COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN - JANUARY 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 1964	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	12 28 38½		+		+		USCGS: 6.8S 129.8E h = 96km
	ipP	NEZ	28 56½						
	eX	NEZ	29 03						
	ePP	NEZ	29 48½						
	eX	EZ	30 03½						
	e(G)	Z	35 15½						
	e(G)	NE	35 18						
	L Max.	Z	45.1						
1	iP	Z	16 02 29				+		USCGS: 55.9S 27.1W h = 33km
1	iP	Z	17 39 05¼				+		USCGS: 45.4N 151.9E h = 45km
	epP	N Z	39 18½						
	eX	Z	39 38½						
	eX	Z	39 57½						
1	eP	N Z	20 09 20½						USCGS: 3.2S 139.7E h = 33km
	epP	Z	09 31½						
	ePP	Z	10 34½						
	eLq	Z	21 19½						
	L Max.	Z	24.8						
2	eSP	NEZ	00 04 02½						USCGS: 45.5N 151.9E h = 60km
2	iP	Z	06 54 21½						
2	eP	N Z	18 23 30½						USCGS: 3.1S 130.0E h = 32km
2	eP	Z	19 21 40						USCGS: 8.4S 157.1E h = 33km
	ePcP	Z	24 36						
	eS	N	26 48						
	eX	Z	27 24						
	eX	Z	28 38						
	eX	N Z	29 11						

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JANUARY (continued)			h. m. s.	s.				km	
3	eP	NEZ	06 21 09						USCGS: 6.9S 128.7E h = 33km
3	iP	NEZ	07 21 25		+		-		USCGS: 7.1S 129.0E h = 157km
	eX	NEZ	22 23½						
	eX	NEZ	23 05½						
	eG	NEZ	28 19						
3	iP	NEZ	21 31 12½		-	+	-		USCGS: 20.4S 178.2W h = 520km
	ePP	Z	32 50						
4	eP	Z	03 08 16						
4	eP	N Z	03 48 07						USCGS: 3.4S 149.2E h = 33km
	eS	NE	53 32						
	eLq	E	55.4						
4	eT	NEZ	04 47 22½						
4	eT	NEZ	08 15.5						
4	iP	NEZ	17 46 42¼		+		-		USCGS: 5.5S 150.0E h = 117km
	eX	NEZ	46 44						
	e(sP)	EZ	47 14						
5	eP	NEZ	03 11 47						USCGS: 20.6S 179.0W h = 650km
5	eP	NEZ	04 56 14						Local.
	eS	NEZ	56 30						
5	eP	Z	05 18 14						
5	eP	Z	09 08 31½						USCGS: 32.5N 141.7E h = 33km
5	ePKP	Z	09 28 07½						USCGS: 17.0N 60.6W h = 33km
5	eP	N Z	10 18 40						USCGS: 26.6S 175.7W h = 31km
	epP	N Z	18 51½						
	eX	E	20 21						
	eX	Z	21 27						
	eX	Z	21 40½						
	eL	NEZ	27.1						
	L Max.	Z	33.0						
5	eP	Z	15 59 57½						
5	eP	NEZ	16 31 10½						USCGS: 61.4S 154.9E h = 33km
	eX	NEZ	31 30½						
	ePP	Z	31 40						
	eX	NEZ	35 40						
	eG	NE	36 29						
5	eP	Z	18 52 32						USCGS: 8.0S 74.5W h = 150km
	epP	Z	53 13						
5	eP	NEZ	23 57 50						USCGS: 52.3S 28.6E h = 33km
	epP	NEZ	57 59						
	ePcP	NEZ	58 06						
	eX	N Z	58 18						
	eX	NEZ	59 11						
	eX	NEZ	59 32½						
	ePP	N Z	24 00 40½						
	ePPP	Z	02 33						
	eS	NEZ	07 30						
	eX	NE	09 02						
	eX	Z	11 38						
	eSS	NE	12 05						
	eSSS	NE	15 28						
	eLq	Z	16.5						
	eG	NE	17.1						
	e(T)	NEZ	25 18 05						

Date 1964	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JANUARY (continued)		h. m. s.	s.				km	
6	iP Z	00 30 41¼						
6	eP NEZ	00 55 33½						
	i(pP) NEZ	56 15¼						
6	iP NEZ	05 47 53¼				+		
6	iP NEZ	06 05 24		+	−	+		USCGS: 27.2N 127.3E h = 110km
	iX Z	05 35½				−		
	e(PcP) Z	05 41						
	eX Z	07 26						
6	eP Z	08 51 22½						
6	iP NEZ	23 58 15				+		USCGS: 50.9N 157.3E h = 33km
	epP NEZ	58 26						
	eX Z	59 45						
	ePS NE	24 09 37						
7	e(P) NEZ	02 12 42						USCGS: 56.8S 147.7E h = 33km
	eX NEZ	13 05½						
	eX Z	13 16						
	eX Z	13 37						
7	iP NEZ	02 21 26		+	−	−		USCGS: 18.0S 178.0W h = 593km
	eX NEZ	21 34½						
	eX NEZ	21 46						
7	eP Z	05 04 19						
	eX Z	05 13						
7	eP NEZ	05 23 12						USCGS: 58.8S 149.4E h = 33km
	epP NEZ	23 22½						
	eX Z	24 52½						
	eS NEZ	27 11						
	e(G) Z	28 18						
7	eP N Z	10 47 34½						USCGS: 3.0S 139.0E h = 47km
	eX N Z	47 43½						
8	eP Z	04 30 12½						USCGS: 5.0S 144.3E h = 72km
8	eP EZ	12 06 15½						USCGS: 18.8S 173.8W h = 23km
	epP NEZ	06 24						
	eX NEZ	06 30½						
	eX Z	06 42						
8	eX Z	12 12 00½						
8	iP NEZ	16 09 04½				−		USCGS: 6.9S 129.4E h = 108km
	epP N Z	09 32						
	eX N Z	10 02						
	eS NE	14 24½						
	eG Z	16 00						
8	iP NEZ	22 38 28¾						USCGS: 3.7S 119.4E h = 90km
	eX EZ	38 44						
	e(S) NE	44 49						
	eSS NEZ	47 41						
9	e(PcP) Z	03 11 33						USCGS: 41.7N 141.9E h = 50km
	i(sP) Z	11 38¾						
9	iP Z	18 44 16						USCGS: 45.5N 150.9E h = 40km
	eS NEZ	54 32						
	eSP N Z	55 11						
	eSS Z	19 00.0						
9	iP Z	21 29 18½						USCGS: 20.0S 178.3W h = 649km

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	△	Remarks
JANUARY (continued)			h. m. s.	s.				km	
9	eL	NEZ	21 58.0						USCGS: 42.6S 174.8E h = 61km
10	iP	Z	05 02 56½						USCGS: 42.0N 142.6E h = 33km
	iX	EZ	03 10½						
	eS	NEZ	12 52½						
10	eP	EZ	17 00 22						USCGS: 15.4S 175.0W h = 33km
10	iP	Z	17 09 47½						USCGS: 45.4N 150.0E h = 50km
10	iP	NEZ	21 59 20¾		+	−	−		USCGS: 6.9S 129.4E h = 117km
	eX	NEZ	59 51						
	iX	N Z	22 00 13½						
	iPP	N Z	00 28½						
	iG	Z	06 15¾						
	eX	EZ	12 17½						
	eX	Z	14 24½						
11	e(P)	NEZ	14 22 24½						
11	eiP	NEZ	15 58 49½						
11	iP	EZ	17 57 48						
11	eiP	NEZ	22 08 51						USCGS: 8.6S 123.4E h = 70km
	eX	NEZ	09 20						
	iX	NEZ	10 17						
	esS	EZ	15 57						
12	iP	Z	06 13 54				−		USCGS: 53.2N 166.3W h = 33km
12	eP	Z	06 30 17						
	eL	N Z	46.5						
	L Max.	E	47.5						
12	iP	N Z	11 19 27		−		+		USCGS: 5.4S 146.8E h = 229km
	eS	E	24 23						
	eX	N	24 27						
	iScP	Z	25 32½						
	ePcS	N	26 04½						
12	eP	Z	12 48 58						USCGS: 56.0S 27.6W h = 33km
12	eP	Z	14 36 06½						USCGS: 10.9S 074.6W h = 94km
	iX	Z	36 18½						
13	e(P)	Z	03 18 54½						
13	iP	NEZ	18 55 32				+		USCGS: 11.6S 166.2E h = 59km
	epP	NEZ	55 44½						
14	eP	NEZ	04 24 22						USCGS: 28.8S 176.2W h = 59km
14	eP	NEZ	10 18 36						USCGS: 16.9S 173.0W h = 33km
14	iP	NEZ	15 44 30		+	+	−		USCGS: 5.2S 150.5E h = 169km
	eX	EZ	44 52						
	eS	NE	49 34						
	eG	NE	51 20						
	eX	NE	52 10						
15	eP	NEZ	18 52 38						USCGS: 28.4S 178.4W h = 211km
	eX	NEZ	52 46						
	epP	EZ	53 30						
	eX	EZ	54 41½						
	ePcP	Z	55 23						
15	iP	NEZ	21 46 48½		−		+		USCGS: 29.1N 140.8E h = 70km
	epP	NEZ	47 03½						
	ePcP	NEZ	47 23						
	ePP	Z	49 23						
	e(S)	NE	55 33						
	eScS	NE	56 20						

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JANUARY (continued)			h. m. s.	s.				km	
15	iP	NEZ	23 11 16½				-		USCGS: 17.4N 179.7E h = 599km
16	iP	NEZ	11 50 42½			+	-		USCGS: 50.5N 154.0E h = 203km
16	eP	Z	21 16 42						USCGS: 17.6N 61.8W h = 45km
	isP	Z	16 57¼						
17	eP	NEZ	03 00 03						USCGS: 21.6S 169.9E h = 33km
	ipP	Z	00 10¼						
	eX	Z	01 03						
	eS	NEZ	04 33						
	eG	NEZ	06.9						
	L Max.	Z	09.1						
17	eP	Z	09 39 03						USCGS: 11.4S 167.4E h = 33km
18	eP	NEZ	12 15 16½						USCGS: 23.1N 120.5E h = 33km
	epP	NEZ	15 29						
	ePP	N	17 47½						
	ePPP	Z	19 13½						
	eX	N Z	20 24½						
	eX	Z	23 44½						
	eS	NE	23 51						
18	eP	Z	14 41 56						
18	eP	Z	15 06 10½						
18	eP	Z	18 50 50						USCGS: 25.1S 176.9W h = 33km
18	iPKP	NEZ	22 53 41				-		USCGS: 18.8N 69.4W h = 95km
	ePP	Z	56 30½						
19	eP	Z	07 06 15½						USCGS: 9.2S 158.2E h = 32km
19	eP	Z	16 23 30						
19	iP	NEZ	23 29 34			+	-		USCGS: 18.3S 176.9W h = 48km
	epP	N Z	29 44½						
	esP	N Z	29 49						
20	eP	NEZ	00 22 06						USCGS: 30.2S 177.8W h = 35km
20	eP	Z	13 02 26						
20	iP	Z	15 50 19¼						USCGS: 23.2N 120.3E h = 49km
20	iP	NEZ	17 14 07¾	-	-	-	+		USCGS: 20.7S 169.9E h = 141km
	eX	NEZ	14 19						
	e(sP)	NEZ	14 48						
	eS	NEZ	18 28						
	eSS	NEZ	20.0						
	eX	NEZ	21.0						
	L Max.	N	23.8						
20	eP	Z	20 48 26						USCGS: 18.8N 120.7E h = 35km
20	iP	NEZ	23 12 43			+	-		USCGS: 30.0S 177.9W h = 44km
20	iP	NEZ	06 19 00½						
21	NIL.								
22	eP	NEZ	02 28 22						USCGS: 45.8S 75.2W h = 33km
22	iP	NEZ	06 52 39½						USCGS: 30.6S 178.0W h = 166km
22	eP	N Z	09 18 45			+			USCGS: 4.2S 136.2E h = 71km
22	eP	NEZ	09 27 50½						
	eX	NEZ	30.6						
22	iP	NEZ	13 56 05½		-	-			
22	iP	NEZ	16 10 33	-	-	-			USCGS: 22.4N 93.6E h = 88km
	iPcP	NEZ	10 37¾						

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	△	Remarks
JANUARY (continued)			h. m. s.	s.				km	
22	eP	NEZ	18 08 03						USCGS: 20.2N 147.1E h = 39km
22	eP	NEZ	18 56 59						USCGS: 7.6N 126.9E h = 144km
22	eP	Z	20 08 18						USCGS: 20.0S 177.6W h = 220km
23	iP	NEZ	00 05 51		+		−		USCGS: 13.7S 165.9E h = 33km
	eS	NE	10 45						
	eX	NE	12.2						
	L Max.	EZ	17.6						
23	iP	NEZ	02 55 50		−	−	+		
23	eP	NEZ	07 11 59						
23	eP	NEZ	16 18 10						USCGS: 11.5N 122.5E h = 47km
24	eP	NEZ	02 46 10½						USCGS: 4.2S 144.2E h = 416km
24	eP	Z	10 39 12						USCGS: 23.5S 179.9E h = 550km
24	eP	NEZ	11 49 15						Local.
24	iP	NEZ	17 28 45		−	+	+		USCGS: 38.7N 129.4E h = 542km
	iX	EZ	28 51						
	ipP	Z	30 45½						
24	eP	NEZ	19 59 49½						USCGS: 17.8S 178.5W h = 584km
24	eP	EZ	21 19 29						USCGS: 21.7S 176.2W h = 32km
24	iP	Z	21 50 34¼						USCGS: 23.6S 179.9E h = 535km
24	eP	NEZ	22 52 24½						USCGS: 7.1S 106.0E h = 94km
	epP	NEZ	52 47						
	ePcP	Z	53 56						
25	eP	Z	03 48 22						USCGS: 16.1S 173.8W h = 33km
25	iP	NEZ	07 10 24¾		+	+	−		USCGS: 22.6S 179.7W h = 606km
25	iP	N Z	17 21 53						
25	iP	NEZ	21 53 00¾				+		USCGS: 22.6S 179.9W h = 350km
25	iP	NEZ	23 13 36¼						USCGS: 20.8S 178.8W h = 580km
26	iPKP	NEZ	09 28 05¼						USCGS: 16.3S 71.7W h = 116km
	iPP	NEZ	29 09						
	ePS	NEZ	38 45½						
26	iP	NEZ	10 12 53						USCGS: 23.1N 120.4E h = 37km
	ipP	Z	13 10¼						
27	eP	NEZ	02 51 47½						USCGS: 66.9S 155.2E h = 33km
	eX	NEZ	51 58						
	eX	Z	52 25						
	L Max.	Z	59.5						
27	iP	NEZ	05 13 13½				+		USCGS: 13.1S 166.5E h = 46km
27	eP	N Z	15 43 14						USCGS: 16.6S 166.1E h = 165km
27	eP	Z	21 31 22½						
28	eP	N Z	05 49 40½						USCGS: 6.3S 148.7E h = 33km
	eX	Z	50 16½						
	ePPP	Z	51 00						
	eX	Z	51 20½						
	eS	NEZ	54 47						
	L Max.	Z	06 01.2						
28	iP	NEZ	06 23 30						USCGS: 20.5S 177.8W h = 473km

Date 1964	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JANUARY (continued)		h. m. s.	s.				km	
28	eP NEZ	14 22 43						USCGS: 36.5N 70.9E h = 207km
	eX Z	22 51						
	epP Z	23 33						
	eSKS NEZ	33 02						
28	iP NEZ	16 32 31			+	+		USCGS: 7.0S 124.5E h = 407km
	eX NEZ	33 02						
28	eP NEZ	22 14 41						
29	eP NEZ	08 55 29½						USCGS: 3.0N 125.7E h = 133km
	ePcP,PP NEZ	57 13						
29	iP NEZ	11 39 54		+		+		
29	eP NEZ	13 14 16½						USCGS: 2.2S 139.5E h = 33km
29	eP Z	18 44 08						USCGS: 6.8S 130.7E h = 33km
29	eP Z	21 14 26						
30	eP EZ	07 43 41						USCGS: 24.6S 176.8W h = 33km
30	eP N Z	09 15 24						USCGS: 11.4N 121.6E h = 33km
30	eP NEZ	12 49 02½						USCGS: 1.7N 99.6E h = 133km
30	eP NEZ	22 10 06½						
	eX Z	10 10½						
30	eX Z	22 14 22						
31	eP EZ	02 43 21						
31	eP Z	12 41 11						USCGS: 23.8N 121.0E h = 33km
31	iP NEZ	21 56 06						

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

COMMONWEALTH OF AUSTRALIA No. 64/2

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN - FEBRUARY 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 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY 1964			h. m. s.	s.				km	
1	ePKP	Z	23 12 57½						USCGS: 19.4N 66.3W h = 37km
	eX	Z	13 17½						
2	isP	Z	05 46 58.8						USCGS: 21.9S 169.5E h = 33km
2	eP	NEZ	09 05 28						USCGS: 24.2N 122.6E h = 28km
	ipP	NEZ	05 38.7						
2	eP	Z	16 56 10						
3	iP	Z	19 07 26.6						USCGS: 49.6N 156.7E h = 40km
3	ePKP	Z	23 32 46						USCGS: 31.0N 114.3W h = 14km
	eX	Z	35 39						
4	eP	Z	03 34 17						
4	iP	Z	10 14 58.8						USCGS: 48.2N 154.4E h = 40km
4	iP	NEZ	23 00 45.1						USCGS: 5.6S 105.5E h = 33km
5	eP	NEZ	02 05 40						
5	eP	NEZ	11 24 26½						USCGS: 30.4S 177.9W h = 114km
5	iP	NEZ	11 41 37.2						USCGS: 19.7S 179.8W h = 414km
	eX	Z	42 00½						
	ipP	Z	43 01.5						
	eS	N Z	46 34½						
	eG	NEZ	49 37						
	eScS	NE	51 16						
	eL	N Z	12 07.5						
5	iP	NEZ	12 55 10.9		-	+	-		USCGS: 16.6S 179.6W h = 475km
5	eP	Z	16 21 43						USCGS: 3.8S 141.3E h = 110km

Date 1964	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	△	Remarks
FEBRUARY (continued)		h. m. s.	s.				km	
6	iP NEZ	02 18 10.6		-	+	+		
	eX EZ	18 21½						
	eX NEZ	19 46½						
	eX NEZ	20 09½						
	eX N Z	22 48						
6	eSKP Z	04 58 11						USCGS: 6.8N 73.1W h = 140km
6	eP Z	08 11 06						USCGS: 27.4N 144.3E h = 40km
6	iP EZ	11 06 29.0						
6	iP NEZ	12 12 48.7						
	eX Z	12 58.9						
6	iP EZ	14 06 05.1						
6	iP NEZ	15 26 29.7			-	+		USCGS: 10.5S 120.7E h = 43km
	iX Z	26 47.5						
	iX NEZ	26 53.8						
	ePPP NEZ	28 15						
	eX EZ	28 24½						
	eS NEZ	32 10						
6	iP NEZ	19 19 29.0						USCGS: 24.0N 126.4E h = 33km
	epP Z	19 39						
	eX Z	22 19½						
7	eP NEZ	09 40 22½						USCGS: 14.8S 167.5E h = 159km
7	ipP EZ	13 10 56.0						USCGS: 39.8N 142.8E h = 45km
7	iP NEZ	20 46 47.9						
7	iP NEZ	23 57 28.9						
8	eP NEZ	10 04 50						USCGS: 9.2N 126.2E h = 37km
	eX Z	04 58½						
	epP E	05 02½						
8	eP Z	11 30 59						USCGS: 52.3N 175.6E h = 60km
9	iP NEZ	02 06 40.3			-	+		USCGS: 16.5S 179.2W h = 480km
	iX Z	06 46.4						
	epP Z	08 11						
	iPP Z	08 17.6						
10	eP Z	00 35 02.0						USCGS: 6.3N 125.8E h = 33km
	eX Z	35 43.6						
10	iP NEZ	10 02 53.6						USCGS: 20.9S 178.6W h = 575km
10	iP NEZ	13 36 07.5						
10	iP Z	17 36 43.7						USCGS: 6.1S 104.1E h = 33km
	isP NEZ	36 58.7						
	ePP NEZ	38 22						
10	eP NEZ	23 50 54						USCGS: 59.8S 150.3E h = 33km
	iPP NEZ	51 23.0						
	iX N Z	52 04.0						
11	iP Z	02 41 56.2						USCGS: 19.5S 174.0W h = 33km
	eX Z	42 03						
	isP Z	42 10.9						
	eX Z	42 23						
	ePP Z	43 17						
11	iP Z	03 59 58.2						USCGS: 27.9N 128.0E h = 78km
	eX Z	04 00 03.9						
	esP Z	00 30.5						

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY (continued)			h. m. s.	s.				km	
11	iP	Z	12 57 21.6						USCGS: 0.2S 126.1E h = 33km
11	iP	NEZ	18 28 58.0						USCGS: 15.9S 173.1W h = 33km
	esP	Z	29 11						
	eL	Z	43 55						
11	iP	NEZ	21 36 00.4						USCGS: 10.2S 161.3E h = 95km
	ipP	N	36 20.4						
12	iP	NEZ	20 38 35.4						USCGS: 3.5S 146.6E h = 33km
	isP	NEZ	38 48.6						
	ePPP	N Z	40 01½						
	eS	E	44 00½						
	eX	N	44 10½						
	eL	E	46.5						
12	iP	Z	22 41 47.2						USCGS: 15.3S 174.4W h = 33km
	iX	EZ	42 03.0						
	eX	E	42 10½						
	eS	EZ	47 50						
	eScS	NEZ	51.5						
13	iP	EZ	01 00 05.8			-	-		
13	iP	N Z	03 32 27.5						USCGS: 3.5S 146.6E h = 33km
	eS	N Z	38 02						
	eLq	E	39.9						
	eLr	N	42.2						
13	eP	Z	10 15 36.5						USCGS: 26.1N 100.9E h = 33km
13	eP	Z	11 49 52.0						USCGS: 18.3S 173.8W h = 33km
14	eP	NEZ	16 36 17.4						USCGS: 5.1S 151.7E h = 55km
	iX	NEZ	36 23.8						
	ipP	NEZ	36 28.3						
	eX	Z	37 10						
	ePcP	Z	39 00						
	eS	NEZ	41 25						
	eScP	Z	42 41½						
	eSS	E	43 45						
14	eP	N Z	18 59 19½						
	eL	Z	19 05.0						
15	iP	NEZ	14 06 43.9			-	+		USCGS: 19.7S 177.8W h = 332km
15	iP	NEZ	19 22 55.7						USCGS: 22.8N 120.6E h = 17km
15	eP	Z	22 08 11½						USCGS: 8.7S 157.1E h = 52km
	eS	N	13.3						
	eL	NEZ	16.5						
16	iP	NEZ	01 43 32.4				+		USCGS: 13.9S 167.0E h = 107km
16	iP	EZ	05 45 24.9				+		
16	iP	NEZ	15 38 07.5						USCGS: 21.5S 178.4W h = 600km
16	e(P)	N Z	21 41 07						USCGS: 5.6S 152.0E h = 49km
	iX	N Z	41 20.1						
17	iP	NEZ	16 01 19.0				+		
	eX	Z	01 24						
	eX	Z	01 32½						
17	iP	NEZ	16 48 55.4		-	-	+		USCGS: 22.6S 179.3E h = 547km
18	iP	Z	01 37 10.0				-		USCGS: 16.2S 166.4E h = 77km
	eX	Z	37 14½						
	eX	Z	37 20						

Date 1964	Phase	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY (continued)		h. m. s.	s.				km	
18	iP NEZ	03 50 53.1						
	eX Z	51 41						
18	eP Z	03 57 47						
18	eP Z	04 01 01						USCGS: 27.5N 91.1E h = 30km
18	eP NEZ	04 09 27						
18	eP NEZ	04 39 05						
18	iP NEZ	04 50 05.9						USCGS: 15.5S 175.0W h = 289km
	eX NEZ	50 16						
	eX NEZ	50 27½						
	epP Z	51 08½						
	ePcP Z	52 04						
18	eP NEZ	04 54 42						USCGS: 14.2N 146.5E h = 78km
	epP Z	55 03½						
18	eiP NEZ	10 41 27.4		+		+		USCGS: 10.3S 161.2E h = 73km
	eX Z	41 39						
	epP Z	41 48½						
	eL E	58.2						
18	eP Z	12 38 09						
18	eP Z	15 58 08						
18	iP NEZ	22 53 16.9				-		USCGS: 14.2S 174.9W h = 33km
19	eP NEZ	06 16 04						
	eX EZ	16 10						
19	eP EZ	09 23 37						USCGS: 9.6S 107.3E h = 48km
	epP Z	23 50						
	eL NEZ	36.5						
19	eX Z	10 18 41						
19	iP NEZ	21 52 30.3						
19	epP NEZ	23 56 06						USCGS: 18.7S 169.2E h = 207km
20	eX NEZ	01 24 03						
20	e(P) NEZ	06 44 42½						
20	eP NEZ	07 23 14½						
20	iP NEZ	09 13 20.8				-		USCGS: 17.7S 178.8W h = 604km
	eX Z	13 29½						
	eX Z	13 45½						
20	iP Z	10 06 08				+		USCGS: 44.6N 150.0E h = 50km
	epP Z	06 19½						
	esP Z	06 28						
20	iP NEZ	18 28 39.7				-		USCGS: 17.2S 179.0W h = 585km
	eX Z	28 49						
	eX Z	29 04½						
21	e(P) Z	14 01 41.0						USCGS: 6.7S 105.5E h = 33km
22	eP NEZ	01 52 38						USCGS: 36.9S 176.9E h = 203km
	esP EZ	53 32						
22	iP EZ	01 59 16.4				-		
23	iP EZ	12 34 24.9			+	+		USCGS: 15.4S 173.8W h = 96km
24	iP NEZ	05 08 17.0				-		USCGS: 24.8S 179.7W h = 290km

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
FEBRUARY (continued)			h. m. s.	s.				km	
24	iP	NEZ	14 59 29.8				+		USCGS: 15.5S 174.0W h = 87km
	iX	Z	59 41.0						
	ipP	Z	59 53.4						
24	iP	NEZ	16 24 00.2				−		USCGS: 31.6S 177.8W h = 377km
24	iP	NEZ	18 50 29.9				−		USCGS: 14.2S 167.2E h = 169km
25	eP	Z	00 46 14½				+		USCGS: 44.7S 37.5E h = 33km
25	eP	Z	03 14 02.4						USCGS: 49.7S 112.1E h = 33km
25	iP	NEZ	18 30 15.4						
25	eP	NEZ	23 29 49						USCGS: 30.1S 177.9W h = 51km
	epP	EZ	29 59						
	iX	NEZ	31 28.5						
25	iP	NEZ	23 37 28.4			+	−		USCGS: 25.9S 178.8W h = 296km
26	eP	NEZ	08 55 42						USCGS: 56.0S 148.4E h = 33km
	ePP	NEZ	56 03						
	eS	E	59 06						
26	iP	NEZ	18 22 47.3		−		+		USCGS: 4.4N 126.2E h = 132km
	epP	Z	23 13						
	iX	N Z	23 22.5						
26	iP	NEZ	21 24 29.0			+	−		USCGS: 20.7S 174.4W h = 33km
	iPcP	Z	26 43.1						
	eSSS	E	33 32						
26	eP	NEZ	23 17 25						USCGS: 11.7S 166.3E h = 64km
27	eX	Z	00 41 32½						
27	eP	Z	06 35 11½						USCGS: 4.5S 143.4E h = 37km
27	eP	NEZ	07 55 08						
27	eP	Z	13 23 54						USCGS: 5.3N 123.7E h = 92km
27	iP	NEZ	15 22 26.8		−	+	+		USCGS: 21.7N 94.4E h = 102km
	iX	NEZ	22 28.0						
	iX	NEZ	22 43.6						
	epP	Z	22 56						
	iS	NE	32 03.7						
28	eP	Z	09 09 37						
28	iP	NEZ	15 16 42.8			+	−		USCGS: 24.4S 179.9E h = 590km
28	iP	NEZ	17 58 36.7				+		USCGS: 18.2N 94.3E h = 43km
	epP	EZ	58 46½						
	esP	Z	58 51						
28	iP	Z	20 54 58.9				+		USCGS: 13.3N 144.7E h = 33km
	ipP	Z	55 11.0						
29	eP	NEZ	20 21 24½						USCGS: 18.2S 172.8W h = 33km
	epP	EZ	21 34						
29	iP	NEZ	23 57 22.9		+	−	−		USCGS: 8.5S 112.7E h = 73km
	eX	NEZ	57 36						
	esP	NEZ	57 51½						
	iX	Z	58 12.5						
	iPcP	Z	59 18.3						
Mar.1	iS	NEZ	00 03 30						
	esS	N	04 12						
	eG	NEZ	06 31						

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

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN - MARCH 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 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MARCH 1964			h. m. s.	s.				km	
2	eP	NEZ	03 44 37½						
2	eP	EZ	19 40 00						USCGS: 18.9S 174.8W h = 105km
	eX	NEZ	40 02½						
	epP	Z	40 24½						
	esP	EZ	40 39						
	eX	Z	42 27						
	eS	N	45 48						
	iScS	N Z	49 50						
2	eP	NEZ	23 42 31						
3	iP	NEZ	01 30 43.1			+	−		USCGS: 18.8S 177.7W h = 552km
	eX	N Z	30 53						
3	iP	EZ	12 25 35.3						
3	iP	NEZ	15 18 31.7			+	−		
	esP	Z	18 45						
3	eX	Z	16 05 14						
3	iP	NEZ	21 47 49.1				+		USCGS: 4.8N 125.5E h = 77km
	iX	NEZ	47 58.1						
	iPP	N Z	49 38.3						
	eS	NEZ	54 23½						
	eSS	N	57 51½						
4	eP	Z	03 22 56½						USCGS: 20.9S 168.6E h = 33km
	ipP	NEZ	23 07.4						
4	iP	NEZ	04 12 59.1						USCGS: 7.1S 129.5E h = 120km
	eX	NEZ	19 41½						
	eX	NEZ	20 08½						
4	iP	NEZ	06 06 59.6		−		−		
4	eP	NEZ	06 14 52½						USCGS: 33.8S 179.6W h = 47km
4	eP	Z	07 25 19						USCGS: 4.2N 123.1E h = 588km

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MARCH (continued)			h. m. s.	s.				km	
4	iP	NEZ	15 30 38.6				-		USCGS: 6.3S 130.2E h = 171km
	epP	Z	31 17½						
4	eP	NEZ	22 40 41						USCGS: 6.8S 129.8E h = 108km
	iX	N	41 33.6						
	eG	NEZ	47 36						
	eX	NEZ	47 49						
	iSS	N	48 13.3						
5	iP	Z	00 02 26.0						USCGS: 11.8N 125.6E h = 91km
5	iP	NEZ	00 10 29.1				-		USCGS: 11.5N 126.0E h = 40km
	eX	Z	11 07						
5	eP	NEZ	03 35 23½						Local.
5	eP	Z	06 07 49½						USCGS: 45.2S 96.4E h = 40km
	iX	NEZ	07 53.4						
	eS	EZ	13 44						
	eSSS	N	16 34						
	eScS	NEZ	18.0						
5	eP	N Z	10 07 50½						USCGS: 11.3S 162.4E h = 33km
5	eP	Z	10 11 47						USCGS: 11.2S 162.2E h = 38km
	iX	Z	12 32.0						
	eS	N	16 48						
5	e(P)	EZ	11 15 05						
5	eP	NEZ	20 39 46						USCGS: 16.4S 173.0W h = 33km
	epP	Z	39 55						
	eX	Z	40 20						
6	iP	NEZ	19 03 40.3						USCGS: 6.1S 154.4E h = 74km
	iX	N Z	04 50.1						
	iPcP	N Z	06 25.5						
	iS	NEZ	08 44						
	eSSS	NEZ	11 08						
	i(ScS)	N	13 43						
6	iP	NEZ	23 57 16.6						USCGS: 22.9S 173.1E h = 54km
	epP	EZ	57 31½						
	eS	NE	00 02.1						
	eLq	N	00 03 30						
	eX	E	00 06.1						
7	iP	EZ	01 52 22.2				-		USCGS: 21.4S 179.3W h = 593km
7	eP	Z	03 20 18						
7	iP	EZ	03 40 47.7		-		+		USCGS: 20.2S 177.8W h = 481km
7	eP	Z	07 35 09½						USCGS: 3.5N 97.1E h = 82km
7	iP	Z	11 08 13.4				-		USCGS: 4.1S 130.3E h = 33km
7	eP	NEZ	23 19 45						USCGS: 19.9S 177.9W h = 534km
	eX	Z	20 04						
	epP	NEZ	21 22						
8	eP	NEZ	01 40 00						USCGS: 44.0S 168.4E h = 33km
	eS	NEZ	43 31						
		T max.	57.1						
8	iP	EZ	04 24 57.2						
8	iP	Z	10 43 32.4					+	USCGS: 6.7S 125.9E h = 540km
	epP	Z	45 07½						
	ePcP	Z	45 46						

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MARCH (continued)			h. m. s.	s.				km	
8	eP	NEZ	11 57 54						USCGS: 46.0S 146.8E h = 33km
	eX	N Z	57 57						
	eS	NEZ	12 02 31						
		T max.	16.5						
9	iP	EZ	12 17 35.4				+		USCGS: 22.0S 179.1W h = 492km
10	eP	NEZ	08 03 39½						
10	eP	Z	12 45 35						USCGS: 8.1S 117.8E h = 33km
	iX	Z	45 41.9						
	isP	Z	45 47.5						
	iX	Z	45 55.5						
10	iP	NEZ	14 07 42.4		+		-		USCGS: 1.9N 127.5E h = 117km
	iX	EZ	07 54.6						
	ipP	NEZ	08 10.4						
	isP	EZ	08 26.8						
	ePP	N Z	09 20½						
	ipPP	Z	09 45.9						
	iScP	Z	13 12.6						
	eS	NE	13 53½						
	eSS	N Z	17 15½						
	eScS	EZ	17 39½						
10	iP	NEZ	21 52 52.3		-	+	+		USCGS: 6.9S 125.6E h = 514km
	epP	Z	54 26½						
10	eP	NEZ	23 16 55½						USCGS: 6.8S 129.4E h = 141km
11	iP	NEZ	01 13 54.0						USCGS: 1.8N 127.1E h = 58km
	eX	EZ	14 04						
	esP	NEZ	14 19						
	eX	EZ	15 14						
	iPP	NEZ	15 35.0						
	iScP	Z	19 30.7						
	iS	N	20 14.0						
12	iP	EZ	04 05 50.5						USCGS: 23.4N 121.6E h = 33km
	iX	Z	08 32.6						
12	eP	N Z	09 01 01						
12	iP	NEZ	10 43 02.8						USCGS: 21.9S 179.5W h = 561km
12	iP	NEZ	22 42 28.1		+		-		USCGS: 13.5N 122.9E h = 33km
	eX	Z	44 41						
13	iP	NEZ	03 57 23.2						USCGS: 25.5N 142.5E h = 33km
13	iP	NEZ	06 25 29.4			+	-		USCGS: 17.7S 178.7W h = 522km
	eX	Z	25 38½						
13	eP	NEZ	08 08 42½						Regional.
	eS	NEZ	09 25½						
13	iP	Z	08 44 13.0						USCGS: 24.0S 179.0E h = 512km
14	eP	Z	01 16 21½						
14	ePKP	EZ	02 57 06½						USCGS: 47.1N 8.3E h = 33km
14	eP	Z	03 00 30½						USCGS: 18.7N 145.6E h = 136km
14	iP	NEZ	11 51 04.8		+	+	-		USCGS: 20.6S 178.5W h = 561km
14	iP	EZ	12 23 28.6				+		USCGS: 20.6S 178.2W h = 260km

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MARCH (continued)			h. m. s.	s.				km	
14	iP	NEZ	15 11 47.8		-	-	+		USCGS: 13.7S 172.3E h = 611km
	eX	N Z	12 01½						
	epP	Z	13 32½						
	iPPP	EZ	14 00.6						
	ePcP	NEZ	14 07						
	esP	Z	14 34						
	eS	E	16 31						
14	$ePKP_1$	Z	15 32 05½						USCGS: 15.9N 60.5W h = 31km
	$iPKP_2$	NEZ	32 09.0						
	ipPKP	Z	32 12.8						
	isPKP	NEZ	32 24.6						
15	eP	NEZ	03 26 08½						USCGS: 1.2N 126.2E h = 43km
	ePP	EZ	27 43½						
15	eP	Z	07 56 39½						
15	epP	Z	10 03 15						USCGS: 53.0N 157.3E h = 170km
15	$iPKP_1$	NEZ	22 50 22.7				-		USCGS: 36.2N 7.6W h = 27km
	isPKP	Z	50 37.0						
	$iPKP_2$	EZ	51 00.9						
	eX	EZ	51 11½						
	e(PP)	EZ	54 52						
	eSKKS	E	23 01 24						
	eSS	N	14 34						
16	iP	Z	01 18 04.0				-		USCGS: 36.9N 95.5E h = 33km
	iX	Z	18 10.0						
	eX	Z	18 30						
16	iP	NEZ	08 56 38.9		+		-		USCGS: 44.8N 146.8E h = 140km
16	iP	NEZ	15 03 12.3				+		USCGS: 8.3S 118.6E h = 33km
	iPP	NEZ	04 44.1						
	iPPP	NEZ	04 58.4						
16	eP	EZ	19 21 52						
16	$iPKP_1$	Z	21 00 31.7						USCGS: 19.5S 65.3W h = 33km
	$iPKP_2$	Z	00 41.1						
16	iP	NEZ	21 45 51.9						USCGS: 20.6S 178.7W h = 578km
17	iP	NEZ	01 12 28.2				-		USCGS: 1.0N 121.0E h = 82km
17	eP	Z	18 13 35½						USCGS: 15.8S 173.3W h = 127km
	eL	NEZ	25.5						
18	iP	N Z	00 17 45.9						USCGS: 17.3S 175.1W h = 268km
18	eP	N Z	02 03 29						Local.
	eS	N	03 43						
18	iP	N Z	04 49 39.6						USCGS: 52.5N 153.6E h = 440km
	iX	Z	49 54.8						
	epP	Z	51 18						
	iPP	Z	53 18.8						
	iSKS	N	59 24						
	iS	NE	59 59						
	esS	E	05 02 50						
18	iP	Z	05 23 26.6						USCGS: 20.2S 178.4W h = 566km
18	iP	N Z	19 58 46.4						USCGS: 10.5S 161.6E h = 85km
19	iP	N Z	02 42 16.4						
19	iP	Z	08 49 58.4						USCGS: 20.3S 178.3W h = 504km
19	iP	N Z	12 00 54.2						USCGS: 28.4N 139.6E h = 450km

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	△	Remarks
MARCH (continued)			h. m. s.	s.				km	
19	iP	NEZ	21 52 03.5						USCGS: 15.1S 172.6W h = 33km
	eX	N Z	52 08½						
	esP	Z	52 19						
	ePPP	Z	54 16½						
	eS	NEZ	58 28						
	eLq	NE	22 02.1						
	eLr	EZ	04.9						
20	eP	Z	01 21 41						USCGS: 62.2S 155.8E h = 33km
	epP	Z	21 50½						
	iPP	N Z	22 16.5						
	eX	E	26 27						
	eL	NEZ	27 26						
20	iP	Z	01 41 44.6						USCGS: 18.6S 177.4W h = 334km
20	eP	Z	04 27 29						USCGS: 6.1S 150.4E h = 34km
20	iP	NEZ	19 02 43.8						USCGS: 7.0S 115.2E h = 121km
	eX	Z	03 24						
	ePcP	Z	04 46						
	esP	Z	07 27						
20	iP	NEZ	19 12 40.4				+		USCGS: 23.6N 94.4E h = 86km
	ePcP	Z	12 54						
	eX	Z	13 12						
20	iP	NEZ	19 22 45.1			+	−		USCGS: 19,8S 173.6W h = 33km
	epP	EZ	22 55.7						
21	iPn	NEZ	02 19 47.8						Regional.
	eP*	NEZ	20 03						
	ePg	NEZ	20 21						
	iSn	NEZ	20 40.0						
	eSg	NEZ	20 57½						
21	iP	NEZ	03 48 39.9		−	+	−		USCGS: 6.4S 127.9E h = 367km
	iX	N Z	49 14.7						
	ipP	Z	49 49.8						
	iPP	NEZ	50 09.1						
	eS	NE	53 45						
	iScP	EZ	54 12.4						
	isS	NE	55 39.5						
	eG	NEZ	56 29						
21	iP	EZ	09 21 10.9						
21	iP	Z	11 04 41.0						USCGS: 15.4S 174.1W h = 153km
21	iP	NEZ	16 33 43.6						USCGS: 27.6S 177.2W h = 33km
	eX	Z	34 16½						
	iPcP	EZ	36 27.4						
	eSSS	N Z	41 25						
	eLq	N Z	44 53						
22	eP	NEZ	01 09 04						
22	iP	NEZ	05 39 32.1						USCGS: 2.7S 126.4E h = 33km
	eX	Z	39 52						
	eX	EZ	40 09						
	eX	Z	40 33						
	ePP	EZ	40 59½						
	ePcP	Z	41 43						
22	ePKP	Z	07 24 17						USCGS: 5.5S 77.1W h = 147km
22	eP	Z	13 49 09½						USCGS: 3.2N 98.0E h = 33km
	eX	Z	49 29½						

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MARCH (continued)			h. m. s.	s.				km	
22	ePKP	NEZ	16 49 01						USCGS: 38.7N 118.8W h = 21km
23	eP	Z	01 10 39½						USCGS: 9.3S 108.2E h = 50km
23	iP	NEZ	22 47 04.0		-	+	+		USCGS: 17.6S 123.2E h = 33km
	ipP	NEZ	47 14.2						
	iX	Z	47 30.3						
	eX	Z	49 08½						
	eLr	N	53 34						
	eX	N	55 31						
	eLr	N	57 47						
24	eP	NEZ	00 33 44						USCGS: 17.1S 178.4W h = 554km
24	eP	Z	08 47 52						USCGS: 19.2N 65.9W h = 58km
25	eP	Z	05 08 45½						
25	eX	NEZ	06 21 46						
25	iP	EZ	11 40 50.4						USCGS: 13.7S 175.9W h = 170km
	isP	EZ	41 39.9						
25	eP	Z	15 38 05½						USCGS: 20.1S 168.8E h = 33km
26	eP	Z	01 25 17						USCGS: 10.3N 122.6E h = 53km
	epP	Z	25 30½						
26	iP	NEZ	02 13 06.1		-		+		USCGS: 11.3N 142.0E h = 33km
	eX	N Z	13 25½						
	eX	NEZ	13 34½						
	iX	Z	14 06.3						
	eS	N	20 08½						
	eL	N	27 22½						
26	eP	Z	07 25 20½						USCGS: 46.4N 145.1E h = 180km
26	iP	NEZ	09 24 29½				+		USCGS: 8.3N 121.8E h = 59km
26	iP	NEZ	12 22 18.4		-		+		USCGS: 6.8S 129.3E h = 156km
	esP	N Z	23 05½						
	ePP	NEZ	23 40½						
	iScP	Z	28 21.4						
	iX	Z	30 01.6						
26	eL	NEZ	14 18.0						
26	eP	EZ	21 38 27½						USCGS: 4.6N 95.8E h = 33km
	eX	Z	39 16½						
27	iP	NEZ	04 42 26.0						USCGS: 25.9N 95.8E h = 93km
	iX	Z	45 07.4						
27	iP	NEZ	20 27 59.7						USCGS: 23.7S 179.9E h = 520km
	eX	Z	28 23½						
	eX	Z	28 34½						
	ePP	Z	29 38						
	iS	NEZ	32 36.6						
	iX	NEZ	35 46.0						
27	eP	Z	23 16 07						USCGS: 27.2N 89.3E h = 32km
28	eP	NEZ	03 51 10						USCGS: 61.1N 147.6W h = 20km
	ePP	NEZ	55 35						
	eX	NEZ	56 06						
	iX	NEZ	58 37.5						
	iSKS	NE	04 01 26.5						
	iX	NE	01 59						
	iX	E	03 23						

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
MARCH (continued)			h. m. s.	s.				km	
28	ePKP	Z	07 28 51.5						USCGS: 58.8N 149.5W h = 20km
28	iP	EZ	10 19 35.6						
28	iP	NEZ	11 38 01.5						USCGS: 0.5N 122.3E h = 140km
	epP	EZ	38 36						
	esP	Z	38 47½						
	iPcP	N Z	39 42.8						
	eS	NEZ	44 21.4						
28	iSKS	NEZ	12 46 22.3						USCGS: 56.5N 154.0W h = 25km
	iX	EZ	47 33.1						
28	eSKS	NEZ	12 57 16						USCGS: 59.1N 149.6W h = 20km
28	ePP	Z	15 07 13						USCGS: 60.4N 146.5W h = 10km
28	ePKKP	Z	15 18 40						USCGS: 60.4N 147.1W h = 10km
28	ePKP	NEZ	20 47 39						USCGS: 59.8N 148.7W h = 40km
	ePP	Z	48 26½						
	ePKKP	NEZ	58 39						
	ePKKP	N Z	58 49						
29	eP	NEZ	04 49 31						
29	iP	Z	15 49 45.8						
29	eL	NEZ	17 32.3						
29	eL	Z	18 39.0						
29	iP	NEZ	21 46 54.4						USCGS: 6.7S 155.1E h = 68km
	esP	NEZ	47 21½						
	iPcP	Z	49 43.6						
	eS	NEZ	52 12½						
	eG	E	54.0						
	eX	Z	56.7						
29	iP	NEZ	23 35 09.4						
30	eX	N	02 43 07						
	eX	NE	44 36						
	eX	NEZ	46 18						
	L max.	NEZ	03 15.1						
30	eX	Z	06 06 16½						
30	iP	NEZ	06 29 35.3				–		
30	eX	N Z	07 38 34						
	eX	N	45 08						
	L max.	NEZ	08 03.5						
30	eP	Z	08 32 33½						
30	eX	Z	09 41 51½						
30	eP	EZ	18 48 54½						USCGS: 24.2S 176.4W h = 33km
	epP	Z	49 04						
30	eP	Z	19 25 31						
31	eP	NEZ	00 20 06½						
31	eP	Z	00 26 30½						USCGS: 45.3N 151.0E h = 60km
	epP	Z	26 42						
	eX	Z	27 06						
	eS	E	36 51						
	L max.	N Z	01 11						

Date 1964	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	05 23 40.1						
	iX	Z	25 15.0						
31	L max.	N Z	09 55.5						
31	iP	NEZ	17 11 04.6		+	+	-		USCGS: 17.7S 178.8W h = 540km
	eS	NE	16 12						
31	e(P)	NEZ	22 38 25						

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

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN - APRIL 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 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	△	Remarks
APRIL 1964			h. m. s.	s.				km	
1	eP	N Z	09 09 03						USCGS: 27.8N 139.5E h = 469km
1	iP	NEZ	14 39 52.2						Local.
	iS	NEZ	39 56.1						
1	e(P)	EZ	19 40 31						
1	eP	NEZ	22 44 16						
2	eP	NEZ	01 21 01½						
2	eP	NEZ	01 22 11						USCGS: 5.9N 95.7E h = 132km
	iX	NEZ	22 15.9						
	ePcP	N Z	22 33						
	ePP	EZ	24 36½						
	iS	NE	30 46						
	iX	E	30 56						
	L max.	NEZ	46.5						
2	e(P)	Z	01 43 09						
2	iP	NEZ	03 20 04.8						USCGS: 5.5N 95.7E h = 108km
2	iP	NEZ	06 59 48.4		-	+	+		USCGS: 6.9S 125.5E h = 485km
	epP	Z	07 01 20½						
	eScP	Z	05 03						
2	iP	NEZ	07 46 28.2		-	+	+		USCGS: 2.0N 125.6E h = 82km
	epP	Z	46 53½						
	iPcP	EZ	48 14.5						
2	e(P)	Z	09 02 44½						
2	iP	NEZ	16 05 07.7		-	+	+		USCGS: 5.8N 125.8E h = 179km
	eX	N Z	05 11½						
	eX	N Z	05 16½						
	esP	N Z	06 15½						
	epPP	N Z	07 35½						
	eS	NE	11 51½						
	eX	E	12 32						
	eSS	NEZ	15 16						
	esSS	NEZ	16 07						

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	△	Remarks
APRIL (continued)			h. m. s.	s.				km	
2	eP	Z	23 40 30½						USCGS: 56.4S 25.1W h = 33km
	epP	Z	40 41½						
3	e(P)	N Z	04 17 47						
3	eP	NEZ	04 22 52½						USCGS: 4.0N 96.6E h = 70km
	epP	N Z	23 10						
	ePcP	Z	23 27						
	eS	N	31 11						
	esS	N	31 41						
3	eX	N Z	08 54 07½						USCGS: 27.9S 178.1W h = 33km
3	eP	EZ	09 11 04½						USCGS: 4.9S 152.1E h = 82km
3	eP	N Z	15 51 32						USCGS: 7.5S 128.7E h = 33km
3	ePKKP	EZ	23 03 15						USCGS: 61.6N 147.6W h = 40km
	ePKKP	Z	03 31						
4	eP	Z	02 47 16½						USCGS: 44.2N 146.0E h = 62km
4	eX	N	05 29.5						
	L max.	NE	47.5						
4	eP	NEZ	07 07 29						USCGS: 5.5N 95.3E h = 157km
4	eX	Z	15 15 07						
4	i(S)	E	18 12 29						
	iX	N	20 08						
4	eP	EZ	18 25 18½						USCGS: 19.7S 175.3W h = 57km
4	eP	NEZ	21 47 27						USCGS: 10.5N 122.1E h = 33km
	ePcP	Z	48 32						
5	eX	Z	01 38 04						
	e(S)	E	48 39						
5	iP	Z	11 31 33.0						USCGS: 41.9S 83.7W h = 33km
6	eP	EZ	01 28 31½						USCGS: 23.4S 180.0W h = 568km
6	eP	EZ	02 41 44½						USCGS: 19.0S 175.5W h = 177km
6	iP	NEZ	23 49 29.8		-		+		USCGS: 5.1S 154.0E h = 116km
	eScP	Z	55 43						
7	iP	NEZ	13 26 03.6		+		-		USCGS: 0.1N 123.2E h = 150km
	ipP	N Z	26 37						
	iScP	Z	31 29						
	eS	NE	32 20						
8	eP	EZ	08 19 55						USCGS: 6.8S 68.9E h = 33km
8	eS(KS)	E	11 20 53						USCGS: 45.8N 150.8E h = 40km
8	iP	N Z	19 49 04.0				-		
8	eP	Z	23 57 00½						USCGS: 21.9S 178.2W h = 323km
9	iP	NEZ	01 04 30.7		+		-		USCGS: 6.3N 125.1E h = 33km
9	iP	Z	01 23 49.5						Local.
10	eP	NEZ	02 45 48						Local.
	eS	N	45 56						
10	iP	NEZ	04 15 40.8						Local.
	eS	NE	15 56						
10	iP	N Z	13 18 57.0		+		+		USCGS: 13.5N 144.9E h = 101km
11	eP	N Z	01 10 21						USCGS: 29.0S 178.9W h = 302km
	iX	EZ	11 05						
	ePP	NEZ	11 36½						
	ePcP	Z	13 04½						
	iS	NEZ	15 03						

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
APRIL (continued)			h. m. s.	s.				km	
11	eP	NEZ	02 26 22½						Local.
	eS	N	26 29						
11	eP	Z	06 21 39½						USCGS: 25.2N 124.4E h = 74km
11	ePKP	Z	12 35 36						USCGS: 56.6N 151.0W h = 20km
12	eP	NEZ	03 28 08						
	eX	N	31.3						
12	eP	NEZ	05 36 28						
	eL	N	45.7						
12	iP	NEZ	06 06 53.9		+		−		USCGS: 13.6S 166.0E h = 33km
	isP	Z	07 06.3						
12	eP	NEZ	11 16 42½						USCGS: 33.9S 179.8W h = 89km
	esP	N Z	17 11						
	eX	EZ	17 54½						
	ePcP	Z	19 50						
	eS	N	21 20						
	eSS	E	22 57						
	iScP	NEZ	23 16						
	eX	N	23 38						
	eScS	NE	27 08						
12	eP	Z	16 33 24						
12	eP	NEZ	20 45 34						USCGS: 16.4S 179.8W h = 509km
	iX	EZ	45 42½						
12	iP	NEZ	22 37 37.5				+		
13	iP	NEZ	01 05 34.3				+		USCGS: 0.1N 123.0E h = 97km
13	eP	NEZ	03 08 52						USCGS: 23.7S 179.0W h = 360km
13	eP	NEZ	06 29 55						USCGS: 19.5S 177.7W h = 574km
	epP	EZ	31 35						
13	ePKP	Z	08 49 36½						USCGS: 45.3N 18.1E h = 33km
13	iP	NEZ	08 54 58.3				−		USCGS: 22.3N 142.1E h = 309km
	eX	N	55 42						
13	eP	EZ	11 30 40						USCGS: 7.1S 129.2E h = 126km
	eX	Z	34 04						
	eX	NEZ	35 19						
13	ePP	Z	14 24 07½						USCGS: 57.6N 151.2W h = 25km
14	iP	NEZ	00 14 07.4			−	+		
14	iP	Z	01 17 09.8				−		USCGS: 49.4N 155.5E h = 60km
14	eP	NEZ	02 35 24						USCGS: 15.8S 177.0W h = 362km
14	eP	NEZ	04 51 42						Local
14	eP	NEZ	05 10 46½						USCGS: 41.0S 80.8E h = 33km
14	iP	NEZ	09 04 32.8				−		USCGS: 17.5S 167.9E h = 33km
14	iP	NEZ	16 26 18.0				+		USCGS: 8.6S 117.3E h = 58km
	ePcP	Z	28 26						
15	iP	Z	01 04 48.8				−		USCGS: 17.8S 178.3W h = 450km
15	eX	NEZ	02 18 45						
15	eP	NEZ	15 06 36½						USCGS: 54.2S 167.0E h = 33km
	epP	EZ	06 42						
	esP	Z	06 49						
	eS	NEZ	09 39						
	eLr	Z	10 38						
	eT	NEZ	21 06						

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	△	Remarks
APRIL (continued)			h. m. s.	s.				km	
15	iP	NEZ	16 48 05.2				+		USCGS: 21.7N 88.0E h = 36km
15	eP	NEZ	16 57 51						USCGS: 37.7S 177.5E h = 41km
15	eP	NEZ	21 42 21						USCGS: 19.7S 175.6W h = 172km
16	eP	NEZ	01 16 09						USCGS: 37.0N 142.7E h = 38km
16	iP	NEZ	02 41 21.1				-		USCGS: 21.5S 170.5E h = 110km
16	iP	NEZ	11 51 25.1				-		USCGS: 23.8S 180.0W h = 530km
16	eP	NEZ	14 11 34						USCGS: 7.0S 155.7E h = 78km
17	eP	NEZ	02 06 25						
17	iP	NEZ	06 06 20.2				+		USCGS: 6.6S 154.9E h = 85km
	eX	Z	09 09						
17	eP	NEZ	14 50 15						USCGS: 16.2S 167.7E h = 65km
18	eP	Z	05 40 10						USCGS: 45.5N 151.1E h = 33km
19	eP	Z	03 54 47½						USCGS: 55.1S 128.5W h = 33km
19	iP	NEZ	04 04 02.3				+		USCGS: 15.4S 173.7W h = 51km
19	eP	NEZ	14 24 30						USCGS: 60.5S 58.3W h = 33km
	iX	NEZ	25 14.4						
19	iP	NEZ	21 40 49.8				+		USCGS: 7.3S 128.3E h = 130km
20	iP	NEZ	13 50 14.8				+		USCGS: 7.3S 128.1E h = 128km
	eX	N Z	51 12						
20	iP	NEZ	15 51 12.0				-		
20	eP	Z	21 21 56						USCGS: 6.9S 129.3E h = 91km
21	eP	NEZ	08 09 43						Local.
21	eP	NEZ	10 29 23						Local.
21	eP	NEZ	20 40 50						
22	eP	NEZ	03 56 25½						Local.
	iS	NEZ	56 29.6						
22	eP	NEZ	06 48 25½						Local.
	eX	NE	48 29						
22	eP	N Z	19 45 40						USCGS: 16.1S 173.4W h = 33km
22	eP	NEZ	20 06 16						USCGS: 15.5S 167.5E h = 123km
	epP	Z	06 45						
	ePcP	NEZ	09 20						
22	iP	NEZ	23 10 12.4				-		USCGS: 13.2S 167.1E h = 218km
23	eP	NEZ	03 39 31						USCGS: 5.3S 134.0E h = 33km
	eS	NEZ	44 48½						
23	eP	N Z	10 39 14						USCGS: 6.6S 155.1E h = 60km
23	eP	NEZ	16 02 19½						Local
	eS	NEZ	02 21½						
23	eP	NEZ	20 54 50						USCGS: 14.0N 124.4E h = 45km
24	eP	NEZ	02 04 11½						Local.
	eX	NEZ	04 14						
24	iP	NEZ	03 24 44.1				+		USCGS: 20.1S 177.8W h = 393km
24	eP	NEZ	05 33 04						USCGS: 3.9S 138.8E h = 118km
24	eP	NEZ	05 49 01						Local.
	eX	NEZ	49 08½						

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	△	Remarks
APRIL (continued)			h. m. s.	s.				km	
24	eP	NEZ	06 02 31						USCGS: 5.1S 144.2E h = 106km
	eS	NE	07 41						
24	ePKP	NEZ	14 59 17½						USCGS: 13.3N 88.8W h = 158km
	epPKP	Z	59 54						
24	eP	NEZ	16 50 43						Local.
	iS	NEZ	50 45.3						
25	iP	NEZ	18 48 32.9				+		USCGS: 24.4N 125.3E h = 33km
26	iP	NEZ	14 08 03.7						USCGS: 5.8S 105.0E h = 90km
	iPcP	Z	09 24.0						
26	iP	NEZ	14 58 25.6						USCGS: 20.6S 178.0W h = 490km
	eX	NEZ	58 39						
	eX	N Z	59 12½						
	eX	Z	59 31						
	ePP	Z	59 56						
	eS	NE	15 03 26						
26	eP	NEZ	20 41 02						
27	eP	NEZ	00 43 46½						
27	eP	NEZ	01 47 04½						USCGS: 0.3N 98.1E h = 33km
	eX	EZ	47 38						
27	eP	NEZ	04 19 07½						Local.
	eS	NEZ	19 24						
27	iP	N Z	04 27 06.9				-		USCGS: 8.6S 148.1E h = 110km
27	eP	NEZ	05 59 59						
	eX	NEZ	06 00 51½						
27	eP	NEZ	06 49 25½						USCGS: 60.1S 151.0E h = 33km
	iPP	N Z	50 02.1						
	eX	Z	50 21½						
	ePcP	Z	53 11½						
	eS	NEZ	53 36½						
28	eP	NEZ	01 59 39						Local.
	eS	NEZ	59 55						
28	eP	NEZ	02 24 02						Local.
	eS	NEZ	24 10½						
28	eP	NEZ	04 31 30						Local.
	eS	NEZ	31 45						
28	eP	NEZ	07 35 00						Local.
	eS	NEZ	35 05½						
29	No S.P. Record 00		24 to 24 00						
30	No S.P. Record 00		00 to 24 00						
30	ePP	N Z	16 11(15)						USCGS: 4.6S 153.2E h = 78km
	eS	NE	16 15(26)						

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

TOOLANGI June 1964

COMMONWEALTH OF AUSTRALIA No.64/6.

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN - JUNE 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 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JUNE	1964		h. m. s.	s.				km	
1	iP	NEZ	06 11 01.8				+		USCGS: 14.6S 167.4E h = 176km
2	eP	NEZ	23 18 38½						USCGS: 14.7S 167.0E h = 82km
	eX	Z	19 51						
3	iP	NEZ	03 01 07.2				+		USCGS: 25.9N 95.8E h = 100km
4	eP	NEZ	01 53 03						USCGS: 24.5N 122.1E h = 33km
4	iP	NEZ	02 43 45.0				+		Local.
	i(S)	NEZ	43 47.2						
4	iP	NEZ	10 25 39.8				-		USCGS: 7.8S 117.6E h = 47km
4	eP	NEZ	11 23 33½						USCGS: 6.1S 149.9E h = 54km
	eS	N	28 40						
4	eP	NEZ	13 02 49						USCGS: 4.9S 134.3E h = 33km
5	eP	N Z	02 14 48½						Local.
5	iP	N Z	09 20 15.1				+		USCGS: 16.2S 177.3E h = 25km
	iX	Z	20 39.0						
6	iP	NEZ	01 11 39.5				+		
6	iP	NEZ	19 20 08.0				+		USCGS: 26.6S 114.4W h = 33km
	iX	Z	20 44.7						
	eS	E	30 31						
7	eP	NEZ	08 30 05						USCGS: 3.0S 130.3E h = 33km
7	eP	NEZ	13 15 26½						USCGS: 48.4S 173.7W h = 33km
7	eX	Z	15 01 07½						USCGS: 36.3N 141.0E h = 36km
8	eP	NEZ	06 45 11½						Local.
	iX	NEZ	45 14.5						
8	iP	NEZ	14 33 43.5				+		
8	eP	N Z	15 54 15						USCGS: 4.9S 151.3E h = 221km

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	△	Remarks
JUNE	(continued)		h. m. s.	s.				km	
8	iP	NEZ	23 02 38.7				+		USCGS: 17.7N 145.7E h = 163km
	iX	NEZ	02 49½						
	epP	EZ	03 10						
	eScP	Z	07 23½						
10	iP	NEZ	18 34 10.9				-		USCGS: 9.4S 117.6E h = 33km
10	iP	NEZ	19 19 37.8				-		USCGS: 18.0S 167.9E h = 47km
	eX	NE	21 39						
10	eP	NEZ	19 57 07						USCGS: 6.1S 104.9E h = 84km
10	iP	NEZ	22 24 52.3				-		USCGS: 5.0N 127.4E h = 146km
	eX	NEZ	25 11						
	esP	NEZ	25 35						
	ePcP	Z	26 31						
	ePP	NEZ	26 47½						
	epPP	Z	27 08½						
	iS	NEZ	31 31.7						
	eSS	NEZ	34 48						
11	eP	NEZ	01 12 17						USCGS: 19.5S 175.4W h = 272km
11	iP	NEZ	02 45 19.2				-		
11	eP	NEZ	06 32 29						
11	eP	NEZ	10 33 09½						USCGS: 2.2S 141.2E h = 67km
	iX	Z	33 18.2						
11	iP	NEZ	13 26 42						USCGS: 1.9S 141.0E h = 40km
	e(PcP)	Z	29 27						
11	iP	NEZ	15 27 44.9				+		USCGS: 2.0S 141.2E h = 33km
11	iP	NEZ	17 08 48.0				+		USCGS: 2.0S 140.8E h = 18km
	ePP	Z	10 04						
	eS	NE	14 27						
	eSSS	N	17 14						
	eX	Z	17 32						
	eScS	N Z	19 09						
11	iP	NEZ	18 43 00.3				-		USCGS: 33.1N 137.6E h = 330km
11	iP	NEZ	19 49 09.6				+		USCGS: 2.1S 141.2E h = 33km
11	iP	NEZ	21 40 37				+		USCGS: 55.9S 27.7W h = 135km
	i(PPS)	NEZ	52 36.0						
12	eP	NEZ	10 57 05						USCGS: 2.1S 141.1E h = 33km
	ipP	Z	57 14.7						
	eS	N	11 02 46						
	eX	Z	02 52						
	eScS	N Z	07 21						
	eLq	E	09 37						
12	iP	NEZ	16 05 16.7				+		USCGS: 11.4N 124.9E h = 183km
	iX	Z	05 45.4						
12	iP	NEZ	18 17 39.5				+		USCGS: 26.5S 178.3E h = 648km
	iX	Z	17 48.6						
	iScP	NEZ	23 07.4				-		
13	iP	NEZ	05 11 20.9				-		USCGS: 1.9S 141.2E h = 33km
13	iP	NEZ	08 05 06.7				-		
13	iP	NEZ	08 34 45.3				+		USCGS: 10.0N 93.0E h = 33km
13	eP	NEZ	11 20 51½						USCGS: 27.3S 178.0W h = 34km

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JUNE	(continued)		h. m. s.	s.				km	
13	iP	NEZ	14 07 47.8				-		USCGS: 3.9S 154.3E h = 474km
	iX	Z	08 02.5						
	iX	NEZ	08 18.3						
	eScP	Z	13 13						
13	iP	NEZ	17 47 47.5				+		USCGS: 23.0N 94.0E h = 61km
	epP	Z	48 06						
	eX	Z	48 17½						
13	iP	NEZ	22 38 12.8				-		USCGS: 27.6S 178.3W h = 94km
	eX	Z	38 22½						
	isP	Z	38 43.4						
	eSS	E	45 24						
13	eP	NEZ	23 53 33½						USCGS: 19.3S 176.5W h = 285km
	eX	Z	54 12						
14	iP	NEZ	11 07 41.7				-		
14	eP	NEZ	19 34 36						USCGS: 6.8S 129.8E h = 81km
15	iP	NEZ	00 15 50.9				+		USCGS: 5.4N 97.0E h = 33km
	iX	NEZ	16 03.7						
	iPcP	Z	16 17.1						
	eS	NEZ	24 19						
	eSS	E	28 33						
15	iP	NEZ	01 17 24.8				+		
	iX	NEZ	18 49.0				+		
	iX	NEZ	20 25.8						
15	eP	NEZ	23 15 27						
16	iP	NEZ	04 13 23.1				+		USCGS: 38.3N 139.1E h = 57km
	iPcP	NEZ	13 32						
	epP	NEZ	13 41						
	iPP	NEZ	16 25.6						
	eSSS	NE	23 30						
16	eP	NEZ	07 04 54						USCGS: 38.7N 139.0E h = 15km
	ePP	Z	07 48						
16	iP	NEZ	07 26 44.1				-		USCGS: 38.5N 139.2E h = 16km
16	iP	NEZ	08 41 14.9				-		USCGS: 22.0S 175.8W h = 33km
16	eP	NEZ	10 03 17						USCGS: 17.3S 178.7W h = 502km
16	iP	NEZ	11 23 03.1				-		USCGS: 2.0S 141.1E h = 13km
	eS	N	28 49						
	eLq	N	37 23						
16	eP	NEZ	17 17 46						USCGS: 15.6N 147.2E h = 33km
16	ePKP	N Z	20 14 27						USCGS: 19.6N 66.8W h = 30km
16	eP	NEZ	22 13 09						
17	iP	NEZ	04 28 20.2				-		Local.
	eX	NEZ	28 36						
17	eP	N Z	15 41 41½						
17	iP	NEZ	22 23 29.3				+		USCGS: 23.8S 179.7W h = 504km
	isPP	N Z	26 31.2						
18	eP	NEZ	06 13 40½						Local.
	eS	NEZ	13 48½						
18	eP	NEZ	07 23 25½						Local.
	eX	NEZ	23 31						
19	eP	NEZ	06 45 27½						Local.

Date 1964	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	eP NEZ	10 17 24						USCGS: 38.8N 139.3E h = 30km
19	eP NEZ	10 45 05						USCGS: 22.6N 121.0E h = 33km
	eX NEZ	45 26½						
21	iP NEZ	01 46 01.4						USCGS: 51.0N 157.0E h = 51km
	ipP N Z	46 16.0						
	isP Z	46 19.2						
21	eP NEZ	22 28 22						USCGS: 16.3S 178.0E h = 18km
	eX EZ	28 29½						
	eX Z	28 40½						
	eM NEZ	40(00)						
22	eP NEZ	00 24 19						USCGS: 15.7S 172.8W h = 33km
	ipP N Z	24 30.0						
	eScS NE	34 37						
22	eP NEZ	02 32 05						USCGS: 36.2N 139.6E h = 55km
22	iP NEZ	03 09 46.4				+		USCGS: 10.4S 161.1E h = 70km
	iX NEZ	09 55.4						
	ipP Z	10 04.8						
	iX N Z	10 40.4						
	ePP N Z	10 53						
	eS N	14 46						
22	eP NEZ	06 44 23						Local.
	eS NEZ	44 29						
	eL NEZ	44 31						
22	iP NEZ	13 46 33.6				-		USCGS: 25.1S 177.4W h = 121km
	iScP Z	52 36.9						
22	iP N Z	14 23 44.6				+		USCGS: 12.5S 166.7E h = 143km
22	iP NEZ	21 33 08.4				+		USCGS: 13.6N 120.3E h = 56km
23	iP NEZ	01 38 42.4				-		USCGS: 43.3N 146.1E h = 77km
	iPcP NEZ	38 44.6						
	ipP Z	39 02.4						
	ePP N Z	41 46½						
	eS NE	48 43½						
	eSS NE	53 43						
	eSSS NE	57 11						
	eLq NE	59 57						
	eLr N Z	02 04(00)						
23	eP NEZ	19 18 19						USCGS: 3.0N 126.6E h = 33km
	eX Z	18 39						
24	eP NEZ	11 41 59½						Local.
24	eP NEZ	15 06 13						USCGS: 7.1S 155.6E h = 123km
26	eP NEZ	02 33 14						Local.
	eX NEZ	33 23						
26	eP NEZ	06 22 20½						Local.
	iX NEZ	22 30.5						
26	iP NEZ	13 16 13.4				+		USCGS: 12.6S 169.4E h = 648km
26	eP NEZ	13 39 08½						USCGS: 9.2S 158.9E h = 17km
	iPP Z	40 11.5						
26	eP NEZ	16 10 58½						USCGS: 5.3S 131.2E h = 60km
28	iP NEZ	07 30 47.5				+		

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
JUNE	(continued)		h. m. s.	s.				km	
28	iP	NEZ	12 58 36.5				-		USCGS: 1.7S 149.6E h = 7km
	eX	Z	58 52½						
	ePP	N	13 00 08						
	eS	NE	04 10½						
	eLr	Z	08 16						
28	iP	NEZ	13 40 11.9				-		Local.
	eX	NEZ	40 34						
	eM	NEZ	40 36						
28	iP	NEZ	14 58 06.0				-		USCGS: 13.2S 167.1E h = 215km
	eX	NEZ	48 16						
29	eP	NEZ	03 43 22½						Local.
	eS	NEZ	43 38						
29	iP	NEZ	05 24 19.8				+		Local.
	eS	NEZ	24 31						
29	eP	NEZ	05 45 33½						
30	iP	NEZ	08 58 27.1				+		USCGS: 6.9S 129.6E h = 99km
30	iP	NEZ	13 54 15.2				-		USCGS: 0.8S 122.5E h = 36km
	eX	Z	54 21						
	iX	NEZ	54 35.6						
	eX	NEZ	54 46						
	ePP	NEZ	55 51						
	ePcP	EZ	56 15						
	ePPP	EZ	56 25						
	eS	NE	14 00 37						
	eSS	NE	03 25						
	eLr	N	05 59						
30	iP	NEZ	17 58 32.3				+		USCGS: 14.3S 173.6E h = 607km
30	iP	NEZ	19 55 19.7				-		USCGS: 0.0 122.9E h = 33km
30	iP	NEZ	20 20 17.2				-		USCGS: 46.6N 144.6E h = 383km
30	iP	NEZ	23 22 25.0				-		USCGS: 0.3S 122.6E h = 56km

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

TOOLANGI July 1964

COMMONWEALTH OF AUSTRALIA No.64/7

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

203 Collins Street,
MELBOURNE. VIC.

SEISMOLOGICAL BULLETIN - JULY 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 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	A_E	A_Z	Remarks
JULY 1964			h. m. s.	s.			km	
1	eP	NEZ	02 59 59.4					USCGS: 46.3N 146.9E h = 33km
	iX	Z	03 00 07.3					
1	eP	NEZ	09 32 53					USCGS: 2.0S 141.2E h = 33km
1	iP	NEZ	13 41 07.2		-		+	USCGS: 1.8N 127.1E h = 33km
2	No record 0127 - 0525 GMT.							
2	eP	NEZ	06 08 51					USCGS: 39.1S 74.7W h = 33km
2	iP	NEZ	12 19 09.5		+	-	-	USCGS: 1.0N 124.3E h = 160km
	eX	NEZ	19 14½					
	iPcP	Z	20 51.2					
3	iP	NEZ	13 22 05.9				-	
	iX	Z	22 20.9					
3	eP	NEZ	13 55 07					
4	iP	NEZ	10 58 15.0		+		-	USCGS: 11.7N 144.5E h = 33km
	iX	Z	58 19.9					
	esP	NEZ	58 28½					
	iPcP	NE	59 38.9					
	eS	N	11 05 21					
	eL	N Z	09 10					
5	eP	NEZ	09 31 44½					
5	iP	NEZ	15 27 55.2				+	
5	iP	NEZ	18 06 21.7				-	USCGS: 11.9N 142.4E h = 20km
5	eM	NEZ	20 04(00)					USCGS: 26.2N 110.2W h = 29km
5	iP	NEZ	23 48 19.1				+	USCGS: 44.7N 149.6E h = 48km
	eX	NEZ	51 40½					
	eS	NE	58 10					
6	eP	NEZ	02 06 00½					
6	eP	NEZ	04 39 22					
6	eP	NEZ	06 01 30					Local.
	iS	NEZ	01 32.8					

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	A_E	A_Z	Remarks
JULY (continued)			h. m. s.	s.			km	
6	iPKP	NEZ	07 40 53.1				+	USCGS: 18.3N 100.4W h = 100km
	ePP	NEZ	42 23					
	ePKKP	EZ	51 04					
	eSKKP	EZ	54 54					
	eSS	NE	58 41					
	eG	N	08 10 44					
	Surface waves till 10 20 GMT.							
6	iP	NEZ	14 26 20.3		-	+	+	USCGS: 6.9S 129.6E h = 100km
	ePPP	N Z	28 05					
	eSS	NE	33 58					
	eLq	NE	37 57					
6	iP	NEZ	19 56 45.5				+	USCGS: 21.2S 173.8E h = 22km
7	iP	NEZ	02 44 25.6				-	Local.
	eS	NEZ	44 33					
7	eP	NEZ	06 45 00½					Local.
7	iP	NEZ	06 48 41.9				-	Local.
	eS	NEZ	48 50½					
7	iP	NEZ	06 52 40.5				-	USCGS: 8.8S 110.7E h = 60km
7	eP	NEZ	07 06 36½					Local.
	eS	NEZ	06 43½					
7	eP	NEZ	07 44 58					USCGS: 23.6S 179.9W h = 462km
	eX	EZ	45 21					
	isP	Z	47 24.8					
	iPcP	Z	47 29.5					
	iS	N	49 35.9					
7	iP	Z	16 34 58.9				+	USCGS: 11.2S 163.2E h = 13km
	iX	Z	35 32.4					
7	iP	NEZ	21 38 03.1		+	+	-	USCGS: 17.3S 178.7W h = 574km
8	eP	NEZ	01 42 57					USCGS: 15.3S 173.1W h = 33km
8	iP	NEZ	03 18 23.3		+	+	+	Local.
	iS	NEZ	18 26.7					
	iL	NEZ	18 29.5					
8	e(P)	NEZ	06 15 07					Local.
8	eP	NEZ	07 06 28					Local.
	iS	NEZ	06 32.1					
8	iP	NEZ	07 17 27.2		-		-	USCGS: 19.2N 121.1E h = 37km
8	iP	NEZ	07 53 49.8		-		+	USCGS: 3.2N 128.4E h = 50km
	epP	N Z	54 00					
	iX	N Z	55 03.3					
	iScP	N Z	59 24.9					
	eS	NE	08 00 17					
	eScS	EZ	03 31					
8	iP	NEZ	11 55 46.8				-	USCGS: 6.4S 154.8E h = 73km
8	iP	NEZ	12 02 17.9		+	-	-	USCGS: 5.5S 129.8E h = 165km
	iX	EZ	03 25.9					
	iPP	NEZ	03 46.5					
	iPcP	N Z	04 51.2					
	iS	NE	07 37.3					
	eScP	Z	08 33					
	ePcS	NE	08 40					
	eX	NE	09 33					
	eScS	NE	12 30					

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	A_E	A_Z	Remarks
JULY (continued)			h. m. s.	s.			km	
8	iP	NEZ	15 30 33.0				-	USCGS: 18.0S 178.5W h = 558km
9	eP	NEZ	04 01 04					Local.
9	iP	NEZ	05 56 58.0		-		-	USCGS: 15.4N 119.8E h = 53km
	ipP	NEZ	57 12.4					
	isP	Z	57 17.7					
9	iP	NEZ	06 12 28.4		-	-	-	Local.
	eS	NEZ	12 32.2					
	L max.	NEZ	12 35.7					
9	iP	NEZ	06 26 09.9				+	Local.
	iS	NEZ	26 19.9					
	L	N	26 24.9					
	L max.	N Z	26 25.5					
9	iP	NEZ	07 11 43.9				-	Local.
	eS	NEZ	11 47.9					
9	iP	NEZ	11 29 03.8				-	USCGS: 23.3S 175.7W h = 43km
	iX	NE	29 07.9					
	iX	NEZ	29 12.0					
	iPP	NEZ	30 29.0					
	iPPP	EZ	30 48.1					
	ePcP	Z	31 13					
	eS	NE	34 44					
	eLq	N	37 38					
	eLr	EZ	39 19					
	No record 13 38 - 18 39 GMT.							
9	eP	NEZ	21 50 44½					USCGS: 1.8S 141.6E h = 33km
	eX	Z	51 04.9					
10	iP	NEZ	02 08 02.8				+	
10	eP	NEZ	04 26 28					Local.
	eS	NEZ	26 44					
10	eP	NEZ	05 49 19½					Local.
10	eP	NEZ	06 14 32					Local.
10	iP	NEZ	06 25 28.9				-	Local.
	iS	NEZ	25 33.0					
	iL	NEZ	25 35.0					
	L Max.	NEZ	25 36.1					
11	eP	NEZ	01 42 23					USCGS: 7.3S 148.0E h = 58km
11	iP	NEZ	06 18 09.3					Local.
	iS	NEZ	18 14.6					
11	iP	Z	06 47 11.3				-	USCGS: 11.7S 166.6E h = 33km
	isP	Z	47 24.7					
11	iP	NEZ	15 44 09.3		-	-	+	USCGS: 5.8N 126.4E h = 152km
	iX	Z	44 16.3					
11	iP	NEZ	19 02 04.0				+	USCGS: 12.2N 141.6E h = 61km
	iX	Z	02 16.4					
12	iP	NEZ	01 57 15.0				-	USCGS: 38.6N 139.2E h = 13km
12	eP	NEZ	07 59 18.5					Local.
	iS	NEZ	59 31.5					
12	iP	Z	20 27 42.5				+	USCGS: 24.9N 95.3E h = 155km
13	eP	NEZ	03 41 41.0					Local.

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	A_E	A_Z	Remarks
JULY (continued)			h. m. s.	s.			km	
13	iP	NEZ	05 58 24.9					Local.
	iS	NEZ	58 28.8					
13	iP	NEZ	11 10 31.2				+	USCGS: 23.7N 94.7E h = 117km
13	iP	NEZ	16 57 09.3				+	USCGS: 8.3S 113.7E h = 153km
14	iP	NEZ	07 14 17.0		+		-	Local.
	iS	NEZ	14 23.2					
	iL	N Z	14 26.1					
14	ePKP	NEZ	10 15 04					USCGS: 19.0N 66.5W h = 46km
15	iP	NEZ	01 32 53.0					Local.
	iS	NEZ	33 10					
15	iP	NEZ	06 11 16.3		+		-	Local.
	eS	NE	11 20½					
	iL	NEZ	11 22.1					
15	iP	NEZ	08 31 13.1					USCGS: 11.3S 166.1E h = 130km
	ipP	EZ	31 37.3					
16	iP	NEZ	02 05 10.3			+	+	Local.
	iS	NEZ	05 14.6					
16	eP	NEZ	05 35 01					Local.
	iS	NEZ	35 08.2					
16	iP	NEZ	11 33 19.7				-	USCGS: 17.9S 179.5W h = 625km
17	eX	NEZ	02 53(15)				-	USCGS: 38.2N 23.7E h = 150km
	iPKP	NEZ	53 28.6					
	iPP	NEZ	56 08.4					
	iSKP	NEZ	56 42.5					
17	iP	NEZ	05 00 44.7				+	USCGS: 24.3S 179.6E h = 495km
	iX	NEZ	01 14.4					
18	eP	NEZ	05 54 48½					Local.
18	eP	NEZ	06 02 22					Local.
18	eP	NEZ	07 20 43½					
18	iP	NEZ	12 53 36.9		-	+	-	USCGS: 0.2N 123.5E h = 97km
	iX	Z	53 47.7					
	isP	NEZ	54 09.1					
19	iP	NEZ	06 56 15.0				+	USCGS: 13.8S 167.0E h = 232km
20	eP	NEZ	06 19 18					Local.
	e(S)	NEZ	19 37					
20	iP	NEZ	06 25 07.5		+	-	+	Local.
	iS	NEZ	25 25.1					
20	eP	NEZ	10 28 36					USCGS: 35.2S 179.8W h = 108km
20	iP	NEZ	22 48 42.4				+	USCGS: 35.5S 179.7E h = 223km
	isPP	Z	50 24.3					
20	eP	NEZ	23 01 35					USCGS: 34.4S 179.2E h = 162km
21	eP	NEZ	01 44 22.3					Local.
	i(S)	NE	44 38.6					
21	eP	NEZ	01 56 40					Local.
	e(S)	N	56 45					
21	eP	NEZ	02 53 14					USCGS: 31.3S 180.0 h = 433km

Date 1964	Phase		Time (G.M.T.)	Amplitude Per.	A_N	A_E	A_Z	Remarks
JULY (continued)			h. m. s	s.			km	
21	iP	NEZ	03 55 14.8				-	USCGS: 26.0S 178.0W h = 222km
	iX	EZ	55 39.5					
	iX	Z	56 02.4					
	iScP	N Z	04 01 20.0				+	
	e(S)	N	01 38½					
21	eP	Z	06 30 14½					Local.
21	iP	NEZ	13 22 19.9		-		+	USCGS: 11.5N 121.9E h = 34km
21	eP	Z	21 08 19½					USCGS: 4.6S 153.3E h = 60km
22	iP	N Z	02 11 43.8				-	USCGS: 1.9S 149.6E h = 78km
22	iP	NEZ	03 56 45.3				+	USCGS: 14.3S 167.4E h = 203km
22	iP	NEZ	06 04 13.2					Local.
	iS	NEZ	04 19.7					
22	eP	NEZ	06 13 50½					Local.
	eS	NEZ	13 53½					
22	eP	NEZ	06 15 45					Local.
	iS	NEZ	15 51.7					
22	eP	N Z	06 42 33½					Local.
	eS	NEZ	42 49					
22	eP	NEZ	08 16 50					Local.
	iS	NEZ	17 08.1					
22	iP	NEZ	08 59 27.7		+	-	-	USCGS: 4.1N 125.7E h = 237km
	eX	N Z	09 01 04½					
22	eP	Z	12 26 45					USCGS: 22.2S 175.4W h = 33km
23	eP	NEZ	02 29 05½					Local.
23	eP	EZ	04 15 19					Local.
	iS	NE	15 26					
23	eP	Z	06 01 00					Local.
	eS	N Z	01 06					
24	eS	NEZ	07 13 49					USCGS: 46.9N 153.9E h = 33km
	eSS	E	19 22					
	eLq	E	26.0					
24	eP	NEZ	07 19 28					Local ?
24	eP	N Z	08 25 13					USCGS: 47.2N 153.8E h = 33km
	eS	E	35 39					
	eSS	E	40 58					
	eSSS	E	44 35					
	eLq	E	47 40					
24	iP	NEZ	11 03 48.6				-	USCGS: 13.1N 145.0E h = 43km
	ipP	Z	03 59.3					
24	eP	Z	13 54(21)					USCGS: 6.6S 154.8E h = 62km
	eS	N	59 12					
	eL	E	14 01.8					
	M	N Z	07.0					
24	eP	Z	17 15 21					USCGS: 47.1N 153.6E h = 33km
	eS	NE	25 50					
	eX	E	31 18					
	eX	N	31 40					
	eL	E	37 54					
25	eP	NEZ	02 31 36½					USCGS: 1.8S 141.0E h = 48km
	eX	E	44.0					

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	A_E	A_Z	Remarks
JULY (continued)			h. m. s.	s.			km	
25	eP	NEZ	12 27 18½					USCGS: 19.9S 176.2W h = 205km
	i(sP)	EZ	28 15					
25	e(SP)	Z	19 59 00					USCGS: 27.9S 70.9W h = 26km
	eX	Z	20 03 48					
	eSS	NE	04.9					
	eLq	NE	16.0					
	eL	NEZ	20 10					
25	eP	NEZ	21 37 35½					USCGS: 2.9N 128.2E h = 22km
	eX	NEZ	37 50					
	iPP	EZ	39 16					
	e(PcP)	Z	39 34					
	iX	NEZ	41 34					
	eS	NE	44.0					
	eX	Z	45.3					
	eScS	E	47 37					
26	iP	EZ	06 34 21.0			+	−	USCGS: 23.4S 180.0 h = 555km
26	eP	NEZ	20 32 31					USCGS: 41N 126.4E h = 33km
27	iP	Z	02 41 32.8					USCGS: 9.2N 126.4E h = 82km
27	eP	NEZ	05 41 31					Local.
	eS	NEZ	41 39					
27	eP	NEZ	11 09 08½					USCGS: 1.9N 126.3E h = 67km
28	eP	NEZ	00 24 10					Local.
	iS	NE	24 13.7					
28	iP	NEZ	04 36 23.0					Local.
	eS	NE	36 31½					
28	eP	Z	05 43 40					Local.
	eS	N	43 44					
28	eP	NEZ	06 52(08)					USCGS: 7.6S 127.3E h = 257km
28	eP	N Z	12 26 06½					USCGS: 51.3S 139.3E h = 34km
	iX	NEZ	26 14					
	ePPP	N	26 24½					
	eX	Z	26 47					
28	iP	NEZ	18 43 26.2					USCGS: 51.2S 139.0E h = 33km
	iPP	N Z	43 37					
	iX	Z	43 55.6					
	iX	N Z	44 09					
	iX	Z	44 18.5					
	eL	NE	45.9					
	eS	NE	46 12					
	eSSS	NE	46 37					
	eT	NEZ	54.0					
	T max.	NEZ	56.8					
28	iP	NEZ	21 49 50.5				+	USCGS: 14.3N 96.2E h = 33km
	eS	EZ	59 03					
	eScS	N	59 46					
	eSS	E	22 03 25					
	M	NEZ	22.0					
28	iP	EZ	22 57 43.6				+	USCGS: 14.1N 96.1E h = 14km
29	iP	N Z	04 45 53.0		−		+	USCGS: 4.0S 128.9E h = 159km
	iX	N	47 08.5					
	iX	NEZ	47 18.6					
29	iP	NEZ	05 33 17.5				−	

Date 1964	Phase		Time (G.M.T.)	Per.	Amplitude A_N	A_E	A_Z	Remarks
JULY (continued)			h. m. s.	s.			km	
29	eP	Z	06 15 04					Local.
	iS	NE	15 07.2					
29	eP	Z	06 49 03					Local.
	iS	NE	49 08.2					
29	e(P)	Z	09 40 14½					
29	eP	NEZ	22 35 30					Local.
30	iP	NEZ	01 28 33.0			+	-	USCGS: 17.7S 178.2W h = 643km
	eX	Z	28 42½					
30	eP	EZ	01 58 31					Local.
30	eP	NEZ	02 24 44					Local.
	iS	NEZ	24 52½					
30	eP	Z	02 59 30					Local.
	e(S)	NEZ	59 51					
30	e(P)	NEZ	03 20 42					Regional ?
30	eP	Z	04 01 05					Local.
	iS	NE	01 09.4					
30	ePKP	Z	05 35 05½					USCGS: 11.1N 86.2W h = 42km
30	iP	NEZ	08 46 03.8				-	USCGS: 55.5S 147.3E h = 33km
30	eP	NEZ	13 19 19					USCGS: 6.0S 154.4E h = 79km
31	eP	NEZ	02 40 52					
31	eP	EZ	02 53 26					Local.
31	eP	N Z	02 56 43					Local.
	iS	NE	56 47.0					
31	eP	NEZ	05 09 30					Local.
31	iP	NEZ	05 58 38.0				-	USCGS: 6.1S 149.4E h = 63km
	iX	N Z	58 44.6					
	eS	NE	06 03 43					
31	iP	NEZ	06 32 25.3		+	+	-	USCGS: 25.7S 179.6W h = 429km
31	eP	EZ	07 16 19½					Local.
31	iP	NEZ	14 59 20.7				+	USCGS: 2.4N 128.2E h = 23km

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