						
	eX	E	44 52						
9	iP	NEZ	17 04 55½						USCGS: 6.7N 123.9E h = 33km
	iX	Z	05 01½						
	iX	EZ	05 19						
9	e(P)	NEZ	19 02 35						
	iX	Z	02 49						
9	iP	NEZ	22 49 56						USCGS: 21.5S 179.0W h = 529km
	iX	Z	52 16						
10	iP	NEZ	01 25 31		-	-	+		USCGS: 15.2S 167.2E h = 142km
	iX	N Z	25 42½						
	isP	N Z	26 17						
	iPP	Z	26 36						
	iX	N Z	27 30						
	iX	Z	27 49						
	iPcP	EZ	28 32½						
10	iP	NEZ	01 32 20						
	iX	Z	32 51½						
10	iP	NEZ	03 04 17		-		+		USCGS: 24.7N 122.1E h = 33km
	iX	N Z	04 34						
	iX	N Z	05 13						
	ePP	EZ	06 39						
10	iP	NEZ	09 44 49½						USCGS: 16.0S 168.4E h = 283km
	iX	Z	45 01½						
	eX	N Z	45 13						
10	iP	NEZ	13 59 06						USCGS: 2.4N 126.6E h = 41km
	iX	Z	59 13½						
11	i(P)	EZ	03 32 43½						
11	iP	NEZ	03 33 34						USCGS: 17.1S 178.8W h = 540km
	iX	Z	33 43½						
	iX	Z	35 47½						
11	iP	NEZ	09 08 57¼		+	+	-		USCGS: 18.7S 177.6W h = 402km
	iX	N Z	09 16						
	iX	Z	09 27						
11	iP	NEZ	09 50 25						USCGS: 0.0S 130.4E h = 33km
	isP	N Z	50 39½						
12	iP	NEZ	20 46 29						USCGS: 7.1S 156.0E h = 97km
	iX	Z	46 44½						
12	iP	NEZ	22 36 41						
12	eP	NEZ	22 53 50						
	iX	Z	53 59½						
	iX	N Z	54 07						
	iX	N Z	54 14½						
	iX	NEZ	54 32						
	iX	Z	55 04½						
13	iP	NEZ	03 54 05						USCGS: 11.7S 160.9E H = 126km
	iX	Z	54 14						
	iX	Z	54 21						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MARCH (cont'd)			h. m. s.	s.				km	
14	iP	NEZ	02 00 42						USCGS: 25.6S 137.6E h = 33km
	iX	NEZ	00 45½						
	ipP	N Z	00 53						
	isP	NEZ	00 57						
	iX	N Z	01 49½						
	iX	Z	02 43½						
	iS	NE	03 11½						
	iX	EZ	03 20						
14	iP	NEZ	08 10 26½		+		−		USCGS: 19.0N 120.4E h = 51km
	iX	Z	10 35½						
	iX	EZ	10 50						
	iX	N Z	11 24						
	iX	Z	11 36						
14	eP	Z	23 21 48						USCGS: 5.9S 144.6E h = 33km
15	iP	NEZ	00 10 34		+		−		USCGS: 5.0S 129.6E h = 295km
	iX	N Z	10 54						
	eX	EZ	11 16						
	iX	Z	16 21						
15	iP	NEZ	00 24 36				+		USCGS: 8.4N 126.4E h = 117km
	iX	NEZ	24 48½						
	iX	NEZ	24 54						
	iX	N Z	25 30						
	ePP	N Z	26 38						
	eX	N Z	26 50						
	eX	NE	35 38						
15	iP	NEZ	00 51 16						
	iX	NEZ	51 27½						
	iX	Z	51 50						
15	iP	NEZ	03 40 35						USCGS: 24.9S 180.0E h = 573km
15	iP	NEZ	04 08 43						USCGS: 25.0S 179.6E h = 563km
15	eP	NEZ	11 04 02						USCGS: 17.5N 119.8E h = 33km
	iX	N Z	04 10						
16	iP	NEZ	03 47 31½						USCGS: 26.1N 92.8E h = 48km
	iX	EZ	47 41						
	iX	Z	48 03						
16	eP	NEZ	08 57 19						USCGS: 46.5N 154.7E h = 26km
	isP	N Z	57 31						
	iX	NEZ	57 39						
	iPP	N Z	09 00 39½						
	ePPP	Z	02 37						
	iS	N	07 46						
	iX	E	07 53						
	iX	NE	08 15						
	eX	N	08.7..						
	eM	N Z	34.0						
16	iP	NEZ	09 39 14¼						Local.
	iS	NEZ	39 29						
16	eP	EZ	13 25 40						USCGS: 20.8S 174.1W h = 33km
16	iP	EZ	21 47 28						USCGS: 20.7S 174.6W h = 33km
17	eP	Z	10 41 31						USCGS: 37.4S 78.2E h = 33km
18	e(P)	EZ	04 07 20						
	iX	Z	07 30						
	iX	EZ	08 41						
18	iP	NEZ	11 46 51½						USCGS: 7.6S 120.2E h = 33km
	i(pP)	NEZ	47 04						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MARCH (continued)		h. m. s.	s.				km	
18	iP NEZ	13 22 39½				-		
	iX Z	22 49						
	iX Z	23 16						
19	eP Z	05 52(21)						USCGS: 22.8S 170.5E 67km
19	eP EZ	14 47 37						USCGS: 22.6S 170.8E h = 33km
	ipP N Z	47 47						
19	eP EZ	19 16 46						USCGS: 8.3N 126.6E h = 109km
	iX NEZ	16 53						
	iX N Z	17 06						
	iX N Z	17 13½						
20	iP NEZ	04 49 18½						USCGS: 19.9S 179.1W h = 680km
	ipP Z	51 04						
	iX EZ	51 10						
	iS NE	54 07½						
20	iP NEZ	04 51 52½						USCGS: 19.6S 179.3W h = 680km
	ipP EZ	53 37						
	iX EZ	53 42½						
	iS NEZ	56 41½						
20	iP EZ	10 52 44½						USCGS: 15.8S 171.7W h = 33km
	iX Z	53 13						
20	iP NEZ	14 52 55						USCGS: 11.9N 93.1E h = 33km
	isP N Z	53 09						
20	eP N Z	16 45 51½						USCGS: 2.4S 138.4E h = 40km
	isP N Z	46 12						
	iPPP N Z	47 32½						
	iX E	48 08½						
	eX E	55 44						
	eX NE	57 39						
	eX NEZ	58 16						
21	eP Z	04 11 41						USCGS: 36.5N 140.9E h = 50km
	iX N Z	11 49½						
	ipP N Z	11 54½						
	isP Z	12 05						
22	iPcP NEZ	04 09 35						USCGS: 46.0N 148.4E h = 115km
22	eP NEZ	23 40 05						USCGS: 52.7S 137.4E h = 33km
	isP NEZ	40 14						
	ePP Z	40 20						
23	iP EZ	01 16 20						USCGS: 25.3S 179.2E h = 560km
	iX Z	16 55						
23	iP NEZ	08 58 13½		-		+		USCGS: 4.9S 145.7E h = 51km
	iX N Z	59 06½						
23	eP EZ	21 18 49						USCGS: 10.0S 113.8E h = 139km
23	eP Z	21 29 58½						USCGS: 2.4S 133.6E h = 130km
23	iP NEZ	23 39 28				+		
	iX N Z	39 43½						
24	iP NEZ	02 14 11				+		USCGS: 9.7S 120.4E h = 33km
	iX EZ	14 19½						
	iX NEZ	14 24						
	iX NEZ	14 39						
	iX Z	15 20½						
	iPcP NEZ	16 38½						
	eS NE	19 29						
	iX E	20 05						
	iX N	21 29						
	iX N	21 49						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MARCH (cont'd)			h. m. s.	s.				km	
24	eP	NEZ	05 36 50						
	iX	Z	36 59						
24	eP	Z	08 25 00						USCGS: 22.6S 170.8E h = 33km
24	eP	N Z	09 38 36						USCGS: 3.2S 146.8E h = 33km
	ipP	N Z	38 45						
	eX	E	51.0..						
24	iP	NEZ	09 52 09½						USCGS: 9.0N 125.6E h = 51km
	ipP	NEZ	52 22						
	iPP	N Z	54 14						
24									no time control between 1100 hours and 1300 hours.
24	eP	NEZ	18 28 05						USCGS: 14.9S 176.0W h = 320km
24	iP	NEZ	21 48 39				+		USCGS: 51.8N 178.1W h = 57km
	ipP	Z	49 02						
24	iP	N Z	22 05 39						
25	iP	NEZ	12 59 57						USCGS: 10.6S 120.4E h = 33km
25	iP	NEZ	20 21 20½						USCGS: 56.3S 149.9E h = 39km
	ipP	Z	21 32						
	ePP	NEZ	21 45						
	i(S)	E	25 05½						
	iX	E	26 10						
	iX	E	26 51						
	iX	Z	28 23						
25	iP	NEZ	22 56 16		+	-	-		USCGS: 7.0N 96.5E h = 30km
	ipP	NEZ	56 27						
	iX	Z	56 42½						
	iX	EZ	56 54						
	iPP	Z	58 25½						
26	iP	NEZ	09 54 39				-		USCGS: 29.7S 177.8W h = 45km
	iX	Z	55 17						
	iX	Z	56 02½						
	iS	NE	59 45						
	iScS	EZ	10 05 06						
26	iP	EZ	11 52 23				-		USCGS: 30.1S 177.4W h = 50km
	iX	Z	52 30						
26	iP	EZ	12 57 57½				-		USCGS: 29.9S 177.6W h = 60km
	ipP	N Z	58 11½						
26	iP	EZ	13 31 21½						USCGS: 29.8S 177.9W h = 42km
	iX	EZ	31 42						
	iS	E	36 34						
	iSS	Z	38 04						
	eSSS	N	38 36						
	eScS	Z	41 43						
26	iP	NEZ	19 59 52½						USCGS: 44.4N 146.7E h = 110km
26	eP	NEZ	21 46 13						USCGS: 36.0N 135.7E h = 33km
	iX	N Z	46 17						
	ePP	N Z	48 59						
26									very heavy microseisms.
27	iP	N Z	14 28 38¼						Local.
	iX	NEZ	28 39						
	iS	NE	28 50½						
	iX	Z	28 51¼						
	iX	E	28 52¼						
	iX	Z	28 53½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MARCH (continued)			h. m. s.	s.				km	
27	iP	NEZ	20 35 27				+		
	iX	NEZ	35 43½						
27	e(P)	EZ	21 45 47½						
	iX	Z	46 01½						
	iX	Z	46 11						
28	iPKP	Z	00 35 41¼						USCGS: 66.4N 019.5W 15km
	ipPKP	NE	35 44						
	iX	Z	36 14½						
	iX	Z	36 50½						
28	i(P)	Z	00 46 15						
	eX	NEZ	46 58						
	eX	EZ	47 23						
	eX	E	58 42						
28	iP	NEZ	01 36 33				+		USCGS: 16.0S 131.9E h = 33km
	eX	EZ	38 02						
	iX	Z	38 07½						
	Surface waves emerging at 01 33 and lasting for approximately 53 min.								
28	iP	NEZ	11 18 49			-	+		USCGS: 30.2S 177.8W h = 38km.
	ipP	EZ	18 59						
	iX	N Z	19 14						
	iX	NEZ	19 23						
	iPcP	Z	21 43						
	iScP	Z	25 19½						
	e(L)	E	28.5..						
28	iP	NEZ	15 20 59½						USCGS: 10.2N 126.2E h = 60km
	iX	Z	21 08½						
	isP	Z	21 24						
	iX	Z	21 40						
28	iP	EZ	23 35 35						USCGS: 29.6S 177.5W h = 54km
	iX	NEZ	35 42						
	iX	EZ	36 01½						
	iX	Z	36 16						
	iPcP	Z	38 25						
	e(L)	NE	44.0..						
29	iP	NEZ	00 10 49¼		-	+	-		Local.
	iS	Z	11 00¾						
29	iP	NEZ	01 46 39½						USCGS: 28.2S 177.9W h = 33km
29	eP	NEZ	06 11 32½						USCGS: 10.3S 160.7E h = 32km
	ipP	Z	11 43						
	iX	Z	12 01						
29	iP	NEZ	21 22 59½				-		USCGS: 30.2S 177.7W h = 60km
	iX	NEZ	23 01½						
	ipP	Z	23 19½						
	iPcP	Z	25 53						
29	iP	NEZ	21 58 21½						Regional.
	iX	NEZ	59 52						
	iX	NEZ	22 00 47						
	iX	E	01 06						
30	e(P)	EZ	00 27 19						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MARCH (continued)			h. m. s.	s.				km	
30	iP	NEZ	01 59 03		+	+	-		USCGS: 19.1S 169.1E h = 160km.
	iX	EZ	59 16						
	eX	EZ	59 45						
	iPP	Z	02 00 02						
	iS	NE	03 32						
	iX	N	03 51						
	iSS	N	05 03						
	iScP	Z	05 44						
	iScS	E	09 36						
30	iP	NEZ	17 04 12½						USCGS: 44.2N 148.0E h = 33km
	isP	N Z	04 29						
	iX	N Z	04 43						
	iX	Z	08 37						
30									Power failure from 19 00 hrs. on 30th to 01 30 hrs. on 31st. Heavy microseisms.
31	eP	NEZ	02 28 41						Regional.
	eX	NEZ	28 52						
	eX	NEZ	29 25						
	eX	NEZ	29 39						
31	eP	NEZ	05 37 07½				-		USCGS; 29.9S 177.7W h = 48km
	iX	NEZ	37 13						
	ipP	N Z	37 20						
	isP	NEZ	37 27						
	iX	NEZ	37 46½						
	iPPP	Z	38 32						
	iPcP	Z	40 06½						
	iS	NEZ	42 14						
	esS	N Z	42 34						
	iSSS	N	44 32						
	eX	Z	45.9						
31	iP	NEZ	07 13 54¼				-		USCGS: 6.1S 149 E h = 60km
	ipP	Z	14 09						
	esP	N Z	14 16						
	iX	Z	14 35						
	i(PP)	NEZ	15 15						
	ePPP	NEZ	15 25						
	iPcP	Z	16 50						
	iS	NE	19 02						
	eX	NE	19 21						
	iSS	E	20 57						
	iX	N	21 48						
	iX	NEZ	23 22						
31	iP	EZ	08 19 03½						USCGS: 29.7S 176.9W h = 60km.
	iX	Z	19 13						
31	iP	NEZ	09 13 37½			-	+		USCGS: 30.1S 177.7W h = 48km
	iX	EZ	13 47						
	iX	EZ	14 05½						
	iX	Z	14 19						
	iX	Z	14 24						
	iPcP	Z	16 32						
31	eP	NEZ	17 38 52						USCGS: 8 N 096.6E h = 33km
	ipP	NEZ	39 02						
	iX	N Z	39 24						
	iX	Z	39 54						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MARCH (continued)		h. m. s.	s.				km	
31	iP NEZ	19 29 09½				+		USCGS: 30.0S 178.0W h = 50km
	isP EZ	29 28½						Heavy microseisms.
	iX Z	29 41						
	iX N Z	29 58½						
	iPP Z	30 23						
	ePcP Z	32 00						
	iX E	33 13						
	eX N	36 30						

(L.S. PRIOR)
A/CHIEF GEOPHYSICIST.

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN

TOOLANGI

Latitude: 37° 34' 17" S. Longitude: 145° 29' 26" E. Height: 604m.

Foundation: Metamorphosed Silurian Sediments.

Instruments: Benioff Variable Reluctance Seismometers, 3 components
Seismometer periods: 1 sec.

Short period recorder
Galvanometer period: 0.2 sec. nominal

Long period recorder
Galvanometer period: 14 sec.

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
APRIL 1963			h. m. s.	s.				km	
1	iP	NEZ	02 26 15		-		+		USCGS: 6.0S 149.0E h = 64km
	ip	NEZ	26 28						
	isP	Z	26 35½						
	iX	N	26 49						
	iX	N	27 03						
1	i(P)	NEZ	02 33 47						
	eX	EZ	34 16						
1	iP	NEZ	03 57 49						USCGS: 13.0S 167.1E h = 213km
1	iP	N Z	04 40 39						USCGS: 44.8N 141.1E h = 255km
	iX	Z	40 48						
1	iP	NEZ	07 08 58						
1	eP	N Z	08 37 03						USCGS: 29.2S 176.6W h = 38km
1	iP	EZ	15 06 30						
1	iP	Z	20 02 37						
2	iP	NEZ	03 39 21½						USCGS: 31.0S 177.6W h = 33km
	isP	EZ	39 34						
	eX	Z	40 08						
	iX	Z	40 35						
2	eP	NEZ	04 49 55						USCGS: 29.7S 177.1W h = 51km
	iX	Z	50 03						
	isP	EZ	50 14						
	iX	EZ	50 24½						
	iPcP	Z	52 44						
2	iP	NEZ	05 04 49						USCGS: 6.1S 149.1E h = 65km
	ipP	Z	05 01½						
2	eP	Z	05 11 30						USCGS: 29.7S 177.0W h = 36km
2	eP	NEZ	05 27 04						USCGS: 31.1S 177.5W h = 33km
	iX	Z	27 11						
2	i(P)	NEZ	10 44 26						
2	iP	NEZ	11 31 47						USCGS: 30.1S 177.1W h = 48km
	iX	Z	32 03						
2	iP	NEZ	11 44 28						USCGS: 5.8S 105.0E h = 91km
	ipP	Z	44 45½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
APRIL (continued)			h. m. s.	s.				km	
2	eP	NEZ	16 10 44						
	iX	Z	10 54						
	eX	NEZ	11 11						
	eX	Z	14 57						
2	iP	Z	16 32 14						USCGS: 53.2N 171.7W h = 142km
	iX	Z	32 27						
	ePP	Z	36 14						
	iX	Z	37 31						
2	i(P)	N Z	16 48 50						
2	iP	NEZ	19 09 30¾						Local.
	iS	NEZ	09 43¼						
3	iP	NEZ	01 29 34						USCGS: 14.7S 176.4W h = 33km
	ipP	N Z	29 44						
3	iP	NEZ	01 40 39		+	−	−		USCGS: 9.2S 123.9E h = 33km
	iPP	EZ	41 56						
	iX	Z	42 19						
	iX	Z	42 56						
	iX	N Z	47 47						
	iX	Z	48 39						
	eL	E	48 58						
3	iP	NEZ	11 28 12				−		USCGS: 29.6S 177.2W h = 48km
	isP	Z	28 40						
3	eP	Z	12 08 14						USCGS: 19.1N 121.4E h = 71km
3	iP	EZ	14 57 47½						USCGS: 55.4S 128.2W h = 33km
	e(S)	NE	15 05.9						
3	iP	Z	15 24 54				+		USCGS: 6.1S 149.1E h = 61km
3	iP	NEZ	19 00 02		+		−		USCGS: 25.2S 179.5W h = 409km
3	iP	Z	19 09 46½						USCGS: 14.4N 146.7E h = 33km
4	eP	Z	13 53 51						USCGS: 21.2N 119.5E h = 19km
4	iP	NEZ	18 32 04½						USCGS: 30.2S 177.6W h = 20km
	isP	Z	32 18						
	iX	Z	32 33						
	iX	Z	32 40½						
4	eP	NEZ	22 07 21						USCGS: 30.3S 177.6W h = 6km
	iX	Z	07 27						
	ipP	Z	07 30						
	iX	Z	07 37						
4	iP	Z	23 34 09						USCGS: 30.2S 177.8W h = 33km
	ipP	Z	34 18½						
5	iP	NEZ	02 32 30						USCGS: 30.2S 177.7W h = 33km
	epP	NEZ	32 38						
	iX	Z	32 48						
5	iP	N Z	05 40 13½						
5	eP	NEZ	06 59 18						USCGS: 1.6S 099.4E h = 33km
	eX	N Z	59 42						
5	eP	NEZ	10 56 24						USCGS: 30.1S 177.2W h = 44km
	esP	Z	56 42						
	iX	Z	57 07						
6	iP	NEZ	02 43 21½		−	+	+		USCGS: 1.7N 124.9E h = 38km
	ipP	Z	43 32						
	iX	Z	43 43½						
	iX	Z	44 05						
	iPP	Z	45 10½						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
APRIL (continued)		h. m. s.	s.				km	
6	iP NEZ	02 58 12						USCGS: 5.1S 145.5E h = 57km
	ipP Z	58 27						
	iX N Z	58 45						
6	eP EZ	05 40 32						USCGS: 30.3S 177.0W h = 33km
	ipP EZ	40 43						
	eX N Z	40 52						
	iX NEZ	41 02						
6	iP ! NEZ	07 09 33		+	+	-		USCGS: 17.5S 178.9W h = 529km
	iX Z	09 58						
	iX EZ	10 17½						
	iX N Z	10 54						
	ipP Z	11 06						
	iX Z	11 25						
	iScP Z	14 36						
	iS NE	14 39½						
6	eP N Z	15 02 26						
6	iP NEZ	15 16 01½						USCGS: 30.2S 177.9W h = 33km
6	eX N Z	18 08 15						USCGS: 32.1S 178.1E h = 197km
	esP Z	08 54½						
	iX Z	11 22½						
6	i(P) EZ	21 25 17						
6	iP N Z	21 41 47½						USCGS: 6.0S 149.9E h = 49km
	ipP N Z	41 58						
	iX N Z	42 32½						
	iPcP Z	44 33½						
6	iP NEZ	23 43 05¼				-		USCGS: 7.2S 132.6E h = 33km
	iX Z	43 24½						
	iX N Z	44 14						
7	iP NEZ	04 04 10½						USCGS: 24.5S 177.0W h = 114km
	iX NEZ	04 26						
	ipP NEZ	04 39						
	iPcP Z	06 43						
7	iP Z	13 15 52½						USCGS: 25.0N 125.1E h = 124km
7	iP NEZ	15 18 20½						USCGS: 27.0N 129.2E h = 33km
	ipP NEZ	18 29½						
	iX N	19 32½						
7	eP Z	15 41 23						USCGS: 53.7N 170.1W h = 202km
7	eP NEZ	22 44 57						USCGS: 4.9S 103.2E h = 72km
	epP NEZ	45 13						
	iPcP Z	46 14						
	iX E	50 02						
	iScP Z	50 06						
	iS NEZ	52 08						
	isS NEZ	52 35						
	eX NE	54 41						
	eX NE	55 00						
	eX Z	55 26						
	eX N	56 26						
	eSSS Z	57 26						
	M EZ	23 09.0						
8	iP NEZ	06 31 41						USCGS: 5.5S 130.1E h = 33km
	eX NEZ	32 09						
	ePPP Z	33 21						
	eX N Z	38 37						
	eX N Z	38 58						
	eX EZ	39 06						
	eX Z	40 06						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
APRIL (continued)			h. m. s.	s.				km	
8	eP	Z	08 02 36½						USCGS: 18.8S 168.5E h = 33km
	epP	Z	02 48						
8	ePKP	Z	14 59 33						USCGS: 27.7N 44.3W h = 33km
8	eP	NEZ	20 57 11						USCGS: 10.4S 161.4E h = 33km
	ipP	Z	57 23						
8	eP	EZ	22 43 20						USCGS: 24.7S 179.8E h = 424km
9	iP !	NEZ	02 08 51		+	+	-		USCGS: 17.7S 178.7W h = 538km
	iX	N Z	09 52						
	ipP	Z	10 24						
	iX	N Z	10 41						
	iX	NEZ	10 56						
	iS	N	13 56½						
9	eP	Z	04 38 16½						USCGS: 17.8S 168.0E h = 35km
9	eP	Z	15 00 46						USCGS: 4.0S 151.0E h = 33km
9	iP	Z	18 51 04						USCGS: 10.5W 122.6E h = 55km
	iX	Z	51 30						
9	eP	NEZ	23 04 09						USCGS: 11.6S 166.1E h = 64km
	ipP	NEZ	04 24						
	iX	NEZ	04 29						
10	iP	NEZ	03 42 55				-		
10	eP	Z	07 57 11						USCGS: 9.2S 125.0E h = 33km
	ipP	N Z	57 20						
	isP	NEZ	57 24						
	iPPP	N	58 40						
	iX	E	08 10 11						
	eX	NE	04 28						
	eX	N	08 42						
	eX	NE	09 09						
	M	N Z	12.6						
10	iP	NEZ	11 46 42½		+		+		USCGS: 3.6N 148.1E h = 108km
	iX	Z	47 00						
	iX	Z	47 29						
11	eP	NEZ	03 06 34½						USCGS: 1.8S 120.0E h = 33km
11	eP	Z	09 40 28½						USCGS: 9.9S 116.2E h = 33km
	esP	NEZ	40 43						
11	eP	Z	19 26 26						USCGS: 17.9S 175.3W h = 171km
12	eP	NEZ	00 54 40½						USCGS: 31.9N 78.8E h = 33km
12	eP	NEZ	08 47 05½						USCGS: 39.0S 176.7E h = 106km
	iX	NEZ	47 19						
	ePPP	N Z	47 54						
	eX	NE	51 44½						
	eX	Z	52 07						
	M	NE	55.5						
12	eP	NEZ	16 44 03½						
12	eP	EZ	20 56 00½						USCGS: 16.7S 173.7W h = 33km
13	eP	Z	03 27 40½						USCGS: 19.2S 175.8W h = 222km
13	eP	Z	03 44 14						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
APRIL (continued)			h. m. s.	s.				km	
13	eP	NEZ	14 38 15½						USCGS: 3.4S 135.4E h = 31km
	ipP	NE	38 25						
	isP	NEZ	38 31						
	iX	N Z	39 50						
	iPcP	NEZ	40 51						
	eX	N	44 08						
	iX	Z	49 28						
	M	E	51.4						
13	eP	EZ	22 13 18½						USCGS: 31.5S 179.6E h = 421km
14	iP	NEZ	00 59 46½						
14	iP	NEZ	03 20 46¼			+	−		
14	iP	NEZ	05 38 47¾			+	−		USCGS: 31.4S 177.8W h = 33km
	ipP	Z	38 57						
	esP	E	39 01						
	iPcP	EZ	41 44						
14	eP	EZ	09 48 05						
14	eP	Z	13 20 50						USCGS: 5.4S 154.2E h = 142km
15	eP	Z	03 09 52½						
15	iP	N Z	15 08 20¾				−		USCGS: 4.0S 129.0E h = 148km
	epP	Z	08 52						
15	iP	Z	20 26 55½						USCGS: 0.9S 128.0E h = 33km
15	eP	NEZ	23 47 02						USCGS: 18.3S 173.7W h = 33km
	iX	NEZ	47 19						
16	eP	NEZ	01 36 52½						USCGS: 0.8S 128.0E h = 33km
	iPP	Z	38 27½						
	iX	N Z	39 45						
	iX	NEZ	43 12½						
16	iP	NEZ	01 44 28½						USCGS: 1.2S 128.4E h = 33km
16	eP	NEZ	02 02 45½						USCGS: 0.7S 128.0E h = 32km
16	iP	NEZ	03 39 58¼						USCGS: 1.1S 127.9E h = 33km
	ipP	N Z	40 08						
	iX	Z	40 25						
16	eP	NEZ	03 54 05½						USCGS: 0.9S 127.8E h = 33km
	eX	Z	54 14						
	iX	Z	54 26						
16	iP	NEZ	04 11 43						USCGS: 0.3S 127.6E h = 33km
16	eP	NEZ	04 17 48						USCGS: 0.8S 128.9E h = 33km
16	eP	Z	05 26 09						
16	eP	NEZ	05 27 51						
16	iP	NEZ	05 38 26						USCGS: 18.4S 177.7W h = 557km
16	iP	NEZ	05 43 49¼				−		
16	iP	NEZ	06 35 22½				+		USCGS: 1.6S 127.8E h = 53km
16	eP	Z	07 48 31						USCGS: 1.1S 129.5E h = 33km
16	eP	NEZ	07 53 07						USCGS: 0.0 127.6E h = 33km
16	eP	NEZ	09 18 01½						USCGS: 0.9S 128.5E h = 33km
	ePP	N Z	19 39						
16	iP	NEZ	12 11 16		−		+		USCGS: 1.0S 127.6E h = 33km
	esP	N Z	11 30						
	eX	N	11 38						
	eS	NE	17 22						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
APRIL	(continued)	h. m. s.	s.				km	
16	eP NEZ	18 33 56						
16	eP NEZ	20 08 15						USCGS: 1.3S 128.9E h = 33km
	iX Z	08 19						
	eX NEZ	09 45						
	ePP Z	09 56						
17	eP NEZ	01 17 45½						USCGS: 0.6S 128.1E h = 89km
	iX NEZ	17 48½						
	ipP NEZ	18 03						
	ePP Z	19 22						
	iX N Z	19 40						
	eS N	23 50						
17	iP NEZ	02 18 07½						USCGS: 19.6S 178.6E h = 33km
	iPP N Z	19 21						
	iPPP EZ	19 44						
	eS NE	23 34						
17	eP NEZ	04 10 43						USCGS: 1.0S 128.3E h = 33km
17	iP NEZ	08 31 12½						USCGS: 15.7S 174.1W h = 124km
	iX E	31 24						
	epP Z	31 43						
17	eP NEZ	10 27 41						USCGS: 1.1S 128.0E h = 33km
17	iP EZ	12 21 09½						USCGS: 18.4S 173.8W h = 33km
17	eP EZ	17 09 55½						USCGS: 3.5S 135.4E h = 39km
17	iP NEZ	18 37 14½						USCGS: 54.9S 28.2W h = 26km
	ipP Z	37 26						
18	iP NEZ	01 58 14¼			+	−		USCGS: 20.3S 177.7W h = 530km
18	eP NEZ	02 44 45						USCGS: 0.7S 128.4E h = 116km
18	iP NEZ	02 56 38						
18	iP NEZ	06 49 49			+	−		
18	e(P) EZ	11 29 34½						
18	iP NEZ	16 53 23½						
18	iP NEZ	22 08 36						USCGS: 1.3S 128.8E h = 33km
	iX NEZ	08 48½						
	ePP Z	10 08						
18	eP NEZ	22 17 20½						USCGS: 1.7S 128.1E h = 63km
	iX Z	17 33						
	iPP N Z	18 43½						
19	iP NEZ	03 54 21½						USCGS: 9.8S 120.5E h = 33km
	iX EZ	54 30						
	eX NEZ	54 43						
	iPP Z	55 46						
	iPPP N Z	56 08						
	iPcP Z	56 49½						
19	eP Z	07 48 00						USCGS: 35.8N 96.9E h = 33km
	iX N Z	48 03						
	eX NEZ	48 20						
	eX N Z	48 59						
	iX N Z	49 23½						
	eSKS NE	58 27						
	eX N	59 16						
	eX N	08 00 23						
19	iP NEZ	10 13 57						
19	iP NEZ	16 30 13½				+		USCGS: 58.8S 26.0W h = 99km
	iX N Z	30 21						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
APRIL	(continued)		h. m. s.	s.				km	
19	iP	N Z	16 36 19½						USCGS: 1.3S 128.8E h = 33km
	iPP	NEZ	37 53½						
19	iP	NEZ	22 50 37				-		USCGS: 29.9S 177.7W h = 41km
	iX	Z	50 45						
20	iP	NEZ	01 15 26½				+		USCGS: 1.2S 128.9E h = 28km
	iX	NEZ	15 31						
	iX	Z	16 10						
	iPP	NEZ	16 58						
20	iP	NEZ	23 23 26½						
21	iP	Z	01 05 13½						USCGS: 16.6S 178.3W h = 33km
	epP	Z	05 23						
21	iP	NEZ	04 49 01						USCGS: 24.1N 122.1E h = 33km
	ipP	NEZ	49 11						
	isP	N Z	50 15						
	iX	N Z	51 15½						
	iPP	Z	51 24						
	iX	E	52 34½						
21	iP	NEZ	05 28 15½						
21	iP	N Z	09 27 47						USCGS: 26.8N 128.5E h = 28km
	iX	Z	27 54½						
21	eP	NEZ	10 45 14½						USCGS: 3.2S 146.9E h = 33km
	eX	N Z	45 40						
	iPPP	N	46 43						
	iX	N Z	46 53						
	eX	Z	48 39						
21	iP	N Z	21 25 37½						USCGS: 0.9S 128.1E h = 33km
	iX	Z	25 50½						
21	iP	NEZ	23 24 18						USCGS: 1.5S 128.7E h = 33km
	iPP	Z	25 47						
22	iP	NEZ	01 54 41		+		-		USCGS: 7.0S 129.2E h = 135km
	iX	Z	55 04						
	iX	EZ	55 34						
	iX	N Z	55 49						
	iPP	NEZ	56 02						
	iX	NEZ	02 00 12						
22	iP	NEZ	07 31 50¾			+	-		USCGS: 29.9S 177.6W h = 33km
	iX	N Z	32 11						
	iX	NEZ	32 22						
	ePcP	Z	34 41						
	iX	Z	34 59						
22	eP	NEZ	08 36 56						USCGS: 5.1S 154.1E h = 132km
	isP	Z	37 39						
22	iP	NEZ	15 14 11				+		USCGS: 19.8S 175.4W h = 53km
	eiP	Z	14 21½						
23	iP	NEZ	02 51 23½						USCGS: 11.4S 165.9E h = 97km
	iX	N Z	51 35½						
	iX	Z	52 06½						
23	iP	Z	07 32 01						USCGS: 60.7S 24.7W h = 33km
	ipP	Z	32 11½						
23	iX	EZ	10 06 56						USCGS: 25.7N 99.5E h = 33km
23	iP	N Z	11 46 19						USCGS: 12.2N 125.7E h = 30km
	iX	Z	46 39½						
	eX	Z	47 00						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
APRIL (continued)			h. m. s.	s.				km	
23	iP	NEZ	15 39 16¼		+	+	−		USCGS: 17.8S 178.7W h = 533km
	iX	Z	39 25½						
	iX	N	39 43						
	eX	Z	39 46						
23	iP	NEZ	18 58 42½						USCGS: 5.1S 146.1E h = 134km
	eX	Z	59 16						
	esP	N Z	19 00 26						
	iPcP	Z	01 27						
24	iP	NEZ	04 02 26						USCGS: 17.2S 174.5W h = 190km
	iX	NEZ	02 37½						
24	iP	NEZ	05 23 27¾						Local.
	iS	NEZ	23 44½						
24	iP	NEZ	05 59 19½				−		USCGS: 1.1S 127.2E h = 33km
	iX	NEZ	59 26						
	ipP	NEZ	59 28½						
	iX	Z	59 49½						
24	iP	NEZ	13 42 53						USCGS: 27.0N 128.8E h = 33km
	ipP	NEZ	43 05						
24	eP	EZ	15 15 12						USCGS: 30.1S 177.8W h = 33km
24	eP	NEZ	20 54 36						USCGS: 20.8S 179.1W h = 603km
24	iP	NEZ	21 48 53½						
	iX	Z	49 06						
	iS	EZ	53 43						
	iScP	Z	53 58						
25	iP	N Z	08 20 36¾		−	+	+		USCGS: 4.7N 122.4E h = 610km
	iX	N Z	20 54½						
	iX	EZ	21 06½						
	iX	NEZ	21 14						
	iX	NEZ	22 32						
	iX	EZ	22 34						
	eS	N	26 47½						
25	eP	EZ	11 22 15						USCGS: 4.3N 62.4E h = 33km
25	eP	Z	11 30 17						USCGS: 31.7N 140.5E h = 53km
	iX	Z	30 22						
25	iP	NEZ	16 43 24½		+		−		USCGS: 1.3S 128.7E h = 33km
	ipP	N Z	43 34						
	iPP	NEZ	44 53						
	iX	Z	45 46						
25	iP	NEZ	17 56 46			+	−		USCGS: 21.6S 178.0W h = 380km
	iX	Z	57 21						
	iX	Z	57 56						
26	iP	NEZ	08 25 49						USCGS: 18.0S 173.8W h = 18km
26	i(P)	NEZ	12 20 23½						USCGS: 24.1N 122.5E h = 33km
26	iP	Z	23 55 41½						
	isP	N Z	55 54						USCGS: 15.9S 173.9W h = 100km
27	iP	Z	08 41 22						USCGS: 00.6S 128.4E h = 33km
27	eP	NEZ	08 50 32						
	ipP	Z	50 41						
	iX	Z	50 51						
	iPP	Z	52 07½						
	i(P)	Z	58 19½						
	iX	E	58 36						
27	iP	NEZ	11 18 06¾			−	+	+	USCGS: 22.8S 68.9W h = 100km
	iX	EZ	18 17						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
APRIL	(continued)	h. m. s.	s.				km	
28	iP NEZ	01 58 38½						USCGS: 1.1S 128.5E h = 26km
28	iP NEZ	14 22 35½		-		+		USCGS: 17.6S 178.5W h = 505km
	iX EZ	22 50						
	iX Z	23 01						
28	eP EZ	15 33 02						USCGS: 17.6S 174.5W h = 60km
28	iP N Z	18 19 45						USCGS: 9.8S 160.3E h = 30km
29	eP Z	01 27 02						USCGS: 7.9S 158.7E h = 72km
29	iP NEZ	04 24 27						Local.
	iS NEZ	24 43						
29	eP Z	05 14 15						USCGS: 23.9N 121.6E h = 118km
	eX Z	14 30						
29	iP N Z	14 57 39						USCGS: 63.9S 159.5E h = 33km
	isP NE	57 53½						
	iX Z	58 04						
30	iP N Z	01 05 52						USCGS: 00.7S 129.0E h = 33km
	iX NEZ	05 55						
	epP NEZ	06 02						
	iX N Z	06 07½						
	iPP N Z	07 27						
	iX Z	07 33						
	iS NE	11 53						
30	iP Z	02 43 35						USCGS: 7.3N 126.5E h = 34km
30	eP EZ	08 33 39						USCGS: 17.1S 175.1W h = 219km
	Heavy microseisms 25-30th April.							

(L.S. PRIOR)
A/CHIEF GEOPHYSICIST

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN.

TOOLANGI

Latitude: 37° 34' 17" S. Longitude: 145° 29' 26" E. Height: 604m.

Foundation: Metamorphosed Silurian Sediments.

Instruments: Benioff Variable Reluctance Seismometers, 3 components
Seismometer periods: 1 sec.
Short period recorder
Galvanometer period: 0.2 sec. nominal
Long period recorder
Galvanometer period: 14 sec.

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	△	Remarks
MAY 1963			h. m. s.	s.				km	
1	iP	NEZ	10 08 55				-		USCGS: 19.0S 169.0E h = 140km
	records badly fogged on 1st May								
2	eX	N Z	02 05 05						
3	eX	Z	01 08 34						
	eX	Z	08 48						
3	iP	NEZ	06 49 00¾						Local.
	iS	NEZ	49 07						
3	iP	NEZ	11 02 38½						USCGS: 15.0S 173.3W h = 33km
	isP	N Z	02 51						
4	iP	NEZ	01 54 17						
4	iP	NEZ	18 28 04						USCGS: 54.4S 144.0E h = 33km
	ipP	NEZ	28 13						
	iPPP	NEZ	28 30						
4	iP	NEZ	19 14 21						USCGS: 56.1S 027.1W h = 33km
	iX	Z	14 29						
5	iP	NEZ	03 56 42						USCGS: 19.8S 177.0W h = 33km
5	iX	N Z	05 30 05						
5	iX	NEZ	06 04 13½						
5	e(P)	Z	08 30 25						
5	iP	NEZ	17 19 24½						USCGS: 17.5S 173.7W h = 33km
	iX	NEZ	19 35						
	iX	NEZ	19 46						
5	i(P)	N Z	20 19 22½						
6	eX	EZ	03 10 53						
6	iP	EZ	08 46 10						USCGS: 9.1S 112.5E h = 84km
	iX	NEZ	46 11½						
	iX	EZ	46 27½						
	iX	N Z	46 34						
	iX	Z	47 18						
6	iP	NEZ	09 21 34						USCGS: 9.9S 160.6E h = 76km
	iX	N Z	21 44						
6	iX	NEZ	14 05 07½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MAY	(continued)		h. m. s.	s.				km	
6	eX	N Z	14 36 28						
	eX	N Z	36 41						
7	iP	NEZ	02 00 53¾						Local.
	iS	NEZ	01 00½						
7	iP	NEZ	05 10 22						USCGS: 18.8N 145.5E h = 93km
7	eX	EZ	13 09 26						
8	iP	NEZ	10 31 45						USCGS: 36.6N 141.0E h = 53km
	ipP	NEZ	32 03½						
	iPP	NEZ	33 41						
	iX	Z	34 23½						
	iPPP	N Z	34 54						
	iX	N Z	35 07						
8	iP	NEZ	15 32 22½						USCGS: 5.3N 125.7E h = 70km
	iX	Z	32 31½						
	iX	NEZ	32 35½						
	iX	Z	32 56						
	iX	NEZ	33 10½						
	iX	NEZ	34 21						
8	iP	NEZ	19 22 58½			+	−		USCGS: 17.2S 175.0W h = 199km
	iX	N Z	23 12½						
8	eP	Z	21 38 02						USCGS: 32.1N 141.5E h = 39km
	ePcP	Z	38 23						
9	eX	N Z	06 24 13						
9	iP	Z	11 34 33½						USCGS: 31.7N 142.3E h = 33km
9	iPKP	Z	15 22 50						USCGS: 12.7N 86.6W h = 33km
9	eP	Z	19 39 46						USCGS: 52.3S 27.5E h = 33km
	iX	N Z	39 53½						
10	iP	NEZ	04 34 16¾				−		USCGS: 20.0S 168.1E h = 33km
	ipP	EZ	34 27½						
	iPP	NEZ	34 55						
	iX	Z	35 17½						
10	iP	EZ	10 35 49½						USCGS: 21.5S 178.5W h = 175km
10	eP	Z	11 21 25						USCGS: 8.4S 67.6E h = 33km
	iX	EZ	21 31½						
10	e(P)	NEZ	15 40 38						
10	ePKP	Z	22 41 40						USCGS: 2.2S 77.6W h = 33km
	iX	Z	41 57						
	iX	N Z	42 05½						
	iX	Z	43 27½						
10	eX	EZ	22 51 26						
11	eX	NEZ	01 24 17						
11	i(P)	Z	03 10 35						
11	iX	N Z	03 41 46½						
11	iP	NEZ	04 51 17½						USCGS: 15.4S 177.1W h = 400km
	iX	N Z	51 36						
	ipP	N Z	52 41						
11	e(P)	EZ	07 04 18½						
	eX	Z	06 03						
11	iP	NEZ	07 56 10¼				−		USCGS: 17.9S 178.5W h = 590km
	iX	EZ	56 19						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MAY (continued)		h. m. s.	s.				km	
11	eP Z	18 00 22½						USCGS: 24.2N 122.5E h = 33km
	iX N Z	00 28						
	iX N Z	00 50						
	iX NEZ	01 09½						
	iX Z	01 17						
	iX Z	01 32						
11	iP Z	19 56 38						USCGS: 34.9S 108.2W h = 33km
12	iP NEZ	09 47 50		+		+		USCGS: 57.5S 159.4E h = 44km
	iX Z	48 00						
	iX N Z	48 09½						
	iPP N Z	48 19						
	iX EZ	49 18½						
	iX N	50 10½						
	iX NE	52 08½						
12	iP N Z	19 29 17						USCGS: 3.4S 146.9E h = 33km
	iX Z	29 33½						
13	iP EZ	07 16 19½						USCGS: 25.7S 179.6E h = 453km
13	iP NEZ	10 21 57½						
	iX EZ	22 08½						
13	ePKP Z	13 02 53						USCGS: 14.5N 92.9W h = 60 km
13	iP NEZ	14 13 19¼				-		USCGS: 19.5S 169.3E h = 163km
	iX EZ	13 32						
13	iP NEZ	22 54 26½						USCGS: 6.0S 150.1E h = 94km
	iX EZ	54 35						
	iX Z	54 41½						
	iX Z	55 12½						
14	iX NEZ	00 17 03½						
14	iP NEZ	15 15 09¾		+		-		USCGS: 5.6S 127.8E h = 405km
	iX N Z	15 40½						
	iX N Z	16 39½						
	iPcP Z	17 27						
14	eP EZ	18 02 33½						USCGS: 30.2S 177.7W h = 33km
14	iP NEZ	23 21 26						USCGS: 4.1S 152.8E h = 58km
	iX NEZ	21 37						
	isP N	21 53						
	iX NEZ	22 01½						
15	iP N Z	02 30 54½						USCGS: 45.8S 074.8W h = 33km
15	eP N Z	02 59 22						USCGS: 3.4S 146.8E h = 33km
	eSSS E	03 07.3						
15	No time marks from 10 58 onwards.							
16	No time marks till 05 00 hours.							
16	i(P) EZ	06 20 29						
	iX NEZ	20 37						
16	iP EZ	09 07 44						USCGS: 30.9S 177.2W h = 53km
16	iX EZ	14 01 35						
16	iP N Z	15 59 51½						USCGS: 00.8S 128.5E h = 50km
	iX N Z	16 00 00½						
	isP N Z	00 08						
	eX Z	01 19						
	iX N Z	08 31						
	iX EZ	08 38						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MAY (continued)			h. m. s.	s.				km	
16	iP	NEZ	16 25 31						USCGS: 1.0S 128.8E h = 33km
	isP	N Z	25 44						
	iX	N Z	25 55						
	eX	N Z	26 17						
16	iP	NEZ	19 26 34		+	+	−		USCGS: 17.6S 178.7W h = 510km
	iX	Z	26 48						
	eX	Z	27 05						
17	eX	NEZ	04 19 03						USCGS: 45.3N 150.8E h = 33km
	iX	NEZ	19 20						
17	iP	NEZ	06 19 04						USCGS: 15.7N 120.1E h = 80km
	ipP	NEZ	19 24						
	isP	NEZ	19 35						
17	iP	EZ	07 38 48						USCGS: 31.0S 179.8W h = 358km
	iX	EZ	38 58						
	iX	Z	44 50						
17	iP	Z	12 21 06						USCGS: 41.7N 141.9E h = 47km
17	eX	Z	17 23 29						
	iX	N Z	23 45						
	iX	Z	24 03						
17	eP	Z	21 38 23						USCGS: 0.8S 128.8E h = 231km
	iX	Z	38 36						
	iX	Z	39 07						
17	iP	NEZ	22 46 47						USCGS: 24.4S 177.2W h = 70km
	iX	EZ	47 01						
	isP	EZ	47 19						
	iX	Z	47 51						
18	i(P)	NEZ	02 04 15						
18	iP	NEZ	12 28 04						USCGS: 0.8S 128.8E h = 231km
	iX	NE	28 15						
	iX	Z	28 27						
	ipP	N Z	28 56						
	iX	Z	33 48						
	iX	Z	34 59						
18	iP	NEZ	13 11 04						USCGS: 8.2S 115.7E h = 68km
	iX	NEZ	11 17						
	iX	EZ	11 44						
18	iX	NEZ	13 40 42						
19	iP	NEZ	01 15 55						USCGS: 46.5S 075.1W h = 33km
	isP	NEZ	16 08						
	iX	N Z	16 35						
	iS	NE	26 30						
	isS	NE	26 47						
	eX	N	27 52						
	iX	E	28 14						
19	eP	Z	11 10 28						USCGS: 1.5N 126.0E h = 106km
19	iP	NEZ	18 39 19						
19	iP	NEZ	19 29 06						USCGS: 2.3N 128.6E h = 166km
19	No time marks from 21 08 hours.								
16th-20th	time control not very accurate, times could one second either way.								
20	No time marks till 01 37 hours.								
20	iP	NEZ	05 20 30						USCGS: 10.4S 161.7E h = 90km.

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MAY	(continued)		h. m. s.	s.				km	
20	iP	NEZ	11 44 15½						USCGS: 30.7S 178.3W h = 34km
	isP	Z	44 29						
	iX	EZ	44 36						
	iX	Z	44 46						
	iPPP	EZ	45 33						
	iPcP	Z	47 11						
	iS	NEZ	49 15						
	iX	NE	49 39						
	iScP	Z	50 51½						
	iX	E	50 59						
	eX	N	51 16						
	iScS	NEZ	54 46						
	iX	E	55 11						
20	iP	NEZ	13 48 52½		+	-	-		
	iX	NEZ	49 04						
	iX	Z	49 28						
20	eP	EZ	21 12 42						USCGS: 2.5N 128.8E h = 148km
	iX	Z	12 52						
21	eP	EZ	17 36 30						USCGS: 11.1S 163.3E h = 33km
	ipP	EZ	36 39½						
	iX	N Z	37 05½						
	iX	Z	37 19						
22	eP	NEZ	02 34 08						USCGS: 11.3S 163.2E h = 60km
22	iP	NEZ	14 09 25						USCGS: 48.6N 154.7E h = 22km
	isP	NEZ	09 38½						
	iX	Z	09 46½						
	iX	N Z	10 07						
	iX	EZ	10 20½						
22	eP	NEZ	15 50 59						USCGS: 4.3N 127.9E h = 58km
	iX	N Z	51 05½						
22	iP	NEZ	22 00 35						USCGS: 8.2S 115.7E h = 33km
	esP	NEZ	00 47						
	iX	NEZ	00 57½						
	iX	Z	01 16						
	iX	Z	01 45						
	iX	EZ	02 49						
	iS	NEZ	06 40						
	iX	NE	09 41						
23	eP	NEZ	00 59 40						USCGS: 1.6N 126.4E h = 33km
	iPP	N Z	01 01 22						
23	eP	NEZ	01 59 14						
23	iP	NEZ	03 40 40		-		+		USCGS: 15.0S 176.7W h = 279km
	iX	Z	40 52						
	ePP	Z	42 13						
	iX	NE	46 28½						
	eX	N	48 39						
	eX	N	49 14						
	eM	NEZ	55.7						
23	eP	Z	03 58 19						
23	iP ?	Z	04 09 48½						
23	iP	NEZ	05 37 55						USCGS: 7.9S 115.3E h = 33km
23	iP	NEZ	06 36 02						
23	iP	NEZ	07 06 44						USCGS: 18.4N 145.2E h = 478km
	eX	Z	06 56						
	iX	Z	08 30						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MAY (continued)		h. m. s.	s.				km	
23	iP NEZ	07 54 16						USCGS: 11.2S 163.3E h = 171km
23	iP N Z	08 00 44						USCGS: 11.0S 163.2E h = 61km
	iX Z	00 55						
	isP Z	01 09						
23	eP N Z	08 03 37						
	iX N Z	03 53						
	iX Z	04 05						
23	eP Z	08 48 15						USCGS: 20.7S 177.9W h = 477km
23	eP Z	12 09 43						USCGS: 44.7S 75.7W h = 33km
23	iP NEZ	15 20 30						USCGS: 6.0N 126.1E h = 88 km
	iX N Z	20 46						
	ePP NEZ	22 22						
	eX EZ	22 33						
	eX N Z	22 46						
24	iP Z	20 58 18						USCGS: 22.8S 179.6W h = 566km
24	eP EZ	21 24 41½						USCGS: 24.5S 179.7E h = 649km
25	eP Z	08 53 12½						USCGS: 42.7N 144.3E h = 80km
	ipP Z	53 34½						
25	eP NEZ	16 20 36½						USCGS: 56.8S 25.0W h = 29km
	ipP N Z	20 45½						
	iX NEZ	20 54½						
	iX N Z	30 12½						
	eX NE	31 19½						
25	iP N Z	16 56 07¾						USCGS: 20.7W 120.9E h = 33km
	isP Z	56 20½						
25	eM NE	18 59.5						
25	eP Z	20 08 18½						USCGS: 31.8N 141.3E h = 111km
25	eP Z	22 23 57½						USCGS: 37.1S 179.5E h = 33km
26	iP NEZ	00 07 22¼						USCGS: 19.7S 174.3W h = 33km
	iX NEZ	07 29½						
	iX Z	07 40½						
	iX N Z	07 54½						
26	iP Z	02 17 04½						
26	iP NEZ	02 36 55½		+	−	+		
26	eP N Z	02 57 42½						USCGS: 1.5S 127.3E h = 33km
	eX N Z	57 47						
26	eP Z	06 49 37						
26	iP NEZ	09 43 07						USCGS: 17.9S 178.5W h = 560km
26	eP EZ	11 05 48						USCGS: 16.0S 173.8W h = 33km
26	eP ? Z	17 46 04½						
26	iP Z	23 20 10½						USCGS: 55.2N 159.9E h = 47km
	eS N	31 18						
26	iP NEZ	23 41 06½						USCGS: 7.2S 128.8E h = 293
	iX NEZ	42 29½						
27	eP Z	04 11 59						USCGS: 55.3N 160.1E h = 54km
	eS N	23 08½						
27	eP N Z	16 27 40½						USCGS: 00.6S 130.1E h = 33km
28	iP NEZ	07 07 17¾						USCGS: 18.6S 177.8W h = 602km

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MAY (continued)			h. m. s.	s.				km	
28	eP	N Z	21 47 44						USCGS: 12.5N 142.1E h = 33km
	iX	N Z	47 50						
29	iP	NEZ	01 08 38½		+	+	-		USCGS: 18.1S 178.0W h = 472km
	iX	Z	09 07½						
29	iP	NEZ	08 34 11		+	+	-		USCGS: 17.7S 178.8W h = 512km
	iX	Z	34 21						
29	eP	EZ	10 46 19						
29	iP	NEZ	11 05 38		+	+	-		USCGS: 18.0S 178.0W h = 550km
	iS	NEZ	10 43½						
29	eP	Z	13 09 38½						USCGS: 22.1S 169.6E h = 33km
29	iP	EZ	13 43 53½						
29	eP	Z	18 10 02						USCGS: 16.3S 174.3W h = 64km
29	iP	NEZ	22 44 23½						
	iX	NEZ	44 32						
	iX	N Z	45 26						
	eX	N	51 04						
	iX	N Z	51 39						
	iX	E	52 13						
29	iX	N Z	23 19 32½						
30	iP	NEZ	03 11 20¼		-	-	+		USCGS: 18.3S 178.3W h = 450km
	eX	N	11 30½						
30	iP	EZ	05 40 29						USCGS: 26.1S 178.3W h = 610km
30	iP	N Z	07 00 00						USCGS: 54.2S 143.7E h = 33km
	iX	N Z	00 08						
	iX	NEZ	00 16						
	iPPP	Z	00 30						
	eS	E	03 11						
	eSS	EZ	03 34						
	iX	NE	04 08						
	iX	NE	04 37						
30	iP	N Z	17 12 08						USCGS: 28.9N 141.5E h = 39km
30	eP	N Z	19 10 18						USCGS: 59.4S 26.9W h = 33km
30	iP	Z	20 37 25½						USCGS: 22.6S 176.2W h = 60km
31	iP	NEZ	12 07 32						USCGS: 20.1S 175.9W h = 136km
31	iX	N Z	13 07 00						
31	iP	NEZ	14 14 14½						USCGS: 30.6S 178.1W h = 60km
	iX	N Z	14 24						
	ipP	N Z	14 29½						

(L.S. PRIOR)
A/CHIEF GEOPHYSICIST

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN.

TOOLANGI

Latitude: 37° 34' 17" S. Longitude: 145° 29' 26" E. Height: 604m.

Foundation: Metamorphosed Silurian Sediments.

Instruments: Benioff Variable Reluctance Seismometers, 3 components
Seismometer periods: 1 sec.

Short period recorder
Galvanometer period: 0.2 sec. nominal

Long period recorder
Galvanometer period: 14 sec.

Milne Shaw Seismograph, EW component
Period: 12 sec.

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JUNE 1963			h. m. s.	s.				km	
1	eP	NEZ	00 06 43½						
	iX	Z	06 53						
	iX	Z	07 01½						
1	i(P)	NEZ	02 28 50½						
1	iP	Z	09 30 25½						USCGS: 20.3S 176.5W h = 33km
1	iP	EZ	12 38 54½						USCGS: 15.0S 172.4W h = 33km
	isP	Z	39 08½						
1	iP	EZ	19 43 50						USCGS: 0.1N 123.1E h = 145km
1	eP	Z	21 13 46						USCGS: 22.2S 169.6E h = 35km
	iX	NEZ	13 50½						
1	iP	EZ	21 21 46½				+		USCGS: 15.2S 173.5W h = 33km
	iX	NEZ	21 49						
	iX	N Z	22 04						
	eX	Z	22 15½						
	eX	EZ	35.7						
2	iP	NEZ	10 06 35½						USCGS: 6.1S 154.4E h = 49km
	ipP	N Z	06 46½						
	iX	N Z	06 56						
	iX	EZ	07 27						
	i(PcP)	EZ	09 14						
	eX	E	16.3..						
	eX	N Z	18.4..						
2	iP	NEZ	21 13 13½						USCGS: 32.8S 179.0W h = 56km
	esP	Z	16 43						
3	iP	EZ	04 50 38						USCGS: 19.1S 177.8W h = 510km
3	iP	EZ	07 25 17						USCGS: 21.0S 175.6W h = 37km
	ipP	EZ	25 27						
3	eP	Z	07 47 12						USCGS: 34.2N 138.7E h = 43km
	eX	N Z	47 15½						
3	iPKP	Z	11 51 02½						USCGS: 5.3N 72.9W h = 21km
	iX	Z	51 14						
	iX	Z	54 28½						
3	iP	NEZ	18 55 13½						USCGS: 29.5S 177.8W h = 49km

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	△	Remarks
JUNE	(continued)		h. m. s.	s.				km	
4	iP	NEZ	03 10 04½						Local.
	iS	NEZ	10 21						
4	iP	NEZ	03 21 41½				+		USCGS: 6.9S 124.8E h = 408km
	iX	EZ	23 19						
4	iP	NEZ	12 00 26½				+		USCGS: 30.5S 177.8W h = 33km
	ipP	NEZ	00 35						
	iX	EZ	00 50						
	iX	N Z	00 58½						
	iX	EZ	03 30						
	eX	E	09.0 ..						
4	iP	EZ	13 12 14½						USCGS: 30.4S 177.6W h = 33km
	iX	Z	12 36						
	iPcP	Z	15 08½						
4	iP	NEZ	14 50 47						USCGS: 4.8S 129.9E h = 188km
	epP	Z	51 24						
	iX	EZ	52 24½						
4	iP	NEZ	19 31 26				+		USCGS: 18.9N 146.2E h = 110km
	ipP	N Z	31 49½						
	isP	N Z	31 59½						
	iX	Z	32 52						
4	iP	NEZ	21 12 16		-	+	+		USCGS: 1.2S 127.3E h = 31km
	iX	NEZ	12 38½						
	iX	N Z	14 11						
	iS	NE	18 22						
	iX	NE	21 38						
5	iP	EZ	05 13 17½						USCGS: 30.7S 177.6W h = 70km
	iX	EZ	13 27½						
	iPPP	Z	14 39						
5	iP	N Z	05 41 08						USCGS: 34.6S 081.5E h = 33km
	isP	EZ	41 23½						
	iX	NE	41 33½						
5	iP	NEZ	08 00 54				-		
5	iP	NEZ	08 56 43						USCGS: 19.7S 177.8W h = 528km
5	iP	Z	09 22 52½						USCGS: 31.2N 142.6E h = 33km
	iPcP	Z	23 14½						
5	iP	NEZ	10 18 11						USCGS: 14.9S 166.8E h = 37km
	isP	EZ	18 16½						
	iX	N Z	18 29½						
	iX	EZ	18 37						
	iPP	N Z	19 07½						
	iX	N Z	19 44½						
	eX	E	23.5 ..						
	eX	EZ	28.0 ..						
5	eP	N Z	11 26 51						USCGS: 3.6S 149.6E h = 33km
	eX	N Z	27 12						
	eX	E	39.0 ..						
5	iP	NEZ	11 52 36						
5	eP	EZ	14 15 02						USCGS: 17.2S 176.7W h = 33km
	iX	Z	15 06						
	ipP	EZ	15 12						
5	iP	NEZ	23 02 13½						USCGS: 3.0S 119.5E h = 75km
	iX	N	02 26						
	iX	Z	02 36½						
	iX	Z	02 52½						
	iX	NEZ	04 02						
	iPPP	N Z	04 29						
	eS	N	08.6						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JUNE (continued)			h. m. s.	s.				km	
6	iP	NEZ	05 29 12½		+		-		USCGS: 19.9N 120.2E h = 33km
	iX	NEZ	29 24½						
	iX	NEZ	29 28						
	iX	Z	29 43½						
	iX	NE	29 47						
	iX	NE	30 06						
	iX	Z	31 23½						
	iX	N Z	32 06½						
	iS	NE	37 38						
6	iP	NEZ	06 17 40						USCGS: 20.1N 120.4E h = 33km
	iX	Z	17 57						
6	i(P)	NEZ	07 18 06						
	iX	N Z	18 15						
6	iP	NEZ	08 31 49				+		USCGS: 6.7N 94.7E h = 33km
	iX	Z	32 13						
	iPcP	EZ	32 20						
	eX	EZ	32 45						
	eX	Z	33 18						
6	eP	NEZ	11 31 29						USCGS: 30.5S 177.7W h = 110km
	iX	Z	31 40						
	eX	EZ	31 58½						
6	iP	NEZ	12 13 27						USCGS: 37.8S 77.9E h = 33km
	iX	EZ	13 43						
6	iP	NEZ	17 48 43¾				+		USCGS: 14.3S 167.3E h = 160km
	iX	EZ	48 53						
	ipP	N Z	49 18						
	iPPP	Z	50 03						
	iX	NEZ	51 23						
7	iP	NEZ	03 28 52½						
7	iP	NEZ	15 42 09½						USCGS: 15.3S 178.9W h = 33km
	iX	EZ	42 33						
	eX	Z	43 22½						
7	eP	NEZ	16 00 07						USCGS: 19.0N 121.8E h = 33km
	iX	EZ	00 23						
	iX	Z	00 36						
	iPcP	EZ	00 56						
	iX	N Z	01 38½						
7	i(P)	NEZ	18 38 00½						
7	iP	NEZ	22 39 49½						USCGS: 15.2S 173.1W h = 33km
	iX	NEZ	40 06						
7	iP	NEZ	22 45 24						USCGS: 15.3S 173.2W h = 33km
	isP	EZ	45 28						
	iX	N	45 37						
	iX	Z	45 43						
	iPP	NE	46 13						
	eSSS	N	55 38						
8	iP	NEZ	01 09 46½						USCGS: 15.1S 173.0W h = 33km
	isP	Z	09 59						
	iX	N Z	10 08½						
	iX	N Z	10 28						
	iX	Z	10 48						
8	iP	Z	02 06 04						USCGS: 23.2S 171.3E h = 47km
	ipP	N	06 14½						
	ePPP	Z	07 04						
	eX	Z	07 48						
8	iX	NEZ	02 38 20½						
	iX	NEZ	38 28½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JUNE (continued)			h. m. s.	s.				km	
8	iP	NEZ	05 40 18½		-		+		USCGS: 5.5S 147.0E h = 170km
	iX	N	40 39						
	isP	Z	41 14						
	iPcP	N Z	43 04						
	eX	N Z	46 32						
8	e(P)	EZ	07 13 31						
8	eX	NEZ	13 29 09½						
	eX	Z	29 15						
8	iP	NEZ	19 59 30						USCGS: 16.1S 176.9W h = 542km
	iX	Z	59 40						
	iX	NE	59 44						
8	iP	NEZ	23 06 25						USCGS: 14.5S 174.0W h = 33km
	ipP	N Z	06 35						
	eX	N Z	06 42						
9	eP	NEZ	01 37 29½						USCGS: 23.5S 176.0W h = 33km
	iX	Z	38 11						
9	iP	NEZ	04 03 49						USCGS: 17.5S 168.0E h = 33km
	isP	EZ	04 04½						
	iX	Z	05 04½						
9	eP	EZ	07 48 23						USCGS: 12.2S 166.9E h = 233km
9	eP	EZ	09 10 47						USCGS: 6.3N 126.1E h = 106km
9	eP	EZ	15 58 26						USCGS: 15.3S 172.9W h = 33km
	iX	Z	59 29						
9	i(P)	EZ	19 44 14						
9	ePKP	EZ	20 57 51						USCGS: 10.7N 41.9W h = 33km
	iX	Z	58 42						
10	eP	NEZ	04 20 43						USCGS: 55.4S 146.4E h = 33km
	iPP	Z	21 00½						
	iPPP	Z	21 12						
	iX	N Z	21 25						
	iX	Z	22 15						
	iX	N	22 26						
	iX	NE	23 20						
	eS	NE	24 04						
	eX	EZ	24 09						
10	eP	N Z	05 18 19						USCGS: 55.2S 146.3E h = 33km
	iX	NEZ	18 25½						
	iPP	N Z	18 34						
	iX	EZ	19 20						
	eX	N	20 56						
10	eP	NEZ	06 43 09½						USCGS: 55.3S 146.1E h = 33km
	iPP	NEZ	43 25						
	iX	NE	46 13						
	iS	E	46 29						
	iX	EZ	46 40						
	iSSS	NEZ	47 01½						
	M	E	51.6						
	T max.	NEZ	07 01.5						
10	iP	EZ	10 59 51½				+		USCGS: 50.9N 160.2E h = 33km
	isP	EZ	11 00 03						
10	iP	NEZ	12 26 19½						USCGS: 4.6S 152.0E h = 174km
	iX	N Z	26 44						
	iX	EZ	27 03						
	iX	NEZ	27 34½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	∠	Remarks
JUNE	(continued)		h. m. s.	s.				km	
10	iP	EZ	13 08 44						
10	iP	N Z	18 48 29½						USCGS: 5.1S 151.7E h = 112km
	isP	Z	49 05½						
10	i(P)	Z	21 06 52½						
	iX	Z	07 06½						
11	iP	NEZ	00 05 18½						USCGS: 4.5S 152.8E h = 69km
	ipP	N Z	05 36½						
	iX	N Z	05 49½						
	iPPP	NEZ	06 43½						
	iX	Z	07 31						
	iPcP	N Z	07 57½						
	eX	EZ	11 40						
11	iP	NEZ	05 32 57						
11	iP	NEZ	11 48 57¼						
	iS	NEZ	49 10¾						
11	iP	NEZ	17 19 02½						USCGS: 23.1S 179.8W h = 550km
11	iP	NEZ	17 19 27½						USCGS: 23.2S 179.7W h = 550km
11	eP	EZ	18 20 11						USCGS: 30.7N 86.9E h = 33km
11	iP	NEZ	18 52 01½						
12	eP	NEZ	03 01 57						USCGS: 30.8N 142.0E h = 33km
	esP	NEZ	02 11						
12	eP	Z	03 37 09½						USCGS: 8.9N 126.5E h = 33km
	ipP	Z	37 21½						
12	iP	NEZ	04 15 46½				+		USCGS: 15.8S 174.2W h = 150km
	iX	NEZ	16 01						
	esP	Z	16 24						
	iX	N Z	16 40						
	iX	EZ	17 04						
12	e(P)	NEZ	07 12 35						
	iX	N	14 34						
	iX	N	15 17						
	iX	Z	15 52						
12	iP	NEZ	08 13 09						
12	eP	NEZ	15 24 40						USCGS: 55.8S 027.8W h = 33km
13	eP	EZ	05 22 19½						USCGS: 15.2S 173.3W h = 33km
	ipP	NEZ	22 28						
	iX	Z	23 05						
13	iP	NEZ	10 41 26						USCGS: 6.1S 130.1E h = 150km
	ipP	EZ	42 00						
	iX	NE	42 09						
	iX	N Z	42 38						
	iX	E	48 27						
	iX	NE	48 31½						
	iSSS	E	48 41½						
	iX	NEZ	49 06						
13	iP	NEZ	15 44 16½						
13	iP	NEZ	17 33 19						USCGS: 4.6S 153.2E h = 54km
	ipP	Z	33 31½						
	isP	N	33 39						
	iPcP	N Z	35 58½						
14	iP	NEZ	16 37 09½				-		USCGS: 17.9S 178.5W h = 587km
	iX	N	37 19½						
	iX	Z	37 32						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JUNE	(continued)		h. m. s.	s.				km	
14	iP	NEZ	19 24 11¾		−	+	−		USCGS: 38.7S 146.0E h = 33km
	iX	NEZ	24 13½						approximately 90 miles S.E.
	iS	NEZ	24 29						of Toolangi.
15	iP	EZ	05 08 50½						USCGS: 15.0S 177.8W h = 350km
	iX	Z	09 11						
15	i(P)	EZ	06 18 31						
15	eP	NEZ	15 43 12½						USCGS: 36.3S 98.9W h = 33km
	ipP	NEZ	43 23						
	iX	NEZ	43 30						
16	eP	EZ	03 42 48						USCGS: 22.7S 176.3W h = 70km
16	iP	NEZ	18 44 13¼						Local.
	iS	EZ	44 30½						
17	iP	NEZ	02 11 24½		+		−		USCGS: 17.7S 178.5W h = 515km
	iX	NEZ	11 34						
	iX	NEZ	11 38						
17	i(P)	NEZ	06 42 46						
	iX	Z	42 51½						
17	iP	NEZ	18 37 43						Approximately 66½S 175W
	ipP	N Z	37 55½						
	iPPP	N Z	39 34						
	iPcP	NEZ	39 51						
	iS	NEZ	43 22						
	iX	NE	45 38						
17	iP	NEZ	20 15 59½				−		USCGS: 20.4S 174.4W h = 33km
	ipP	N Z	16 09						
	iX	N Z	16 17½						
	iX	N Z	17 08						
17	iP	NEZ	23 11 08¾		−	+	+		USCGS: 4.1S 102.2E h = 73km
	ipP	NEZ	11 26						
	iX	NEZ	11 50						
	iPcP	NEZ	12 21						
	iX	N Z	12 39½						
	iX	EZ	13 24½						
18	iP	NEZ	04 13 25½						USCGS: 29.0N 129.9E h = 33km
	iX	N Z	13 33½						
	iPcP	Z	13 50						
18	iP	N Z	23 23 47½						USCGS: 12.6N 124.2E h = 16km
	iX	Z	24 02						
19	eP	NEZ	09 17 19½						USCGS: 4.7N 126.5E h = 83km
	eX	NEZ	17 28						
	iX	N Z	18 37						
	eS	N	23.9						
19	iP	EZ	10 59 31						USCGS: 25.0N 92.1E h = 51km
	ipP	EZ	59 46½						
	iX	Z	59 52						
19	iP	Z	12 05 08						USCGS: 9.3S 158.8E h = 33km
	isP	Z	05 23½						
	iX	Z	05 38						
19	iP	NEZ	18 28 34½						USCGS: 3.5S 153.4E h = 279km
	iX	N Z	28 41½						
	iX	EZ	28 54½						
	iX	N Z	29 20½						
	isP	N Z	30 00						
	iX	Z	30 24½						
	eX	Z	34 24						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JUNE	(continued)		h. m. s.	s.				km	
19									Very heavy microseisms.
20	iP	EZ	01 07 44						USCGS: 36.3N 144.5E h = 33km
20	i(P)	N Z	03 22 59½						
20	i(P)	NEZ	22 29 28						
20	iP	NEZ	22 52 52½						USCGS: 27.9S 176.6W h = 41km
	iX	N Z	53 00						
	iX	EZ	53 16						
	iX	EZ	54 14						
	iPcP	Z	55 35						
21	iP	NEZ	00 14 48½				-		
	iX	NEZ	15 03						
	iX	NEZ	15 29						
21	eP	N Z	13 13 49½						USCGS: 15.1S 173.3W h = 33km
21	iP	EZ	14 16 08½						USCGS: 12.7S 167.4E h = 275km
21	iP	NEZ	14 37 55						USCGS: 2.7N 128.6E h = 219km
21	eP	NEZ	15 38 36						USCGS: 25.2N 92.2E h = 56km
	ipP	EZ	38 49½						
	iX	Z	39 04						
	iX	Z	39 09½						
	eX	Z	39 37						
21	eP	NEZ	17 49 16½						USCGS: 27.9S 176.2W h = 33km
	isP	EZ	49 29						
	iX	Z	49 41						
21	iP	NEZ	21 48 22						USCGS: 29.7S 177.4W h = 43km
	ipP	EZ	48 33						
	iX	Z	49 05						
	iX	EZ	54 36						
	iX	NE	54 51						
22	eP	NEZ	04 43 46						USCGS: 6.1S 154.4E h = 64km
	iX	Z	44 19						
	iPcP	N Z	46 33½						
22	eP	NEZ	08 47 54						USCGS: 41.1S 90.2W h = 33km
	eX	N Z	48 20						
22	i(P)	NEZ	13 09 23½						
22	iP	NEZ	14 07 55						
22	iP	NEZ	16 19 25		+	-	-		USCGS: 6.0S 113.1E h = 595km
	iX	NEZ	20 00						
	iX	Z	21 01						
	esP	Z	22 16						
22	iP	NEZ	18 49 51						
22	iP	NEZ	21 34 21						USCGS: 30.1S 177.2W h = 33km
	ipP	EZ	34 30						
	isP	NE	34 36						
22	i(P)	EZ	22 08 54						
22/23									No records from 22 20 to 06 25 due power failure.
23	iP	NEZ	08 59 27		+		-		USCGS: 6.0S 146.6E h = 61km
	iX	EZ	59 36						
	isP	NEZ	59 49						
	iX	E	09 00 13						
	iX	Z	00 25½						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JUNE (continued)		h. m. s.	s.				km	
23	iP NEZ	10 59 16						USCGS: 9.0S 113.1E h = 175km
	iX EZ	59 38½						
23	iP NEZ	18 36 03						USCGS: 12.3N 140.7E h = 42km
	epP N Z	36 13½						
	iX Z	36 23						
24	iP NEZ	03 05 36						USCGS: 10.6S 163.3E h = 58km
	iX N Z	05 47						
24	eP Z	04 41(27)						USCGS: 59.5N 151.7W h = 52km
	iX Z	42 04						
	iX N Z	45 42						
	iPP NEZ	45 48						
	iX NE	47 07½						
	iPS N	55 08						
	iX EZ	56 21½						
	iX N Z	56 34½						
24	iP NEZ	06 00 40						
	iX N Z	00 47						
	iX EZ	00 54						
24	iP NEZ	07 22 15¾						Local.
	iS NEZ	22 33						
24	iP NEZ	13 01 11½						
	iX N Z	01 21						
24	eP NEZ	13 24 38½						USCGS: 25.5S 175.6W h = 238
	eX Z	24 45						
	iX NE	25 13						
	iX NE	25 24						
24	eP NEZ	15 08 36½						USCGS: 15.5S 177.5W h = 412km
	iX NEZ	08 39						
	iX N Z	08 47						
	iX N Z	08 51						
	iX N Z	09 13½						
24	iP NEZ	15 58 32½						
	iX EZ	58 39						
	iX Z	58 45						
	iX Z	59 05						
25	iP NEZ	02 36 01¼		+	+	−		USCGS: 18.9S 177.5W h = 566km
	iX NEZ	36 11½						
	iX NE	36 41						
	iX NE	36 49½						
25	iX EZ	04 19 42						
25	iP NEZ	10 33 18						
25	eP Z	14 40 29						USCGS: 8.4S 106.5E h = 78km
	eX EZ	40 36						
	epP NEZ	40 47½						
	iPP NEZ	42 15						
	ipPP NEZ	42 30½						
	iX NEZ	43 21						
25	iP NEZ	16 11 09				+		USCGS: 20.4S 176.1W h = 250km
	iX Z	11 12						
	iX N	11 17½						
26	iP NEZ	08 04 24½						USCGS: 11.5N 143.0E h = 48km
	iX EZ	04 40½						
	iX N	04 46						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JUNE (continued)			h. m. s.	s.				km	
26	eP	NEZ	09 49 51						USCGS: 4.6N 126.3E h = 33km
	iX	NEZ	50 11½						
	iX	N Z	50 32						
	iX	NE	50 51½						
	iPP	NEZ	51 38½						
26	ePKP	Z	18 01 56						USCGS: 7.1N 082.3W h = 20km
27	iP	EZ	07 29 37½						USCGS: 23.2S 177.1W h = 338km
27	iP	NEZ	08 15 49½						
27	i(P)	EZ	08 20 46						USCGS: 15.6S 172.9W h = 33km
	iX	EZ	20 55						
27	iP	NEZ	11 54 37½						USCGS: 8.3S 111.2E h = 180km
	iX	Z	56 38½						
	iX	EZ	56 55½						
27	iP	NEZ	12 27 42½						USCGS: 30.1S 177.7W h = 44km
	isP	N Z	28 01½						
	iX	EZ	28 13						
	iPP	N Z	28 46						
27	iP	NEZ	15 44 05½						USCGS: 14.4N 93.7E h = 33km
	isP	Z	44 20½						
	iX	Z	44 35						
27	i(P)	EZ	17 47 27						
28	iP	NEZ	02 39 37						USCGS: 27.5S 66.1E h = 33km
	iX	NEZ	39 45						
	iX	Z	40 19						
	iX	Z	40 34½						
28	eP	NEZ	13 57 45						USCGS: 1.3N 97.4E h = 50km
	iX	Z	57 54						
	ipP	Z	57 58½						
	iX	N Z	58 11						
	iX	NEZ	58 39						
28	iP	NEZ	22 08 11						USCGS: 46.5N 153.2E h = 33km
	i(pP)	N Z	08 23½						
	iX	Z	09 15½						
	iS	NE	18 33						
	i(sS)	NE	18 53						
	e(PS)	N	19 30						
	iX	E	22 10						
	eX	E	26 37						
	eSSS	E	27 45						
	iX	EZ	27 51						
	eL	E	30 12						
29	iP	NEZ	08 37 21						USCGS: 8.7S 119.8E h = 75km
	iX	N Z	37 53½						
	iPP	NEZ	38 46						
29	iP	NEZ	09 25 38½				-		
	iX	NEZ	26 14½						
29	iP	NEZ	12 52 33½				-		USCGS: 11.6N 142.7E h = 30km
	iX	N Z	52 40½						
	iX	Z	52 51						
	iX	N Z	53 16½						
	iX	N Z	54 07½						
29	iP	NEZ	13 13 10				-		USCGS: 11.7N 142.8E h = 33km
	iX	NEZ	13 51½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JUNE (continued)			h. m. s.	s.				km	
29	i(P)	NEZ	13 23 32						
29	i(P)	NEZ	13 27 49½						
	iX	EZ	28 07½						
29	iP	NEZ	23 08 00				-		USCGS: 16.8S 172.9W h = 33km
	iX	EZ	08 30½						
30	iP	NEZ	01 47 52						USCGS: 11.8N 142.5E h = 33km
30	iP	NEZ	04 28 03						USCGS: 11.7N 142.6E h = 33km
	eiP	NEZ	28 18½						
30	iP	NEZ	06 54 36						USCGS: 2.5S 102.4E h = 160km
	iPcP	NEZ	55 43½						
30	iP	NEZ	07 07 11¼						Local.
	i(S)	E	07 27½						
	iX	NEZ	07 29½						

(L.S. PRIOR)
A/CHIEF GEOPHYSICIST.

Toolangi Copied HSS.

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT July - Dec 1963 No. 63/7.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN.

TOOLANGI

Latitude: 37° 34' 17" S. Longitude: 145° 29' 26" E. Height: 604m.

Foundation: Metamorphosed Silurian Sediments.

Instruments: Benioff Variable Reluctance Seismometers, 3 components
Seismometer periods: 1 sec.

Short period recorder
Galvanometer period: 0.2 sec. nominal

Long period recorder
Galvanometer period: 14 sec.

Milne-Shaw Seismograph E-W component
Period: 12 sec.

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JULY 1963			h. m. s.	s.				km	
1	iP	NEZ	00 50 49½						
1	iP	NEZ	02 51 58½						
1	e(P)	NEZ	11 35 54						
	iX	N Z	36 07½						
1	iP	NEZ	17 58 51						USCGS: 20.8S 169.2E h = 33km
	iX	NEZ	58 54½						
	i(sP)	NEZ	59 03						
	iX	NEZ	59 16½						
2	iP	NEZ	14 12 32½						
3	iP	NEZ	09 53 08¼						Local.
	iX	N Z	53 11						
	iS	NEZ	53 19						
	iX	Z	53 21¾						
4	iPKP	NEZ	06 09 19						USCGS: 43.7N 126.4W h = 33km
	iX	Z	09 44						
4	e(P)	EZ	07 06 01						USCGS: 24.0N 122.4E h = 63km
	iX	NEZ	06 10						
4	eP	NEZ	11 04 34						USCGS: 26.3S 177.7W h = 158km
	iX	NEZ	04 50						
	ipP	EZ	05 18						
	iPP	EZ	05 45						
	iPPP	EZ	05 58½						
	iX	NEZ	06 32½						
	iX	EZ	06 48						
	iPcP	NEZ	07 06						
	iX	NEZ	08 06						
	iS	NE	09 38						
	iScP	N Z	10 44						
	isS	NE	10 52						
	iPcS	NE	10 59						
	iX	N	11 36						
	iSSS	NE	12 27						
	iX	E	13 35						
	iScS	E	14 42						
4	eP	EZ	14 23 54						USCGS: 22.9S 175.6W h = 33km

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JULY (continued)			h. m. s.	s.				km	
4	iP	NEZ	21 53 38						USCGS: 00.5N 120.6E h = 59km
	ipP	N Z	53 52						
	isP	NEZ	54 01						
6	iP	NEZ	05 14 29						
	iX	Z	14 39						
6	iP	EZ	05 27 21						USCGS: 31.8S 179.0W h = 33km
	iX	Z	27 37½						
6	eP	Z	17 58 41½						USCGS: 11.6N 142.7E h = 26km
	iX	NEZ	58 42½						
	iX	NEZ	59 02½						
7	eP	NEZ	00 09 41						USCGS: 42.2S 84.4E h = 33km
7	eP	NEZ	11 00 38½						USCGS: 6.2N 124.5S h = 33km
7	iP	NEZ	22 09 28½						
8	iP	NEZ	05 39 36						
	iX	NEZ	39 44½						
9	eP	Z	06 24 49						USCGS: 00.8N 121.5E h = 142km
	iX	Z	25 15½						
9	e(P)	Z	17 45 22						USCGS: 24.2N 122.4E h = 33km
10	iP	NEZ	04 35 50						USCGS: 29.7S 177.2W h = 33km
	ipP	EZ	36 02						
10	eP	EZ	05 35 28						USCGS: 46.3N 152.9E h = 33km
	ipP	Z	35 38½						
	e(S)	NE	45 53						
	eX	N Z	06 08.3						
10	iPKP	NEZ	10 09 44						USCGS: 13.4N 44.9W h = 37km
	iX	N Z	10 48½						
10	eP	NEZ	16 55 03						USCGS: 30.2S 177.8W h = 25km
	iX	EZ	55 21						
10	iP	NEZ	17 29 10						
10	iP	NEZ	17 49 06						
10	iP	NEZ	20 01 45						USCGS: 19.2N 145.2E h = 171km
	iX	NEZ	01 55						
	eX	NE	02 29						
	eX	EZ	02 50						
	iX	N Z	03 04½						
	iX	Z	03 45						
11	iP	NEZ	02 28 20						
11	eP	NEZ	17 55 20½						USCGS: 12.0S 166.5E h = 144km
12	iP	NEZ	08 01 29						USCGS: 17.9S 178.5W h = 550km
12	no record from 17 hrs.49 mins. to 20 hrs.27 mins. due power failure.								
13	eP	N Z	14 17 18						USCGS: 24.3N 122.3E h = 33km
14	iP	EZ	00 08 44½						USCGS: 30.5S 177.2W h = 33km
	epP	N Z	08 55						
	e(PP)	NEZ	10 12						
14	eP	NEZ	04 05 34½						USCGS: 30.5S 177.3W h = 50km
	iX	N Z	05 45						
	i(pP)	EZ	05 49½						
	iX	N Z	06 06½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JULY (continued)			h. m. s.	s.				km	
14	ePKP	Z	06 01 13						USCGS: 10.4N 62.6W h = 24km
	iPKP	NEZ	01 17						
	iX	N Z	01 39½						
14	eP	NEZ	14 34 42½						USCGS: 30.2S 177.4W h = 42km
	iX	N Z	34 52						
	iX	Z	35 08						
14	iP	NEZ	17 11 28½		-		+		USCGS: 39.4S 174.9E h = 189km
	iX	Z	11 36						
	iX	Z	11 39						
	iX	NEZ	12 00½						
	iX	EZ	12 11						
	isP	E	12 30½						
	ePcP	Z	15 13						
15	i(P)	NEZ	08 17 40½						
16	iP	EZ	08 07 45						USCGS: 15.4S 173.3W h = 33km
	iX	EZ	07 50						
	iX	N Z	08 04						
16	e(P)	N Z	13 07 04						
	iX	Z	07 10						
	iX	Z	07 23						
16	iP	EZ	14 10 41						
16	ePKP	N Z	18 46 12½						USCGS: 43.1N 41.5E h = 33km
	iX	Z	46 15						
	iX	Z	46 20½						
	iX	NE	46 29½						
	iX	Z	46 51½						
16	iP	NEZ	19 14 49½				-		USCGS: 30.6S 177.2W h = 41km
	iX	EZ	15 00						
	iX	N Z	15 10						
	iX	N Z	15 29						
	iX	NEZ	16 03½						
	iX	EZ	17 52½						
	eX	E	24.7						
	eX	E	25.8						
16/17	no record	23 hrs. 17 mins. to 01 hrs. 30 mins. (power failure)							
17	no record	05 hrs. 46 mins. to 06 hrs. 56 mins. (power failure)							
17	iP	NEZ	03 36 24						USCGS: 46.9S 33.3E h = 33km
	iX	N Z	36 32½						
	eX	NEZ	37 14						
17	iP	NEZ	07 10 18						USCGS: 7.5S 107.2E h = 41km
	iX	N Z	10 27½						
	isP	Z	10 37						
	iX	NEZ	10 47						
	iX	E	11 09						
17	iPKP	Z	12 16 01						USCGS: 43.1N 41.5E h = 33km
17	eP	NEZ	19 11 14						USCGS: 14.9S 167.3E h = 138km
18	eP	N Z	05 10 21						USCGS: 61.0S 22.3W h = 33km
	eX	EZ	10 26						
	iX	N Z	10 44						
	eX	Z	10 56						

Date 1963	Phase		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JULY (continued)			h. m. s.	s.				km	
19	iP	NEZ	05 16 15		-	+	+		
	iX	N Z	16 50						
	iX	Z	18 04½						
19	iPKP	NEZ	06 05 09						USCGS: 43.4N 8.2E h = 33km
19	iPKP	EZ	06 05 45						USCGS: 43.3N 8.1E h = 33km
	iPKP	NEZ	05 48½						
	iX	EZ	05 54						
	iX	Z	06 05½						
19	iP	NEZ	08 54 06						
19	iP	NEZ	12 20 25						
	eX	EZ	20 34						
20	iP	NEZ	05 35 25						USCGS: 14.4N 142.9E h = 33km
20	iP	NEZ	06 40 42¼		+	-	+		USCGS: 57.6S 148.5E h = 33km
	ipP	NEZ	40 51½						
	iPPP	N Z	41 17						
	iX	NEZ	41 41						
	iX	Z	42 01						
	iS	EZ	44 31						
	T max.	NEZ	07 01.5						
21	iP	NEZ	14 54 10½						USCGS: 9.7N 122.3E h = 54km
	iX	NEZ	54 17½						
	isP	EZ	54 35						
22	iP	NEZ	00 35 32½						USCGS: 6.1S 148.9E h = 59km
	iX	NEZ	35 41						
	isP	N Z	35 51½						
	iX	Z	36 06						
	ePP	Z	36 35						
	iPcP	Z	38 25½						
	eS	E	40.7						
	eX	NEZ	43 12						
	eX	EZ	43 23						
	eX	E	45 16						
	eL	NEZ	46.5						
	part of 'quake missing in record change.								
23	iP	NEZ	05 41 35						Local.
	iX	NEZ	41 41¾						
	i(S)	NEZ	41 43¾						
23	eP	Z	06 29 47½						USCGS: 41.5N 141.9E h = 91km
	iX	Z	30 15						
24	iP	NEZ	05 29 05½						USCGS: 20.6S 178.7W h = 531km
24	iP	NEZ	06 21 40						
	iX	EZ	21 44						
24	eP	EZ	11 08 55						USCGS: 16.7S 177.4W h = 33km
24	eP	NEZ	11 43 01						USCGS: 24.6N 122.0E h = 54km
	iX	Z	43 08						
	iX	Z	43 14½						
	iX	Z	43 23						
	iX	NEZ	43 57½						
	iX	N Z	44 27						
	ePPP	Z	45 28						
24	eP	NEZ	16 52 52½						USCGS: 6.4S 147.8E h = 55km
	eX	Z	53 01						
	iX	N Z	53 36½						
	eX	N Z	54 02						
	iX	NEZ	55 56½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JULY (continued)			h. m. s.	s.				km	
24	eP	N Z	19 10 46						USCGS: 9.0S 158.2E h = 33km
	iX	NEZ	10 51						
	iX	N Z	11 09½						
	iPcP	Z	13 43						
	eX	Z	13 51						
	iX	EZ	13 58						
24	eP	N Z	21 02 47						USCGS: 17.9S 167.2E h = 33km
	esP	NEZ	03 01						
	ePP	N Z	03 23						
24	eP	N Z	21 53 53½						USCGS: 9.7S 154.4E h = 16km
	iX	N Z	54 04½						
	eX	N Z	54 08½						
25	iP	NEZ	03 00 47½						Local.
	iS	EZ	01 04						
25	iP	NEZ	05 37 18						
25	iP	NEZ	06 21 36½						
	iX	NEZ	21 52						
25	ePKP	Z	07 23 17						USCGS: 6.8N 073.0W h = 152km
	iX	EZ	23 22						
	iX	Z	23 36						
25	iP	NEZ	07 26 35						
	iX	N Z	26 38						
25	iP	NEZ	11 17 59½						
	eX	N Z	18 08½						
25	iP	NEZ	11 53 15						USCGS: 20.0S 179.4W h = 522km
25	iP	NEZ	19 36 01		+	+	−		
25	e(P)	N Z	21 43 06						
26	ePKP	Z	04 36 39						USCGS: 42.1N 21.5E h = 33km
	iX	NEZ	36 44						
26	iP	NEZ	05 32 41				+		USCGS: 15.0S 167.3E h = 124km
	eX	EZ	32 50						
	iX	NEZ	32 58						
	iX	NEZ	33 04						
	iPcP	Z	35 42						
27	ePKP	EZ	06 18 05						USCGS: 43.5N 8.4E h = 33km
	iX	N Z	18 13						
27	iP	NEZ	08 07 01½						USCGS: 19.7S 178.5W h = 523km
27	iP	NEZ	16 59 28½						USCGS: 35.9S 102.7W h = 33km
	ipP	EZ	59 38						
28	iP	NEZ	04 07 54¼						Local.
	iS	NEZ	08 01¼						
28	eP	NEZ	07 18 41						USCGS: 29.8S 177.6W h = 33km
	iX	N Z	18 57						
28	iP	NEZ	08 02 57						USCGS: 11.3S 112.1E h = 21km
	ipP	EZ	03 07						
	iPcP	Z	05 02½						
28	iP	NEZ	10 13 22						USCGS: 1.5N 127.1E h = 33km
28	iP	NEZ	17 33 56½						Local.
	iS	NEZ	34 06						
29	iP	NEZ	04 55 08						USCGS: 30.4S 177.7W h = 33km
	iX	NEZ	55 15½						
	iX	Z	55 25						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JULY (continued)			h. m. s.	s.				km	
29	eP	NEZ	05 39 47						USCGS: 6.7S 107.1E h = 85km
	ipP	E	40 04						
29	iP	NEZ	20 20 30½						USCGS: 30.2S 177.3W h = 39km
	ipP	EZ	20 39						
	iX	Z	20 51						
	iX	N Z	21 00						
	iX	Z	21 07						
	iX	EZ	21 41						
29	iP	EZ	20 23 01						USCGS: 29.7S 177.0W h = 33km
	ipP	NEZ	23 10						
	iX	Z	23 45						
	ePP	Z	24 13						
	iX	EZ	24 49½						
29	iP	NEZ	23 25 05½						USCGS: 30.1S 177.1W h = 48km
	iX	EZ	25 11						
	ipP	NEZ	25 18						
	iX	NEZ	25 56½						
	iPP	Z	26 11						
29	eP	NEZ	23 46 50						USCGS: 5.4S 131.6E h = 33km
	ipP	N Z	47 01						
	iX	NEZ	47 08½						
	eX	EZ	47 56						
	iX	Z	48 30½						
30	eP	EZ	03 03 54						USCGS: 30.0S 177.2W h = 40km
	eX	Z	04 03						
30	iP	EZ	04 33 49						USCGS: 30.2S 177.3W h = 17km
	iX	N Z	33 59						
	iX	N	34 06½						
	eL	NEZ	45.0						
30	iP	NEZ	05 52 17						USCGS: 29.6S 177.3W h = 33km
	iX	NEZ	52 25						
	iX	EZ	52 38						
	iX	EZ	52 45½						
	iPP	Z	53 27						
	eX	NE	53 31						
	iPcP	Z	55 07½						
	iX	Z	55 16½						
	eS	NE	57 18						
	esS	E	57 34						
	iX	N Z	59 34						
	iX	E	06 00 13½						
30	iP	NEZ	14 04 38½						USCGS: 55.9S 27.5W h = 33km
	isP	NEZ	04 53						
	iX	N Z	05 11						
	iX	EZ	05 21						
	iPP	N Z	08 02						
30	iP	NEZ	14 29 38						USCGS: 29.5S 177.1W h = 33km
	iX	NEZ	29 56						
	iX	N Z	30 01						
	eX	Z	30 13						
	ePcP	Z	32 31						
30	iP	NEZ	15 10 58½						USCGS: 29.9S 177.4W h = 76km
	iX	EZ	11 08						
	iX	Z	11 19						
	eSSS	E	20.2						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JULY (continued)			h. m. s.	s.				km	
30	iP	NEZ	23 37 29						USCGS: 7.3S 128.9E h = 143km
	iX	NEZ	37 39						
	iX	NEZ	38 24						
	iX	NEZ	38 54½						
	iX	N Z	41 25½						
31	eP	N Z	01 50 40						USCGS: 29.8S 177.2W h = 65km
	iX	N Z	50 51						
	ipP	N Z	50 57½						
	iX	E	51 10						
	iX	Z	51 13½						
	ePcP	NEZ	53 31						
	eL	E	59.6						
31	iP	NEZ	14 51 09						USCGS: 8.2S 116.4E h = 33km
	isP	NEZ	51 23						
	iPP	EZ	52 40½						
	eX	NE	58.6						

(L.S. PRIOR)
A/CHIEF GEOPHYSICIST

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN

TOOLANGI

Latitude: 37° 34' 17" S. Longitude: 145° 29' 26" E. Height: 604m.

Foundation: Metamorphosed Silurian Sediments.

Instruments: Benioff Variable Reluctance Seismometers, 3 components
Seismometer periods: 1 sec.
Short period recorder
Galvanometer period: 0.2 sec. nominal
Long period recorder
Galvanometer period: 14 sec.
Milne-Shaw Seismograph E-W component
Period: 12 sec.

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
AUGUST 1963			h. m. s.	s.				km	
1	iP	NEZ	12 49 00½						
	iX	Z	49 04½						
1	eP	NEZ	15 27 18½						USCGS: 29.8S 177.2W h = 59km
	eX	EZ	27 31½						
	esP	Z	27 41						
1	iP	NEZ	21 00 24½						USCGS: 17.6S 178.9W h = 526km
2	iP	NEZ	09 52 41¼						Local.
	iS	NEZ	52 51½						
2	eP	NEZ	10 31 00						USCGS: 26.8N 141.3E h = 109km
	iX	N Z	31 19½						
2	iP	NEZ	19 34 51½						USCGS: 6.0N 125.1E h = 118km
	iX	Z	35 05½						
	iX	N Z	35 09½						
	ipP	Z	35 14						
	isP	EZ	35 31½						
3	iP	NEZ	03 53 54½		+		-		USCGS: 7.6S 156.8E h = 402km
	iX	EZ	53 58						
	ipP	NEZ	55 13½						
	iX	N Z	55 40						
	iPcP	Z	56 36						
3	$ePKP_1$	N Z	10 41 22½						USCGS: 7.7N 35.8W h = 33km
	$iPKP_2$	NEZ	41 33						
	iX	NEZ	41 40½						
	iX	Z	42 53						
	eSS	E	11 04.3..						
3	iP	NEZ	20 32 19						USCGS: 30.7S 178.3W h = 37km
4	eP	NEZ	07 16 12½						USCGS: 9.4S 114.2E h = 117km
	iX	EZ	16 30						
4	iP	NEZ	09 19 07						USCGS: 22.6S 173.4E h = 72km
4	iP	NEZ	10 00 32½						USCGS: 7.7S 129.5E h = 159km
	iX	Z	00 45						
4	eP	NEZ	21 47 18						USCGS: 5.2S 145.9E h = 59km

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
AUGUST (cont'd)			h. m. s.	s.				km	
5	iP	NEZ	00 00 41						USCGS: 17.5S 179.1W h = 515km
	iX	Z	00 50½						
	iX	Z	00 58						
	iX	EZ	01 11½						
	iX	EZ	01 45						
	iPP	Z	02 18						
	isP	EZ	03 12						
	iX	EZ	04 28½						
	iScP	NEZ	05 47½						
	iS	EZ	05 52½						
	iX	EZ	05 58½						
2nd to 5th heavy microseisms.									
No record on 3rd from 22 28 to 23 06									
5	eP	Z	07 48 07						USCGS: 27.2S 178.0W h = 33km
5	eP	NEZ	15 44 18						USCGS: 60.7S 154.3E h = 33km
	iX	EZ	44 41						
	iPP	NEZ	44 55						
	eX	Z	45 44½						
	eS	E	48 38						
	eSSS	E	49 34						
	iX	E	49 45½						
	eX	Z	51 20						
6	iP	NEZ	01 40 52						USCGS: 11.3S 167.1E h = 33km
	iX	Z	41 08						
6	iP	EZ	11 40 07						
6	iP	NEZ	11 57 01½						
7	iP	NEZ	04 32 14						USCGS: 21.8S 173.5E h = 106km
	iX	EZ	32 20½						
	iX	NEZ	32 26						
	M	N	45.5						
7	iP	NEZ	04 46 46						USCGS: 54.0N 142.1E h = 33km
	eX	Z	46 52½						
7	iP	NEZ	05 12 03½						
7	iP	NEZ	07 30 49½						
7	ePKP	Z	07 37 19½						USCGS: 7.5N 37.2W h = 33km
7	iP	NEZ	11 21 19½						USCGS: 20.0S 178.3W h = 600km
	iX	Z	21 24½						
7	iP	NEZ	11 23 01						USCGS: 20.1S 178.4W h = 600km
7	iP	NEZ	14 03 20						USCGS: 18.2S 177.9W h = 508km
	iX	EZ	03 33½						
7	iP	NEZ	15 45 26				-		USCGS: 21.2S 177.8W h = 352km
	iX	NE	45 49						
7	eP	N Z	17 25 57						USCGS: 56.1S 27.0W h = 33km
	eX	EZ	26 18						
7	iP	N Z	21 33 54						
	iX	NEZ	34 01						
8	eP	Z	02 27 53½						USCGS: 54.2N 168.1E h = 33km
	eX	Z	28 48						
	iScS	NE	39 19						
	eL	E	55.0						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
AUGUST (cont'd)			h. m. s.	s.				km	
8	eP	Z	11 10 43						USCGS: 35.9S 103.6W h = 33km
	eX	Z	11 00½						
	iX	N Z	12 28½						
8	eP	N Z	11 22 34						USCGS: 5.8S 151.0E h = 48km
	isP	N	22 56½						
	iX	Z	24 11½						
8	eP	N Z	11 52 12						USCGS: 27.3N 129.2E h = 93km
	iX	Z	52 25						
8	iP	NEZ	14 02 37						USCGS: 18.3N 145.3E h = 423km
	epP	Z	04 04						
9	ePKP	NEZ	06 25 04						USCGS: 14.5N 11.9E h = 33km
	ipPKP	Z	25 13						
	iX	Z	25 19						
	iX	Z	25 39						
9	iP	NEZ	10 15 49						USCGS: 21.6S 171.1E h = 153km
9	iP	NEZ	14 21 56						USCGS: 1.2N 125.6E h = 33km
9	iP	N Z	14 44 26½						USCGS: 15.3S 175.7W h = 33km
	isP	EZ	44 41						
	iX	N Z	44 43½						
	iX	NEZ	46 14						
	iS	NE	50 38½						
	eSSS	E	54 03						
	eL	NEZ	56.6						
9	eP	N Z	15 19 37						USCGS: 3.0S 152.3E h = 143km
	epP	Z	20 10½						
9	eP	EZ	21 46 30						
	iX	NEZ	46 40						
	iX	EZ	46 49½						
	iX	Z	49 24						
10	eP	Z	02 44 21						USCGS: 15.6S 175.0W h = 33km
	isP	EZ	44 23						
	iX	E	44 31½						
10	iP	NEZ	08 16 47½						
	iX	Z	16 53						
10	iP	NEZ	13 28 04						USCGS: 24.7N 142.7E h = 33km
	iX	EZ	28 26						
10	iP	NEZ	16 12 49						USCGS: 15.0S 179.0W h = 389km
	iX	NEZ	12 51						
10	eP	NEZ	17 58 23						USCGS: 3.2S 141.9E h = 88km
	iX	EZ	58 40½						
10	iP	NEZ	18 17 03						USCGS: 54.4S 132.8W h = 33km
	iX	N Z	17 10½						
	iX	EZ	17 22½						
11	eP	N Z	01 39 30½						USCGS: 60.5S 154.9E h = 33km
	iX	N Z	39 42						
	i(pP)	N Z	39 44½						
	i(sP)	NE	39 59						
	iX	NEZ	40 05						
	iPP	E	40 28½						
	iPPP	N Z	40 56						
	eX	N	43 32						
	e(S)	E	43 50						
	iX	N	44 19½						
	eX	EZ	44 28						
	e(ScP)	N Z	46 29						
	M	E	47.4						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
AUGUST (cont'd)			h. m. s.	s.				km	
11	iP	NEZ	05 30 28						USCGS: 17.4S 179.0W h = 509km
	iX	Z	30 37						
11	eP	Z	07 49 05						USCGS: 38.8N 140.9E h = 45km
11	iP	NEZ	10 17 00						
11	iP	EZ	13 44 30						
11	eP	Z	16 40 36½						
	iX	EZ	40 49½						
11	iP	NEZ	20 27 07						
11	iP	NEZ	21 22 31						USCGS: 7.7S 108.8E h = 169km
12	iP	NEZ	09 04 25						USCGS: 11.6S 166.3E h = 53km
	iX	N	04 34½						
	ipP	N Z	04 39						
	isP	EZ	04 48						
12	iP	NEZ	10 16 48		+	-	-		USCGS: 4.7S 131.1E h = 92km
	iX	N Z	17 00½						
	i(sP)	N Z	17 26						
	iX	NEZ	17 50						
	iPP	N Z	18 07						
	iPPP	NE	18 22						
	eX	NEZ	23 25						
	e(SS)	NE	24 12½						
12	eP	EZ	21 06 12½						USCGS: 21.9S 175.7W h = 33km
	iX	Z	06 25						
13	iP	NEZ	05 00 14		+	-	-		USCGS: 7.2S 124.5E h = 542km
	iX	Z	00 27						
	iX	N Z	01 08						
	ipP	NEZ	01 50						
	iPP	NEZ	01 51½						
	iPcP	Z	02 26						
	eS	N	05 12						
	iScP	NEZ	05 19						
13	iP	NEZ	06 35 29½						USCGS: 20.6S 178.5W h = 562km
13	eP	NEZ	06 59 37						USCGS: 19.1S 173.9W h = 28km
	iX	EZ	07 00 06½						
13	iP	NEZ	14 38 09½						Local
	iS	NEZ	38 22						
13	iP	NEZ	22 00 08						USCGS: 19.3S 173.7W h = 33km
	iX	Z	00 10½						
	isP	N Z	00 20½						
	iX	NEZ	00 56½						
13	iP	NEZ	23 29 27½				-		
	iX	E	29 35						
14	eP	EZ	02 53 56						USCGS: 21.4S 175.2W h = 33km
	iX	EZ	54 15						
14	iP	NEZ	03 39 05						USCGS: 4.9S 152.3E h = 62km
14	eP	EZ	16 28 58½						USCGS: 24.1N 122.4E h = 28km
	isP	NEZ	29 12½						
14	eP	NEZ	18 50 48½						USCGS: 3.4S 135.4E h = 33km
	isP	NEZ	51 05						
	iPP	NEZ	52 12						
	i(PcP)	Z	53 07						
	iX	Z	55 24½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
AUGUST (cont'd)			h. m. s.	s.				km	
14	iP	NEZ	21 55 01						USCGS: 17.5S 178.3W h = 487km
15	iP	NEZ	02 27 13½		+		-		USCGS: 27.9N 139.6E h = 476km
15	iP	Z	06 23 11						USCGS: 37.9N 141.6E h = 59km
	eX	Z	23 20½						
	iPcP	N Z	23 24						
	iX	Z	23 36						
	iX	N Z	24 15½						
	iX	Z	25 03½						
	iS	NE	32 47						
	iX	NE	33 21						
15	ePKP	Z	17 42 55½						USCGS: 13.8S 69.3W h = 543km
	iX	Z	43 13						
	iX	Z	43 20						
	iX	Z	44 39						
	iX	Z	46 39						
	iSKS	NE	49 16						
	ePKKP	Z	53 14						
	iSP	Z	53 25½						
	iSKSP	Z	53 38						
	records obscured by very heavy microseisms.								
16	iP	NEZ	23 23 59½						USCGS: 48.9S 122.8E h = 33km
	ipP	NEZ	24 08						
	iPP	Z	24 19½						
	iPPP	NEZ	24 31½						
	eX	NEZ	25 05½						
	e(S)	E	27.7						
	M	E	31.2						
	T.max.	NEZ	42.5						
17	iP	NEZ	05 41 06						USCGS: 20.0S 174.0W h = 33km
	ipP	E	41 15						
	iX	Z	41 26						
17	iP	NEZ	11 23 47						USCGS: 30.6N 130.9E h = 33km
	iX	NEZ	23 58½						
	iPcP	NEZ	24 10						
	iX	N Z	24 13						
	iX	Z	25 16						
	iX	Z	26 03½						
	iS	NE	32 55						
	isS	NE	33 13						
	iScS	E	34 10						
	e(SS)	E	45.5						
	eX	E	47.2						
17	ePKP	Z	11 52 02½						USCGS: 17.7N 94.3W h = 163km
	iX	Z	53 03½						
18	iP	Z	07 21 07						USCGS: 35.9N 139.2E h = 153km
18	iP	NEZ	18 44 31						
18	eP	Z	18 56 30						USCGS: 50.3N 176.9W h = 33km
	iPcP	NEZ	56 35½						
	isP	Z	56 43½						
	iX	Z	57 07						
18	iP	NEZ	19 59 06				-		USCGS: 18.0S 178.3W h = 544km
	iX	EZ	59 13½						
	iX	Z	59 15						
18	e(P)	NEZ	20 25 35						USCGS: 22.5S 175.2W h = 33km
	esP	EZ	25 49½						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
AUGUST (cont'd)		h. m. s.	s.				km	
18	iP EZ	20 33 52½						USCGS: 32.1S 178.1W H = 33km
	ipP N Z	34 04						
	iX EZ	34 08½						
	iX N	34 22						
	iPP Z	34 51						
	iX E	35 07						
	iX E	35 36½						
	iPcP Z	36 51						
	iScP Z	40 35½						
	eX E	42.0						
	eX N Z	43.7						
19	eP NEZ	04 30 10½						USCGS: 32.0S 177.9W h = 33km
	ipP EZ	30 12½						
	iX Z	30 23						
	iX NE	30 28						
	iPP N Z	31 01						
	iX Z	31 36						
	iPcP Z	33 11						
	eX N	36 27						
	iScP N Z	36 52½						
19	eP NEZ	10 03 45½						USCGS: 59.8S 25.9W h = 33km
	iPcP NEZ	03 53½						
	eX EZ	04 12½						
19	iP NEZ	16 59 42½						USCGS: 17.0S 168.8E h = 231km
20	eP NEZ	00 34 47						USCGS: 21.9S 175.8W h = 33km
20	iP NEZ	15 55 32½						
20	eP N Z	16 00 04						USCGS: 41.2N 142.7E h = 50km
	iPcP N Z	00 09½						
	iX N Z	00 24						
	eX EZ	00 38						
20	iP NEZ	19 50 13½						USCGS: 30.2S 177.8W h = 43km
	iX Z	50 18½						
	ipP Z	50 28						
21	iX NEZ	03 59 04						USCGS: 14.3N 72.5W h = 33km
21	eP NEZ	23 06 21						USCGS: 21.3S 176.0W h = 140km
22	eP NEZ	01 28 39½						
22	no record from 03 43 to 05 10 due power failure.							
22	eP N Z	14 46 36						USCGS: 1.9S 133.9E h = 33km
22	iP N Z	19 58 34½						USCGS: 9.4S 158.0E h = 33km
	ipP Z	58 42½						
	isP Z	58 46						
	iPP N Z	59 37½						
	iX Z	20 00 48½						
	iPcP Z	01 32						
	iS NE	03 34						
	eLq NE	05 04						
	iLr Z	06 51						
22	iPKP EZ	23 39 19						USCGS: 4.3N 76.4W h = 100km
23	iP Z	09 47 55½						Local.
	iS NEZ	48 20						
23	eP Z	14 36 14						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
AUGUST (cont'd)			h. m. s.	s.				km	
23	eP	Z	23 32 53½						USCGS: 28.6N 142.5E h = 45km
	esP	N Z	33 09						
24	iP	NEZ	03 24 23						USCGS: 30.7S 178.2W h = 42km
	ipP	N Z	24 32½						
	isP	NEZ	24 37½						
	iX	EZ	24 59						
24	iP	EZ	12 56 08½						USCGS: 37.3S 178.2W h = 36km
	eX	Z	56 31						
	eX	Z	56 36½						
25	iP	NEZ	12 24 38		+	+	-		USCGS: 17.5S 178.8W h = 565km
	ipP	Z	26 13						
	iPcP	Z	26 47						
	iX	Z	27 46						
	iScP	Z	29 38						
	iS	NEZ	29 43						
	eG	Z	33 13						
	iScS	NE	33 48						
25	iP	NEZ	13 32 21						USCGS: 17.9S 178.8W h = 610km
	iX	Z	32 30						
	eX	Z	32 51						
25	iP	NEZ	13 41 13						USCGS: 17.4S 178.7W h = 540km
	iX	EZ	41 22						
26	iP	NEZ	02 33 41						USCGS: 26.3S 178.8E h = 546km
26	iP	NEZ	04 56 07						USCGS: 17.7S 178.8W h = 575km
	iX	N Z	56 21						
26	iP	NEZ	05 51 15						USCGS: 6.8S 105.6E h = 33km
	iX	Z	51 28						
26	iP	NEZ	23 39 10½						USCGS: 7.7S 127.3E h = 151km
	isP	N Z	40 07						
	iPPP	N Z	40 49						
	iPcP	Z	41 43						
27	iP	NEZ	01 26 36						
	iX	EZ	26 47						
27	e(P)	Z	03 36 25						USCGS: 45.9S 75.3W h = 33km
	ipP	Z	36 34						
27	eP	NEZ	19 21 12						
	iX	N Z	21 22½						
	iX	N Z	21 33						
	i(PP)	EZ	22 31						
	i(PcP)	EZ	23 22						
	eX	Z	29 31½						
28	eP	NEZ	12 54 06½						USCGS: 61.9S 164.5E h = 33km
	epP	NEZ	54 17½						
	isP	N	54 21½						
	eX	E	54 33½						
	iPP	Z	54 49½						
	e(SSS)	E	13 00 21						
28	iP	NEZ	16 01 41						USCGS: 28.3N 141.0E h = 96km
	iX	EZ	01 58						
	i(pP)	EZ	02 06½						
	eX	Z	03 11½						
29	iP	NEZ	01 30 16		-		+		USCGS: 2.0N 123.4E h = 43km
	ipP	N Z	30 26						
	isP	NEZ	30 32½						
	iX	Z	31 10						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
AUGUST (cont'd)			h. m. s.	s.				km	
29	i(P)	NEZ	04 38 55½						
	eX	E	39 03						
	eX	Z	39 49½						
29	i(P)	NEZ	06 01 39½						
29	eP	NEZ	09 07 36½						USCGS: 39.6N 74.2E h = 31km
29	iP	NEZ	15 42 36½						
29	ePKP	EZ	15 49 18						USCGS: 7.1S 81.6W h = 23km
	iPP	Z	50 29½						
	epPP	Z	50 54						
	isPP	Z	51 13½						
	iPKKP	EZ	59 41½						
	ePS	NE	16 00.4						
	eSS	E	06 37						
	esSS	NE	07 14						
	e(SSS)	NE	11 37						
29	iP	NEZ	21 05 25½						USCGS: 15.5S 172.9W h = 33km
	ipP	EZ	05 36½						
	iX	Z	05 55½						
29	iP	EZ	21 51 59						
30	iP	NEZ	10 34 15½						
	i(PcP)	NEZ	35 03						
	iX	N Z	35 17						
	e(PP)	NEZ	36 47½						
30	eX	EZ	13 59 02						USCGS: 23.4S 175.4W h = 33km
30	i(P)	NEZ	14 05 02						
31	iP	NEZ	03 05 19						
	eX	N Z	05 27						
	eX	N Z	05 39						
31	eP	NEZ	17 01 37½						USCGS: 2.0N 127.5E h = 70km
	ePP	Z	03 20½						
	ePcP	N Z	03 26						
31	iP	NEZ	21 32 12¼				+		USCGS: 21.5S 179.2W h = 543km
	iX	NE	32 27						
	iX	EZ	32 44½						

(L.S. PRIOR)
A/CHIEF GEOPHYSICIST

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN.

TOOLANGI

Latitude: 37° 34' 17" S. Longitude: 145° 29' 26" E. Height: 604m.

Foundation: Metamorphosed Silurian Sediments.

Instruments: Benioff Variable Reluctance Seismometers, 3 components
Seismometer periods: 1 sec.

Short period recorder
Galvanometer period: 0.2 sec. nominal

Long period recorder
Galvanometer period: 14 sec.

Milne Shaw Seismograph E - W component
Period: 12 sec.

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
SEPTEMBER 1963			h. m. s.	s.				km	
2	iP	NEZ	02 33 52½						
2	iP	EZ	13 07 20						
	eX	N	07 30						
2	iP	NEZ	22 42 59½						USCGS: 37.9S 179.5E h = 33km
	ipP	NEZ	43 07						
	eX	NEZ	43 21½						
2	eP	Z	23 57 24½						USCGS: 45.4N 150.8E h = 33km
	isP	Z	57 38						
3	e(P)	NEZ	03 49 16						
3	eP	NEZ	03 54 49						USCGS: 60.3S 152.0E h = 33km
	iX	NEZ	55 08½						
	iX	N Z	55 42½						
3	iP	EZ	18 30 14						
4	iPKP	Z	05 26 30½						USCGS: 36.1N 5.3E h = 38km
	iPKP	NEZ	26 38						
	iX	N Z	27 04						
	iX	Z	27 30						
5	iP	NEZ	01 02 24½				+		USCGS: 17.8S 178.5W h = 558km
6	iP	NEZ	01 47 56½						USCGS: 19.3S 176.9W h = 66km
	iX	EZ	48 02½						
	ipP	Z	48 14						
6	iP	NEZ	02 28 15½				-		
	iX	EZ	28 29						
	e(P)	Z	36 07						
	iX	Z	36 22½						
6	iP	NEZ	03 18 14						
6	eP	Z	05 36 17						USCGS: 10.9S 164.8E h = 33km
6	iP	NEZ	06 15 31½		+		-		USCGS: 36.4N 130.6E h = 33km
	ipP	NEZ	15 40½						
	iX	NEZ	15 53½						
	iX	EZ	16 34½						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
SEPTEMBER (continued)		h. m. s.	s.				km	
6	iP NEZ	08 18 55½						USCGS: 6.1N 126.2E h = 47km
	iX EZ	19 22		-		+		
	ePP NEZ	20 47						
6	iP N Z	10 22 28				-		USCGS: 24.0S 179.9E h = 500km
	iX N Z	22 48½						
	iX Z	23 08½						
	iPcP NEZ	27 05						
7	iP NEZ	01 28 35½						USCGS: 36.4N 130.6E h = 33km
	ipP EZ	28 44½						
	iPcP EZ	28 56						
7	iP NEZ	04 16 05½				-		USCGS: 5.9S 129.8E h = 169km
	iPP Z	17 25½						
7	eP EZ	08 50 40½						USCGS: 8.8S 117.5E h = 81km
	ipP N Z	51 05						
	iX EZ	51 46½						
7	iP Z	12 57 00						USCGS: 54.0N 160.3E h = 110km
	i(pP) Z	57 35						
7	iP NEZ	13 51 00						USCGS: 7.1S 148.1E h = 64km
7	iP NEZ	15 22 52½						USCGS: 22.0S 179.6W h = 558km
7	iP NEZ	19 33 39						USCGS: 3.0S 130.4E h = 33km
	ipP Z	33 48½						
	eX EZ	33 57						
	iX Z	34 02						
7	eP Z	22 11 34						USCGS: 27.8N 141.5E h = 50km
	iX Z	11 50½						
8	eP NEZ	00 54 00						USCGS: 28.1S 176.8W h = 57km
	ipP NEZ	54 16						
8	iP NEZ	04 47 45						USCGS: 18.1S 178.4W h = 520km
	iX NEZ	47 53						
	iX Z	48 15						
8	iP NEZ	07 44 26						USCGS: 20.7S 178.3W h = 573km
	iX N Z	44 36						
	iX Z	45 30						
	iPcP N Z	46 30½						
8	eP Z	09 18 47						USCGS: 36.2S 100.5W h = 33km
8	eP EZ	13 12 43						USCGS: 30.3S 177.9W h = 33km
8	eP NEZ	19 37 01						USCGS: 21.9S 174.6W h = 33km
	esP EZ	37 16						
8	iP NEZ	19 56 17¼		+	+	-		USCGS: 23.6S 179.8E h = 550km
	iX NEZ	57 14						
	iPP EZ	57 58						
	iX Z	59 04						
	iX Z	20 00 02						
	iS NEZ	00 56						
	eX Z	03 45½						
	iSS NE	04 05½						
	iScS NE	05 46						
9	iP NEZ	00 24 59		+	+	-		USCGS: 22.6S 179.5W h = 550km
	iX Z	25 13						
9	eP N Z	02 52 25						USCGS: 4.4S 152.7E h = 34km
	ipP N Z	52 33½						
	ePP N Z	53 45						
	eS NE	57 50						
	esS NE	58 03						
	eLq Z	59 37						
	eLr NE	03 01 38						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
SEPTEMBER (continued)			h. m. s.	s.				km	
9	iP	NEZ	12 30 06						USCGS: 12.3N 141.3E h = 76km
9	iP	NEZ	12 58 08						USCGS: 14.7S 167.4E h = 182km
	ipP	Z	58 43½						
	isP	Z	58 57½						
	iX	Z	59 13						
9	iP	NEZ	18 04 23½			+	−		USCGS: 23.5S 180.0E h = 512km
10	eP	NEZ	06 31 03						USCGS: 23.0S 179.8E h = 520km
	iPP	Z	32 44						
10	eP	NEZ	19 20 54½						USCGS: 19.0S 175.8E h = 33km
	esP	Z	21 10						
10/11	iP	NEZ	00 03 25½						USCGS: 3.4S 131.4E h = 64km
	esP	NEZ	03 49½						
11	iP	NEZ	00 59 37						USCGS: 4.1S 151.8E h = 205km
11	iP	NEZ	09 06 41¼				+		USCGS: 3.5S 131.2E h = 33km
	isP	N Z	06 59						
	eX	Z	07 21						
12	iP	NEZ	03 17 27						USCGS: 22.5S 170.7E h = 54km
12	iX	EZ	08 25 24½						
13	eX	EZ	05 26 55½						
13	eP	Z	18 21 03						USCGS: 49.6S 117.2E h = 33km
13	eP	NEZ	23 39 44						USCGS: 31.3S 179.3W h = 16km
14	eP	N Z	00 22 48½						USCGS: 3.5S 131.2E h = 33km
	iX	NEZ	22 53						
	iX	EZ	23 11						
14	iP	NEZ	00 25 36						USCGS: 3.6S 131.2E h = 33km
14	iP	NEZ	00 44 17½						USCGS: 31.3S 179.1W h = 33km
	ipP	Z	44 26½						
	iX	Z	44 46½						
14	iP	NEZ	02 24 04				−		USCGS: 22.0N 121.3E h = 90km
	iX	Z	25 03						
14	iP	NEZ	03 07 55						
14	eP	Z	03 58 21½						USCGS: 31.4S 179.0W h = 33km
	iX	NEZ	58 25						
	iX	NEZ	58 40						
	ePP	EZ	59 17½						
	e(S)	E	04 03 28						
14	iP	Z	07 26 04½						USCGS: 19.0N 145.0E h = 610km
14	iP	N Z	09 37 10½						USCGS: 25.5N 142.6E h = 43km
15	iP	N Z	00 53 24		+		−		USCGS: 10.3S 165.6E h = 43km
	iX	Z	54 12						
	eS	NE	58 33½						
15	iP	NEZ	02 03 55						
15	iP	N Z	02 04 07						USCGS: 9.4S 167.0E h = 33km
	ipP	EZ	04 17½						
15	iP	EZ	02 08 14						USCGS: 32.0S 178.7W h = 33km
	iX	Z	08 19½						
15	iP	N Z	04 56 52½						USCGS: 10.2S 165.3E h = 31km
15	ePP	Z	05 55 32½						USCGS: 44.3N 114.8W h = 33km
	iX	EZ	55 38½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
SEPTEMBER (continued)			h. m. s.	s.				km	
15	iP	N Z	06 21 54½						USCGS: 10.2S 165.4E h = 28km
	ipP	EZ	22 24						
15	eX	EZ	08 32 24						USCGS: 5.9S 146.7E h = 89km
15	iP	NEZ	08 37 18½						USCGS: 30.4S 179.3W h = 33km
	ipP	EZ	37 28½						
15	ipP	Z	09 14 27½						USCGS: 13.8S 166.4E h = 36km
	iX	Z	14 49½						
15	eP	Z	11 06 15						USCGS: 17.1S 173.8E h = 33km
16	iP	NEZ	01 55 43½						USCGS: 10.2S 165.3E h = 33km
16	iP	NEZ	20 11 34½						USCGS: 13.4S 166.5E h = 28km
	ipP	Z	11 44½						
	eX	Z	12 13½						
17	iP	NEZ	19 26 40½						USCGS: 10.1S 165.3E h = 17km
	iPP	N Z	27 46½						
	iPPP	Z	28 03						
	iX	NEZ	29 45½						
	iS	NE	31 52½						
	iX	Z	32 07½						
17	iP	N Z	20 04 07½						USCGS: 10.1S 165.0E h = 36km
17	iP	NEZ	20 07 26½						USCGS: 9.9S 164.7E h = 33km
17	i(P)	N Z	20 19 59½						
17	eP	NEZ	22 34 59						USCGS: 10.2S 165.1E h = 33km
18	iP	NEZ	02 02 13				-		USCGS: 10.7S 165.1E h = 28km
18	iP	NEZ	15 02 39½						
18	iPKP	EZ	17 17 23½						USCGS: 40.9N 29.2E h = 33km
18	eP	NEZ	17 24 43						USCGS: 3.3S 139.9E h = 90km
	iX	Z	24 59						
	isP	N	25 21						
19	iP	NEZ	09 05 32½			+	-		USCGS: 22.0S 179.6W h = 563km
19	iP	NEZ	19 02 19½						USCGS: 19.7S 177.7W h = 536km
19	iP	NEZ	19 35 10						USCGS: 15.2S 167.6E h = 161km
	iX	Z	35 21½						
	iX	Z	35 33						
19/20	iP	NEZ	00 05 43						USCGS: 0.2N 124.0E h = 122km
	iPcP	Z	07 34						
20	iP	NEZ	19 10 03		-		+		USCGS: 1.6N 127.1E h = 97km
	ePP	Z	11 43						
	iPcP	N Z	11 46						
21	eP	N Z	04 03 33						USCGS: 00.0N 119.7E h = 47km
	ePP	N Z	05 16						
21	iP	NEZ	05 44 21¾						Local.
	iS	NEZ	44 32¼						
21	iP	NEZ	16 33 58			+	-		USCGS: 23.0S 179.8E h = 483km
	iX	NEZ	34 00						
22	iP	NEZ	03 02 52						USCGS: 19.3S 175.9E h = 28km
	iX	NEZ	02 58						
	ipP	NEZ	03 00						
	iPP	NEZ	03 59						
22	iP	NEZ	19 28 26				-		USCGS: 19.2S 175.9E h = 24km
	ipP	N Z	28 33						
	isP	NEZ	28 39						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
SEPTEMBER (continued)			h. m. s.	s.				km	
22	eP	N Z	19 35 14						USCGS: 10.3S 165.1E h = 33km
23	iP	Z	05 44 11						USCGS: 7.3S 122.1E h = 543km
	iX	Z	45 51½						
24	iP	NEZ	09 32 31				+		
24	iP	Z	15 51 50½						USCGS: 10.5S 164.6E h = 33km
	iX	Z	51 57						
24	ePKP	Z	16 48 52						USCGS: 10.6S 78.0W h = 80km
	iX	EZ	49 02½						
	ePP	Z	50 03						
	epPP	Z	50 25						
	iPKKP	NEZ	59 23½						
	iPS	NEZ	59 50½						
25	eP	N Z	13 50 47						USCGS: 10.3S 164.4E h = 43km
25	iP	NEZ	14 07 21½						USCGS: 10.2S 164.4E h = 33km
	iX	NEZ	07 43						
25	iP	NEZ	14 56 44½						USCGS: 10.1S 164.5E h = 33km
	iX	Z	57 38½						
25	iP	NEZ	21 03 41						USCGS: 10.5S 164.7E h = 36km
26	eP	Z	01 18 00						USCGS: 10.4S 164.6E h = 33km
26	eP	NEZ	05 41 23						USCGS: 50.4N 176.9W h = 33km
	epP	Z	41 33						
26	iP	NEZ	06 01 22½						USCGS: 5.6S 148.0E h = 156km
	iX	Z	01 30						
	epP	N Z	02 01						
	iPcP	Z	04 08½						
26	iP	NEZ	11 00 26						USCGS: 17.4S 178.8W h = 512km
	iX	Z	00 35½						
26	iP	NEZ	20 42 40¼	+			−		USCGS: 3.3S 141.9E h = 33km
	isP	NEZ	42 53½						
	ePP	N	43 56						
27	eX	N	04 03 35						
	eX	EZ	03 40						
27	iP	NEZ	04 47 15						
	iS	NEZ	47 41						
	iX	NEZ	47 45						
27	iP	EZ	10 34 37						USCGS: 17.1S 174.6E h = 33km
	ipP	EZ	34 45						
27	eP	NEZ	11 13 27						USCGS: 11.3N 126.0E h = 17km
	iX	NEZ	13 43½						
	ePP	N Z	15 27						
	eS	N	20 51						
27	eP	N Z	11 32 24						USCGS: 17.2S 174.7E h = 33km
	iX	NEZ	32 28½						
	iX	N Z	32 36						
	iPPP	N Z	33 47						
	eSS	N	39 32						
28	iP	NEZ	00 38 11½						USCGS: 49.8S 125.9E h = 33km
	ipP	NEZ	38 22						
	iPP	EZ	38 28						
	eX	Z	38 52						
	T Max.	NEZ	55½						
28	i(P)	NEZ	01 24 27						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
SEPTEMBER (continued)			h. m. s.	s.				deg	
28	eP	Z	03 08 34						USCGS: 20.5S 174.3W h = 33km
28	iP	NEZ	05 31 51¾				+		USCGS: 17.8S 178.6W h = 548km
	iX	Z	32 00½						
28	iP	NEZ	06 12 07½						USCGS: 22.9N 94.5E h = 108km
28	iP	N Z	07 03 32¾			−	+		USCGS: 31.5S 179.6E h = 457km
	ipP	Z	04 46						
	iPcP	Z	06 28						
	eS	NE	07 49						
	iScP	Z	09 24						
28	iP	NEZ	11 12 25				−		USCGS: 18.1S 177.9W h = 604km
28	iP	NEZ	18 51 37						USCGS: 3.5S 102.0E h = 29km
	ipP	Z	51 46½						
	eX	EZ	53 18½						
28	eP	Z	23 17 11						USCGS: 13.4S 166.3E h = 53km
29	iP	NEZ	01 12 21½				−		USCGS: 17.7S 179.0W h = 649km
29	eP	N Z	03 00(40)						USCGS: 62.0S 163.5E h = 33km
	eX	N Z	00 58						
	eX	NEZ	01 05						
	eX	E	06 24						
	eLr	E	07 18						
	eX	E	08 18						
29	iP	NEZ	19 43 26						USCGS: 6.0N 125.3E h = 117km
	ipP	NEZ	43 46½						
	iPcP	Z	44 52½						
	eScP	Z	48 40½						
	iS	NE	50 15						
29	iP	NEZ	20 40 37½						USCGS: 21.6N 142.9E h =325km
30	iP	NEZ	09 01 44		−	+	+		USCGS: 1.3S 128.5E h = 30km
	ipP	Z	01 53						
	isP	EZ	01 57						
	ePP	Z	03 11½						
30	iP	Z	09 49 29½						USCGS: 14.7S 177.5W h = 362km
30	iP	NEZ	15 47 42½						USCGS: 2.2S 134.1E h = 135km
30	eP	NEZ	23 08 24						USCGS: 9.4N 142.3E h = 33km

(L.S. PRIOR)
A/CHIEF GEOPHYSICIST

COMMONWEALTH OF AUSTRALIA No.63/10.

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN.

TOOLANGI

Latitude: 37° 34' 17" S. Longitude: 145° 29' 26" E. Height: 604m.

Foundation: Metamorphosed Silurian Sediments.

Instruments: Benioff Variable Reluctance Seismometers, 3 components
Seismometer periods: 1 sec.

Short period recorder
Galvanometer period: 0.2 sec. nominal

Long period recorder
Galvanometer period: 14 sec.

Milne Shaw Seismograph E - W component
Period: 12 sec.

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
OCTOBER 1963			h. m. s.	s.				km	
1	iP	NEZ	02 26 00						
1	iP	NEZ	03 15 35½						USCGS: 14.5S 167.5E h = 170km
1	iP	NEZ	05 09 38						USCGS: 18.5N 145.2E h = 225km
1	iP	NEZ	19 55 14						
2	eP	N Z	03 37 53						USCGS: 5.4S 152.0E h = 65km
2	eP	NEZ	05 54 28						USCGS: 20.8S 174.1W h = 33km
	eX	Z	55 06						
3	iP	NEZ	05 42 47½						USCGS: 22.3N 121.1E h = 55km
	iPcP	Z	43 18						
3	iP	NEZ	14 01 37						USCGS: 15.3S 173.4W h = 36km
3	eP	NEZ	16 00 44						USCGS: 58.5S 25.1W h = 54km
3	iP	NEZ	23 35 47						USCGS: 32.2N 131.6E h = 33km
	ipP	NEZ	35 58½						
	iPcP	Z	36 09						
	iX	NE	36 20						
	iX	EZ	36 44						
	ePP	N Z	38 31						
	iS	NE	45 04						
4	eP	NEZ	02 54 56						USCGS: 20.7S 174.0W h = 33km
	epP	Z	55 05						
	eX	Z	55 31						
4	iP	NEZ	03 45 52						
4	iP	Z	03 56 56½						USCGS: 58.4S 25.0W h = 33km
4	e(P)	Z	04 15 05						
4	iP	NEZ	15 38 16						
5	iP	NEZ	00 22 42½						USCGS: 15.7S 173.3W h = 33km
	iX	NEZ	22 45						
	epP	EZ	22 52						
	iX	Z	23 03½						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
OCTOBER (continued)		h. m. s.	s.				km	
5	iP NEZ	02 03 20½						USCGS: 16.0S 173.2W h = 79km
	iX EZ	03 22½						
	iX EZ	03 30½						
	ipP Z	03 35						
5	iP NEZ	05 23 23½						USCGS: 15.9S 173.2W h = 33km
	eX EZ	23 30						
	eX EZ	23 49						
	iX EZ	24 04						
5	eP EZ	06 26 27						USCGS: 15.6S 173.1W h = 33km
	ipP EZ	26 36						
5	iP NEZ	06 48 54						USCGS: 2.7N 127.4E h = 175km
5	i(P) NEZ	07 04 04						
5	iP NEZ	12 57 11						USCGS: 15.7S 173.6W h = 33km
6	e(P) NEZ	13 34 18						
6	eP N Z	17 29 16						
7	ePKP Z	04 18 56½						USCGS: 11.6N 86.9W h = 50km
	epPKP Z	19 07½						
7	eP Z	11 27 45						USCGS: 12.1S 65.4E h = 33km
7	iP NEZ	13 20 11¾		+	+	-		USCGS: 23.6S 179.9E h = 550km
	iX EZ	21 25						
	ipP NEZ	21 44						
	iPP EZ	21 51½						
	iPcP EZ	22 46						
	esPP Z	23 29						
	iS NEZ	24 48						
	iScP EZ	25 37						
	e(SS) NE	27.9						
	iScS NEZ	29 37						
7	eP N Z	23 47 07						USCGS: 42.7N 110.5E h = 33km
	iX N Z	47 45						
8	eP NEZ	00 24 55						USCGS: 15.1S 173.2W h = 33km
	ipP Z	25 06½						
	iX NEZ	25 40½						
	ePcP N Z	26 43						
8	eP Z	01 11 49						USCGS: 3.1S 128.8E h = 33km
8	iP NEZ	02 09 16½						USCGS: 21.2S 177.9W h = 380km
8	i(P) Z	06 35 28						USCGS: 11.3N 125.9E h = 39km
	ipP NEZ	35 37						
	eX EZ	36 08						
	ePP Z	37 08						
8	eP Z	13 24 03						USCGS: 45.5S 35.3E h = 33km
	ePcP N Z	24 11½						
8	e(P) NEZ	16 23 22						
	eX Z	23 34						
8	iP NEZ	18 53 40						
8	iP NEZ	20 37 25						USCGS: 2.6N 128.4E h = 166km
	i(pP) Z	38 08						
	iPcP Z	39 11½						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
OCTOBER (continued)		h. m. s.	s.				km	
9	eP NEZ	10 22 16½						
	iX EZ	22 20½						
	iX EZ	22 23						
	iX N Z	22 38½						
9	iP EZ	10 44 16½						USCGS: 20.3S 174.4W h = 33km
	ipP Z	44 23½						
9	iP NEZ	13 02 10½		+	+	-		
	iX Z	08 12½						
9	iP Z	14 46 21						USCGS: 27.7N 138.5E h = 556km
9	iP NEZ	23 47 20						USCGS: 8.4S 126.1E h = 229km
	iX NEZ	47 25						
	eX E	55 25						
	iX N Z	55 28½						
	eX N	56 40						
10	eP NEZ	00 56 51						USCGS: 5.6S 145.6E h = 102km
	epP Z	01 03 19						
10	eP NEZ	10 58 06						
10	eP NEZ	12.12 06						USCGS: 20.2S 175.2W h = 25km
10	i(P) Z	14 24 29						
	iX N Z	24 31						
10	eP N Z	16 58 43						USCGS: 12.4N 144.0E h = 35km
	iX N Z	59 09						
11	eP NEZ	00 07 08½						USCGS: 24.1S 179.6W h = 437km
	iX NEZ	07 23½						
	iX Z	07 29						
	iX N Z	07 44½						
11	iP NEZ	05 03 38						Local.
	iS NEZ	03 53½						
11	iP NEZ	16 40 24¾				-		USCGS: 18.5S 177.7W h = 583km
	iX NEZ	40 34						
12	eP NEZ	11 39 15½						USCGS: 44.8N 149.0E h = 40km
	ipP NEZ	39 30½						
	iX EZ	39 48						
	iX Z	41 04½						
	eS NE	49 15						
	eScS E	49 38						
	eX NE	49 56						
	ePS E	50 14						
	eX E	54 24						
	eX NE	55.2						
	e(Lq) NE	12 01 09						
13	iP NEZ	05 30 13½						USCGS: 44.5N 149.5E h = 60km
	eX E	32 10½						phases obscured by coda.
	ePPP E	35 16½						
	i(S) E	40 32						
	i(SKS) N	40 38						
	eX E	40 58						
13	eP EZ	06 17 51						USCGS: 45.9N 151.9E h = 55km
13	eP Z	07 15 45						USCGS: 45.5N 150.6E h = 50km
13	eP Z	09 28 43						USCGS: 44.6N 149.6E h = 50km

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
OCTOBER (continued)			h. m. s.	s.				km	
13	eP	Z	12 54 36						USCGS: 44.4N 149.4E h = 55km
13	eP	N Z	13 10 41						USCGS: 45.0N 150.0E h = 50km
	ipP	Z	10 55						
13	iP	Z	14 38 29				+		USCGS: 44.5N 149.5E h = 50km
13	iP	NEZ	16 12 16				+		USCGS: 45.9N 150.5E h = 35km
	isP	N Z	12 36						
	iX	Z	14 41						
	eS(KS)	NE	22 34						
	eX	NE	22 58						
13	iP	EZ	16 58 19				+		
13	eP	Z	18 26 01½						USCGS: 44.2N 149.4E h = 55km
	epP	Z	27 18½						
13	iP	EZ	19 40 01½				-		USCGS: 45.7N 151.7E h = 45km
13	iP	Z	22 07 18½						USCGS: 44.7N 152.1E h = 50km
14	e(P)	Z	02 13 22						USCGS: 25.2N 95.3E h = 33km
14	eP	N Z	04 23 34						USCGS: 44.7N 150.6E h = 45km
	eX	Z	24 06						
14	e(P)	NEZ	05 19 28						
14	eP	Z	05 36 32						USCGS: 44.5N 151.0E h = 55km
14	eP	Z	08 06 52						USCGS: 44.8N 151.2E h = 55km
14	iP	NEZ	13 34 02						USCGS: 44.8N 151.0E h = 60km
	ipP	N Z	34 18						
	iX	N	34 35						
	iX	Z	34 41						
15	eP	EZ	07 14 25						USCGS: 20.5S 173.9W h = 33km
15	iPKP	Z	10 19 17						USCGS: 67.2N 18.4W h = 33km
15	eP	NEZ	19 59 30						
	iX	EZ	59 46						
15	iP	NEZ	21 52 10						USCGS; 3.0S 129.9E h = 27km
	ipP	NEZ	52 18						
	iX	N Z	52 26						
	iPP	Z	53 36½						
	iPcP	Z	54 26						
	iX	Z	55 13						
	eS	E	58 03						
	eLq	E	22 00 15						
	eLr	E	01 38						
	eX	E	03 02						
16	iP	NEZ	07 18 57						USCGS: 22.2S 179.5W h = 539km
16	iP	EZ	07 27 29						
16	eP	N Z	10 43 15						USCGS: 45.2N 150.4E h = 45km
	ipP	N Z	43 30						
16	iP	NEZ	12 55 09						USCGS: 1.8S 127.9E h = 33km
	iX	NEZ	55 20						
	iX	Z	55 34½						
	iPP	N	56 47						
16	e(P)	Z	13 59 16						
	eX	NEZ	59 34						
16	eP	Z	20 48 01						USCGS: 8.8N 137.9E h = 28km
	ipP	NEZ	48 06½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
OCTOBER (continued)			h. m. s.	s.				km	
16	epP	Z	21 43 27						USCGS; 44.4N 150.9E h = 80km
16	iPKP	Z	22 40 59						USCGS: 17.7N 62.0W h = 67km
17	iP	N Z	03 14 36½						USCGS: 11.6N 140.6E h = 70km
	iX	NEZ	14 39½						
	ipP	N Z	14 49½						
	eX	EZ	15 21						
17	iP	N Z	07 11 48½						
17	iP	EZ	11 41 27½						USCGS: 17.3S 168.0E h = 33km
17	eP	NEZ	14 22 56						USCGS: 9.8N 126.5E h = 33km
	isP	NEZ	23 10						
17	iP	NEZ	19 12 05						USCGS: 6.6N 126.3E h = 33km
17	eP	N Z	23 36 55						USCGS: 44.6N 149.0E h = 45km
	ipP	N Z	37 06½						
	iX	NEZ	37 20½						
	iX	Z	38 07						
	eS	EZ	47 02						
	eX	Z	00 01 18						
	M	Z	11.0						
18	eP	NEZ	00 28 44						
18	iP	NEZ	02 53 22						USCGS: 18.0S 178.7W h = 650km
	eX	EZ	53 31						
18	eP	Z	08 47 50½						USCGS: 10.5S 161.6E h = 33km
19	eP	NEZ	02 31 19½						USCGS: 46.8N 153.7E h = 45km
19	eX	Z	03 47 05						USCGS: 46.6N 153.8E h = 33km
19	eP	NEZ	09 11 13						USCGS: 9.9N 126.1E h = 86km
	iX	NEZ	11 28						
19	iP	NEZ	11 59 56½						USCGS: 10.1S 119.3E h = 33km
19	iP	EZ	14 41 52						
	iX	Z	42 03						
19	eP	NEZ	18 09 46						USCGS: 35.9S 80.5E h = 33km
	iX	NEZ	09 50						
20	eP	N Z	01 05 34½						USCGS: 44.7N 150.7E h = 25km
	isP	Z	05 49						
	iX	N Z	05 54½						
	iX	Z	06 38						
	eX	E	07 13½						
	iX	Z	09 17						
	e(SKS)	E	15 56						
	eX	E	19 31						
	iSS	E	20 54						
	eX	E	21 22						
	e(Lg)	E	27 44						
	iX	E	32 25						
20	iP	Z	02 09 22½						
20	iP	Z	03 06 17½						
	iX	Z	06 31						
	eX	Z	11 24						
20	eP	NEZ	03 42 41						
20	iP	EZ	06 22 39½						USCGS: 43.9N 150.7E h = 50km
	iPcP	Z	22 42						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
OCTOBER (continued)			h. m. s.	s.				km	
20	iP	NEZ	08 29 20						Local.
	iX	Z	31 09						
	i(S)	NE	31 15½						
20	eP	N Z	09 23 01						USCGS: 44.4N 150.0E h = 40km
	iX	Z	23 22						
	iX	NEZ	23 30						
	iX	N Z	23 36						
	eX	Z	24 12						
20	eP	NEZ	11 11 38½						USCGS: 16.1S 066.3E h = 33km
	epP	NEZ	11 47½						
	ePcP	EZ	11 59½						
20	eP	Z	12 04 57½						USCGS: 44.7N 150.2E h = 45km
20	ePKP	NEZ	13 19 35						USCGS: 24.1N 5.1E h = 0 km
20	eP	NEZ	15 38 08						
20	eP	NEZ	17 53 47						USCGS: 44.2N 149.6E h = 45km
20	eP	Z	18 11 15						USCGS: 44.2N 149.6E h = 45km
21	epP	NEZ	02 37 32						USCGS: 22.9S 172.1E h = 54km
	iX	Z	37 49						
21	i(P)	NEZ	06 25 21						
	iX	NEZ	25 36						
21	eP	EZ	09 25 44						USCGS: 23.6S 176.1W h = 33km
21	iP	NEZ	13 16 20½						USCGS: 3.3S 150.2E h = 43km
	iX	N Z	16 27½						
	ipP	N Z	16 31½						
	iX	N Z	16 57½						
21	iP	EZ	13 52 57½						USCGS: 44.6N 149.8E h = 33km
21	iP	NEZ	15 50 44½						USCGS: 45.5N 149.7E h = 55km
	eX	Z	51 15						
21	eP	NEZ	17 33 01½						USCGS: 44.1N 150.3E h = 65km
21	eP	N Z	23 30 56						USCGS: 44.0N 150.3E h = 50km
	ipP	N Z	31 10						
22	iP	NEZ	15 41 45¾		−		+		USCGS: 11.6S 166.3E h = 80km
	ipP	Z	42 01						
23	iP	NEZ	08 02 27½		−		+		
	i(pP)	NEZ	02 55½						
23	iP	NEZ	09 59 06				−		USCGS: 41.2N 144.2E h = 50km
	epP	Z	59 19						
23	iP	N Z	10 22 51½						USCGS: 6.9S 148.4E h = 29km
	isP	N Z	23 04						
23	iP	NEZ	14 54 40½						USCGS: 12.2N 125.7E h = 99km
	epP	Z	55 09						
23	iP	NEZ	20 20 29						USCGS: 25.9S 178.8W h = 343km
23	iP	Z	20 36 14						USCGS: 19.4N 155.5W h = 5km
	iPcP	Z	36 17						
24	iP	NEZ	07 35 21		−	+	+		USCGS: 4.9S 102.9E h = 50km
	ipP	EZ	35 35						
	isP	NEZ	35 41						
	i(PcP)	EZ	36 18						
	iS	NE	42 35½						
24	eP	EZ	18 42 42						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
OCTOBER (continued)			h. m. s.	s.				km	
24	iP	NEZ	19 30 04½						USCGS: 28.3N 128.5E h = 33km
25	eP	EZ	01 36 25½						USCGS: 62.3S 156.9E h = 33km
	eX	E	42 10						
25	iP	NEZ	20 07 50						USCGS: 12.3N 144.5E h = 29km
	ipP	N Z	08 02						
	isP	EZ	08 12						
	eS	E	15.0						
26	eP	NEZ	04 07 59						
26	iP	NEZ	06 12 02½						
26	eP	Z	08 40 32						USCGS: 20.7S 169.0E h = 33km
	ipP	EZ	40 44						
26	eP	NEZ	11 34 06						
	e(pP)	Z	34 18½						
26	eP	Z	11 44 12						
26	iP	NEZ	12 41 28¾		−		+		USCGS: 15.8S 174.0W h = 115km
	iX	Z	41 39½						
	isP	NEZ	42 05						
26	iP	NEZ	19 02 10½						USCGS: 07.0S 129.7E h = 125km
	iX	Z	02 23½						
	iX	N Z	03 09						
	iX	N	04 11						
	eG	E	09 18						
	iX	N	09 51						
26	eP	NEZ	22 47 57						
	eX	Z	54 23½						
	eX	E	57.0						
27	iP	NEZ	08 52 07		+	+	−		USCGS: 17.9S 178.5W h = 586km
	iX	NEZ	52 16						
	iX	EZ	52 37½						
	eX	N Z	54 00						
	iS	E	57 11						
	eX	Z	57 28						
27	iP	Z	10 45 53						USCGS: 22.8S 175.2W h = 35km
	eLr	EZ	56.7						
27	iP	NEZ	18 31 36						USCGS: 24.3S 176.1W h = 33km
	ipP	Z	31 43						
	iPP	N Z	32 05½						
	ePPP	Z	33 10						
	eX	E	42.0						
27	iP	NEZ	19 44 11						USCGS: 16.8S 173.5W h = 33km
	ipP	Z	44 23						
27	eP	EZ	20 17 56						
27	eP	NEZ	23 14 41½						
	e(pP)	Z	15 10						
	e(S)	NEZ	17 56						
28	iP	NEZ	00 45 05¾		+	−	−		USCGS: 1.9N 124.8E h = 232km
28	eP	EZ	08 02 05						USCGS: 24.3S 176.0W h = 33km
	epP	EZ	02 15½						
	eS	E	08.1						
	eScS	E	12 33						
	Max.	EZ	17.5						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	△	Remarks
OCTOBER (continued)			h. m. s.	s.				km	
28	eP	N Z	11 28 05						USCGS: 57.1S 147.1E h = 33km
28	eP	NEZ	12 16 22						USCGS: 52.8N 159.8E h = 33km
	isP	Z	16 35						
28	iP	NEZ	20 04 59				-		USCGS: 24.5S 179.9E h = 532km
29	iP	EZ	11 02 39½						USCGS: 18.0S 178.3W h = 494km
29	eP	EZ	20 28 51						USCGS: 26.2S 177.8W h = 49km
	eL	Z	38.0						
29	eP	Z	22 29(30)						
	eL	Z	40.0						
30	e(P)	NEZ	03 09 03						
31	iP	NEZ	03 24 54						USCGS: 21.8S 175.0W h = 33km
	esP	Z	25 08						
	iPP	Z	25 43						
	eX	E	34.1						
	ePcP	E	37.7						
31	iP	NEZ	08 58 01¼						USCGS: 17.9S 178.8W h = 637km
	iX	NEZ	58 10½						
	iX	Z	58 31½						
31	iP	NEZ	10 00 50						USCGS: 19.3S 177.4W h = 555km
	eL	EZ	25.0						
31	iP	NEZ	10 53 39						USCGS: 10.5S 162.0E h = 38km

(L.S. PRIOR)
ASSISTANT DIRECTOR (GEOPHYSICS)

COMMONWEALTH OF AUSTRALIA No.63/11.

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN - NOVEMBER 1963 to Jan 1964

TOOLANGI

Latitude: 37° 34' 17" S. Longitude: 145° 29' 26" E. Height: 604m.

Foundation: Metamorphosed Silurian Sediments.

Instruments: Short period - 3 components: Benioff Variable Reluctance.
Seismometer periods: 1 sec.
Galvanometer periods: 0.2 sec. nominal.

Long period - vertical component: Columbia Original.
Seismometer period: 15 secs.
Galvanometer period: 90 secs.

- 2 horizontal components: Sprengnether.
Seismometer periods: 15 secs.
Galvanometer periods: 90 secs.

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
			h. m. s.	s.				km	
1	eP	NEZ	21 06 21						USCGS: 22.5S 176.8W h = 71km.
	esP	EZ	06 49						
	iX	E	08 03						
	iPcP	Z	08 48						
	eScP	Z	12 22						
1	eP	Z	22 53 41						USCGS: 44.9N 148.9E h = 60km
2	eP	Z	22 28 19½						USCGS: 1.9S 138.9E h = 33km
	eX	EZ	41.3						
3	ePKP	NEZ	03 29 08½						USCGS: 3.5S 077.8W h = 33km
	ePP	NEZ	30 44½						
	eSP	Z	40.5						
	ePS	E	40.7						
	eSS	E	47.8						
	eSSS	EZ	04 01.3						
	eLq	Z	09.0						
3	iP	NEZ	12 02 07						Regional.
	iX	NE	02 40½						
	iX	E	03 20½						
4	iP	NEZ	01 20 25¾						USCGS: 15.1S 167.3E h = 154km
	ipP	Z	20 57						
4	iP	NEZ	01 23 46						
4	iP	NEZ	02 43 13						USCGS: 7.0S 129.5E h = 129km
4	eX	NEZ	03 49 58						USCGS: 6.9S 129.8E h = 100km
4	iP	NEZ	05 29 36¾				+		USCGS: 6.8S 129.8E h = 80km.
4	iP	N Z	07 27 02						
4	iP	NEZ	15 20 07				-		USCGS: 7.0S 129.4E h = 132km
	iX	Z	20 20						
	eX	E	27 11						
	eX	Z	27 43						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
NOVEMBER (continued)		h. m. s.	s.				km	
4	eP NEZ	19 58 38						USCGS: 6.9S 129.5E h = 104km
	esP NEZ	59 30½						
4	eP NEZ	22 23 41						USCGS: 6.8S 129.8E h = 122km
	epP NEZ	24 29						
	esP NEZ	24 43						
	ePP Z	24 53						
	eLq NEZ	30 28						
5	eX EZ	01 18 48						
5	iP NEZ	05 23 00						USCGS: 7.3S 129.2E h = 141km
	iPP Z	24 09						
5	eP NEZ	06 12 55						USCGS: 6.9S 129.4E h = 94km
	iX NEZ	13 59						
	isPP NEZ	14 41						
5	iP EZ	08 23 41						USCGS: 24.8S 179.7E h = 606km
5	iP NEZ	08 50 07		+		-		USCGS: 7.2S 129.0E h = 112km
	ipP Z	50 19½						
	esP Z	50 36½						
	eX Z	50 57						
	iX E	57 00						
	eX Z	57 17						
	iX N	57 43½						
5	e(P) EZ	13 26 32						
5	e(P) NEZ	13 58 21						
	iX N Z	58 26						
6	iP NEZ	00 00 55		+	-	-		USCGS: 1.7N 126.4E h = 28km
	ipP NEZ	01 06						
	iPP N Z	02 33						
6	eP NEZ	07 42 22						USCGS: 2.5S 138.6E h = 38km
	M EZ	58.2						
6	iP NEZ	09 07 48		+		-		USCGS: 7.1S 129.2E h = 90km
	iX NEZ	08 43						
	eLq NEZ	14 41						
	M Z	23.0						
6	iX NEZ	11 00 05						USCGS: 3.0S 138.7E h = 16km
	iX NEZ	02 04						
	iPcP NEZ	02 14½						
	eLq E	11.9						
	eLr Z	15.5						
6	eP NEZ	13 43 10½						
7	iP NEZ	00 01 31½						
7	iP EZ	16 00 34						USCGS: 2.7N 128.4E h = 216km
	eX EZ	00 46½						
7	eL EZ	17 17.8						
8	eP EZ	04 29 50						USCGS: 23.0S 170.9E h = 35km
	epP NEZ	30 02						
8	iP NEZ	05 10 57						USCGS: 21.5S 179.7W h = 659km
8	iP NEZ	05 12 08¾						Local.
	iS NEZ	12 25½						
8	iP NEZ	16 21 17½		+	-	-		USCGS: 2.7N 128.4E h = 216km
	iX NEZ	21 35						
	epP EZ	22 02						
	ePP NEZ	23 00						
	eX Z	17 07.9						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
NOVEMBER (continued)			h. m. s.	s.				km	
9	iP	NEZ	01 19 27						USCGS: 11.9S 166.6E h = 112km
9	eP	NEZ	05 45 56						USCGS: 5.6S 105.5E h = 33km
	eX	EZ	46 02						
	ePcP	Z	46 15						
	eX	Z	52 28						
9	iP	NEZ	18 18 43						
9	eP	NEZ	18 57 18						USCGS: 7.1S 129.4E h = 80km
9	ePKP	Z	21 33 14						USCGS: 9.0S 071.5W h = 600km
	eX	NEZ	33 20						
	iX	NE	33 24½						
	iX	N Z	35 07						
	eSKS	NE	39 33						
	iX	NE	41 03						
	eSS	E	50.3						
10	iPKP	Z	01 18 28						USCGS: 9.2S 071.5W h = 600km
	iX	NEZ	18 30						
	ePP	Z	20 17						
	eX	NEZ	21 27						
	epPP	Z	22 16						
	e(SS)	E	36 22						
10	iP	NEZ	04 38 19						USCGS: 6.9S 129.3E h = 181km
	esP	NEZ	39 13						
	eX	NEZ	41 31						
10	eP	EZ	05 11 01						USCGS: 26.5N 93.2E h = 66km
	ePcP	EZ	11 13						
10	eP	Z	09 02 24						USCGS: 44.5N 149.4E h = 45km
	ipP	N Z	02 39						
10	iP	NEZ	17 30 01½				+		USCGS: 44.4N 149.0E h = 40km
	ePcP	EZ	30 11½						
	iX	N	30 21½						
	eS	N Z	40 15						
	eLq	E	51.7						
	eX	E	57.7						
	M	Z	18 04.2						
10	iP	NEZ	19 26 01½						USCGS: 26.2S 178.3E h = 607km
11	iP	NEZ	00 21 35½						USCGS: 7.0S 129.5E h = 132km
	iX	NEZ	21 41						
	isP	N Z	24 11½						
	iX	NEZ	24 51½						
	iLq	E	28 21						
	iX	EZ	28 49						
	eX	NEZ	29 23½						
	iScS	NEZ	31 34						
	iX	N	32 29½						
11	eP	Z	10 01 58						USCGS: 44.6N 148.9E h = 55km
11	iP	NEZ	11 36 30½				+		USCGS: 16.9S 174.4W h = 185km
	iX	EZ	36 40½						
	epP	N Z	36 53						
	esP	EZ	37 15						
	ePP	Z	38 30						
	eX	N	40 30						
	e(S)	Z	42 34						
11	e(P)	Z	14 39 21						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
NOVEMBER (continued)			h. m. s.	s.				km	
12	e(P)	NEZ	11 45 18						
	iX	NEZ	46 00						
12	iPKP	NEZ	12 45 32						USCGS: 15.8S 72.4W h = 33km
	M	EZ	13 05.5						
13	eP	Z	05 23 02						
13	iP	N Z	08 45 47½						USCGS: 4.9S 132.3E h = 33km
13	iP	NEZ	11 24 18¼						USCGS: 23.8S 179.9W h = 520km
13	eP	Z	17 25 55						USCGS: 22.9S 175.3W h = 33km
	M	EZ	40.5						
14	eP	NEZ	00 26 23						USCGS: 30.1S 177.4W h = 42km
	epP	Z	26 33						
14	iP	NEZ	04 38 36¾						
14	eP	NEZ	04 41 49						USCGS: 17.5S 167.7E h = 33km
	epP	Z	41 58						
	eL	EZ	47.4						
	M	EZ	52.0						
14	eP	NEZ	16 51 01						
15	eP	NEZ	06 45 25						Local.
	iS	NEZ	45 28¾						
15	iP	NEZ	21 18 50		+		−		USCGS: 44.3N 149.0E h = 50km
	ipP	NEZ	19 04				−		
	isP	NEZ	19 16¾				+		
	eX	NE	20 54½						
	eS	E	29.1						
	eL	E	40.6						
16	eP	NEZ	06 59 07						USCGS: 41.3S 087.5W h = 11km
	ipP	Z	59 13½						
	eX	Z	59 22						
16	eP	NEZ	22 50 34¼			−	−		USCGS: 22.3S 175.0W h = 33km
	ipP	NEZ	50 38½						
	ePPP	NE	52 39						
	ePcP	Z	52 41						
	eLq	N Z	59.3						
	M	N Z	23 08.8						
16	eP	NEZ	23 47 08						USCGS: 22.1S 175.3W h = 33km
	esP	Z	47 22						
17	eP	NEZ	00 56 06½						USCGS: 22.2S 175.0W h = 33km
17	ePKP	NEZ	01 07 53						USCGS: 7.6N 037.4W h = 33km
	iPKP	N Z	08 06½						
	eX	NEZ	08 30						
	eX	N Z	10 02½						
	eX	EZ	12.6						
	eLq	E	52.1						
17	iP	Z	05 57 40½				+		
17	iP	NEZ	06 31 36¾				+		
17	iP	NEZ	07 59 07				+		USCGS: 6.3N 126.2E h = 33km
17	iP	NEZ	12 20 20½		+	+	−		
	ipP	NEZ	20 29½						
	eX	E	21 19						
	eX	Z	21 26						
17	eP	NEZ	18 47 14½						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	△	Remarks
NOVEMBER (continued)			h. m. s.	s.				km	
17	eP	NEZ	20 10 04						USCGS: 7.1S 129.6E h = 137km
18	eiP	NEZ	01 08 38		+		+		USCGS: 3.6S 143.4E h = 33km
	eiX	N Z	08 41						
	epP	Z	08 46						
	eL	EZ	17.9						
	M	EZ	21.5						
18	ePP	Z	01 57 27½						USCGS: 29.3N 57.0E h = 33km
18	iPPP	NEZ	05 27 18		-	+	+		USCGS: 8.4S 113.5E h = 104km
18	eP	Z	06 09 47						USCGS: 22.4S 170.5E h = 33km
18	eP	NEZ	06 54 11						
	eX	NEZ	54 22						
18	eP	EZ	13 19 28½						USCGS: 35.5S 179.9W h = 50km
18	eP	NEZ	13 59 26						USCGS: 15.9S 113.3W h = 33km
18	eP	Z	14 57 14						
	eX	Z	58 09						
	e(S)	EZ	15 08 02						
	e(SS)	EZ	14.5						
	eL	EZ	26.2						
	M	EZ	36.0						
18	iP	NEZ	19 47 48¼			+	-		
18	iP	NEZ	21 17 21¼						USCGS: 13.4S 166.6E h = 51km
	eX	NEZ	17 30½						
	eL	EZ	24.0						
19	iP	Z	04 48 58½				+		USCGS: 39.7N 129.5E h = 537km
19	iP	N Z	10 51 27½				-		USCGS: 22.5S 171.3E h = 36km
	isP	Z	51 43						
	iX	Z	51 49						
	e(PcP)	Z	54 16						
	eL	EZ	58.5						
19	iP	Z	11 13 11				-		USCGS: 44.4N 149.2E h = 33km
	ipP	Z	13 21						
19	eP	Z	12 25 26						
19	iP	Z	12 36 40½						USCGS: 30.2S 060.8E h = 33km
19	eP	Z	17 51(41)						USCGS: 53.1N 159.6E h = 40km
	eX	Z	51 55						
19	eP	NEZ	18 26 06						USCGS: 5.0S 102.2E h = 37km
	e(S)	E	33(14)						
	M	EZ	50.5						
20	iP	NEZ	04 13 31½		+		-		USCGS: 5.5S 148.2E h = 201km
	ipP	N Z	14 17						
	eG	E	21 15						
20	i(P)	EZ	05 49 08¾						
20	iP	Z	09 02 09½						USCGS: 17.5S 172.8W h = 33km
20	iX	Z	09 31 47						
20	iP	NEZ	12 07 05½						USCGS: 22.2S 175.2W h = 33km
	eL	E	18.0						
	M	Z	21.5						
20	iP	N Z	16 30 12¼						
20	iP	NEZ	17 08 22¾						USCGS: 31.5N 131.6E h = 33km

Date 1963	Phase	Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z		Remarks
NOVEMBER (continued)		h. m. s.	s.				km	
20	iP NEZ	18 57 54						USCGS: 6.4N 126.2E h = 33km
	eX Z	59 41						
21	iP NEZ	06 01 18						USCGS: 17.9S 178.6W h = 595km
21	iP NEZ	06 43 50						
21	iP NEZ	19 14 27½						
21	iP EZ	21 14 19¾						
	i(pP) Z	14 36¼						
22	iP NEZ	00 26 34						USCGS: 5.9S 107.9E h = 323km
	ipP N Z	27 39¾						
	iScP Z	31 26¼						
22	iP Z	11 03 24½						
22	eP Z	14 58 10						USCGS: 44.4N 149.0E h = 33km
22	eP EZ	17 11 25						USCGS: 17.9S 172.8W h = 33km
22	iP EZ	17 48 57						
22	eP Z	22 04 33						
23	iP NEZ	05 04 49						USCGS: 15.0S 167.3E h = 116km
	iX N Z	05 07						
23	iP Z	09 26 35½						
24	eX EZ	04 05 35						USCGS: 2.9S 128.8E h = 42km
24	iP EZ	05 15 49¼						USCGS: 22.1S 175.6W h = 33km
24	eP EZ	05 20 30						USCGS: 21.9S 175.8W h = 33km
24	eP Z	15 37 48						USCGS: 6.1S 147.6E h = 75km
25	iP NEZ	00 58 27						USCGS: 16.3S 174.6W h = 196km
	eX Z	58 38						
	eX NEZ	58 42						
25	eP NEZ	16 57 08½						USCGS: 22.6N 121.3E h = 33km
	eX Z	57 29						
26	eP NEZ	03 05 12½						USCGS: 26.9S 176.5W h = 46km
26	eP N Z	04 15 13½						
26	iP NEZ	06 58 41¾		+	−	−		USCGS: 6.8S 129.6E h = 111km
	eX Z	07 00 48						
	eScP Z	04 50						
	eX NEZ	05 27½						
	eX NEZ	07 06						
26	eP NEZ	08 53 49½						USCGS: 7.1S 129.2E h = 117km
26	iP NEZ	22 56 48		−	+	+		USCGS: 16.6S 175.2E h = 33km
	ePP NEZ	58 02						
	e(S) N Z	03 02¼						
	eL N Z	06.0						
	M Z	07.1						
27	e(P) NEZ	06 27 00½						
	eX NEZ	27 17						
27	eP NEZ	14 07 05½						USCGS: 3.1N 126.6E h = 33km
	e(PP) NEZ	14 09 09						
28	eP N Z	15 14 11						USCGS: 12.1S 166.1E h = 33km
	eX Z	14 17						
28	eP NEZ	18 19 40						USCGS: 27.4S 179.1E h = 593km
28	e(P) Z	19 32 50						USCGS: 12.2S 165.9E h = 25km

Date 1963	Phase	Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
NOVEMBER (continued)		h. m. s.	s.				km	
28	eP Z	19 35 28						
28	iP NEZ	20 04 30¼						USCGS: 7.0S 129.3E h = 101km
29	eP Z	06 30 44						
29	eP EZ	14 39 24						
29	iP NEZ	19 01 53¾						USCGS: 17.3S 178.4W h = 528km
30	iP NEZ	00 05 16						USCGS: 17.9S 178.8W h = 608km
30	iP NEZ	09 55 47½						USCGS: 1.6N 128.4E h = 61km
	eX Z	55 57						
	ipP N Z	56 15¾						
	iPP Z	57 25¼						
	iS N	10 02 04						
	eSS EZ	05 06						
30	iP NEZ	21 50 59½						USCGS: 6.6N 094.2E h = 33km
	ipP EZ	51 10¾						

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COMMONWEALTH OF AUSTRALIA No.63/12.

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN - DECEMBER 1963

TOOLANGI

Latitude: 37° 34' 17" S. Longitude: 145° 29' 26" E. Height: 604m.

Foundations: Metamorphosed Silurian Sediments.

Instruments: Short period - 3 components: Benioff Variable Reluctance.
Seismometer periods: 1 sec.
Galvanometer periods: 0.2 sec. nominal.

Long period - vertical component: Columbia Original.
Seismometer period: 15 secs.
Galvanometer period: 90 secs.

- 2 horizontal components: Sprengnether.
Seismometer periods: 15 secs.
Galvanometer periods: 90 secs.

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
		h. m. s.	s.				km	
1	iP NEZ	07 53 33¾						USCGS: 3.9S 146.3E h = 33km
1	eP Z	09 45 42						USCGS: 7.4N 093.5E h = 27km
1	eP Z	11 58 56						USCGS: 4.6S 154.8E h = 479km
2	eP NEZ	00 31 25						USCGS: 15.3S 173.7W h = 348km
2	iP NEZ	03 45 06¼						
2	iP EZ	16 07 32¼						
2	iP EZ	17 38 09¼						
3	eP NEZ	04 26 58						USCGS: 4.2S 102.9E h = 50km
	epP Z	27 09						
3	eP Z	07 19 51						USCGS: 6.2S 147.6E h = 97km
3	iP NEZ	14 40 00¾			-	+		USCGS: 18.5S 177.8W h = 615km
3	eP N Z	19 50 03						
3	iP N Z	21 21 35				+		USCGS: 12.2S 166.0E h = 32km
	eX N Z	21 40¼						
	i(pP) N Z	21 46¾						
	ePP EZ	22 36½						
	ePPP Z	23 19¾						
	eS N Z	26 45						
	eSS Z	28.8						
3	iP Z	21 36 27				+		USCGS: 12.0S 166.0E h = 40km
	eX Z	36 35						
	ipP NEZ	36 39						
4	eP N Z	00 19 42						USCGS: 12.1S 166.1E h = 39km
	epP Z	19 54						
	esP Z	20 20						
4	eP EZ	00 50 34						USCGS: 34.0S 179.3W h = 33km

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
DECEMBER (continued)			h. m. s.	s.				km	
4	eP	Z	01 40 15						USCGS: 46.2N 153.1E h = 20km
4	iP	NEZ	03 00 39½		+		−		USCGS: 4.8S 130.1E h = 33km
	eX	N Z	00 47						
4	eP	EZ	07 52 39						
4	iP	NEZ	09 41 14¼		+	−	+		USCGS: 17.9S 178.4W h = 574km
	eX	EZ	41 24						
4	eP	NEZ	16 12 03						USCGS: 35.5S 102.8W h = 33km
	ipP	Z	12 27						
	eS	NE	22 36						
	ePPS	NE	23 30						
5	eP	Z	04 35 46½						USCGS: 35.7S 103.1W h = 33km
5	eP	Z	13 13 17						USCGS: 12.2W 143.9E h = 33km
6	iP	NEZ	02 03 13½				−		USCGS: 5.8S 150.3E h = 61km
	iPP	Z	05 12¼						
	iPcP	Z	05 54						
6	iP	NEZ	02 48 41						
	iX	Z	48 50						
7	iP	NEZ	04 13 52½		−	−	+		USCGS: 22.1S 179.4W h = 546km
	eX	NEZ	14 01½						
	eX	NEZ	14 05						
	iX	Z	14 33¼				+		
	epP	Z	14 46						
	iPcP	Z	16 16¼				−		
	eS	N	18 35						
	eG	NE	21.8						
7	eP	Z	04 52 23						USCGS: 18.8S 169.2E h = 39km
7	eP	NEZ	10 38 45						USCGS: 20.8S 174.0E h = 33km
	epP	Z	38 55						
	eX	Z	39 16						
	e(S)	NE	43 45						
	L Max.	NE	48.5						
7	eP	Z	15 26 49						USCGS: 12.3N 143.9E h = 33km
	eL	NE	40¾						
7	eP	EZ	17 43 26						USCGS: 29.3S 178.5W h = 209km
	epP	Z	44 12½						
8	iP	NEZ	09 44 45¼						
9	eP	NEZ	06 24 13						
9	eP	NEZ	09 21 38						
	eX	Z	21 52						
9	iP	NEZ	10 59 58¾		+	+	−		USCGS: 21.1S 178.0W h = 435km
	iX	Z	11 00 21						
	ipP	Z	01 30¾						
	iPP	NEZ	01 46						
	eS	E	05 03						
9	iP	NEZ	21 16 09						USCGS: 11.4S 166.4E h = 167km
10	iP	NEZ	03 37 43¼						
	eX	NEZ	38 50						
	iX	NEZ	39 02						
10	eP	NEZ	03 39 11						USCGS: 6.2S 128.1E h = 366km
	isPP	NE	42 49¾						
	eX	E	43 12						
	eS	NE	45 19						
	eX	NE	45 27						

Date 1963	Phase		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	△	Remarks
DECEMBER (continued)			h. m. s.	s.				km	
10	iP	NEZ	06 43 15¼		−	+	−		USCGS: 58.1S 026.4W h = 110km
	epP	Z	43 38						
10	iP	NEZ	13 16 51½		+		+		USCGS: 7.2N 125.1E h = 33km
	isP	Z	17 06½						
10	eP	N Z	15 03 20						
10	ePKP	Z	20 23 06						USCGS: 17.1N 60.4W h = 33km
11	iP	NEZ	00 55 40½						USCGS: 15.1S 173.6W h = 33km
	isP	EZ	55 55¼						
11	eP	NEZ	02 23 04						Local.
	eS	NEZ	23 22						
11	iP	NEZ	02 37 45						USCGS: 17.8S 178.6W h = 537km
	iS	N	42 51½						
11	iP	NEZ	04 01 22½		−	+	+		USCGS: 7.2S 125.5E h = 145km
	eX	Z	02 40½						
	iPP	NEZ	02 51¾						
11	eP	NEZ	06 36 48½						
11	iP	NEZ	10 10 46¾						USCGS: 8.0N 126.1E h = 33km
11	eP	NEZ	11 18 10½						USCGS: 24.2S 179.3E h = 540km
12	eP	Z	15 13 03						USCGS: 4.5N 97.2E h = 33km
13	eP	NEZ	04 32 33						USCGS: 2.7S 78.4W h = 109km
13	eP	NEZ	05 00 42						
13	eP	NEZ	06 32 01						
13	eP	NEZ	13 31 58						
	e(S)	NE	32 30						
13	iP	NEZ	22 52 04¼		+	−	+		
	eX	N Z	52 33						
14	iP	NEZ	01 51 40¼		+	+	−		USCGS: 17.9S 178.3W h = 550km
14	iP	NEZ	05 13 21						USCGS: 13.8S 169.9E h = 614km
14	eP	N Z	07 42 12½						USCGS: 2.8S 140.8E h = 33km
15	eP	Z	00 11 21						USCGS: 18.0S 178.5W h = 638km
15	eP	NEZ	17 39 19						USCGS: 9.4S 124.1E h = 33km
	esP	NEZ	39 33						
	eL	NE	49.8						
15	iP	NEZ	19 42 25		+	−	−		USCGS: 4.8S 108.0E h = 650km
	eX	NEZ	43 01						
	ePcP	EZ	43 43						
	epP	NEZ	44 19.						
	ePP	NEZ	44 24.						
	iS	NEZ	48 34¼						
	eX	Z	50 05						
	eSS	NEZ	52.0						
	Max.	NE	58.5						
	Max.	E	20 00.0						
15	eP	NEZ	23 24 19						
16	iP	NEZ	02 00 04½			−	−		USCGS: 6.4S 105.4E h = 64km
	eX	Z	00 43						
	iS	NEZ	07 02½						
	eX	Z	10 19						
	eLq	NE	10 25						

Date 1963	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
DECEMBER (continued)			h. m. s.	s.				km	
16	iP	EZ	05 14 59¾						USCGS: 5.0S 133.8E h = 39km
	iX	EZ	15 05¼						
16	iP	NEZ	14 22 08¾		-	-	-		USCGS: 49.1S 127.1E h = 33km
	eS	E	25 18						
	eX	NE	26 13						
	T max.	Z	38¼						
16	iP	NEZ	15 26 27½			+	-		USCGS: 15.2S 173.7W h = 33km
16	eP	Z	16 15 11						USCGS: 6.5S 105.3E h = 46km
17	eP	NEZ	02 59 06½						
17	eP	NEZ	10 25 27½						
	e(pP)	Z	25 41½						
	eX	NEZ	33.5						
18	eiP	NEZ	00 36 47¾						USCGS: 24.8S 176.6W h = 46km
	eS	NEZ	42 11						
	ePcS	E	43 01						
18	eP	NEZ	07 00 04						
18	iP	NEZ	12 28 04¼						USCGS: 29.9S 177.2W h = 130km
	eX	Z	28 15						
	epP	EZ	28 32						
19	eP	NEZ	00 35 57						USCGS: 39.0S 25.7E h = 33km
19	iP	EZ	08 30 46						USCGS: 24.9S 179.3W h = 33km
19	iP	NEZ	15 42 24¼						
19	iP	NEZ	18 30 38¼						
20	eiP	NEZ	00 30 09½						USCGS: 8.6S 160.4E h = 69km
	eX	Z	30 17½						
	ipP	Z	30 21						
	isP	N Z	30 30						
	iPP	Z	31 36½						
	eS	NE	35 47½						
20	eP	NEZ	04 26 51½						USCGS: 6.9S 129.5E h = 58km
	eX	N Z	27 43						
	ePP	NEZ	27 54						
20	iP	NEZ	05 00 28¼						USCGS: 14.8S 173.4W h = 33km
20	iP	NEZ	09 03 51½		+	-	-		USCGS: 7.0S 129.3E h = 103km
	esP	NE	04 41½						
	eS	NE	09 04						
	ePcS	NE	10 35½						
	iL	N Z	11 11½						
20	eP	EZ	16 01 19						USCGS: 12.8S 66.0E h = 33km
20	eP	Z	16 35 39						USCGS: 12.7S 066.3E h = 33km
20	eP	Z	21 19 12						USCGS: 20.3S 174.8W h = 33km
21	iP	NEZ	04 19 35¾				-		USCGS: 18.0S 178.3W h = 595km
21	iP	NEZ	06 58 40						
	eX	NE	07 08.8						
21	eP	NEZ	07 00 38						
21	eP	NEZ	08 41 07½						USCGS: 7.1S 129.2E h = 143km
21	iP	NEZ	12 41 27¼			+	-		USCGS: 21.2S 175.8W h = 90km
	eX	N Z	41 38						
	esP	N Z	41 54½						
	eL	NE	50.1						

Date 1963	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
DECEMBER (continued)		h. m. s.	s.				km	
21	iP NEZ	13 19 04¼						USCGS: 16.1N 119.7E h = 49km
	eX Z	19 14						
	epP NE	19 16						
	eS NE	27.0						
	eX NE	36.5						
21	iP NEZ	22 10 41			−	+		USCGS: 23.4S 178.8W h = 112km
22	eiP NEZ	12 03 40		+		+		USCGS: 6.1S 146.9E h = 102km
	ePP N Z	04 49½						
22	eP Z	13 40 35						USCGS: 34.9S 173.9E h = 82km
22	iP NEZ	23 36 08						
23	eP EZ	16 35 18½						USCGS: 24.5N 121.8E h = 130km
23	eP NEZ	21 12 04½						
23	eP NEZ	23 15 09½						
	eX NEZ	15 39½						
24	eP N Z	09 14 22½						USCGS: 5.0S 155.1E h = 197km
24	iP NEZ	11 24 27¾		+	−	+		USCGS: 13.1S 166.7E h = 61km
	i(pP) NEZ	24 36½						
	esP Z	24 47						
24	eP Z	19 07 27						USCGS: 6.6S 146.8E h = 53km
24	iP NEZ	21 10 07						USCGS: 53.0S 159.5E h = 33km
	eX NE	10 32						
	iS NE	13 41						
	T max. NEZ	28.3						
25	iP Z	05 26 48¾						USCGS: 17.7S 178.0W h = 523km
25	iP NEZ	03 48 42¾		+	−	−		Local.
	eS EZ	48 51						
25	eP Z	09 28 07½						USCGS: 19.0S 173.2W h = 33km
26	e(P) NEZ	16 31 49						USCGS: 1.4N 126.7E h = 65km
	epP NEZ	32 02						
	esP NEZ	32 09						
	ePP N Z	33 26						
27	iP NEZ	03 02 55¼						
27	iP Z	05 29 22½						USCGS: 15.1S 175.2W h = 33km
	eX N Z	29 27½						
	e(sP) N Z	29 40						
27	eP NEZ	07 43 54						Local
28	iP Z	04 41 28						USCGS: 20.2S 177.9W h = 507km
28	eP NEZ	05 51 52						USCGS: 5.1S 153.5E h = 70km
	eX NEZ	52 26						
	eX NEZ	52 35						
	eX Z	56 11½						
	eS E	57 06½						
28	eP Z	07 11 06						USCGS: 14.4N 92.3W h = 33km
28	eP NEZ	07 26 10						
28	iP NEZ	09 09 55½			−	+		USCGS: 32.7S 178.9W h = 33km
	eX Z	10 19						
	ePP NE	11 03						
	ePPP EZ	11 08						
	eS NE	14 43						
	eL N	17.4						
28	eP NEZ	09 16 30						

Date 1963	Phase		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	△	Remarks
DECEMBER (continued)			h. m. s.	s.				km	
28	eP	NEZ	18 10 45						USCGS: 60.4S 51.8W h = 49km
	epP	Z	10 55½						
29	iP	NEZ	03 06 25½				-		USCGS: 30.9S 177.8W h = 33km
29	eP	Z	11 58 58½						USCGS: 6.1S 148.9E h = 86km
29	eP	N Z	15 06 37						USCGS: 20.7S 178.4W h = 534km
30	iP	NEZ	01 05 20¼						USCGS: 3.4S 128.8E h = 82km
	ipP	Z	05 31¼						
30	eP	NEZ	01 25 12½						USCGS: 21.6N 144.5E h = 120km
	ipP	Z	25 43½						
30	iP	Z	13 41 48						
	eX	Z	42 07						
	eS	NEZ	52 02						
30	iP	NEZ	15 13 01¾			+	-		USCGS: 9.4N 126.0E h = 102km
	isP	Z	13 34¼						
	iPcP	Z	14 06¾						
30	iP	NEZ	22 16 42		-	-	+		USCGS: 6.9N 94.7E h = 64km
	iPcP	N Z	17 14¼						
31	iPP	NEZ	00 00 27½		+	-	-		USCGS: 2.5S 78.4N h = 33km
31	iP	NEZ	00 12 19¾						
	eX	Z	12 36						
31	eP	NEZ	00 36 59						
31	iP	NEZ	02 59 19¾		-	-	+		
31	iP	NEZ	10 28 10¾						
31	iP	NEZ	17 50 10¼				+		USCGS: 56.5S 26.0W h = 30km
	ePP	NEZ	53 20						
	epPP	NEZ	53 46						
	eS	NE	18 00 43						
	eSS	N	06 00						
	esSS	E	06 29						
	eSSS	E	09 59						
	eLq	E	12 23						
	eG	E	13 00						
	eLr	E	15.9						
	L max.	NEZ	25.5						
31	eP	NEZ	19 24 29						USCGS: 17.4S 174.2W h = 80km
	eX	NEZ	24 36						
	eX	NEZ	24 38						
	esP	NEZ	25 04½						
	eX	N Z	25 09						
	eX	EZ	25 19						
	eX	NEZ	25 24						
	ePP	EZ	25 33						
	ePcP	Z	26 13						
	ePPP	Z	26 59						

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