RIVERVIEW COLLEGE OBSERVATORY

SEISMOLOGICAL BULLETIN

1964

RIVERVIEW, SYDNEY, AUSTRALIA

RIVERVIEW COLLEGE OBSERVATORY

RIVERVIEW, N. S. W.

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SEISMOLOGICAL BULLETIN, JANUARY-DEC., 1964.

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Lat. 33° 49' 46" S. Long. 151° 09' 30" E. h 25m. Foundation : Triassic Sandstone.

INSTRUMENTS:

U.S.C.G.S. World Wide Standardised Seismometers:

Benioff Variable Reluctance Seismometer NS, EW, Vert.
To 1.0s, Tg 0.75s, Magnification 12,500 at 1.0s.
Sprengnether Long-period Seismometer NS, EW, Vert.
To 30s, Tg 100s, Magnification 750 at 30s.

Galitzin Aperiodic Seismometer NS, EW, Vert.

N.B. Benioff readings designated N E Z
Sprengnether L.P. N' E' Z'
Galitzin N" E" Z" Amplitudes from Galitzin response *

No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
1	Jan. 1	e Z	12 28 39						Masked by microseisms.
		e Z'	28 55	17					USCGS: 6.8S, 129.8E, H 12 21 55.4,
		e(S) N'	33 40	15					h 96 km.ca. Mag. 5.7
		eLR Z'	37.8	47			2		
		M N'E'	41.8	18	3	3			
		M Z'	43.5	15			3		
2	1	eLR Z'	15 04.5	30					USCGS: 4.3S, 105.9W, H 14 18 53.9,
		M E'Z'	08	20		½	1		h 33 km.ca. Mag. 4.6
3	1	(P) Z	17 38 44½						Masked by microseisms.
		e Z'	38 49	10			1		USCGS: 45.4N, 151.9E, H 17 26 43.5,
		e Z'	48 42	13			2		h 45 km.ca., Mag.5.6; 6 Pal-
		iS N'E'N"E"	48 44	11	-2	-4½			isades.
		i(SKS) N"	48 57	7	-2*				*Amplitude from Galitzin.
		PS N'	49.5	18	2				
		e Z'	49.6	20					
		eSS Z'	53 51	26					
		eSS N'	53 53	22	1				
		eLQ E'	59.7	39		3			
		eL Z'	18 03.4	(50)					
		M E'	07.3	14		3			
		M N'Z'	08.1	19,22	3		5		
		M N'	12.3	19	4				
		M E'Z'	13.3	18,20		2	6		
		M E'	18.7	19		3			
		M N'Z'	19.0	18	5		8		
		W_2 M Z'	19 53	21			½		
4	1	eL E'	20 17.0	40					Masked by microseisms & coda of No.3
		eL Z'	18.3	40					USCGS: 3.2S, 139.7E, H 20 02 32.5,
		i E'E"	19 52	5, 18		-9			h 33 km.ca. Mag. 6.3
		i N"	19 55	5	+4*				* From Galitzin.
		M N'E'Z'	22.8	15	4	7	8		
	2	e E	00 02 53						Local.
		i N	02 54	0.5	+0.02				
		m E	02 55½	0.5		0.04			
	2	(e) N	01 58 58						Quarry blast ?
		m N	59 03	0.7	0.10				
		m Z	59 06	0.8			0.05		
	2	e NZ	16 44 33	0.4					Local or regional ?
5	2	e N'	18 02 41	(13)					
		e E'	04 20	25					
		eL E'	04.7	38					
		eL Z'	06.5	35					
		M N'Z'	08.4	23	1		1		
		M E'	08.6	18		1			

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No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
6	Jan. 2	eP N'E'Z'	19 20 58	8	1	½	2½	2870	S.P. records obscured by microseisms.
		i Z"	21 02	8			+6*	2598	* From Galitzin.
		eS N'E'	25 26	10	4				USCGS: 8.4S, 157.1E, H 19 15 23.9,
		i N"	25 32	9	+5*				h 33 km.ca., Mag. 5.5
		e Z'	25 36	9					
		i Z'	25 45	9			-4		
		i Z"	25 47	8			+9*		
		m N'N"	25 48	8	7				
		i E'E"	25 51	11		+7			
		eSS N'	26 33	22	3				
		eSSS E'	26 49	22		3			
		eL Z'	27.4	32ca					
		M E'Z'	30.3	13,16		8	4		
		M N'	31.0	12	7				
		M Z'	32.6	12			7		
7	3	eL Z'	01 00.1	23					USCGS: 5.9S, 146.7E, H 00 45 20.4,
									h 34 km.ca., Mag. 4.6
8	3	(P) Z	01 05 07						Masked by microseisms.
		e(S) N'	09 38	10	1				USCGS: 8.5S, 157.4E, H 00 59 33.8,
		eL Z'	12.2	24					h 61 km.ca., Mag. 4.8
		M N'E'	14.3	13	½	½			
	3	e N	04 45 56	0.7	0.02				Local ? Seismic ??
	3	(Sg) N	05 55 52.3	0.4					Quarry blast.
		i Z	55 52.8	0.5			+0.04		
		m N	55 55	0.7	0.12				
		m EZ	55 57	0.7		0.11	0.15		
9	3	N'E'	07 33	Feeble surface waves.					USCGS: 7.1S, 129.0E, H 07 14 54.2,
									h 157 km.ca.
10	3	(i) Z	21 30 56½				+		Masked by microseisms.
		e N'	37 54	?					USCGS: 20.4S, 178.2W, H 21 24 56.3,
		e Z'	38 04	15					h 520 km.ca., Mag. 5.3
11	4	eL E'	03 32.1	35					USCGS: 23.4S, 180.0, H 03 18 02.4,
		eL Z'	33.5	35					h 509 km.ca., Mag. 4.5
		M N'E'Z'	35.5	20,23	1	1	1		
12	4	e N'	03 52 35	20	1				Confused by coda of No.11
		eLQ E'	54.5	38					USCGS: 3.4S, 149.2E, H 03 41 22.6,
		L E'	55.7	32		6			h 33 km.ca., Mag. 4.3
		eLR Z'	56.2	38					
		M N'Z'	58.3	23	5		5		
		M E'	58.8	18		5			
		M Z'	04 02.8	15			8		
13	4	N'Z'	11 15	Feeble surface waves.					USCGS: 21.6N, 121.8E, H 10 38 58.8,
									h 33 km.ca., Mag. 4.7
14	4	(iP) Z	17 46 08				+		Masked by microseisms.
		e(S) N'	50.7						USCGS: 5.5S, 150.0E, H 17 40 23.3,
		e Z'	51.2						h 117 km.ca., Mag. 5.2
		eL Z'	53.8	38					
		M E'	58.2	15		¼			
		M N'Z'	58.7	16	¼		¼		
15	5	e(P) Z'	10 18 13						USCGS: 26.6S, 175.7W, H 10 11 53.0,
		e E'	19 05	8		½			h 31 km.ca., Mag. 5.1
		e Z'	19 10	11			1		
		eL E'Z'	26.0	40		2½	2½		
		M N'E'Z'	30.4	12,17	3	4	8		
16	5	eP Z'	16 31 40	12			1½		USCGS: 61.4S, 154.9E, H 16 25 52.6,
		ePP Z'	32 29	10			1½		h 33 km.ca.
		e(S) N'	36 15	18	1				
		e Z'	36 25	22			2		
		e E'	36 32	17		3			
		eLQ E'	37.0	38					
		L E'	37.9	20		19			
		eLR Z'	38.1	36					

Continued on next page.

No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
16 cont.	Jan. 5	LR N'Z'	16 39.0	28	18		27		
		M E'	39.2	18		5			
		M N'Z'	40.3	18	8		11		
17	5	Z'	18 55	Surface waves.					(USCGS: 51.1N, 179.6W, H 17 50 45.3, h 33 km.ca., Mag. 4.3)
18	5	iP Z'	23 58 24	9			-3½	9140	Compression.
		e Z'	58 44	9				82°2	P lost on S.P. in change of records.
		iS N"E"	00 08 35½	8	-8*	+4*			S confused on L.P. by claibration pulses. * From Galitzin.
		e N'E'	09 18	30	8	7			
		ePS Z'	09 29	21			5		USCGS: 52.3S, 28.6E, H 23 46 10.7, h 33 km.ca.
		eG E'	19.4	47		25			
		eLQ N'	20.0	35	12				
		iLR Z'	23.7	32			+14		
		M N'Z'	30.2	18	12		20		
		M E'	31.0	17		5			
		eW2 Z'	01 56.6	40					
		M Z'	02 05	22			1		
19	6	iP Z	06 05 12.5	1.2			+0.24		Compression
		iP Z'Z"	05 13	5			+1		USCGS: 27.2N, 127.3E, H 05 54 42.7, h 110 km.ca., Mag 5.7
		e(S) E'	13 48	8					
		e(S) N'	13 49	8					
		e Z'	14 16	18					
		eL Z'	25.9	40					
		L Z'	28.1	30			1		
		M Z'	32.7	20			½		
20	6	Z'	14 43	Long waves.					
21	6	iP Z'	23 57 55	5			+2½	9460	Compression. Lost on S.P. in change
		e Z'	58 10	8			3	85°1	of records.
		iSKS N"	00 08 14½	8	+3*				SKS & S confused by calibration pulses on L.P. * From Galitzin.
		eS E"	08 21½	8		2			
		eLQ E'	20.6	50		4			
		eLR N'	24.5	40					USCGS: 50.9N, 157.3E, H 23 45 23.4, h 33 km.ca., Mag 5.6
		eLR Z'	24.8	38					
		L N'Z'	26.0	32	4		7		
		L E'	27.0	27		3			
		M E'	29.4	23		3			
		M N'Z'	32	22	3		3		
22	7	eL N'	02 19.0	21					Masked by microseisms etc.
		eLR Z'	20.1	24					USCGS: 56.8S, 147.7E, H 02 08 19.1, h 33 km.ca.
23	7	e(LQ) E'	05 28.3	22					Obscured by microseisms & long-period wanderings.
		eLR N'Z'	29.5	30					
		L N'Z'	30.2	30	5		7		USCGS: 58.8S, 149.4E, H 05 18 24.5, h 33 km.ca.
		(T) NE	38 51	½					
24	7	eL E'	10 56.3	?					Obscured by microseisms & long-period wanderings.
		eL Z'	58.3	30					
		M E'	59.3	20		1½			USCGS: 3.0S, 139.0E, H 10 40 42.9, h 47km.ca., Mag. 5.0
		M N'Z'	01.4	15	1½		2½		
25	7	e N'	13 22.3						Obscured by microseisms etc.
		M N'Z'	24.6	18	1		2		USCGS: 56.8S, 26.1W, H 12 32 54.5, h 33 km.ca., Mag.5.6
	8	e E	03 57 14	0.5					Quarry blast ?
		f N	57 16½	0.5	+0.03				
		m N	57 18½	0.7	0.10				
26	8	(P) Z	04 29 04½						Obscured by microseisms etc.
		eL Z'	38.6						USCGS: 5.0S, 144.3E, H 04 23 46.3, h 72 km.ca., Mag. 5.1
27	8	N'	11 34	Feeble long waves.					
28	8	e N'	12 14.2						USCGS: 18.8S, 173.8W, H 11 58 42.5, h 33 km.ca., Mag. 4.8
		eL Z'	15.8	22					
		M E'Z'	20	15		1	1		

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No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
29	Jan. 8	N'	16 20	Feeble surface waves.					USCGS: 6.9S, 129.4E, H 16 02 30.0, h 108 km.ca.
30	8	iP Z'Z"	22 38 36	4			+4		Compression.
		i Z	38 37	1.5			-0.34		USCGS: 3.7S, 119.4E, H 22 30 49.7, h 90 km.ca., Mag. 5.2
		i Z	38 43	1.3			+0.17		
		i Z	38 46	1.3			+0.17		
		e(PP) Z'	40 25	(9)					
		i(S) N"	45 04	6	+2*				* From Galitzin.
		i E'E"	45 09	10		+2½			
		e(SS) E'	48 02	12		1½			
		e(SS) Z'	48 08	12			1½		
		i N'	48 18	11	+2				
		(eL) E'	50.6	(80)					
		M E'	54.4	21		3			
		M N'Z'	56.1	16,22	4		4		
		M Z'	59.3	14			6		
	8	eP Z	23 31 11	0.3					Local.
		i(S) N	31 42½	0.5	+0.02				
		m NE	31 48½	0.6	0.31	0.20			
		m Z	31 53½	0.6			0.15		
31	9	iP Z'	18 43 56	5			+3	8900	Compression.
		ipP Z'	44 06	5			+6	8091	
		e Z'	44 14	(17)					USCGS: 45.5N, 150.9E, H 18 31 52.4, h 40 km.ca., Mag. 5.6
		iS E'Z'E"	53 57	13		-8	-5		
		iS N'N"	53 58	13	-6				
		isS E'E"	54 19	13		-			
		e Z'	54 34	24			6		
		e N'	54 39	36	6				
		eSS N'	59 10	25	6				
		eSSS N'Z'	19 02.5	28,28	3½		3		
		eLQ E'	05.1	43		15			
		eLR Z'	09.1	33					
		M N'Z'	11.8	25	8		15		
		M E'	13.0	23		5			
		W_2 Z'	20 56	23					
32	9	e(P) Z'	21 52 47						Masked by microseisms.
		e N'	55 36	14					USCGS: 42.6S, 174.8E, H 21 47 09 h 61 km.ca., Mag. 5.5
		e E'	55 41	9					
		eL E'	56.3	21					
		eL Z'	56.6	25					
		M N'	58.4	13	1				
		M E'Z'	58.8	17		1	2		
33	10	e Z'	05 02 53	?					Confused by microseisms & long-period wanderings.
		eS N'E'	12 18	?					USCGS: 42.0N, 142.6E, H 04 50 53.4, h 33 km.ca., Mag. 5.5, Berkeley Mag. 5¾-6
		eSS N'Z'	17 20	27	2		2		
		eLQ E'	23.0	40					
		eLR Z'	25.5	35					
		M N'Z'	32.7	22	4		6		
		M E'	33.3	22		3			
34	10	e(P) Z'	17 09.5	(27)					Masked by microseisms.
		e(PPP) E'	14.4	19					USCGS: 45.4N, 150.0E, H 16 57 26.5, h 50 km.ca., Mag. 5.4
		e Z'	14.7	18					
		e(SS) E'	24.4	29					
		e(SS) N'	24.5	27					
		e N'	28.0	27					
		eL E'	30.6	41					
		M N'E'Z'	36.5	27	½	1	1		
35	10	e Z'	22 08.6	?					Masked by microseisms.
		M Z'	14.2	14			1		USCGS: 6.9S, 129.4E, H 21 52 47.6, h 117 km.ca., Mag. 5.5
36	11	eL Z'	09 36.8	26					USCGS: 14.1S, 169.6E, H 09 24 15.6, h 33km.ca., Mag. 4.9
37	11	Z'	10 55	Feeble surface waves.					USCGS: 11.4S, 90.9E, H 10 23 10.9, h 33 km.ca.

No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
38	Jan.11	iP Z	22 08 57.9	1.0			-0.16		Dilatation.
		e E'	16.3	(26)					USCGS: 8.6S, 123.4E, H 22 02 03,
		eL N'	18.2	45					h 70 km.ca., Mag.5.5
		eL Z'	18.9	45					
39	12	M N"	00 16	Feeble.					
40	12	eP Z'	06 13 30						Microseisms present.
		ePP Z'	17 25						USCGS: 53.2N, 166.3W, H 06 00 13.2,
		e N'	23.3	?					h 33 km.ca., Mag. 5.5
		e N'	24.1	17	1				
		e Z'	26.3	18			½		
		eLQ E'	39.5	40					
		eLR Z'	43.0	36			1		
		M N'E'Z'	49	22	1	1	2		
		W_2 Z'	08 15	26					
41	12	eP Z'	11 18 56					3200	Microseisms present.
		iP Z	18 57	1.3			-0.33	28°8	Dilatation.
		e N'Z'	19 47	10					h 0.03
		isP N'Z'	20 05	5	+1		-3		USCGS: 5.4S, 146.8E, H 11 13 19.6,
		iS E'E"	23 28	6		+1½			h 229 km.ca., Mag. 5.6
		eS N'	23 29	16	1				
		e Z'	25 27	14			2		
		e(G) E'	25.5	40		2			
		eL Z'	26.6	30					
		M N'E'	28.4	19	2	5			
		M Z'	30.4	16			3		
42	12	e(L) N'	14 45.5	?					Masked by microseisms.
		eL Z'	46.4	?					USCGS: 4.4S, 137.3E, H 14 28 20.0,
		M E'	48.5	14		½			h 22 km.ca., Mag. 5.4
		M N'Z'	48.8	15	1		2½		
	12	e N	21 57 12						Local.
		m N	57 17½	0.6	0.05				
43	13	Z'	00 40	Feeble long waves.					(USCGS: 19.3S, 69.3W, H 22 33 41,12th
									h 204 km.ca., Mag. 4.2)
	13	m N	03 32 15	0.7	0.03				Quarry blast?
44	13	iP Z	18 54 40	1.2			+0.18		Compression. L.P records masked
		m Z	54 42	1.2			0.32		by microseisms.
		e N'Z'	59 20	20	1		2		USCGS: 11.6S, 166.2E, H 18 49 09.8,
		e E'	59 26	20		1			h 59 km.ca., Mag. 5.2
		M N'E'Z'	19 02.3	25	1½	1½	4		
45	14	(iP) Z	04 23 42½				-		Dilatation. S.P & L.P. records masked
		eLR Z'	31.1	28			2		by large microseisms.
		M N'	32.7	16	2				USCGS: 28.8S, 176.2W, H 04 17 50.5,
		M E'	34.0	16		3			h 89 km.ca., Mag. 4.7
		M Z'	35.8	16			7		
46	14	iP NZ	15 43 55.1	0.9	+0.07		-0.31	3050	Dilatation.
		iP Z'	43 56	12			-5½	27°4	Large microseisms on L.P & Galitzin
		i(pP) N	44 06.7	0.9	+0.11				records.
		i Z'	44 39	12			-4		USCGS: 5.2S, 150.8E, H 15 38 13.8,
		iPP Z"	44 43	6			+10*		h 169 km.ca., Mag. 5.6
		iPPP Z'	44 55	12			-8		* From Galitzin.
		i Z"	44 57	7			+14*		
		iS E'E"	48 31	7		-5			
		e Z'	48.7	24			4		
		m N'	48.8	23	7				
		i E'	49 33	6		+7			
	--	iSS N'	49 51	13	+6				-- i Z" 49 45 per.5s, +9μ*
		i N"	49 58	7	+7*				
		iSSS E'	50 09	12		+5			
		i Z"	50 12	7			+12*		
		i Z'	50 27	11			+16		
		eL E'	50.6	36					
		eL Z'	51.3	43					

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No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	
	1964		h m s	s	μ	μ	μ	km.	
46 cont.	Jan.14	L E'	15 52.3	26		16			
		LR N'Z'	52.5	35	12		21		
		M E'	53.9	16		13			
		M N'Z'	55.1	16	14		23		
	15	eP Z	01 56 48						Local.
		iS NEZ	57 12.2	0.4	+0.10	-0.07	+0.07		
	15	m N	06 24 14½	0.7	0.04				Local. Quarry blast ?
	15	e E	06 43 18						Local. Qaurry blast ?
		m N	43 20½	0.7	0.04				
47	15	(P) Z	18 51 56						Large microseisms on all records.
		e Z'	53 05						USCGS: 28.4S, 178.4W, H 18 46 32.9,
		e(L) Z'	57.6	19					h 211 km.ca., Mag. 4.7
	15	e E	19 16 27	0.5					T waves ? or small local tremors ?
		i E	17 16½	0.5		+			
		e NE	20 04	0.5					
48	15	iP Z	21 46 29.1	1.0			+0.13	7010	Compression.
		eP Z'	46 29½	6				63°1	Large microseisms on L.P. & Galitzin
		iS N'N"	54 56	10	-6				records.
		i E'E"	54 59	8		+4			USCGS: 29.1N, 140.8E, H 21 36 05.0,
		e Z'	55.0	16			4		h 70 km.ca., Mag. 6.4,
		ePS N'E'	55 19	25					Pasadena 6¾.
		e Z'	55.4	44					
		iScS E'	56 22	7		+5			
		m N	56.4	45	8				
		e N'Z'	58.5	32					
		eSS Z'	59.1	35			5		
		e N'	22 01.4	33					
		eLQ E'	02.2	(40)					
		eL E'	04.0	36					
		eL N'	05.1	29	12				
		eLR Z'	07.0	36					
		LR N'Z'	08.0	34	11		24		
		LR E'	08.3	29		9			
		M N'Z'	10.1	24	11		17		
		M E'	10.8	22		8			
	16	i N	02 03 49.7	0.5	+0.02				Quarry blast ?
		i Z	03 49.8	0.5			+0.03		
		m N	03 52½	0.6	0.12				
	16	i(Sg) N	06 11 10.4	0.5	-0.03				Quarry blast.
		i Z	11 11.2	0.5			+0.04		
		m N	11 14	0.7	0.21				
		m EZ	11 17	0.7		0.06	0.06		
	16	e NZ	22 31 05½	0.5					Quarry blast.
		m N	31 26	0.5	0.02				
		m E	31 28½	0.7		0.03			
	16	m N	23 02 41	0.6	0.03				Local. Seismic ??
	17	e NZ	02 02 51½	0.5					Blasting ?
		m E	02 52	0.5		0.06			
49	17	iP EZ	02 59 05.9	0.8		+0.06	-0.12	2380	Dilatation.
		iP N'E'Z'E"Z"	59 06	8	+3	+6	-11	21°4	
		e NZ	59 09	2.2	0.4		1.5		USCGS: 21.6S, 169.9E, H 02 54 26.8,
		i Z"	59 10	7			+20*		h 33 km.ca.
		ipP N"E"	59 15	7	+4*	+10*			* From Galitzin.
		isP Z	59 18.7	1.5			+0.9		
		isP Z'	59 19	10			+7		
		iS N'	03 02 57	12	-16				
		iS E'	02 58	11		+19			
		i Z'	03 01	11			-		
		i N"	03 03	9	+22*				
		i E"	03 07	7		+19*			

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No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
49	Jan.17	iPcP Z'Z"	03 03 09	12			+36		
cont.		eL N'E'	03.4	24					
		i N"	03 45	9	+13*				* From Galitzin.
		eL E'	04.0	32					
		eL Z'	04.1	32					
		LR E'Z'	04.7	24		16	25		
		M E'Z'	05.4	21		14	28		
		M N'	06.2	14	15				
	17	Pg EZ	03 57 55	0.4					Quarry blast.
		iSg E	58 00	0.5		+0.08			
		i Z	58 00.5	0.5			+0.08		
		i N	58 01	0.5	+0.04				
		m N	58 05	0.7	0.40				
		m EZ	58 08	0.7		0.14	0.20		
50	17	e Z'	09 43.6	Feeble.					USCGS: 11.4S, 162.4E, H 09 32 51.6, h 33 km.ca., Mag.4.7
	17	e N	23 32 05½						Local. Seismic ??
51	18	eL Z'	07 47.6	Masked by microseisms.					USCGS: 32.5S, 103.7W, H 07 10 22, h 33 km.ca., Mag. 4.5
52	18	eiP N'Z'	12 15 12	12	2		+7	7180	Compression. Microseisms present.
		sP Z'	15 27	?				64°6	
		ePP N'Z'	17.6	?					USCGS: 23.1N, 120.5E, H 12 04 40.0, h 33 km.ca., Mag. 6.1,
		ePPP N'	19.2	?					Palisades 6½-6¾,
		e N'	23 10	(18)					Pasadena 6¾,
		eS N'	23 48	(16)					Berkeley 6¾-7
		e Z'	23 49	12			3		
		iS E'	23 50	12		-4			
		iPS ! N'	24 10	30	+21				
		ePS Z'	24 11	21					
		i E'	24 32	22		+8			
		e Z'	24.7	40			4		
		i N'E'	25 07	12	-6	-6			
		e(SS) Z'	28.3	24			5		
		eSSS E'	30 41	30		7			
		iSSS N'	30 53	22	+7				
		eLQ N'	31.3	?					
		eLQ E'	31.4	42					
		eL Z'	33.0	36					
		eL E'	33.6	40					
		eLR N'	33.8	34	9				
		L Z'	35.3	50			13		
		L E'	35.8	36		10			
		M N'Z'	40.5	23	14		17		
		M E	41.4	22		13			
		M N'E'Z'	46	20	8	12	17		F 15h 25m.
	18	(i) Z	15 05 40½				+		Large microseisms present.
53	18	eLR Z'	18 57.9	25					USCGS: 25.1S, 176.9W, H 18 44 05.0, h 33 km.ca., Mag. 4.6
54	19	e E'	07 10.3	(12)					Masked by microseisms & long-period wanderings.
		eL Z'	12.2	26					
		M N'Z'	14.4	16	1½		1½		USCGS: 9.2S, 158.2E, H 07 00 03.3, h 32 km.ca., Mag. 5.7
		M E'	15.0	12		3			
55	19	M Z'	07 40.4	19			1		Masked by microseisms etc. h 33km)
									(USCGS: 58.6S, 25.1W, H 06 49 55.9/
56	19	M Z'	08 16	Feeble					USCGS: 5.9S, 134.1E, H 07 55 09, h 33 km.ca., Mag. 4.7
57	19	M Z'	10 15	Feeble					(USCGS: 26.9N, 54.0E, H 09 13 53.5, h 33 km.ca., Mag. 5.6
58	19	iP Z	23 28 47.6	0.7			-0.03		Dilatation. USCGS: 18.3S, 176.9W, H 23 22 19.1, h 48 km.ca., Mag.4.5

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No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
59	Jan.20	iP Z	00 21 25.4	0.7			+0.02		Compression.
									USCGS: 30.2S, 177.8W, H 00 15 48.4, h 35 km.ca., Mag. 4.4
	20	e N	06 23 25						Quarry blast ?
		m N	23 29	0.7	0.04				
	20	e EZ	06 44 29	0.3					Quarry blast ?
		m N	44 31	0.7	0.08				
		m EZ	44 34	0.8		0.07	0.08		
	20	(Pg) Z	06 46 37½						Quarry blast.
		iSg NE	46 41.2	0.4	-0.08	+0.03			
		m N	46 43½	0.6		0.38			
		m EZ	46 46	0.7		0.10	0.11		
	20	e NE	10 27 39	0.5					Local.
		e N	27 46	0.5					
60	20	iP NEZ	17 13 13.9	1.0	-0.10	-0.19	+0.59	2370	Compression.
		iP N'E'Z'	13 14	5	-	-	+	21°3	h 0.01 ca.
		m Z	13 17	1.1			2.64		
		m N'E'Z'	13 18	5	15	26	57		USCGS: 20.7S, 169.9E, H 17 08 37.4, h 141 km.ca., Mag. 6.1
		i E	13 27.5	1.4					Pasadena 6¾
		i(pP) NZ	13 32	1.2	-0.90		-0.30		
		i Z'	13 37	5			+8		
		iPP E'Z'	13 44	6		-14	+29		
		iPPP N'E'	13 55	11	-17	-26			
		PPP Z'	13 57	11			41		
		i N'E'Z'	14 21	7	+11	+17	-31		
		iS N'E'	17 00	10	-	-			
		i Z'	17 05	11			+97		
		m N'E'	17 08	11	79	110			
		iPcP Z	17 15	0.9			+0.11		
		i Z'	17 32	12			+45		
		isS N'	17 36	16	+48				
		iSS E'	17 43	13		+58			
		i Z'	17 50	12			-100		
		i E"	17 56	7		+65*			* From Galitzin.
		m N'	18.0	24	137				
		m E'	18.2	20		61			
		eL Z'	18.2	36					
		L Z'	19.0	36			59		
		M Z'	20.6	16			37		
		ScP Z	20 40½	1.2			0.26		
		iPcS N	20 53.5	1.3	+0.17				
		M E'	20.9	15		34			
		M N'	21.2	14	59				
		M Z'	21.7	15			43		
	20	e N	21 50 28						Blasting ?
		i Z	50 29.2	0.3			+		
		m N	50 29.5	0.4	+0.07				
		m EZ	50 30	0.4		0.09	0.10		
61	20	eP Z	23 12 02½	0.7			0.04		USCGS: 30.0S, 177.9W, H 23 06 26.2, h 44 km.ca., Mag. 5.1
		e Z'	16 58	20					
		eLR Z'	19.1	25			3		
		eLR E'	19.2	25		1			
		M N'E'Z'	20.8	19	½	1	2		
	21	(Sg) N	06 54 25						Quarry blast.
		i EZ	54 25.3	0.4		+0.03	+		
		m N	54 27½	0.7	0.18				
		m EZ	54 30	0.7		0.07	0.09		
62	21	eP Z	22 27 11.2	0.8					Microseisms present. L.P.records confused by calibration pulses.
		e Z'	38.6	21					
		M Z'	47.0	18			1		USCGS: 10.6N, 125.3E, H 22 18 13.0, h 53 km.ca., Mag. 5.2
		M N'	47.9	18	1				
		M E'	48.6	18		1			

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No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
63	Jan.22	eL Z'	02 56.5	28					Confused by microseisms & long-period
		M Z'	59.7	20			1		wanderings.
									USCGS: 45.8S, 75.2W, H 02 15 29.1,
									h 33 km.ca., Mag. 4.7
64	22	eL E'	04 15.2	20					Confused by microseisms & long-period
		M Z'	19.3	13			1		wanderings.
	22	i E	05 15 50½			+			Quarry blast ?
		m NE	15 53	0.5	0.04	0.06			
	22	iPg EZ	06 03 34.5	?		-	-		Quarry blast.
		iSg N	03 37.8	0.5	-0.17				
		i EZ	03 38.0	0.5		+0.08	-0.14		
		m N	03 40	0.6	1.20				
		m EZ	03 42½	0.7		0.39	0.57		
65	22	e(L) E'	09 28.5	?					Confused by microseisms etc.
		L E'	30.0	20		5			USCGS: 4.2S, 136.2E, H 09 12 03.4,
		M N'E'Z'	33	13	7	4	12		h 71 km.ca., Mag. 5.1
	22	(iP) N	13 56 01½	1	+0.05				
66	22	iP Z	16 10 40.1	1.0			-0.10	8700	Dilatation. Microseisms present.
		i Z	10 55.7	1.3			-0.24	78°3	
		iS N'N"	20 32	9	+2				USCGS: 22.4N, 93.6E, H 15 58 46.5,
		eL N'	33.0	52					h 88 km.ca., Mag. 6.1
		eL Z'	36.4	55					
		M N'	38	34	2				
		M E'Z'	39	38,40		1	2		
67	22	eL N'	17 59.2	24					Masked by microseisms.
		LR N'E'	18 00.2	21	1	1			USCGS: 4.0S, 133.9E, H 17 41 50,
		M Z'	04.0	16			1		h 33 km.ca.
		M E'	06.7	17		1			
68	23	iP Z	00 05 00.0	0.8			+0.13	2780ca	Compression.
		i Z	05 02	0.8			+0.29	25° ca	P lost in change of records on L.P.
		i N"E"Z"	05 02½	5	-7*	-5*	+13*		S and following phases confused by
		i(PP) N"E"Z"	05 33	7	-15*	-13*	+29*		calibration pulses.
		iS N	09 19	14	+33 ca				* From Galitzin.
		i E'E"	09 21	13		+12			Jan.22
		i Z"	09 26	9			+23*		USCGS: 13.7S, 165.9E, H 23 59 43.6,
		i(sS) N"	09 31	11	+61ca*				h 33 km.ca., Mag. 6.0
		i E"	09 32	9		+43*			
		m Z'	09.7	14			45		
		i E"	09 46	9		+44*			
		i E'	10 10	12		+33			
		i(SS) N'	10 17	22	+44 ca				
		LR Z'	11.4	26			42		
		M N"	12.8	14	42*ca				
		M E"	13.3	16		39*			
		M Z"	14.1	15			53*		
	23	Pg EZ	06 24 52.7	0.3					Quarry blast.
		iSg N	24 56.3	0.4	+0.04				
		i Z	24 56.5	0.4			+0.05		
		m N	24 59	0.5	0.16				
		m EZ	25 01½	0.6		0.09	0.09		
	24	(P) Z	02 45 30						Masked by microseisms.
									USCGS: 4.2S, 154.2E, H 02 40 00.1,
									h 416 km.ca.. Mag. 4.3
	24	i N	05 34 14.8	0.5	+0.07				Local. Seismic ?
		i Z	34 15.5	0.5			-0.04		
69	24	iP Z	17 28 32.6	0.7			+0.08		Compression.
		i Z	29 08	1.0			0.09		L.P. records masked by microseisms.
		e N'	40.6	(24)					USCGS: 38.7N, 129.4E, H 17 17 45.5,
									h 542 km.ca., Mag. 5.3

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No.	Date	Phase & Component		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km.	
70	Jan.25	eL	Z'	12 22.8	23					Masked by microseisms.
		M	Z'	27.4	16			1		USCGS: 28.3S, 176.5W, H 12 09 08.8, h 17 km.ca., Mag. 4.5
71	25	eL	Z'	15 23.7	24					Masked by microseisms.
		M	Z'	25.8	19			1		USCGS : 5.2S, 153.1E, H 15 09 17.3, h 64 km.ca., Mag. 4.6
72	25	e(S)	N'	22 19.8	17					Masked by microseisms.
		eL	Z'	22.9	30					USCGS: 5.3S, 153.2E, H 22 09 00.8, h 42 km.ca., Mag. 4.8
		M	Z'	24.8	21			2½		
		M	E'Z'	25.5	16	1	1			
73	26	(eP)	Z'	09 24 15	?					Masked by microseisms.
		e(sP)	Z'	24 52	(20)					h 100 km.ca. Gutenberg's Tables used in interpretation.
		iPP	Z'	29 04	8			+5		
		e	Z'	29.2	16					USCGS: 16.3S, 71.7W, H 09 09 33.9, h 116 km.ca., Mag. 6.1
		ipPP	Z'	29 32	7			+3		
		isPP	Z'	29 47	5			+6		
		e	E'	32 04						
		eSKS	E'	34 43	10		1			
		eSKS	N'	34 44	9	1				
		e(PKKP)	Z'	38 23	23					
		eSP	E'	38 38	25		2			
		e	N'	38 43	25					
		m	Z'	39.0	23			6		
		eSPP	N'	39 43	(20)					
		ePPS	N'	40 07	(20)					
		e	Z'	40.4	(28)					
		e	N'	40 29	20					
		eSS	N'	44 53	18	1				
		e(sSS)	E'	45 57	22		3			
		e(LQ)	E'	56.9	40					
		e	N'	58 38	32					
		eLR	Z'	10 02.5	40					
		eLR	N'	03.2	46					
		LR	N'E'Z'	05	55	4	3	7		
		e(W_2)	Z'	11 04.8	50					
		M	Z'	08	56			3		
74	27	iPKP	Z	01 32 01	0.7			+0.03		Microseisms present.
		i	Z	32 04	0.8			+0.04		USCGS: 00?0, 17.9W, H 01 12 23.5, h 33 km.ca., Mag. 5.3
		M	Z'	02 30		Feeble.				
75	27	eL	E'	02 58.2	20		2			Masked by microseisms & long-period wanderings.
		eL	N'	59.3	24	2				USCGS: 60.9S, 155.2E, H 02 46 33.4, h 33 km.ca.
		M	N'Z'	03 01.0	17	1		2		
		M	E'	01.4	12		2			
76	27	(iP)	Z	05 12 19.7	1.0			+0.05		Masked by microseisms.
		i	Z	12 22	0.7			-0.04		USCGS: 13.1S, 166.5E, H 05 07 00.3, h 46 km.ca., Mag. 4.2
	27	i	E	21 39 20.6	?		+			Local blasting ?
		i	EZ	39 21.4	0.3		+0.06	+0.11		
	28	i	N	05 14 42.2	0.6	+0.04				Quarry blast ?
		m	N	14 43½	0.7	0.11				
		m	Z	14 44	0.7			0.04		
	28	i	N	05 23 19.2	0.3	+0.09				Quarry blast ?
		m	N	23 20	0.5	0.07				
77	28	(eP)	Z'	05 49 04	7					Microseisms present
		iP	Z	49 12.0	1.0			+0.09	(3050)	Compression.
		i	Z	49 23.5	1.0			-0.14	(27?4)	
		i	Z	49 37	1.1			-0.15		USCGS: 6.3S, 148.7E, H 05 43 22.1, h 33 km. ca., Mag. 5.1
		eS	N'	53 48	18					
		isS	N'	54 03	16	+6				
		ei	Z'	54 05	16			+6		
		e(SSS)	E'	55 24	26		2			
		eL	N'E'	56.1	29					
		eL	Z'	56.7	(40)					

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No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
77	Jan.28	L N'	05 57.3	28	5				
cont.		LR E'	57.9	24		7			
		M N'E'Z'	06 00.3	18	4	11	12		
		M N'Z'	02.3	16	7		12		
	28	e NE	06 23 30	0.5					Local. Seismic ?
78	28	ipP Z'	14 23 40	7			-3		Dilatation. Microseisms present.
		e Z'	27 31	7			2		
		ipPP E'Z'	27 55	8		-2	-7		USCGS: 36.5N, 70.9E, H 14 09 17.1,
		i N'	27 56	8	+2				h 207 km.ca., Mag. 6.1
		i Z'	28 17	9			-3		
		e Z'	30 27	9			3		
		e Z'	32 13	9			3		
		eiSKS N'	33 09	16	+2				
		ei E'	33 11	17		-3			
		e Z'	33 49	20			1		
		eS E'	34 12	21		2			
		isS Z'	35 46	13			+5		
		ei E'	35 50	25		-4			
		e N'	35 51	18	2				
		ePS Z'	36 16	27			5		
		e N'	36 40	18	2				
		iPPS Z'	37 09	8			-15		
		e N'	37.9	32	2				
		eSS E'	41.5	17		4			
		eSS N'Z'	41.7	18			5		
		e Z'	42.1	39			6		
		m N'	42.1	40	7				
		e E'	42.3	40		7			
		m E'	43.2	37		8			
		e E'	47.1	25		4			
		e Z'	49.8	32					
		e N'	50.8	31	3				
		e E'	51.6	40		6			
		e Z'	52.8	25			7		
		eL Z'	58.3	66					
		eL N'	58.6	65					
		L Z'	59.4	66			26		
		L N'E'	59.7	60-65	10	12			
		M Z'	15 04.1	24			6		
		M N'	04.6	25	2				
		M E'	05.9	24		4			
	28	i(P) Z	14 38 51½	0.8			0.04		Microseisms present.
79	28	i(P) Z	16 32 34½	0.8			+0.04		Microseisms present.
									USCGS: 7.0S, 124.5E, H 16 26 05.6,
									h 407 km.ca., Mag. 5.1
	29	m N	01 18 53	0.7	0.03				Quarry blast ?
	29	ePg Z	06 40 35	0.3					Quarry blast.
		iSg N	40 38.6	0.3	+0.04				
		i EZ	40 39.0	0.3		-0.12	+0.12		
		m N	40 41½	0.6	0.11				
		m EZ	40 43½	0.7		0.08	0.09		
	29	iSg N	07 17 18.7	0.5	+0.02				Quarry blast.
		m N	17 23	0.7	0.19				
		m EZ	17 26	0.7		0.04	0.05		
	29	Pg Z	07 29 22½						Quarry blast
		i EZ	29 26.0	0.4		+0.02	+0.03		
		m N	29 28½	0.6	0.04				
		m EZ	29 30½	0.7		0.04	0.04		
80	29	eL E'	13 22.9	35					Obscured by microseisms.
		M E'	26.1	16		½			USCGS: 2.2S, 139.5E, H 13 07 18,
		M N'	26.6	15	½				h 33 km.ca., Mag. 4.4
		M Z'	27.5	15			½		

RIVERVIEW COLLEGE OBSERVATORY
SEISMOLOGICAL BULLETIN, JAN.- FEB.,1964.

No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
	Jan.29	e NEZ	23 28 09	0.4					Local. Quarry blast ?
	30	i Z	01 42 58.3	0.3			-0.06		Blasting ?
	30	i N	01 58 42.3	0.3	-0.07				Blasting ?
	30	m N	02 12 33	0.6	0.02				Blasting ?
	30	i(P) NZ	03 52 47.8	0.4	-0.02		+0.02		Local. Quarry blast ?
		i NE	53 08.5	0.5	+0.03	+0.03			
		m N	53 11	0.5	0.05				
	30	(Pg) Z	06 55 20½						Quarry blast.
		iSg NEZ	55 24	0.4	+0.04	-0.04	+0.04		
		m N	55 26	0.7	0.20				
		m EZ	55 28½	0.7		0.09	0.10		
81	30	e Z'	18 55.7	Feeble.					(USCGS: 27.3N, 29.9E, H 17 45 54.6, h 41 km.ca., Mag. 5.3)
		M Z'	19 03	22					
	31	i EZ	07 10 26.8	0.5		+	+0.02		Quarry blast. Double ?
		i N	10 28.0	0.6	+0.07				
		i N	10 31.5	0.6	+0.03				
		i Z	10 32.0	0.5			+0.04		
		m N	10 33½	0.7	0.16				
		m EZ	10 36	0.7		0.10	0.15		
82	31	e(L) E'	22 00.9	(20)	Feeble.				
		eL Z'	01.8	23					
	Feb. 1	(i) Z	00 45 39.8						Masked by microseisms.
		iSg N	45 42.5	0.5	+0.03				Quarry blast.
		i Z	45 42.8	0.5			+0.06		
		m N	45 44½	0.6	0.19				
		m EZ	45 47	0.7		0.07	0.11		
	1	(Pg) Z	01 59 56.3						Quarry blast.
		iSg NE	02 00 01.0	0.4	+0.04				
		i Z	00 01.5	0.5			+0.04		
		m N	00 07	0.7	0.31				
		m E	00 08½	0.7		0.06			
		m Z	00 09½	0.7			0.06		
83	1	Z'	02 46	Feeble surface waves, masked by microseisms.					(USCGS: 51.8N, 170.8W, H 01 47 52.1, h 34 km.ca, Mag.5.2, 5-5¼Pal.)
	1	i NEZ	04 40 16.5	0.3	+0.03	(+0.03)	+0.05		Quarry blast ?
		m E	40 19	0.4		0.07			
		m Z	40 20½	0.5			0.06		
84	2	N'Z'	05 54	Feeble surface waves, masked by microseisms.					USCGS: 21.9S, 169.5E, H 05 41 13.0, h 33 km.ca.)
85	2	i Z	09 05 35				-		Masked by microseisms.
		(e) N'E'	14.1	28					Long-period wanderings present.
		e Z'	18.7	(30)					USCGS: 24.2N, 122.6E, H 08 54 48.3, h 28 km.ca., Mag. 5.0
		eL Z'	25.8	38					
		M E'	29.8	25		1			
		M N'	31.2	21	1				
		M Z'	31.8	21			3		
	3	iSg N	06 56 41.0	0.5	-0.05				Quarry blast.
		i Z	56 41.2	0.5			+0.04		
		m N	56 43½	0.6	0.34				
		m EZ	56 46	0.6		0.08	0.09		
86	3	Z'	23 42	Feeble surface waves.					
	4	iPg EZ	07 22 07.5	0.3		+0.08	+0.05		Compression. Quarry blast.
		iSg E	22 11.3	0.3		+0.28			
		iSg NZ	22 11.5	0.3	+0.11		-0.28		
		m N	22 13½	0.7	0.18				
		m EZ	22 15½	0.7		0.27	0.35		
	5	i NE	05 45 17½	0.4	+	+			Local. Quarry blast ?
		m E	45 20	0.5		0.06			

No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km	
87	Feb. 5	(P) Z	11 41 30						Masked by microseisms.
		eP N'Z'	41 31	?					
		i Z	41 41½	1.5			+0.22		
		i Z'Z"	41 42	4*			+5*		* From Galitzin.
		e N'Z'	48.1	25ca	3				
		iS N'E'Z'N"E"	50 41	10	-4	-3	-4		USCGS: 36.5N, 141.0E, H 11 30 15.7, h 46 km.ca., Mag. 5.4, Pasadena 6¼
		isS E'	51 08	7		-3			
		i E'	51 35	7		-3			
		e N'	51 36	30	3				
		i E'	52 03	7		-3			
		e E'	54 46	27					
		e(SS) N'	55 06	32					
		e Z'	55.2	25					
		m N'	55.9	30	2				
		e E'	57 18	27					
		e(SSS) E'	58.2	29		2			
		eLQ E'	12 00.6	34		6			
		eLQ N'	00.8	40					
		L E'	03.4	28		3			
		eLR Z'	03.8	40					
		L N'	04.4	34	4				
		M E'	06.6	28		4			
		M N'	07.0	28	4				
		M Z'	07.4	27			8		
		M N'Z'	09.3	24	6		9		
88	5	e(PP) Z"	11 42 07	7					Confused by No.87.
		e E'	42 09	7		2			USCGS: 19.7S, 179.8W, H 11 35 18.6, h 414 km.ca., Mag. 5.5
		i Z Z'Z"	42 10	1.2, 6			(-0.14 (-7		
		i Z E"	42 13	1.5, 6*		-3*	-0.42		* From Galitzin.
		e Z'	45 08	19					
		e E'	45 20	18					
		e E'	47 45	10					
		e N'	47 50	10	4				
		i E'Z'	47 53	9		+2	+7		
		i Z"	48 01	7			+7*		
89	5	eL Z'	16 31.1	30					Masked by microseisms.
		M Z'	33.6	21			1		USCGS: 3.8S, 141.3E, H 16 15 08.1, h 110 km.ca., Mag. 4.5
		M N'E'	34.3	20	½	1			
90	6	M Z'	02 37	19			1		Masked by microseisms & long-period wanderings.
	6	i(Sg) N	06 03 52.8	0.5	-0.02				Quarry blast ?
		m E	03 54	0.5		0.10			
		m NZ	03 55½	0.5	0.07		0.12		
	6	i Z	06 48 57.3	0.5			+0.01		Quarry blast ?
		i E	48 57.5	0.5		+0.02			
		m Z	49 01½	0.7			0.07		
		m E	49 02	0.5		0.04			
91	6	eP Z'	13 21 17	?					Microseisms present.
		ePP Z'	25 20	16			2		
		e Z'	31 40	22			4		USCGS: 55.7N, 155.8W, H 13 07 25.2, h 33 km.ca., Mag. 6¾-7 Pasadena, Palisades 6½-6¾ Berkeley.
		iSKS N'	31 48	18	+12				
		iSKS E'	31 49	18		+5			
		e N'	32 33	24					
		iS E'	32 51	25		-19			
		m N'E'Z'	33.1	26	10	34	7		
		ei(PS) N'	34 12	24	+11				
		i(PS) Z'	34 14	24			-11		
		i(PS) E'	34 15	24		+8			
		iPPS E'	35 03	20		+7			
		e N'	39 22	28					
		iSS E'	39 41	26		+22			
		iSS N'	39 55	25	+17				
		SS Z'	39 56	27			10		
		i E'	40 16	26		+19			

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RIVERVIEW COLLEGE OBSERVATORY
SEISMOLOGICAL BULLETIN, FEBRUARY, 1964.

No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km	
91 cont.	Feb. 6	(PSPS) Z'	13 40.6	23			11		
		iSSS E'	43 25	22		+9			
		iSSS N'	43 27	25	+11				
		e Z'	44.8	26			9		
		i(ScSScS) E'	45 13	22		+13			
		e E'	45.7	44					
		i Z'	46 33	20			+9		
		eLQ E'	48.5	38					
		ei(SKKKS) N'	48.7	23	+14				
		L E'	49.1	32		16			
		e Z'	49.3	(35)					
		i E'	49.6	32		-25			
		i N'Z'	49.7	24	+19		17		
		eL Z'	52.6	50					
		iLR Z'	53 47	28			-16		
		LR N'E'	54.9	27	14	11			
		M N'	58.3	24	9				
		M Z'	58.6	22		28			
		M E&Z'	14 01.0	20		15	22		
		M (W_2) Z'	15 21	22			18		
		M Z'	32	19			18		
92	6	i(P) Z	15 26 41½	0.8			+0.06		Microseisms present. Coda of No.91 obscures L.P. records. USCGS: 10.5S, 120.7E, H 15 19 38.1, h 43 km.ca., Mag. 4.9
93	6	e N'	19 28.1	11					Masked by microseisms.
		(eL) E'	39.3	?					USCGS: 24.0N, 126.4E, H 19 08 57.8,
		e(L) Z'	41.8	(20)					h 33 km.ca., Mag. 4.8
		M E'	48.7	16		½			
		M N'Z'	49.4	16	¼		1		
94	5	e(P) Z'	20 38 27	?					Masked by microseisms.
		e N'	43.8	?					USCGS: 33.5S, 178.4W, H 20 32 54.9,
		eL Z'	45.3	22					h 33 km.ca., Mag. 5.0
		M N'E'Z'	48	14-17	1	1	3		
95	6	Z'	22 57	Feeble surface waves, masked by microseisms.					
96	7	eL Z'	06 45.3	(24)					Masked by microseisms.
		eL N'	45.9	20					USCGS: 5.8S, 154.0E, H 06 31 21.8,
									h 77 km.ca., Mag. 4.6
97	7	iP Z	09 39 30.6	1.0			-0.80		Dilatation. Microseisms present. USCGS: 14.8S, 167.5E, H 09 34 27.2, h 159 km.ca., Mag. 4.4
98	7	Z'	11 42	Feeble surface waves.					(USCGS: 18.6N, 155.9W, H 11 06 21, h 33 km.ca., Mag. 4.4)
99	7	e N'	13 20 24	24					Masked by microseisms & long-period
		eL Z'	33.8	36					wanderings. USCGS: 39.8N, 142.8E,
		M N'Z'	37	23	½		1		H 12 58 33.6, h 45 km.ca, Mag 5.4
	8	ePg EZ	01 01 42½	0.3					Quarry blast.
		iSg NE	01 46.5	0.4	+0.03	-0.07			
		i Z	01 46.7	0.4			+0.09		
		m N	01 48½	0.6	0.06				
		m EZ	01 51	0.7		0.07	0.13		
100	8	iP Z	11 30 33.5	0.8			-0.09		Dilatation. Microseisms present.
		i Z	30 34.6	0.8			+0.09		USCGS: 52.3N, 175.6E, H 11 17 46.5,
		eLR Z'	58.5	40					h 60 km.ca., Mag. 5.4
		M N'Z'	12 02.6	24	1½		1½		
101	8	M E'	17 48	17		1			Masked by microseisms.
102	8	Z'	21 31	Feeble surface waves, masked by microseisms.					
103	9	P Z	02 05 54	(0.5)					Masked by microseisms.
		P E	05 55	(0.5)					USCGS: 16.5S, 179.2W, H 02 00 07.3,
		e N'	10 29	?					h 480 km.ca., Mag. 5.3
		M Z'	13.6	17			1½		

No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
	Feb.10	iSg NE	07 01 45.7	0.5	-0.05	+			Quarry blast.
		i Z	01 45.8	0.5			+0.03		
		m N	01 48	0.7	0.34				
		m Z	01 50½	0.7			0.06		
	10	i NEZ	07 52 06½	0.3	+	(+)	(+)		Quarry blast.
		m N	52 08½	0.7	0.13				
		m EZ	52 10½	0.7			0.11		
104	10	e Z	17 37 16						Masked by microseisms.
		eS N'	44 22						USCGS: 6.1S, 104.1E, H 17 27 07,
		(eL) N'	50.3	(45)					h 126 km.ca., Mag. 5.5
		eL Z'	55.6	30					Or 6.1S, 104.1E, H 17 27 58,
		M N'	58.6	20	½				h 33 km.ca., Mag. 5.5
		M E'Z'	18 01	20		1	1½		
	10	i N	22 55 19	(0.4)	+				Blasting ?
		m NE	55 20	0.3	0.25	0.11			
105	10	e E'	23 56.3						USCGS: 59.8S, 150.3E, H 23 45 58.4,
		eL Z'	57.7	22					h 33 km.ca.
	11	i(Sg) N	06 43 10.3	0.5	+0.02				Quarry blast.
		i EZ	43 10.8	0.5		+0.02	+0.02		
		m N	43 13	0.7	0.17				
		m EZ	43 15	0.7		0.05	0.06		
	11	i(Sg) N	06 57 10.4	0.5	-0.02				Quarry blast.
		i EZ	57 10.7	0.5		-0.03	+0.03		
		m N	57 13	0.7	0.12				
		m EZ	57 15½	0.7		0.09	0.10		
	11	i E	07 22 25			+			Quarry blast.
		i(Sg) NE	22 27.5	0.5	+	+			
		i Z	22 27.7	0.5			+0.05		
		m N	22 31½	0.6	0.07				
		m EZ	22 35	0.7		0.08	0.08		
	11	i NZ	08 07 22.5	(0.7)	+		+		Confused by microseisms.
		i Z	08 04.5	1.2			+0.13		
106	11	e(PP) Z'	18 29 41						Masked by microseisms.
		e(S) N'	34 05						USCGS: 15.9S, 173.1W, H 18 21 05.5,
		e E'	34 08						h 33km.ca., Mag. 5.2
		e Z'	34 09	16					
		eL N'	36.7	23	1				
		e E'	37 02	14					
		eL E'Z'	38.3	20			1½		
		M N'	40.9	13	2				
		M E'Z'	42.0	17		2	3		
107	11	(P) Z	19 05 04½						Microseisms present. L.P. records
		e E'	12.4						confused by coda of No.106.
		e N'	12.8						USCGS: 7.1S, 154.5E, H 19 00 18,
		M Z'	16.4	12			1		h 78 km.ca.
		M N'E'	17,0	12	½	1			
	12	i E	07 27 25.5	0.5		+0.02			Local. Quarry blast ?
		m N	27 29	0.6	0.04				
108	12	Z'	07 37	Feeble long waves, masked by microseisms.					
109	12	eP Z'	20 38 05					3390	Microseisms present.
		e N'Z'	38 09					30°5	
		ePP N'	39 04						USCGS: 3.5S, 146.6E, H 21 31 53.2,
		ePP Z'	39 05						h 33 km.ca., Mag. 5.4
		eS N'E'Z'	43 06	21		4			
		m N'	43.6	30	9				
		m Z'	43.8	30			7		
		m Z'	44.3	30			7		
		e N'E'	44.4	30	4	5			
		eG E'	45.3	50					
		e Z'	45 38	30			9		

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No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
109 cont.	Feb. 12	G Max. E'	20 46.2	40		50			
		iLR N'	46 55	30	+14				
		LR Z'	47.0	33					
		M E'	49.1	21		32			
		M N'Z'	50.3	21	32		50		
								3970	
110	12	eP Z'	22 41 02					35°7	USCGS: 15.3S, 174.4W, H 22 33 59.2, h 33 km.ca., Mag. 5.0, Berkeley 5¾
		ePP Z'	42 20	7			2		
		ePPP E'	42 40	12		1			
		ePPP Z'	42 42	12			1		
		iS E'	46 39	16		-3			
		e Z'	46 47	18			5		
		iSSS N'	49 25	25	-15				
		eSSS E'	49 26	20		4			
		e Z'	49 31	20			4		
		eLR Z'	50.8	33					
		LR E'Z'	51.5	30		10	16		
		M N'	55.1	12	8				
		M E'Z'	56.7	17		9	17		
									All records masked by microseisms.
111	13	e Z'	03 33 09						N'E' also confused by long-period
		e Z'	37 22						wanderings.
		eL E'	39.2	40					USCGS: 3.5S, 146.6E, H 03 25 45.1,
		eL Z'	39.9	39					h 33 km.ca., Mag. 4.9
		L E'	40.2	35		4			
		M N'	42.2	25	3				
		M E'Z'	43.0	20-24		6	6		
		M N'Z'	47	13	7		13		
	13	i E	04 24 36	(0.3)		+			Quarry blast.
		i NZ	24 36½	0.3	(+)		+		
		m E	24 38½	0.4		0.08			
112	13	Z'	05 04	Feeble surface waves masked by microseisms.					
									Masked by microseisms.
113	13	e N'E'	10 42.3	16	1	1			(USCGS: 26.1N, 100.9E, H 10 03 50.6,
		e Z'	42.5	25			1		h 33 km.ca., Mag. 4.7)
		e N'	46.4	17					
		eL N'	49.9	30					
		eL Z'	50.1	30					
		LR N'E'Z'	50.7	30	1	1	3		
									Quarry blast.
	14	e NEZ	05 37 34½	0.3					
		i N	37 35.8	0.4	+0.03				
		i Z	37 36.5	0.4			+0.02		
		m E	37 37	0.5		0.04			
									Quarry blast.
	14	(Pg) Z	06 43 15						
		e(Sg) N	43 18½	0.3					
		i EZ	43 18.9	0.3		-0.06	+0.07		
		m N	43 21	0.7	0.06				
		m EZ	43 24	0.7		0.08	0.11		
								3040	Microseisms present.
114	14	eP Z'	16 35 37	?				27°5	USCGS: 5.1S, 151.7E, H 16 29 45.0,
		e Z	35 40	1					h 55 km.ca., Mag.6.0,
		i Z	35 46.7	1			+0.11		Pasadena 6¾
		e N'Z'	35 47	16					
		m N'Z'	36.1	25	4½		7½		
		iPP Z	36 27	1			+0.14		
		iPPP Z	36 36	1			+0.16		
		e N'Z'	36 46	16	4		5		
		e N'	37.1	40	4				
		e E'	37.5	30		1			
		e Z'	39.8	40					
		e E'	40.0	26		2			
		eS N'	40 17	16	7				
		i N'	40 33	27	+59				
		i Z'	40 39	28			+57		
		i E'	40 58	24		+18			
		SS Z'	41 33	30					
		iSSS N'	41 54	20	+16				

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No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
114	Feb.14	iLR E'	16 42.1	38		+36			
		LR N	42.3	37	19				
		iM Z'	43 57	30			+74		
		M N'Z'	45.2	24	51		88		
		M E'	45.7	22		43			
		e N'	18 05.0	60					
		M N'	08.7	66	3				
		e(W_2) Z'	19 07	40					
		M N'Z'	14	26	½		1		
	15	Pg Z	01 41 14				(+)		Quarry blast.
		iSg EZ	41 18.0	0.4		-0.07	+0.07		
		i N	41 19.0	0.5	+0.04				
		m EZ	41 22	0.7		0.08	0.12		
	15	i N	05 35 23.0	0.6	-0.03				Quarry blast.
		i Z	35 23.4	0.6			+0.05		
		i NE	35 25.0	0.3	+0.08	+0.06			
		m E	35 26½	0.5		0.09			
		m NZ	35 27	0.5	0.23		0.27		
	15	Pg EZ	05 49 23.2	(0.3)		(+)	(+)		Quarry blast.
		iSg E	49 28.2	0.3		+0.09			
		iSg N	49 28.3	0.3	+0.08				
		i Z	49 28.8	0.5			+0.06		
		i N	49 29.7	0.5	+0.06				
		m N	49 33½	0.7	0.42				
		m EZ	49 36	0.7		0.10	0.16		
115	15	e(S) N'	16 43 57	21	1				Masked by microseisms.
		e Z'	44 06	20			1		USCGS: 4.8S, 152.4E, H 16 33 08.0,
		eLR N'Z'	47.4	30					h 71 km.ca., Mag. 5.5
		M Z'	49.0	21			3		
		M N'E'	49.5	20	1	1			
116	15	e(P) Z'	22 07 30						Masked by microseisms.
		e(S) N'	11 44	13					USCGS: 8.7S, 157.1E, H 22 01 58.4,
		eL N'	13.4	27					h 52 km.ca., Mag. 5.1
		eL Z'	13.8	30					
		M N'E'Z'	15.2	20-24	1	1½	3		
	16	e N	09 58 48	0.5					Local. Seismic ??
117	16	e(P) Z'	21 40 34						Masked by microseisms & long-period
		e(S) E'	45 08	?					wanderings.
		e Z'	45 21	16			2		USCGS: 5.6S, 152.0E, H 21 34 32.3,
		e N'	45 28	18	2				h 49 km.ca., Mag. 5.6
		eL(Q) E'	46.7	36		3			
		eL Z'	48.3	38					
		eL N'	48.4	38					
		M E'	48.8	20		4			
		M N'Z'	50.9	19	4		7		
	17	i(Sg) N	07 00 14.5	0.4	+0.02				Quarry blast.
		i EZ	00 14.7	0.4		+0.03	-0.03		
		m N	00 17	0.7	0.16				
		m EZ	00 19	0.7		0.06	0.10		
	17	(Pg) Z	07 16 15.2						Quarry blast.
		iSg N	16 18.6	0.4	-0.09				
		i EZ	16 19.0	0.4		-0.09	-0.08		
		m N	16 21	0.7	0.52				
		m EZ	16 23	0.7		0.10	0.11		
118	17	L Z'	17 42	Feeble.					
119	18	eP Z'	01 36 21	6					Microseisms present.
		i Z	36 24.6	0.9			+0.07		
		i Z	36 40	0.7			-0.04		USCGS: 16.2S, 166.4E, H 01 31 21.8,
		iS N'	40 25	11	-2				h 77 km.ca., Mag. 4.8
		i E'	40 31	9		+2			
		i Z'	40 34	13			+2		

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No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
119 cont.	Feb.18	e N'	01 40.7	23					
		e Z'	41.4	24					
		M N'E'Z'	43.6	16	1½	1	1½		
	18	i EZ	03 24 57.7	0.5		+0.03	-0.03		Quarry blast ?
		m N	25 01	0.7	0.04				
		m EZ	25 04	0.7		0.03	0.04		
	18	(P) Z	04 00 59						Masked by microseisms. USCGS: 27.5N, 91.1E, H 03 48 35.6, h 30 km.ca., Mag. 5.6
120	18	e E'	05 01 13						Masked by microseisms etc. USCGS: 15.5S, 175.0W, H 04 42 47.7, h 289 km.ca., Mag. 4.8
		M E'	08.8	17		1			
		M Z'	12.6	18			1		
121	18	iP Z'	10 40 41	5			+2		Compression. Microseisms present.
		e N'	41 03	6					
		i Z'	41 04	6			-2		USCGS: 10.3S, 161.2E, H 10 35 20.1, h 73 km.ca., Mag. 4.9
		e(S) E'	45 23	11		½			
		e N'	45 24	11	1				
		e Z'	45 26	10			1		
		e N'	46.1	26					
		eLR E'	46.9	34					
		eLR Z'	47.0	34					
		LR N'E'Z'	47.7	30	3	2	6		
122	18	(e) E'	12 39.7	?					
		e Z'	44.1	?					
		e N'	48.6	(20)					
		e E'	49.4	(24)					
		eLQ N'	59.2	(45)					
		L N'	13 00.5	34	2				
		eLR E'Z'	03.7	40					
		M E'Z'	06.2	26		1	1		
	18	i(Sg) N	22 55 56.5	0.5	-0.04				Blasting ?
		m NE	55 57½	0.4	0.21	0.08			
		m Z	55 58	0.5			0.06		
	19	i NE	03 59 23½	0.5	+0.05				Blasting ?
	19	(Pg) Z	07 09 27½						Qaurry blast.
		iSg N	09 31.3	0.4	+0.03				
		i EZ	09 31.6	0.4		-0.03	+0.04		
		m N	09 33½	0.6	0.15				
		m EZ	09 35½	0.7		0.07	0.11		
	19	e(Sg) N	07 23 34½	0.5					Quarry blast.
		m N	23 39½	0.7	0.11				
		m E	23 40½	0.7		0.04			
		m Z	23 41½	0.7			0.05		
123	19	eL Z'	09 39.3	31					Masked by microseisms & long-period wanderings. USCGS: 9.6S, 107.3E, H 09 15 29.4, h 48 km.ca., Mag. 5.0
		M N'	42.8	12	4				
		M Z'	45.6	18			4		
		M E'	45.9	18		2			
124	19	i(P) Z	23 54 25	0.8			+0.05		Masked by microseisms. USCGS: 18.7S, 169.2E, H 23 49 45.2, h 207 km.ca., Mag. 4.7
		e Z'	59.3	14					
	20	i Z	01 09 02.7	0.5			+0.03		Small local tremor ?
		i N	09 23.5	0.5	+0.04				
		i E	09 23.6	0.5		+0.07			
		m N	09 26	0.5	0.07				
		m Z	09 31	0.7			0.04		
	20	(Pg) EZ	07 40 13½						Quarry blast.
		e(Sg) N	40 17	0.3					
		i EZ	40 17.3	0.3		-0.09	+0.10		
		m N	40 19½	0.6	0.07				
		m E	40 22	0.7		0.07	0.10		

No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
	Feb.20	eSg N	08 51 05½	0.5					Quarry blast.
		i E	51 06.0	0.5		+0.04			
		i Z	51 06.2	0.5			+0.05		
		m N	51 10	0.7	0.37				
		m E	51 12½	0.7		0.11			
		m Z	51 13½	0.7			0.11		
125	20	e(P) Z'	10 05 49						Masked by microseisms.
		eS E'	15 49	9		½			USCGS: 44.6N, 150.0E, H 09 53 51.1,
		e N'	16.2	(13)					h 50 km.ca., Mag. 5.2
		e E'	16 18	(13)					
		eLQ E'	27.3	(27)					
		M N'Z'	37.2	21	½		1		
	20	(iP) Z	18 27 53½						Masked by microseisms.
									USCGS: 17.2S, 179.0W, H 18 22 16,
									h 585 km.ca., Mag. 3.9
126	20	eL Z'	21 39.3	26					
	21	e N	04 27 02½	0.5					Local. Seismic ?
		i EZ	27 03½	0.4		-	+		
	21	e N	05 42 12	0.5					Quarry blast ?
		m NE	42 14	0.5	0.04	0.05			
	21	i Z	06 31 41	0.5			+		Quarry blast ?
		m N	31 45	0.7	0.04				
		m Z	31 48	0.8			0.05		
	21	(P) Z	13 15 59				+		Masked by microseisms.
									USCGS: 18.8S, 169.3E, H 13 11 21.8,
									h 234 km.ca., Mag. 4.6
127	21	Z'	14 18	Feeble surface waves.					USCGS: 6.7S, 105.5E, H 13 53 06.0,
									h 33 km.ca., Mag.5.2
128	22	i(P) Z	01 52 45	1.3			+0.1		Masked by microseisms. Long-period
		e N'	57 22	13	1				wanderings on N'E'Z'.
									USCGS: 36.9S, 176.9E, H 01 47 32.1,
									h 203 km.ca., Mag. 5.1
	22	i Z	01 54 49.8				+		Quarry blast ?
		m N	54 51½	0.6	0.02				
		m Z	54 54	0.7			0.03		
	22	e N	02 43 11½	0.5					Quarry blast.
		e EZ	43 12	0.5					
		m N	43 16½	0.7	0.12				
		m EZ	43 19½	0.7		0.05	0.05		
129	22	iP Z	08 56 17½	0.8			+		Microseisms present.
		m Z	56 19	0.8			0.11		N'E'Z' masked by long-period wander-
		eL E'Z'	09 03.5	26		1	2		ings. /h 33 km.ca. Mag.5.1
		M E'Z'	05.5	17		1	2		USCGS: 30.1S, 177.3W, H 08 50 35.0/
130	24	Z'	17 57	Feeble surface waves, masked by microseisms.					
131	25	eL Z'	01 13	24					USCGS: 44.7S, 37.5E, H 00 34 32.0,
									h 33 km.ca., Mag. 6.7
	25	i N	02 19 40.4	0.7	+0.04				Quarry blast ?
		m N	19 41½	0.7	0.05				
132	25	e N'	02 51.5						Masked by microseisms & long-period
		e E'	52.3						wanderings.
		eL Z'	53.4	25					USCGS: 9.1S, 110.7E, H02 28 55.5,
		M N'	54.4	18	1				h 81 km.ca.
		M Z'	55.9	20			2		
	25	e N	02 54 58½	0.5					Local. Quarry blast ? h 33 km.ca.
133	25	eL Z'	03 23.9	25.			2		USCGS: 49.7S, 112.1E, H 03 08 24/
	25	e EZ	05 33 00	0.3					Local. Quarry blast ?
		i NE	33 01½	0.3	-	+			
		i N	33 02½	0.3	+				

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No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
	Feb.25	iPg EZ	07 07 19.5	0.3		+	+		Quarry blast.
		i(Sg) EZ	07 23.4	0.4		-0.06	+0.06		
		m N	07 25½	0.6	0.04				
		m EZ	07 27½	0.7		0.12	0.18		
134	25	e(S) N'	15 29 16	18					Masked by microseisms.
		eL Z'	33.5	22					USCGS: 5.6S, 151.8E, H 15 18 32.9,
		M N'E'Z'	34.8	20	½	½	1		h 42 km.ca., Mag.5.0
135	25	Z'	21 26	Feeble surface waves, masked by microseisms.					(USCGS: 11.5N, 142.0E, H 20 57 30.6, h 16 km.ca., Mag. 4.7)
136	25	iP Z	23 29 09½	1			-0.09		Dilatation. Microseisms present.
		eLR Z'	36.2	26			1½		USCGS: 30.1S, 177.9W, H 23 23 33.3,
		M E'Z'	38.5	17		1	2		h 51 km.ca., Mag. 4.8
	26	e N	02 06 45½	0.5					Quarry blast.
		i(Sg) N	06 48.7	0.4	+0.06				
		m N	06 50½	0.6	0.12				
		m Z	06 51½	0.6			0.05		
	26	e NZ	05 42 45½						Local. Quarry blast.?
		i E	42 47.2	0.5	+0.03				
	26	iSg N	06 58 27.4	0.5	+0.03				Quarry blast.
		i E	58 27.5	0.4		+0.03			
		i Z	58 27.8	0.4			+0.07		
		m N	58 30	0.7	0.27				
		m EZ	58 32	0.7		0.10	0.09		
	26	Pg Z	07 15 27						Quarry blast.
		i(Sg) EZ	15 31	0.3		+0.09	-0.07		
		m N	15 32½	0.6	0.05				
		m EZ	15 35	0.7		0.18	0.21		
	26	i N	07 57 37.9	0.7	0.04				Quarry blast ?
137	26	(eP) Z'	08 56 24						Masked by microseisms & long-period wanderings.
		e Z'	56 30						USCGS: 56.0S, 148.4E, H 08 51 30,
		eL Z'	09 01.3	27					h 33 km.ca., Mag. 4.8
		LR N'Z'	02	2		3			
		M E'	03.5	14		1			
138	26	E'	18 29	Feeble waves.					USCGS: 4.4N, 126.2E, H 18 14 37.9, h 132 km.ca., Mag. 5.3
139	26	(eP) Z'	21 23.8						Masked by microseisms.
		e Z'	24 56	(10)					USCGS: 20.7S, 174.4W, H 21 17 08.1,
		e Z'	29.3	16					h 33 km.ca., Mag. 5.0
		eL N'	31.3	30					
		eLR Z'	33.0	25					
		M N'E'Z'	36.0	14,19	1	2	4		
140	26	(iP) Z	23 16 31	1			-0.08		Microseisms present.
		eL Z'	23.4	26					USCGS: 11.7S, 166.3E, H 23 11 04.4,
	27	e Z	01 54 19½						h 64 km.ca., Mag. 4.7
		m NE	54.20	0.3	0.09	0.16			Local blasting ?
141	27	eL Z'	03 26.4	21					
		M Z'	30.6	16			½		
	27	e N	06 55 41½						Quarry blast ?
		m N	55 44½	0.6	0.05				
		m EZ	55 47	0.7		0.05	0.06		
142	27	eL Z'	12 27.5						USCGS: 18.9N, 104.0W, H 11 35 32.4,
		M Z'	36.3	17			½		h 33 km.ca., Mag. 4.5

No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
142	Feb.27	iP Z	15 22 34.6	1.1			+0.80	8660	Compression.
		iP E	22 34.8	1.1		+0.08		78°	h 0.01
		iP N'E'Z'Z"	22 35	6	-	+	+6		
		iPcP Z	22 42	1.0			-0.08		USCGS: 21.7N, 94.4E, H 15 10 48.4,
		ipP Z'Z"	23 00	5			-		h 102 km.ca., Mag. 6.4
		i Z'	23 19	6			+4		
		e(PP) Z'	25 27	15					
		e N'	25 36	15					
		iS N'E'N"E"	32 18½	9	+8		+5		
		e E'	32.5	(25)					
		eSKS N'	32 34	10	3				
		e Z'	32 47	20					
		isS N'	33 05	8	-4				
		i N"	33 08	7	+6*				* From Galitzin.
		e(SS) N'E'	37.0	30					
		eG N'	44.1	70	9				
		eG E'	44.3	70		7			
		eLR Z'	47.1	50					
		LR Z'	49.3	50			9		
		M E'	53.4	33		1½			
		M Z'	54.0	33			3		
		M N'	54.4	22	1½				
	28	? Z	01 44 49				+		Local. Seismic ?
	28	(i) Z	02 22 25.5	0.5			+		Regional.
		e N	22 39	0.5					
		m NEZ	23 19	1.4	0.07	0.11	0.20		
	28	i Z	06 00 10.5	0.4			-0.02		Quarry blast ?
		m E	00 12	0.6	0.07				
		m NZ	00 13½	0.7		0.06	0.06		
	28	(Pg) E	06 11 28½						Quarry blast.
		i(Sg) N	11 33.8	0.5	+0.02				
		i E	11 34.3	0.5		+0.03			
		m N	11 38	0.7	0.16				
		m EZ	11 41	0.7		0.08	0.12		
144	28	(iP) Z	06 44 16½	0.8			+0.03		Masked by microseisms.
		e N'	50.2	16					
		M Z'	55.5	14			½		
145	28	Z	14 27	Feeble surface waves.					
146	28	e(S) N'	18 08 43						USCGS: 18.2N, 94.3E, H 17 47 05.9,
		(eL) N'	19.0	64					h 43 km.ca., Mag. 5.3
		(eL) E'	20.3	56					
		M N'	26.6	30	1				
		M E'Z'	30.6	26		½	1		
	28	e N	19 42 19	0.5					Seismic ?
		e Z	19 43 44	0.5					"
		i Z	19 44 05	0.5			+		"
147	28	E'	21 07	Feeble long waves.					USCGS: 13.3N, 144.7E, H 20 46 00.1,
									h 33 km.ca., Mag.5.2
	28	e Z	22 43 47½	0.5					Local. Seismic ?
	29	i EZ	01 28 04	0.5		+	+		Quarry blast.
		m N	28 08½	0.7	0.03				
	29	(e) E	03 27 37						Quarry blast ?
		m N	27 44	0.7	0.02				
148	29	eP Z'	15 31 18	10					Masked by microseisms.
		e Z'	33 40	10					USCGS: 34.8N, 141.7E, H 15 20 12.8,
		e(S) N'	40 23	10					h 34 km.ca., Mag. 5.1
		e(S) E'	40 24	10					
		e E'	41 24	16					
		eL E'	50.6	26					
		M Z'	16 00.2	18			1		
		M N'E'	00.5	16	1	½			

No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
149	Feb.29	(e) E	20 26 20						Masked by microseisms.
		eL Z'	30.4	25					USCGS: 18.2S, 172.8W, H 20 13 41.6,
		M E'Z'	32.4	20		½	1		h 33 km.ca., Mag. 5.1
							-5	4860	Dilatation. Microseisms present.
150	29	iP Z'Z"	23 57 39	4			-3*	4397	* From Galitzin. h 0.15015
		ipP Z"	58 10	4			2		USCGS: 8.5S, 112.7E, H 23 49 40.8,
		e Z'	58 12	13			-3*		h 73 km.ca., Mag. 5.8
		iPcP Z"	59 25	4					S lost on N'E'Z' while changing
		iS N"	24 03 59	6	+3				records. Calibration pulses confuse
		iS E"Z"	04 00	6		-3*	+3*		following phases.
		i N"	04 44	7	-2*				
		iSS N"E'E"	07 17	8	-3*	+3			
		iSS Z'Z"	07 18	10			+4		
		i N'	07 23	10	+5				
		m N"	07 34	11	4*				
		eL Z'	10.4	42			6		
		eL E'	10.6	42		5			
		M N'	12.7	20	3½				
	Mar. 1	i EZ	02 32 50.2	0.3		-0.04	+0.04		Local. Seismic ?
		e N'	02 50.6	19					Masked by microseisms & long-period
151	1	e Z'	50.8						wanderings.
		eL Z'	53.1	25			1		USCGS: 7.1S, 155.4E, H 02 40 21.6,
		M N'Z'	56.1	15	1				h 100 km.ca., Mag. 4.8
		M E'	57.5	12		½			
	1	e N"E"	06 09.8	12					Seismic ?
	2	i E	01 55 09	?		+			Blasting ?
		i N	55 09.5	0.4	-0.12				
		i E	55 09.7	0.4		+0.05			
	2	i E	06 56 10½	0.4	-				Quarry blast ?
		m N	56 12	0.7	0.05				
	2	m N	06 58 56	0.7	0.06				Quarry blast ?
		m Z	58 58	0.7			0.04		
	2	i N	07 28 49.5	0.3	+0.04				Quarry blast ?
		m N	28 51	0.7	0.06				
									Masked by microseisms.
152	2	e(P) Z'	19 39 47	?					USCGS: 18.9S, 174.8W, H 1932 41.7,
		e E'Z'	40 09	10			+3		h 105 km.ca., Mag. 5.3
		i Z'	41 30	8					
		e E'	44 21	8					
		e N'	44 24	?					
		e Z'	44 25	?					
		e Z'	45 13	20			1		
		i(S) N'	45 22	(12)	-				
		e E'	45 28	15		2			
		(L) N'	47 20	28	4				
		M N'	49.1	15	6				
		M E'Z'	49.2	22		3	5		
		i E'	50 37	11		+4			
	3	i(P) NZ	04 31 08½	0.3	-			+	Local.
		i(S) NE	31 29½	0.5	+0.04	-0.04			
	3	e(Pg) Z	04 40 37						Quarry blast.
		i(Sg) NZ	40 40.4	0.3	+0.03		+0.04		
		m NEZ	40 43½	0.5	0.04		0.05		
	3	e EZ	07 50 19	0.5					Quarry blast.
		iSg N	50 19.8	0.6	-0.03				
		i E	50 20.5	0.4		-0.04			
		m N	50 22½	0.7	0.26				
		i Z	50 22.7	0.7			+0.05		
		m EZ	50 24½	0.8		0.13	0.16		
									Masked by microseisms.
153	3	(iP) Z	15 17 53						USCGS: 30.4S, 177.9W, H 15 12 14.9,
		eL Z'	24.8	23					h 33 km.ca., Mag. 4.3
		M E'Z'	26.5	18			½	1	

No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
154	Mar. 3	(P) Z	16 04 22½						Masked by microseisms.
		e Z'	08 40	13					
		e E'	08 49	13		½			
		e N'	09 27	14	½				
		eL E'	10.0	22					
		eLR E'Z'	10.7	28		1	2		
		M Z'	12.4	18			2		
		M N'E'	12.8	13,16	1	1			
155	3	(e) Z'	17 21 26						Masked by microseisms.
		e E'	25.0						
		e N'	25 15						
		eLR Z'	26.8	27					
		M E'Z'	28.5	17		½	1		
		M N'	30.4	11	½				
	3	(iP) EZ	21 35 08			+	-		Masked by microseisms.
156	3	iP Z	21 47 44	1			+0.05		Compression. Microseisms present.
		e(S) N'	54 07	9	½				USCGS: 4.8N, 125.5E, H 21 39 31.0,
		e E'	54 18	13		½			h 77 km.ca., Mag. 4.9
		e E'	57 18	10		1			
		e(SS) N'E'	57 40	11	½	1			
		e Z'	58 05	12			½		
		eL N'	22 00.1	(22)					
		M E'	04.3	16		½			
		M N'Z'	08.8	17	½		½		
157	4	eL Z'	03 26.8	Feeble.					USCGS: 20.9S, 168.6E, H 03 17 22.7,
									h 33 km.ca., Mag. 4.6
	4	e Z	04 10 34½						Local. Seismic ?
		i E	10 36½	0.4		+0.03			
		i Z	10 37½	0.4			-0.02		
158	4	(iP) Z	04 13 01½						Masked by microseisms. Long-period
		e Z	13 30						wanderings on N'E'Z'
		e E"	17 39						USCGS: 7.1S, 129.5E, H 04 06 27.6,
		i N	21 46½	1.2	-0.15				h 120 km.ca., Mag. 5.3
		M Z'	28.0	12			1		
159	4	Z'	05 44	Feeble surface waves.					(USCGS: 53.8N, 169.7W, H 05 03 38.1,
									h 33 km.ca., Mag. 4.3)
	4	(Pg) Z	07 26 07½						Quarry blast.
		iSg N	26 11.0	0.5	+0.04				
		i EZ	26 11.3	0.5		-0.04	+0.06		
		m N	26 13½	0.7	0.34				
		m EZ	26 15½	0.7		0.11	0.15		
160	4	N'E'Z'	15 46	Feeble surface waves.					USCGS: 6.3S, 130.2E, H 15 24 07.6,
									h 171 km.ca., Mag. 5.7
161	4	N'	17 19	Feeble surface waves.					USCGS: 10.9S, 164.5E, H 17 02 59.8,
									h 33 km.ca., Mag. 4.7
162	4	eL N'E'	22 51.5	27					Masked by microseisms & long-period
		M N'E'	52.4	18	1	1			wanderings. / h 108 km.ca. Mag.5.2
		M Z'	53.4	16			1		USCGS: 6.8S, 129.8E, H 22 34 06.3/
163	5	P Z	00 10 22½						Masked by microseisms. N'E'Z' con-
		i Z	10 30	1.3					fused by calibration pulses.
		M Z'	30.3	16			½		USCGS: 11.5N, 126.0E, H 00 01 19.6,
									h 40 km.ca., Mag. 4.7
	5	e NE	04 11 14	0.4					Local. Qaurry blast ?
164	5	(eP) Z'	06 08 34						Masked by microseisms & long-period
		e Z'	08 47	7					Wanderings.
		e(S) E'	15 12	13					USCGS: 45.2S, 96.4E, H 06 00 41.3,
		e N'	15 22	10	1				h 40 km.ca., Mag. 5.5
		m E'	15 24	13		3			
		e E'	18 32	13		2			
		e N'	18 42	23	2				
		eLR Z'	21.1	32					
		LR N'E'Z'	21.8	30	5	5	10		
		M N'E'Z'	23	19	2	7	8		

RIVERVIEW COLLEGE OBSERVATORY
SEISMOLOGICAL BULLETIN, MARCH, 1964.

No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
	Mar. 5	i(Sg) NE	07 25 06.3	0.5	+0.01	+0.02			Quarry blast.
		i Z	25 06.5	0.5			+0.02		
		i N	25 09.5	0.5	-0.04				
		m N	25 11½	0.7	0.14				
	5	i N	08 00 04	0.7	+0.04				Quarry blast ?
		m EZ	00 06	0.8		0.05	0.04		
165	5	eP N'E'Z'	10 10 57	8			-2		USCGS: 11.2S, 162.2E, H 10 05 37.2,
		ePP Z'	11 38	7			1		h 38 km.ca., Mag. 5.1
		eS N'	15 21	9	2				
		e E'	15 28	10		4			
		e Z'	15 29	9			3		
		i N'	15 30	9	+5				
		i Z'	16 04	6			+3		
		e N'E'	16 06	13-16	2	2			
		e Z'	16.2	13			2		
		eL Z'	16.8	34					
		eL E'	17.2	25					
		L Z'	17.7	30			4		
		M N'	21.0	12	4				
		M E'	22.1	13		5			
		M Z'	25.8	13			6		
166	5	e(S) E'Z'	20 44 47	9					Masked by microseisms.
		e E'	45.1	16					USCGS: 16.4S, 173.0W, H 20 31 57.4,
		e Z'	47 27	23					h 33 km.ca., Mag. 4.7
		e N'	47 35	20	1				
		eLR Z'	48.9	30					
		eLR E'	49.1	30					
		M E'Z'	51.0	19		1	2		
	6	(Pg) Z	06 33 27½						Quarry blast.
		i(Sg) EZ	33 31	0.4		+0.02	-0.02		
		m N	33 33½	0.7	0.08				
		m EZ	33 35½	0.7		0.04	0.05		
167	6	(e) Z'	13 01 40	7					Masked by microseisms.
		e(L) E'	12.8	19					USCGS: 4.2S, 134.6E, H 12 54 35.9,
		e N'	12.9	7					h 33 km.ca.
		M N'Z'	16.2	11	½		1		
		M E'	17.3	10		½			
168	6	eP Z'	19 03 00	9			2		S.P. records masked by large micro-
		i Z	03 02.1	0.8			+0.13		seisms. L.P. masked by microseisms
		e N'	03.1	(22)					& long-period wanderings.
		e Z'	03 20	11			4		
		e(S) N'	07 36	12	3				USCGS: 6.1S, 154.4E, H 18 57 16.1,
		e Z'	07 43	34					h 74 km.ca., Mag. 5.8,
		e E'	07.9	18		4			6 Palisades.
		m N'Z'	08.1	27	8		10		
		e E'	08.7	25		3			
		L E'	09.6	33		10			
		eL N'	10.3	(45)					
		eLR Z'	10.5	34					
		iLR N'	10.8	30	+13				
		M N'Z'	11.9	25	15		29		
		M E'	12.4	17		11			
169	6	eLR E'Z'	20 55	25					Masked by microseisms etc.
									USCGS: 19.5S, 174.5E, H 20 42 55.8,
									h 56 km.ca., Mag. 4.6
170	6	i(P) Z	23 56 42	1.6			+0.41		Large microseisms present.
		M N'E'	24 05	13					USCGS: 22.9S, 173.1E, H 23 51 28.5,
									h 54 km.ca., Mag. 4.6
171	7	eL Z'	11 26.2	25			1		Masked by microseisms etc.
		M Z'	30.4	17			1		USCGS: 4.1S, 130. 3E, H 11 01 12.1,
									h 33 km.ca., Mag. 4.2

No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks.
	1964		h m s	s	μ	μ	μ	km.	
172	Mar.7	e N'	21 17.1						Masked by microseisms & long-period wanderings.
		(eL) Z'	19.7	30					
		M N'Z'	25.0	15	2		4		USCGS: 5.6S, 152.7E, H 21 06 06.9, h 62 km.ca., Mag. 4.8
		M E'	25.5	14		2			
173	8	P Z	01 39 40½	0.5				1890	Large microseisms present.
		iP Z'	39 41	7			-9	1790	Dilatation.
		iP N'E'	39 42	7	-6	+6			USCGS: 44.0S, 168.4E, H 01 35 48.1, h 33 km.ca., Mag. 5.6
		i NZ	39 44	1.3	+0.17		+0.58		
		i Z	39 47½	1.5			+1.08		
		e N'E'Z'	39 49	20	5	5	7		
		eS N'	42 47	15	3				
		eS E'	42 49	15		2			
		iSS N E	43 08	14	+6	+8			
		i Z'	43 12	10			+8		
		iSSS N'	43 22	14	+16				
		eL Z'	43.4	26					
		i E'	43 36	16		+18			
		i N'	43 49	16	+18				
		LR Z'	44.0	20			35		
		LR N'	44.4	18	14				
		M N'	45.2	16	10				
		M E'	45.4	16		14			
		T NZ	55.9	0.5					
		T Max. NEZ	56.7	0.5	1.28	0.86	1.67		
174	8	(iP) Z	11 58 05	1.2			+		Masked by microseisms.
		e Z'	58 22	?					USCGS: 46.0S, 146.8E, H 11 55 49.7, h 33 km.ca.
		e(L) N'	12 02 20	(25)					
		e(L) E'	02 23	18					
		eL Z'	02.9	26					
		L Z'	03.3	25			3		
	9	(Pg) Z	07 13 44						Quarry blast.
		iSg N	13 47.5	0.5	+0.05				
		i EZ	12 47.8	0.4		-0.06	+0.06		
		m N	13 49½	0.6	0.03				
		m EZ	13 52	0.7		0.06	0.08		
	10	i E	02 03 07.7	0.5		-0.03			Quarry blast ?
		i Z	03 08.0	0.5			+0.04		
		i N	03 09.8	0.5	-				
		m N	03 13	0.7	0.06				
		m E	03 16	0.8		0.07			
		m Z	03 16	0.7			0.08		
	10	m N	04 16.0	0.6	0.06				Quarry blast ?
	10	e N	07 24 45½						Quarry blast ?
		i N	24 48.8	0.3	+				
		m N	24 50½	0.7	0.06				
	10	iSg N	07 28 23.5	0.5	+0.02				Quarry blast.
		i EZ	28 23.8	0.4		+0.04	-0.04		
		i N	28 25.2	0.6	-0.10				
		m N	28 26½	0.6	0.20				
		m EZ	28 28½	0.7		0.09	0.12		
176	10	iP Z	14 07 36½	1.7			+0.43	4660	Compression. Microseisms present.
		iP Z'Z"	07 37	4			+5	4129	h 0.01 ca.
		e(pP) Z'	08 03	5			5		USCGS: 1.9N, 127.5E, H 13 59 54.8, h 117 km.ca., Mag. 5.6
		i Z	08 31	1.6			-0.32		
		ePP Z'	09 17	6			3		
		i Z"	09 23	5			+5*		* From Galitzin.
		e N'E'	09 26	16	1	1			
		eS N'	13 47	12	1				
		e E'	13 52	18		1			
		e N'	14 22	15					
		eSSS N'	17 36	15	2				
		eSSS E'	17 37	16		5			
		eSSS Z'	17 41	16			5		

Continued on next page.

No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
176	Mar.10	eL E'	14 19.3	50					
cont.		eL N'Z'	19.4	52					
		L Z'	20.7	50			4		
		M N'	25.6	14	1				
		M E'Z'	27.2	17		1	3		
177	11	iP Z	01 13 49.5	1.2			+0.52	4670	Compression.
		iP Z'	13 49½	6			+3	42.0	
		P NE	13 50	1.2	0.08	0.08			USCGS: 1.8N, 127.1E, H 01 06 00.4,
		m Z	13 51	1.2			0.71		h 58 km.ca., Mag. 5.6
		iPP Z	15 27.5	1.2			+0.13		
		i Z'	15 35	?	+				
		eS N'	20 06	14	1				
		eSS Z'	23 15	15					
		eSS N'	23 16	17	1				
		e E'	23 29	13		2			
		i Z'	23 48	16			+4		
		eL Z'	26.4	50			3		
		eL E'	27.2	40					
		M N'	29.7	25	2				
		M E'	31.2	20		4			
		M Z'	32.8	27			3		
178	11	(e) N'	04 08.6						Masked by microseisms & long-period
		eL Z'	27.1	30					wanderings. /h 33 km.ca., Mag.5.2
		M Z'	31.8	19			1		USCGS: 23.4N, 121.6E, H 03 55 14.0/
	12	e(Sg) N	07 49 41						Quarry blast ?
		i EZ	49 41.5	0.3		+0.06	+0.05		
		m N	49 44	0.5	0.05				
		m EZ	49 46	0.6		0.05	0.06		
	12	i E	07 50 20.3	0.4		+			Quarry blast ?
		i Z	50 20.5	0.4			+0.07		
		m N	50 23	0.6	0.06				
		m EZ	50 25	0.6		0.08	0.10		
179	12	(iP) Z	22 42 04½				+		Masked by microseisms.
		e(S) E'	50 03	19					Long-period wanderings on N'E'
		e N'	50 06	19					
		e N'	53.3	16					USCGS: 13.5N, 122.9E, H 22 32 56.7,
		e Z'	54 20	13					h 33 km.ca., Mag. 5.3
		m N'	54.3	18	2				
		m Z'	54.8	20			3		
		eL Z'	58.7	50					
		M E'	23 04.2	22		2			
		M Z'	04.4	17			3		
		M N'	05.2	19	2				
180	13	eL Z'	05 12.4	28					Masked by microseisms etc.
		M Z'	22.0	16			2		USCGS: 4.1S, 105.1W, H 04 26 23.5,
									h 33 km.ca., Mag. 4.6
	13	(Pg) E	06 14 01½						Quarry blast.
		e(Sg) N	14 04½						
		i EZ	14 05.2	0.5		-0.03	+0.03		
		m N	14 07½	0.6	0.06				
		m EZ	14 09½	0.7		0.13	0.14		
181	13	(iP) Z	06 24 44½				+		Masked by microseisms. Long-period
		e Z'	49.1	?					wanderings on N'E'.
									USCGS: 17.7S, 178.7W, H 06 19 02.5,
									h 522 km.ca., Mag. 4.6
182	13	i(P) EZ	08 08 18.8	0.5			+0.01		Local.
		i E	08 41½	0.5		+0.02			
		i N	08 52.8	0.4	-0.05				
		m E	08 54	0.5		0.10			
		m N	08 56	0.5	0.16				
		m Z	09 00	0.7			0.09		
183	14	(P) Z'	01 16 14½	5			1		Masked by microseisms.
		M Z'	27.7	24			1		

No.	Date	Phase & Component		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km.	
	Mar 14	i(Sg)	N	02 03 56.8	0.5	+0.02				Quarry blast
		m	N	04 02	0.7	0.25				
	14	i	E'	02 10 48.5	0.5	.	+0.03			Quarry blast
		i	Z	10 48.8	0.5			+0.04		
		i	N	10 51.5	0.8	+0.05				
		m	Z	10 55	0.8			0.10		
		m	E	10 55½	0.7		0.08			
	14	m	E	06 40 40	0.8		0.08			Local. Seismic ?
184	14		N'E'Z'	12 59						Surface waves masked by microseisms
185	14	iP	Z	15 10 57.8	1.0			-0.16	3080	Dilatation
		esP	Z'	13 41	(10)				27°.7	h 0.09, H 15 05 54½
		eS	E'	15 00	10		2			USCGS: 13.7S, 172.3E, H 15 05 54.4,
		iScP	EZ	16 46½	1.0		+0.08	-0.08		h 611 km. ca Mag. 5.1
		e(L)	Z'	17.8	20					
		M	E'	20.2	16		1			
		M	Z'	20.4	18			1		
186	14	PKP	Z	15 32 04						Microseisms present
		M	Z'	16 25	Feeble					USCGS: 15.9N, 60.5W, H 15 12 22.4
										h 31 km. ca, Mag. 5.4
187	15	eL	Z'	03 44.6	Feeble and masked by microseisms					USCGS: 1.2N, 126.2E, H 03 18 13.6
										h 43 km. ca
188	15	iPKP	Z'	22 50 25	9			+4		
		iPP	Z'	55 17	14			+5		USCGS: 36.2N, 7.6W, H 22 30 26.0
		i	Z'	23 00 43	13			3		h 27 km. ca, Mag. 6¾-7 Pas.,
		e	Z'	05.4	14			3		7-7¼ Bks, 6¼-6½ Pal., 6.2
		ePPS	N'	08.2	21	1				Between 23h 17m & 23h 25m L.P. confused
		e	Z'	08.6	20			3		by calibration pulses
		e	Z'	09.5	30					
		eSS	N'	15.3	34	3				
		e	E'	16.1	33		3			
		e	N'	20.2	28	4				
		e	N'	25.4	34					
		e	E'	26.6	41		3			
		e	Z'	27.4	35			2		
		(G)	N'	33	60	3				
		eLR	N'E'	40.6	54	5	4			
		M	E'	48.9	46		13			
		M	E'	51.7	38		13			
		M	N'	52.6	30	9				
		M	Z'	54.0	32			14		
		M	Z'	55.0	29			15		
	16	i	E	01 56 58½						Blasting ?
		m	NE	57 00	0.4	0.15	0.05			
	16	(Pg)	Z	07 03 42						Quarry blast
		i(Sg)	N	03 46.7	0.5	+0.02				
		m	N	03 51	0.7	0.19				
		m	EZ	03 53½	0.7		0.10	0.15		
	16	(Pg)	EZ	07 38 11						Quarry blast
		iSg	N	38 14.0	0.5	-0.02				
		i	E	38 14.2	0.3		+0.06			
		i	Z	38 14.5	0.3			+0.11		
		m	N	38 16½	0.6	0.23				
		m	EZ	38 19	0.7		0.21	0.26		
189	16	(i)	Z	15 02 59	1			+		Masked by microseisms.
		i	Z	03 30½	1.2			+0.09		
		i	Z	04 07	1.0			+0.12		USCGS: 8.3S, 118.6E, H 14 55 55,
		e	N'	08 30	(16)					h 33 km.ca.
		e	Z'	08 36	18					
		eL	E'Z'	10.8	21					
		M	Z'	12.4	24			2		

RIVERVIEW COLLEGE OBSERVATORY
SEISMOLOGICAL BULLETIN, MARCH, 1964

No	Date	Phase & Component		Time (G.M.T.) h m s	Per. s	Amplitude A_N μ	A_E μ	A_Z μ	Δ km.	Remarks
	1964									
190	Mar 16	eL	Z'	19 12	27					Masked by microseisms USCGS: 9.6S, 166.4E, H 18 59 28 h 33 km. ca, Mag. 4.5
191	16	e	N'	19 27.2	18					Masked by microseisms
192	16	(iP)	Z	21 45 06				+		Masked by microseisms
		i	Z	46 25½	1.3			+0.09		USCGS: 20.6S, 178.7W, H 21 39 42.5, h 578 km. ca, Mag. 4.9
		e	E'	52.2	(16)					
		e	N'	54.6	(20)					
	17	i(Pg)	N	01 49 01½	0.4					Quarry blast ?
		i(Sg)	N	49 05	0.3	+0.04				
		m	N	49 07	0.7	0.06				
	17	e(Pg)	N	01 49 25	0.4					Quarry blast ?
		i(Sg)	N	49 28.5	0.3	+0.03				
		m	N	49 30½	0.7	0.04				
	17	e(Pg)	N	01 49 55.7	0.4					Quarry blast ?
		i(Sg)	N	49 59	0.3	+0.04				
		m	N	50 01	0.7	0.05				
	17	(Pg)	Z	07 14 49						Quarry blast
		i(Sg)	EZ	14 53.0	0.5		+0.03	-0.03		
		m	EZ	14 57	0.7		0.11	0.15		
193	17	e(S)	E'Z'	18 18.6	(16)					Masked by microseisms USCGS: 15.8S, 173.3W, H 18 05 52 h 33 km. ca, Mag. 4.6
		e	N'	21.5						
		eL	Z'	22.5	35					
		eL	E'	22.8	30					
		L	Z'	23.3	30			2		
		M	E'	25.5	18		1			
		M	N'	25.6	14	1				
		M	Z'	25.7	18			2		
	18	(P)	Z	00 17 25						Masked by microseisms USCGS: 17.3S, 175.1W, H 00 10 34.8 h 268 km. ca, Mag. 4.8
		(P)	Z'	17 26	5					Blasting ?
	18	e	E	01 56 17.2						
		i	N	56 18.2	0.5	-0.05				
		m	N	56 19	0.4	0.25				
		m	EZ	56 20	0.4		0.10	0.12		
	18	i	E	02 03 31	0.5		+			Local ?
194	18	iP	Z	04 49 22.5	1.2			+0.12	9640	Compression, h 0.06, H 04 37 23
		iP	Z'Z"	49 22½	4			+5	86°.7	USCGS: 52.5N, 153.6E, H 04 37 26.9 h 440 km. ca, Mag. 5.6
		m	Z	49 24½	2.0			1.66		
		iPcP	Z	49 27	1.0			-0.06		
		i	Z'	50 33	4			-3		
		ipP	Z'Z"	50 57	7			+4		
		isP	Z'	51 39	10			-4		
		iSKS	N'N"	59 05	10	-4				
		e	Z'	59 22	13					
		iS	N'N"E'E"	59 23	11	+4	+6			
		e	N'E'	59.6	20					
		isS	N'	05 02 06	12	+2				
		e	E'	02 11	22		1			
		e	E'	05 08	22		1			
		L	E'	12.0	27		3			
		L	Z'	14.1	25			3		
		M	Z'	21.3	20			2		
	18	P	NZ	05 22 07½	0.4					Local tremor or quarry blast
		iS	N	22 15½	0.4	-0.07				
		i	NEZ	22 18½	0.4	+0.09	(-0.04)	(-0.07)		
		m	E	22 20	0.4		0.12			
		m	NZ	22 21	0.5	0.15		0.18		
	18	iP	NZ	05 29 42	0.4	(-)		(-)		Local tremor or quarry blast
		iS	N	29 50.3	0.4	-0.05				
		i	NZ	29 53.3	0.5	-0.06		-0.03		

Continued on next page

No.	Date	Phase & Component		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km.	
cont.	Mar 18	m	E	05 29 53.3	0.5		0.06			
		m	NZ	29 55½	0.5	0.15		0.10		
	18	iP	NZ	05 36 40.7	0.4	+0.02		+0.04		Local tremor or quarry blast
		i	Z	36 42.3	0.5			+0.04		
		iS	N	36 48.8	0.4	+0.06				
		m	E	36 54½	0.5		0.07			
		m	NZ	36 55	0.5	0.12		0.11		
	18	iP	NZ	05 43 27.7	0.4	+		+		Local tremor or quarry blast
		i	Z	43 29.7	0.5			+		
		iS	N	43 35.7	0.4		+0.02			
		m	NE	43 39½	0.5	0.11	0.05			
		m	Z	43 41½	0.5			0.09		
195	19	e	Z'	04 53 47						Masked by microseisms
		M	Z'	58.4	14			1		USCGS: 21.9S, 179.5E, H 04 45 50.9, h 613 km ca, Mag.4.7
	19	i	E	05 25 25			+			Microseisms ?
		i	N	25 45½		+				
	19	i	E	07 09 31.4	0.4		+			Quarry blast
		iSg	N	09 33.9	0.5	-0.03				
		iSg	E	09 34.0	0.5		+0.02			
		i	Z	09 34.2	0.5			+0.04		
		m	N	09 36	0.7	0.24				
		m	EZ	09 39	0.7		0.09	0.10		
	19	(Pg)	Z	07 27 26						Quarry blast
		i	E	27 28.5			+			
		iSg	N	27 29.4	0.5	-0.03				
		m	N	27 32	0.7	0.22				
		m	EZ	27 34	0.8		0.12	0.14		
196	19	eL	Z'	08 54.6						Masked by microseisms
		M	E'	55.5	15		½			USCGS: 20.3S, 178.3W, H 08 43 40.5
		M	N'Z'	56.8	17	½		1		h 504 km. ca, Mag. 4.5
197	19	(e)	Z	10 03 53						Masked by microseisms
		e	E'	15 48	18					USCGS: 14.7N, 56.3E, H 09 42 34.9
		eL	Z'	30.5	40					h 33 km. ca
		M	E'Z'	37	22		1	2		
198	19	(P)	Z	21 51 06						Masked by microseisms
		eP	Z'	51 17	10			3	4240	USCGS: 15.1S, 172.6W, H 21 44 03.8
		e	E'	51 22					38°.1	h 33 km. ca, Mag. 5.6
		e(PP)	E'	52 44	7		2			
		i	Z'	52 54	7			3		
		eS	N'	57 07	16	2				
		e	E'	57 09	18					
		e	Z'	57 11	18					
		m	E'Z'	57.5	21.24		8	8		
		e	Z'	58 27	12			3		
		LQ	N'	22 00.0	38	8				
		e	Z'	00 11	20			7		
		eLR	Z'	01.9	26					
		eLR	E'	02.0	26					
		LR	E'Z'	02.5	26		29	42		
		M	N'	05.0	15	7				
		M	E'Z'	06.5	16		16	20		
199	20	(P)	Z'	01 21 10	4					Masked by microseisms and long period wanderings. USCGS: 62.2S, 155.8E, H 01 16 12.8, h 33 km. ca.
		e	E'	28 11	18		3			
		e	N'	28 23	14	2				
		eL	Z'	29.0	28					
		L	N'Z'	29.6	28	3		5		
	20	i(Pg)	Z'	01 54 55½				+		Quarry blast ?
		i(Sg)	N'E'	55 00½	0.4	+0.02	-0.04			
		m	N	55 05	0.7	0.20				
		m	EZ	55 08½	0.7		0.08	0.09		

RIVERVIEW COLLEGE OBSERVATORY
SEISMOLOGICAL BULLETIN, March, 1964

No.	Date	Phase & Component		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km.	
200	Mar 20	e	Z'	04 34.7						Masked by microseisms and long period wanderings. USCGS: 6.1S, 150.4E, H 04 21 08.1, h 34 km. ca, Mag. 4.9
		M	E'	36.4	17		4			
		M	Z'	38.4	13			3		
	20	i	NZ	05 59 51½	0.5	+0.03		+0.01		Quarry blast ?
		i	E	59 52	0.5		+0.04			
		m	NEZ	59 54½	0.6	0.04	0.04	0.04		
	20	i	E	06 02 02			+			Quarry blast ?
		m	N	02 03½	0.6	0.05				
		m	EZ	02 06½	0.6		0.04	0.05		
201	20	(iP)	Z	19 03 01	13			+		Masked by large microseisms. USCGS: 7.0S, 115.2E, H 18 55 10.8, h 121 km. ca, Mag. 5.4
		e	N'	09.6						
		eL	N'E'	14.1	44					
		eL	Z'	15.4	38					
		M	N'E'	17.8	23	1	1			
		M	N'Z'	21.7	19	1		1		
								-0.06		Dilatation
202	21	iP	Z	02 19 09.5	0.4					Regional WSW of Riverview
		iP	NEZ	19 09.7	0.4	+0.02	+0.08	+0.09		
		m	NEZ	19 10½	0.4	0.04	0.12	0.15		
		iS	N	19 32	0.6	+0.20				
		i	Z	19 32½	0.6			+0.13		
		m	N	19 33½	0.7	0.75				
		m	EZ	19 35	0.7		0.63	0.42		
203	21	iP	NEZ	03 48 39.3	1.0	-0.16	+0.22	+1.09	3800	Compression, h 0.05, H 03 42 24
		iP	NEZN"E"Z"	48 39½	5&15	{-18 / -8	{+15 / +6	{+27 / +11	34°.2	Waves of 5 to 7 secs period superposed on all phases on L.P. records
		m	NEZ	48 42	1.0	0.18	0.22	0.93		USCGS: 6.4S, 127.9E, H 03 42 19.6, h 367 km. ca. Felt in Darwin
		i	Z'	48 45	6			+16		
		ipP	Z'	49 46	5			+11		
		i	Z'	50 02	5			+		
		iPP	N'E'Z'	50 07	5	-	+	+		
		m	N'E'Z'	50 21	18	12	11	24		
		sP	Z'	50 25	(14)					
		eS	N'E'	53 40				10		
		e	Z'	53.7	28					
		iS	N'E'	53 45	12	-16	-24			
		e	N'	54.1	30	7				
		iScP	Z	54 12	1.0			+0.16		
		eisS	E'	55 40	15		+20			
		isS	N'	55 43	15	+19				
		i	E'E"	55 54	9		+			
		i	E'	56 05	(7)		-			
		i	Z'	56 12	(13)		+			
		eiSS	E'	56 20	20		+38			
		iSS	N'Z'	56 24	20, 7	+33		-		
		i	Z'	56 36	20			+60		
		i	E'	56 50	18		-21			
		(ScS)	E'	58 17	5		-24			
		L	N'E'	58.4	40					
		M	Z'	04 02.2	22			-	34	
		e	N'	05 15	55					
204	21	(ePS)	E'	15 37.2						Masked by microseisms USCGS: 18.7N, 103.1W, H 15 08 14.3, h 83 km. ca, Mag. 5¼ Pal., 5.0
		eL	N'	55.3						
		eL	Z'	16 00.4	(27)					
		M	Z'	09.4	16			1		
205	21	eP	Z	16 33 02	0.7					Long P. masked by microseisms and confused by coda of 204
		i	Z	33 04.7	1.4			+0.13		USCGS: 27.6S, 177.2W, H 16 27 11.7 h 33 km. ca, Mag. 5.6
		e	Z'	38 07	24					
		eLR	E'Z'	40.1	30					
		LR	E'Z'	40.8	30			2	3	
		M	Z'	42.0	18				3	
		M	N'E'	42.4	18	1	2			
206	22		N'E'Z'	05 54	Feeble surface waves masked by microseisms and large periodic wanderings					USCGS: 2.7S, 126.4E, H 05 32 07.7 h 33 km. ca, Mag. 5.1

No	Date	Phase & Component		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude AE	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km.	
207	Mar 22	(i)	Z	09 14 16½				+		Masked by microseisms
		eL	Z'	21.3	20					(USCGS: 35.7S, 72.9W, H 08 35 06.4
		M	Z'	25.0	20			1		h 33 km. ca, Mag. 5.1)
208	23		N'	01 26	Feeble surface waves masked by micro-					(USCGS: 9.3S, 108.2E, H 01 02 36.1,
					seisms and long period wanderings					h 50 km. ca.)
209	23	eP	Z	22 47 22½						Large microseisms on all records
		i	N	54 16	1.4	+0.33				Long period wanderings on L.P.
		eL	N'	56 51	21	3				USCGS: 17.6S, 123.2E, H 22 41 15.8
		M	E'Z'	23 00.4	15		6	9		h 33 km. ca
		M	N'	00.5	14	4				
	24	i	E	01 33 33	0.3		+			Local blasting ?
		m	NEZ	33 34	0.3	0.03	0.06	0.09		
	24	i	N	07 27 30.4	0.3	-0.04				Quarry blast ?
		i	EZ	27 30.7	0.5		+0.03	-0.03		
		m	N	27 35½	0.6	0.12				
		m	E	27 38	0.6		0.03			
210	25	i	N	06 18 44½		+				Local or regional
		i	E	19 05½	0.6	. .	+0.03			Masked by microseisms
		m	NZ	19 13	1.2	0.18	.	0.12		
		m	E	19 16	1.0		0.12			
	25	iPg	EZ	07 06 49.2	0.3		+0.05	+0.05		Compression , Quarry blast
		iSg	N	06 52.8	0.4	-0.08				
		i	EZ	06 53.2	0.4		-0.15	+0.19		
		i	Z	06 55.5	0.4			+0.11		
		m	N	06 55½	0.6	0.43				
		m	EZ	06 57½	0.7	...	0.27	0.33		
	25	e	N	07 26 33						Quarry blast ?
		m	N	26 37	0.7	0.09				
		m	EZ	26 40	0.7		0.06	0.08		
211	25	e(P)	E	15 37.1	(1.0)					Masked by microseisms
		eL	Z'	42.2	22					USCGS: 20.1S, 168.8E, H 15 32 26.0
		M	E'Z'	44.0	18		1	2		h 33 km. ca, Mag. 4.7
212	25	i(P)	NZ	22 00 53	(0.4)	-		(+)		Local or regional
		i(S)	N	01 12.8	0.5	-0.03				Superposed on microseisms
		i	E	01 14.0	0.5		+0.09			
		m	N	01 16½	0.5	0.09				
		i	N	01 58.5	1.0	+0.06				
	25	i	N	23 26 45½	1.0	+0.05				Probably only microseisms
		i	EZ	26 58	1.3		+0.14	+0.20		
213	26		Z'	02 01	Feeble surface waves					USCGS: 21.5S, 174.6W, H 01 43 04
										h 33 km. ca, Mag. 4.3
214	26	eP	Z'	02 12 45	7			2	5110	Microseisms present
		e	Z'	14 20	8				46°.0	E' confused by long period wanderings
		i	Z'	14 40	7			+3		USCGS: 11.3N, 142.0E, H 02 04 20.2
		i	Z'	15 04	6			+7		h 33 km. ca, Mag. 4.9
		eS	N'	19 27	22	3				
		e	N'	20 21	22	2				
		e	Z'	23 19	17					
		eL	Z'	26.6	41					
		eL	N'	26.8	40					
		L	N'Z'	27.5	38	7		12		
		M	E'	29.6	18		9			
		M	N'	30.5	22	9				
		M	Z'	30.9	23			11		
		M	E'	32.1	18		7			
		M	N'Z'	34.0	17	12		21		
	26	e	N	03 20 36	0.6					Local or regional ?
	26	e	N	03 30 31½	0.6					Local or regional ?
		e	N	30 55	0.6					
	26	m	E	05 10 52	0.7		0.04			Quarry blast ?

No	Date	Phase & Component		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km.	
	Mar 26	(Pg)	Z	05 46 45½						Quarry blast
		i(Sg)	NE	46 50.5	0.4	+0.03	+0.03			
		i	N	46 53.7	0.5	0.09				
		m	N	46 55½	0.7	0.25				
		m	EZ	46 58	0.7		0.07	0.08		
215	26	(i)	N	12 29 50		-				Masked by microseisms
		i	E	30 17			-			USCGS: 6.8S, 129.3E, H 12 15 47,
		e	Z'	32.7						h 156 km. ca, Mag. 5.3
		eL	Z'	36.3	18					
216	26	(i)	Z'	13 48 07						Masked by microseisms
		e	E'	55.5	(15)					USCGS: 4.4S, 104.7W, H 13 29 56.2
		e	E'	56 46	(15)					h 33 km. ca, Mag. 4.9
		e	E'	57 24	(16)					
		e	Z'	57 34						
		eSS	Z'	14 01.7	22					
		e	E'	02 10	20		2			
		e	Z'	02.2	30					
		e(SSS)	Z'	05 54	17					
		eLR	E'Z'	16.1	32					
		M	N'E'Z'	19.2	21	1	3	5		
		M	Z'	25.5	17			5		
		M	E'	25.8	17		2			
		M	N'	27.3	15	2				
217	27	(P)	Z	04 42 32½						Masked by microseisms
		e	Z	42 40						USCGS: 25.9N, 95.8E, H 04 30 33.0
										h 93 km. ca, Mag. 5.4
218	27	P	Z	20 27 14					3040 27°.3 ca	Microseisms present
		e(PcP)	E'	30 13						h 0.08 ca, H 20 22 11 ca
		iS	N'N'	31 16	10	-5				USCGS: 23.7S, 179.9E, H 20 22 10.6
		iS	E'	31 17	10		-3			h 520 km. ca, Mag. 5.0
		i	E'	34 05	9		+6			
		i	Z'	34 10	18			-6		
		i	E'	34 29	8	-6				
		i	N'	34 33	9	+4				
		e(ScS)	N'	36 54	11					
		i	E'	37 05	7		+5			
		i	N'	37 09	7	+5				
		M	E'Z'	39.2	14		2	4		
	27	i	NE	21 21 04.2	0.7	+0.04	+0.03			Local
	27	i	NE	21 21 59.0	0.7	+0.09	+0.06			Local
219	28	eP	Z'	03 50 37	(20)					Large microseisms present
		i	N'Z'	51 18	24	-9		+37		L.P. records indecipherable from 04
		i	E'	55 56			+			till 20h. Galitzin's indecipherable until 09 h
		i	N'	55 57		+				USCGS: 61.1N, 147.6W, H 03 36 12.7,
		i(SKS)	E'	04 01 04						h 20 km. ca Mag. 8.4 Pas,
										8¼-8¾ Brk, 8.6 Pal., 8.5
220	28	iP	Z	11 38 02.8	1.3			+0.74	4960	Compression [illegible] h 0.02 ca
		ipP	Z	38 34.5	1.3			-0.30	44°.6	Large microseisms on Galitzin record
		i	Z"	38 49	6			+15*		Long period records indecipherable
		isP	Z	38 59	1.5			+0.46		USCGS: 0.5N, 122.3E, H 11 30 09.8,
		ipPcP	NEZ	39 47	1.3	+0.20	-0.20	-0.59		h 140 km. ca, 5.8
		iS	N"	44 26	7	-19*				
		i	E"	44 29	8		+11*			
		i	E"	45 19	8		+14*			
		iSS	Z"	47 41	9			-15*		
		i	E"	47 45	7		-8*			
		M	E"	48.3	13		9*			
		M	N"	48.4	15	11*				
221	28	e(S)	E"	12 46 29						Masked by large microseisms
		M	Z"	13 13.4	21			24*		USCGS: 56.5N, 154.0W, H 12 20 49.8
										h 25 km. ca, Mag. 6.5 Pas, 5¼-5¾
										Brk, 6.1
222	28	iSKS	N'	20 54 01	20	+5				Earlier phases masked by large
		iS	E'	55 22	20		-5			microseisms and long per. wandering

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No	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
222	Mar 28	ePS E'	20 56 54	20					USCGS: 59.8N, 148.7W, H 20 29 08.6,
cont.		iPS N'Z'	56 58	20	+7		-8		h 40 km, Mag. 5.8. 6.6 Pas,
		iSS E'	21 02 35	20		-8			6½-6¾ Brk, Pal.
		iSS Z'	02 39	20			+7		
		iSS N'	02 41	22	-5				
		eLQ E'	12.7	40		7			
		eLQ N'	13.2	35	5				
		M E'	24	22		6			
		M N'Z'	25	22	8		21		
223	29	(eSKS) N'	06 29.4						Masked by large microseisms and
		eS E'	30 16	18		4			long period wanderings.
		ePS Z'	31.8						USCGS: 56.1N, 154.3W, H 06 04 44.5
		eSS E'	37 13	16					h 30 km, Mag. 5.6, 5.8 Pas,
		eSS N'	37 22	20					6-6¼ Pal, 5¼-5½ Brk
		eSSS N'E'	40.9	24					
		eLQ E'	46.4	30					
		eL Z'	52.2	25					
		M N'E'	58.7	19	3	3			
		M Z'	07 02.6	18			7		
224	29	eSKS N'	17 06.1	(14)					Masked by microseisms
		ePS N'	09 05	17	1				USCGS: 59.8N, 146.9W, H 16 40 59.3
		eSS N'E'	15.0	27					h 20 km., Mag. 5.4
		eSS Z'	15.1	27					
		eLQ E'	25.0	42					
		eLR Z'	29.5	40					
		LR Z'	30.6	33			4		
		LR N'E'	30.8	33	2	2			
		M E'	36.4	22		2			
		M N'Z'	39.0	19	2		4		
225	29	eL Z'	18 41.8	32					USCGS: 59.9N, 146.1W, H 17 53 02.2
		M N'Z'	52.5	22	½		1		h 15 km, Mag. 5.0
226	29	iP Z	21 46 12.5	1.0			+	2920	Compression
		m Z	46 14	1.0			0.13	26°.3	L.P. masked by microseisms
		e N'	46 22	14					[illegible]
		ipP Z	46 23.7	1.2			+0.28		USCGS: 6.7S, 155.1E, H 21 40 32.7
		e Z'	46 28	14					h 68 km ca, Mag. 5.3, 6 Pal.
		i Z	46 33.4	1.2			+0.26		
		eS N'	50 41	14					
		e E'	51.0	22					
		i Z'	51 10	25			+8		
		m N'	51.4	24	8				
		i N"	51 25	10	+8*				
		eL E'	52.4	34		8			
		i E"	52 33	7		+8*			
		eL N'	52.7	34	6				
		M N'	54.4	28	8				
		M Z'	55.1	23			13		
		M E'	55.4	15		5			
227	30	eP Z'	02 32 08					11340	Large microseisms present
		ePP Z'	36 15					102°	H 02 18 12
		eSKS N'	42 48	15	4				USCGS: 56.6N, 152.9W, H 02 18 06.3
		eSKS E'	42 49	15		2			h 25 km, Mag. 5.8, 6.6 Pas, 6½-6¾
		eS E'	43 47	16					Brk, 6¾ Pal
		m N'E'	44.1	18	6	12			
		ePS Z'	45 14	24			4		
		ePS N'	45 17	20	3				
		ePS E'	45 20	20		2			
		iSS E'	50 31	20		+11			
		SS N'	51.1	24	5				
		SS Z'	51.2	24			5		
		eLQ E'	03 00.1	(60)					
		eLR Z'	05.5	24			11		
		M Z'	12.0	20			32		
		M N'E'	12.5	20	13	11			

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RIVERVIEW COLLEGE OBSERVATORY
SEISMOLOGICAL BULLETIN, MARCH, 1964

No	Date	Phase & Component		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
227	Mar 30	MW2	E'	04 33.5	21		4			
cont.			N'Z'	34.3	20	7		13		
										Masked by microseisms
228	30	(ePP)	Z'	07 28.3						USCGS: 59.9N, 145.7W, H 07 09 34.0
		iSKS	N'	34 33	10	+3				h 15 km, Mag. 5.6, 6.2 Pas,
		ePS	E'	37 33	16		1			5¾-6 Brk, 6¼-6½ Pal
		ePS	N'Z'	37 35	16	2		2		
		ePPS	Z'	38 38	20			1		
		eSS	E'	43 27						
		eSS	N'	43 33	25	1				
		eSS	Z'	43 39	22			2		
		e(LQ)	N'	52.2	50					
		eLQ	E'	53.6	50		5			
		eLQ	N'	54.1	42	3				
		eLR	Z'	58.5	32					
		eLR	N'E'	58.6	32					
		M	E'	08 04.1	22		3			
		M	Z'	05.5	22		6			
		M	N'	08.1	20	4				
		MW2	N'	09 24	20	1				
			Z'	26	19			2		
										USCGS: 56.4N, 152.5W, H 11 48 40.4
229	30	M	Z'	12 42	18			1		h 20 km, Mag. 5.2
										Masked by microseisms
230	30	e(S)	E'	13 29 23	13					USCGS: 56.5N, 152.7W, H 13 03 34.7,
		e(SS)	E'	36.2	20					h 20 km, Mag. 5.4, 5.3 Pas,
		eLR	Z'	51.9	24					4¾-5¼ Brk, 5½-5¾ Pal
		M	N'E'Z'	57.5	20	1	1	2		
										USCGS: 56.4N, 152.6W, H 13 32 18.5
231	30	M	Z'	14 26	19			2		h 15 km, Mag. 4.8
	30	iP	EZ	14 32 43.8	0.4		+0.02	+0.04		Local
		i	N	33 06.1	0.5	-0.03				
		m	N	33 07	0.7	0.14				
		m	EZ	33 09	0.7		0.13	0.09		
	30	e	NE	14 43 32½						Local
										Masked by microseisms and long
232	30	e(S)	E'	16 35 14						period wanderings
		eL	Z'	56.7						
		M	Z'	17 03.1	20			3		USCGS: 56.6N, 152.1W, H 16 09 28.4,
		M	E'N'	04	18	2	1			h 25 km, Mag. 5.5, 5.5 Pas,
		M(W2)	Z'	18 23	22			1		5½-5¾ Brk, 5¾-6 Pal
										Masked by microseisms, l.p. wandering
233	30	eLR	Z'	18 56.5	24					USCGS: 24.2S, 176.4W, H 18 42 03.4
		M	N'E'Z'	58	19	1½	3	4		h 33 km ca, Mag. 4.6
										Masked by microseisms and long period
234	31	e(P)	Z'	00 26.7	?					wandering.
		e	N'E'Z'	36 10	14					USCGS: 45.3N, 151.0E, H 00 14 11.7,
		eLQ	E'	47.3	40		4			h 60 km, 5.3, 5½-5¾ Pal.
		LR	N'Z'	53	25	3		5		
										Quarry blast Masked by microseisms
	31	i	Z	02 01 35.5				+		
		iSg	N	01 36.8	0.5	-0.07				
		m	E	01 37½	0.3		0.24			
		m	NZ	01 38	0.5	0.40		0.10		
										Masked by microseisms
235	31	e	E'	09 28.4						USCGS: 50.8N, 130.2W, H 09 01 30.2
		e(SS)	E'	35 51	30					h 15 km, Mag. 5.6, 6 Pas, 6-6¼ Brk,
		e	N'	36.0	20					6½-6¾ Pal
		eLQ	N'	46.3	40					
		(G)	NE	47	48	5	4			
		eLR	N'E'Z'	51.5	30					
		M	E'	55.4	21		3			
		M	N'Z'	57.0	21	1		5		
										2nd shock ?
		e(W2)	Z'	11 03	27					
		M	Z'	21	17			2		
										(USCGS: 60.1N, 146.4W, H 11 52 13.9
236	31	eL	Z'	12 41	25					h 15 km, Mag. 4.4)
		M	Z'	48	20			1		
								+		Microseisms present USCGS: 17.7S, 178.
237	31	iP	Z	17 10 19	0.5					H 17 04 39.0, h 540 km ca, Mag. 4.4
		m	Z	10 20	0.5			0.06		

No	Date	Phase & Component		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
238	Apr 1	eL	Z'	04 10.4	30					USCGS: 57.2N, 151.3E, H 03 23 17.2
		M	Z'	20	20			1		h 25 km, Mag. 5¼ Pal, 5.1
	1	(Pg)	Z	07 09 21½						Quarry blast
		iSg	NE	09 24.9	0.4	-0.02	+0.03			
		i	Z	09 25.1	0.5			+0.05		
		m	N	09 27½	0.7	0.17				
		m	EZ	09 29½	0.7		0.07	0.08		
	2	(Sg)	E	07 59 14½	0.3					Quarry blast
		i	Z	59 14.7	0.4			+0.03		
		m	N	59 17	0.7	0.09				
		m	EZ	59 19	0.75		0.09	0.11		
	2	i(Pg)	Z	07 59 22	0.4					Quarry blast
		i Sg	EZ	59 26.1	0.4		-0.08	+0.10		
		m	N	59 27½	0.6	0.04				
		m	EZ	59 31	0.7		0.17	0.22		
	2	e	Z	01 15 05						Local Seismic ?
		m	Z	15 06½	0.6			0.04		
239	2	iP	Z'	01 22 30½	3			-6	7290	Dilatation
		iP	Z	22 30.8	1.3			+0.38	65°.6	Compression
		i	Z'	22 35	3			+13		Microseisms present
		m	Z	22 36	2.5			3		USCGS: 6.1N, 95.4E, H 01 11 55.7
		e	Z'	22 47	10					h 129 km, Mag. 5.1, 7 Pas
		iPcP	Z'	23 04	5			-7		
		e	E'Z'	24 18	18		1	4		
		PP	Z	24 57	2.5			1.66		
		(S)	E'	31 08	8		4			
		iS	N'	31 12	15	+23				
		i	E'	31 21			+			
		ePS	N'	31 39	(22)					
		iScS	N'E'	32 19	10	+7	+13			
		i	Z'	32 42	13			+11		
		e	Z'	35 48	30					
		m	Z'	37.1	27			18		
		(SSS)	N'E'	38 40	30	21				
		LQ	N'	39.6	70					
		iL	N'E'	40.6	52	+	+45			
		L	N'E'	41.6	52	125 ca	50ca			
		eLR	Z'	42.7	42			41		
		M	N'E'	44.6	33	150ca	87ca			
		M	Z'	45.4	33			70ca		
		M	Z'	48.4	28			85ca		
		M	N'	48.9	19					
		M	N'E'Z'	52	19	155ca	150ca	200ca		
		e	N'E'	03 15	70					F 05h 50m
	2	i	N	01 57 28.3		+				Blasting
		m	NE	57 29	0.5	0.12	0.05			
240	2	iP	Z	06 59 51½	0.9			+0.05		Compression USCGS: 6.9S, 125.5E
										H 06 53 31.5, h 485 km ca Mag. 4.8
	2	e	EZ	08 03 32						Quarry blast ?
		m	NE	03 36	0.7	0.03	0.07			
		i	Z	39.6	0.5			-0.04		
241	2	eP	Z	16 05 02	1				5150	Microseisms present
		i	Z	05 11	1.0			+0.09	46°.3	h 0.01 ca
		i	Z	05 17	1.2			+0.18		USCGS: 5.8N, 125.8E, H 15 56 52.6
		e	Z'	05 55	?					h 179 km ca, Mag. 5.7
		PPP	Z	07 36	1.3			0.16		
		eiS	N'	11 41	18	-4				
		esS	E'	12 21	15		2			
		e	N'	12 33	16	2				
		iSS	E'	15 05	16		-6			
		iSS	N'	15 14	13	+5				
		eSS	Z'	15 15	18					
		m	N'E'Z'	16.0	22	3	6	4		
		eL	E'	16.8	52					

No	Date	Phase & Component		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
241	Apr 2	eLR	Z'	16 18.8	50			5		
cont.		L	E'	19.0	44		5			
		M	E'	22.9	17		2			
		M	Z'	23.7	20			3		
		M	N'Z'	26.0	17,21	3		4		
242	2	e(P)	Z	20 00 17						Masked by microseisms
		e	E'	03 39	(14)					
		eT	Z	16 49	0.5					
		T max	N	17 18	0.6	0.03				
			E	17 23	0.6		0.03			
			Z	17 37	0.6			0.04		
243	2	i(P)	Z	23 40 23.4	0.6			+		Masked by microseisms
		i	Z	40 57.4	0.6			+		(USCGS: 56.4S, 25.1W, H 23 27 52.4,
		e	N'	24 19.2	17					h 33 km ca, Mag. 6.0)
		e	Z'	19.4	17					
244	3	iP	Z	04 23 08.2	1.1			+0.16		Compression Microseisms present
		isP	Z	23 32	0.8			+0.05		N' E' confused by long period
		(e)	N'	31.6	?					wanderings
		e	N'	32.1	?					USCGS: 4.0N, 96.6E, H 04 12 41.9
		e	Z'	37.6	24					h 70 km ca, Mag. 5.8
		eL	Z'	42.9	44					
		M	Z'	47	31			4		
		M	N'E'	48	27	3	3			
	3	i(Sg)	N	05 42 10.9	0.5	+0.03				Quarry blast
		i	EZ	42 11.2	0.5		-0.02	+0.03		
		m	N	42 13½	0.6	0.16				
		m	EZ	42 16	0.7		0.04	0.05		
	3	m	N	05 56 42½	0.7	0.07				Quarry blast
		m	EZ	56 44½	0.7		0.04	0.04		
	3	m	E	06 41 39½	0.7		0.04			Quarry blast
245	3		Z'	09 37	Feeble waves masked by microseisms					USCGS: 59.6N, 144.7W, H 08 38 42.8,
										h 10 km, Mag. 5.4
246	3	(ePP)	Z'	22 52.5						Masked by microseisms
		e	Z'	23 02.1						N' E' confused by long period wanderin
		e(SS)	E'	07.7	18					USCGS: 61.6N, 147.6W, H 22 33 42.2,
		e(SS)	Z'	08.0						h 40 km, Mag. 5.7, 6¼-6½ Pal,
		eLR	Z'	22.6	37					5¼-6 Pas, Brk
		M	Z'	31.1	27			1		
247	4	M	Z'	00 19	22			1		
	4	i(Sg)	N	00 55 06	0.3	-0.08				Quarry blast ?
		m	N	55 07	0.5	0.08				
	4	i(Sg)	N	00 55 27	0.3	-0.12				Quarry blast ?
		m	N	55 28	0.5	0.13				
	4	i(Sg)	N	01 10 44½	0.3	-0.14				Quarry blast ?
		m	N	10 45½	0.5	0.16				
248	4	(SKS)	N'	05 18 59						Masked by microseisms
		e(PS)	Z'	22.1						N' E' confused by long period
		eSS	Z'	28.1	25			1		wanderings
		eSS	N'	28.2						USCGS: 60.1N, 146.7W, H 04 54 01.7
		e(SSS)	N'	31.6						h 40 km, Mag. 5.6, (5.5 Pas,
		e(SSS)	Z'	31.7						5¼-5¾ Brk)
		eLR	Z'	43.1	36					
		LR	N'E'Z'	43.7	30	2	2	3		
		M	E'Z'	47.8	22		1½	3		
		M	N'	48.3	22	2				
	4	i	E	06 38 03.5	0.4		-0.03			Quarry blast ?
		m	N	38 08½	0.7	0.09				
		m	E	38 11	0.7		0.04			
248	4	M	Z'	07 04	23			1		W2 of 248 ?

RIVERVIEW COLLEGE OBSERVATORY
SEISMOLOGICAL BULLETIN, APRIL, 1964

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
249	Apr 4	e(S)	E'	09 06 13	18		2			Masked by microseisms 08 40 29.8
		eL	Z'	28.2	28					USCGS: 56.5N, 152.6W, H 08 43 29.3,
		M	Z'	34.3	20			5		h 15 km, Mag. 5.3, 6.0 Pal,
		M	N'E'	34.6	20	2	1½			
250	4	eL	Z'	09 57.8	30					Confused by coda of 249
		M	N'E'Z'	10 05.5	20	1½	2	4		USCGS: 56.9N, 152.7W, H 09 10 55.1,
										h 15 km, Mag. 5.9, (5.5 Pas,
										5¼-5¾ Brk), 5¾-6 Pal
251	4	(PP)	Z'	18 04 18	?					Masked by microseisms
		iSKS	N'	10 36	7	+3				USCGS: 56.3N, 154.4W, H 17 46 08.6
		iS	N'E'	11 43	12	+3	-9			h 25 km, Mag. 5.7, 5¾-6 Brk, 6½ Pas,
		i	E'	11 55	12		+8			6½-6¾ Pal
		ePS	Z'	13 07	24			3		
		e	N'	18 16	27					
		eSS	E'	18 38	30		9			
		m	N'E'	19.4	23	5	8			
		m	Z'	19.6	24			4		
		e(SSS)	N'E'	22.4	30	3	4			
		e	E'	23.9	34		4			
		LQ	N'E'	27.9	50-60					
		M	N'	38.8	20	6				
		M	Z'	39.1	20			12		
		M	E'	40.1	20		7			
		M	Z'	44.4	19			19		
		W2M	N'E'Z'	19 58	20	3	3	7		
252	4	e	N'	21 55.5						Masked by microseisms
		e	N'	58.7						USCGS: 10.5N, 122.1E, H 21 38 14.0,
		eL	Z'	22 03.8	(36)					h 33 km ca, Mag. 5.3
253	5	eS	N'	01 47 45	18					Masked by microseisms
		eS	E'	47 48	18					USCGS: 56.1N, 153.7W, H 01 22 12.2,
		m	N'E'	48.1	18	2	4			h 20 km, Mag. 5.2
		eSS	E'	54 46	22		2			
		eSS	N'	54.9	22	2				
		eSSS	N'	58.5	24	2				
		eLQ	E'	02 04.1	30		3			
		eLR	E'	08.7	30					
		eLR	Z'	09.3	27			3		
		M	N'E'Z'	16	20	5	5	12		
		W2M	Z'	03 39	20			2½		
254	5	M	N'E'Z'	02 36	19	2	3	7		USCGS: 56.2N, 153.5 W, H 01 41 42.5,
										h 20 km ca, Mag. 5.2, 5.7 Pas,
										5-5½ Brk
255	5		N'E'Z'	12.0	Feeble surface waves					(USCGS: 41.9S, 83.7W, H 11 18 38.9,
										h 33 km ca, Mag. 5.3)
256	5		Z'	20 27	Feeble surface waves					USCGS: 60.2N, 146.7W, H 19 28 18.1,
										h 15 km ca, Mag. 5.8, 5.1 Pas,
										5-5½ Brk, 5½ Pal
	6	e(Pg)	N	04 43 18	0.5					Quarry blast ?
		i(Sg)	NEZ	43 21.5	0.3	+0.05	+0.03	+0.07		
		m	NEZ	43 25	0.6	0.03	0.03	0.05		
	6	iSg	N	06 56 48	0.7	+0.04				Quarry blast ?
		m	N	56 52	0.7	0.23				
		m	EZ	56 55	0.8		0.12	0.12		
257	6		Z'	07 47	Feeble long waves masked by microseisms					
258	6	eL	N'	22 49.6	18					Masked by microseisms
		M	N'Z'	53.5	13	2		1		
259	6	iP	Z	23 48 50.2	0.8			+0.13		Compression
		m	NZ	48 51	0.8	0.04		0.18		L.P. records masked by microseisms
		i	Z	49 04.2	1.5			+0.26		USCGS: 5.1S, 154.0E, H 23 43 01.7
		eL	Z'	56.8	28					h 116 km ca, Mag. 4.8
	7	i	N	01 59 04.5	0.3	+0.05				Quarry blast ?

No	Date	Phase & Component		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Apr 7	iP	Z	04 29 19	0.4			+0.02		Local
		i(S)	NE	29 40	0.5	+0.03	+0.04			
		m	N	29 42½	0.5	0.05				
260	7	i	Z'	13 26 45	5			+2		P obscured by microseisms
		i	Z	27 03	1.0			-0.12		USCGS: 0.1N, 123.2E, H 13 18 18.9,
		iS	E'	32 19	9		+4			h 150 km ca, Mag. 5.9
		i(SS)	N'	35 31	12	+3				
		e	E'Z'	35 33	23					
		eL	Z'	38.6	45					
	8	m	NE	02 02 33	0.4	0.19	0.07			Blasting ?
	8	(iP)	Z	05 05 35	0.8			-0.07		Large microseisms present
										USCGS: 9.7N, 125.6E, H 04 56 53.2,
										h 126 km ca, Mag. 5.0
	8	i(Sg)	N	05 19 24½	0.5	-0.03				Quarry blast
		m	N	1927	0.7	0.16				Large microseisms present
		m	EZ	19 29	0.7		0.08	0.09		
	8	(Sg)	N	07 15 35½						Quarry blast
		m	N	15 39½	0.75	0.25				Microseisms present
261	8	(iP)	Z'	08 20 21				-		Masked by large microseisms and
		(e)	E'	31.5						long period wanderings
		eL	E'Z'	45.9	38		1½	3		USCGS: 6.8S, 68.9E, H 08 08 11.8,
		M	N'E'	51	18	1½	1½			h 33 km ca, Mag. 5.7
262	8	e(P)	Z'	11 10.2	16				8890	All records masked by large
		iS	E'	20 13	13		-5		ca	microseisms
		iS	N'	20 14	13	-4			80°	USCGS: 45.8N, 150.8E, H 10 58 09.1,
		e	Z'	20.3	13			4	ca	h 40 km ca, 5.5 Mag., 5½-5¾ Brk,
		i	E'	20 38	13		5			6¼-6½ Pal
		ePS	N'Z'	21.0	21	2		3		
		eSS	E'	25 14	26		1½			
		eSS	N'	25 20	26	3				
		eSSS	N'	28.9	24	2				
		eLQ	E'	31.4	40		9			
		eLR	Z'	35.4	35					
		M	N'Z'	38.0	25	5		8		
		M	E'	38.7	22		3			
	9	i	EZ	01 43 45.6	0.4		+0.04	+0.05		Quarry blast ?
		m	N	43 48	0.6	0.07				Masked by microseisms
		m	EZ	43 50	0.6		0.09	0.06		
	9	(Sg)	NE	07 27 14						Masked by microseisms
		m	N	27 19	0.7	0.26				Quarry blast
	10	iSg	N	06 03 34.5	0.5	+ 0.05				Large microseisms throughout Apr 10
		i	Z	03 35	0.5			+0.05		Quarry blast
		m	N	03 37	0.7	0.30				
		m	EZ	03 39	0.8		0.06	0.10		
263	11	(iP)	Z	01 09 46.5				+		Masked by large microseisms
		e	N'	15 43	14	3				USCGS: 29.0S, 178.9W, H 01 04 30.2,
		e	Z'	15 48	16			2		h 302 km ca, Mag. 5.3
		e	N'	16.1	20	3				
264	11	e	Z'	17 17.9	Feeble waves masked by microseisms					(USCGS: 40.5N, 25.0E, H 1600 42.8,
										h 33 km ca, Mag 5.1)
265	12	eSKS	N'	01 49 07						Alaskan aftershock
		iS	E'	50 15	17		-3			Early phases obscured by microseisms
		eSS	E'	57 13	20		2			USCGS: 56.6N, 152.2W, H 01 24 31.2,
		eSSS	E'	02 00.7	27		1			h 22 km ca, Mag. 5.6
		eLQ	E'	06.5	50		3			
		eLR	Z'	11.7	30			3		
		M	N'E'Z'	19	20	4½	4	10		
		MW2	N'E'Z'	03 39	21	1	1	2½		
		M	N'Z'	48	18	2		4		
266	12	(e)	Z	05 36 43						Masked by microseisms
		(eL)	N'	46.3	32					
		eL	E'	47.5	28					

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No	Date	Phase & Component		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
266	Apr 12	M	N'E'	05 49.3	17	2½	1½			
cont.		M	Z'	52.0	14	.	.	3½		
267	12	iP	Z	06 06 02.3	0.7			+		Compression
		iP	NE	06 02.6	0.7	+	+			L.P. records confused by coda
		m	NEZ	06 03½	0.8	0.04	0.04	0.19		of 266
		ipP	Z	06 11	1.0			+0.12		USCGS: 13.6S, 166.0E, H 06 00 46.4,
		iPP	Z	06 35½	1.0			-0.11		h 33 km ca, Mag. 5.0
		e	E'Z'	10 36	12		1½	2		
		e	N'	10 47	12	1				
		e	E'	11.2	7					
		e	N'	11.3	20					
		eL	Z'	12.9	18					
		M	N'	14.5	15	1½				
		M	E'Z'	15.7	15		1	3		
268	12	iP	E'Z'	11 16 05	9		-5	+10	2670	Compression
		iP	N'	16 06	7	+2			24°	h 0.01 ca
		ipP	Z'	16 28	6			+6	ca	USCGS: 33.9S, 179.8W, H 11 10 54.8,
		i	N'	16 29	6	+2				h 89 km ca, Mag. 5.4
		i	E'	16 35	6		+4			
		isP	E'Z'	16 40	8		+7	-12		
		ePP	N'	16 43	7	2				
		e	Z'	20 07	30					
		i	E'	20 16	11		+12			
		i	N'	20 28	10	+4				
		i(SS)	E'	21 06	11		+5			
		i(SS)	N'	21 10	15	-8				
		e	Z'	21 18	20			5		
		eLR	Z'	22 14	32					
		eL	N'	22.4	28	4				
		LRMax	Z'	22.7	32			20		
		LRMax	E'	22.8	32		13			
		M	N'Z'	24.7	15 (17	3		3		
269	12	(e)	Z'	13 15 35						Feeble, masked by microseisms
		e	E'	27.6	13					USCGS: 56.6N, 151.3W, H 12 48 02.2,
		e(L)	Z'	38.6						h 33 km, Mag. 5.1
270	12	e(L)	E'	22 24.6	20					
		eL	N'	25.6	25					
		eL	Z'	25.7	25					
271	13	(P)	Z	06 29 27						Masked by microseisms
		e	Z'	36.8	16					USCGS: 19.5S, 177.7W, H 06 23 34.1,
										h 574 km ca, Mag. 4.4
272	13	iP	Z	08 54 37	0.9			-0.08		Dilatation
		e(PcP)	Z	55 17	1.3					USCGS: 22.3N, 142.1E, H 08 45 24.6,
										h 309 km ca, Mag. 5.1
273	13	e	E'	09 34.3						(USCGS: 58.4N, 151.2W, H 08 41 53.9,
		eL	N'	40.5						h 33 km ca)
		eL	Z'	42.5						
		M	N'E'Z'	54	22	½	½	1		
274	13		N'E'Z'	11 54	Feeble surface waves					USCGS: 6.9N,126.6E, H 11 26 52.1,
										h 110 km ca
275	13	e(SKS)	N'E'	12 51 05	10					USCGS: 59.4N, 143.9W, H 12 25 36,
		e	N'Z'	54 04	11					h 40 km ca, Mag. 4.9
		e	E'	59.6	26					
		e	N'	59.9	26					
		eI	N'E'	13 03.4	32					
		eLQ	N'E'	10.0	40	1½	2			
		eLR	Z'	14.8	35			1		
		M	N'Z'	20.7	22	½		1		
		M	E'	22.5	20		½			
276	13	eL	Z'	17 06	20					(USCGS: 56.6N, 152.1W, H 16 14 06.3,
										h 33 km ca, Mag. 5.1)
	14	i	N	00 30 05.2	0.3	+0.03				Blasting ?
		i	EZ	30 05.5	0.3		-0.05	+0.06		
277	14	eL	Z'	01 47.4	(20)					(USCGS: 49.4N, 155.5E, H 01 04 28.8,
										h 60 km ca, Mag. 5.2)

No	Date	Phase & Component		Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Apr 14	i	N	04 50 03.2	0.5	+0.02				Local Seismic ?
		i	Z	50 03.5	0.5			+0.03		
		m	E	50 05	0.4		0.03			
		m	N	50 06	0.5	0.02				
278	14	P	Z	05 11 28						Microseisms present
		eLR	Z'	27.9	30					USCGS: 41.0S, 80.8E, H 05 01 59.1,
		M	N'	30.2	19	1				h 33 km ca
		M	E'Z'	32.0	18		2	2		
	14	(Sg)	N	05 16 19						Quarry blast
		i	Z	16 19.5	0.5			-0.02		
		m	N	16 21.5	0.7	0.08				
		m	EZ	16 24	0.7		0.06	0.06		
	14	i(Sg)	NE	06 00 10	0.5	-0.03	+0.05			Quarry blast ?
		m	E	00 11	0.7		0.07			
		m	NZ	00 13	0.7	0.09		0.12		
279	14	iP	N'E'Z'	09 03 38	5	+1	+1	-4		Dilatation
		i	EZ	03 45	1.0		-0.09	+0.25		USCGS: 17.5S, 167.9E, H 08 58 41.9,
		i(S)	N'	07 44	12	-5				h 33 km ca, Mag. 4.6
		m	E'Z'	07.9	12		5	6		
		i	N'	08 07	10	+				
		eSS	E'	08 16	12		3			
		e	E'	08 37	12		2			
		e(SSS)	N'Z'	08 45	16	3		3		
		eLR	Z'	09.1	26					
		eLR	E'	09.2	25					
		M	E'	10.6	19		9			
		M	Z'	10.9	19		14			
		M	N'	11.7	17	5				
280	14	iP	Z	16 26 26.2	0.8			+0.03		Compression
		eL	E'	45.7	31					USCGS: 8.6S, 117.3E, H 16 18 54,
		eL	Z'	47.2	27					h 58 km ca, Mag. 5.3
281	14	e	Z'	23 19.2						Masked by microseisms
		e	N'	28.2						(USCGS: 58.0N, 152.6W, H 22 55 31.3,
		eL	E'	38.2	25					h 30 km, Mag. 5.4)
		M	Z'	49.0	22			f		
282	15	eL	Z'	01 11.2	20	Feeble				USCGS: 17.8S, 178.3W, H 00 58 15,
										h 450 km ca, Mag. 4.0
	15	i(Sg)	NZ	04 44 57	0.5	-0.03		+0.03		Quarry blast ?
		m	NEZ	45 00½	0.5	0.21	0.07	0.26		
	15	Pg	EZ	05 25 29	0.4					Quarry blast
		iSg	EZ	25 32.7	0.4		+0.07	-0.08		
		m	N	25 35	0.7	0.11				
		m	EZ	25 37	0.7		0.14	0.19		
	15	m	N	05 50 42	0.6	0.03				Quarry blast ?
	15	i	E	11 30 03.6	0.4		-0.02			Local
		i	NZ	30 04.4	0.5	-0.03		+0.05		
283	15	(i)	NZ	15 06 22½						Masked by microseisms
		e	N'	06 27						USCGS: 45.2S, 167.0E, H 15 02 28,
		e(L)	N'	09.8	(27)					h 33 km ca, Mag. 5.3
		eLR	Z'	10.0	24					
		eLR	E'	10.2	24					
		M	N'E'Z'	11.7	16	½	½	1		
		eT	N	22 27						
		T max	EZ	23 05	0.6		0.18	0.16		
		T max	N	23 08	0.6	0.19				
284	15	eSKS	N'E'	15 55.3						Masked by microseisms
		iS	N'E'	56 22	8	+1	-2			Alaskan aftershock
		e	N'E'	56.5	13		2			USCGS: 56.5N, 154.4W, H 15 30 47.1
		ePS	Z'	57 46						h 35 km, Mag. 5.5
		eSS	E'	16 03 16	27		1			
		eSS	N'	03 27	26	1				
		eSS	Z'	03.8	23			1		

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No	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km	
284 cont.	Apr 15	eSSS N'E'	16 06.8	22	½	1			
		eLQ E'	12.6						
		M N'Z'	24	20	1		4		
		M E'	25	20		2			
		W2M Z'	17 51	20			1		
285	16	eS N'E'	01 25 06	11					Masked by microseisms and l.p. wanderings
		e(L) N'Z'	41.1	(26)					
		M Z'	50	17			1		USCGS: 37.0N, 142.7E, H 01 04 34.5 h 38 km ca, Mag. 5.1
286	16	(P) Z	02 40 28						Masked by microseisms
		e Z'	40 45	8			1		USCGS: 21.5S, 170.5E, H 02 35 48.9, h 110 km ca, Mag. 4.6
		i Z	40 50				-		
		i(S) N'	44 17	7	+3				
		i E'	44 19	7		-6			
		i Z'	44 21	7			-4		
		M N'	48.6	12	1½				
		M E'Z'	49.3	14		½	1		
	16	iP Z	04 23 29.5	0.2			+0.16		Local tremor?
		i(S) E	23 45.7	0.3		+0.06			P superposed on microseisms
		i N	23 46.1	0.3	+0.08				
		m N	23 48	0.3	0.12				
		m E	23 49	0.3		0.14			
	16	(P) Z	04 32 10						Local tremor?
		(S) N	32 25	0.5					Superposed on microseisms
		m N	32 27½	0.5	0.04				
		m E	32 28	0.5		0.05			
	16	(Pg) E	05 23 22						Quarry blast
		iSg N	23 25.3	0.5	+0.02				
		i Z	23 25.8	0.5			+0.03		
		m N	23 28	0.6	0.04				
		m EZ	23 30	0.7		0.16	0.18		
	16	Pg EZ	07 28 37.5	0.3					Quarry blast
		iSg N	28 40.7	0.5	+0.03				
		m N	28 42	0.7	0.11				
		m E	28 45	0.7		0.03			
		m Z	28 46	0.7			0.06		
287	16	e N'E'	14 07.1	Feeble local waves					
288	16	iP Z	14 10 52½	1			-0.08		Microseisms present
		i Z	11 07½	0.7			-0.04		USCGS: 7.0S, 155.7E, H 14 05 14.9, h 78 km ca, Mag. 5.4
		i N	11 10	0.8	+0.03				
		i(S) N'	15 31	22	1				
		e Z'	15.7	22			1½		
		e N'	16 05	15	1				
		eL E'	17.1	31		2			
		eLR Z'	18.2	28					
		LR N'Z'	19	28	1½		3½		
		M N'Z'	21.1	18	2		3		
		M E'	22.2	14		1			
	16	i Z	19 14 33.4	0.6			+0.02		Local
		i NZ	14 38.2	0.7	-0.03		+0.04		
289	16	e Z'	19 46 05						Masked by microseisms
		iSKS N'N"	51 30	9	+2				Alaskan aftershock:
		iS N'E'N"E"	52 37	13	+2	-4			USCGS: 56.4N, 152.9W, H 19 26 57.4, h 30 km ca, Mag. 5.4
		i E'	52 49	13		+6			
		ePS Z'	54 02	16			2		
		ePS N'E'	54 03	16	1	1			
		iSS E'	59 29	18		-3			
		eSS N'	59 36	21	2				
		e Z'	20 00.2	26			1½		
		eSSS E'	03.1	28		1½			
		eLQ E'	08.8	32					
		eLR E'Z'	14.0	30		2	5		
		M N'E'Z'	21.0	20	7	6	14		
		W2M N'Z'	21 45.6	20	2½		5		

No	Date	Phase & Component		Time (G.M.T.)	Por.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
290	Apr 17	eSKS	N'	05 14 03	8	2				Masked by microseisms
		eS	N'E'	15 11	18	½	1			Alaskan aftershock ?
		ePS	Z'	16.6						USCGS: 56.4N, 152.9W, H 04 49 30.5,
		eSS	E'	22 07	16		1			h 25 km ca, Mag. 5.3
		eL	N'E'	36.7	27					
		eLR	Z'	37.1	26					
		M	N'E'Z'	43.7	20	1½	1½	4		
	17	ePg	Z	06 02 12	0.3					Quarry blast
		iSg	N	02 15.4	0.4	+0.04				
		i	EZ	02 15.7	0.4		+0.05	+0.07		
		m	N	02 18	0.7	0.26				
		m	EZ	02 20½	0.7		0.10	0.11		
291	17	iP	Z	06 05 38.7	1.0			+0.11		Compression
		ipP	Z	05 49.4	1.0			-0.12		USCGS: 6.6S, 154.9E, H 06 00 00.2,
		e(S)	N'	10 08	13	2				h 85 km ca, Mag. 5.4
		e	N'E'Z'	10.4	24	8	3	9		
		eL	N'E'	12.0	31	6	8			
		eLR	Z'	13.0	30					
		M	N'Z'	14.5	23	10		17		
		M	E'	14.7	18		7			
	17	i	EZ	07 20 26	0.3		(-)	(-)		Local Seismic ?
		m	Z	20 31½	0.7			0.04		
292	17	e	N'	14 53.6						Masked by microseisms
		eLR	Z'	55.3	27			1		USCGS: 16.2S, 167.7E, H 14 44 20.8,
		eL	E'	55.3	25		1			h 65 km ca, Mag. 4.2
	18	(i)	Z	00 46 22½						Local
		i	NZ	46 46.9	0.5	+0.06		+0.06		
		m	N	46 48	0.5	0.11				
		m	E	46 49	0.5		0.07			
		m	Z	46 50	0.5			0.06		
	18	(Pg)	E	05 52 24½						Quarry blast
		i(Sg)	N	52 29.5	0.5	+0.02				
		i	Z	52 30	0.5			+0.03		
		i	N	52 32.7	0.7	+0.10				
		m	N	52 34½	0.7	0.29				
		m	EZ	52 37	0.7		0.11	0.16		
293	18	eL	Z'	06 06.9	22					Masked by microseisms
		eL	N'	07.0	23					(USCGS: 45.5N, 151.1E, H 05 27 44.6
		M	Z'	09.1	22			1		h 33 km ca, Mag. 5.3)
294	18	eL	Z'	08 31.5	30					Masked by microseisms
		M	Z'	35.1	22			1		(USCGS: 57.4N, 149.8W, H 07 47 03.3,
										h 30 km ca, Mag. 5.1, or 29.0N, 129.(
										H 07 58 26.9, h 33 km ca, Mag. 4.9)
295	18	e	E'	20 41.9	18					Masked by microseisms
		e	E'	59.1						(USCGS:56.1N, 153.7W, H 20 08 19.7,
		eL	Z'	21 02.0	(24)					h 15 km ca, Mag. 4.9)
		M	N'E'Z'	10	20	1	1	3		
		M(W2)	Z'	22 31	18			1		
	19	i(Sg)	NE	00 33 44.3	0.3	(-)	-0.04			Quarry blast
		m	N	33 49	0.7	0.14				
		m	EZ	33 52	0.7		0.04	0.07		
296	19	e(P)	Z'	04 02 55	26					Confused by microseisms and l.p.
		eLR	N'Z'	11.3	31					wanderings
		eLR	E'	11.4	31					USCGS: 15.4S, 173.7W, H 03 56 13.7,
		LR	N'E'Z'	12	30	3	2	5		h 51 km ca, Mag. 4.2
297	19	e(S)	E'	05 36 49	11		1			USCGS: 41.7S, 83.9W, H 05 13 01.6,
		e	N'	37 56	16	1				h 33 km ca, Mag. 5.5
		e	N'	38.6	(24)					
		e	E'	51.1						
		eLR	N'Z'	53.9	30					
		M	N'E'Z'	59	19	1½	2	5		
298	19		E'Z'	08 46	Feeble surface waves					USCGS: 17.7S, 167.8E, H 08 35 31.6,
										h 15 km ca, Mag. 4.6

No	Date	Phase & Component		Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
299	Apr 19	(iP)	Z	14 24 49½						Masked by microseisms
		(ePP)	Z'	28 02	(10)					USCGS: 60.5S, 58.3W, H 14 12 21.9
		e(S)	E'	35 10	(14)					h 33 km ca, Mag. 5.4
		e	N'	35 14	(12)					
		e(PS)	N'	36.0	(22)					
		e	N'	39.4	55					
		e(SS)	E'	40.6						
		e(SS)	Z'	40.8	(34)					
		eG	E'	47.5	54					
		e	N'	47.8	44					
		e	Z'	47.9	41			3		
		max	N'E'	48.2	40, 54	7	21			
		eLR	E'	49.3	30					
		LR	E'	50.3	29		12			
		M	N'Z'	53.7	22	4		8		
		M	N'E'Z'	15 01	17	5	5	9		
		(W2)	N'Z'	16 28	26					
	20	(i)	N	01 58 50.3						Blasting
		m	N	58 51½	0.4	0.15				
		m	EZ	58 52	0.4		0.08	0.09		
300	20	e	E'	12 23 32	?					Masked by microseisms and l.p.
		ePS	Z'	24 43	17					wanderings
		eSS	N'E'	30.9	26					USCGS: 61.4 N, 147.3W, H 11 56 41.6,
		eLR	Z'	46.4	35					30 km ca, Mag. 5.7, 6-6¼ Pal, 6½ Pas,
		M	N'	50.3	25	1				6¾ Brk
		M	Z'	51.0	25			2		
		M	E'	52.9	25		1			
		(W2)	Z'	14 08	21					
301	21	eL	Z'	05 52.7	28					Masked by microseisms and l.p. wanderings USCGS: 61.5N, 147.4W, H 05 01 35.7, h 40 km ca, Mag. 5.4 6 Pas, 4¾-5 Bks
302	22	eL	Z'	19 55.6	21					Masked by microseisms USCGS: 16.1S, 173.4W, H 19 37 53.2 h 33 km ca, Mag. 5.0
303	22	iP	Z	20 05 26.2	0.7			+0.06	2590	Compression
		isP	Z'	05 59	6			+3	23°.3	Microseisms present
		iS	N'	09 29	8	-3				h 0.01, H 20 00 26½
		e	E'	09 36						USCGS: 15.5S, 167.5E, H 20 00 22.8,
		i	Z'	09 37	7			-3		h 123 km ca, Mag. 5.0
		i	N'	09 39	9	+6				
		i	Z'	09 44	7			+4		
		isS	N'	10 05	9	-4				
		iSS	N'E'Z'	10 23	10	-3	-4	-7		
		i	N'	10 38	10	-5				
		eL	Z'	11.3	40			5		
		M	E'Z'	13.3	17		3	3		
		M	N'	13.6	14	4				
304	22	iP	NEZ	23 09 20.9	1.0	+	+	-0.16		Dilatation
										USCGS: 13.2S, 167.1E, H 23 04 13.8,
										h 218 km ca, Mag. 4.0
305	23	iP	NZ	01 37 29.7	0.8	+0.03		-0.05		Dilatation Microseisms present
		e	N'Z'	42.1	(22)					USCGS: 6.7S, 155.0E, H 01 31 40.3,
		eL	Z'	45.1	27					h 72 km ca, Mag. 5.0
	23	(P)	Z	02 35 32						Local
		i(S)	E	35 37	0.4		+0.05			
		i	Z	35 37.3	0.5			+0.03		
		m	EZ	35 45	0.7		0.05	0.05		
306	23	iP	NZ	03 39 21½	.	+		-	3660	Dilatation
		iP	N'E'Z'N"E"	39 22	9	+7	-4	-20	32°.9	Microseisms present
		m	NZ	39 23½	2.6	1.0		3.5		USCGS: 5.3S, 134.0E, H 03 32 50.3,
		i	N"	39 30	7	+7*				h 33 km ca, Mag. 6.4
		i	N'Z'	39 40	13	+12		-30		Felt Darwin
		iPP	Z'	40 34	6			+13		
		iS	N'	44 36	10	+26				
		i	E'	44 44	13		+13			

cont. next page

No	Date	Phase	& Component	Time (G.M.T.)	Por.	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
306	Apr 23	i	N'	03 44 55	20	-56				
cont.		i	E'	45 06	21		-39			
		i	Z'	45 08	24			+84		
		eL	N'E'	47.0	50	70	66			Surface waves illegible on L.P. & Galitzin records
		M	Z	50.3	4					
		M	N	50.6	(4)					
		M	E	50.8	(4)					
		eW2	N'Z'	06 25	23					
		M	N'Z'	34	20	1		2		
307	23	P	Z	10 38 28						Microseisms present
		e(S)	N'	43 12	20	1				USCGS: 6.6S, 155.1E, H 10 32 47.9
		e	Z'	43.3	21					h 60 km ca, Mag. 5.3
		eLQ	E'	44.8	30					
		eLR	Z'	45.8	29					
		M	Z'	47.4	22			2		
		M	N'	47.5	21	1				
		M	E'	47.6	15		1			
	23	iP	Z	21 20 21.4	0.4			+		Local
		i	Z	20 24.7	0.4			+0.06		
		i	N	20 24.9	0.4	+0.04				
		iS	N	20 40.9	0.4	-0.05				
		m	N	20 44	0.5	0.06				
		m	E	20 45½	0.4		0.10			
	24	i	Z	01 27 46.6	0.3			-0.03		Local Seismic ?
	24	i	NZ	02 27 55.7	0.4	-0.02		0.04		Local Seismic ?
308	24	eP	Z	06 02 05½	1				3250	Microseisms present
		iP	N'Z'	02 06	8	+6	-?	-12	29°.2	Dilatation
		isP	Z	02 30.6	1.5			+0.68		h 0.005 ca H 05 56 08
		i	Z	02 34.0	1.5			+0.62		USCGS: 5.1S, 144.2E, H 05 56 10.1,
		i	N'	02 37	5	+6				h 106 km ca, Mag. 6.3, 6½-6¾ Bks
		i	N'Z'	02 42	7	+8		-20		
		i	N'	03 41	8	+10				
		i	Z'	03 45	8			+11		
		i	Z	05 02.5	1.7			+1.17		
		iS	E'	06 52	11		-22			
		i	N'	06 55	9	-10				
		i	E'	07 04			+			
		isS	E'	07 22	16		-26			
		i	E"	07 29	10		+31*			
		i	N'	07 53	11	+34				
		i	N'	08 14	11	+29				
		eL	E'	09.3	48					
		X	Z'	09.4	24			53		
		eLR	Z'	10.1	46			145		
		LR	E'	10.5	29		140 ca			
		LR	N'Z'	11.1	43,46	80		88		
		M	Z'	13.1	25			77		
		M	N'	14.0	20	120				
		M	Z'	14.5	19			115		
		M	E'	14.7	18		97			
		M	E'	15.5	15		120			
		M	N'Z'	16.0	13	150 ca		180 ca		
	24	i	Z	06 07 52	0.5			+0.04		Local Superposed on No 308
		i	N	07 52.7	0.5	+0.03				
		m	E	08 15½	0.5		0.05			
	24	i	N	06 17 38.4		+				Local Superposed on No 308
		m	N	17 40½	0.6	0.25				
309	24	e	Z'	15 01.4						Masked by microseisms
		e(SKKS)	E'	07.6						USCGS: 13.3N, 88.8W, H 14 40 28.3
		ePS	E'Z'	10.7	16		1	1		h 158 km ca, Mag. 5.1, 6 Pal
		eL	E'Z'	37	31					
310	25		Z'	04 29	Feeble long waves masked by microseisms					USCGS: 37.3S, 94.5W, H 03 48 36 h 33 km ca, Mag. 4.5

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
311	Apr 25	i(P)	Z	05 42 31.5	0.8			+0.03		Microseisms present
		e(S)	N'	47 03	22					USCGS 6.7S 155.0E H 05 36 42.2
		e	Z'	47.1	25					h 72 km ca Mag 5.1
		eL	E'	48.5	32					
		eL	N'	49.8	26					
		eL	Z'	50.2	27					
		M	N'Z'	53.0	16	1		1		
312	25	eL	N'	06 43.8	22					Masked by microseisms
		eL	Z'	45.2	25					(USCGS 45.6N 149.1E H 05 56 40.8
										h 33 km ca Mag 4.1)
313	25	i(P)	Z	18 48 23.4				+		Masked by microseisms and l.p.
		(e)	N'	56 51	30					wanderings on l.p. records
		M	Z'	19 11.4	27			1		USCGS 24.4 N 125.3 E H 18 37 58.1
										h 33 km ca Mag 5.3
	26	e	NZ	01 48 49½						Local or regional
314	26	iP	Z	14 08 22.6	0.7			+0.04		Compression
		i(S)	E'	15 33	?					Microseisms present
		eL	N'	21.7	(44)					USCGS 5.8S 105.0E H 13 59 27.7
		M	N'E'Z'	29	24	¼	½	1		h 90 km ca Mag 5.6
315	26	iP	EZ	14 57 39.7	1.1		+0.11	-0.31		Dilatation
		ePg	Z'	57 40	?					L.P. records masked by microseisms
		i	N	57 44.8	0.9	+0.08				USCGS 20.6S 178.0W H 14 52 07.6
		(eS)	E'	15 02.1	?					h 490 km ca Mag 5.1
		e	E'	04 55	10					
		e	N'Z'	05.0	19	1		2		
		i	E	07 55	1		+0.04			
		i	E	08 43	1		+0.04			
316	26	eL	Z'	22 29.8	27					USCGS 28.1S 178.2W H 22 17 02.2
		M	N'Z'	32.6	14	1½		1		h 37 km ca Mag 4.1
	26	i	N	23 00 43		-				Blasting
		i	EZ	00 43½	0.3		+0.08	-0.05		
		m	N	00 44	0.4	0.11				
		m	EZ	00 44½	0.4		0.13	0.12		
317	26	eL	E'Z'	23 46.7	24					
		M	N'	49.4	13	1				
	27	m	E	00 41 16	0.7		0.05			Local or regional
		m	N	41 17	0.5	0.07				Masked by microseisms
		m	Z	41 28½	0.7			0.04		
318	27	eL	N'	02 06.9	30					Masked by microseisms & l.p.
		eL	Z'	08.4	32					wanderings
		M	N'E'Z'	11.5	27	1½	(½)	1½		USCGS 0.3N 98.1E H 01 37 12.1
		M	N'E'Z'	16	20	1	1½	2		h 33 km ca Mag 5.3
	27	e	N	04 04 45						Local Seismic ?
		m	NEZ	04 46½	0.6	0.03	0.04			
319	27	iP	N'Z'	06 50 00	7	+4		+9	3000	Compression
		i	N'Z'	50 07	5	+5		+9	27°	USCGS 60.1S 151.0E H 06 44 25.1
		i	N'Z'	50 35	10	-6		-10		h 33 km ca Mag 5.0
		m	N'Z'	51.0	14	8		7		
		e	E'	53 59	10		4			
		i	N'Z'	54 11	8			+11		
		e	Z'	54.4	(27)					
		iS	E'	54 37	12		+33			
		i	E'	54 49	12		+39			
		i	E'	55 07	11		+			
		i	E'	55 18	15		+			
		m	E'	55.5	20		86			
		eL	Z'	55.9	30					
		iL	Z'	56 14	28			+65		
		LR	Z'	56.3	25			130		
		iL	N'	56 32	25	+110				
		M	E'	57.9	14		93			
		F	Z'	10.3						
320	27	iP	Z	14 40 52½	1.0			-0.09		Dilatation USCGS 19.8S 170.1E
										H 14 36 18 h 274 km ca

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Apr 28	i	N	06 00 22	0.5	+0.02				Quarry blast ?
		m	E	00 23½	0.6		0.10			
		m	NZ	00 25½	0.6	0.05		0.06		
	28	Pg.	Z	06 16 17	0.3					Quarry blast
		iSg	NEZ	16 21.0	0.4	+0.03	-0.08	+0.09		
		m	N	16 23½	0.7	0.06				
		m	EZ	16 25½	0.7		0.16	0.18		
321	28	(e)	Z	15 01 02						Masked by microseisms
		e	E'	05.6	17					USCGS 11.9S 166.2E H 14 55 25.5
		eL	Z'	08.0	22					h 42 km ca Mag 4.2
	29	i	N	01 56 43.3	0.4	-				Local Non-seismic ?
	29	i	N	02 56 40.8	0.7	+0.02				Local
	29	iP	NZ	02 57 18.7	0.3	+0.03		-0.03		Local
		iS	E	57 37.5	0.4		-0.04			
		m	NE	57 38½	0.4	0.06	0.12			
		m	Z	57 40	0.4			0.05		
322	29	e(L)	Z'	05 40	Feeble waves masked by microseisms					(USCGS 39.3N 23.7E H 04 21 06.7
										h 33 km ca Mag 5.1 5¼ Pal)
323	29	eL	Z'	18 24.1	23	Masked by microseisms				(USCGS 58.2S 15.7W H 17 37 43.1
										h 33 km ca Mag 5.6)
324	30	eP	Z	16 09 27	1					Microseisms present
		e	Z	09 43	1.5					USCGS 4.6S 153.2E H 1603 31.4
		i(pP)	Z	09 49½	1.0			-0.12		h 78 km ca Mag 5.2
		e	N'	10 24	14	2				
		e	Z'	10 29	14			3		
		eS	N'	14 10	13	5				
		e	Z'	14 13						
		m	N'E'	14.6	24	21	5			
		m	Z'	14.7	32			19		
		eL	N'	17.3	36					
		M	Z'	18.2	31			34		
		M	N'E'	18.4	31	21	11			
325	30	e	N'	19 13.3		Masked by microseisms				(USCGS 11.8S 166.0E H 19 03 08
										h 40 km ca)
326	30	e	N'Z'	21 47	Feeble waves masked by microseisms					USCGS 12.5S 165.1E H 21 37 04
										h 33 km ca Mag 4.0
	May 1	iP	Z	04 15 14.5	0.5			-0.01		Dilatation
		i	N	15 15	0.5	-0.01				Local
		iS	NE	15 35.7	0.7	+0.05	+0.07			
		m	E	16 09½	1.2		0.07			
	1	iP	NZ	04 16 54.7	0.5			-0.03		Dilatation
		iS	NE	17 15.7	0.7	+0.06	+0.07			Local
		m	N	17 18	0.5	0.09				
	1	e(P)	Z	05 32 56	?					Local
		e	N	33 14	0.4					
		i	EZ	33 14.5	0.4		+0.03	+0.02		
		i	E	33 16.0	0.4		+0.06			
		m	N	33 17½	0.4	0.04				
	1	iSg	N	06 06 30.9	0.4	-0.05				Quarry blast
		m	N	06 33½	0.6	0.22				
		m	EZ	06 35½	0.7		0.06	0.07		
327	1	(e)	Z	06 49 28		Masked by microseisms				(USCGS 60.5N 145.6W H 06 01 55.4
		eL	N'E'	07 00.1	20					h 20 km ca Mag 5.4)
	1	(eP)	Z	16 11 22½	0.6	Microseisms present				USCGS 14.3S 167.1E H 16 06 12
										h 95 km ca
	1	i(Pg)	E	23 17 16.7	0.4		+0.02			Quarry blast
		i	Z	17 17.1	0.5			+0.01		
		m	N	17 21	0.7	0.03				
		m	EZ	17 25	0.7		0.05	0.05		
328	1	(e)	Z'	23 52 31	?	Masked by microseisms				USCGS 32.3S 179.5W H 23 47 35.3
		e	Z'	57 27	18			1		h 33 km ca Mag 4.8
		e	N"	57 29						

RIVERVIEW COLLEGE OBSERVATORY
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No	Date	Phase & Componont		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
328	May 1	[illegible]	E"	24 0[illegible]	16		½*			
cont.		[illegible]	N"	01.7	15	3*				
	2	i	EZ	00 46 34½	0.4		+	+		Local blasting ?
		i	N	46 35½	0.4	-0.06				
		m	N	46 38	0.5	0.11				
		m	EZ	46 39	0.6		0.04	0.04		
	2	i	N	02 48 38.5	0.5	+0.01				Local ?
		i	Z	48 39.5	?			-		
		i	E	48 41	0.5		-			
		i	N	48 46.5	0.5	-0.01				
	2	ePg	Z	04 53 24½	0.4					Quarry blast
		iSg	NE	53 29.5	0.4	+0.02	+0.03			
		i	Z	53 30.0	0.6			+0.04		
		i	N	53 33.0	0.5	0.05				
		m	N	53 34½	0.7	0.17				
		m	EZ	53 37	0.7		0.04	0.06		
329	2	iP	ZZ'Z"	16 23 04.0	(1.5			(+0.22	8870	Compression
					6			+6	79°.8	H 16 10 58
		e	N'Z'	23 12	8			6		USCGS 45.5N 150.3E H 16 11 00.2
		i	N"Z"	23 15	6	-2*		+9*		h 35 km ca Mag 5.7
		i	Z	23 16.5	1.4			+0.21		
		ei	Z'	33 00	16			9		
		iS	E'E"	33 03	13		-13			
		iS	N'N"	33 04	13	-12				
		i	Z"	33 08	8			+7*		
		isS	N'	33 20	13	+9				
		i	E'E"	33 26		-	-			
		i	N'	33 38	22	-9				
		i	Z'	33 41	20			-9		
		iPPS	N'	34 11	46	-10				
		e	E'	37.5	21					
		iSS	N'	38 15	27	+11				
		e	Z'	38 27	18					
		m	N'	38.8	27	12				
		m	Z'	39.0	24			6		
		e	E'	39.5	33		3			
		SSS	N'Z'	41 40	26	6		5		
		G	E'	44.2	44		29			
		M	N'Z'	50.6	26	14		21		
		M	E'	51.4	25		9			
	RIV	W2M	N'Z'	18 47	22	1		2		
330	3	iP	Z	07 49 42.0	08			+0.04		Compression Microseisms present
331	3	eL	Z'	13 59.6	25					Masked by microseisms
	3	i	N	23 00 27	0.4	+0.02				Blasting ? Local
		i	EZ	00 28	0.3		+0.04	+0.05		
	4	i	NEZ	01 58 04.7	0.4	-0.03	-0.03	-0.03		Blasting ? Local
		m	EZ	58 06	0.5		0.04	0.03		
	4	i	E	05 11 46	0.5		-0.02			Quarry blast ?
		i	N	11 48.5	0.5	-0.01				
		m	N	11 50	0.7	0.05				
		m	EZ	11 52½	0.7		0.03	0.03		
	4	iSg	NZ	07 04 15.9	0.5	-0.04		-0.02		Quarry blast
		i	E	04 16	0.5		-0.02			
		m	N	04 18½	0.7	0.37				
		m	EZ	04 20½	0.7		0.07	0.09		
	4	i	Z	10 03 21.5	0.9			-0.05		Microseisms present
	4	e	N	10 14 10½	1					Microseisms present Local
		i	Z	14 14	?			+		
332	4		Z'	16:00	Feeble surface waves masked by microseisms					
333	4	(e)	Z'	17 18 34						Masked by microseisms and confused by 1 p wanderings
		e(PS)	N'	30 03	18					

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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
333	May 4	e(SS)	N'	17 34.9	18					USCGS 55.8S 4.4W H 17 05 20
cont		e	E'	39.7	20					h 33 km ca Mag 5.4
		e	E'	41.3	28					
		m	E'	42.0	28		3			
		(LQ)	E'	43.5	50					
		eLR	Z'	47.6	38					
		M	N'Z'	50.3	28	2		4		
		M	N'E'Z'	52.8	22	1½	1½	3½		
335	4		N'E'Z'	21 01	Feeble surface waves					
336	4		N'E'Z'	21 33	Feeble surface waves					
	5	ePg	Z	06 37 31½						Quarry blast
		iSg	N	37 34.6	0.4	+0.07				
		i	EZ	37 35	0.3		+0.09	+0.16		
		m	N	37 36½	0.5	0.27				
		m	EZ	37 39	0.6		0.11	0.09		
	5	i	E	07 18 40.5	?		+			Quarry blast ?
		i	E	18 45.2	0.5		+0.01			
		m	N	18 49	0.6	0.10				
		m	EZ	18 52½	0.6		0.04	0.07		
337	5	P	Z'	08 50 26						Masked by microseisms
		e(S)	N'	54 49	13	1				USCGS 9.0S 156.6E H 08 44 59.1
		eL	N'	56.5	37					h 33 km ca Mag 5.1
		eLR	Z'	57.1	30			4		
		M	E'	59.4	14		3			
		M	N'Z'	09 00.1	15	2		2		
338	5	(e)	E'	11 36.6						Masked by microseisms
		e	E'	49.2	20					USCGS 55.8 S 4.3 W H 11 12 52
		eL	N'	55.3	(40)					h 33 km ca
		eLR	Z'	57.0	29			1		
		M	E'Z'	12 02.1	19		1	2		
		M	N'Z'	04.0	17	1		2		
	6	e(P)	NEZ	00 54 03	0.3					Local
		i	N	54 13.5	0.5	+0.02				Masked by microseisms
		i	E	54 23.8	0.4		+0.03			
		i	Z	54 27.0	0.8			-0.06		
		i	N	54 30.5	0.4	+0.05				
		m	E	54 32	0.5		0.06			
		m	Z	54 33½	0.8			0.06		
	6	e	NZ	01 58 12						Local
		i	Z	58 18.5	0.5			-0.02		Masked by microseisms
		i	N	58 34.5	0.5	+				
		m	E	58 40½	0.5		0.04			
	6	i	EZ	03 01 52.0	0.5		+0.02	+0.03		Local Seismic ?
		i	N	01 53.8	0.4	+0.08				Masked by microseisms
		i	N	01 54.5	0.5	+0.10				
		i	EZ	01 55.6	0.6		+0.04	+0.06		
339	6	(P)	Z'	04 40 11						Masked by microseisms
		e	E'	05 01.9	30		2			USCGS 60.7 S 25.2 W H 04 27 02.4
		M	N'Z'	17.5	17	1		2		h 33 km ca
	6	(Pg)	E	06 30 46½						Quarry blast
		i	Z	30 47.3	0.5			+		Masked by microseisms
		iSg	EZ	30 50.1	0.4		+0.06	+0.07		
		i	N	30 50.3	0.5	+0.02				
		i	N	30 51.5	0.6	+0.10				
		m	EZ	30 54½	0.7		0.17	0.23		
340	6	iP	N'E'Z'N"E"Z"	08 16 07	9	+4	+2	-9	2860	Dilatation
		e	Z	16 07½	1.8			0.6	25°.7	S P records masked by microseisms
		i	Z	16 20	1.5			+0.4		USCGS 11.1 S 162.2 E H 08 10 47.5
		i	N'E'N"	16 21	5	+4	+2			h 40 km Mag 5.1
		i	Z'Z"	16 22	5			+5		
		iS	N'	20 31	9	-8				
		i	E'	20 37	11		+13			

Cont next page

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
340	May 6	i	Z'	08 20 40	12					
cont		i	N'	20 42	9	+16				
		i	N'E'Z'	20 55	7	+9	+10	-12		
		e	N'	21.2	14	9				
		i	Z'	21 26	12			+10		
		e	E'	21 28	13		8			
		i	Z'	22 16	12			+8		
		L	E'	22 22	25		11			
		eLR	Z'	22.5	26			20		
		i	N'	22 34	26	+11				
		i	Z'	23 49	12					
		M	N'E'	25.3	14	12	14			
		M	E'	26.8	14		18			
		M	Z'	27.9	14			15		
		M	Z'	31.0	13			27		
341	6	(i)	Z	15 38 02	1.5			+		Masked by microseisms
		(eSKS)	N'	51 15	?					USCGS 56.7 N 152.1 W H 15 26 35.5
		e(S)	E'	52 18	15					h 15 km ca Mag 5.4
		e(SS)	E'	59 20	20					
		eL	Z'	16 13.6	30					
		eL	E'	14.1	27					
		M	N'E'Z'	20	20	½	½	1½		
342	6	e(L)	Z'	17 38.1	21	Masked by microseisms				(USCGS 38.0 N 142.4 E H 17 10 53.7
		M	Z'	46.8	20			1		h 33 km ca Mag 4.7)
343	6	eP	Z'	20 37 07	?					Masked by microseisms
		(eS)	N'	41 45	?					
		e	Z'	41 52	20			1		
		e	E'	42 08	13		½			
		e	N'	42 34	18	1				
		eLR	Z'	43.4	28					
		eLR	E'	43.5	27					
		M	N'Z'	45.5	19	2		5		
		M	E'	46.6	19		3			
344	7	i(P)	Z	00 41 08				+		Masked by microseisms
		e(S)	E'	45 56	?					USCGS 18.2 S 176.6 W H 00 34 57.2
		e(L)	Z'	48 45	?					h 300 km ca Mag 5.4
345	7		Z'	04 04	Feeble long waves					USCGS 4.6 S 153.5 E H 03 49 53.8
										h 53 km ca Mag 4.6
	7	i	Z	05 57 59.9	?			+		Quarry blast ?
		m	E	58 03	0.5		0.14			
		m	N	58 04	0.7	0.06				
		m	Z	58 05	0.7			0.12		
346	7	ePP	Z'	06 04 27	13			1		Microseisms present
		eSKS	N'	10 33	(17)					USCGS 4.0 S 34.9 E H 05 45 29.5
		iSKS	E'	10 37	17		+2			h 33 km ca Mag 6.4 6¼-6½ Pal
		e(SKKS)	E'	11 27	10		1			
		e	N'	12.2	(30)					
		ePS	E'	13 43	(23)					
		ePS	Z'	13 52	12			2		
		m	N'E'	14.1	32	1	4			
		e	Z'	14 23	24			2		
		iPPS	Z'	15 09	13			+3		
		e	E'	17.1	36					
		eSS	N'	19 53	25	4				
		m	E'	20.4	36		9			
		eSSS	E'Z'	23.9	35		4	3		
		e	Z'	27.6	30			3		
		eG	N'	30.4	80					
		eLR	E'Z'	37.0	47		8	12		
		M	E'	47.0	19		7			
		M	N'Z'	48.2	19	6		14		Coda merged in no 347
	7	(ePg)	Z	06 18 36½						Quarry blast
		iSg	N	18 39.7	0.5	-0.03				
		i	EZ	18 40.0	0.3		-0.16	+0.16		
		m	N	18 42	0.7	0.16				
		m	EZ	18 44	0.7		0.10	0.10		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	May 7	iSg	N	06 29 12.6	0.5	-0.02				Quarry blast
		i	E	29 12.8	0.5		+0.02			
		i	Z	29 13.2	0.5			+0.04		
		m	N	29 17½	0.6	0.15				
		m	E	29 18	0.6		0.05			
		m	Z	29 20	0.7			0.06		
347	7	iP	Z	08 09 52.7	1.7			+0.47	8450	Compression
		iP	Z'	09 53	6			+22	76°.0	H 07 58 07
		iP	N'	09 54	6	-5				USCGS 40.4 N 139.0 E H 07 58 14.3
		m	Z	10 01	1.8			1.23		h 33 km ca Mag 6.2 7 Pas Brk
		ipP	N'Z'	10 02	6	+7		-23		6½-6¾ Pal
		iS	N'	19 32	13	-11				
		iS	E'	19 33	14		-10			
		e	N'	19 46	11	8				
		isS	E'	19 51	11		+8			
		i	N'	20 02	20	+12				
		i	N'	20 22	11	+11				
		ePPS	Z'	20 34	25			14		
		e	N'	20 40	40	24				
		iSS	N'	24 25	30	+20				
		iSS	Z'	24 36	27			+17		
		eSSS	Z'	27 35	24			10		
		eSSS	N'	27 38	23	7				
		eLQ	E'	29.7	60		49			
		eLQ	N'	30.5	55	40				
		i	E'	33 00	25		-33			
		i	Z'	33 15	26			+24		
		i	N'	33 36	28	-27				
		eLR	Z'	34.0	40					
		LR	N'	34.6	38	45				
		LR	Z'	34.8	40			53		
		M	E'	37.3	26		23			
		M	N'Z'	38.2	26	40		69		
		e(W2)	N'	10 11.5	50					
		W2M	N'Z'	29	25	3		4		
348	7	e	N'	11 29 09	10	1				Masked by coda of 347
		e	E'	32.5	20					(USCGS 29.0 N 141.5 E H 11 15 35.1 h 26 km ca Mag 4.7)
349	7	iP	Z'	20 24 29	6			+4	8440	Compression
		i	Z	24 32½	1.5			+0.24	75°.9	H 20 12 44
		e	N'	24 33	10	1				USCGS 40.5 N 139.0 E H 20 12 49.3
		i	Z	24 37½	1.5			-0.24		h 33 km ca Mag 5.9
		i	Z'	24 39	8			+5		
		e	Z	24 48	2			0.45		
		i	Z'	24 49	8			+4		
		iS	N'	34 08	12	-3				
		e	E'	34 16	(28)					
		i	Z'	34 39	10			+3		
		e	N'	34 41	13	2				
		e(PS)	N'	35 00	46	4				
		e	Z'	35.2	(35)					
		eSS	N'	38 55	34	3				
		e	Z'	39.3	34			3		
		eSSS	N'	42 30	27	1½				
		eLQ	E'	43.5	60					
		eG	E'	44.7	60		11			
		eL	N'	45.1	56					
		e	Z'	47.8	27			6		
		e	N'	47.9	27	5				
		eLR	Z'	48.6	45			9		
		M	N'Z'	52.6	27	8		14		
		M	E'	54.6	22		5			
		W2M	Z'	22 43	23			1		
350	7	M	N'E'Z'	23 27	18	1	1	2		Earlier phases masked by calibration pulses
351	8	e	Z'	03 03 20	13	Feeble				

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
352	May 8	e	E'	03 46.1						Masked by microseisms
		eL	Z'	48.3	22					USCGS 32.7 S 178.3 W H 03 35 59.9
		M	N'	51.4	15	1				h 40 km ca Mag 4.5
		M	E'Z'	52.0	16		1	2		
353	8	eL	Z'	04 10.1	23					Masked by microseisms and coda of
		M	Z'	12.1	17			3		352 USCGS 33.1 S 178.3 W
		M	E'	13.3	16		½			H 03 57 50.1 h 47 km ca Mag 4.3
354	8	e(L)	Z'	04 23.7	19					Masked by coda of 353
		M	Z'	25.2	17			1		
	8	iP	NZ	04 28 12.2	0.5	-0.01		+0.02		Compression Regional
		i(S)	NE	28 33.2	0.6	+0.05	+0.03			
		i	Z	28 34.2	0.5			+0.02		
	8	iSg	N	04 30 51.8	0.5	+0.02				Quarry blast
		i	EZ	30 52.2	0.5		+0.02	-0.02		
		i	N	30 55.2	0.5	+0.07				
		m	NZ	30 57	0.7	0.23		0.04		
	8	e	N	05 17 31.3						Local Blasting ?
		i	NE	17 31.8	0.6	+0.03	+0.08			
		i	Z	17 32.2	0.4			+0.02		
355	8		Z'	05 24	Feeble waves masked by microseisms					
	8	i(Pg)	E	06 09 55.3	0.4		+0.02			Quarry blast
		e(Sg)	N	09 57.7	0.6					
		i	EZ	09 58.7	0.5		+0.03	-0.03		
		m	N	10 02	0.6	0.23				
		m	EZ	10 05	0.7		0.11	0.13		
356	8	e(L)	E'	07 28	Feeble					
357	8	e	N'E'	16 47.5	20					Masked by microseisms
		e(SS)	E'	54.4	30					USCGS 56.7 N 154.0 W H 16 21 49.8
		e	N'Z'	55.0	25					h 25 km Mag 5.3
		e	E'	17 03.8	?					
		e	N'	04.6	25					
		eL	Z '	09.5						
		M	E'Z'	14.0	21		1	2		
		M	N'	15.4	20	½				
358	8	e	N'	22 03.1	16	Masked by microseisms and l p wanderings				
		(eL)	N'E'	05.4	42					(USCGS 1.7 N 126.5 E H 21 45 47
		eL	Z'	07.7	34					h 33 km ca)
359	8	eP	Z	23 53 54	0.7	Microseisms present				L P records confused by calibration pulses
		e	E'	24 10 45	22					USCGS 52.2 N 169.5 W H 23 40 44.1
		M	Z'	29.5	20			1		h 20 km ca Mag 5.2
360	9	iP	Z	02 15 39.2	0.8			+0.05		Compression
		e	Z'	51 03	?					L P records masked by microseisms
		M	Z'	03 00.0	15			1		USCGS 52.2 N 169.6 W H 02 02 28.8
										h 25 km ca Mag 5.1
361	9	(eP)	Z	13 56 54½	L P records feeble and masked by microseisms					
		e	Z	57 05	0.8					USCGS 8.1 N 123,2 E H 13 48 05.3
		e	E'	14 04 12	(14)					h 60 km ca Mag 5.7
		e	N'	07.6	(16)					
		e	E'Z'	09.0	18					
		e	E'	13.6	22					
		e	N'	16.5	20					
362	9	iP	Z	18 21 35.4	0.8			+0.09		Compression
		iP	NE	21 35.6	0.8	-0.02	-0.03			L P records masked by microseisms
		m	Z	21 37	0.8			0.16		USCGS 13.7 S 166.6 E H 18 16 17.5
		isP	Z	21 49.4	1.0			+0.10		h 41 km ca Mag 5.0
		e	Z'	21 50	9					
		i	Z	22 08	1.0			-0.13		
		e(S)	N'	25 55	7					
		e	Z'	26 02	21			2		
		e(LQ)	N'	26.8	(30)					
		eLR	E'Z'	28.0	26					
		M	E'	29.4	19		2			
		M	N'Z'	30.5	17	2		4		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
363	May 9	eP	Z	21 13 06	1.0				2890	USCGS 9.2 S 156.7 E H 21 07 41.6
		i	Z'	13 07	6			-6	26°.0	h 26 km ca Mag 5.4
		i	Z	13 12.4	0.9			-0.08		
		i	Z'	13 26	6			+3		
		e(S)	N'	17 32						
		i	N"	17 43	8	-10*				
		m	N'	17 45	9	5				
		eLR	N'	19.5	32					
		eLR	E'	19.6	26					
		LR	Z'	20.1	30			8		
		LR	N'E'	20.3	32	4	1½			
		M	E'	22.3	15		4			
		M	N'Z'	22.6	18	2		3		
364	10	(eP)	Z	03 50 08						L P masked by microseisms
		i	Z	50 13.7	0.8			+0.02		
		e	E'	56.4	?					
365	10	iP	Z	05 50 07.2	0.8			+0.04		Compression
		eL	E'	06 08.1	26					L P records masked by microseisms
		eL	N'	10.5	31					USCGS 29.0 N 141.5 E H 05 39 42.6
		M	N'Z'	13.3	26	1		1½		h 62 km ca Mag 5.3 4¾-5 Brk
366	10	e(P)	Z	06 33 42						Masked by microseisms
		e	N'E'Z'	38.6	25	1	½	2		USCGS 14.6 S 153.2 E H 06 27 45.6
		eL	E'	40.3	32					h 77 km ca Mag 4.6
		eL	N'	40.4	35					
		eLR	N'Z'	42.0	34			4		
		M	E'	44.2	18		2			
		M	N'	44.5	19	2				
		M	Z'	44.7	19			3		
367	10		Z'	14 51		Feeble surface waves masked by microseisms (USCGS 51.4 N 129.2 W				H 13 44 03 h 33 km ca Mag 4.1)
	11	i	N	00 59 54.8	0.4	-0.02				Local Seismic ?
368	11	iP	Z	05 34 16.0	0.9			+0.05		Compression Microseisms present
										USCGS 24.6 S 179.9 E H 05 29 16.6
										h 515 km ca Mag 4.8
	11	iPg	EZ	06 52 04.8	0.3		+0.04	+0.03		Quarry blast
		(Sg)	N	52 08.5	?					
		i	Z	52 08.8						
		m	N	52 11	0.7	0.05				
		m	EZ	52 13	0.7		0.18	0.24		
	11	iSg	N	07 07 36.0	0.5	-0.03				Quarry blast
		i	EZ	07 36.5	0.5		-0.03	+0.05		
		m	N	07 38½	0.6	0.26				
		m	EZ	07 41	0.6		0.08	0.11		
369	11	eL	E'Z'	14 54.1	25	Masked by microseisms and l.p.				wanderings USCGS 22.5 S 175.8 W
		M	E'Z'	56.6	18		2	3		H 14 39 04 h 50 km ca Mag 5.3
370	11	iP	Z	15 05 20.3	0.9			-0.09		Dilatation Microseisms present
										USCGS 4.3 N 127.9 E H 14 57 16.6
										h 60 km ca Mag 5.7
	11	(iP)	Z	17 15 59.8	1			+		Large microseisms present
	12	(Sg)	N	06 56 18	?					Quarry blast ?
		i	E	56 19	0.3		+0.05			Large microseisms on all records
		m	N	56 20½	0.7	0.13				L P wanderings on l p records
		m	EZ	56 23	0.7		0.06	0.08		
371	12	eL	Z'	18 33.6		Masked by large microseisms and l p wanderings USCGS 19.9 S				
		M	E'Z'	38.0	15		2	3	173.9 W	H 18 17 07.7 h 33 km ca Mag 5.5
372	12	e	E'	18 42.5	20					Confused by large microseisms &
		e(SS)	E'	49.4	15					coda of 371
		e(LQ)	E'	58.8	48					USCGS 56.6 N 152.4 W H 18 16 41.9
		eL	E'	19 03.5	30					h 10 km ca Mag 5.3 5½-5¾ Brk
		M	N'E'Z'	11	21	4	4	9		6-6¼ Pal
373	13	eL	Z'	00 23.8	21			3		Masked by large micross and l p wanderings
		M	Z'	29.5	20			4		USCGS 14.8 S 176.7 W H 00 07 01.8
										h 33 km ca Mag 4.7

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
374	May 13	iP	Z'	05 30 57	13			+11		Compression
		e	E'	31 02	18		5			Large microseisms and l p wanderings
		i(PP)	E'Z'	31 39	9		-10	+12		on N' and E'
		e(S)	N'	35 13	?					USCGS 32.8 S 178.3 W H 05 25 26.1
		e	N'	35 32	?					h 33 km ca Mag 5.3
		e	Z'	35.7	26			25		
		m	E'	35.8	20		12			
		i(SS)	N'	36 21	23	-30				
		eLR	E'Z'	37.3	33					
		LR	E'Z'	38	33		38	64		
		M	N'	39.2	17	28				
		M	N'E'Z'	41	17	27	40	72		
375	13	iP	Z	11 11 29.2	1.0			+0.07		Compression Microseisms present
										USCGS 21.8 S 179.6 W H 11 06 16.4
										h 578 Mag 4.6
376	13	(e)	Z	16 48 16						Masked by large microseisms
		(e)	Z	48 19						USCGS 32.7 S 178.6 W H 16 42 48.3
		e	Z	48 30						h 33 km ca Mag.5.1
		e	Z'	53 06	20					
		e	N'	53 45	20	2				
		eL	E'	54.6	31					
		M	N'E'Z'	56.5	21	3	5	12		
377	13	e	Z'	20 48.1						Masked by large microseisms
		e	N'	48.9	15	2				USCGS 32.4 S 178.3 W H 20 37 54
		eL	E'	49.8	27					h 70 km ca Mag 4.9
		eL	Z'	50.0	26			3		
		M	N'E'Z'	52½	18	3	4	8		
	13	e	E	22 58 37½	0.4					Local blasting ?
		i	N	58 38½	0.5	+				
		m	N	58 39½	0.5	0.10				
378	14	(P)	Z	01 10 56½		No 1 p records for May 14				Masked by microseisms
		M	N"	19.1	13	2*				USCGS 32.9 S 178.8 W H 01 05 47.6
										h 309 km ca Mag 4.6
	14	i	EZ	02 02 04.2	0.4		+0.04	+0.02		Quarry blast ?
		i(Sg)	N	02 05.3	0.5	-0.09				
		m	Ne	02 06½	0.4	0.59	0.16			
		m	Z	02 07	0.4			0.14		
379	14	(P)	Z	02 36 41		Masked by microseisms				USCGS 4.5 S 152.9 E H 02 30 32.2
		M	E"	47.7	13		2*			h 32 km ca Mag 4.9
	14	(Pg)	Z	06 04 34						Quarry blast
		iSg	N	04 37.6	0.5	-0.04				
		i	Z	04 38	0.5			+0.03		
		m	N	04 40	0.7	0.33				
		m	EZ	04 42½	0.7			0.11		
	14	(i)	Z	06 46 27	(0.3)					Local Superposed on microseisms
		i	EZ	46 31.2	0.3		-	+0.08		
		i	N	46 32.7	(0.5)	+				
		m	EZ	46 35½	0.7			0.05		
	15	i	E	02 14 19.5	0.4		+0.03			Quarry blast ?
		i	Z	14 20.2	0.5			+0.06		Masked by microseisms
		m	N	19 23½	0.7	0.08				
	15	i	E	05 58 38.7	0.5		-0.02			Quarry blast ?
		i	Z	58 39.3	0.5			+0.04		Masked by microseisms
		m	N	58 43	0.8	0.06				
		m	EZ	58 46½	0.8		0.08	0.09		
	15	i	EZ	06 02 38.8	0.4		-0.03	+0.03		Quarry blast ?
		m	N	02 41	0.6	0.02				Masked by microseisms
		m	EZ	02 43	0.7		0.06	0.03		
	15	iPg	E	06 03 51.2			+			Quarry blast
		iSg	NE	03 54.7	0.3	+0.10	+0.06			Superposed on microseisms
		i	Z	03 55.0	0.3			+0.11		
		m	N	03 57½	0.6	0.27				
		m	EZ	03 59	0.7		0.10	0.18		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	May 15	i(Sg)	N	06 06 28.1	0.5	+0.02				Quarry blast
		i	E	06 28.3	0.4		+0.01			Masked by microseisms
		i	Z	06 28.5	0.4			+0.02		
		m	N	06 31	0.7	0.18				
		m	EZ	06 33	0.7		0.05	0.09		
	15	i(Sg)	N	06 11 38.7		+				Quarry blast ?
		m	N	11 43	0.7	0.08				Masked by microseisms
		m	E	11 45	0.7		0.04			
380	15	(eP)	Z	10 56 32						Masked by microseisms
		(eP)	N'	56 34						USCGS 3.5 S 149.1 E H 10 50 21
		ePP	N'	57 31	11	1				h 44 km ca Mag 4.7
		iS	N'	11 01 36	10	+6				
		e	Z'	01 45	20			3		
		m	N'	02.0	22	5				
		eSS	E'	03 16	20		4			
		eG	E'	03.7	42		12			
		eL	N'	04.9	40					
		LR	Z'	05.8	35			15		
		LR	N'	06.0	35	8				
		M	N'	07.3	22	12				
		M	E'	07.5	18		16			
		M	Z'	07.6	23			15		
		M	N'	08.8	17	12				
		M	Z'	09.0	17			20		
	16	(e)	NZ	05 02 35½						Quarry blast ?
		e	Z	02 37						
		m	E	02 38	0.5		0.42			
		m	NZ	02 39	0.5	0.17		0.21		
381	16	e(L)	Z'	12 51.4	23					Masked by microseisms
		M	Z'	53.9	17			2		
382	16	iP	Z'Z"	16 13 17	10			+9	2950	Compression
		i	Z	13 18	2.2			-0.74	26°.5	S P masked by microseisms
		m	E'	13 26	10		4			USCGS 32.8 S 178.3 W H 16 07 46.2
		i	Z'	13 42	9			+8		h 33 km ca Mag 5.4 6.0 Pas
		i	E'	13 44	9		-5			
		ePP	E'	14 01	11		4			
		eiS	N'E'	17 47	13		+5			
		i	Z'	17 49	11			+8		
		i	Z'	18 12	14			+10		
		i(SS)	N'	18 41	21	-9				
		eL	Z'	19.6	30			7		
		eL	E'	19.7	33		6			
		LR	Z'	20.4	26			13		
		M	N'	21.8	16	20				
		M	E'Z'	23.3	18		27	40		
383	16		E'Z'	19 21	Feeble waves masked by microseisms					
384	17	(e)	N'	01 18 22						Masked by microseisms
		e	N'	23 30	(11)					(USCGS 59.4 N 142.7 W H 00 50 17.9
		eL	Z'	24.9	22					h 35 km ca Mag 5.1 5¾ Pas
		M	N'E'Z'	27.5	17	1	1	2		6-6¼ Brk 6¼-6½ Pal)
385	17		E'Z'	02 40	Feeble waves					
386	17		Z'	03 07	Feeble waves					
387	17	(eP)	Z'	17 10 52	7					Masked by microseisms
		e	N'	16 06	20					USCGS 33.2 S 178.4 W H 17 05 24.8
		e	E'	16 21	14					h 33 km ca Mag 4.6
		eL	Z'	17.4	30					
		eL	E'	17.9	22					
		M	N'	19.3	16	2				
		M	Z'	20.0	18			4		
		M	E'	20.4	17		2			
388	17		N'Z'	18 37	Feeble waves					USCGS 33.3 S 178.3 W H 18 25 56
										h 59 km ca

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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
389	May 17	iPP	Z'	19 51 19	6			+		Masked by microseisms
		e	E'	20 02.4	(13)					USCGS 35.2 N 35.9 W H 19 26 20.6
		e	Z'	08.3						h 33 km ca Mag 5.6 6¼ Pas
		(eSS)	E'	13.3	(26)					5¾-6 Brk
		eSS	N'	13 24	25					
		e	E'	14.7	35					
		e	Z'	16 15	19					
		e(SSS)	E'	19.2	(50)					
		eSSS	N'	19.6	48	4				
		eSSS	Z'	20.6	30			3		
		e	E'	22.9	36		5			
		e	N'	31.4	50	3				
		eLQ	N'	36.0	62					
		eG	N'	38.0	68	8				
		e	E'	38.4	(86)					
		e	E'	42.7	80					Soismic ?
		e	N'	43.8	(100)					..
		eLR	N'	46.2	52	5				
		eLR	Z'	47.9	50			5		
		M	E'	55.1	25		5			
		M	Z'	55.6	25			8		
		M	N'	56.4	25	4				
RIV	17	I P	N	21 49 29.7	0.4	+0.01				Local ?
		I	EZ	49 30.4	0.4		+0.02	+0.04		
	18	e	N	04 13 24	0.4					
		m	N	13 28	0.5	0.02				
	18	ePg	Z	07 45 01						Quarry blast ?
		eSg	E	45 05½	0.5					
		i	Z	45 06	0.5			+0.02		
		i	N	45 09½	0.7	+0.03				
		m	N	45 10½	0.7	0.05				
		m	EZ	45 13	0.7		0.06	0.06		
390	18	(eP)	Z	14 18 41½						Masked by microseisms
		e	Z	18 55½						USCGS 21.2 S 174.5 W H 14 12 10.1
		(eS)	E'	24 10						h 33 km ca Mag 5.6 4½ Brk
		e	Z'	24 14						
		eL	N'	26.2	28					
		e	Z'	26 20	20			1		
		eLR	E'	27.6	25					
		eLR	Z'	27.9	26			2		
		M	N'	29.6	15	3				
		M	E'Z'	32.0	17		3	6		
391	18	eL	E'	18 01.2	30	Masked by microseisms				(USCGS 18.2 N 147.3 E H 17 38 25.5
										h 19 km ca, Mag 5.1)
392	18	eL	N'E'	18 31.1	28	Masked by microseisms				
		eL	Z'	32.5	24					
	19	i	E	03 03 59.5	(0.5)		-			Blasting ?
		m	N	04 00½	0.5	0.08				
		m	EZ	04 01	0.5		0.06	0.06		
	19	i	NZ	03 32 42.5	0.3	+0.04		+0.05		Blasting ?
	19	i	E	05 31 06.2	0.3		+0.03			Local Blasting ?
		m	E	31 08	0.5		0.02			
	19	i	NZ	06 01 34	0.4	+0.02		+0.02		Blasting ?
		m	E	01 36	0.5		0.06			
		m	Z	01 37	0.6			0.04		
		m	N	01 37½	0.5	0.04				
	19	(Pg)	E	06 48 50						Quarry blast
		iSg	N	48 53.6	0.5	-0.03				
		i	Z	48 53.8	0.5			-0.04		
		i	E	48 54	0.5		-0.05			
		m	N	48 56	0.6	0.32				
		m	EZ	48 58½	0.7		0.06	0.09		
393	19	eL	E'Z'	10 39		Masked by microseisms				

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
394'	May 19	eL	N'Z'	11 18		Masked by microseisms				(USCGS 45.5 N 150.3 E H 10 39 24.8 h 33 km ca Mag 5.4)
395	19	(iP)	Z	20 34 07½		Masked by microseisms				USCGS 1.2 S 133.8E H 20 27 24.8
		M	N'Z'	50.9	14	½		1		h 33 km ca
396	19	e	Z'	23 25 25	14					Earlier phases lost in calibration
		e	E'	30 59	14		1			pulses
		e	N'	32 10	22	1				Masked by microseisms
		e	Z'	33.5	20					USCGS 0.7 S 80.2 W H 23 03 41.8
		ePS	E'	33 52	18		2			h 54 km ca Mag 5.4 5½-5½ Brk
		iPS	Z'	33 53	15			-4		5½ Pal
		e	Z'	35 05	22			1		
		e	Z'	39.5	22					
		iSS	N'	40 37	34	+3				
		i	E'	40 56	28		+3			
		e	N'	43 50	23	1				
		eLQ	N'	54.3	40	3				
		e(G)	N'	55.9	60	7				
		M	N"E"Z"	24 03	22	5*	6*	14*		
	20	iP	NZ	00 59 59.0	0.5	(-)		+0.02		Compression
		e	N	01 00 19	0.5					Regional
		i(S)	NE	00 19.8	0.6	+0.05	+0.06			
	20	i	E	01 09 54.8	0.4		+0.04			Local Seismic ?
		i	NZ	09 55.0	0.4	+0.02		+0.02		
397	20	(eP)	Z	04 59 03						Microseisms present N'E' confused
		e	Z	59 04						by large l p wanderings
		e	Z'	05 03.8	(22)					USCGS 31.4 S, 178.2 W H 04 53 30.3
		eLR	Z'	05.9	26			2		h 33 km ca Mag 4.8
	20	i	Z	05 16 25.5	0.6			+0.02		Local Seismic ?
398	20	iP	NZ	06 07 45.4	1.3			+0.66	3690	Compression h 0.01 H 06 01 16
		iP	Z'Z"	07 45½	2½			+6 ca	33°.2	USCGS 2.7 S 139.3 E H 06 01 14.8
		m	Z	07 47	1.6			1.24		h 61 km ca Mag 5.8
		i pP	Z	08 07.5	1.3			+0.17		
		i sP	Z	08 19.7	1.3			-0.24		
		i	E'Z'	11 31	9		-2	+6		
		e	E'	12.1	11		3			
		i	Z'	12 26	10			+4		
		iS	N'	12 57	8	+4				
		i	E'	13 00	7		+4			
		i	Z'	13 04	6			+4		
		e	N'	13.1	26	5				
		e	Z'	13.2	24			4		
		eSS	Z'	15.1	28			5		
		e(G)	E'	15.6	50		9			
		eL	N'	16.5	40	5				
		eL	E'	16.7	40		8			
		eLR	Z'	17.3	42			13		
		i	E'	18 53	7		+28			
		i	N'	19 12	6	+20				
		M	Z'	20.0	17			30		
		M	N'	20.3	18	21				
		M	E'	21.0	17		30			
		M	Z'	21.2	17			29		
	20	eP	N	23 54 46½	0.5					Local
		e	Z	54 47						
		i	NZ	54 51.5	0.5	-0.02		-0.03		
		i	E	54 54.8	0.4		+0.03			
		i	Z	54 56	0.5			+0.04		
		i	N	54 58.5	0.4	+0.06				
		m	N	55 05	0.5	0.06				
		m	E	55 07	0.5		0.06			
		m	Z	55 16	0.5			0.06		
	21	iPg	EZ	06 08 11.6	0.4		+0.02	+0.02		Compression
		iSg	N	08 15.4	0.4	-0.03				Quarry blast
		i	EZ	08 15.7	0.3		+0.09	+0.15		

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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
cont	May 21	m	E	06 08 16	0.4		0.10			
		i	N	08 16.5	0.3	+0.09				
		m	N	08 18	0.6	0.16				
		i	EZ	08 19	0.7		+0.07	+0.13		
		m	EZ	08 20	0.7		0.15	0.19		
	21	i(Sg)	NEZ	06 16 59.8	0.5	+	-0.04	-0.05		Quarry blast
		m	N	17 02	0.6	0.12				
		m	EZ	17 04½	0.7		0.11	0.12		
400	21		N'E'Z'	07 39	Feeble surface waves					
401	21	(e)	E'	16 00.2						USCGS 59.0 N 153.5 W H 15 36 01.5
		eLQ	N'E'	18.8	35					h 15 km ca Mag 5.3 5¾-6 Brk
		eLR	E'	24.3	27					
		M	N'Z'	27.6	23	½		1		
		M"	E'	29.4	22		¼			
		(W2)	Z'	17 48						
	21	(i)	Z	22 50 41.2						Local Seismic ?
		i	N	50 45.2	0.5	+0.01				
402	22	eP	Z'	0031 57	11			1		USCGS 34.7 S 179.6 W H 00 26 44.8
		ePP	Z'	32 33	9			2		h 58 km ca Mag 4.5
		e(S)	N*	36 18						
		e	Z'	36 39	21			2		
		e(SS)	N'	37 14	21	1				
		eLR	Z'	38.5	26					
		M	Z'	40.2	19			8		
		M	N'	40.8	16	6				
		M	E'	41.5	16		5			
	22	i	Z	04 13 51.5	1.0			+0.04		Local Seismic ?
	22	e	EZ	04 14 47½	0.5					Local Seismic ?
403	22	i(P)	Z	05 04 16	1.0			+0.05		USCGS 20.3 S 169.4 E H 04 59 26.2
					Microseisms present					h 144 km ca Mag 4.7
	22	i	EZ	05 51 50	(0.4)		+	-		Local Non seismic ?
		i	N	51 51½	(0.4)		(+)			
	22	iPg	EZ	06 01 05.5	0.3		+0.04	+0.03		Compression
		Sg	N	01 09.2	0.4					Quarry blast
		i	EZ	01 09.6	0.3		+0.14	+0.22		
		m	E	01 10	0.3		0.22			
		i	Z	01 11.3	0.3			+0.10		
		m	N	01 12	0.8	0.06				
		i	EZ	01 12.8	0.7		+0.07	+0.13		
		m	EZ	01 14	0.7		0.12	0.15		
	22	e	Z	07 10 04½						Local Seismic ?
		i	Z	10 06.5	0.5			-0.03		
	22	(iP)	Z	10 11 11				+		USCGS 2.7 N 124.8 E H 10 03 42
					Microseisms present					h 201 km ca Mag 4.9
404	22	(i)	Z	13 17 39.5				+		Masked by microseisms
		e	N'	32.2	24					
		eL	Z'	34.9	22					
405	22	i	Z	14 17 07	1.3			+0.11		(USCGS 8.3 N 126.3 E H 14 07 12
										h 121 km ca Mag 4.6)
	22	i	Z	14 45 54½				+		
	22	e	N	21 39 20½						Local ?
		i	Z	39 21.6	0.7			+0.03		
	23	e	Z	02 03 14½						Regional ?
		i	Z	03 45.3	0.5			+0.01		
		i	E	03 50.2	0.5		-0.02			
406	23	iP	Z	11 32 20.7	0.7			+0.04		Compression USCGS 28.6 N 139.4 E
					Microseisms present					H 11 22 33.3 h 409 km ca Mag 5.1
407	23	e(L)	E'	15 10.7	(30)	Masked by large microseisms				
		M	E'	15.3	18		2			
		M	N'	16.6	15	1				
		M	Z'	18.3	14			3		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
408	May 23	e(P)	Z	20 13 14		Masked by microseisms				
		i	Z	13 32.9	1			+0.07		
		T max	N	31 35	0.5	0.06				
		T max	Z	31 40						
	23	(iP)	Z	23 56 17.7	1.2			+		Microseisms present
409	24	(P)	Z	04 19 37½		Masked by microseisms				Large microseisms on 1 p & Galitzin records
		e	E'	25.1	(10)					
		e	N'	27.2	18	2				USCGS 22.6 S 174.1 W H 04 13 05.1
		e	Z'	27.8	17					h 33 km ca Mag 5.7 5-5¼ Brk
		eL	Z'	28.6	30			4		
		eL	E'	28.7	28		3			
		M	N'	30.9	14	6				
		M	E'Z'	33.5	16		5	9		
410	24	(iP)	Z	10 42 25	1.2			+0.09		Masked by microseisms
		e	N'	51.8						USCGS 34.3 N 141.1 E H 10 31 24.1
		e	E'	11 01.5	(25)					h 33 km ca Mag 5.2
		e	N'	01.9	(25)					
		e	N'	04.4	(25)					
		e	Z'	07.7	(25)					
		M	N'Z'	15.8	18	1		2		
411	24		N'	21 07		Feeble waves masked by microseisms				USCGS 15.9 S 167.6 E H 20 57 38.3
										h 29 km ca Mag 4.4
412	24	iP	Z	22 27 12	2.2			+0.45		Compression
		iP	Z'Z"	27 13	5			+4		Microseisms present large on 1 p
		e	Z	27 28	1.5					& Galitzin records
		e	N'	31 04						USCGS 30.7 S 177.8 E H 22 22 27.6
		e	N'	31.9	16	2				h 149 km ca Mag 4.8
		e(L)	E'	33.0						
	25	i	NE	01 56 55.6	0.3	-0.09	+0.05			Local blasting ?
		i	Z	56 56.5	0.3			+0.05		
	25	e	Z	04 19 58.5						Local Seismic ?
		e	E	19 58.8	0.3					
	25	(P)	Z	05 05 17		Masked by microseisms				USCGS 30.6 S 178.0 W H 04 59 39.6
										h 33 km ca Mag 4.3
413	25	eP	Z	19 54 29	1.3				6920	Masked by microseisms
		i	Z'	54 31	6			-4	62° 3	USCGS 9.1 S 88.9 E H 19 44 07.0
		eS	E'	20 02 51						h 33 km ca Mag 5.5
		e	Z'	03.0	18					
		ePS	E'	03 10	30		3			
		ePS	N'	03 11	21					
		e(SS)	E'	06 39	18					
		eSS	N'	06 59	18					
		e	N'	09 52	19	3				
		eLQ	N'	10.1	50					
		eL	E'	12.4	48		3			
		eL	Z'	12.5	50			5		
		M	N'	14.3	28	7				
		M	N'	17.4	14	10				
		M	E'Z'	19.0	19		6	8		
	26	i	Z	01 46 43	0.5			+0.02		Local Seismic ?
	26	i	NE	01 54 42.5	0.5	-0.03	+0.04			Local Seismic ?
		i	Z	54 42.6	0.3			+0.02		
	26	ePg	Z	02 22 41	0.3					Quarry blast ?
		iSg	NE	22 45.4	0.4	+0.03	+0.04			
		i	Z	22 45.6	0.5			+0.03		
		i	N	22 48.5	0.7	+0.09				
		m	N	22 49½	0.7	0.13				
		m	EZ	22 52	0.7		0.06	0.06		
414	26	e	Z'	02 53.1		Masked by microseisms				USCGS 2.9 S 130.3 E H 02 37 04.8
		M	N'Z'	03 03	17	1		1		h 33 km ca
	26	iPg	Z	03 01 57	0.3			+0.03		Local tremor
		i	Z	01 58.6	0.3			-0.04		
		iSg	N	02 04.0	0.3	+0.05				

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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
cont	May 26	iSg	E	03 02 04.2	0.4		+0.04			
		m	NE	04 08	0.5	0.05	0.06			
		m	E	04 13	0.4					
		m	Z	04 17½	0.6			0.05		
	26	i	Z	04 44 18	0.3					Local tremor
		i	E	44 22.5	0.6		+0.05			Masked by microseisms
		i	N	44 22.6	0.6	+0.03				
		i	N	44 25.1	0.6	+0.04				
		m	Z	44 25½	0.5			0.04		
	26	i(Pg)	Z	04 50 58.7	0.3			-0.05		Local tremor
		i	NZ	51 00.8	0.4	+0.02		+0.05		Masked by microseisms
		iSg	N	51 04.8	0.3	+0.07				
		i	E	51 05.0	0.4		+0.12			
		i	N	51 08.9	0.4	+0.09				
		m	E	51 09	0.5		0.12			
		m	Z	51 12	0.5			0.10		
	26	i(Pg)	Z	04 54 21				+		Local tremor
		i	E	54 23.0	0.5		+			Masked by microseisms
		i(Sg)	NE	54 27	0.7	+0.03	+0.04			
		m	E	54 31	0.6		0.05			
		i	N	54 33.5	0.6	+0.04				
		m	Z	54 34½	0.7			0.08		
	26	i(Pg)	Z	04 59 26.3				+		Local tremor
		i	E	59 28.5	0.5		+0.03			Masked by microseisms
		i(Sg)	NEZ	59 32.8	0.5	+0.03	-0.08	-0.06		
		i	E	59 34.3	0.5		+0.08			
		i	E	59 36.8	0.4		+0.09			
		i	N	59 37.3	0.4	+0.09				
		m	EZ	59 39½	0.5		0.10	0.10		
	26	(Pg)	Z	06 48 31½		Masked by microseisms				Quarry blast
		iSg	N	48 35.8	0.5	-0.05				
		i	E	48 36	0.5		+0.02			
		i	N	48 37.3	0.6	+0.16				
		m	N	48 38	0.7	0.37				
		m	EZ	48 40½	0.7		0.06	0.08		
	26	i	E	06 57 48½	0.5		+0.02			Quarry blast
		i	Z	57 49	0.6			-0.03		Masked by microseisms
		(Sg)	N	57 50½						
		m	N	57 53	0.7	0.05				
		m	EZ	57 56	0.7		0.03	0.04		
415	26	(P)	Z	09 49 49		Masked by microseisms				L P records confused by l p wanderings
		i	Z	51 14.5	1.5			+0.20		USCGS 16.5 N 145.9 E H 09 40 57.9
		i	N	53 13.5	1.5	-0.12				h 94 km ca Mag 5.5
		e(L)	Z'	10 06.5						
416	26	iP	Z'	11 12 00	(7)			+	9840	Compression
		i	Z	12 01	(1)			+	88°.5	Microseisms on s p records
		i	Z	12 03.7	1.0			-0.48		L P records and Galitzin records
		e	E'	12 04	7					difficult to read owing to
		i	Z	12 07.7	1.0			+0.96		overlapping traces
		i !	N'Z'	12 08	14	+39		+140		H10 59 04
		m	Z	12 12	1.5			4.90		USCGS 56.2 S 27.8 W H 10 59 12.3
		m	NE	12 13½	1.4	0.92	0.53			h 120 km ca Mag 7½-7¾ Pas Brk
		i	Z'	12 32	10			+27		7-7¼ Pal
		i	N'	12 47	11	-20				
		m	Z'	13.0	17			61		
		i	E'	14 17	11		+9			
		iPP	E'	15 35	11		+8			
		i	N'	15 47	15	+42				
		m	Z'	15.9	18			90		
		iSKS	N'	22 27	24	+64				
		iS	E'	22 45	24		-61			
		i	Z'	22 53	20			+34		
		i	N'	22 57	28	+63				
		iPS	Z'	23 54	16			+40		cont next page

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
416	May 26	iPPS	N'	11 24.3	20	+145				
cont		i	Z'	24.8	24			+72		
		i	N'	24.9	24	-130				
		i	N'	25.4	48	+155				
		X	Z'	25.6	40			94		
		i	N'	28 08	30	+41				
		iSS	N'	28 45	40	-85				
		iLQ	E'	36 10	34		-46			
		LQ max	E'	37.1	34		120			
		X	Z'	37.6	40			82		
		G	E'	37.9	70 ca					
		iLR	Z'	41.7	50			-		
		iLR	N'	41.9	50	+				
		L R max	N'Z'	43.3	60	310 ca		410 ca		
			E'	43.5	35		100			
		M	E'	44.8	26		93			
		M	Z'	45.2	30			200 ca		
		M	N'	45.6	30	130 ca				
		M	N'E'Z'	53	19	87	60	135		
	26	(iP)	Z	13 46 22	1.5			+0.26		
	27	e	N	01 03 57						Blasting ?
		m	NEZ	03 58	0.4	0.05	0.04	0.05		
417	27	iP	Z	01 09 33.9	0.9			-0.21		Dilatation
		e	Z'	19 44	16					N'E' confused by 1 p wanderings
		eSKS	N'	19 54	18					USCGS 56.1 S 27.6 W H 00 56 42.5
		eS	E'	20 16	20					h 105 km ca Mag 5.6 5 Pal
		e	Z'	21 14	18					
		e	N'	21 42	20					
		e(SS)	Z'	26.6	24					
		e(LQ)	E'	33.7	32					
		eL	Z'	39.4	50					
		M	N'Z'	46.6	20	1		3		
	27	e	N	03 16 00						Local Seismic ?
		m	NZ	16 15	0.6					
	27	i	Z	06 00 35				+		Quarry blast
		i(Sg)	N	00 37½	0.5	+0.02				
		m	NEZ	00 41	0.6	0.06	0.05	0.14		
	27	i	E	06 17 56.8	(0.4)		+			Local ? Quarry blast ?
		i	N	17 58.2	0.7	+0.13				
		i	Z	18 00.5	0.7			+0.07		
		i	E	18 01	0.7		+0.05			
418	27	(P)	Z	06 43 43		Masked by microseisms				N'E' confused by 1 p wanderings
		(i)	Z	43 47						USCGS 56.2 S 27.4 W H 06 30 57.7
		eL	Z'	07 13.6	45					h 116 km ca Mag 5.8
		M	Z'	22.8	18			1		
419	27		N'Z'	11 36		Feeble long waves masked by micross				USCGS 18.4 S 173.1 W H 11 20 26.8
										h 33 km ca Mag 4.6
420	27		N'Z'	19 01		Feeble long waves masked by micross				(USCGS 59.1 N 146.4 W H 17 52 08.4
										h 33 km ca Mag 4.0)
421	28	(eL)	Z'	02 28.3						(USCGS 24.5 N 122.0 E H 01 56 58.9
		M	Z'	33.8	22			1		h 41 km ca Mag 5.9)
422	28		Z'	21 58		Feeble surface waves				USCGS 3.6 S 102.7 W H 21 09 09.5
										h 33 km ca Mag 4.5
423	28	iP	Z	23 36 10.4	1.1			+0.25		Compression
		e(PP)	Z	37 49						N'E' records confused by 1 p wanderings
		e	Z'	46.1	18					USCGS 1.6 N 127.2 E H 23 28 27.9
		M	Z'	57.0	13			1		h 103 km ca Mag 6.3
	29	i(Sg)	NE	01 58 53.5	0.4	+0.02	+0.02			Quarry blast ?
		i	Z	58 53.7	0.5			+0.02		
		m	N	58 58½	0.7	0.06				
	29	i(P)	Z	02 32 52.3	0.5			+0.02		Local
		i	N	32 52.6	0.5	+0.01				
		i(S)	NE	33 13.2	0.6	+0.05	+0.06			

RIVERVIEW COLLEGE OBSERVATORY
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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	May 29	i	N	03 59 38	0.5	+0.01				Local Seismic ?
	29	iPg	Z	04 18 32.0	0.3			+0.02		Quarry blast
		iSg	E	18 35.2	0.4		+0.05			
		i	NZ	18 35.4	0.3	+0.05		+0.09		
		m	E	18 37	0.6		0.08			
		m	NZ	18 39	0.6	0.03		0.07		
	29	iSg	N	06 31 02.2	0.6	+0.05				Quarry blast
		i	Z	31 02.6	0.6			+0.04		
		m	N	31 04½	0.7	0.31				
		m	EZ	31 07	0.7		0.10	0.12		
	29	iP	Z	09 47 06.9	0.3			-0.03		Local felt at Dalton & Gunning
		iP	NE	47 07.0	0.3		+0.02	+0.04		
		iS	N.	47 30.5	0.5	+0.03				
		iS	E	47 30.7	0.5		+0.05			
		i	Z	47 30.9	0.5			-0.04		
		m	NE	47 33½	0.5	0.37	0.46			
		m	Z	47 35	0.6			0.44		
	29	iP	NZ	10 33 25.5	0.4	-0.01		-0.02		Local
		i(S)	E	33 34.4	0.5		+0.02			
		m	E	33 41½	0.8		0.05			
		m	N	33 47½	0.7	0.06				
		m	Z	33 48½	1.2			0.21		
424	29	iP	Z	18 39 39.9	0.7			+0.04		Compression USCGS 26.2 S 178.3E H18 35 02.3 h 614 km ca Mag 5.4
	29	(iP)	Z	19 06 34½		Masked by microseisms				USCGS 26.2 S 178.3 E H 19 01 57.0 h 613 km ca Mag 4.1
425	29	eL	N'	20 28.7	26	Masked by microseisms				USCGS 0.5 S 134.7 E H 20 09 01 h 33 km ca Mag 5.1
		M	E'	30.4	18		2			
		M	N'Z'	32.4	15	1		2		
426	30	eL	Z'	01 07.7	18					
	30	iSg	N	02 52 41.5	0.5	+0.02				Quarry blast
		i	E	52 41.7	0.4		+0.03			
		i	Z	52 41.8	0.4			+0.03		
		m	N	52 44½	0.7	0.20				
		m	EZ	52 46	0.7		0.07	0.06		
	30	iP	NZ	11 55 01.3	0.4	+0.01		-0.02		Local
		iP	E	55 01.4	0.4		+0.03			
		iS	NE	55 10.0	0.4	+0.02	-0.08			
		m	N	55 11	0.5	0.03				
427	30	(eP)	Z'	14 41 50	6					Masked by microseisms
		e	Z'	41 54	6					USCGS 36.2 N 141.1 E H 14 30 45.3
		e	Z'	42 05	10					h 49 km ca Mag 5.4 5½-5¾ Pal
		iS	N'E'N"E"	51 07	9	-3	-5			
		e	Z'	51.2	16			2		
		e	N'E'	51.3	20					
		i	E'E"	51 28	7		+4			
		e	N'	51.9	32					
		i	E'E"	52 04	7		-5			
		e(SS)	Z'	55.6	30			1		
		e	N'	55.9	26	1				
		e(SSS)	E'	58.6	30		3			
		eLQ	E'	15 01.0	35		6			
		eL	E'	02.9	32		3			
		eL	N'Z'	04.9	30	2		3		
		M	N'Z'	09.9	23	5		8		
		M	E'	10.4	22		3			
428	31	iP	Z	00 52 27.2	1.0			+0.16	8660	Compression
		iP	Z'Z"	52 28	7			+7	77°.9	h 0.005 H 00 40 35
		m	EZ	52 32	1.0		0.10	0.25		USCGS 43.5 N 146.8 E H 00 40 36.4
		iPcP	Z'	52 39	6			+5		h 48 km ca Mag 6.3 6½-6¾ Pal
		ipP	N'Z'	52 47	10	-4		+11		
		ipP	Z	52 47.2	1.2			+0.30		
		i(eP)	Z	52 53.2	1.5			-0.82		
		e	Z'	53.0	21			7		cont next page

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
428	May 31	e	Z'	01 01.5	30			3		
cont		i	Z'	02 11	20			-16		
		iS	N'N"	02 14	12	+				
		iS	E'E"	02 15	12		-17			
		m	N'	02.5	16	22				
		iScS	E'	02 38	12		-7			
		isS	N'N"	02 40	12	+20				
		i	Z'	02 41	10			-		
		i	E"	02 43	10		+14*			
		i	Z'	02 53	14			-26		
		iPS	N'	03 05	14	-9				
		e	E'	06.6	26		7			
		eSS	Z'	07.2	34			11		
		iSS	N'	07 17	27	+27				
		i	E'	12 49	17		+17			
		iLQ	E'	13.3	42		+60 ca			
		iL	N'	13.8	27	+15				
		iLR	Z'	16.3	40			+34		
		iLR	N'	16.5	40	+30				
		iLR	E'	16.7	30		+36			
		i	N'	17.9	30	-55ca				
		M	Z'	18.5	26			73 ca		
		M	N'Z'	19.7	25	49		80 ca		
		M	E'	20.9	24		47			
		W2M	N'Z'	03 05	27	3		5		
429	31	e(P)	Z'	17 21 23						Masked by large microseisms
		e	Z'	21 28						USCGS 13.6 S 172.1 E H 17 15 26.8
		e(S)	E'	25 54	12					h 73 km ca Mag 5.0 4¾-5 Brk
		e	N'Z'	26.0	13					
		i	N'E'Z'	26 11	12	+4	+5	+3		
		e(LQ)	N'	27.2	22					
		e	E'	27.6	24		3			
		eLR	N'E'Z'	28.6	30	5	7	11		
		M	Z'	29.3	25			14		
		M	E'	29.8	23		7			
		M	N'	30.9	16	4				
430	31	eL	N'Z'	23 16	Masked by large microseisms					
431	Jun 1	iP	Z	06 10 09.7	0.8			+		Compression
		m	NEZ	10 11	0.8	0.05	0.09	0.36		L P records obscured by large microsc
		i	Z	10 51.5	1.2			-0.18		and l p wanderings
		e	N'	15 40						USCGS 14.6 S 167.4 E H 06 05 07.6
		e	E'	15 47						h 176 km ca Mag 5.2
432	1	e(PP)	Z'	13 24 54						USCGS 21.0 S 175.7 W H 13 17 20.7
		e	Z'	28.9						h 35 km ca Mag 5.2
		eLR	Z'	32.1	28					
		eLR	E'	32.2	28					
		M	N'E'Z'	33.6	15 21	1	3	5		
	2	e	N	04 05 37						Local
		i	Z	05 38	0.5			+0.02		
		i	NE	05 38.5	0.4	+0.04	+0.04			
	2	iSg	NE	06 44 52.7	0.4	+0.04	+0.04			Quarry blast
		i	Z	44 52.8	0.5			+0.02		
		m	N	44 57½	0.7	0.11				
433	2		N'Z'	17 07		Surface waves				USCGS 59.7 N 144.4 W H 16 09 23.5
										h 15 km ca Mag 5.1 Brk 4¾
434	2	iP	Z	23 17 47.9	0.9			+0.11		Compression
		i	Z	18 04.9	0.9			-0.08		L P records confused by calib-
		i	Z	18 09.4	1.1			+0.13		ration pulses
		eL	Z'	23.9	26			2		USCGS 14.7 S 167.0 E H 23 12 37.8
										h 82 km ca Mag 4.7
435	3	iP	Z	03 01 11.8	1.2			+0.12		Compression
		eL	Z'	28.6	41					USCGS 25.9 N 95.8 E H 02 49 14.9
										h 100 km ca Mag 5.5
	3	e	NE	05 11 26						Local Seismic ?
		m	NZ	11 28	0.5	0.02		0.03		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Jun 3	(eP)	Z	05 14 39						Microseisms present
	3	i	EZ	06 10 35.6	0.4		-0.02	+0.03		Quarry blast ?
		m	EZ	10 40	0.7		0.07	0.09		
RIV	3	iP	NEZ	06 28 31.5	0.5	+	+	+		Seismic ?
436	3	e(L)	N'	18 09.2	17					USCGS 18.8 S 173.7 W H 17 54 14.7
		eL	Z'	10.9	20					h 33 km ca Mag 4.8
		M	N'	13.4	14	1				
		M	EZ'	14.5	16		1½	2		
437	4	eL	Z'	05 21.9	28	Feeble				(USCGS 17.5 N 100.8 W H 04 28 54.7
										h 22 km ca Mag 4.7)
	4	i(Sg)	NE	06 54 20.8	0.5	+0.03	+0.01			Quarry blast
		i	Z	54 21.5	0.5			+0.02		
		i	N	54 24	0.8	+0.12				
		m	N	54 26	0.7	0.31				
		m	EZ	54 29	0.7		0.04	0.05		
	4	Pg	EZ	06 59 16.5	0.3					Quarry blast
		iSg	N	59 19.9	0.4	-0.07				
		i	EZ	59 20.4	0.4		-0.07	+0.07		
		m	N	59 22½	0.6	0.35				
		m	EZ	59 24½	0.7		0.14	0.18		
438	4	eP	Z	10 25 52½	0.7					Masked by microseisms
		e	Z'	35 04	14					USCGS 7.8S 117.6 E H 10 18 15.3
		eL	Z'	37.2	(40)					h 47 km ca Mag 5.2
		M	N'E'	41.4	22	2	1			
		M	Z'	43.8	19			1		
439	4	e(P)	Z'	11 23 05	11			1½		Masked by microseisms
		e(S)	N'	27 46	24	6				USCGS 6.1 S 149.9 E H 11 17 11.8
		e	Z'	27 54	24			6		h 54 km ca
		e	E'	28 13	19		1			
		eL	N'	29.9	30					
		eLR	Z'	30.9	32			4		
		M	N'Z'	32.6	22	4		6		
		M	E'	33.1	19		4			
440	4	eL	N'	12 58.2	21					(USCGS 9.6 S 76.1 W H 11 46 01.7
										h 124 km ca Mag 5.3)
441	4	e(P)	Z'	13 02 33	9					Confused by coda of 440
		eL	N'	13.2	24					USCGS 4.9 S 134.2 E H 12 56 02.6
		M	N'	17.2	12	4				h 33 km ca
		M	Z'	18.8	10			9		
		M	E'	19.2	11		6			
	5	e	NZ	01 58 36½	0.3					Local Quarry blast ?
		i	E	58 37	0.4		+0.02			
		m	N	58 42	0.7	0.08				
		m	Z	58 44	0.8			0.05		
		m	E	58 45	0.7		0.04			
	5	e	N	04 17 32	0.5					Local Seismic ?
	5	e	E	05 32 27	0.4					Local Seismic ?
442	5	eLR	Z'	09 26.9	30					USCGS 16.2 S 177.3 E H 09 13 20.0
		LR	Z'	27.7	28			3		h 25 km ca Mag 5.2
	6	e	N	01 51 23.3	0.3					Local Quarry blast ?
		i	E	51 23.6	0.3		+0.09			Masked by microseisms
		m	N	51 28½	0.7	0.26				
	6	i	N	02 53 07.8	0.5	+0.06				Quarry blast
		i	Z	53 08.0	0.5			+0.05		Masked by microseisms
		m	N	53 10	0.6	0.35				
		m	EZ	53 12	0.7		0.09	0.14		
443	6	e(SS)	E"	19 35 20						No s p or l p records after 15 h
		eL	E"	44.5	30					Masked by microseisms
		M	N"	47.4	21	4*				USCGS 26.6 S 114.4 W H 19 07 51.4
		M	E"	48.3	21		6*			h 33 km ca Mag 5.8
444	7		N'E'Z'	08 49		Feeble surface waves masked by microseisms				USCGS 3.0 S 130.3 E
										H 08 22 55.9 h 33 km ca Mag 4.8

No	Date	PHASE & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
445	Jun 7	eL	Z'	13 24.7	22	Masked by microseisms				USCGS 18.4 S 173.7 W H 13 07 53.2
		M	E'Z'	27.6	18		1	2		h 33 km ca Mag 4.5
446	7	eL	N'	16 59.0	26	Masked by microseisms				
		eL	E'Z'	17 00.1	27					
		M	E'Z'	02.0	17		1	1		
447	7	eL	N'	20 58.1	23	Masked by microseisms				USCGS 30.4 S 67.6 W H 20 10 15.9
		M	Z'	21 02.8	20			1		h 29 km ca Mag 5.2
448	8	eL	N'	02 38.9	26	Masked by microseisms				USCGS 22.1 S 179.5 W H 02 26 42.3
		eL	Z'	40.2	23					h 554 km ca Mag 4.7
	8	(iP)	Z	14 32 55		Masked by microseisms				
449	8	eL	Z'	18 11.3	23	Masked by microseisms				USCGS 6.1 S 153.6 E H 17 56 18.5
		M	E'	13.0	14		1			h 59 km ca Mag 4.5
		M	N'Z'	14.7	16	1		2		
450	10		Z'	18 48		Feeble long waves masked by large micross				USCGS 9.4 S 117.6 E
	No s p NS record									H 18 26 54.5 h 33 km ca Mag 5.0
451	10	(iP)	E	19 18 49			+			Masked by large microseisms
		eL	E'Z'	24.2	25					USCGS 18.0 S 167.9 E H 19 13 52.6
										h 47 km ca Mag 5.3
452	10	iP	Z'	22 24 46	5			+10	5010	Compression
		ipP	Z'	25 09	5			+	45°.1	Large micross present S P Z
		i	Z'	25 13	7			-10		unreadable
		iS	E'	31 17	15		+10			h 0.01 ca H 22 16 38
		iS	N'	31 18	17	-8				USCGS 5.0 N 127.4 E H 22 16 44.8
		e(sS)	E'	31 53	13		5			h 146 km ca Mag 5.5
		e	Z'	34.4	42			7		
		iSS	E'	34 32	13		+7			
		iSS	N'	34 34	13	+12				
		i	E'	34 50	13		-11			
		i	N'	35 15	11	-12				
		eL	Z'	37.5	54					
		L	N'E'Z'	38.5	50	9	13	14		
		M	N'E'	40.8	32	11	12			
		M	N'	44.3	22	7				
		M	Z'	44.8	19			13		
453	11	M	N"	10 50.0	10	3*	Jun 11	12		No standardised records Maintenance team overhauling seismometers
						Masked by large microseisms				USCGS 2.2 S 141.2 E H 10 26 16.8
										h 67 km ca
454	11	e(S)	N"	17 14 11		Masked by large microseisms				USCGS 2.0 S 140.8 E H 17 01 48.5
		M	E"	21.6	13		15*			h 18 km ca
		M	N"	22.1	13	12*				
		M	Z"	23.1	13			14*		
455	12	e	N"	11 02.4		Masked by large microseisms				USCGS 2.1 S 141.1 E H 10 50 09.1
		M	E"	09.9	13		10*			h 33 km ca Mag 5.5
		M	N"	10.6	13	12*				
456	13	e	Z'	05 16 45		Masked by microseisms				USCGS 1.9 S 141.2 E H 05 04 23.5
		eL	N'E'Z'	20.7	40	3		5		h 33 km ca Mag 5.9
		M	Z'	22.3	25			4		
		M	E'	24.0	19		6			
		M	N'	24.2	19	4				
457	13	(iP)	Z'	08 04 28	5			+4		Large microseisms present
		e	E'	10 15	22					
		e	N'	10 16	22	2				
		e	Z'	10.6	(22)					
		eL	E'	13.1	42					
		eL	Z'	13.7	42					
		L	N'Z'	15	40	4		7		
		M	E'	18	18		8			
458	13	e	E'	11 25 02	15					Masked by microseisms
		e	N'	25.1	17					USCGS 27.3 S 178.0 W H 11 14 26.5
		e	N'	26.3	16	2				h 48 km ca Mag 4.8
		eLR	E'Z'	27.2	30		2	3		
		M	N'	30.0	13	8				
		M	E'Z'	30.8	18		2	3		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
459	Jun 13	iP	NZ	14 07 09.3	0.8	+0.10		-0.35		Dilatation
		m	Z	07 10	0.8			0.46		L P records masked by micross
		i	N	07 14	0.8	-0.10				USCGS 3.9 S 154.3 E H 14 01 40.2
		i	Z	07 34	1.0			+0.11		h 474 km ca Mag 5.5
		eL	N'Z'	14.0	20					
460	13	eL	Z'	16 04.9	22					Masked by microseisms
		M	N'	07.5	13	2				
461	13	(eP)	Z'	22 37 32						Masked by microseisms
		e	Z'	38 12						USCGS 27.6 S 178.3 W H 22 31 53.5
		e(S)	N'	42 12	12	4				h 94 km ca Mag 5.2
		e	Z'	42 20	15			3		
		e	E'	42 28	15		3			
		e	N'	42 33	15	4				
		e	N'	43 22	15	4				
		e	Z'	43 35	20			4		
		i	N'	43 43	15	+9				
		eLR	E'	44.5	28		8			
		iLR	Z'	44 37	28			+12		
		M	N'	47.3	13	23				
		M	E'Z'	48.3	16		7	11		
462	14	(i)	Z	01 26 00.5				+		Masked by microseisms
		e	Z'	30 22	15					USCGS 27.5 S 177.5 W H 01 19 57.7
		e	N'	31.9	15					h 33 km ca
		eLR	E'Z'	32.8	26		2	3		
		M	E'Z'	35.3	17		1	3		
		M	N'	35.5	13	3				
463	14	e	N'	05 24.6						Masked by microseisms
		eL	E'	26.5	25			2		
		M	N'Z'	29	14	2		2		
464	14	e	N'	13 03.2						Masked by microseisms
		eL	N'	14.1	36					USCGS 38.0 N 38.5 E H 12 15 31.3
		eL	Z'	15.8	44					h 8 km ca
		M	N'	27.3	21	1				
		M	E'Z'	29.8	19		2	3		
465	15	eP	Z"	00 16 05	4	No s p records until 04 h				No l p records Jun 15 Maintenance
		i	Z"	16 11	4			+		team working on seismometers
		e(S)	E"	24 51	8					Masked by microseisms
		e	N"	25 00	10					USCGS 5.4 N 97.0 E H 00 05 31.1
		eL	N"	36.0	33					h 33 km ca Mag 5.5
		M	N"	42.2	18	10*				
		M	E"	45.4	19		5*			
		M	Z"	45.9	19			8*		
466	15	e(T)	Z	11 18 51						
		max	NE	19 35	0.5	0.02	0.02			
	15	i	NEZ	21 22 41.7	0.3	+	+	+		Local blasting ?
		m	EZ	22 42½	0.3		0.06	0.09		
467	16	iP	N"Z"	04 13 14½	4	-5*		+12*	8500	Compression (* Galitzin)
		i	Z"	13 20½	9			+110*	76°.5	H 04 01 26 h 0.00
		i	E"	13 24	9		+5*			S P records off until 04 h 14 m
		m	N"Z"	13.5	9	44*		130*		L P .. .. 04 h 30 m
		iPP	N"	16 13	12	+14*				USCGS 38.3 N 139.1 E H 04 01 44.3
		i	Z"	16 15	12			+54*		h 57 km ca Mag 6.1 7½-7½ Pas
		iS	N"E"	22 56½	11	+34*	-58*			7¼ Pal
		i	Z"	22 57½	10			+25*		
		iPS	Z"	23 40	10			+41*		
		i	N"E"	23 42	10	+26*	-46*			
		LQ	E'	32.5 ca	64 ca		560 ca			
		LR	N'Z'	37	50 ca	280 ca		400 ca		
		M	E'	39½ ca	30		150 ca			
		M	N'Z'	41	27	180 ca		170 ca		
		M	E'	43	21		140 ca			
	16	(P)	Z	07 04 40½		Masked by microseisms				USCGS 38.7 N 139.0 E H 06 53 05.0
										h 15 km ca Mag 5.6

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
468	Jun 16	eP	Z	11 22 40½	1			0.04	3910	USCGS 2.0 S 141.1 E H 11 16 03.1
		eP	Z'	22 41	7			2	35°.2	h 13 km ca Mag 5.9
		e	Z	24 08	1.5			0.24		
		eS	N'	28 11	20	1½				
		e	E'	28 15	16					
		e	Z'	28 32	22					
		eL	E'	31.1	40					
		eLR	N'Z'	31.7	45					
		LR	N'Z'	33	40	4		6		
		M	N'E'Z'	36	18	4	6	3		
469	16	e	N'	17 34.2	19					USCGS 5.8 S 154.0 E H 17 23 30.4
		e	Z'	34.3	19					h 60 km ca Mag 5.7
		eL	N'	37.2	25					
		eL	Z'	37.5	27					
470	16	eL	Z'	22 20.7	26					USCGS 15.3 S 172.8 W H 22 03 14
		M	Z'	23.8	17			1		h 33 km ca Mag 4.7
	17	(Pg)	E	06 57 26.3						Quarry blast
		iSg	NEZ	57 29.6	0.6	+0.07	+0.03	-0.04		
		i	E	57 30.2	0.6		+0.04			
		i!	N	57 31.1	0.6	-0.40				
		m	N	57 32	0.6	0.44				
		i	EZ	57 33.2	0.7		+0.12	+0.15		
		m	EZ	57 34	0.7		0.16	0.21		
471	17	(P)	Z	07 53 43½		Microseisms present				USCGS 19.6 S 169.0 E H 07 48 58.5
		eL	Z'	59.5		Feeble				h 58 km ca Mag 4.5
	17	i	EZ	23 04 08.6	0.4		-0.04			Quarry blast
		i(Sg)	N	04 11.7	0.5	+0.05				
		m	N	04 13½	0.7	0.12				
		m	EZ	04 16	0.7		0.07	0.09		
	18	i	E	01 40 38.4	0.3		+0.04			Local Seismic ?
		i	N	40 38.6	0.3	+0.03				
		m	Z	40 41	0.5			0.02		
	18	e	E	05 30 42½						Local Seismic ?
		m	NE	30 44	0.5	0.02	0.03			
	18	iSg	N	07 03 48	0.5	-0.05				Quarry blast
		i	E	03 49	0.4		+0.03			
		m	N	03 50½	0.7	0.35				
		m	EZ	03 53	0.7		0.04	0.05		
472	18		Z'	16 27		Feeble surface waves				
	18	i(P)	NEZ	17 42 08.2	0.6	+0.06	+0.02	+0.02		Local ?
473	18	e(SKS)	N'E'	18 24.3						USCGS 47.5 N 154.9 E H 18 01 47.6
		M	N'Z'	47.5	18	½		½		h 33 Mag 5.3 5 Pal
474	18		Z'	21 22		Feeble surface waves				USCGS 39.3 S 74.7 W H 20 33 53.3
										h 26 km ca Mag 5.3
	19	(Pg)	Z	06 26 05½	0.5					Quarry blast
		i(Sg)	N	26 10.2	0.5	+0.02				
		i	E	26 10.4	0.4		-0.03			
		i	Z	26 10.8	0.5			+0.04		
		i	N	26 12.9	0.4	+0.08				
		m	N	26 14½	0.7	0.17				
		m	EZ	26 17	0.7		0.09	0.08		
475	19	eL	Z'	10 40.4						USCGS 38.8 N 139.3 E H 10 05 36.4
										h 30 km ca Mag 5.6 5½ Brk
476	19	M	N'E'Z'	11 14	18	½	½	½		USCGS 22.6 N 121.0 E H 10 34 33.6
										h 33 km ca Mag 5.2
	19	(P)	NZ	13 35 22		Masked by microseisms				USCGS 22.2 N 143.3 E H 13 25 52
										h 121 km ca Mag 4.6

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Jun 20	i	EZ	02 28 30.3	0.5		-0.02	+0.02		Quarry blast ?
		i	N	28 31.5	0.7	0.05				
		m	EZ	28 34½	0.7		0.08	0.11		
	20	i	E	03 49 42.7			+			Microseisms present
	20	i	E	04 50 55			+			Microseisms present
	20	(ePg)		05 48 20½						
		iSg	NE	48 25.5	0.4	+0.03	-0.02			Quarry blast
		i	N	48 28.8	0.4	+0.10				
		m	N	48 30½	0.7	0.25				
		m	EZ	48 33	0.8		0.05	0.06		
477	20	eL	Z'	10 15.6	22					USCGS 19.9 S 174.1 W H 09 59 08.9
		M	E'Z'	17.3	19		½	½		h 33 km ca Mag 4.7
478	20	(eL)	Z'	16 22.6	(30)					USCGS 3.3 S 142.4 E H 16 06 44.3
		M	N'E'	26	17	1	1½			h 33 km ca Mag 5.5
		M	Z'	27	17			½		
479	21	(P)	Z	01 45 42		Micross present		L P		records confused by 1 p wanderings
		(eL)	Z'	02 13	30					USCGS 51.0 N 157.0 E H 01 33 11.2
										h 51 km ca Mag 5.7
480	21		N'Z'	22 01		Feeble surface waves masked by microseisms etc				
481	21	e	N'	22 34.6	17	3				Masked by micross and 1 p wanderings
		eL	Z'	35.4	30					
		L	Z'	36.2	30			3		
		M	N'	36.6	16	2				
482	22	(eP)	Z'	00 23 33		Masked by microseisms				E' confused by 1 p wanderings
		e	Z'	23 53						USCGS 15.7 S 172.8 W H 00 16 27.4
		i(PP)	E'Z'	25 16	7			-3		h 33 km ca Mag 5.1
		e	Z'	29 25	19			1½		
		e(S)	N'E'	29 32	17	1½	3			
		e	N'	32 14	22	5				
		eL	Z'	34.0	25					
		M	N'	37.0	15	6				
		M	Z'	38.0	18			10		
		M	E'	38.3	17		6			
483	22	iP	Z	03 08 58	1.1			-0.09	2780	Dilatation
		iP	Z'Z"	08 59	8			+6	25°.0	Compression
		i	Z'Z"	09 17	7			+4		E' confused by 1 p wanderings
		i	N'E'	09 19	7	+5	+			USCGS 10.4 S 161.1 E H 03 03 37.9
		m	Z'	09 25	8			9		h 70 km ca Mag 5.4
		eS	N'	13 17	9					
		i	N'	13 33	8	+6				
		e	Z'	13 34	22			7		
		i	N"	13 54	8	+9*				
		i	Z'	14 07	11					
		i	E'	14 08	9		+9			
		eSS	N'	14 16	28	8				
		i	E'	14 21	9		+12			
		eL	Z'	14 44	25					
		eL	E'	15 03	32					
		L	Z'	15.8	30			23		
		L	N'E'	15.9	30	17	11			
		M	Z'	16.3	23			19		
		M	N'	16.4	22	16				
484	22	e	N'	07 40.0	14	Masked by micross & 1 p wanderings				USCGS 18.0 S 167.6 E
		eL	Z'	.41.7	21					H 07 30 59.5 h 33 km ca Mag 4.7
		M	Z'	47.4	15			½		
485	22		N'	13 54		Feeble waves masked by micross & 1 p wanderings				USCGS 25.1 S 177.4 W H 1340 02.8
										h 121 km ca Mag 5.1
486	23	iP	Z	01 38 23.5	1.7			-0.64	8540	Dilatation
		iP	N'Z'N"Z"	38 24	9	+7		-20	76°.8	
		m	Z	38 27	1.7			1.19		USCGS 43.3 N 146.1 E H 01 26 37.0
		ipP	N"	38 33	4	+3*				h 77 km ca Mag 6.2, 7 Pas, 6¾-7 Brk,
		isP	Z"	38 38	5			+12*		6¾ Pal
		i	N'Z'	38 42	6	+7		-24		cont next page

No	Date	Phase & Component		Time (G.M.T.) h m s	Per s	Amplitude AN μ	Amplitude AE μ	Amplitude AZ μ	Δ km	Remarks
486 cont	1964 Jun 23	i	N'Z'	01 38 50	20	-9		+24		
		i	Z	38 52.5	1.2			+0.51		
		iPP	Z'	41 16	10			-8		
		iPP	N'	41 17	10	+5				
		e	N'	43 10	24					
		e	Z'	47.2	32			6		
		iS	E'Z'E"	48 07	18		-15	-15		
		iS	N'N"	48 08	18	-28				
		i	N"	48 18	8	+11*				
		i	N"	48 30	9	+21*				
		iScS	N'	48 32	15	+30				
		i	E'E"	48 36	16		+5			
		i	Z'	48 46	25			-22		
		i	N'	49 49 29	40	+28				
		i	E'E'	49 52 41	24		+8			
		iSS	N'E'	53 12	24	+14	10			
		i	E'	58 38	23		+26			
		i	Z'	59 00	20			+23		
		iLQ	E'	59 13	40		+43			
		iLR	N'	02 02 20	42	+63				
		iLR	Z'	02 30	40			-95 ca		
		L	E'	02.8	32		41			
		M	N'Z'	04.5	32	70 ca		105 ca		
		M	E'	05.7	25		25			
		M	N'Z'	06	27	56 ca		80 ca		
		e	N'Z'	03 42	50	10		12		
487	23	eL	Z'	19 31.7	38					USCGS 3.0 N 126.6 E H 19 10 11.4 h 33 km ca Mag 5.3
	24	i	E	01 57 13.6	0.5		+			Local Blasting ?
		i	N	57 14.3	0.5	+				
		m	N	57 15	0.5	0.10				
		m	EZ	57 15½	0.4		0.08	0.05		
	24	(Pg)	E	06 53 04.7	0.5	Masked by microseisms				Quarry blast
		iSg	N	53 09.1	0.5	+0.03				
		i	N	53 11.7	0.5	+0.12				
		m	N	53 14	0.6	0.33				
		m	EZ	53 16	0.7		0.11	0.08		
488	24	(P)	Z	11 41 59		Masked by microseisms				
		eT	NEZ	58.5	0.5					
	24	(iP)	Z	15 05 31	1.1			+		Masked by microseisms USCGS 7.1 S 155.6 E H 14 59 58.7 h 123 km ca Mag 5.0
	25	i	N	05 39 29.5	0.5	-				Local Seismic ?
		i	E	39 29.7	0.4		+			
		m	E	39 31½	0.5		0.04			
	25	i(Sg)	N	06 41 40.7	0.5	+0.02				Quarry blast
		i	E	41 41	0.4		+0.02			
		i	Z	41 41.5	0.5			+0.01		
		m	N	41 43½	0.7	0.13				
		m	EZ	41 46	0.7		0.05	0.04		
	25	ePg	Z	07 26 25.5						Quarry blast
		iSg	EZ	26 29.5	0.4		+0.06	-0.05		
		m	N	26 31½	0.7	0.11				
		m	EZ	26 34	0.7		0.12	0.15		
	26	i	EZ	01 49 51.5	0.4		-0.05	+0.02		Local Quarry blast ?
		m	N	49 56	0.7	0.11				
		m	EZ	49 59	0.7		0.04	0.05		
	26	i(Sg)	NZ	06 00 23.7	0.5	-0.04		+0.01		Quarry blast ?
		i	E	00 24.2	0.5		+0.04			
		m	NZ	00 26½	0.7	0.08		0.12		
		m	E	00 27	0.6		0.06			
	26	e	N	06 41 35	0.5					Regional ? Seismic ?
		m	N	41 46	0.6	0.03				
		m	E	41 50	0.6		0.02			

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Jun 26	m	N	06 43 04	0.7	0.02				Regional ? Seismic ?
	26	ePg	EZ	07 55 46½						Quarry blast
		iSg	N	55 50.9	0.5	-0.02				
		i	Z	55 51.3	0.5			+0.03		
		i	E	55 51.5	0.5		+0.04			
		m	N	55 55	0.7	0.12				
		m	EZ	55 57½	0.7		0.05	0.08		
489	26	iP	Z	13 15 22.7	0.6			+0.02		Microseisms present USCGS 12.6 S 169.4 E H 13 10 28.9 h 648 km ca Mag 4.9
490	26	e	E'	13 42 56	13		1			Masked by microseisms USCGS 9.2 S 158.9 E H 13 32 52.3 h 17 km ca Mag 5.6
		e	N'	42 58	13	2				
		eL	N'	44.2	25					
		M	N'	46.6	16	2				
		M	E'	48.3	11		4			
	27	e	EZ	05 41 09	0.4					Local Seismic ?
	27	(Pg)	EZ	06 15 18	0.4					Quarry blast
		iSg	E	15 22.5	0.4		+0.06			
		iSg	NZ	15 22.7	0.5	-0.03		+0.09		
		i	N	15 25.5	0.6	+0.09				
		m	N	15 27	0.6	0.12				
		m	EZ	15 29½	0.7		0.13	0.14		
	28	e	N	01 00 41.3	0.5					Local Seismic ?
		e	N	01 04	0.5					
		m	E	01 17	0.6		0.02			
	28	e	N	01 10 48½	0.5					Local Seismic ?
		e	E	10 54½	0.6					
491	28	eP	Z	12 58 03	1.3				3620	Compression
		iP	Z'	58 05	5			+4	32°.6	H 12 51 33
		i	Z	58 11	1.3			+0.26		USCGS 1.7 S 149.6 E H 12 51 34.6
		i	Z'Z"	58 12	5			+7		h 7 km ca Mag 6.4 5¾-6 Brk
		ePP	N'	59 14	8	3				
		e	Z'	59 19	7					
		iPPP	N'Z'	59 27	8	-6		+5		
		e	N'	13 03 09	16	4				
		eS	E'	03 15						
		i	N'	03 25	18	+20				
		e	Z'	03 30	27			10		
		i	E'	04 22						
		iL!	E'	05 38	40		-40			
		iSSS	N'	05 42	16	+20				
		iL	N'	06.3	30	+23				
		L max	E'	06.7	34		85			
		eL	Z'	06.8	42					
		L max	N'	07.0	30	38				
		L max	Z'	07.5	42			32		
		M	E'	09.9	17		43			
		M	N'Z'	10.5	20	36		31		
		M	N'Z'	11.6	19	41		59		
	28	e	N	13 42 50	1					Regional
492	28	iP	Z	14 57 15.5	0.8			-0.06		Dilatation USCGS 13.2 S 167.1 E H 14 52 08.4 h 215 km ca Mag 5.4
		i	NE	57 16.3	0.7	+0.03	+0.05			
		m	Z	57 17	1.0			0.39		
		iPcP	Z	15 00 44	0.8			+0.04		
493	28	M	E'	15 36	16		2			Confused by 1 p wanderings
		M	N'Z'	37	23	2		2½		
494	28	e(PKP)	Z	17 47 51		N'E'Z' masked by microseisms and 1 p wanderings				USCGS 4.0 N 32.4 W H 17 27 59.8 h 33 km ca Mag 5.3 5¼-5½ Pal
		(eL)	Z'	18 40						
		M	N'Z'	49	20	1		1½		
	29	iPg	EZ	06 55 04.1	0.3		(+)	+0.04		Compression
		iSg	N	55 07.7	0.3	+0.05				Quarry blast
		i	EZ	55 08.0	0.4		-0.10	+0.10		
		m	N	55 10	0.5	0.07				

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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
cont	1964			h m s	s	μ	μ	μ	km	
	Jun 29	i	EZ	06 55 11.2	0.7		+0.09	+0.15		
		m	EZ	55 12	0.7		0.18	0.21		
	30	i	EZ	01 55 56	0.4		+0.04	+		Local Non seismic ?
		m	N	55 57½	0.4	0.05				
		m	EZ	55 59	0.4		0.07	0.06		
	30	i	N	06 23 55	0.6	+0.02				Local Non seismic ?
	30	e	NE	06 54 29						Local Non seismic ?
		m	EZ	54 34	0.8		0.08	0.04		
	30	i	EZ	07 04 04.8	0.3		-0.05	+0.05		Local Non seismic ?
		m	N	04 06½	0.7	0.02				
		m	EZ	04 09	0.7		0.06	0.06		
495	30	eP	N'E'Z'	13 54 18					4760	Microseisms present
		e	Z	54 19					42°.8	H 13 46 17
		i	N'E'Z'	54 23	9	+8	-6	-17		USCGS 0.8 S 122.5 E H 13 46 21.6
		i	N"E"Z"	54 24	8	-10*	+7*	+35*		h 36 km ca Mag 6.3
		ePP	E'	56 00	20		7			
		iPcP	N'Z'N"Z"	56 11	6	-17		+17		
		iS	N'E'N"E"	14 00 43	20	-64	-57			
		i	N'	03 17	20	+32				
		iSS	E'	03 40	34		-66			
		iSS	N'	03 46	34	+120				
		i	Z"	04 00	9			+39*		
		iScS	N'E'	04 16	16	-101	-100			
		L	N'E'	05	55	74	78			
		eLR	Z'	06.5	50					
		M	N'	07.0	40	116				
		M	E'	07.7	36		118			
		M	N'E'	09.2	22	133	116			
		M	E'	12.0	20		100			
		M	N'Z'	12.9	21	100		118		
496	30	(P)	Z	19 55 23						Masked by microseisms
		e(S)	N'	20 01 45	(15)					USCGS 0.0 122.9 E H 19 47 22.5
		e	E'Z'	05.2	17					h 33 km ca Mag 4.9
		eL	E'	08.0	35		2			
		eL	Z'	08.7	40			1½		
497	30	iP	Z	20 19 59.5	0.7			-0.05		Dilatation
										USCGS 46.6 N 144.6 E H 20 08 28.5
										h 383 km ca Mag 5.5
	30	i	Z	22 13 53.5	0.2			+0.08		Local Non seismic ?
498	30	e	N'	23 29 03	8	3				Masked by micross & l p wanderings
		M	E'	37.3	19		2			USCGS 0.3 S 122.6 E H 23 14 33
		M	N'	40.6	14	3				h 56 km ca Mag 5.3
		M	Z'	41.0	15			2		
	July 1	i	NEZ	02 02 33.2	0.5	-0.10	+0.06	+0.02		Quarry blast
		m	E	02 34	0.4		0.22			
		m	N	02 34½	0.4	0.62				
		m	Z	02 35	0.4			0.19		
	1	i	E	03 54 01½	0.3		+0.04			Local Seismic ?
		i	N	54 04	0.5	+0.02				
	1	i	NE	05 46 21½	0.5	+0.01	+0.03			
	1	i	NE	06 38 16.8	0.4	+0.03	+0.04			Quarry blast
		i	Z	38 17.0	0.5			+0.04		
		m	N	38 19½	0.7	0.23				
		m	EZ	38 21½	0.7		0.09	0.09		
	1	iPg	EZ	06 58 24.2	0.4		+0.03	+0.02		Compression Quarry blast
		iSg	N	58 27.8	0.4	-0.03				
		i	EZ	58 28.3	0.3		-0.11	+0.14		
		m	N	58 30	0.7	0.16				
		m	EZ	58 32½	0.7		0.21	0.26		
	1	i	E	07 02 19	0.7		+0.05			Local ? Seismic ?

No	Date	PHASE & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
499	July 1	iP	Z	09 32 30	1.2			+0.08		Compression
		eL	E'	41.0	36					USCGS 2.0 S 141.2 E H 09 25 54
		eL	Z'	42.4	34					h 33 km ca
		M	E'	44.8	15		1			
		M	N'	45.9	16	1				
500	1	e(S)	E'	10 08 45	10					Masked by microseisms
		eL	E'	19.5	36					USCGS 45.2 N 150.3 E H 09 46 49.6
		M	N'	27 .0	21	1				h 75 km ca Mag 4.8 5-5¼ Pal
		M	Z'	32.8	20			1		
501	1	iP	Z	13 41 02.0	1.1			+0.10		Compression USCGS 1.8 N 127.1 E
										H 13 33 10 h 33 km ca Mag 4.5
	2	i	NE	03 18 35.6	0.5	+0.03	+0.03			Local Seismic ?
502	2	eP	Z	05 11 44½						Masked by microseisms
		e	Z	11 54	1.3			0.11		USCGS 1.2 N 118.9 E H 05 03 35
		e	N'	19.2						h 133 km ca
		e	Z'	22.3	17					
		eL	N'	26.3	30					
		M	E'	29.0	22		½			
		M	N'	29.5	22	1				
		M	Z'	33.6	16			½		
	2	i	EZ	06 59 26.5	0.5		+0.01	+0.02		Local Seismic ?
		i	Z	59 30.6	0.5			+0.02		
503	2	iP	Z	12 19 09.0				+		Compression Microseisms present
		i	E	19 13.5			+			USCGS 1.0 N 124.3 E H 12 11 22
		i	Z	19 16.5				+		h 160 km ca
		e(SS)	N'	28.6						
		e	E'	28 40	(8)					
		e(L)	N'	33	(22)					
504	2	e(L)	Z'	17 53.6	25					Confused by micross & 1 p wanderings
										(USCGS 47.7 N 128.8 W H 17 17 34.4
										h 14 km ca Mag 5.0 5½ Pal)
	2	i	E	22 49 20.5	0.4		-0.03			Local Seismic ?
		i	Z	49 21	0.5			+0.02		
		m	N	49 26	0.7	0.06				
		m	EZ	49 28	0.7		0.06	0.06		
	3	i	E	00 43 49.2	0.4		+0.03			Quarry blast ?
		i	N	43 52.3	0.4	+0.05				
		m	N	43 54	0.7	0.11				
		m	EZ	43 56½	0.7		0.05	0.06		
	3	i	E	02 12 14.6	0.5		+0.03			Quarry blast ?
		i	Z	12 14.9	0.6			+0.06		
		m	N	12 19	0.6	0.10				
		m	EZ	12 21½	0.7		0.11	0.11		
	3	i	E	04 36 01.5	0.3		-0.06			Local blasting ?
		i	N	36 01.8	0.3	+0.12				
		i	Z	36 01.9	0.3			-0.19		
		m	NEZ	36 03	0.3	0.15	0.24	0.35		
	3	iSg	N	06 21 26.7	0.6	+0.05				Quarry blast
		i	EZ	21 27	0.5		+0.03	+0.04		
		m	N	21 29	0.6	0.29				
		m	EZ	21 31½	0.7		0.07	0.10		
505	3	M	N'E'	14 07						Masked by micross & 1 p wanderings
506	3	eL	N'	22 07						Masked by micross USCGS 21.9 S
										170.1 E H 21 58 08.1 h 45 km ca
	4	(ePg)	Z	01 21 22	0.3					Masked by micross Quarry blast ?
		i(Sg)	E	21 26	0.4		+0.05			
		i	Z	21 26.2	0.4			+0.05		
		m	E	21 29 ½	0.7		0.06			
		m	N	21 30	0.6	0.03				
		m	Z	21 31	0.6			0.06		
507	4	(iP)	Z	10 57 50.5						Masked by microseisms
		e(S)	N'	11 04 28	20					USCGS 11.7 N 144.5 E H 10 49 28.8
		m	N'	05.0	20	4				h 33 km ca Mag 6.0

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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
507	Jul 4	e	Z'	11 05.4	17					
cont		e(SS)	N'	07.8	18	2				
		e	Z'	08.1	18			3		
		(LQ)	E'	09.4	40					
		L	E'	11.0	28		5			
		eL	Z'	11.3	38					
		M	E'	16.2	17		4			
		M	N'Z'	16.5	20	4		5		
508	5		Z'	15 35						Feeble waves masked by micross
	5	(P)	Z	18 05 52						Masked by micross
										USCGS 11.9 N 142.4 E H 17 57 30.9
509	5									h 20 km ca Mag 5.0
		e(PP)	Z'	19 27.3						Masked by micross
		e	N'	35 03	15	1½				E' confused by 1 p wanderings
		e(PS)	Z'	36 47	21			1		USCGS 26.2 N 110.2 W H 19 07 57.8
		e(SS)	E'	42.7	20		1½			h 29 km ca Mag 6.0 5¾-6 Brk
		e	N'	42 47	26	3				6-6¼ Pal
		e(SSS)	Z'	46 29	25			1		
		eL	N'	53.4	42	4				
		eLR	Z'	55.5	50					
		M	N'E'	20 00.3	27	5	12			
		M	Z'	00.6	27			16		
		e	N'	51.0	60					
		e	Z'	21 06.3	45 ca					
		M(W2)	Z'	20	23			3		
510	5	(eP)	Z'	23 48 00						Masked by micross
		i	Z'	48 11	5			-6		USCGS 44.8 N 149.6 E H 23 36 01.5
		e	Z'	57 52	21			3		h 54 km ca Mag 5.5 6¼ Pas 6-6¼ Pal
		iS	E'	57 54	21		-6			
		i	N'	57 56	21	-5				
		e	N'	58.6	21	4				
		eLQ	E'	24 08.8	38		9			
		M	E'	19.5	20		6			
		M	N'	19.8	21	9				
		M	Z'	20.0	21			10		
	6	i	NZ	00 43 31	0.2	-0.10		+0.12		Local blasting ?
	6	i	NEZ	01 15 27.5	0.2	+0.08	+0.16	+0.20		Local blasting ?
	6	i	E	01 17 18.5	0.5		+0.03			Local Seismic ?
		m	N	17 19½	0.7	0.03				
511	6	(ePKP)	Z'	02 33 11						Masked by micross
		e(S)	N'	41 42	15	3				E' confused by 1 p wanderings
		ePS	Z'	43 22	21					USCGS 26.2 N 110.4 W H 02 14 36.0
		e	E'	43.5	14		4			h 33 km ca Mag 5.4 6-6¼ Brk Pal
		e(SS)	Z'	48.9						
		eSS	N'	49.2	20	5				
		e	E'	49.5	22					
		e(SSS)	Z'	53 08						
		eSSS	N'	53 35	20	2				
		eG	N'	03 00.0	50	14				
		eL	Z'	00.5	42					
		eL	Z'	03.0	45					
		M	N'E'	06.8	27	12	25			
		M	Z'	07.2	27			34		
		MW2	E'Z'	04 26.5	23		5	7		
		M	N'	27.8	23	4				
	6	i	NE	05 54 39.5	0.5	+0.01	+0.04			Local Seismic ?
		i	Z	54 41	0.5			+0.01		
512	6	(eP)	Z'	07 36 56						Masked by micross
		eP	Z'	37 10	30				12800	E' confused by 1 p wanderings
		(ePKP)	Z'	40 37				3	115° ca	USCGS 18.3 N 100.4 W H 07 22 11.7
		ePP	Z'	41 49	33					h 100 km ca Mag 6.3, 6¾-7 Pas Brk
		PP	Z'	42.2	33			11		7¼-7½ Pal
		e(PPP)	Z'	44.4	26			5		
		e(SKS)	E'	47 28	10		4			

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No	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
512 cont.	July 6	i(SKKS) E'	07 48 41	14			+5		
		e(S) N'	49 36	36	5				
		e Z'	50 12	38			8		
		iPS ! E'Z'	51 27	26		-23	+31		
		i Z'	52 00	26			+18		
		m E'	52.3	26		44			
		i Z'	53 00	30			+27		
		i E'	53 12	30		+24			
		m Z'	53.7	30					
		e E'	54 44	32		17			
		e Z'	55.1	22			7		
		e(SS) E'	57.1	28		9			
		eSS Z'	57.5	52			21		
		SS N'	57.9	35	21				
		iSS ! E'	57 59	40		-58			
		iSSS Z'	08 01 26	46			-33		
		eSSS E'	01 27	46					
		i E'	01 50	40		+42			
		m Z'	02.0	46			45		
		e Z'	05.8	42			18		
		iLQ ! N'	09 17	46	+43				
		L Z'	10.0	50			23		
		L N'	10.4	40	76				
		iLR ! E'Z'	14 57	38		+40	+39		
		M E'Z'	16.0	30		70	88		
		M N'E'Z'	16.9	25	15	63	97		
	6	i E	07 48 28	0.8		+0.04			
513	6	iP Z	10 11 47	0.7			-0.05		Dilatation. USCGS:6.3S,154.7E
		M N'Z'	20.6	22	4		5		H 10 06 02.3, h 49 km.ca. Mag.6.4
514	6	i(P) Z	12 39 32½	1.3			+0.02		Masked by microseisms.
		e N'	43 34	?					USCGS:17.8S, 167.5E, H 12 34 35.8, h 33 km.ca., Mag. 4.3
515	6	iP EZ	14 26 17.2	1.0		+0.04	+0.13		Compression. N'E'Z' masked by micro-
		i(sP) Z	26 49.5	1.5			+0.26		seisms & long-period wanderings.
		i E	34 01	1.0		+0.07			USCGS: 6.9S, 129.6E, H 14 19 46.3,
		e N	34 04½	2					h 100 km.ca., Mag. 5.8
		M N'	39.7	16	2				
516	6	iP Z	19 55 54.5	1.5			+		Compression
		iP Z'Z"	55 55	3			+2		
		m EZ	55 56½	1.5		0.22	0.86		USCGS: 21.2S, 173.8E, H 19 50 42.1,
		e(S) E'Z'	20 00 12	10					h 22 km.ca., Mag. 4.8
		e N'	00 13	7	3				
		i N'	00 41	7	+3				
		i N'	01 05	9	-4				
		eL Z'	01.9	28			9		
		eL E'	02.1	25		7			
		M N'Z'	03.0	19	5		6		
		M E'	03.4	20		6			
	7	i NEZ	01 34 57	0.2	+0.22	+0.20	(+)0.08		Local blasting ?
	7	i NE	03 24 04	0.6	+0.03	+0.02			Local. Seismic ?
	7	i NE	04 23 29.5	0.2	+0.16	-0.12			Local blasting ?
		i Z	23 29.7	0.2			+0.10		
	7	i NEZ	06 00 39.5	0.3	+0.06	+0.04	+0.05		Blasting ?
		m E	00 41½	0.4		0.10			
		m NZ	00 43	0.4	0.11		0.16		
	7	iPg EZ	06 57 02.7	0.3		+0.02	+0.03		Compression. Quarry blast.
		iSg NEZ	57 06.7	0.4	+0.07	+0.08	+0.13		
		m N	57 09½	0.6	0.37				
		m EZ	57 11½	0.5		0.08	0.06		h 60km.ca.)
517	7	Z'	07 10	Feeble long waves.					(USCGS: 8.8S, 110.7E, H 06 44 49.2/
518	7	e N'	07 50 57	13					USCGS: 23.6S, 179.9W, H 07 39 04.2,
		eL N'Z'	51.3	20					h 462 km.ca., Mag. 5.5

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No	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
519	July 7	ePg Z'	16 34 11	?					Masked by microseisms.
		e N'	39 06	13					USCGS: 11.2S, 163.2E, H 16 28 42.9
		e N'	39 21	20					h 13 km.ca., Mag. 5.1
		eL Z'	40.6	26					
		M N'	41.9	16	2				
	8	ePg Z	01 35 46	0.3					Quarry blast.
		iSg N	35 50.5	0.4	-0.03				
		i E	35 50.7	0.4		+0.04			
		i N	35 53.7	0.4	-0.06				
		m N	35 56	0.7	0.11				
		m EZ	35 58	0.7		0.06	0.05		
	8	i N	01 41 25.3	0.4	+0.03				Local. Seismic ?
520	8	eL Z'	01 52.2	24					USCGS: 15.3S, 173.1W, H 01 35 02.5
		M Z'	55.2	18			1		h 33 km.ca., Mag. 4.8
	8	i N	06 38 47.8	0.5	+0.01				Local. Seismic ?
		i E	38 51.8	0.7		+0.03			
		i N	38 55.5	0.6	+0.02				
		i Z	38 55.7	0.5			-0.03		
521	8	ePg Z'	07 53 42	5			2	4650	Microseisms present.
		e Z	53 43½	0.7				41°8	
		i Z	54 06.5	1.0			+0.08		USCGS: 3.2N, 128.4E, H 07 45 48.6,
		eS N'	59 57	(15)					h 50 km.ca., Mag. 5.5
		eSS N'	08 03 03	(20)					
		i N'	03 16	10	+4				
		eLQ N'	03,4	30	3				
		e Z'	03 25	13			1		
		eL N'	05.1	39					
		eL Z'	08.9	27					
		M E'	09	22		4			
		M N'Z'	13	19	4		6		
522	8	eP Z	11 55 05½					2990	Microseisms present.
		e N'	55 18	11	1			26°9	
		e Z'	55 23	11			2		USCGS: 6.4S, 154.8E, H 11 49 23.7
		eS N'	59 38	10	2				h 73 km.ca., Mag. 5.1
		e N'Z'	59.9	23	7		6		
		eL E'	12 01.5	30		4			
		eL N'	02.6	30	9				
523	8	iP Z	12 02 13.7	1.0			+0.30	3640	Compression
		i N'E'Z'N"E"Z"	02 16	4	-8	+4	-31	32°7	h 0.00 H 11 55 42
		m NEZ	02 18	1.0	0.38	0.30	2.16		
		e Z'	03 10	19			16		USCGS: 5.5S, 129.8E, H 11 55 39
		iPPP N'E'Z'	03 41	15	-22	+12	+28		h 165 km.ca., Mag. 6.5
		iS N'N"	07 27	11	+60				
		iS E'E"	07 28	12		+103			
		e Z'	07 40	30			21		
		i E'	09 15	22		-54			
		iSS Z'	09 24	24			+17		
		iSS N'	09 29	19	+35				
		iSSS N'E'Z'	09 50	13	-34	-43	+60		
		m N'E'Z'	10.1	13	110	80	61		
		eL N'E'	10.3	70					Waves 5 - 10 s per superposed
		eL Z'	10.7	70					on long waves.
		L N'E'	11.8	70	115	100			
		L Z'	12,5	70			100		
		M N'E'	14,5	22	95	110			
		M N'Z'	17.1	16	70		87		
		M E'	17.4	17		74			
		M Z'	18.5	17			110		
	9	i Z	01 28 21.9	0.5			-0.02		Local. Seismic ?
		i E	28 22.2	0.5		-0.02			
	9	(e) EZ	01 30 15						Local. Seismic ?
		i E	30 32.9	0.5		-0.02			
		i EZ	30 58½	0.5		+0.02	-		

No.	Date	Phase & Component	Time (G.M.T.)	Per.	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km.	
	July 9	i EZ	07 33 13.5	0.5		-0.03	+0.02		Local. Seismic ?
	9	i E	01 56 05.8	0.4		-0.03			Local. Seismic ?
		i Z	56 06.2	0.5			+0.03		
		i N	56 11.0	0.5	+0.01				
		m EZ	56 14	0.7		0.05	0.05		
	9	iP NZ	04 25 51.0	0.5	(-0.01)		+0.02		Compression. Local. Seismic ??
		iS N	26 11.7	0.6	+0.05				
		iS E	26 11.8	0.6		+0.05			
524	9	(P) Z	05 56 55.3						Masked by microseisms. N'E' confused by long-period wanderings.
		eL Z'	06 16.5	34					
		M N'Z'	23.8	19	1		1		USCGS: 15.4N, 119.8E, H 05 47 09.2, h 53 km.ca., Mag. 5.5
	9	i Z	06 24 04.5	0.4			+0.02		Local. Seismic ?
		i E	24 04.7	0.4		-0.02			
		m EZ	24 08.6	0.6		0.03	0.03		
	9	e N	06 28 11½	0.5					Local. Seismic ?
		m NZ	28 26½	0.8	0.02		0.03		
	9	(e) Z	07 46 45½						Local. Seismic ?
		i EZ	46 50.3	0.3		+0.05	+0.04		
		m N	46 52	0.6	0.02				
		m EZ	46 54½	0.7		0.03	0.04		
525	9	iP Z	11 28 21.0	0.7			+0.04	3470	Compression
		i Z	28 23.5	0.8			+0.12	31°2	
		i Z'Z"	28 24	7			+5		USCGS: 23.3S, 175.7W, H 11 22 05.4, h 43 km.ca., Mag. 5.7, 5½-5¾ Brk.
		m Z	28 26	0.8			0.13		
		e Z'	28.7	20			4		
		ePP Z'	29 24	12			3		
		ePP E'	29 26	6					
		i E'	29 47	6		+9			
		i Z'	29 49	6			+7		
		e Z'	30 27	16			3		
		iS N'	33 24	6	+3				
		iS E'	33 25	12		-4			
		e E	33 41	25		7			
		e N'	33 44	27	4				
		i Z'	33 51	24			+11		
		e Z'	34 57	22			5		
		iSS N'	35 10	15	-7				
		iSSS N'	35 35	18	+30				
		e Z'	35 41	28			14		
		eL E'	35.9	30		11			
		i N'	36 07	19	+20				
		eL Z'	36.3	?					
		L Max. N'	36.6	21	28				
		iLR E'Z'	36 41	30		+37	+32		
		LR Max. Z'	37.2	28			91		
		LR Max. E'	37.4	28		68			
		M N'	38.0	17	30				
	9	(P) Z	12 13 11	Microseisms present.					USCGS: 34.2N, 140.9E, H 12 02 11.9 h 49 km.ca., Mag. 5.0
526	9	eP Z	16 44 50	1.0				2570	h 0.015 ca.
		i NEZ	44 52.3	1.0	-.10	-0.09	+0.26	23°1	
		i N'E'Z'	44 53	4	-190	-195	+420		USCGS: 15.5S, 167.6E, H 16 39 49.3, h 121 km.ca. Mag 6.6
		i NEZ	44 54.3	1.5	+3.58	+4.00	-14.94		7½ Pas.
		i NEZ	45 00.5	1.0	-1.02	-1.15	+3.00		7½-7¾ Brk.
		i N'E'Z'	45 01	6	+63	+61	-100		
		ipP N'E'	45 18	8	+65	+81			
		isP E'Z'	45 30	18		+105	-160ca		
		i N'	45 32	18	+115				
		iPcP Z	48 35	1.3			-1.21		
		iS N'	48 48	?	-				After iS L.P. records indecipherable. Galitzins indecipherable from 16h 44m 53s.
		iS E'	48 49	13		-104			
		i N	48 57	3.5	-30				
		i E	48 59	2.0		+3.78	+2.7		

Continued on next page.

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
526 cont	July 9	f	E	16 49 06	2.4		+8.81			
		m	N	49 07	3.3	62				
		i	N	49 23	2.5	-6.9				
		m	N	49 38	3.0	29				
		f	Z	49 50	3.0			+22		
		f	E	49 53			+			
		fScP	Z	52 02	3.0			-11		
		f(ScS)	NE	55 50	2.5	-3.58	+3.50			
		e	N'	18 57	90					
		e	Z'	19 00	90					
		X	N'	20	70	17				
527	9	eP	Z'	21 50 23						Masked by microseisms
		e(S)	N'	55 45	15					USCGS 1.8 S 141.6 E H 21 43 46.3
		e	N'	56 05	15					h 33 km ca
		eLR	N'Z'	22 00.0	38	3½		4½		
		M	E'	02.7	16		6			
		M	N'	03.1	16	4½				
	10	f	Z	01 48 44.7	0.7			+0.03		Local Seismic ?
528	10	eL	Z'	05 21.1	27					
	10	f	NE	05 55 44.3	0.5	+0.02	-0.03			Local Quarry blast
	10	f(Sg)	N	06 15 53	0.5	+0.02				Quarry blast
		i	E	15 53½	0.5		+0.02			
		m	N	15 57	0.7	0.08				
		m	EZ	16 00	0.7		0.06	0.06		
	10	fPg	EZ	06 18 17.1	0.4		+0.04	+0.04		Compression Quarry blast
		fSg	N	18 20.7	0.4	-0.07				
		i	E	18 21.1	0.3		+0.11			
		i	Z	18 21.3	0.3			+0.21		
		f	Z	18 22.7	0.5			+0.06		
		m	N	18 23½	0.6	0.28				
		m	EZ	18 25½	0.7		0.26	0.35		
529	11	e	N'	01 46.7						Masked by micross and l p
		eL	Z'	49.9	27					wanderings
		M	Z'	52.8	17			4		USCGS 7.3 S 148.0 E H 01 36 16.3
		M	N	53.0	16	4				h 58 km ca Mag 5.1
?	11	e	Z	02 06 21						Quarry blast
		m	N	06 25	0.7	0.08				Masked by micross
		m	EZ	06 28½	0.7		0.03	0.05		
	11	i	N	03 20 10.8	0.4	+0.02				Local Seismic ?
		i	Z	20 11.1	0.4			+0.03		
		f	E	20 11.3	0.4		+0.04			
	11	i	NE	04 44 06.4	0.4	+0.03	+0.12			Quarry blast
		f	N	44 06.9	0.3	+0.11				
		m	E	44 07	0.5		0.38			
		m	NZ	44 08½	0.5	0.12		0.14		
	11	fPg	EZ	06 07 35	0.3		+0.04	+		
		fSg	E	07 38.9	0.3		+0.10			
		f	NZ	07 39.1	0.3	+0.05		+0.14		
		m	N	07 41	0.6	0.08				
		m	EZ	07 43½	0.7		0.16	0.21		
	11	i	N	06 28 25	0.5	+0.01				Local Seismic ?
		m	E	28 29½	0.7		0.04			
		m	NZ	28 33	0.7	0.02		0.04		
	11	(P)	Z	06 46 23						Micross present
										USCGS 11.7 S 166.6 E H 06 40 45.6
530	11	iP	Z	15 44 03.2	1.0			+0.06		h 33 km ca Mag 4.4
										Micross present
										USCGS 5.8 N 126.4 E H 15 35 53.1
531	11	iP	Z	17 37 17	0.8			-0.04		h 152 km ca Mag 5.0
										Micross present
										USCGS 15.5 S 167.7 E H 17 32 16.8
										h 143 km ca Mag 4.5

No	Date	Phase and Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
532	July 12	(eL)	Z'	02 22						Masked by micross & l p wanderings
		M	N'Z'	30	16	1½		1½		USCGS 38.6 N 139.2 E H 01 45 25.6 h 13 km ca Mag 5½-5½ Pal 6.0
	13	Pg	EZ	07 04 26.5						Quarry blast
		e(Sg)	N	04 30.2	0.4					
		i	EZ	04 30.4	0.3		+0.11	-0.09		
		m	N	04 34	0.5	0.11				
		m	EZ	04 35	0.7		0.17	0.20		
533	13	M	E'	10 20.4	16		1½			Masked by micross & l p wanderings
		M	N'Z'	21	16	2		1½		USCGS 15.9 S 167.9 E H 10 08 07.2 h 33 km ca Mag 5.4
534	13	iP	Z	11 10 37.5	1.0			+0.09		Compression Micross present USCGS 23.7 N 94.7 E H 10 58 47.7 h 117 km ca Mag 6.5
	13	(P)	Z	16 57 20						Masked by micross USCGS 8.3 S 113.7 E H 16 49 38.8 h 153 km
	14	(Pg)	Z	06 33 15½						Quarry blast
		iSg	N	33 19	0.4	-0.04				
		m	N	33 21½	0.6	0.29				
		m	EZ	33 23½	0.6		0.07	0.08		
	14	iSg	NE	07 13 34.7	0.5	+0.07				Quarry blast
		i	Z	13 35	0.5			+0.03		
		m	N	13 39	0.7	0.38				
		m	EZ	13 41½	0.7		0.08	0.10		
535	14		Z'	18 25						Long waves masked by micross & l p wanderings
536	14		Z'	18 48						Long waves masked by micross & l p wanderings USCGS 52.7 S 139.4 E H 18 38 39.1 h 36 km ca
	14	i	EZ	23 17 00.2	0.4		+0.06	+0.04		Quarry blast
		i(Sg)	N	17 03	0.5	+0.05				
		m	N	17 05	0.7	0.16				
		m	EZ	17 07½	0.7		0.06	0.09		
537	14	iP	Z'Z"	23 17 17	6			+3		Compression
		e	E'	21 48	13		2			USCGS 34.3 S 179.1 E H 23 12 12.7 h 75 km ca Mag 5.1
		e	N'	21 49	18	2				
		eLR	Z'	23.1	29			2		
		M	E'	24.8	16		2			
		M	N'	24.8	15	5				
		M	Z'	26.0	17			2		
	15	i	NEZ	01 58 04	0.3	-0.16	+0.10	+0.05		Local blasting
		m	EZ	58 05	0.4		0.07	0.06		
	15	iP	Z	04 20 08.8	0.5			+0.03		Compression Local
		i	N	20 24.5	0.5	+0.02				
		i(S)	NE	20 29.6	0.6	+0.03	+0.03			
	15	i	Z	06 00 23.0	0.4			-		Quarry blast
		i	N	00 25.8	0.4	+0.08				
		i	Z	00 26.0	0.4			+0.04		
		m	E	00 27	0.4		0.27			
		m	Z	00 29½	0.5			0.13		
	15	i(pP)	Z	08 30 49	1.0			-0.10		Masked by micross USCGS 11.3 S 166.1 E H 08 24 56.5 h 130 km ca Mag 4.7
	16	(Pg)	Z	06 51 20	(0.4)					Quarry blast Masked by micross
		i	Z	51 22	(0.4)			+		
		i	EZ	51 25	0.4		+0.05	+0.05		
		i	N	51 26	0.7	+0.03				
		m	NEZ	51 29	0.7	0.02	0.08	0.09		
	16	(iP)	Z	11 32 41	1.2			+0.12		Microseisms present USCGS 17.9 S 179.5 W H 11 27 05 h 625 km Mag 4.2
	16	(iP)	Z	23 49 03	1.3			+0.36		Microseisms present

No	Date	Phase and Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	July 17	(i)	E	02 02 20						Quarry blast
		e	Z	02 22						Masked by microseisms
		e	N	02 24						
		i	N	02 27.5	0.5	+0.07				
		m	N	02 29	0.7	0.24				
	17	m	NE	02 03 13	0.5	0.04	0.11			Quarry blast? Masked by micross
538	17	e	Z	02 53 01						Masked by micross & 1 p wanderings
		iPKP	Z	53 33	0.8			+0.07		on N'E'Z'
		i	Z'	56 53				-		(USCGS 38.2 N 23.7 E H 02 34 26.9
		e	Z'	58 02						h 150 km ca Mag 5.4 $5\frac{1}{2}$-$5\frac{3}{4}$ Brk)
		e	Z'	03 08.7						
		(L)	Z'	40	(70)					
		M	Z'	55.7	20			2		
539	17	iP	Z	04 59 58.7	0.8			+0.08		Compression Micross present
		i	Z	05 00 00.6	0.8			+0.08		USCGS 24.3 S 179.6 E H 04 55 00
		i	N	00 23.7	1.0	+0.06				h 495 km ca
		i	E	00 46.0	1.0		+0.10			
		i	N	01 06	1.2	+0.09				
		i	EZ	05 13	1.3		+0.13	-0.23		
	17	i	EZ	06 09 17	0.4		+	+		Quarry blast ? Masked by micross
		m	N	09 $19\frac{1}{2}$	0.6	0.10				
	18	i	EZ	05 53 32	0.4		-0.04	+0.03		Quarry blast ?
		m	N	53 34	0.6	0.03				
		i	Z	53 35.5	0.7			+0.05		
		m	EZ	53 $36\frac{1}{2}$	0.7		0.07	0.09		
	18	(i)	Z	12 48 $35\frac{1}{2}$						Masked by microseisms
540	18	iP	Z	12 53 38.5				+		Compression
		i	Z	54 09.5	1.1			+0.21		L P records confused by micross &
		eS	N'	59 43	10	2				l p wanderings
		i(ScS)	N'E'	13 03 13	8	-4	+3			USCGS 0.2 N 123.5 E H 12 45 47.7
		e	Z'	03 44	21					h 97 km ca Mag 5.8
		eL	Z'	06.2	43					
	18	i	E	13 38 $45\frac{1}{2}$	0.5		-			Local ?
541	19	iP	Z	06 55 24.5	1			-0.09		Dilatation Micross present
		ipP	Z	56 03.5	1			+0.07		USCGS 13.8 S 167.0 E H 06 50 22.3
542	19	eL	Z'	13 58.1	25					h 232 km ca Mag 4.6
										USCGS 15.1 S 173.4 W H 13 40 06.6
543	20	eL	Z'	04 43.5	24					h 33 km ca Mag 4.7
										Masked by micross
										USCGS 6.7 S 154.6 E H 04 29 28
	20	i(Sg)	N	06 56 10	0.6	-0.04				h 78 km ca Mag 5.0
		m	N	56 $12\frac{1}{2}$	0.7	0.31				Quarry blast Masked by micross
		m	EZ	56 15	0.7		0.08	0.09		
	20	i	N	06 32 48.5	0.6	+0.03				Local Seismic ?
		m	E	32 $53\frac{1}{2}$	0.7		0.06			
		m	Z	32 57	0.8			0.05		
544	20	eL	Z'	09 50.2	21					Masked by micross USCGS 64.5 S
545	20	(P)	Z	10 28 09						176.7 E H 09 34 22 h 33 km ca
		e	Z'	32.6						Masked by micross
		eL	Z'	34.4	24					USCGS 35.2 S 179.8 W H 10 22 53
		M	Z'	36.1	19			4		h 108 km ca Mag 4.8
		M	N'	36.6	16	5				
		M	E'	36.8	16		3			
546	20	(P)	Z'	22 48 07						Masked by micross
		e	Z'	52.8	11					
		e	N'E'	53.3	12					USCGS 35.5 S 179.7 E H 22 43 15
		eL	Z'	54.5	25					h 223 km ca Mag 4.9
		M	Z'	56.4	18			5		
		M	N'	56.7	16	6				
		M	E'	56.9	17		4			

RIVERVIEW COLLEGE OBSERVATORY
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No	Date	Phase and Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
547	July 20	e(L)	N'	23 05.6						Masked by no 546
		M	N'	08.3	15	6				{USCGS 34.4 S 179.2 E H 22 56 01
		M	Z'	08.7	15			3		h 162 km ca Mag 5.0}
548	21	eL	Z'	01 59.5						Masked by micross
549	21	iP	Z	03 54 31.2	1.5			+0.30	3190	Compression Micross present
		ipP	EZ	55 14	1.5		-0.24	+0.30	28°.7	h 0.03 ca H 03 48 53
		i	Z'Z"	55 17	4			+6		USCGS 26.0 S 178.0 W H 03 48 59.1
		e	Z	55 19	1.8			0.50		h 222 km ca Mag 5.8 6½ Pas
		e	E	55 21	2.4		0.79			5¼-5½ Brk
		i	E	55 33	1.5		-0.30			
		iPP	Z'	55 35	10			+6		
		i	E	55 38	1.7		+0.37			
		i	E'E"	55 40	11		+5			
		eS	N'E'	55 03	11	2½	1½			
		isS	N'	04 00 20	15	+8				
		e	Z'	00 33	13			4		
		i(ScP)	Z	01 03.5	1.0			+0.10		
		i	Z	01 05.3	1.0			+0.20		
		i	N'	01 14	18	+15				
		e	Z'	01.4	27			5		
		M	N'	04.0	15	8				
		i(ScS)	N'	04 57	10	-6				
		i(ScS)	E'E"	05 00	9		+4			
		i(sScS)	E'E"	06 34	10		+6			
		M	Z'	07.3	15			5		
	21	Pg	Z	06 43 45	0.5					Quarry blast
		iSg	NE	43 49.8	0.5	+0.02	-0.05			
		i	Z	43 50.2	0.5			+0.07		
		i	N	43 53.0	0.5	0.07				
		m	N	43 55	0.5	0.10				
		m	EZ	43 56½	0.7		0.14	0.16		
	21	Pg	E	06 20 16.8	0.3					Quarry blast
		iSg	N	20 20.3	0.4	-0.09				
		i	E	20 20.7	0.3		-0.07			
		i	Z	20 21.0	0.3			+0.18		
		m	N	20 23	0.6	0.43				
		i	Z	20 23.3	0.5			+0.08		
		m	EZ	20 25	0.7		0.18	0.19		
550	21	(P)	Z	13 22 20						Masked by micross
		(e)	N'	30.2	30					L P records confused by 1 p
		e	Z'	34 15	15			1½		wanderings
		e	N'	35.3	15	2½				USCGS 11.5 N 121.9 E H 13 13 00.2
		eL	N'Z'	39.5	44					h 34 km ca
		M	E'	45.2	19		2			
		M	N'Z'	47.4	20	3		2		
551	21	(iP)	Z	21 07 54½				+		Masked by micross
		e(S)	N'	12 40	24	6				USCGS 4.6 S 153.3 E H 21 01 49.5
		e	Z'	12 50	24			4		h 60 km ca Mag 4.9
		eL	N'	15.5	40					
		eL	Z'	15.8	35					
		M	Z'	17.4	23			7		
		M	N'E'	17.9	20	6	5			
	22	(iP)	Z	03 55 53.5	0.9			-0.07		Micross present
										USCGS 14.3 S 167.4 E H 03 50 51.6
										h 203 km ca Mag 4.0
	22	e(Pg)	Z	04 25 33.8						Local Seismic ?
		i	E	25 36.8	0.4		+0.05			
		i	NZ	25 37.2	0.3	+0.04		+0.07		
		m	EZ	25 40	0.5		0.14	0.09		
	22	(Pg)	Z	06 49 46½						Quarry blast
		iSg	N	49 50.5	0.4	-0.05				
		i	EZ	49 51.1	0.3		+0.09	-0.06		
		m	N	49 53	0.7	0.18				
		m	EZ	49 55½	0.7		0.15	0.17		

No	Date	Phase and Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
552	July 22	M	N'	07 50	14					Feeble and masked by micross
										USCGS 16.3 S 167.7 E H 07 37 52.4
										h 6 km ca
	23	(P)	Z	00 26 05						Local P masked by micross
		iS	NE	26 25.4	0.6	+0.08	+0.05			
	23	e	EZ	01 54 27½						Blasting ?
		i	N	54 28.5	0.5	+				
		m	NE	54 29	0.4	0.20	0.10			
	23	e	E	03 01 17.5						Blasting ?
		i	Z	01 18.5	0.3			+0.09		
	23	i	E	05 57 50	(0.5)		+			Quarry blast ?
		i	Z	57 50.5	(0.5)			+		
		i	E	57 51.3	0.5		+0.12			
		i	N	57 52.7	0.6	+0.09				
		m	Z	57 53½	0.6			0.12		
	23	i	E	06 55 34.6	0.4		+0.06			Quarry blast
		i	Z	55 34.9	0.5			+0.05		
		i(Sg)	N	55 37	0.4	-				
		m	NEZ	55 40	0.7	0.08	0.09	0.10		
	23	iSg	N	06 55 56.5	0.5	-0.04				Quarry blast
		i	EZ	55 57.1	0.4		+0.04	+0.06		
		m	NEZ	56 00	0.7	0.33	0.09	0.09		
553	23		Z'	22 55						Feeble surface waves masked by micros
	24	iPg	EZ	06 16 52.1			+	+		Quarry blast
		iSg	N	16 55.5	0.5	-0.03				
		i	EZ	16 56.0	0.3		+0.15	-0.14		
		m	NEZ	17 00	0.7	0.20	0.18	0.20		
554	24	(e)	Z'	07 03 19						Masked by microseisms
		e	Z'	03 24	9			3		USCGS 46.9 N 153.9 E H 06 50 52.8
		i(S)	E'	13 13	16		-6			h 33 km ca Mag 5.9 6 Pas Brk
		e	N'	13 18	14	4				
		e(SS)	N'	18 40	21	4				
		i(SS)	Z'	18 44	15			+4		
		eG	E'	24.5	42		12			
		eL	Z'	28.6	34			6		
		eL	N'	28.7	34	5				
		M	N'E'Z'	36	21	13	4	15		
555	24	iP	Z'	08 24 54	10			-6	9010	Dilatation
		isP	Z'	25 09	12			+8	81°.1	Micross and coda of no 554 present
		iS	N'E'	35 00	16	-17	-23			H 08 12 41
		m	Z'	35.2	16			12		USCGS 47.2 N 153.8 E H 08 12 40.0
		e	N'	35 34						h 33 km ca Mag 5.9 6½ Pas
		i	N'	35 44	18	+20				
		e	N'E'	36 25	34	13				
		iSS	N'	40 22	22	+19				
		iSS	Z'	40 30	18			+23		
		iSSS	N'	43 40	20	+10				
		(LQ)	E'	46.3	44		51			
		LR	Z'	50.4	40			31		
		iM	Z'	54.0	21			-33		
		M	N'E'Z'	58.6	20	48	25	69		
556	24	eP	Z	13 53 28					3020	Micross present
		i	Z	53 29.5	0.7			+0.08	27°.2	h 0.005 H 13 47 49
		epP	Z'	53 42						USCGS 6.6 S 154.8 E H 13 47 48.6
		eS	N'	58 00	15	3				h 62 km ca Mag 5.6
		i	Z'	58 24	19			+11		
		isS	N'	58 25	18	-15				
		e	E'	58 27	17		6			
		e	E'	59.7	33					
		i	N'	59 45	7	+13				
		i	E'	59 49	6		+13			
		e	Z'	59.9	27			4		
		LR	Z'	14 01.3	30			11		
		M	N'E'Z'	02.6	20	14	10	18		
		e	N'Z'	04.0	17	17		18		

RIVERVIEW COLLEGE OBSERVATORY
SEISMOLOGICAL BULLETIN JULY 1964

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
557	July 24	eP	Z'	17 15 00	9				9080	Microseisms present
		iS	N'E'	25 09	13	-5	-7		81°.7	H 17 02 44
		e	Z'	25 13	16			3		USCGS 47.1 N 153.6 E H 17 02 49.2
		iScS	E'	25 24	12		-			h 33 km ca Mag 5.8 6½ Pas 6 Brk
		e	N'	25.9	40	5				
		iSS	N'	30 32	23	+5				
		eSS	Z'	30 40	23			4		
		eG	E'	36.5	42		16			
		eLQ	N'	36.9	35					
		M	E'	46.0	21		7			
		M	N'Z'	48.7	20	14		19		
558	25	eL	Z'	02 41.2	30					Large micross USCGS 1.8 S 141.0 E
										H 02 24 38.9 h 48 km ca
559	25	eP	Z	12 26 32.5	0.7					Micross present
		i	Z	26 34.0	0.8			+0.04		USCGS 19.9 S 176.2 W H 12 20 22.2
										h 205 km ca Mag 5.3
560	25	(eP)	Z'	19 45.5						Masked by micross
		ePP	Z'	50 05						USCGS 27.9 S 70.9 W H 19 31 07.0
		eSKS	N'E'	56 02	18	2	1			h 26 km ca Mag 6.1 6½ Pas 6 Brk
		ePS	Z'	58.9	25					
		ePS	N'	59 06	20	4				
		ePS	E'	59 12	20		4			
		m	Z'	59.5	25			5		
		e	Z'	20 00.2	30			2		
		eSS	N'	04.1	38	5				
		eSS	Z'	04.5	38					
		m	N'Z'	05.4	26			5		
		e	Z'	12.3	28			3		
		eLQ	N'E'	16.0	45	7	6			
		eLR	Z'	20.1	30					
		M	N'E'Z'	27	19	4	4	8		
561	25	e(P)	Z	21 37 30						Micross present
		e	N'	44 07	14	2				USCGS 2.9 N 128.2 E H 21 29 33.2
		eL	N'Z'	50.2	42					h 22 km ca Mag 5.1
		M	E'	53.5	20		4			
		M	N'Z'	55.0	23	5		7		
562	26	eL	NE'	08 46.4	20	2	3			
		eL	Z'	47.5	30			2		
563	26		N'Z'	20 52						Feeble surface waves masked by micross
										(USCGS 4.1 N 126.4 E H 20 24 13.9
										h 33 km ca Mag 4.8)
	27	iSg	N	06 48 32.8	0.4	-0.09				Quarry blast
		i	E	48 32.9	0.4		+0.04			
		i	Z	48 33.0	0.4			-0.02		
		m	NEZ	48 37	0.7	0.42	0.09	0.09		
564	27	eL	N'	23 42.4	22					
		M	Z'	46.4	20			1		
	28	i	E	01 56 44.0	0.5		+0.03			Local Blasting ?
		i	N	56 45.7	0.4	-0.03				
		i	Z	56 46.5	0.5			+0.03		
	28	i	E	07 00 58.0	0.5		+0.02			Quarry blast
		i	Z	00 58.5	0.5			+0.02		
		m	N	01 04	0.6	0.04				
	28	i(Pg)	EZ	07 17 09.0	0.4		+0.04	+0.03		Quarry blast
		i(Sg)	N	17 11.5	0.5	-0.05				
		i	Z	17 12.7	0.4			-0.09		
		i	E	17 13.0	0.5		-0.06			
		m	NEZ	17 16	0.7	0.32	0.21	0.28		
	28	(i)	E	07 27 12.5	(0.5)			(+)		Local Seismic ?
		i	NZ	27 22	0.7	+0.03		+0.03		
		i	N	27 23.5	0.6	-0.05				
		m	Z	27 24½	0.7			0.06		
		m	N	27 29	0.8	0.05				
		i	EZ	27 33	0.7		-0.05	+0.05		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
565	July 28	i(P)	Z	08 04 38.8				+		Masked by microseisms
										USCGS 18.9 S 169.4 E H 08 00 00.3
										h 237 km ca Mag 4.8
	28	i	NZ	08 10 56.7	0.5	+0.02		+0.01		Local
		i	E	11 00	0.5		+0.03			
		i	NE	11 04.5	0.6	-0.03		-0.04		
566	28	eL	N'Z'	12 32.0	27	2		3		USCGS 51.2 S 139.3 E H 12 22 43.0
										h 34 km ca
567	28	iP	Z	18 44 31.0	0.8			+0.05	2260	Compression
		iP	N'Z'N"Z"	44 31	10	+34		+45	20°.3	USCGS 51.2 S 139.0 E H 18 40 04.3
		iP	E'E"	44 32	10		+15			h 33 km ca Mag 5.3
		i	Z	44 33.5	2.0			+2.55		
		ipP	Z	44 41	1.3			+0.84		
		isP	Z	44 43	1.7			+1.28		
		iPP	Z'	44 50	10			+19		
		iS	E'E"	48 12	12		+100			
		i	Z'	48 15	12			-52		
		i	N'	48 21	10	+55				
		iSS	E'	48 43			+			
		iL	N'	49 01	30	-91				
		iL	Z'	49 07	30			-		
		L max	Z'	49.6	27			330 ca		
		M	N'E'Z'	50.3	23	170	140	330		
568	28	iP	Z'Z"	21 50 00	7			-7	8070	Dilatation Micross present
		iS	E'	59 21	8		-4		72°.6	USCGS 14.3 N 96.2 E H 21 38 43.5
		e(PS)	E'	59 50	26		4			h 33 km ca Mag 5.5
		e	N'	22 00 12	27					
		e(SS)	E'	04.0	22					
		iSS	E'	04 18	18		-5			
		eSS	Z'	04 21	22			3		
		i	E'	07 57	15		+5			
		m	N'	08.3	18	6				
		eLR	N'Z'	13.0	44					
		eLR	E'	13.3	42					
		LR max	N'E'Z'	15.3	35	17	13	21		
		M	Z'	18.8	26			25		
		M	N'E'	20	20	25	16			
	29	e	E	02 07 01						Blasting ?
		i	N	07 02	0.6	-0.12				
		m	NEZ	07 03	0.3	0.98	0.22	0.12		
	29	iSg	N	07 19 55.5	0.4	+0.02				Quarry blast
		iSg	E	19 55.7	0.4		-0.07			
		i	Z	19 56	0.4			+0.05		
		m	NEZ	19 59	0.6	0.09	0.09	0.10		
	30	i	N	02 19 41	0.5	+0.01				Quarry blast
		e(Sg)	N	19 43	0.7					
		i	N	19 44	0.7	+0.07				
		m	N	19 46	0.7	0.17				
	30	e	N	03 38 40	0.5					Regional ? Seismic ?
		e	EZ	39 12	0.5					
569	30	e(PS)	Z'	05 46.6						Masked by micross
		e(SS)	E'	53.7	30		1½			USCGS 11.1 N 86.2 W H 05 16 03.3
		eL	Z'	06 14.0	25					h 42 km ca Mag 5.7 5¾-6 Pal
		M	N'E'Z'	22	17	1½	2	3		
	30	i(Sg)	N	06 46 25.7	0.4	+0.02				Quarry blast ?
		i	E	46 26.0	0.3		+0.04			
		i	Z	46 26.2	0.4			+0.03		
		m	N	46 28½	0.6	0.09				
	30	e(Sg)	N	06 56 15½						Quarry blast
		i	Z	56 16.0	0.4			+0.04		
		i	E	56 16.2	0.4		+0.04			
		m	N	56 18½	0.6	0.07				
		i	Z	56 19.5	0.7			+0.06		
		m	EZ	56 20½	0.7		0.09	0.12		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
570	July 30	e(P)	N	08 46 49½	2					Masked by microseisms
		e	Z	46 50	2					USCGS 55.5 S 147.3 E H 08 41 54
		e	E'	50 52	14			1		h 33 km ca
		eL	N'Z'	52.0	23	1		1		
571	30	iP	Z	13 18 38.5	0.7			+0.03		Compression USCGS 6.0 S 154.4 E
		iP	N	18 38.8	0.7	+0.01				H 13 12 54.3 h 79 km ca
	31	(Pg)	Z	01 59 08.7						Quarry blast
		iSg	NE	59 12.5	0.4	+0.03	+0.03			
		i	Z	59 13.0	0.5			+0.03		
		i	N	59 15.8	0.5	0.08				
		m	NEZ	59 19	0.7	0.22	0.06	0.07		
	31	e	N	02 58 59½						Regional
		e	E	59 04	0.5					
		e	Z	59 20	0.5					
		m	Z	59 44	0.5			0.03		
	31	i(P)	NZ	04 11 15.0	0.5	-0.02		+0.02		Quarry blast
		i(S)	NE	11 36.0	0.6	+0.03	+0.04			
	31	i	NZ	04 14 06.6	0.4	+0.03		+0.02		
		i	NEZ	14 10.0	0.3	+0.10	+0.06	+0.12		
		i	Z	14 12.8	0.4			+0.08		
		m	E	14 13½	0.5		0.07			
	31	e	NEZ	05 50 22	0.4					Local
572	31	eP	Z	05 58 04	1.5				3090	Microseisms present h 0.00
		e	N'Z'	58 11					27°.8	USCGS 6.1 S 149.4 E H 05 52 18.8
		i	Z	58 13	1.2			+0.14		h 63 km ca Mag 5.9
		i	Z	58 20	1.2			+0.20		
		i	Z	58 25	1.2			+0.27		
		i	N'Z'	58 26	20	-12		+19		
		i	N'Z'	59 12	16	+17		-14		
		e	N'	59.5	40	17				
		e	Z'	06 00 12	28					
		e	N'	02 04	28	7				
		e	Z'	02 14	36			20		
		e	E'	02.4	40					
		iS	N'	02 43	28	-72				
		i	Z'	02 59	30			+130 ca		
		i	E'	03 18	22		-			
		m	N'	03.3	28	120				
		m	E'	03.6	22		27			
		iSS	N'E'	04 04	15	+30	-22			
		eL	E'	04.6	36		40			
		eLR	N'	04.9	32	43				
		iL	Z'	05 42	36			+75		
		L	N'	05.9	37	86				
		L	E'	06.1	28		105			
		L	Z'	06.5	36			120		
		M	N'Z'	08.0	23	93		130 ca		
		M	E'	08.3	18		74			
		e	N'	07 29	60	10				Seismic ?
		e(W2)	N'Z'	08 33	30					
	31	iSg	N	06 27 47.2	0.5	+0.04				Quarry blast
		m	NEZ	27 51	0.7	0.14	0.04	0.03		
573	31	eP	EZ	06 31 40	0.7					USCGS 25.7 S 179.6 W H 06 26 36.7
		m	Z	31 41	0.7			0.05		h 429 km ca Mag 5.1
	Aug 1	i	N	00 47 58.0	0.5	-0.13				
		i	E	47 58.3	0.3		+0.06			
		m	NZ	47 59	0.5	0.17		0.04		
574	2	e(L)	N'	07 24.5	17	Masked by microseisms				USCGS 3.8 S 123.2 E H 07 03 11.4
		M	Z'	27.6	16					h 37 km ca Mag 5.4
575	2	eL	N'Z'	09 23.7	(30)	Masked by microseisms				USCGS 56.2 N 149.9 W H 08 36 16.9
		M	Z'	29.7	18					h 31 km ca Mag 5.4 6 Pas 4¾-5 Brk 5¼ Pal

RIVERVIEW COLLEGE OBSERVATORY
SEISMOLOGICAL BULLETIN AUGUST 1964

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Aug 3	e	E	01 59 20.3						Local blasting ?
		i	NE	59 21.1	0.3	-0.18	+0.07			
576	3	(P)	Z	07 55 10		Masked by microseisms				N' E' Z' records confused by l p wanderings
		e	N'	08 03.8	32	2				
		e(SSS)	N'	10.6	(24)					USCGS 22.6 N 121.3 E H 07 44 44.3
		(eL)	E'	14.1						h 33 km ca Mag 5.4
		e	N'	14.3	(22)					
		eL	N'	16.9	28					
		M	N'E'Z'	21	20	2	1	2		
577	3	(P)	Z	17 15 40½		Masked by micross				USCGS 8.3 S 118.7 E H 17 08 11.2
		M	N'E'Z'	33		Feeble				h 33 km ca
578	4	(P)	Z	03 43 17		Masked by micross				USCGS 2.5 S 139.8 E H 03 36 42.0
		M	N'Z'	57	17	Feeble				h 33 km ca Mag 5.7
	4	e	N	06 38 14½	0.4					Local Seismic ?
		i	Z	38 14.7	0.4			+0.02		
		i	E	38 15.0	0.4		+0.02			
		m	E	38 17	0.5		0.04			
		i	NZ	38 17.7	0.4	-0.04		+0.02		
	4	i	EZ	06 44 38.9	0.4		+0.02	+		Quarry blast ?
		m	N	44 39	0.6	0.09				
		m	EZ	44 42	0.5		0.03	0.03		
	4	e	NE	07 00 37½	0.3					Quarry blast
		m	N	00 42	0.7	0.09				
	4	i(Pg)	Z	07 07 31						Quarry blast
		i(Sg)	NEZ	07 34.9	0.5	+0.08	+0.03	-0.03		
		m	NEZ	07 41	0.7	0.41	0.09	0.10		
	4	iSg	N	07 09 18.3	0.6	-0.04				Quarry blast
		i	Z	09 18.5	0.6			-0.03		
		m	NEZ	09 22	0.8	0.41	0.11	0.11		
579	4	iP	Z	17 36 30.7	1.0			+0.09	9010	Compression
		ipP	Z	36 56.5	1			+0.05	81°.1	N' E' Z' records confused by micross and l p wanderings
		PP	Z	39 33						
		iS	E'	46 31	10		+2			h 0.01
		eLR	Z'	18 01.0	40					USCGS 46.5 N 151.1 E H 1724 29.2
		M	N'Z'	05	23	3		2		h 101 km ca Mag 5.9 5½-5¾ Brk
	4	i	NEZ	23 00 22.9	0.3	-0.17	+0.10	-		Local blasting ?
	5	i	E	07 00 03.7	0.3		+			Quarry blast Masked by micross
		i	Z	00 04.2	0.5			+		
		i	N	00 07.0	0.5	+				
		m	NE	00 10	0.7	0.12	0.09			
580	5	iP	EZ	11 11 04.4	1.5		-0.66	+2.4	2850	Compression
		iP	E'Z'E"Z"	11 05	11		-12	+20	25°.6	h 0.03 H 11 05 54
		i	Z'Z"	11 37	8			+7		USCGS 32.1 S 179.8 E H 11 06 02.6
		ipP	E'Z'Z"	11 48	7		-17	+29		h 235 km ca Mag 5.8 6¾ Pas 5½ Brk
		i	E"	11 51	7		+28*			
		i	Z	11 53.5	2.3			+5.3		
		i	Z"	12 11	9			+34*		
		isP	E'Z'	12 16	13		+18	-33		
		i	N'	12 24	6	+				
		i	N'	12 31	6	+8				
		iPcP	Z'	14 29½	8			-9		
		eS	N'	15 14	10	7				
		i	E'Z'	15 18	10		+	-13		
		i	E'Z'	15 28	10		-17	-19		
		i	N'	15 33	9	+13				
		i	N'	15 43	9	+15				
		e	Z'	16.4	25					
		isS	N'	16 28	11	-18				
		iSS	Z'	16 40	27			-41		
		m	N'	16.9	22	68				
		eL	E'	17.8	60		27			
		i(ScP)	Z	17 51	1.2			+0.18		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Aug 5	(e)	N	13 16 20		Masked by microseisms				Local
		i	E	16 20.8	0.5					
		i	N	16 26	0.5	+0.03				
		m	E	16 27½	0.6		0.05			
581	5	eL	N'Z'	20 26.7	22					
582	5	i(P)	Z'	22 36 30	6			-4		Masked by micross
		i	Z	36 31	1.5			+0.22		USCGS 41.1 S 74.9 W H 22 23 13.0
		ePP	Z'	40 13	6			3		h 33 km ca Mag 6.1 6¾ Pas 6½ Brk
		e(S)	E	47 46						
		e	E'	48.8	20					
		e(PS)	N'	49.0	18	4				
		eSS	Z'	54.06	22			2		
		eSS	N'	54 09	20	2				
		eLQ	N'E'	23 03.0	40	5	5			
		eLR	Z'	06.6	27			3		
		M	N'E'Z'	10	20	3	2	4		
	6	i(Pg)	NZ	06 00 28½	(0.4)	+				Quarry blast
		i(Sg)	N	00 31.3	0.4	+0.08				
		i	Z	00 31.4	0.4			+0.03		
		m	E	00 32½	0.5		0.36			
		m	NZ	00 34½	0.6	0.12		0.11		
	6	e	NE	06 29 17						Quarry blast ?
		m	NEZ	29 23	0.7	0.08	0.06	0.08		
	6	i(Sg)	N	06 40 15.3	0.5	+0.02				Quarry blast ?
		i	EZ	40 15.7	0.4		+0.02	+0.02		
		m	N	40 18	0.7	0.12				
583	6	iP	Z	07 19 10.0	1.0			+0.12		Compression USCGS 9.1 S 120.8 E
										H 07 12 01.1 h 58 km ca Mag 5.6
584	6	eL	E'Z'	13 57	30					USCGS 4.2 S 140.5 E H 13 41 36.5
		M	N'E'	59	19	½	1			h 50 km ca
585	6	eP	Z	17 08 42½		Masked by microseisms				USCGS 22.5 S 179.5 W H 17 03 28.9
										h 504 km ca Mag 5.3
586	6	e(S)	E'	18 50.5	18		1			USCGS 56.9 N 152.1 W H 18 24 50.5
		e(SS)	E'	57.4	16		1			h 39 km ca Mag 5.6
		e(LQ)	E'	19 06.8	28					
		eLR	N'E'	12.2	25					
		M	N'E'Z'	19	20	1	1	2		
	6	i	NEZ	21 29 06.3	0.4	(-)	(+)	-		Local
		i	NE	29 09.2	0.4	-	-			
	6	e	N	23 31 33½	0.5					Local
587	6	i(P)	Z	23 47 37		Masked by microseisms				USCGS 19.2 S 167.6 E H 23 42 45.7
		i	Z	47 44	1			+0.06		h 43 km ca Mag 5.0
		e(L)	Z'	51.6						
		eL	E'	52.1	18					
	7	e	E	00 33 10						Local Seismic ?
		i	EZ	33 10.9	0.3		+0.05	+0.09		
	7	iP	NZ	01 40 30	0.5	+0.01		+0.02		Local
		iS	NE	40 51	0.6	+0.07	+0.03			
	7	e	E	05 28 17½	0.8		0.05			Local Seismic ?
		m	NZ	28 22	0.8	0.04		0.03		
	7	i	EZ	06 06 17.1	0.5		+0.01	+0.02		Quarry blast ?
		m	N	06 19	0.6	0.02				
		i	Z	06 20.5	0.7			+0.05		
		m	E	06 21½	0.6		0.05			
	7	iPg	EZ	06 16 51.8	(0.5)		+	+		Quarry blast
		iSg	EZ	16 55.7	0.4		+0.07	+0.04		
		i	N	16 58.0	0.6	-0.03				
		m	EZ	17 00½	0.7		0.15	0.25		
588	7	eL	N'E'Z'	16 11	25	Feeble				
	8	i	NEZ	05 36 38	0.5	+0.02	-0.04	+0.02		Quarry blast ?
		m	N	36 40	0.7	0.11				

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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s.	μ	μ	μ	km	
	Aug 8	(P)	Z	15 10 17½		Masked by microseisms				USCGS 31.7 N 140.2 E H 14 59 41.2 h 110 km ca Mag 5.7
589	9	e(S)	N'	20 20 40		Masked by microseisms				USCGS 0.3 S 125.1 E H 20 06 36.9 h 59 km ca Mag 5.0
		eL	NZ'	26.5	41					
		M	N'Z'	31.5	24	1		2		
	9	(e)	E	22 21 16						Blasting ?
		i	NEZ	21 17.2	0.3	-0.13	+0.07	-0.04		
		m	E	21 18½	0.4		0.05			
	9.	i	N	23 35 33.0	0.5	+				Local Seismic ?
		i	NEZ	35 37.7	0.3	+	+	-		
	10	(iPKP)	Z	01 29 53				+		Masked by micross USCGS 19.1N 67.3W H 01 10 12.4 h 33 km ca Mag 5.5
	10	iPg	EZ	07 27 41.1	0.4		+0.03	+0.03		Compression Quarry blast
		iSg	N	27 44.7	0.5	-0.07				
		i	EZ	27 45.1	0.5		+0.07	+0.14		
		i	Z	27 46.6	0.5			+0.09		
		m	NEZ	27 49	0.6	0.45	0.40	0.46		
	10	(i)	Z	08 02 23						Local Seismic ?
		m	NE	02 28½	0.8	0.03	0.08			
	10	i	EZ	08 19 28.9	0.3		+0.04	-0.05		Local Seismic ?
		i	E	19 30.6	0.4		+0.06			
590	10	iP	Z	21 45 50.0	0.8			+0.06		Compression
		m	Z	45 52	0.8			0.11		N' E' Z' records confused by micross and l p wanderings
		eS	N'	50.6	23	1				
		e	Z'	50.7	25			2		USCGS 6.2 S 154.5 E H 21 40 10.4 h 105 km ca Mag 5.7
		eLR	Z'	53.3	32					
		M	N'Z'	54.9	22	3		4		
591	11	iP	Z	02 00 40.3	0.6			-0.03		Dilatation Micross present
		m	Z	00 41½	0.6			0.06		USCGS 5.8 S 154.1 E H 01 55 25.0 h 425 km ca Mag 5.3
	11	(Pg)	E	06 31 57.1						Quarry blast
		i	EZ	32 00.2	0.4		-0.08	-0.06		
		m	N	32 01½	0.6	0.05				
		i	EZ	32 03.3	0.7		+0.08	+0.10		
		m	EZ	32 04½	0.7		0.12	0.18		
	11	i	E	07 06 37.0	0.4		+			Quarry blast
		i	N	06 40.5	0.7	+0.07				
		m	N	06 41½	0.7	0.08				
	11	iPg	EZ	07 12 17.5	0.4		+	+		Quarry blast
		iSg	NEZ	12 21.1	0.4	+0.04	+0.06	-0.06		
		i	EZ	12 24.0	0.7		+0.07	+0.12		
		m	NEZ	12 25	0.7	0.10	0.16	0.20		
	12	i	NEZ	05 00 11.8	(0.4)	+	-	+		Quarry blast
		i	N	00 15.1	0.5	+0.05				
		m	NEZ	00 19	0.7	0.18	0.04	0.04		
	12	i	E	05 40 49	0.5		+			Local Seismic ?
		i	Z	40 53.5	0.6			+0.04		
	12	Pg	EZ	06 40 49.4	(0.4)					Quarry blast
		iSg	E	40 54.2	0.5		+0.04			
		i	Z	40 54.4	0.5			+0.06		
		i	N	40 56.5	0.5	+0.03				
		m	NEZ	41 00	0.7	0.16	0.17	0.17		
	12	iPg	EZ	07 07 54.5	0.4		+0.02	+0.02		Compression Quarry blast
		iSg	N	07 58.0	0.5	-0.13				
		i	EZ	07 58.5	0.4		-0.18	+0.19		
		m	NEZ	08 02	0.7	0.88	0.23	0.30		
	12	i(Sg)	NE	07 44 24.4	0.5	+0.02	+0.02			Quarry blast
		i	Z	44 24.8	0.5			+0.02		
		m	N	44 27	0.6	0.13				
		m	EZ	44 29	0.6		0.04	0.05		

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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
592	Aug 13	iP	Z	00 36 36.9	1.0			-0.25	3140	Dilatation
		iP	N'E'Z'N"E"Z"	36 37	6	+14	+2	-28	28°.2	h 0.05 H 00 31 14
		i	NEZ	36 38.3	1.0	-0.34	-0.10	+1.79		USCGS 5.4 S 154.3 E H 00 31 14.1
		m	EZ	36 41	1.0		0.32	2.08		h 383 km ca Mag 6.0
		m	N	36 45	1.0	0.64				
		i	Z	37 12	1.0			-0.56		
		ipP	N'Z'	37 45	6	-20		+34		
		i	N"Z"	37 46	5	+22*		-37*		
		iPP	Z	37 49.5	1.0			+0.60		
		m	N'E'Z'	37 53	7	29	5	46		
		isP	Z'	38 20				+		
		i	N'	38 23	6	-				
		i	Z'	38 26	7			+25		
		i	Z'	38 32	7			+36		
		i	N'	38 37		+				
		i	Z'	40 55	7			+55		
		iS	N'E'N"E"	40 56	7	+160 ca	-24			
		i	N'	41 06						
		i	Z'	41 11	(7)			+		
		m	N'E'Z'	41.4	22	84	27	59		
		isS	E'	42 54						
		iSS	N'Z'	43 01	9	-54		-		
		iSS	E'	43 05	24		-220 ca			
		i	N'	43 14	16	+130 ca				
		i	Z'	43 18	18			+77		
		i	E'	43 50	11		-85			
		M	Z'	50.6	15			130ca		
593	13	i(P)	Z	04 34 55.5				+		N' E' Z' records masked by microseisms
		i	Z	35 58				+		and 1 p wanderings
		eL	N'	46.2	24					USCGS 6.0 S 130.4 E H 04 28 23.2
		i	Z'	47 15	7			+3		h 127 km ca Mag 5.0
		i	N'N"	48 58	7	+4*				
		M	N'Z'	50.2	16	2.		4		
		i	N'N"	50 53	7	+4*				
	13	i(Sg)	NEZ	06 34 00	0.4	+	(+)	+		Quarry blast
		i	N	34 02.5	0.4	-0.07				
		m	N	34 04½	0.7	0.23				
		m	EZ	34 07	0.7		0.07	0.07		
	13	Pg	EZ	07 05 32.3	0.3					Quarry blast
		iSg	EZ	05 36.2	0.4		-0.08	+0.08		
		i	EZ	05 39.5	0.7		+0.05	+0.08		
		m	EZ	05 40½	0.7		0.10	0.12		
	14	(i)	NZ	04 17 15		Masked by microseisms				Local
		i	NE	17 36	0.5	+0.05	+0.05			
	14	ePg	EZ	06 28 42.7	0.3					Quarry blast
		iSg	E	28 46.3	0.4		+0.02			
		i	Z	28 46.5	0.5			+0.03		
		m	NEZ	28 49	0.7	0.03	0.11	0.11		
594	14		Z'	07 28		Feeble long waves masked by micross				USCGS 9.8 S 123.8 E H 07 08 55.9
										h 33 km ca
	14	(e)	EZ	07 25 38		Superposed on micross				Local Seismic ?
		i	N	25 39		+				
		i	E	25 54½	0.6		-			
		i	Z	26 15				+		
595	14	(P)	Z	21 53 19		Masked by micross				USCGS 18.8 S 168.2 E H 21 48 31.2
		iPP	Z	53 42	1.4			+		h 26 km ca Mag 4.6
		e(L)	N'	57.1	(30)					
		M	N'E'Z'	22 00	18	1	1	1		
	15	i(Sg)	N	02 04 47.2	0.5	+0.01				Quarry blast
		i	N	04 50.5	0.5	+0.06				
		m	NEZ	04 54	0.7	0.21	0.03	0.06		
596	15	eL	N'	03 59.5	(24)	Confused by micross &		1 p wanderings		USCGS 5.5 S 104.1 E
		M	N'Z'	04 04	23	2		1		H 03 34 50.8 h 33 km ca Mag 5.2

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
597	Aug 15	M	N'	04 38.2	20	1	Confused by micross & 1 p wanderings.			USCGS 4.1 S 104.7 E H 04 10 09.3 h 17 km ca
	15	(Sg)	N	06 35 53½						Quarry blast
		i	EZ	35 54	0.4		-0.04	+0.05		
		m	NEZ	35 58	0.6	0.13	0.04	0.04		
598	15	eT	E	19 58 09						
		T max	N	58 35	0.7	0.07				
		T max	E	58 40	0.7		0.05			
		T max	Z	58 45	0.7			0.07		
599	16	eT	EZ	01 03 07	0.6					
		eT	N	03 12	0.6					
600	16	(i)	N	11 13 10	1.0	+0.04	Micross present			USCGS 5.9 S 151.4 E H 11 08 00.2 h 54 km ca
		eL	NZ	23	21					
601	17	eL	N'	15 29.7	(25)					(USCGS 24.2 N 94.0 E H 14 42 56.6 h 184 km ca Mag 4.7)
		eL	E'Z'	31.2	25					
	17	(P)	Z	16 51 32½				-		Masked by micross
	17	i	EZ	21 59 56.1	(0.3)		+	+		Local Seismic ?
602	18	e(P)	Z'	04 59.4		N' E' records confused by 1 p wanderings				USCGS 26.4 S 71.5 W H 04 44 58.0 h 8 km ca Mag 6.4 6 Brk
		ePP	Z'	05 03 46	9					
		(e)	E'	08.9	(20)					
		ePS	Z'	13 12	18					
		e	N'	13 15	18					
		eSS	Z'	19 13	24					
		e	E'	19 15	24					
		e	E'	22.2	20					
		e(SSS)	Z'	23.2	20					
		e	Z'	26.5	(30)					
		eL	Z'	29.9	32					
		eL	N'	.30.2	44					
		M	N'E'Z'	35.6	25	2	2	5		
		M	Z'	42.3	17			6		
i	18	iSg	N	07 23 46.3	0.5	+0.07				Quarry blast
		i	EZ	23 46.5	0.3		+0.08	+0.04		
		m	NEZ	23 50	0.6	0.60	0.10	0.08		
603	18	eL	Z'	11 51	30	Feeble				USCGS 0.5 N 67.2 E H 11 09 43.4 h 33 km ca Mag 5.1
	19	i	E	06 00 51.8	(0.4)					Local Seismic ?
		m	E	00 53½	0.4		0.15			
	19	i	NZ	06 11 45.3	0.3	+0.07		+0.02		
		m	E	11 46½	0.4		0.11			
		i	NZ	11 47.5	0.4	+0.03		+0.03		
		m	Z	11 49	0.4			0.05		
	19	i(Sg)	N	07 36 44.7	(0.5)	+				Quarry blast
		i	EZ	36 45.0	0.3		+0.08	+0.04		
		i	N	36 46.0	0.4	+0.03				
		m	NE	36 47.8	0.6	0.10	0.03			
		m	Z	36 49½	0.6			0.03		
604	19	eL	N'E'	10 23.3						USCGS 28.2 N 52.6 E H 09 33 10.0 h 50 km ca Mag 5.6
		eLR	Z'	27.3	33					
605	19	eL	E'Z'	16 16.1	30					USCGS 28.2 N 52.7 E H 15 20 13.9 h 52 km ca Mag 5.6
	20	i	NEZ	02 00 33.5	0.5	-0.11	+	+		Quarry blast
		m	NEZ	00 35½	0.4	0.67	0.22	0.12		
	20	iP	NZ	03 34 40.4	0.4	-0.02		+0.03		Compression
		i(S)	NE	35 01.4	0.6	+0.10	+0.03			Local
		i	Z	35 02.1	0.6			+0.04		
	20	i(Sg)	N	06 32 21.7	0.5	+0.03				Quarry blast
		i	EZ	32 22.0	0.5		-0.02	+0.03		
		i	N	32 24.6	0.7					
		m	NEZ	32 27½	0.7	0.11	0.04	0.07		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Aug 20	(Pg)	EZ	06 58 49	(0.5)					Quarry blast
		i(Sg)	N	58 52.7	0.5	+0.01				
		i	EZ	58 53.1	0.4		+0.05	-0.04		
		i	NZ	58 54.5	0.7	+0.16		+0.05		
		m	N	58 55½	0.7	0.21				
		i	EZ	58 56.4	0.7		+0.08	+0.15		
		m	EZ	58 57½	0.7		0.21	0.25		
606	20	iPKP	Z	08 57 21.1	0.6			+0.02		Compression Micross present USCGS 14.9 N 60.4 W H 08 37 47.1 h 65 km ca Mag 5.5
607	20	ePg	Z'	12 58 40	5	Microseisms present				USCGS 37.4 S 78.3 E H 12 48 47.7 h 33 km ca
		e(S)	N'	13 06 46	9					
		e	Z'	06 50	7			2		
		e	E'	06 56	22					
		eLQ	N'E'	13.2	30					
		eLR	E'Z'	16.1	30					
		M	N'E'Z'	18	21	1	1	2		
		M	E'Z'	20	17		2	3		
608	20	eL	E'	15 31.7	22					USCGS 0.8 S 132.6 E H 15 11 53 h 33 km ca
		M	E'	35.7	15		1			
609	20		N'E'	17 48		Feeble long waves				USCGS 3.0 N 128.3 E H 17 30 42.3 h 178 km ca Mag 4.8
	21	i	EZ	06 23 16.0	0.5		+	+0.04		Quarry blast
		i	E	23 16.7	0.5		+0.03			
		m	N	23 19	0.6	0.05				
		m	EZ	23 21½	0.7		0.10	0.13		
	21	iPg	EZ	06 42 03.5	0.3		+	+0.03		Compression
		iSg	EZ	42 07.5	0.3		-0.12	+0.14		Quarry blast
		i	N	42 08.6	0.3	+0.11				
		m	NEZ	42 11	0.6	0.06	0.08	0.10		
	21	(e)	Z	23 02 01						Quarry blast
		iSg	N	02 04	0.4	+0.02				
		i	EZ	02 04.3	0.3		+0.04	+0.05		
		m	N	02 07	0.7	0.14				
	21	(iP)	Z	23 54 24.7				+		Masked by micross USCGS 18.7 S 169.1E H 23 49 13.6 h 81 km ca
610	22	e(SS)	N'	00 16 27	16		Earlier phases obscured			USCGS 12.2 S 110.5 E H 23 58 56.6 h 35 km ca Mag 5.3
		e	Z'	16.6	16		by calibration pulses			
		eL	N'E'Z'	19.2	35					
		M	N'	24.6	13	12				
		M	E'Z'	26.9	14		5	7		
611	22	eL	Z'	03 54.6	28					USCGS 31.5 N 114.3 W H 03 03 20.7 h 15 km ca Mag 5.3 5¼-5½ Pas
	22	iSg	N	04 55 16.3	0.5	-0.04				Quarry blast ?
		i	EZ	55 18.3	0.4		+0.06	-0.05		
		i	Z	55 19.2	0.5			+0.08		
		m	NEZ	55 19.5	0.5	0.14	0.20	0.17		
	22	i	NEZ	05 13 21	0.4	-0.02	+0.03	+0.02		Local Seismic ?
		m	NE	13 23	0.5	0.03	0.04			
612	22	eL	Z'	06 36	(25)					
		M	Z'	38.7	25			1		
	22	e	N	10 46 18	0.7					Local Seismic ?
	22	(P)	Z	12 46 45½		Micross present				USCGS 10.5 S 161.6 E H 12 41 22.1 h 50 km ca Mag 5.0
613	23	eL	Z'	11 22.5	26	Masked by micross & 1 p wanderings				
		M	N'E'Z'	26	16	2	2	2		
614	23	ePg	N'Z'	15 29 49	9	2		2	3100	USCGS 6.1 S 149.4 E H 15 24 05.3 h 63 km ca Mag 4.9
		ipP	N'Z'	29 59	14	+4		-6	27°.9	
		ePP	N'	30 38	12	3				
		eiPP	Z'	30 39	10			-4		
		e	E'	34 20	10					
		iS	N'	34 29	24	-20				

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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
614	Aug 23	i	Z'	15 34 46	26			+33		
cont		m	N'	34.8	24	36				
		i	E'	35 08	23		+8			
		iSS	Z'	35 48	20			+12		
		e(LQ)	E'	35.8	35					
		iL	N'	36 40	30	-11				
		eL	Z'	37.1	37					
		iL	E'	37 08	27		+19			
		L	N'E'	38.0	35	19	27			
		M	N'E'Z'	40	21	25	35	29		
		W2	Z'	18 17	22					
	24	(iP)	Z	17 34 01	Large micross on all records					USCGS 0.2 N 123.8 E H 17 26 15.1 h 127 km ca Mag 5.4
	25	iPg	EZ	07 26 27	0.3		+	(+)		Quarry blast
		iSg	NEZ	26 31.2	0.3	+0.03	-0.13	+0.13		
		m	EZ	26 35½	0.7		0.13	0.16		
615	25	ePP	Z'	14 06 41	(16)	Large microseisms present				USCGS 78.2 N 126.6 E H 13 47 20.6 h 50 km ca Mag 6.1 6¼-6½ Pas 6½ Brk
		e	N'	06 46	(16)					
		e(SKKS)	N'	13 38	13					
		ePS	N'	16 17						
		ePS	Z'	16 21						
		e	N'	16 36	20	6				
		ePPS	N'Z'	17.5	(22)					
		eSS	N'	22.4						
		e	N'	23.2						
		eSSS	Z'	26.6	36					
		eSSS	N'	26.9	32	5				
		e	Z'	30.9	40					
		e	N'	31.0	30					
		eL	E'	33.4	47					
		e(G)	E'	35.1	55		6			
		e	N'	35.5	50					
		e	E'	37.0	40		11			
		eLR	Z'	41.5	50					
		M	N'E'Z'	49	23	11	7	11		
		M	N'Z'	59.4	19	10		18		
616	25		N'E'Z'	21 17	Feeble long waves masked by microseisms					USCGS 19.5 S 176.9 W H 21 03 30 h 444 km ca Mag 4.2 Local blasting ?
	26	e	EZ	01 56 34						
		m	EZ	56 35	0.3		0.07	0.09		
	26	iSg	NEZ	07 06 55.6	0.4	+0.06	+0.04	-0.03		Quarry blast
		i	N	06 58.7	0.7	+0.21				
		m	N	06 59½	0.7	0.26				
		m	EZ	07 02½	0.7		0.06	0.07		
	26	iPg	EZ	07 32 28.5	(0.3)		(+)	+		Quarry blast
		i(Sg)	N	32 32.5	0.3	+0.04				
		i	EZ	32 32.8	0.3		-0.12	+0.14		
		i	N	32 34.0	0.3	-0.07				
		m	NEZ	32 37	0.5	0.12	0.07	0.08		
	26	e(Sg)	N	07 53 20						Quarry blast
		i	EZ	53 20.5	0.4		+0.04	+0.05		
		m	NEZ	53 24	0.7	0.05	0.10	0.28		
617	26	iP	Z	19 36 49.6	1.4			+0.10		Microseisms present USCGS 20.3 S 178.3 W H 19 31 40.8 h 510 km ca Mag 4.3 Local blasting
	27	i	EZ	00 29 12	0.3		+0.04	(-)		
		m	EZ	29 13	0.3		0.07	0.11		
618	27	(P)	Z	04 51 39½	Masked by microseisms					USCGS 5.6 S 133.9 E H 04 45 02.6 h 9 km ca Mag 5.1
		e(L)	E'	05 01.6	(25)					
		eL	N'	02.4	20					
		M	E'	03.2	15		2			
		M	N'E'Z'	06	16	3	3	4		
	27	iPg	Z	06 03 49.2	0.3			+0.03		Quarry blast
		i	N	03 49.6	0.5	+0.02				

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RIVERVIEW COLLEGE OBSERVATORY
SEISMOLOGICAL BULLETIN AUGUST 1964

No	Date	Phase & Component		Time (G.M.T.) h m s	Per s	Amplitude A_N μ	Amplitude AE μ	Amplitude A_Z μ	Δ km	Remarks
	1964									
cont	Aug 27	iSg	N	06 03 52.1	0.4	+0.10				
		i	EZ	03 52.3	0.4		+0.02	+0.06		
		i	E	03 53.3	0.6		+0.15			
		m	NEZ	03 55½	0.6	0.11	0.09	0.17		
	27	i	E	07 06 33.8	0.5		+0.03			Local Seismic ?
		m	N	06 37½	0.7	0.03				
		m	Z	06 41	0.8			0.05		
619	27	e	Z'	08 01 54		Masked by microseisms				USCGS 17.5 S 173.0 W H 07 53 54.8
		e	E'Z'	06.8	18					h 33 km ca Mag 5.3 4½-4¾ Brk
		eL	N'	09.3	22					
		eL	E'Z'	11.5	24					
		M	N'E'Z'	13.4	16	3	2	2		
620	27	e	N'	13 45.4	(38)					(USCGS 27.5 N 55.9 E H 12 56 46.1
		eL	E'Z'	52.4	27					h 33 km ca Mag 5.3)
621	27		E'Z'	20 50	Feeble surface waves					(USCGS 35.5 N 28.7 E H 19 31 56.9
										h 33 km ca Mag 4.7)
622	28	(iP)	Z	04 41 03	Masked by microseisms					USCGS 19.8 S 178.2 W H 04 35 29.3
		e(S)	N'	45 20	11					h 580 km ca Mag 5.4
		e(S)	E'	45 22						
		e	N'Z'	48.5	18					
		eScS	NE	50 29	2					
		iScS	N'E'N"	50 29	8	-3	+			
	28	e	N	05 23 41						Local Seismic ?
		i	Z	23 43.1	0.4			+0.05		
623	28		N'	13 53	Feeble waves masked by micross					(USCGS 7.1 N 95.1 E H 13 21 13.5
										h 33 km ca Mag 5.1)
	29	e	Z	00 14 41½	0.4					Local Seismic ?
		i	EZ	14 43.4	0.4		+0.02	-0.03		
	29	i(Sg)	N	06 21 47.9	0.4	-0.03				Quarry blast
		i	NZ	21 49.2	0.7	+0.08		+		
		m	NEZ	21 52	0.8	0.20	0.08	0.10		
624	29	eL	E'Z'	13 39	26					USCGS 13.7 S 172.6 E H 13 25 25.9
										h 33 km ca Mag 5.0
625	30	eL	Z'	01 43.9						
		M	N'Z'	49.4	17	½		1		
626	30	(P)	Z	08 53 31		Masked by micross				USCGS 5.0 S 144.5 E H 08 47 34.7
		e(L)	E'	09 01.1						h 93 km ca Mag 5.8
627	30	e(L)	N'	20 49.6		Masked by micross				USCGS 13.6 S 172.4 E H 20 37 09.2
		eL	E'Z'	50.3	31			4		h 33 km ca Mag 4.9
		M	N'E'Z'	53	17	2	2	3		
628	30	iP	Z	21 51 03.3	0.8			-0.04		Microseisms present
		i	Z	51 04.2	0.8			+0.11		USCGS 19.9 S 176.0 W H 21 44 56.9
		e(L)	N'	58.4	24					h 253 km ca Mag 5.6
629	30	eL	Z'	22 43.7	27					USCGS 13.7 S 172.5 E H 22 30 24.8
										h 33 km ca
	30	(i)	E	22 58 44						Local Blasting ?
		i	NE	58 45	0.4	+0.07	+0.12			
		m	Z	58 46	0.4			0.05		
630	31	iP	Z	02 26 30.7	1.0			+0.05		Micross present L p wanderings
		eL	E'Z'	51.1	30					& micross on N' E' Z' records
		M	E'Z'	55.8	17		2	4		USCGS 35.2 S 106.0 W H 02 14 20.3
										h 33 km ca Mag 5.2
	31	i	NZ	05 35 07	0.5	+		+		Local Very small
	31	Pg	Z	07 36 13	0.3					Quarry blast
		iSg	NE	36 16.5	0.4	+	+0.04			
		i	Z	36 16.7	0.4			+0.10		
		m	NEZ	36 20	0.7	0.06	0.16	0.19		
	Sept 1	iSg	N	02 03 33.2	0.5	-0.06				Quarry blast
		i	Z	03 33.6	0.5			+0.05		
		m	NZ	03 36	0.6	0.43		0.06		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Sept 1	iPg	Z	04 23 47.6	0.5			+0.03		Quarry blast
		iSg	NE	23 52.5	0.5	+0.08	+0.08			
		i	Z	23 52.7	0.4			-0.04		
		i	N	23 56.0	0.9	+0.33				
		m	NEZ	23 59	0.7	0.67	0.16	0.24		
	1	i	EZ	07 58 40.5	0.3		-0.06	+0.07		Quarry blast ?
		m	NEZ	58 44	0.6	0.04	0.06	0.06		
631	1	e(S)	N'	13 45 15	10	1				Masked by microseisms
		i	E	45 17	9		+1			USCGS 27.2 N 92.3 E H 13 22 36.6
		eLQ	N'	58.4	56 ca					h 33 km ca Mag 5.7
		eL	E'	14 00.5	45					
		eLR	Z'	03.6	38					
		M	N'	05.4	34	1				
		M	N'E'Z'	15.3	21	1	1	1		
632	1	iP	Z	17 29 44.7	0.8			+0.06		Compression
										USCGS 51.2 N 170.6 W H 17 16 40.4
										h 25 km ca Mag 5.5
633	1	eP	Z'	20 53 48		Masked by micross				USCGS 57.2 S 147.1 E H 20 48 39
		e(S)	E'	58 08	9		2			h 33 km ca
		eLR	N'Z'	59.3	27	2		2		
		M	N'E'Z'	21 01.5	15	2	1	2		
	2	i(Sg)	E	07 34 53.1	0.4		+0.04			Quarry blast
		i	Z	34 53.3	0.5			+0.03		
		m	N	34 55	0.7	0.03				
		i	EZ	34 56.4	0.7		+0.04	+0.06		
		m	EZ	34 57½	0.7		0.07	0.10		
634	2	iP	Z	21 37 20.3	0.8			+0.04		Compression
		e	N'	42 09						USCGS 18.6 S 169.4 E h 21 32 39.6
										h 218 km ca Mag 4.9
	3	e	Z	02 12 00						Local Seismic ?
	3	iP	NZ	03 02 43.3	0.5	+0.01		+0.02		Quarry blast
		i	NZ	02 47.3	0.5	+0.01		+0.01		
		iS	NE	03 04.4	0.6	-0.08	+0.03			
		i	E	03 10.5	0.5		+0.04			
	3	e	Z	05 44 40						Local Seismic ?
		i	E	44 59.4	0.5		+0.04			
635	3	e	E'	10 27 31	10					
		eLR	Z'	29.0	29					
		M	E'Z'	31.2	20		1	1		
636	3	(P)	Z	17 06 04½		Microseisms present				USCGS 15.2 S 173.5 W H 16 58 55.4
		e(LQ)	N'	14.6	25					h 33 km ca Mag 5.1
		eLR	N'Z'	16.6	28			1		
		M	N'E'Z'	19	16	½	1	1		
	4	i	NE	01 55 35.5	0.4	-0.12	-0.05			Local blasting ?
637	4	(PKP)	Z	03 48 31½		Masked by microseisms				(USCGS 7.6 N 36.9 W H 03 28 33.1
		M	Z'	04 56.6	18			1		h 22 km ca Mag 5.4)
	4	iPg	EZ	06 25 54.6	0.4		+0.04	+0.03		Compression
		iSg	N	25 58.0	0.4	-0.05				Quarry blast
		i	EZ	25 58.5	0.4		+0.10	-0.10		
		i	Z	26 00	0.5			+0.06		
		m	N	26 01	0.6	0.17				
		i	EZ	26 01.7	0.7		+0.10	+0.18		
		m	EZ	26 02½	0.7		0.17	0.22		
	4	(e)	E	07 57 38½						Local
		e	N	57 43	0.5					
		m	N	57 54½	0.6	0.04				
		m	Z	57 58	0.6			0.04		
638	4	iP	Z	10 41 04.5	1.5			+0.60	3950	Compression
		iP	N'E'Z'Z"	41 05	7	-2	+2	+6	35°.5	USCGS 4.0 S 131.4 E H 10 34 13.1
		m	NEZ	41 07	1.5	0.2	0.12	1.14		h 33 km ca Mag 5.9 5½-5¾ Brk
		iS	N'N"	46 37	11	-12	Cont			

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RIVERVIEW COLLEGE OBSERVATORY
SEISMOLOGICAL BULLETIN SEPTEMBER 1964

No	Date	Phase & Component	Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km	
638	Sept 4	iS E'E"	10 46 38	11		-5			
cont		isS E'	46 51	11		+10			
		e N'E'Z'	47	27	11	5	8		
		i N'E'N"E"	49 05	10	+9	+17			
		eL N'E'	49.7	45	13	9			
		eL Z'	51.9	35			9		
		M N'E'	52.9	28	18	24			
		M N'E'Z'	57	18	32	56			
		M N'	11 01.6	16	37				
		W2M Z'	13 29	23			1		
639	4	(eL) N'	16 29.4		Masked by microseisms				USCGS 4.0 S 131.5 E H 16 10 53.0 h 37 km ca Mag 4.7
		M N'E'Z'	33	18	½	1	1		
640	4	e N'	17 23.5		Masked by microseisms				USCGS 3.9 S 131.5 E H 17 10 28.4 h 33 km ca Mag 4.8
		eL E'	27.9	34					
		M N'E'Z'	33.4	15	1	1	2		
	5	(Pg) Z	01 48 44.8						Quarry blast
		i NEZ	48 48.8	0.4	+0.02	-0.07	+0.09		
		m EZ	48 54	0.7		0.10	0.12		
	5	iSg N	01 59 10.3	0.5	+0.05				Quarry blast
		i EZ	59 10.8	0.5		+0.06	+0.04		
		m N	59 15	0.7	0.26				
	5	(P) Z	02 21 56		Masked by microseisms				USCGS 32.2 S 179.5 E H 02 17 14.4 h 397 km ca Mag 4.6
641	5	iP Z	02 59 38.5	1.0			+0.35	3140	Compression
		iP N'Z'N"Z"	59 38½	3	-6		+13	28°.2	USCGS 5.8 S 154.0 E H 02 53 50.6 h 69 km ca Mag 6.4
		i N	59 38.8	1.0	-0.9				
		m NEZ	59 41½	1.0	0.16	0.09	0.62		
		i Z	59 44.5	1.4			+0.65		
		ipP N'Z'	59 47	5	+		-		
		isP Z	59 50	1.8			-2.0		
		isP N'Z'	59 50	12	+17		-26		
		i Z	03 00 01.3	1.5			+1.6		
		iS E'E"	04 20	9		+23			
		i N'	04 30	24	+74				
		isS E'	04 37	22		+20			
		i Z'	04 39	22			+58		
		iSS Z'	05 37	18			+30		
		eL Z'	06.2	34			27		
		iL N'	06 18	32	-60				
		M E'	06.7	33					
		iM N'	07 27	30	+57				
		M N'Z'	08.5	25	120 ca		160 ca		
		M E'	09.0	16		90ca			
		M(W2) N'E'Z'	05 41	25	1	1	2		
	5	(P) Z	04 15 35½		Masked by microseisms				USCGS 6.0 S 153.8 E H 04 09 51.6 h 81 km ca Mag 4.8
642	5	(P) Z	07 33 03		Masked by microseisms				USCGS 5.9 S 153.7 E H 07 27 21.0 h 106 km ca Mag 4.6
	5	M Z'	07 50.8	20			1		USCGS 33.6 S 77.6 E H 07 20 45 h 33 km ca
643	5	(iP) Z	12 00 17½				+		Masked by micross
		e E'	04 22	13		2			USCGS 54.0 S 141.1 E H 11 55 37 h 33 km ca
		e N'	04 32	10	2				
		eL N'Z'	05.3	30	2		3		
		M N'E'	07.5	10	2	2			
		M Z'	07.7	15			1		
644	5	(PKP) Z	12 47 01½		Masked by micross on all records				USCGS 0.6 N 25.9 W H 12 27 22.2 h 33 km ca Mag 4.7
		eSS E'	13 09.6	(30)					
		e N'	11.3	(30)					
		eSSS E'	15.2	(30)					
		eLQ E'	27.9	43		2			
		eL N'	29.1	56					
		eLR Z'	36.7	30					
		M N'Z'	43	21	1		1		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
645	Sept 5	e	E'	18 55.0		Masked by microseisms				USCGS 53.9 S 140.4 E H 18 46 19
		e(L)	N'Z'	56.3	24					h 33 km ca
646	6	eP	Z'	03 32 48	4			5		Microseisms present
		eP	Z	32 49						USCGS 17.8 S 168.2 E H 03 27 47.9
		e(S)	E'N'	36 52	11		2			h 33 km ca Mag 4.8
		eL	N'E'	37.4	24					
		eLR	Z'	38.1	34					
		M	N'E'Z'	40	17	3	2	2		
647	6		N'Z'	04 31		Surface waves				(USCGS 46.7 S 13.5 W H 03 38 48.8
										h 33 km ca Mag 4.8)
648	6	iP	Z	11 21 10.9	1.2			-0.01		Dilatation
		eL	E'	27.6	30					N'E'Z' records masked by microseisms
		eLR	N'Z'	28.9	30					USCGS 6.0 S 153.7 E H 11 15 27.9
		L	N'Z'	30.0	25	1		2		h 90 km ca Mag 4.5
		M	N'E'Z'	32	18	2	1	2		
649	6	e(P)	Z	18 49 23½	1.2	Masked by microseisms				USCGS 10.0 N 140.2 E H 18 41 01.8
		eS	N'	56 02	18	3				h 33 km ca Mag 5.1
		e	E'	56 04	18		1			
		eSS	N'E'	59 18	19	1	4			
		eLQ	E'	19 00.3	40					
		L	E'	01.4	40		8			
		eLR	N'	01.7	35	4				
		eL	Z'	02.7	40					
		L	Z'	03.5	40			7		
		L	N'	03.6	30	6				
		M	N'E'Z'	06	19	4	6	5		
650	6	(iP)	Z	20 40 22				+		Masked by microseisms
		eL	N'Z'	49.1	33					USCGS 4.7 S 144.8 E H 20 34 22.2
										h 76 km ca Mag 5.7
	6	i	EZ	21 02 55	0.3		+0.05	+0.07		Local blasting ?
651	6	(ePS)	E'	21 32.1		Masked by microseisms				USCGS 6.0 S 107.1 W H 21 05 48
		eLR	Z'	50.5	31					h 33 km ca Mag 5.0
		M	E'Z'	58.2	17		1	1		
	6	(e)	Z	21 39 16						Quarry blast ?
		i	N	39 20	0.7	+0.08				
	7	i	EZ	01 03 49.8	0.3		+0.04	+0.07		Local blasting ?
	7	i	Z	01 49 36	0.6			+0.01		Local Seismic ?
	7	Pg	EZ	01 59 13						Quarry blast
		iSg	E	59 17.5	0.5		+0.03			
		i	Z	59 18.2	0.5			+0.08		
		m	E	59 18½	0.5		0.09			
		m	N	59 22½	0.7	0.15				
		m	EZ	59 26	0.7		0.17	0.19		
	8	i	N	01 57 39.2	0.4	-0.09				Local blasting ?
	8	Pg	EZ	06 53 22.3	0.5					Quarry blast
		iSg	E	53 27.2	0.5		+0.06			
		i	Z	53 27.3	0.5			-0.04		
		m	N	53 31	0.6	0.08				
		m	EZ	53 34	0.7		0.18	0.19		
652	8	i(P)	Z	08 03 10.8	1.2			+0.10		Compression
		i	Z	03 59.4	1.2			-0.16		All records masked by microseisms
		(S)	N'E'	09 44						USCGS 5.8 N 126.1 E H 07 54 57.9
		e	N'E'	13 15						h 177 km ca Mag 5.4
653	8	(P)	Z	13 50 28½		Masked by microseisms				(USCGS 29.6 N 142.0 E H 13 40 03.5
		e	N'	56 06						h 77 km ca Mag 5.6)
654	8	e	N'	14 21.8	16	Masked by microseisms				USCGS 23.8 S 177.5 W H 14 09 19.2
		eL	E'Z'	23.0	28		1	2		h 213 km ca Mag 4.7
		M	N'	25.2	13	4				
		M	E'Z'	28.0	17		1	2		
655	8		N'E'Z'	16 19		Long waves				

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
656	Sept 8		E'	20 49		Long waves				USCGS 6.9 N 126.4 E H 20 22 54.2 h 33 km ca
	9	e	N	04 55 57½						Quarry blast
		m	NEZ	56 05	0.7	0.13	0.04	0.06		
	9	Pg	EZ	07 16 19.4						Quarry blast
		iSg	N	16 22.8	0.5	+0.07				
		i	EZ	16 23.2	0.4		+0.08	-0.08		
		i	Z	16 25.0	0.7			+0.07		
		m	NEZ	16 27	0.7	0.58	0.16	0.16		
	10	i	NEZ	01 57 23	0.4	-0.08	+0.04	-0.02		Local blasting ?
		m	EZ	57 24	0.4		0.07	0.07		
	10	iP	NZ	03 26 48.2	0.5	+0.01		+0.03		Comoression
		iS	NE	27 09.3	0.6	+0.15	+0.05			Quarry blast
		i	Z	27 09.8	0.6			-0.05		
		i	E	27 14.8	0.5		+0.06			
	10	i(Sg)	N	06 00 19.8	0.5	+0.03				Quarry blast ?
		i	NEZ	00 22.7	0.5	+0.10	+0.04	+0.06		
		i	Z	00 25.2	0.6			-0.20		
		m	NE	00 26	0.6	0.12	0.10			
	10	i	EZ	06 30 02.8	0.5		+0.03	+0.04		Quarry blast ?
		m	N	30 07	0.8	0.09				
		m	EZ	30 10	0.8		0.11	0.12		
	10	iPg	Z	06 36 07.0	0.4			+0.02		Quarry blast ?
		i(Sg)	N	36 10.8		+				
		i	EZ	36 11.0	0.4		-0.11	+0.12		
		m	NEZ	36 15	0.7	0.10	0.21	0.24		
	10	(i)	Z	23 12 37.6				+		Masked by microseisms
	11	i	N	03 45 50.7	0.4	+0.06				Local Blasting ?
	12	Pg	EZ	06 00 40½	0.4		(-)	(+)		Quarry blast
		iSg	E	00 45.2	0.4		-0.08			
		i	Z	00 45.7	0.5			+0.07		
		m	N	00 50½	0.7	0.08				
		m	EZ	00 53	0.8		0.14	0.16		
657	12	eL	N'Z'	10 56.5	25	2		1		Masked by microseisms
		M	N	58.6	13	3				USCGS 24.7 S 170.5 E H 10 48 19.2 h 33 km ca Mag 4.0
658	12	iP	NZ	12 49 18.3	1.5			-0.90	3370	Dilatation
		iP	N'Z'Z"	49 19	5	+		-	30°.3	Microseisms present N'E'Z' and Galitzin records
		ipP	Z	49 41.5	1.0			+0.19		h 0.01 ca
		i	Z'Z"	49 46	5			+		USCGS 4.4 S 144.0 E H 12 43 19.0
		i	Z'	50 27	7			+6		h 120 km ca Mag 6.3
		iS	E'E"	54 10½	5		+9			6½ Pas 6¼-6½ Brk
		i	N'	54 13	21	-5				
		e	Z'	54 24	24			4		
		i(sS)	E'	54 44	14		+3			
		e	N'	55 00	18	6				
		e	E'	55 42	18					
		eL	E'	56.5	40		16			
		eL	N'	57.0	55					
		L	N'Z'	58.6	47	20		29		
		M	N'E'Z'	13 00.5	23	11	12	13		
659	12	iP	Z	15 24 53.4	1.2			-0.34		Dilatation
		m	Z	24 55½	1.2			0.53		N' E' Z' records masked by micross
		(PP)	Z	26 33	2.0			0.66		USCGS 17.4 S 179.9 W H 15 19 22.3
		e(sP)	Z'	27 36						h 561 km ca Mag 5.8
		e	Z'	29 13	18			3		4¼-4½ Brk
		eS	E'	29 14	10		+5			
		i(ScP)	Z	30 22½	1.0			-0.08		
		e	E'Z'	32 12	16		2	4		
		i(ScS)	E'	34 23	6		+4			
660	12	iP	NZ	22 11 13.5	2.5	+3.8		+5.1		Compression
		i	N'E'Z'N"E"Z"	11 15		-	*	-		N' E' Z' and Galitzin records
		m	NEZ	11 16	2.5	12.6	6.5	32.6		mostly indecipherable

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
660	Sept 12	i(S)	E'	22 14 27			+			USCGS 49.1 S 164.2 E H 22 07 03.2
cont		i	Z'	14 40	20			+150 ca		h 33 km ca Mag 6.9
		eL	E'	14.9	13					7½ Pas Brk
		T max	N	29 47	0.5	0.90				
		T max	Z	29 51	0.5			0.98		
		T max	E	29 54	0.5		0.75			
661	12	(P)	Z	22 20 54	0.8			0.10		Aftershock
		T max	Z	39.3	0.5			0.08		
		T max	N	39.4	0.6	0.07				
	12	(T)	NEZ	22 55	0.5					Aftershock ?
662	13	eP	Z	00 25 17.5		Microseisms present				N' E' Z' records confused by coda
		iP	N'Z'	25 18	7	+7		+7		of 661 Aftershock
		i	N'E'	28 48	16	+9	+21			USCGS 49.3 S 163.7 E H 00 21 06.7
		M	Z'	31.0	13			15		h 33 km ca
		T max	Z	43 49	0.5			0.13		
		T max	E	43 50	0.5		0.13			
		T max	N	43 53	0.5	0.14				
663	13	iP	Z	02 54 23.7	1.0			+0.10		Compression N' E' Z' records
		e	N	57 57	(8)					masked by micross & l.p. wanderings
		eL	Z'	58.8	22					USCGS 49.4 S 162.9 E H 02 50 18.2
		T max	NEZ	03 12.8	0.6					h 33 km ca
	13	T	NZ	04 53.8						
	13	T	NZ	05 38.5						
	13	T	NEZ	06 05.7						
664	13	iP	Z	15 11 42.0				+		Compression
		e	E'	15 11						Microseisms present on all records
		e	N'	15 15						USCGS 49.4 S 163.3 E H 15 07 31.9
		eL	Z'	16.0	23					h 33 km ca
		T max	N	30 02	0.5	0.08				
		T max	E	30 07	0.5		0.06			
		T max	Z	30 11	0.5			0.09		
	14	i	NE	01 57 42.3	0.4	-0.08	+0.04			Local blasting ?
665	14	eL	Z'	12 39.0	31					USCGS 41.9 S 89.5 W H 11 58 31
										h 33 km ca Mag 4.5
666	14	eL	N'	13 18.7	21					USCGS 9.5 S 111.8 E H 12 56 32.2
		eL	E'Z'	21.5	22					h 127 km ca
	15	iP	N	02 53 49.6	0.4	+0.03				[illegible] blast
		iP	Z	53 49.8	0.4			+0.05		
		iS	NE	54 10.8	0.6	+0.18	-0.07			
667	15	iP	Z	05 45 35.6	1.0			-0.10	4650	Dilatation
		iP	Z'Z"	45 36	4			-5	41°.8	USCGS 0.1 S 124.6 E H [illegible]5 37 45.4
		m	Z	45 37	1.0			0.37		h 33 km ca Mag 5.3
		i	Z	45 52.8	1.0			+0.12		
		ePP	Z'	47 19						
		iS	E'	51 51	10		+4			
		e	E'	54 58	12		1			
		e	Z'	54 59	18			2		
		i	E'	55 08	7		-4			
		eL	N'	56.6	40					
		eL	Z'	57.6	48					
		L	N'E'Z'	59.5	37	5	4	3		
		M	N'E'Z'	06 02	25	4	4	7		
	15	(Pg)	Z	06 45 32						Quarry blast
		iSg	N	45 36.2	0.6	-0.05				
		m	NEZ	45 40	0.7	0.40	0.14	0.17		
	15	(P)	Z	10 16 21		Masked by microseisms				
		T max	E	34 46	0.5		0.03			
			N	34 50	0.5	0.02				
			Z	34 55	0.5			0.05		
668	15		Z'	12 02		Feeble surface waves				USCGS 22.2 S 175.2 W H 11 44 13.7
										h 33 km ca Mag 4.7
669	15	e	Z'	12 57.4		Masked by microseisms				USCGS 16.0 S 172.9 W H 12 44 12.2
		e(L)	N'	59.8	20	Cont next page				h 33 km ca Mag 5.3

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No	Date	Phase & Component	Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
669 cont	Sept 15	eL Z'	13 01.0	24					
		M N'E'Z'	03.8	16	2	2	2		
670	15	iP Z	15 40 39½	1.0			+0.10	7800	Compression
		iP E'Z'E"Z"	40 40	6		+3	+14	70°.2	h 0.01 ca H 15 29 36
		m Z	40 43	0.9			0.21		USCGS 8.9 N 93.1 E H 15 29 32.2
		iPcP Z	41 00	0.7			+		h 37 km ca Mag 6.2
		ipP Z	41 09½	1.0			+0.14		5½ Pal
		iS N'E'N"E"	49 42	11	+40	+35			
		i Z'Z"	49 43	8			-8		
		isS N'E'N"E"	50 34	11	+37	+8			
		e E'	50.8	48		12			
		eSS N'	54.1	24	7				
		eSSS N'	57 16	17	7				
		eSSS E'	57 27	24		9			
		m N'	57.8	24	14				
		eLQ N'E'	58.7	50					
		L N'E'	16 00	70	44	23			
		iLR N'	00.6	48	-47				
		M N'	02.0	45	48				
		M E'Z'	06.7	32		36	55		
	15	T NEZ	20 24	0.5					
671	16	iS N'N"	01 46 56	7	-5	Confused by microseisms and long period wanderings			
		(eL) N'	58.6	45					USCGS 10.9 N 93.1 E H 01 26 26.9
		eL Z'	02 01.0	46					h 47 km ca Mag 5.7
		M N'E'Z'	07.6	27	5	5	5		
		M N'E'Z'	10.0	22	6	6	7		
	16	i N	01 59 18.2	0.5	+0.01				Quarry blast ?
		i N	59 21.5	0.4	+0.04				
		m N	59 23	0.7	0.12				
672	16	e(P) Z'	05 26 33	6	Confused by microseisms and long period wanderings				
		e Z'	27 35	6					USCGS 5.9 S 152.0 E H 05 20 46.1
		M N'E'Z'	37.7	16	4	5	6		h 29 km ca Mag 6.2
	16	i N	06 47 03.2	0.4	+0.02				Quarry blast ?
		i EZ	47 03.5	0.4		-0.04	+0.04		
		m NEZ	47 07	0.7	0.04	0.08	0.09		
	16	i NEZ	08 23 17.0	0.5	+0.02	+0.03	+0.02		Local Quarry blast ?
		i E	23 20.5	0.7		-			
		m E	23 21½	0.7		0.08			
		m NZ	23 25½	0.6	0.05		0.07		
	16	(T) NE	17 52	0.5					
	17	e NEZ	05 45 59	0.5					Small Local Seismic ?
	17	i E	06 21 11.2	0.6		+0.02			Small Local Seismic ?
		i Z	21 15.7	0.7			+0.04		
	17	e N	06 37 25	0.5					Quarry blast ?
		m N	37 26	0.6	0.06				
	17	iPg EZ	06 44 12.0	0.3		+	+		Quarry blast
		iSg N	44 15.8	0.3	+0.04				
		i EZ	44 16.0	0.3		-0.16	+0.16		
		m NEZ	44 20	0.7	0.10	0.14	0.10		
673	17	eL Z'	07 13.1	27	Masked by micross & long period wanderings				
		M N'E'Z'	15.2	17	1	1	1		USCGS 26.5 S 176.4 W H 06 59 37.8
									h 33 km ca Mag 4.8
	17	i(Sg) E	07 34 38.3	0.4		+0.03			Quarry blast ?
		i Z	34 38.6	0.5			+0.05		
		m NEZ	34 42	0.7	0.07	0.04	0.04		
674	18	eL Z'	14 35.8	43	Masked by microseisms				(USCGS 39.8 N 29.7 W H 13 12 42.3
		M Z'	47.8	21			1		h 20 km ca Mag 5.5)
	19	i N	02 27 04.6	0.5	+0.06				Quarry blast ?
		m N	27 05½	0.5	0.10				
	19	i NEZ	0[illegible] 14 03	0.5	+0.03	+0.10	+0.03		Quarry blast ?
		m NEZ	14 05	0.5	0.19	0.38	0.20		

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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Sept 19	i	NZ	05 08 54.5	0.5	+0.[illegible]		+		Local Seismic ?
		i	E	08 58.0	0.6		-0.07			
		m	NZ	09 03	0.6	0.04		0.05		
675	19	e(PS)	E'	05 38 13	14	Masked by micross & l.p. wanderings				USCGS 15.3 N 94.0 W
		e	Z'	38.3						H 05 08 15.1 h 42 km ca Mag 5.3
		eL	Z'	06 03.2	25					6 Pas 5¾-6 Brk
	19	e	NE	05 52 28	0.5					Small Local Seismic ?
676	20	e	N'	04 52.3		Masked by microseisms				USCGS 49.6 S 116.2 W H 04 33 29.4
		e	N'	53.3	16					h 33 km ca Mag 5.2
		e	N'E'Z'	53.6	22	3	3	1		
		eLQ	E'N'	05 01.2	40	2	2			
		eLR	N'Z'	04.1	31					
		L	N'E'Z'	05.4	24	3	3	8		
		M	Z'	09.2	17			6		
677	20	iP	Z	14 45 58.7	0.8			-0.14		Dilatation
										USCGS 30.0 N 138.1 E H 14 36 05.3
	20	e	N	15 46 37	0.5					h 454 km ca Mag 4.9
		m	N	46 56	0.5	0.03				Local Seismic ?
678	21	iP	EZ	04 28 28.7	0.7		+0.03	-0.08	3160	Dilatation Micross present
		i(pP)	Z	30 06	1.0			-0.10	28°.4	H 04 23 19½ h 0.09
		iPcP	Z	31 21	0.7			-0.06		USCGS 21.8 S 179.6 W H 04 23 19.7
		iS	E'E"	32 36	10		+3			h 609 km ca Mag 5.4
	21	iSg	N	06 52 25.2	0.5	-0.05				Quarry blast
		i	E	52 25.7	0.5		+0.03			
		m	NEZ	52 29	0.7	0.40	0.11	0.14		
	21	(Pg)	E	07 35 46½						Quarry blast
		i(Sg)	N	35 50		-				
		i	EZ	35 50.2	0.5		-0.07	+0.07		
		m	NEZ	35 53	0.7	0.10	0.08	0.09		
679	21	e(L)	N'E'	08 51.7		Masked by micross				USCGS 2.1 S 128.3 E H 08 30 54.4
										h 36 km ca Mag 5.7
680	21	(P)	Z	12 06 48		Masked by microseisms				USCGS 17.8 S 167.3 E H 12 01 46.6
		e(S)	N'	10 36	10	1				h 33 km ca Mag 5.1
		e	E'	10 46	7		2			
		eL	Z'	11.9	(30)					
		L	N'E'Z'	13	20	1	1	2		
681	21	(P)	Z	18 15 52½		Masked by microseisms				USCGS 30.1 S 179.5 W H 18 10 51.6
		e	N'Z'	22.2						h 319 km ca Mag 5.2
	22	e	N	03 47 24						Local Seismic ?
		i	NE	47 29	0.5	0.02	-0.05			
		m	NZ	47 34	0.5	0.03		0.04		
	22	i	EZ	05 58 53.7	0.5		-	+		Local Seismic ?
	22	i	Z	06 00 16						Local blasting
		m	NZ	00 18½	0.4			0.11		
	22	i	EZ	06 29 10.5	0.3		+	+		Local Blasting ?
		m	EZ	29 15	0.5		0.03	0.04		
	23	i	NEZ	01 55 49.5	0.3	-0.07	+0.06	-0.04		Local Blasting ?
682	23		Z'	05 45		Surface waves masked by large micross				USCGS 53.6 N 163.9 W H 04 59 47.4
	23	i(Sg)	N	06 30 24.7	0.6	-0.04				h 29 km ca Mag 5.5 5-5½ Brk
		m	NEZ	30 30	0.7	0.20	0.05	0.04		Quarry blast
	23	iPg	Z	06 50 16.7	0.3			+0.03		Quarry blast
		iSg	N	50 20.2	0.4	-0.02				
		i	E	50 20.4	0.3		+0.07			
		i	Z	50 20.5	0.3			+0.07		
		m	NEZ	50 24	0.7	0.11	0.12	0.13		
683	24		N'E'	17 36		Feeble long waves masked by large microseisms				USCGS 5.8 N 126.4 E H 17 18 12.1 h 132 km ca

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
684	Sept 23	(P)	Z	17 39 49		Masked by microseisms				
		T max	NEZ	58.2	0.6	0.04	0.03	0.03		
	24	iP	NZ	01 18 48.0	0.4	+0.03		-0.04		Dilatation
		iS	N	19 09.2	0.6	+0.08				
	24	e	N	05 41 40½	0.5					Local Seismic ?
		m	NE	41 43	0.5	0.03	0.03			
	24	i	EZ	06 24 25.5	0.3		-0.04	+0.05		Quarry blast ?
		m	EZ	24 29½	0.7		0.05	0.06		
685	24	e	N'	09 25 23	22	Masked by microseisms				USCGS 5.6 S 151.8 E H 09 14 38.6
		e	Z'	25 24	22					h 33 km ca Mag 5.3
		e	E'	26.5	21					
		eL	Z'	28.5	35					
		M	N'E'Z'	31.2	19	2	1	2		
	25	i	EZ	01 50 34.5	0.3		-0.05	+0.10		Local blasting ?
										S P N S defective most of day
	25	iPg	EZ	06 17 44.3	0.4		+0.02	+0.02		Quarry blast
		(Sg)	N	17 48						S P N S defective
		i	EZ	17 48.4	0.4		-0.10	+0.10		
		m	N	17 50						
		i	Z	17 50.7	0.6					
		m	EZ	17 52½	0.7		0.13	0.17		
	25	(T)	E	11 25.2	0.5					
686	25	(iP)	Z	15 54 59	Masked by micross			+		N' E' Z' records confused by micross
		e(LR)	N'Z'	16 22.3	35					USCGS 50.3 N 176.6 E H 15 42 17.9
										h 30 km ca Mag 5.5
687	25	e	Z"	23 34.5	Masked by microseisms					USCGS 30.7 S 179.9 W H 23 27 49.7
					No NiE Z N' E' Z' records from					h 424 km ca Mag 5.3
					23h 14 Sept 25 to 02h 00 Sept 26					
688	26	e	E'Z'	03 51.4	Masked by microseisms					USCGS 17.7 S 173.3 W H 03 38 32.7
		eL	N'Z'	54½	27	2				h 33 km ca Mag 5.1
		M	N'E'Z'	59.8	15	3	3	4		
	26	i	N	04 01 44.2	0.5	+0.09				Blasting ?
		m	NEZ	01 46	0.6	0.16	0.06	0.06		
689	26	eP	Z'	07 54 32		Microseisms present				USCGS 49.0 S 164.5 E H 07 50 19
		i	NZ	54 33.2	0.8	+0.02		+0.10		h 33 km ca Mag 5.2
		i	N	54 36	1.0	+0.05				
		e	E'	58 02	14		2			
		eL	Z'	58.3	27					
		e	N'	58 19	12					
		eL	N'	58.7	23					
		M	Z'	59.7	18			2		
		eT	N	08 12.0						
		T max	Z	12 54	0.6			0.05		
			E	12 57	0.6		0.05			
			N	13 01	0.6	0.06				
690	26		N'Z'	13 06	Feeble surface waves masked by microseisms					
691	26	iP	Z	23 01 12.9	1.0			-0.16		Dilatation
		isP	Z	01 26.5	1.0			+0.12		USCGS 4.9 S 153.5 E H 22 55 14.8
		e(S)	N'	06 07	24	4				h 34 km ca Mag 5.5
		e	Z'	06.3	26			3		
		e	E'	06 20						
		eL	N'E'	08	32		4			
		eLR	Z'	09.2	29					
		M	N'E'Z'	10	26	5	3	7		
692	27	M	N'E'Z'	08 22.2	18	1	1	1		Masked by micross & 1 p wanderings
										USCGS 2.2 N 126.5 E H 07 53 53.4
										h 70 km ca Mag 5.3
693	27	(iP)	Z	10 01 23				+		Masked by microseisms
		eL	N'	15.3	(32)					USCGS 2.3 N 126.7 E H 09 53 36.6
		M	N'E'Z'	22	18	1	1	1		h 100 km ca Mag 5.1
694	27	eL	N'	15 43.5	28	Masked by microseisms				USCGS 11.3 S 116.6 E H 15 24 17.2
		M	N'	45.6	16	2				h 33 km ca Mag 5.2
		M	E'	50.2	14		1			

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
695	Sept 27	eL	Z'	16 39.2	25	Masked by microseisms				
		M	N'E'Z'	45.5	20	1	1	1		
696	27	e	N'	22 12.4	17	Masked by microseisms				USCGS 5.5 S 151.6 E H 22 01 40.2
		eL	Z'	15.6	27					h 50 km ca Mag 5.4
		M	N'E'Z'	17.6	20	1	1	1		
	28	i	EZ	01 56 36.5	0.5		+0.04	+		Blasting ?
		m	Z	56 39½	0.5			0.04		
697	28	iPKP	Z	05 24 30	1.1			-0.15		Microseisms present
		M	N'Z'	06 20	Feeble					USCGS 1.2 S 24.1 W H 05 04 55.5
										h 37 km ca Mag 5.5
	28	e	N	05 43 52						Blasting ?
		i	EZ	43 52.3	0.4		+0.05	-0.04		
		i	E	43 54.0	0.5		+0.05			
	28	i	E	06 26 44.3	0.4		-0.02			Quarry blast ?
		i	N	26 47.3		+				
		m	NZ	26 50	0.7	0.12		0.06		
698	28		N'E'	11 59	Feeble surface waves masked by microseisms					
	29	(e)	Z	01 59 18½						Quarry blast
		i	NE	59 20.5	0.4		-0.12	+0.07		
		m	NEZ	59 22	0.4	0.64	0.21	0.13		
	29	(e)	N	04 27 17						Local
		i	Z	27 20.3	0.3			+0.06		
		m	NEZ	27 23	0.5	0.04	0.11	0.11		
	29	(T)	N	10 26						
699	29	(P)	Z'	14 06 59		Masked by microseisms				USCCS 20.4 S 174.4 W H 14 00 14.9
		e	E'	08 15						h 29 km ca Mag 5.7
		e(S)	E'	12 15						6½ Pas 5¾ Brk
		e	Z'	12 30	20			2		
		eL	N'	14.5	32	7				
		eLR	Z'	16.2	26			8		
		M	N'	18.7	16	6				
		M	E'Z'	19.7	18		17	25		
	30	i	NEZ	06 01 54.1	0.4	-0.05	-0.04	+0.02		Quarry blast ?
		m	NEZ	01 56	0.6	0.09	0.21	0.08		
	30	i	EZ	06 32 59.3	0.5		+0.05	-0.06		Quarry blast ?
		m	NEZ	33 05	0.7	0.07	0.08	0.09		
700	30		N'Z'	09 30	Feeble long waves masked by micross					(USCGS 32.5 S 71.6 W H 08 23 12.2
										h 33 km ca Mag 4.3)
701	Oct 1	iP	Z	02 53 40.5	0.7			-0.04		USCGS 4.0 S 153.5 E H 02 47 43.7
						Microseisms present				h 128 km ca
	1	iPg	EZ	06 31 44.1	0.4		+0.03	+0.04		Compression Quarry blast
		iSg	N	31 47.3	0.4	-0.06				
		i	NEZ	31 48.5	0.5	+0.07	-0.10	+0.14		
		m	NEZ	31 52	0.6	0.25	0.23	0.32		
	1	i	EZ	22 11 11.3	0.3		+0.04	+0.09		Local blasting ?
702	2	(eP)	Z'	01 11 13	5	Masked by micross &				USCGS 51.9 N 142.9 E H 00 58 39.2
		eL	Z'	42.2	24	long per wanderings				h 33 km ca Mag 5.7
	2	i(Sg)	NE	01 37 59.2	0.4	+0.06	+0.05			Quarry blast
		i	Z	37 59.7	0.5			+0.05		
		i	N	38 02.3	0.7	+0.17				
		m	NEZ	38 06	0.7	0.55	0.10	0.15		
	2	(T)	NZ	03 41.8						
	2	i	Z	03 14 50.8				+		Local Seismic ?
		i	NZ	14 51.7	0.3	-0.07		+0.04		
	2	i(Pg)	NZ	04 19 11.9	0.4	-		(+)		Quarry blast ?
		iSg	E	19 15.1	0.4		+0.06			
		i	NZ	19 15.3	0.3	+0.08		+0.10		
		m	NEZ	19 18	0.5	0.05	0.11	0.12		
	2	m	N	06 04 52½	0.8	0.07				Quarry blast ?

NO	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Oct 2	i	EZ	06 32 55.3	0.4		-0.04	+0.05		Quarry blast
		m	NEZ	32 59	0.6	0.05	0.10	0.10		
703	2	e	E'	09 33 04		Masked by microseisms				
		M	N'E'Z'	38	12	2	2	1		
704	2	(eL)	E'	09 57.4						USCGS 10.4 S 162.4 E H 09 47 27.2
		eL	N'	58.2	27	1				h 58 km ca Mag 5.2
		M	E'Z'	10 01.3	15		1	1		
705	2	iP	NZ	13 06 05.5	1.2	-0.13		+0.52	2920	Compression
		i	N'E'Z'N"E"Z"	06 13	+5	+4	-3	8	26°.3	USCGS 10.5 S 162.4 E H 13 00 39.7
		i	N'Z'	07 08	7	-4		+6		h 68 km ca Mag 6.0
		i	Z	07 22.5	1.5			+0.64		
		e	N'	10 20						
		eS	E'	10 34						
		i	E'E"	10 41	13		+23			
		i	N'N"	10 42	13	+9				
		i	Z'	10 43	15			+14		
		i	E'	11 04	14		+29			
		i	Z'	11 09	14			+17		
		i(LQ)	N'E'	11 27	30	+69	-44			
		i(SS)	Z'	11 48	18			-36		
		eL	Z'	12.3	30					
		M	Z'	13.6	19			27		
		M	N'E'	14.5	16	57		34		
	3	m	NEZ	01 34 14	0.6	0.05	0.05	0.05		Quarry blast ? Masked by micross
706	3	iP	Z	17 08 18	1.2			+0.16		Compression
		N' E' Z' records confused by micross & l p wanderings								USCGS 18.1 S 178.8 W H 17 02 48.0
										h 673 km ca Mag 4.4
707	3		N'	22 14	Feeble surface waves masked by micross & l p wanderings					USCGS 10.3 S 164.5 E H 22 00 53.8 h 66 km ca Mag 4.4
708	4	(e)	Z'	00 58 26	Masked by micross & l p wanderings					
		e	Z'	58 41						
		eLR	Z'	01 07.6						
709	4	eL	Z'	09 47.0	27	Masked by micross & l p wanderings				
	5	i	Z	03 54 37.4	0.4			+0.07		Local blasting ?
	5	e	Z	05 35 20	0.5					Seismic ?
710	5	e	N'	08 45.6	23	1	Masked by micross			USCGS 16.7 S 173.7 W H 08 30 15.7
		eLR	Z'	47.5	26			1		h 33 km ca Mag 5.1
		eL	E'	47.7	26		1			
711	5	(P)	Z	13 17 00		Masked by micross				USCGS 22.3 S 171.6 E H 13 12 15.5
		e	E'	20 56						h 145 km ca Mag 4.9
		e	N'	21 15						
712	5	e	N'	14 12.7	(25)	Masked by micross				USCGS 22.2 S 175.8 W H 13 58 56.9
		eLR	Z'	13.8	26			2		h 33 km ca Mag 5.1
		eL	E'	13.9	26		1			
	6	(T)	NE	01 56.5						
713	6	(e)	N'	06 30.5		Masked by micross				USCGS 18.6 N 119.6 E H 08 11 32.6
		(eL)	Z'	40.4						h 33 km ca Mag 6.0
		M	N'E'Z'	49	19	1	1	1		
	6	iSg	N	06 36 12	0.5	-0.04				Quarry blast
		i	EZ	36 12.6	0.5		+0.03	+0.05		
		i	N	36 13.5	0.7	+0.09				
		m	N	36 14½	0.7	0.28				
		i	Z	36 15.9	0.7			+0.15		
		m	EZ	36 17	0.7		0.16	0.17		
714	6	(iP)	N	07 30 33		+	Micross present			L P wandering on N' E' Z' records
		e	Z'	40 46						USCGS 36.2 S 100.9 W H 07 17 57.1
		e(SKS)	N'	40 49	16	2				h 33 km ca Mag 5.5
		e(PS)	N'	41 38	18	3				
		e(SS)	E'	45.6						
		e	N'Z'	46	22			2		
		m	E	46.5	18		2			

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No	Date	Phase & Component	Time (G.M.T.)	Per	Amplitude AN	Amplitude A_E	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km	
714 cont	Oct 6	e(SSS) Z'	07 49.5	22					
		e(LQ) E'	52.6	(42)					
		eLR E'Z'	56	34					
		L N'E'Z'	56.7	34	3	3	5		
715	6	(ePKP) Z!	14 50 25	18	Microseisms present				USCGS 40.3 N 28.2 E H 14 31 19.2
		ePKP Z'	50 47	11			2		h 10 km ca Mag 6.0
		ePP Z'	53 13	16			3		$6\frac{3}{4}$-7 Pas Brk
		iPKS E'	54 13	13		+6			$6\frac{1}{4}$ Pal
		i N'	54 15	12	-4				
		e Z'	54 18	16			4		
		e(PPP) E'	56 11	16		2			
		ePPP Z'	56 13	24			3		
		eSKSP E'	15 03 11	15		1			
		ePPS E'	05 14	14		4			
		iPPS Z'	05 20	18			-5		
		e E'	06 36	18	3				
		i Z'	06 38	18			+8		
		e N'	07.2	24					
		e E'	07 30	22		4			
		e E'	12.6	44		4			
		e N'	17 46	34	6				
		eG N'E'	29.0	70	13	8			
		eL E'	33.8	50					
		L N'E'	35.5	40	15	13			
		eL Z'	36.2	52					
		L Z'	37.5	52			29		
		M N'E'Z'	48	23	15	14	23		
		M E'Z'	52.9	21		21	27		
716	6	eP Z	19 17 28	1.4			0.19		Microseisms present
		eL Z'	24.0	21					USCGS 16.1 S 168.6 E H 19 12 12.0
									h 21 km ca Mag 5.4
	6	i N	23 14 42.2	0.7	+0.04				Quarry blast
		m N	14 44	0.7	0.06				
717	7	eP Z	03 57 $50\frac{1}{2}$		Microseisms present				USCGS 6.8 S 155.2 E H 03 52 11.3
		i Z	58 01.8	0.7			+0.04		h 70 km ca Mag 5.5
		eL Z'	04 06.2	20					
	7	i Z	04 59 35				+		Quarry blast ?
		i N	59 38	0.8	+0.08				
	7	e NE	07 11 59						Quarry blast ?
		i E	12 02	0.6		+			
		m E	12 03	0.7		0.09			
		i NZ	12 06.7	0.6	-0.03		-0.04		
	7	ePg Z	07 44 34.8						Quarry blast
		iSg N	44 38 5	0.5	+0.04				
		i EZ	44 38.8	0.4		+0.06	-0.05		
		i N	44 39.8	0.5	+0.05				
		m NEZ	44 42	0.7	0.34	0.09	0.07		
	8	i NZ	05 59 06.3	0.4	-		-0.03		Quarry blast
		m NEZ	59 09	0.6		0.03	0.08		
718	8	(e) N'	10 49 48	6					USCGS 6.5 S 154.4 E H 10 39 13.0
		eL N'Z'	53.4	22					h 74 km ca Mag 5.2
	8	i E	21 59 47.5	0.5		+0.02			Quarry blast ?
		e NZ	59 50	0.6					
		m NEZ	59 55	0.7	0.05	0.05	0.06		
	9	i Z	03 34 44.8	0.3			-		Local Seismic ?
	9	i N	05 19 41		-				Local Seismic ?
		m NE	19 43	0.6	0.03	0.04			
	9	i N	05 53 26	0.7	+0.04				Quarry blast ?
		m N	53 27	0.7	0.06				
	9	i EZ	06 20 28.5	0.3					Local Seismic ?
		m EZ	20 33	0.5					

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Oct 9	i	Z	06 21 20.3				(+)		Local Seismic ?
		i	N	21 21.5	0.7	+0.05				
		m	NEZ	21 24	0.7	0.11	0.04	0.04		
719	9	eP	Z'	21 41 23		Microseisms present			4210	USCGS 16.2 S 171.9 W H 21 34 09.2
		eS	N'	47 12	12	1			37°.9	h 33 km ca Mag 5.8
		eLQ	N'	49.7	26	3				5¼ Brk
		eLR	Z'	51.7	25			2		
		eLR	E'	51.8	25		2			
		M	N'E'Z'	54.2	16	3	1	2		
720	9	(P)	Z	22 04 34½		Masked by microseisms				N' E' Z' records obscured by coda
		e	Z	04 46	1.0			0.07		of 719
		T	N	22 32	0.5					
		T	E	22 37	0.5					
	10	i	Z	04 59 52.3	0.3			+0.04		Local Seismic ?
		m	NEZ	59 54	0.5	0.02	0.03	0.04		
	10	ePg	Z	05 49 22½						Quarry blast
		iSg	N	49 26.0	0.4	+0.03				
		i	EZ	49 26.5	0.4		-0.05	+0.05		
		i	N	49 27.5	0.5	+0.05				
		m	N	49 29½	0.5	0.08				
		i	EZ	49 29.7	0.7		+0.04	+0.07		
		m	EZ	49 31	0.7		0.08	0.11		
	10	i	Z	07 02 31.6	0.3			+0.02		Local Seismic.?
	10	e	Z	07 14 54	0.3					Local Seismic ?
		i	Z	14 55	0.5			+0.03		
		m	NE	14 56	0.5	0.03	0.02			
	10	i	Z	07 17 59.5	0.3			+0.02		Local Seismic ?
721	10		Z'	21 04	Feeble surface waves masked by micross					
	11	(P)	Z	00 18 37		Masked by micross				USCGS 16.2 S 168.2 E H 00 13 13.4
										h 17 km ca Mag 5.3
722	11	(P)	Z	10 18 10		Masked by micross				USCGS 19.1 N 156.6 W H 10 [illegible]6 44.9
		eL	Z'	40	35					h 33 km ca Mag 5.3
		M	E'Z'	45	20		1	1		4¾-5 Brk
723	11	iP	Z	11 15 49.6	1.0			+0.12		Compression
		m	Z	15 52	1.0			0.24		USCGS 13.6 S 166.6 E H 11 10 33.6
		i(pP)	Z	16 03.6	0.8			+0.07		h 68 km ca Mag 5.0
		e	N'	20 21						
		e	Z'	20 23	20					
		e	N'	20 47	15	1				
		e	N'	21 18	17					
		eLR	N'E'Z'	22.2.	27	1	2	2		
724	11	eP	Z'	21 23 04		Microseisms present			4800	USCGS 0.6 S 121.7 E H 21 15 03.9
		e	Z	23 05					43°.2	h 33 km ca Mag 6.3
		i	ZZ'	23 09	5			+9		6¼-6½ Pal
		iPcP	Z'	24 52	4			+13		
		i	Z	24 53	2.5			-2.2		
		e	N'Z'	26 29	15	4		5		
		e	E'	26 33	15		4			
		i	E'Z'	27 05	10		-6	-9		
		iS	N'	29 28	15	+				
		i	E'	29 31	15		+			
		m	N'E'	29.8	16	19	11			
		i	N'	30 13	17	+12				
		i	N'	30 29	17	+16				
		i	E'	32 19	22		+13			
		eiSS	N'	32 27	24	-				
		m	N'E'	32.9	24	49	32			
		i(ScS)	E'	33 03	7		+15			
		eLQ	N'	33.7	56	46				
		eLQ	E'	33.9	56		40			
		eL	Z'	35.4	41					
		M	N'E'	38.1	21	110ca	110ca			
		M	Z'	40.3	21			27		
		M	N'E'Z'	43.4	20	63	47	62		

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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Oct 12	(Pg)	Z	06 46 34½						Quarry blast
		i(Sg)	N	46 38	0.5	-0.05				
		i	EZ	46 38.7	0.5		-0.04	+0.04		
		m	NEZ	46 42	0.6	0.24	0.09	0.12		
725	12	(i)	Z	09 00 44	1.3			+0.21		Masked by microseisms
		e	Z'	11.9						
		eL	N'E'	35.4	(25)					
		eL	N'Z'	37.5	28					
726	12	eL	Z'	11 58.7	26	Masked by microseisms				USCGS 4.5 S 144.5 E H 11 43 35.3
		M	Z'	12 02.0	20			1		h 77 km ca Mag 5.2
727	12	iP	Z	15 50 55	1.2			+0.14	4680	Microseisms present
		i	Z	51 12.5	1.2			+0.16	42°.1	USCGS 3.0 N 126.7 E H 15 42 54.7
		e	Z'	51 19	11			2		h 59 km ca Mag 5.9
		ePP	Z'	52 39	18			2		5¾-6 Pal
		e	E'	52 44	16					
		e	N'	52 52	17	2				
		i	Z'	53 03	6			-5		
		ePPP	N'	53 09	17	2				
		eS	N'	57 12	14	4				
		e	N'	57.4	34	6				
		e	Z'	57.6	40			5		
		X	N'Z'	58.5	36	6				
		X	E'	58.8	32		2			
		i(SS)	Z'	16 00 35	30			+6		
		i(SS)	N'E'	00 36	20	+8	+10			
		eL	N'E'	01.8	58	6	7			
		L	E'	03.3	47		8			
		eLR	N'Z'	04.0	46	9				
		M	N'E'Z'	08.0	29	10	11	10		
728	12	eP	Z'	22 07 40		Micross present			8950	L P wanderings on N' E' records
		iS	N'	17 43	11	+2			80°.5	USCGS 31.3 S 110.8 W H 21 55 33.2
		e	N'	18 04	20	1				h 25 km ca Mag 6.0
		eG	N'	28.7	42	6				6¼ Pas Brk
		eLR	Z'	31.1	40					5¾ Pal
		LR	Z'	32.7	30			4		
		M	N'E'Z'	43.5	17	3	2	4		
	13	i	N	01 58 11.5	0.4	-0.05				Local Blasting ?
	13	iPg	EZ	06 11 13.1	0.3		+0.04	+0.04		Compression Quarry blast
		iSg	N	11 16.8	0.3	+0.06				
		i	EZ	11 17.2	0.4		-0.10	+0.12		
		i	N	11 18.0	0.4	-0.07				
		m	N	11 20	0.5	0.11				
		i	EZ	11 20.4	0.7		0.08	0.11		
		m	EZ	11 21½	0.7		0.13	0.19		
	13	i	EZ	06 25 12.0	0.3		+0.09	-0.07		Quarry blast
		m	N	25 14	0.5	0.06				
		i	EZ	25 14.5	0.7		+0.05	+0.07		
		m	EZ	25 15½	0.7		0.09	0.LL		
729	13	e(P)	Z	10 45 14	1	Masked by micross				USCGS 3.3 S 149.9 E H 10 38 59.3
		ePP	Z'	46 07						h 59 km ca Mag 5.1
		ePP	N'	46 09						
		eS	N'	50 07	21	3				
		e	E'	50 09						
		e	Z'	50 22	20			1		
		e	E'	51.9	22		2			
		eLQ	E'	52.4	35		10			
		eL	N'	53.0	30					
		M	N'Z'	55.6	22	10		12		
		M	E'	57.6	15		16			
730	13	e(S)	N'	18 20.7		Masked by micross				USCGS 22.1 S 170.5 E H 18 12 14.5
		eL	Z'	22.2						h 41 km ca Mag 4.7
731	13	eL	Z'	19 30.3	(20)	Masked by micross				

RIVERVIEW COLLEGE OBSERVATORY
SEISMOLOGICAL BULLETIN OCTOBER 1964

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Oct 13	i	NE	23 30 57.9	0.5	+0.05	+0.03			Local Blasting ?
		i	Z	30 59.3	(0.5)			+		
	14	e	N	02 42 03						Local
		m	NEZ	42 23	0.6	0.04	0.03	0.04		
732	14	P	Z	03 16 02	1.4			0.37	7540	Microseisms present
		eS	E'	24 56	10		1		67°.8	N' E' Z' records confused by 1 p wanderings
		e	E'	32 14	14		1			USCGS 33.4 N 141.8 E H 03 04 59.6
		eL	E'	34.1						h 33 km ca Mag 5.6
		M	N'E'Z'	43.7	18	1	1	1		
	14	i	N	03 18 33.5	0.5	+0.02				Local ? Seismic ?
		i	E	18 38.0	0.6		+0.04			
		i	NZ	18 41.3	0.7	-0.03		-0.04		
	14	i	NZ	04 01 42.5	0.6	-0.03		+0.07		Local Seismic ?
	14	i	Z	05 01 15.5				+		Local Seismic ?
		m	N	01 20	0.7	0.04				
	14	e	NEZ	05 35 38	0.4					Local Seismic ?
	14	(Pg)	Z	06 53 48		Masked by microseisms				Quarry blast
		iSg	N	53 41.5	0.4	+0.03				
		i	EZ	53 41.8	0.4		-0.10	+0.12		
		m	NEZ	53 46	0.7	0.06	0.18	0.18		
	14	(Sg)	N	07 35 58	0.5					Quarry blast ?
		i	Z	35 59	0.5			-0.03		
		m	N	36 01	0.7	0.11				
733	14	e(L)	E'	11 19.2	18					
		eL	N'Z'	20.5	23					
734	14	(P)	Z	12 12 25		Masked by microseisms				USCGS 5.7 S 150.5 E H 12 06 38.1
		eL	N'Z'	20.3		Feeble				h 89 km ca Mag 4.0
	15	e	N	01 57 18	0.7					Local Seismic ?
		m	N	57 19½	0.7	0.04				
	15	e	Z	01 57 40	0.5					Local Seismic ?
		i	NZ	57 41.5	0.5	-0.03		+0.03		
735	15	eL	Z'	02 21.1	23					USCGS 6.6 S 154.8 E H 02 07 06.4
										h 62 km ca Mag 5.1
	15	e	E	05 48 45½	0.3					Local Seismic ?
	15	i	NZ	06 00 33	0.5	-		-0.03		Quarry blast ?
		m	Z	00 36	0.5			0.06		
	15	e	E	07 19 38	0.3					Quarry blast ?
		i	N	19 38.5	0.5	+0.03				
		m	NEZ	19 42	0.8	0.19	0.04	0.09		
	15	i	NZ	08 16 49	0.3	+		+		Quarry blast ?
		m	NEZ	16 54	0.6	0.05	0.15	0.07		
		m	NZ	16 57½	0.6	0.06	.	0.06		
736	15	eP	Z'	20 38 53	10			1	8710	USCGS 44.7 N 149.8 E H 20 26 53.5
		e	N'	39 02	8	1			78°.4	h 49 km ca Mag 5.2
		e	Z'	39 11	10			1		
		eS	E'	48 45	18		3			
		e	N'Z'	48 50	22	2		1		
		i(ScS)	N'	49 12	10	-3				
		e	E'	49 20	16		3			
		ePS	N'	49 29	12					
		eSS	N'	53.8	25	2				
		eG	E'	59.7	40		5			
		eL	N'	21 00.2	28					
		eL	Z'	04.4	(34)					
		M	N'E'Z'	07	21	5	3	3		
		M	N'Z'	12	20	5		5		
		W2M	Z'	22 59	18			1		
	15	e	N	21 40 59	(0.3)					Local blasting ?
		i	EZ	40 59.5	0.3		+0.06	+0.12		

No	Date	Phase& Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Oct 16	i	EZ	06 13 55.1	0.4		+0.07	+0.08		Quarry blast
		m	NEZ	13 58	0.6	0.04	0.08	0.13		
	16	iPg	EZ	06 15 03.8	0.4		+0.02	+0.02		Compression Quarry blast
		iSg	N	15 07.5	0.4	-0.05				
		i	EZ	15 07.8	0.4		-0.08	+0.09		
		m	NEZ	15 12	0.7	0.25	0.14	0.17		
737	16	(P)	Z	06 21 20		Masked by microseisms				USCGS 23.6 S 177.6 W H 06 15 31.5
		e	Z'	22 41	6			2		h 178 km ca Mag 5.5
		i	N'	28 07	13	+4				
		m	N'	28.5	20	7				
		M	N'E'Z'	31.5	15	5	1	1		
738	16	eP	Z'	07 11 36	9				8760	USCGS 44.3 N 149.5 E H 06 59 38.6
		m	Z'	11.8	9			6	78°.8	h 33 km ca Mag 5.5
		i	Z'Z"	12 16	9			+3		
		iS	E'	21 30	21		-9			
		i	N'Z'	21 32	21	-6		-4		
		i	E'	22 09	15		+7			
		iPS	N'	22 17	15	+6				
		e	E'	26 14	25		4			
		eSS	N'	26 33	22	6				
		LQ	E'	32.4	40		15			
		eL	Z'	35.1	(50)					
		L	Z'	37.4	30			6		
		M	N'E'	39.9	21	11	7			
		M	N'E'Z'	46	19	14	8	20		
739	16	iS	E'	08 40 18	20		-6			Masked by coda of no 738
		LQ	E'	51.2	40		7			USCGS 44.6 N 149.4 E H 08 18 28.3
		M	N'E'Z'	09 04.5	20	6	3	7		h 33 km ca Mag 5.2 6-6¼ Pal
740	16	S	E'	09 40.1	20		4			Masked by codas of nos 738 & 739
		LQ	E'	51.0	40		6			USCGS 44.5 N 149.1 E H 09 18 16.6
		M	N'E'Z'	10 04.5	20	7	3	10		h 33 km ca Mag 5.4
741	17	iP	Z	01 44 14.8	1.0			-0.16	3080	Dilatation
		sP	Z	44 30	1.1			0.21	27°.7	Microseisms present
		i	N	44 32	1.2	+0.25				N' E' Z' records also confused by
		i	Z"	44 55	3			+		1 p wanderings
		iPPP	N	45 15	1.0	-0.10				USCGS 7.0 S 155.8 E H 01 38 36.0
		i	N	47 53½	1.5	+0.02				h 58 km ca Mag 4.7
		eS	N'	48 53	22					
		i	Z'Z"	49 13	24			+6		
		i	N'	49 28	20	+7				
		e(L)	E'	50.4	33					
		e	Z'	50 41	24					
		e	N'	50 52	26	6				
		eLR	Z'	51.6	28					
		M	N'Z'	54	20	8		8		
	17	(i)	Z	03 25 54		Masked by microseisms				USCGS 0.7 N 119.3 E H 03 17 28.1
										h 62 km ca Mag 5.4
	17	i(Sg)	N	03 33 16.4	0.6	-0.05				Quarry blast
		i	E	33 18	0.5		-0.13			
		m	NEZ	33 19	0.5	0.22	0.19	0.23		
	17	iP	NZ	03 44 33.8	0.5			+0.02		Compression [illegible]y blast
		iS	NE	44 55	0.6	-0.09	+0.05			
	17	(Pg)	EZ	05 29 43						Quarry blast ?
		iSg	E	29 46.3	0.4		-0.07			
		i	Z	29 46.4	0.4			+0.07		
		m	NEZ	29 50	0.6	0.05	0.09	0.09		
742	17	iP	Z	06 00 35.0	1.0			+0.12	2510	Compression Micross present
		iP	Z'Z"	00 35	5			+5	22°.6	E' confused by 1 p wanderings
		i	Z	00 38	1.0			+0.13		h 0.01
		ePP	Z'	00 59						USCGS 22.3 S 171.5 E H 05 55 54.4
		iPP	E'E"	01 00	4		+4*			h 116 km ca Mag 5.3
		iS	N'N"	04 31	8	+9				
		iPcP	E'E"	04 35	7		-9			

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No	Date	Phase & Component	Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km	
742	Oct 17	i Z'	06 04 37	6			-5		
cont		eL Z'	05.3	35					
		L N'	05.4	23	7				
		L Z'	06.2	35			4		
743	17	(P) Z	10 07 18		Masked by microseisms				USCGS 21.8 S 170.2 E H 10 02 57
		e Z'	11.9						h 33 km ca
		eL Z'	12.3	30					
	17	(T) N	13 01.6		Masked by microseisms				
744	17	(e) Z	15 08 37		All records masked by microseisms				USCGS 7.1 S 129.4 E H 15 01 14.0
		i E	09 27½	1		+			h 117 km ca Mag 5.5
		e N	15 35	1½					
		e N'E'	20	(15)					
745	18	N'Z'	07 00		Feeble waves masked by microseisms				
746	18	(e) Z'	09 19 25		Masked by microseisms				USCGS 2.9 N 65.7 E H 09 06 26.0
		e(SS) E'	35 56	18					h 33 km ca
		eL E'Z'	47.4	(38)					
		M N'E'Z'	51.5	23	1	1	1		
747	18	iP Z	12 38 47.3	0.7			+0.06	4000	Compression
		iP N'E'Z'N"E"Z"	38 47½	10	-8	+8	+22	36°.0	Preceded bymicross on N E Z
		i NEZ	38 48	1.0	-0.08	+0.16	+0.72		h 0.09
		m NEZ	38 50½	1.3	0.43	0.81	3.8		USCGS 7.0 S 124.0 E H 12 32 24.1
		i Z'	40 21	9			+		h 574 km ca Mag 5.8
		ipP N'E'Z'N"E"Z"	40 26	12	+22	-21	-48		
		i Z	40 26.7	1.5			+2.5		
		m Z	40 31	1.5			4.6		
		i Z'	41 24	16			+18		
		i Z'Z"	43 44	6			+		
		iS N'E'N"E"	43 46	15	-16	+33			
		i Z'	43 53	8			+63		
		i N'N"	43 56	13	+86				
		m E'	44.1	18		+150ca			
		e N'Z'	44 10	32	49		32		
		isS N'E'	46 46	15	-55	+67			
		iSS Z'	46 57	15			+38		
		m N'E'Z'	47.2	15	170	140	78		
		iScS E'	47 52	14					
		M N'E'Z'	54	23	43	43	50		
		e Z'	13 59.4	50			6		
		e N'E'	14 09	60	6	6			
748	18	L N'E'Z'	22 15						USCGS 7.1 N 144.4 E H 21 56 01.0
									h 33 km ca Mag 4.8
	19	iSg N	06 37 06.5	0.6	-0.04				Quarry blast
		i Z	37 07.0				-		
		m NEZ	37 10	0.8	0.40	0.11	0.12		
		m EZ	37 13½	0.8		0.10	0.12		
749	19	eL E'	13 42.5	30					USCGS 4.6 S 152.9 E H 13 29 29.4
		eL Z'	43.7						h 70 km ca Mag 4.9
		M N'Z'	47	16	½	½			
750	19	iP Z	13 59 44.2	0.8			-0.07		Dilatation Micross present
		e N'Z'	14 04 16	14					USCGS 14.4 S 166.4 E H 13 54 29.1
		eL Z'	05.7	27					h 9 km ca Mag 4.6
		M N'	08.1	13	½				
	19	i Z	21 29 49.3	0.25			+0.12		Local Seismic ?
	19	i Z	22 14 37.3	0.25			+0.06		Local Seismic ?
	19	e N	22 42 35½						Local blasting ?
		m NE	42 36½	0.3	0.20	0.11			
	20	iSg N	07 45 50.6	0.5	+0.06				Quarry blast
		i NEZ	45 51.4	0.4	+0.07	+0.07	+0.07		
		m NEZ	45 55	0.7	0.50	0.10	0.12		
751	20	e E'	07 49 15	15					
		(T) NEZ	08 04.5	0.5					

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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Oct 21	e	Z	01 59 32.7	0.5					Quarry blast
		e	N	59 34.7	0.6					
		m	NZ	59 39	0.7	0.14		0.04		
	21	e	EZ	02 14 50						Quarry blast
		i	NEZ	14 51.8	0.5	-0.27	+0.15	+0.06		
		m	NEZ	14 53	0.5	0.79	0.41	0.20		
	21	e	N	04 43 29½						Local Seismic ?
		i	Z	43 30	0.3			+0.04		
		m	NEZ	43 31	0.5	0.02	0.04	0.03		
	21	e	EZ	05 46 51	0.5					Local Seismic ?
	21	iSg	N	06 29 34.5	0.6	+0.04				Quarry blast ?
		i	E	29 34.7	0.5		-0.03			
		m	NEZ	29 40	0.7	0.20	0.04	0.04		
	21	i	NE	07 28 50.	0.6	+0.01	+0.04			Local Seismic ?
		m	NEZ	28 57	0.8	0.05	0.03	0.06		
752	21	iP	Z	10 14 02.4	0.7			+0.03		Compression Feeble
		e	E'Z'	20.6	(24)					USCGS 14.1 S 166.7 E H 10 08 46.7
										h 45 km ca Mag 4.4
753	21	e	E'	12 39.1	(30)					
		eL	E'Z'	49.0	27					
754	21		Z'	15 59		Feeble long waves				
755	21	iP	Z'	23 21 44	6			-6		Dilatation
		i	Z"	21 45	6			+7*		USCGS 28.1 N 93.8 E H 23 09 18.8
		e	E'	21 46	7		1			h 37 km ca Mag 5.9
		e	Z'	24 43	11			1		
		eS	N'	31 53	14	6				
		iS	E'E"	31 55	13		+9			
		e	Z'	32 00	20			3		
		ePS	Z'	32 40	16			4		
		eSS	Z'	37 14	15					
		eSS	E'	37 18	20		4			
		e	Z'	41.3	30					
		eLQ	N'	43.1	(46)					
		eLR	Z'	49.5	45			9		
		LR	Z'	51.4	42					
		M	N'E'Z'	58.5	25	8	7	10		
		W2M	N'Z'	25 40	22	1		2		
	22	iP	Z	04 19 39.7	0.5			+0.02		Compression Local
		iS	NE	20 00.8	0.5	-0.08	+0.04			
	22	iSg	N	06 31 09.2	0.5	+0.02				Quarry blast
		i	EZ	31 09.4	0.5		-0.02	-0.03		
		m	NEZ	31 14	0.7	0.11	0.06	0.07		
756	22	L	N'Z'	10 31		Feeble				(USCGS 36.7 N 141.1 E H 09 54 36.9
										h 40 km ca Mag 4.8)
757	22	M	E'Z'	12 20		Feeble				
	23	i	EZ	02 03 06.5	0.3		+0.04	+0.04		Quarry blast ?
		m	EZ	03 11	0.6		0.04	0.05		
758	23	ePKP	Z'	02 15 51						Micross on all records
		i	Z	15 54.5	1.2			+0.16		N' E' Z' also confused by 1 p
		i	Z	15 57.4	1.1			+0.24		wanderings
		m	Z	16 01	1.1			0.40		USCGS 19.8 N 56.0 W H 01 56 03.2
		e	Z'	16.2						h 31 km ca Mag 6.4
		i	Z	16 28	1.0			+0.21		6½ Brk
		ePP	Z'	19 41	16			4		6¾ Pas
		ePPP	Z'	23.1	20			1		
		eSS	N'Z'	39.0	18			2		
		(e)	E'	40.9	50		7			Seismic ?
		(e)	N'	41.1	60	5				..
		(eLQ)	E'	57.9	50		3			..
		eLQ	N'	59.2	50	6				
		eLR	Z'	03 06.9	40					
		LR	Z'	09.2	40			7		Cont next page

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
758	Oct 23	M	N'E'Z'	03 25	23	5	5	10		
cont		M	N'E'	28.5	20	6	7			
	23	i(Sg)	N	06 13 33.0	0.4	+0.04				Quarry blast
		i	EZ	13 33.5	0.4		+0.06	+0.06		
		m	NEZ	13 37	0.7	0.08	0.14	0.14		
759	23	i(P)	Z	06 59 59.7	1.2			+		Masked by microseisms & 1 p wand.
		i	N	07 00 00.5	1.2	+				USCGS 2.7 S 142.1 E H 06 53 25.1
		eL	E'	09.7	22					h 33 km ca Mag 4.6
		M	N'E'	12.8	18	2	2			
760	23	e(S)	N'	21 28.2	Masked by micross & 1 p wanderings					USCGS 44.0 N 147.5 E H 21 06 24.2
		e(SS)	N'	33.2	25	1				h 45 km ca Mag 5.9
		eLQ	E'	39.1	34					
		eLR	Z'	43.5	32					
		M	N'Z'	47.5	24	1		2		
	24	iPg	EZ	02 27 46	0.3		+	(+)		Quarry blast
		iSg	N	27 49.3	0.4	-0.04				
		i	EZ	27 49.8	0.4		-0.05	+0.07		
		m	NEZ	27 53	0.7	0.15	0.07	0.07		
	24	iSg	N	04 12 38.3	0.5	-0.02				Quarry blast
		m	NEZ	12 42	0.5	0.22	0.35	0.25		
761	24	(e)	Z'	09 56 42		Masked by microseisms				USCGS 19.1 S 169.7 E H 09 51 27.3
		e(S)	N'E'	10 00 30.5	8	1	1			h 33 km ca
		eL	E'Z'	01.8	34		1	2		
762	24	(iP)	Z	22 11 01	0.8			+		Masked by microseisms
		M	E'	22.3		Feeble				USCGS 4.5 S 152.9 E H 22 04 57.5
										h 49 km ca Mag 5.8
763	25	e	N'	10 17.5	20	Feeble				USCGS 15.3 S 173.3 W H 10 01 48
		eL	E'Z'	20.1	22					h 33 km ca Mag 5.0
764	25	(P)	Z	12 14 07		Masked by microseisms				h 600 km ca
		iScP	Z	19 40.3	0.9			+0.06		USCGS 21.7 S 179.2 W H 12 08 46.9
		e	N'	21 18	11	2				h 534 km ca Mag 5.5
		e	E'	21 26	11		1			
		iScS	N	23 36	1.2	-0.08				
		eScS	N'	23 37						
	26	e(Sg)	N	01 58 16½						Quarry blast
		i	N	58 20	0.4	+0.07				
		m	N	58 21½	0.7	0.15				
	26	e	Z	03 24 09						Local blasting ?
		i	EZ	24 09.7	0.3		-0.06	+0.09		
765	26	eP	Z	04 09 43		Masked by microseisms				USCGS 49.1 S 163.7 E H 04 05 37.0
		eL	Z'	14.5						h 33 km ca
		eT	NE	27.6	0.6					
	26	i	NEZ	06 00 09	0.4	-	+0.04	+0.05		Quarry blast
		m	NEZ	00 12	0.5	0.15	0.09	0.19		
766	26	eP	Z'	14 30 52					4710	USCGS 2.2 N 126.8 E H 14 22 57.8
		i	Z	30 52.3	1.8			-0.50	42°.4	h 48 km ca Mag 6.0
		e	Z	31 16½	1.8			0.25		
		i	Z	31 36	1.0			+0.06		
		eS	N'E'	37 11½	13					
		e	Z'	37 34	32			1		
		e	N'	37 50	31	1				
		eSS	Z'	40 23	26					
		e	N'	40 35	25	1				
		eLQ	E'	40 40	27		1			
		eL	E'	42.6	47					
		eLR	Z'	43.5	42					
		LR	N'Z'	46.0	34	1		2		
		M	E'	47.4	26		2			
		M	N'E'Z'	50.2	26	1½	1½	2		
	27	i	E	01 54 13.5	0.5		+			Local Seismic ?
		i	NEZ	54 15.1	0.3	-0.06	-0.05	+		
		i	EZ	54 15.8	0.5		+0.04	+0.04		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Oct 27	e	Z	05 30 17½						Local Seismic ?
		i	EZ	30 20.0	0.5		+0.03	-0.02		
		i	Z	30 22.3	0.5			+0.04		
		m	NEZ	30 26	0.8	0.05	0.06	0.06		
	27	i	NE	06 12 23.3	0.5	-	+			Very small Local Seismic ?
	27	Pg	EZ	06 42 54½						Quarry blast
		iSg	NZ	42 58.5	0.5	+0.04		-0.03		
		i	EZ	42 59.5	0.5		-0.04	+0.03		
		m	NEZ	43 02	0.6	0.26	0.23	0.27		
767	27	(P)	Z	20 06 19		Masked by microseisms				USCGS 27.6 S 176.8 W H 20 00 35
		e	Z'	11.3	20					h 168 km ca Mag 4.5
		eL	E'Z'	12.9	34					
		LR	E'Z'	14.3	25		1½	2		
		M	N'E'Z'	16	17	1½	2½	3		
768	27	iP	N'E'Z'	21 32 32	7	+1	+2	+5	4900	Compression
		iS	NE'	39 02	11	-6	-16		44°.1	H 21 24 25
		i	Z'	39 05	8			+5		USCGS 45.6 S 96.1 E H 21 24 31.2
		i(SS)	N'E'	42 21	21	-9	+5			h 33 km ca
		e	Z'	42 31	20			3		
		eLR	Z'	45.0	31					
		LR	N'E'Z'	45.6	28	20	19	30		
		M	N'E'Z'	47.8	18	12	27	27		
769	27	iP	Z	22 48 43.0	1.5			+0.14		Compression N' E' Z' records obscured by coda
		i	Z	48 47.5	1.2			+0.09		of no 768 USCGS 58.5 S 66.2 W H 22 36 18
										Mag 5.4
	28	i	Z	01 32 12.0	0.3			+0.06		Local Seismic ?
	28	e	N	02 04 43½						Blasting ?
		i	E	04 44.5	0.6		+			
		m	NE	04 45	0.6	0.04	0.09			
770	28	e	Z'	06 03.6						
		M	N'E'Z'	07.4	14	2	1	1		
	28	iPg	EZ	06 29 38.7	0.4		+0.03	+0.02		Compression Quarry blast
		iSg	N	29 42.2	0.5	-0.11				
		i	EZ	29 42.7	0.5		-0.11	+0.16		
		m	N	29 44½	0.6	0.69				
		i	EZ	29 46	0.7		+0.15	+0.23		
		m	EZ	29 47	0.7		0.28	0.36		
	29	iSg	N	06 30 15.3	0.6	+0.07				Quarry blast
		i	EZ	30 16.0	0.5		+0.04	-0.04		
		m	NEZ	30 19	0.7	0.40	0.16	0.17		
771	29	iP	NZ	06 57 06.5	0.8	+0.04		+0.06		USCGS 13.4 S 166.6 E H 06 51 46
		eL	N'Z'	07 02.3	27	Microseisms present				h 43 km ca Mag 4.9
772	29		N'E'Z'	23 25		Feeble surface waves masked by micross				USCGS 6.9 S 143.6 E H 23 07 41.0
										h 33 km ca Mag 4.7
773	30	e(S)	E'	02 32 28	(20)	Masked by micross & l p wanderings				USCGS 35.0 S 107.3 W H 02 10 37.6
		eL	N'E'Z'	47	32					h 33 km ca Mag 4.8
	30	iP	NZ	02 51 14.7	0.5	+		+0.04		Compression
		iS	NE	51 35.7	0.6	-0.15	+0.09			Local Seismic ?
		m	N	51 36½	0.6	0.18				
	30	i	NEZ	06 16 12.5	0.5	+0.03	+0.03	+0.03		Quarry blast ?
		m	NEZ	16 16	0.6	0.05	0.06	0.08		
774	31		N'E'	20 32		Surface waves masked by microseisms				
775	Nov 1	eP	Z	03 01 45	1	Microseisms present				USCGS 25.1 S 179.7 W H 02 56 41.4
										h 459 km ca Mag 5.0
776	1	iP	Z	12 33 59.2	1.0			+0.22	4690	Compression Preceded by micross
		eP	Z'	33 59½					42°.3	N' E' Z' & Galitzin records have
		m	Z	34 01	1.0			0.40		large micross throughout day
		e	N'	34 06						H 12 26 07
		e	Z'	34 33						USCGS 3.1 N 128.1 E H 12 26 06.2
		e(PP)	N'	35 47	(24)					h 65 km ca Mag 6.3
		iPcP	Z	35 51	1.0			-0.16		Cont next page 5¾-6 Pal

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
776 cont	Nov 1	e	E'	12 36 06						
		e	Z'	36 08	18			2		
		eS	N'E'	40 17.5	13	3	3			
		e	Z'	40 50	30					
		e	N'	41.2	30	4				
		eSS	N'E'	43 24	14					
		e	Z'	43 29	18			3		
		i	N'E'	43 38	20	+9	+11			
		iScS	N'	43 56	6	-9				
		iSSS	Z'	44 14	[illegible]		4			
		eL	N'E'	44.8	54	8	6			
		i	N'	45 10	6	+7				
		i	E'	45 16	7		+7			
		eL	Z'	46.2	52			4		
		M	N'E'Z'	52	22	5	6	8		
	2	e	NEZ	01 54 55	0.5					Blasting ?
		m	NE	54 57	0.3	0.20	0.11			
	2	Pg	E	04 43 41½				(+)		Quarry blast
		iSg	N	43 45	0.5	+0.06				
		i	EZ	43 45.4	0.4		+0.05	+0.11		
		m	NEZ	43 49	0.7	0.40	0.11	0.11		
777	2	eL	Z'	05 22.4		Masked by microseisms				USCGS 7.5 S 128.7E H 05 03 52.3 h 48 km ca Mag 4.5
	3	i	E	06 00 30	0.5		-0.07			Quarry blast
		m	NEZ	00 32	0.7		0.05	0.08		Masked by large microseisms
778	3	e	Z	12 50 53	Masked by large microseisms					USCGS 0.1 N 123.7 E H 12 43 04.7 h 149 km ca Mag 5.4
		e	Z'	53 35						
		eS	N'E'	57 03.5	10	2	1			
		e	N'	13 00.2	12	2				
		e	E'Z'	00.5	18			1		
		eL	N'	01.7	45					
		eLR	Z'	03.4	42					
		L	N'	04.7	30	2				
779	3	eL	E'	18 43.1	31					USCGS 1.7 S 149.8 E H 18 28 58.6 h 35 km ca Mag 5.8
780	3	eL	E'	20 18.3	32		1			
		M	N'E'Z'	22	20	1	1	1		
	4	Pg	Z	06 56 18	0.4					Quarry blast
		iSg	NE	56 22	0.4	+0.03	+0.05			
		i	Z	56 22.2	0.4			+0.07		
		m	N	56 24½	0.6	0.10				
		i	Z	56 25.5	0.7			+0.11		
		m	EZ	56 26½	0.7		0.14	0.18		
781	4	e	N'	21 18.1		Masked by microseisms				USCGS 6.8 N 125.4 E H 21 02 38.7 h 70 km ca
		e	Z'	21.4	14					
		M	E'	29.2	14		1			
		M	N'Z'	34.5	18	1		1		
	5	(P)	Z	01 53 07		Microseisms present				USCGS 5.1 S 146.1 E H 01 47 42.1 h 137 km ca
	5	(Pg)	E	06 30 03½	(0.4)					Quarry blast
		i(g)	NE	30 07.8	0.5	-0.02	+0.02			
		i	NZ	30 09	0.5	+0.05		+0.01		
		m	NEZ	30 13	0.7	0.10	0.04	0.04		
782	5	eL	E'	07 20.4	37		1			Masked by microseisms
		eLR	Z'	22.7	35			1		USCGS 9.2 N 142.0 E H 07 01 15.3
		M	N'E'Z'	26.5	18	1	1	1		h 33 km ca Mag 4.8
	5	i	EZ	07 38 05.7	0.3		+	+		Local Seismic ?
		i	N	38 07.3	0.7	+				
		m	NE	38 09	0.7	0.08	0.03			
	6	e	Z	01 52 03						Local Seismic ?
		e	NEZ	52 05						
	6	(e)	Z	02 51 54						Local Seismic ?
		e	E	52 10½	0.3					
		i	NEZ	52 13	0.4	+0.02	+0.05	-0.02		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
	Nov 6	e	N	04 35 44						Local Seismic ?
		i	E	35 45.8	0.5		+0.06			
783	6	iP	Z	10 05 17.8	1.5			-0.24	8760	Dilatation
		iP	Z'Z"	05 18	7			-1½	78°.8	USCGS 44.4 N 149.0 E H 09 53 22.4
		e(sP)	Z	05 34	2.2			0.65		h 60 km ca Mag 5.7
		i	Z"	05 35	4			-3*		5½-5¾ Pal
		eS	E'	15 12						
		iScS	N'	15 32	9	+2				
		eLQ	E'	26.2	40					
		eLR	N'Z'	30.0	35					
		L	N'E'Z'	32	25	2	2	3		
		M	N'E'Z'	36.5	21	2	2	3		
	6	(P)	Z	15 19 43						Local tremor
		i	E	19 47.3	0.5		+0.02			
		i(S)	E	20 06.9	0.4		+0.04			
		i	N	20 07.5	0.4	+0.04				
		i	N	20 10.4	0.4	+0.05				
		m	EZ	20 10½	0.8		0.08	0.05		
	7	e	N	06 35 38						Local Seismic ?
		i	N	35 41.4						
		m	E	35 41½	0.75		0.07			
		i	NZ	35 45.6	0.7	-0.03		-0.03		
784	7	e(S)	N'	07 54 54	13		Masked by microseisms			USCGS 6.5 S 148.2 E H 07 44 05.7
		eLR	N'Z'	57.7	30					h 48 km ca Mag 5.3
		M	N'E'Z'	08 00.6	20	3	2	3		
785	7	eL	E'	15 22.4	38					
		M	N'Z'	28	24	Feeble				
786	7	eS	N'	18 55 34		Masked by microseisms				USCGS 0.4 N 100.1 E H 18 37 43.7
		e	E'	56 34						h 107 km ca Mag 5.1
		eLQ	N'	19 02.0	50					
		eL	E'	04.0	40					
		eLR	N'Z'	05.3	45	6				
		M	N'E'Z'	10	24	7	3	4		
		M	N'	12.9	15	12				
		M	E'Z'	14.3	20		5	7		
		M	E'Z'	17.2	18		5	8		
787	8	iP	N'E'Z'N"E"Z"	0248 06	5	+15	-5	+15	2010	Compression
		i	N'E'Z'N"E"Z"	48 11	12	+30	-13	+28	18°.1	H 02 43 54 h 0.00
		PP	NEZ	48 21	0.7	0.21	0.11	0.48		USCGS 49.0 S 163.7 E H 02 43 57
		i	N'	48 42	7	+10				h 33 km ca Mag 6½-6½ Pal
		i	Z'	48 45	8			-14		6½ Pas
		i	Z"	48 48	8			+19*		
		iS	E'	51 24	16		+12			
		i	N'	51 27	16	+10				
		isS	E'E"	51 38	18		+170ca			
		i	Z'	51 40	16			+35		
		iSS	Z"	51 46	10			-68*		
		SS	N'	51 47	18	86				
		iLR	Z'	52 26	25			+63		
		M	N'E'Z'	53	21	105ca	71	130ca		
		eT	N	03 04.5	0.6					
		Tmax	Z	06 43	0.5			0.43		
			N	06 46	0.6	0.55				
			E	06 48	0.5		0.42			
788	9	e(pP)	N	04 51 26						No Z record Light failed 02 49
		i	E	51 44						USCGS 7.2 S 128.2 E H 04 44 19.9
		e	N	52 09						h 129 km ca Mag 5.3
		eS	N'E'	56 06	9					
		M	N'E'Z'	05 06.0	16	4	4	6		
	9	e(T)	NE	18 14.8						
789	9	e(P)	Z'	18 53 42	10					USCGS 19.3 N 121.0 E H 18 43 38.6
		e	E'	19 02.3	(20)					h 33 km ca Mag 5.0
		e	N'	06.3	18					

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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
789	Nov 9	e(L)	Z'	19 09.0	22					
cont		e	Z'	12.8	25					
		M	N'E'Z'	19.5	18	½	½	½		
	10	i	NEZ	02 47 25.3	0.4	-0.02	+0.03	+0.02		Local Seismic ?
790	10	e(S)	N'	16 46.3	(20)	Masked by microseisms				USCGS 3.7 S 136.5 E H 16 34 15.5 h 14 km ca Mag 5.4
		eL	E'	50.2	30					
		eLR	N'	51.4	25					
		M	E'	52.6	18		5			
		M	N'E'Z'	55.5	14	4	2	6		
	11	e	EZ	02 15 07		Masked by microseisms				Quarry blast ?
		e	N	15 09½						
		m	NEZ	15 13	0.7	0.04	0.03	0.04		
791	11	e	N'E'Z'	03 39 2[illegible]	12	Masked by microseisms				
		eLR	Z'	40.7	26					
		L	E'Z'	41.6	23		1	1		
		M	N'	43.1	12	1				
	11	e	Z	05 53 07½						Local Blasting ?
		i	E	53 09½	0.5		+0.05			
	11	i	NEZ	05 58 20.0	0.5	+0.04	+	+0.04		Quarry blast ?
		m	NEZ	58 23	0.6	0.09	0.42	0.08		
792	11	e	E	07 11.8		Masked by microseisms				
		eL	Z'	12.4	24			1		
		T	NEZ	26	0.5					
793	11	M	E'Z'	09 03	16	Feeble				(USCGS 49.4 N 144.6 W H 08 01 26.1 h 10 km ca Mag 5.2)
794	11		Z'	12 21		Feeble long waves				
795	11		N'Z'	14 03		Feeble long waves				
796	11	eL	E'Z'	14 23.6	22					USCGS 29.4 S 178.2 W H 14 11 05 h 89 km ca Mag 4.1
		M	N'	25.2	13	½				
797	11		Z'	15 15		Feeble surface waves				(USCGS 56.8 N 161.1 E H 14 37 22.6 h 33 km ca Mag 4.7)
798	11		Z'	15 50		Feeble surface waves				
799	11		N'E'Z'	19 09		Feeble surface waves				
800	11	(e)	Z'	19 32.3						USCGS 38.7 N 140.1 E H 19 16 57 h 89 km ca Mag 4.4
		eL	N'Z'	49.5	40					
		M	N'E'Z'	57.5	20	½	½	½		
801	11	iP	Z	21 33 15.0	0.8			+0.63		Compression USCGS 13.7 S 167.2 E H 21 28 03.0 h 135 km ca Mag 3.9
802	12	e	N'	01 02 09						USCGS 33.2 S 179.9 W H 00 55 26 h 74 km ca Mag 4.2
		eL	Z'	06.9	24					
		M	N'E'	08.0	16	1	½			
803	12	e	Z'	01 17.5						USCGS 33.0 S 179.7 E H 01 12 08 h 8 km ca
		e	Z'	20.1	18					
		e(L)	N'	22.1	20					
		M	N'E'Z'	24.4	19	2	1	1½		
	12	e(Pg)	E	01 25 38	0.4					Local Double quarry blast ?
		e	Z	25 38½						
		i(Sg)	E	25 43.2	0.4		+0.03			
		i	Z	25 43.8	0.5			+0.05		
		m	E	25 44	0.5		0.07			
		m	EZ	25 51	0.7		0.10	0.10		
	12	i	EZ	01 55 26	0.4		+0.04	+0.02		Local Seismic ?
		i	NE	55 27.8	0.4	-0.05	-0.04			
		i	EZ	55 28.7	0.5		-0.04	+0.04		
804	12	ePP	Z'	05 41 11	6					USCGS 18.2 S 176.4 W H 05 33 29 h 107 km ca Mag 5.2
		e	E'	41 18	6					
		iS	N'	45 19	12	+3				
		e	E'	45 28	16		3			
		e	N'	47 12	18	2				
		e	N'	47 48	20	4				

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No	Date	Phase & Component	Time (G.M.T.)	Per	Amplitude AN	Amplitude A_E	Amplitude A_Z	Δ	Remarks
804 cont	Nov 12	eL E'Z'	05 49	30		5	7		
		M N'E'Z'	53	15	13	8	10		
	12	e EZ	06 08 23						Quarry blast ?
		i NZ	08 24.5	0.6	+0.03		+0.06		
		m EZ	08 27½	0.7		0.08	0.12		
805	12	e N'	09 40.6	Feeble					(USCGS 16.7 S 174.6 W H 09 25 54.1 h 190 km ca Mag 4.8)
806	12	E'Z'	13 34	Feeble surface waves					USCGS 29.1 S 178.3 W H 13 21 13 h 136 km ca Mag 3.7
807	12	N'E'Z'	19 23	Feeble long waves					
	12	i NE	21 09 57.8	0.3	-0.05	+0.06			Local blasting ?
		i Z	09 58.1	0.3			+0.08		
808	13	Z'	00 50	Feeble long waves					(USCGS 18.5 S 177.1 W H 00 35 49 h 329 km ca Mag 4.2)
	13	i E	02 13 04½	0.5		+			Local Seismic ?
		m EZ	13 10.8	0.7		0.03	0.04		
	13	Pg EZ	06 32 35	0.4		(+)	(+)		Quarry blast
		iSg EZ	32 39.0	0.4		+0.10	+0.17		
		m NEZ	32 42	0.7	0.08	0.16	0.21		
	13	(P) Z	13 34 29	Masked by microseisms					
809	13	eL E'Z'	20 09.0	25					
810	13	eP Z	22 03 06	1.8			0.47		USCGS 29.2 S 178.1 W H 21 57 30 h 77 km ca Mag 5.4
		e Z	03 13	1.7			0.36		
		i Z	03 17	1.2			+0.14		
		e(S) E'	07 48	13		2			
		e N'Z'	07 52	13	1		2		
		eL E'Z'	09.7	30					
		L E'Z'	10.3	30		4	7		
		M N'E'Z'	13	15	5	4	6		
	14	(P) Z	02 50 43½						Local Small
		S NE	51 04	0.6	+	-			
811	14	e N'	04 16 17	Masked by micross & l p wanderings					USCGS 33.6 N 131.6 E H 03 56 06.0 h 60 km ca Mag 5.3
		e Z'	24.5						
		eL Z'	30.4	33			1		
812	14	e N	10 57 24½	1.1					USCGS 40.0 S 144.3 E H 10 53 01 h 33 km ca
813	14	eL E'Z'	13 44						
814	14	eL E'	16 31						
815	14	eL E'Z'	19 17						USCGS 18.1 S 168.0 E H 19 06 14.6 h 5 km ca Mag 4.4
816	15	eL E'	16 23.9	22					USCGS 24.0 N 122.2 E H 15 52 21.5 h 42 km ca Mag 5.4
		eL Z'	25.9	20					
		M N'E'Z'	29	21	½	½	½		
817	15	e(P) N	16 49 56½	Masked by microseisms					USCGS 49.5 S 163.6 E H 16 45 44.8 h 33 km ca
		i(P) Z	49 58	1.0					
		e(S) E'	53.4	14			1		
		e N'	53.6	14	½				
		eT NE	17 07.7						
	15	eT E	17 14.9	0.5	Masked by microseisms				
818	15	eL E'	22 01	Masked by microseisms					
		eT NE	15.5	0.5					
	16	i E	05 49 24.2	0.4		+0.04			Local Seismic ?
	16	i EZ	06 29 00.8	0.3		-0.05	+0.05		Quarry blast ?
		i N	29 02	0.5	+0.02				
		m EZ	29 05	0.7		0.05	0.06		
	16	iSg N	06 56 32.5	0.5	+0.04				Quarry blast
		i EZ	56 32.6	0.4		-0.06	-0.06		
		m NEZ	56 37	0.7	0.22	0.08	0.11		
819	16	eL Z'	13 46.5	25					
		M E'Z'	48.7	16		¼	½		
		M N'	50.8	12	½				

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
820	Nov 16	e	Z	22 49 15	2.0	Masked by microseisms				USCGS 1.0 N 118.8 E H 22 40 44.0
		eS	E'	55 57						h 33 km ca Mag 6.7
		e	N'	56 02	.13	1				
		e(SS)	E'	59 24	11		2			
		e	Z'	59 34	21			1		
		eL	N'Z'	23 00.9	50					
		eL	Z'	03.3	40					
		M	N'E'	05.5	28	2	2			
		M	E'Z'	08.7	20		1½	1		
821	17	e	N'	00 16.7	20					USCGS 17.3 S 173.7 W H 00 01 17.1
		eL	E'	18.2	27					h 33 km ca Mag 5.4
		eLR	Z'	18.5	27					
		M	E'Z'	20.8	17		1	1		
	17	i	EZ	01 25 40.8	0.3		+0.05	+		Local blasting ?
		i	EZ	25 41.6	0.3		+0.09	+0.14		
	17	iSg	N	07 03 49.0	0.7	+0.05				Quarry blast
		i	EZ	03 49.4	0.5		+0.06	+0.05		
		i	N	03 52	0.7	+0.26				
		m	NEZ	03 54	0.7	0.32	0.06	0.06		
	17	(Pg)	Z	07 30 35.2						Quarry blast
		iSg	N	30 38.7	0.5	-0.06				
		i	EZ	30 39.3	0.4		+0.08	-0.07		
		m	NEZ	30 42	0.7	0.39	0.21	0.22		
822	17	eiP	N'Z'	08 21 28	11	+		-	3130	Dilatation
		i	Z'	21 34				+	28°.2	USCGS 5.7 S 150.7 E H 08 15 39.3
		i	N'Z'	21 40	12	+33		-43		h 45 km ca Mag 6.7
		m	Z	21 48	2.1			4.7		7¼ Pas
		iS	N'	26 10	28	+145ca				7-7¼ Brk
		i	E'	26 21	11		+190			
		i	Z'	26 25	28			+175ca		
		i	E'	26 52	24		+53			
		iSSS	Z'	27 53	12			+43		
		LR	N'Z'	29	40	180ca		210		
		i	E'	29 02	24		+150ca			
		M	N'E'Z'	31.3	23	210ca	180ca	250ca		
		X	N'	09 55	70	26				
		W2M	Z'	11 12.7	25			7		
823	17	(P)	Z	14 44 05		Masked by microseisms				USCGS 3.5 S 150.1 E H 14 37 53
		eS	N'	49 04	12	1				h 33 km ca Mag 5.0
		e	N'	49 22	15	1½				
		eLQ	E'	51.3	35		2			
		eLR	Z'	52.7	35					
		M	N'E'Z'	55.5	19	3	4	4		
824	17	iP	Z	19 08 43.2	1.2			+0.13		Microseisms present
		eS	E'	15 25	13		1			USCGS 12.7 N 144.9 E H 19 00 10.4
		e	N'	15 29	17					h 43 km ca Mag 5.1
		e(SS)	E'	18 36	13		1			
		eL	E'	20.8	32					
		L	E'	21.9	25		4			
		M	N'E'Z'	27	20	2	3	4		
	18	i	E	02 55 40.5	0.6		+0.03			Local Seismic ?
		i	Z	55 44.5	0.6			+0.04		
	18	(iP)	Z	03 32 21				+		Masked by microseisms
										USCGS 9.6 S 116.8 E H 03 24 53.9
										h 82 km ca Mag 4.8
	18	i	NEZ	05 00 16.5	0.5	-0.19	+0.06	+0.02		Blast Quarry ?
		m	NEZ	00 18	0.4	1.05	0.34	0.14		
	18	i	EZ	06 15 40.0	0.4		-0.04	+0.05		Quarry blast ?
		m	NEZ	15 43.5	0.7	0.03	0.04	0.05		
	18	e(Sg)	N	06 59 21½	0.5					Quarry blast
		e	Z	59 24½	0.7					
		m	NEZ	59 27	0.7	0.18	0.04	0.05		

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No	Date	Phase & Component	Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km	
825	Nov 18	eP Z	14 40 44½					2970	Microseisms present Dilatation
		iP N'Z'Z"	40 45	8	+2		-4	26°.7	USCGS 6.0 S 148.2 E H 14 34 54.5
		ipP Z	40 54.3	1.2			+0.42		h 49 km ca Mag 6.1
		isP Z	40 58.1	1.2			+0.53		
		i N'Z'N"Z"	41 01	8	-8		+11		
		PPP N'	41 44	14	6				
		iS N'N"	45 16	12	+10				
		i Z'	45 19	10			-		
		i Z'	45 33	27			+32		
		i N'	45 36	23	+36				
		i E'	45 37	8		+11			
		e(SSS) E'	46 45	26		11			
		i Z'	47 12	18			+16		
		eL E'	47.2	36		24			
		iLR E'	48 06	30		+45			
		eL N'	48.2	32					
		eLR Z'	48.7	33					
		Lmax E'	48.8	30		45			
		M N'Z'	50.1	27	43		36		
		M N'E'Z'	52.6	16	67	69	80		
826	18	ePPP Z'	22 29 08		Masked by microseisms				USCGS 20.2 S 174.1 W H 22 21 01.9
		eS N'	33 02	11					h 33 km ca Mag 5.8
		eL E'Z'	37.2	27					
		M N'E'Z'	41.5	14	9	12	16		
	19	i Z	06 01 46.7	0.4			+0.08		No N record after 01 19 Light bulb
		m EZ	01 49	0.6		0.17	0.18		burnt out Quarry blast ?
									Masked by large microseisms
	19	e E	06 59 26						Quarry blast ?
		m EZ	59 30	0.7		0.16			Masked by large microseisms
827	19	eS E'	15 56 43		Masked by microseisms				USCGS 3.4 S 150.1 E H 15 45 31.2
		e N'	56 45						h 38 km ca Mag 5.7
		eL E'Z'	59.6	35		5			
		M N'Z'	16 02.3	22	5		5		
		M E'	04.1	14		8			
828	19	iP Z	23 40 57.5	2.0			-1.38	3100	Dilatation
		iP N'Z'N"Z"	40 58	20	+19		-22	27°.9	USCGS 6.0 S 150.8 E H 23 35 06.0
		i N'Z'	41 05	20	+46ca		+59		h 3 km ca Mag 6.0
		m Z	41 17	1.1			1.91		6¾ Pas Brk
		iPP N'Z'	41 51	15	+45ca		-41		
		iS E'	45 38	26		-80ca			
		i N"	45 46		+	After 23h 47m		Galitzin	records illegible
		i!! Z'	45 58	25			+		Turning point invisible
		iSSS E'	47 23	30		+110ca			
829	20	Z'	05 09		Feeble surface waves				
830	20	Z'	06 39		Feeble surface waves				
831	20	Z'	07 14		Feeble surface waves				
832	20	N'E'Z'	19 37		Feeble surface waves				USCGS 4.9 S 145,4 E H 19 21 10.0
									h 152 km ca Mag 5.8
833	20	N'E'Z'	23 55		Feeble surface waves				
834	21	M N'Z'	00 17	20	1		1		
835	21	iP Z	02 24 23.7	1.0			-0.08	4820	Dilatation
		e(pP) Z	25 10½	1.2			0.12	43°.4	h 0.03
		e(pP) Z	25 15	1.5			0.24		USCGS 1.0 N 124.0 E H 02 16 44.5
		i Z	25 48.5	1.5			+0.26		h 248 km ca Mag 5.8
		iS N'N"	30 34	10	+8				
		i E'E"	30 42			+			
		iSS E'E"	33 49	7		+5			
		i Z'	33 52	10			+4		
		iScS N'N"	33 54	9	-5				
		e Z'	34.0	25					
		i N'N"	34 07	9	+4				
		M N'E'Z'	42	16	2	2	3		

RIVERVIEW COLLEGE OBSERVATORY
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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
836	Nov 21	eL	Z'	04 33.1	31					USCGS 1.9 N 96.8 E H 04 01 02.0
		M	E'Z'	38	22		1	1		h 33 km ca Mag 5.2
	21	i	Z	06 24 24.5				+		Microseisms present
										USCGS 14.9 S 167.2 E H 06 19 16.0
										h 97 km ca Mag 5.1
837	21	iP	Z	12 47 36	1.0			+0.09		Microseisms present
		ePN	NZ'	47 36						USCGS 6.2 S 150.5 E H 12 41 47.8
		e	N'	48 18	10					h 43 km ca Mag 4.9
		eS	N'	52 21	17	3				
		e	Z'	52 31	10			2		
		eLQ	E'	53.8	34					
		eLR	Z'	55.2	34			3		
		eL	N'	55.3	34	3				
		M	N'E'Z'	57.3	19	4	5	5		
		M	N'E'Z'	59.5	15	5	5	6		
838	21	eS	N'	15 49 35	20	Preliminaries obscured				USCGS 12.8 N 145.2 E H 15 34 13.2
		e	E'	52 39	9	by microseisms				h 35 km ca Mag 5.2
		eSS	N'	52 51	20					
		e(L)	E'	54.1	41					
		eL	E'	55.5	28		3			
		M	N'E'Z'	16 00.6	18	1	2	1		
839	21		N'E'Z'	23 41		Feeble surface waves.				USCGS 5.7 S 150.8 E H 23 26 22.3
										h 59 km ca Mag 4.9
	22	(iP)	Z	02 44 18				+		Microseisms present
840	22	iP	Z	02 45 34.5	1.1			-0.16		Dilatation
		m	Z	45 40	1.0			0.26		USCGS 22.1 S 171.1 E H 02 40 55.9
		e(S)	E'	49 24	8					h 106 km ca Mag 5.3
		i	N'N"E'E"	49 28.5	7	+5	-5			
		e	Z'	49 32	9			2		
		e	N'	49 56	25	4				
		eL	Z'	50.2	33					
841	22	eP	Z'	05 16 27	Masked by micross & l p wanderings					USCGS 6.2 S 150.4 E H 05 10 41.2
		(e)	N'	21 23	(16)					h 39 km ca Mag 4.7
		(eL)	E'	23.5	(28)					
		eL	N'	24.6	30					
		eL	Z'	25.1	24					
		M	N'E'Z'	28.0	15	1	1	2		
842	22	P	Z	05 52 20	1.0			0.09		Microseisms on all records
		eS	N'	57 07	18	1				USCGS 6.2 S 150.4 E H 05 46 33.3
		e	Z'	57 17	20			1		h 47 km ca Mag 5.4
		e	N'	57 31	14	2				
		M	N'E'Z'	06 01.5	20	2	2	2		
		M	N'E'Z'	03.6	15	4	2	6		
843	22	P	Z	09 32 16		Masked by microseisms				USCGS 3.4 S 130.7 E H 09 25 15.8
		eL	E'	44.0						h 33 km ca Mag 5.4
		M	E'Z'	49	17		1	1		
	23	e(P)	NZ	05 44 22½	0.4	Masked by microseisms				Local
		e	EZ	44 43.3	0.6		0.04			
		i(S)	N	44 43.7	0.6	-0.10				
	23	i	Z	07 01 25	0.5			+0.03		Quarry blast ?
		i	N	01 27.2		+				
		m	NEZ	01 30	0.7	0.08	0.10	0.12		
844	23	e	N'	09 11.6	15	Masked by microseisms				USCGS 6.5 S 150.7 E H 09 01 11.0
		eL	E'	14.7	21					h 63 km ca Mag 4.9
		eL	Z'	16.0	21					
		M	N'E'Z'	19.4	14	4	3	4		
845	23	P	Z	22 23 31½		Microseisms present				USCGS 0.1 S 124.5 E H 22 15 47.0
		pP	Z	23 46½	1.5			0.29		h 66 km ca Mag 5.7
		eS	N'	29 45	16	1				
		eSS	Z'	32 59	16			1		
		eL	E'	35.9	31					
		eLR	N'Z'	37.4	31					
		M	N'E'Z'	40.5	24	1	1	2		

No	Date	Phase & Component	Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km	
846	Nov 24	P . Z	01 44 36½	1.3			0.14		Microseisms present
		e N'	49 35	14					USCGS 6.3 S 150.7 E H 01 38 49.6
		e E'	50.4	15					h 33 km ca Mag 5.5
		eL E'	51.4	30					
		eLR Z'	52.4	30					
		M N'E'Z'	54.5	19	3	3	4		
	24	i EZ	01 55 34	0.5		-	+		Local Seismic ?
		m EZ	55 36½	0.4		0.05	0.05		
	24	e N	06 36 20½						Local Quarry blast ?
		i EZ	36 20.9	0.4		+	+0.04		
		m N	36 23	0.7	0.09				
	24	i EZ	06 45 05.9			+	+		
		m E	45 10						
847	24	(eP) Z	10 50 04½	1.5	Masked by microseisms & l p wanderings on N' E' Z' records				
		i Z	50 06.5	1.2			+0.42		USCGS 6.8 S 107.4 E H 10 41 33.5
		e(S) E'	57 02						h 125 km ca Mag 6.0
		eL Z'	11 03.5						
848	24	iP N"Z'N"Z"	12 50 16	7	-3	+1	+9	5890	Compression
		i N'E'Z'	50 22	7	+4	-2	-9	53°.0	USCGS 13.1 N 124.7 E H 12 40 51.4
		i N"E"Z"	50 24	6	-4*	+2*	+14*		h 5 km ca Mag 6.1
		m Z	50 36	1.2			0.42		
		ePP N'Z'	52 15	11			4		
		e Z'	52.5	18			2		
		e(S) N'N"	57 40	11					
		iS! N'N"	57 45	15	-36				
		i E'E"Z'Z"	57 47½	7		-17	-15		
		iPPS E'	58 01	7		+12			
		i N"	58 08	7	+11*				
		iScS E'	59 58	12		+5			
		iSS E'	13 01 21	20		+14			
		e Z'	01.7	18			10		
		i N'	01 58	20	17				
		m Z'	02.2	21			20		
		eL N'	04.0	34					
		i E'	04 10	18					
		L E'	05.7	32					
		Lmax E'	06.5	28		23			
		M N'E'Z'	12.6	22	19	20	17		
		W2M N'E'Z'	15 28	23			1		
	24	(iP) Z	13 00 01	1.0			+0.10		Masked by microseisms
									USCGS 13.2 N 124.9 E H 12 50 40.2
									h 97 km ca Mag 5.0
849	24	M Z'	24 08						USCGS 23.2 S 176.0 W H 23 51 20
									h 33 km ca Mag 4.7
	25	i NEZ	01 14 56	0.3	+0.04	+0.04	+0.07		Local blasting ?
	25	e N	02 03 24½						Quarry blast ?
		m NE	03 26	0.6	0.05	0.12			
	25	i E	05 29 16.7	0.4		+0.03			Quarry blast ?
		i(Sg) N	29 19.8	0.4	+0.03				
		i N	29 20.5	0.7	+0.06				
		m N	29 21½	0.7	0.08				
	25	e(Sg) N	06 39 22	0.5					Quarry blast ?
		i EZ	39 22.6	0.5		+0.04	+0.04		
		i N	39 24.8	0.5	-0.04				
		m N	39 26½	0.7	0.12				
	25	i E	06 57 07.5	0.5		+0.01			Local Seismic ?
		m Z	57 11½	0.7			0.04		
		i E	57 11.8	0.6		+0.02			
	25	i NE	06 59 06.6	0.5	+0.02	+			Quarry blast ?
		m N	59 08	0.6	0.04				
	25	e NEZ	07 20 08½	0.5					Local Seismic ?
		i Z	20 11	0.7			-0.05		
		m NEZ	20 15	0.9	0.05	0.08	0.08		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
850	Nov 25	iP	Z	09 30 55.3	1.0			+0.24	4480	Compression
		i	N	31 02	1.0	+0.06			40°.3	h 0.10 H 09 24 11
		iScP	Z	35 35	1.0			-0.09		Microseisms on N' E' Z' records
		iS	N'Z'N"	36 19	6	±19		+		USCGS 4.3 S 122.2 E H 09 24 08.9
		iS	E'E"	36 20	6		+9			h 610 km ca Mag 6.2
		e	E'	39 27	12					
		isS	N'	39 34	9	+5				
		iScS	N'E'	39 47	7	-8	-7			
		eL	N'E'	44.3	29					
		M	N'E'Z'	46	20	2	2	2		
851	25		N'E'	13 13		Feeble long waves				USCGS 9.5 S 158,8 E H 13 02 41.7
										h 38 km ca Mag 5.4
	25	i(P)	Z	16 28 01.6	0.5			+		Local
		i	NE	28 01.8	0.5	+0.05	+0.03			
852	25	eL	E'	20 01.9	19		6			Masked by microseisms
		M	N'E'	03.1	13	4	5			(USCGS 5.2 S 125.2 E H 19 35 16.4
										h 430 km ca Mag 5.1)
853	26	eP	Z'	10 31 49	7	Large micross on all			7180	USCGS 24.9 N 122.0E H 10 21 07.2
		ePcP	Z'	32 20	7	records			64°.6	h 33 km ca Mag 5.4
		eS	N'	40 25	30	3				6-6¼ Pal
		e	E'	40 43	25		3			
		e	E'	47 52	22		2			
		eL	Z'	51 45	50			6		
		M	N'E'Z'	58	22	9	8	12		
	27	i	NE	03 16 07.5	0.6	-0.08	+0.04			Local Seismic ?
		i	E	16 13.5	0.6		+0.03			
	27	e	E	04 22 50	0.3					Local Seismic ?
	27	e(P)	Z	04 31 11	0.5					Local Seismic ?
		i	NE	31 29.3	0.4	+0.03	+0.04			
	27	i	EZ	06 14 35.4	0.3		+0.02	+0.05		Quarry blast ?
		m	NEZ	14 39	0.7	0.09	0.08	0.08		
	27	(e)	Z	06 55 24						Local Seismic ?
		i	EN	55 43	0.4	+	+			
	27	e	N	09 12 08	0.6					Local Seismic ?
		e	N	55 12	0.6					
		e	N	57 07	0.6					
854	28	e(L)	NE	00 52.0	24	1	1			
	28	i(Pg)	EZ	01 54 15.3	0.5		-	-		Quarry blast Double ?
		iSg	NE	54 20.0	0.4	+0.04	+0.04			
		m	EZ	54 21½	0.5		0.14	0.11		
		i	N	54 23.3	0.7	+0.10				
		m	NEZ	54 27	0.7	0.31	0.18	0.18		
	28	m	N	05 38 49	0.7	0.03				Quarry blast ?
	28	iSg	N	05 53 54.3	0.5	+0.03				Quarry blast
		i	Z	53 55.3	0.5			+0.03		
		m	NEZ	53 58	0.7	0.18	0.08	0.07		
855	28	i(P)	Z	16 56 01.5	1.2			+0.12		Microseisms present
		e	N'E'	17 21.2	18.					USCGS 7.7 S 71.2 W H 16 41 33.4
										h 626 km ca Mag 5.4
	29	(P)	Z	06 24 37½		Masked by microseisms				USCGS 19.4 S 169.2 E H 06 20 10
										h 324 km ca Mag 4.9
	30	i	E	06 06 25			+			Local Seismic ? Very small
		i	NE	06 48	0.5	-	-			
	30	eSg	N	07 16 29.3	0.5					Quarry blast
		i	E	16 29.8	0.4		+0.04			
		m	NEZ	16 33	0.7	0.11	0.04	0.05		
856	30	eP	Z	12 38 35	P masked by microseisms				7410	H 12 27 45
		eP	Z'	38 37	5			3	66°.7	USCGS 6.8 N 94.8 E H 12 27 38.6
		i	Z'	38 48	6			-4		h 33 km ca Mag 5.7
		e	Z'	38 57	9			3		6½-6¾ Pal
		iS	N'	47 23	15	+9				

Cont next page

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
856	Nov 30	iScS	N'	12 48 26	15	+8				
cont		e	Z'	52.0	33			3		
		(SSS)	N'	55.0	27	11				
		eL	N'	55.6	55	21				
		eL	E'	56.0	70		13			
		eLR	N'	57.0	50	41				
		LR	E'	58.1	50		24			
		eL	Z'	58.6	50			11		
		M	N'E'Z'	13 02	35	62	32	33		
		M	N'E'Z'	07	22	58	57	65		
	30	i(P)	NZ	17 14 30.5	0.5	+0.02		+0.03		Local
	Dec 1	i	NE	02 03 19	0.5	+0.03	+0.08			Local Seismic ?
857	1	iP	Z	04 59 39.4	1.1			+0.10		Compression
		i	Z	59 41.7	0.9			+0.09		Microseisms present
		i	Z	05 00 18	1.3			-0.12		L P wanderings on N' E' Z' records
		ePP	Z'	01 02	7			2		h 0.02 ca
		e	N'	06 09	12	2				USCGS 18.9 S 175.8 W H 04 53 23.9
		e	N'	07 10	12	2				h 232 km ca Mag 5.5
		e	N'Z'	07 23	18	5		3		
		M	N'	09.6	15	2				
		iScS	E'	09 46	6		-3			
	1	i	E	05 34 59	0.8		+0.05			
		i	NZ	35 03.3	0.8	-0.07		+0.10		
	1	i	EZ	06 09 45	0.4		+0.04	+0.05		Quarry blast ?
		m	EZ	09 49	0.7		0.07	0.08		
858	1	eL	E'Z'	11 59.7	22					USCGS 30.9 S 177.9 W H 11 47 02.4
										h 33 km ca Mag 4.9
	2	i(Sg)	N	02 11 12.8	0.6	+0.02				Quarry blast
		m	N	11 17	0.7	0.18				
	2	i	E	06 44 36.8			+			Quarry blast
		i(Sg)	N	44 39.7	0.5	-0.04				
		i	EZ	44 40.5	0.4		-0.05	+0.05		
		m	NEZ	44 44	0.7	0.27	0.10	0.09		
859	2	e	N'E'	10 18.7		Masked by microseisms				USCGS 9.1 S 158.0 E H 10 08 39.6
		eL	N'E'Z'	20.4	26					h 42 km ca Mag 5.6
		M	N'E'Z'	23.2	15	1	3	1		
860	2	e(S)	N'	14 37 40		Masked by microseisms				USCGS 49.1 S 121.4 E H 14 27 15.4
		eL	N'E'Z'	40.0	28					h 16 km ca
	3	i	EZ	00 33 14	0.7		+0.01	+0.02		Local Seismic ?
		i	E	33 16	0.7		+0.04			
		i	NEZ	33 20	0.7	+0.03	+0.14	+0.04		
		m	NZ	33 27	0.7	0.06		0.10		
	3	i	NEZ	00 43 12.7	0.3	(+)	(-)	+		Local Seismic ?
		i(S)	NE	43 18.7	0.3	+0.09	-0.15			
		i	Z	43 21.0	0.3			+0.06		
		m	NEZ	43 25	0.5	0.06	0.10	0.07		
	3	e	EZ	00 48 09	0.5					Local
		i(S)	E	48 15.5	0.5		-0.07			
		m	NEZ	48 22	0.5	0.05	0.08	0.05		
861	3	e(P)	Z'	04 02 00	7			2		Masked by micross & 1 p wanderings
		eL	Z'	26.1	37					USCGS 15.0 S 66.8 E H 03 50 01.2
		M	N'E'Z'	32	20	3	1	2		h 46 km ca Mag 6.1
	3	i	NE	05 46 47.8	0.5	+0.02	+0.03			Quarry blast
	3	e	NZ	05 58 03	0.5					Quarry blast ?
		i	NEZ	58 05.8	0.5	+0.04	+0.05	+0.04		
		m	NEZ	58 08	0.6	0.13	0.15	0.20		
	3	e	N	06 28 35½						Quarry blast ?
		m	N	28 37½	0.7	0.06				
	3	i	NEZ	06 45 10.5	0.5	+0.06	-	+		Quarry blast
		m	NEZ	45 15	0.7	0.11	0.04	0.06		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
862	Dec 3	e(L)	N'	08 28.2	Masked by micross & l p wanderings					USCGS 6.1 S 150.6 E H 08 16 55.4
		eL	E'	29.1	31					h 35 km ca Mag 4.7
		eL	Z'	31.3	23					
		M	N'E'Z'	33.3	15	1	2	2		
	3	e	EZ	22 10 09						Local Seismic ?
	4	iP	Z	03 45 31.5	0.5			+0.02		Compression
		i	Z	45 52.5	0.6			+0.03		Local Seismic ?
		iS	EN	45 53	0.6	-0.09	+0.07			
863	4	iP	Z'	15 54 30	9			-5	3040	Dilatation
		iP	N'	54 31	9	+3			27°.4	N E Z records obscured by micross
		eS	E'	59 06	(13)					USCGS 6.4 S 150.7 E H 15 48 43.4
		e	N'	59 10	10					h 19 km ca Mag 5.2
		isS	N'	59 20	17	+16				
		i	Z	59 26	17			+16		
		eL	N'Z'	16 02	33			13		
		i	N'	02 32	13	+14				
		M	N'E'Z'	04.5	18	14	18	19		
		iM	N'E'Z'	05.7	13	-21	+13	-25		
		M	N'E'Z'	07	15	58	35	59		
864	4	e	N'	20 35 26	18					
		eL	Z'	38.4	(25)					
		M	N'Z'	41.5	16	1		1		
865	4	e(S)	N'	21 22.2	22					USCGS 5.5 S 151.2 E H 21 11 40.0
		e	Z'	22.4	20					h 101 km ca Mag 5.2
		eL	N'Z'	25.7	28					
		M	N'E'Z'	27.3	20	1	1	1		
	5	i	E	01 10 25	0.5		+0.02			Quarry blast ?
		m	NEZ	10 30	0.7	0.04	0.04	0.05		
	5	i(Sg)	N	04 26 28.2	0.5	-0.04				Quarry blast ?
		i	Z	26 28.4	0.5			+0.03		
		m	NEZ	26 31	0.5	0.20	0.17	0.22		
866	5		N'E'Z'	05 16		Feeble surface waves				
	5	i	EZ	05 22 02	0.4		+	+		Quarry blast ?
		m	NEZ	22 05	0.6	0.06	0.04	0.05		
	6	e	NEZ	02 15 56	0.3					Local Seismic ?
	6	eL	E'Z'	02 58	28			2		Masked by micross & l p wanderings
867	6	eP	Z'	04 33 56	Masked by micross & l p wanderings					USCGS 2.3 S 138.3 E H 04 27 16
		e	N'	39 40	28					h 33 km ca Mag 5.0
		eL	N'Z'	43.8	39					
		M	N'E'Z'	46.5	21	11	13	8		
		M	Z'	51.0	17			8		
868	6	e	Z'	08 19 52	Masked by micross & l p wanderings					
		e	N'	25 45						
		eL	Z'	26.8	(28)					
		M	N'E'Z'	30.3	15	8	6	8		
	6		Z'	16 15	Feeble surface waves					
	6	i	EZ	22 56 24	0.5		+0.04	+		Local Seismic ?
		m	NEZ	56 25	0.5	0.06	0.04	0.04		
	7	i	EZ	06 03 33.8	0.4		+0.04	+0.05		Quarry blast ?
		m	N	03 36	0.7	0.10				
	7	e(Pg)	EZ	06 05 21.6	0.3					Quarry blast
		iSg	E	05 25.4	0.4		-0.04			
		i	NZ	05 26	0.4	+0.05		+0.05		
		m	NEZ	05 29	0.6	0.05	0.06	0.10		
	7	(Sg)	N	06 11 29½						Quarry blast
		e	E	11 30						
		m	E	11 34	0.8		0.10			
	7	ePg	EZ	06 45 35	0.4					Quarry blast
		iSg	NE	45 39.5	0.5	+0.02	-0.03			
		i	Z	45 40.0	0.5			+0.05		
		m	NEZ	45 45	0.7	0.08	0.11	0.14		

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
869	Dec 7	eP	Z'	09 04 34					3170	N E Z records masked by microseisms
		e	N'	04 47	11	4			28°.5	USCGS 5.4 S 151.3 E H 08 58 43.8
		isP	Z'	04 48	11			-4		h 54 km ca Mag 5.8
		e	Z	04 48	2.0			0.68		6 Pal
		iPP	Z'	05 32	9			+4		5½-5¾ Brk
		e	N'	05 36	15	3				
		iS	N'N"	09 18	11	-7				
		i	Z'	09 35	25			+14		
		m	N'	09.6	24	16				
		i	N"	09 40	9	-10*				
		e	E'	09 53	23		6			
		i	N'N"	10 04	15	+10				
		i	E'	10 26	9		+5			
		iSS	E'	10 42	14		+6			
		eLQ	E'	10.9	30					
		eL	N'	11.3	34					
		i	E"	11 54	8		+11*			
		L	E'	11.9	28		20			
		eLR	N'Z'	12.4	40					
		L	N'Z'	13.1	34	13		18		
		M	N'E'Z'	15	21	23	16	27		
870	7	(P)	Z	15 48 53		Masked by microseisms				USCGS 5.1 S 145.9 E H 15 43 29.7
		e	N'	54 24						h 219 km ca Mag 5.0
		e	E'	55 20						
		e	N'	55 32	9	1				
		eL	N'E'	57	27					
		M	N'E'Z'	59	18	3	4	1		
	7	eP	NZ	17 21 35½	0.5					Local
		iS	N	21 51.7	0.5	+0.02				
		i	Z	21 52	0.5			+0.03		
871	7	L	N'E'Z'	19 51	25					USCGS 7.6 S 128.0 E H 19 31 35
										h 144 km ca
	8	e	N	01 20 51.3	0.3					Local blasting ?
		i	EZ	20 52.0	0.3		-0.06	+0.10		
	8	iSg	N	06 30 17.7	0.4	+0.04				Quarry blast
		i	EZ	30 18.0	0.4		+0.04	+0.06		
		m	NEZ	30 21	0.7	0.24	0.08	0.08		
	8	(Pg)	E	06 36 09½	0.4					Quarry blast
		i	N	36 11	0.6	+0.04				
		i(Sg)	E	36 15.0	0.5		+0.02			
		i	NZ	36 15.7	0.6	+0.04		+0.04		
		i	E	36 16.0	0.5		+0.03			
		m	NEZ	36 19	0.7	0.25	0.09	0.08		
872	8	e(S)	N'E'	18 10 04	11	Masked by microseisms				USCGS 34.7 N 139.2 E H 17 49 46.3
		eG	E'	19.8	50		4			h 31 km ca Mag 5.2
		eL	Z'	22.8	40					
		M	N'Z'	25.9	25	2		3		
873	8	(PKP)	NZ	21 15 31		+		+		(USCGS 19.0 N 64.0 W H 20 55 55.3
						Masked by microseisms				h 55 km ca Mag 4.5)
874	9	e(SP)	N'Z'	14 02.6		Large microseisms wanderings on N' E'		Also large l p Z' records		(USCGS 27.5 S 63.2 W H 13 35 42.4
										h 586 km ca Mag 5.9 5-5¼ Brk 6¼ Pal
	10	i	NE	03 03 37.3	0.4	-	+			Local Seismic ?
	10	iSg	N	05 59 15.5	0.4	+0.02				Quarry blast
		i	Z	59 15.7	0.5			+		
		i	E	59 16	0.5		+			
		m	NEZ	59 18	0.5	0.07	0.05	0.11		
	10	i	Z	06 05 02.7	0.4			+0.05		Quarry blast ?
		i	E	05 02.8	0.4		+0.05			
		m	EZ	05 07	0.7		0.08	0.10		
	10	i	Z	06 29 42½	0.5			+0.03		Local ?
	10	e	EZ	06 53 39						Quarry blast ?
		m	E	53 43	0.7		0.10			

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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
875	Dec 10	(iP)	Z	15 22 42	1.5			+0.28		Compression Micross present
		iP	Z'Z"	22 45	8			+6		USCGS 40.4 N 138.9 E H 15 11 05.5
		e	N'	22 50	8	1				h 33 km ca Mag 6.0
		i	Z"	22 52	6			+7*		6 Pal
		e	Z'	22 57	8			4		6¾-7 Brk
		e(S)	E'	32 08	10		3			
		e(PS)	E'	32 40	12		2			
		e	N'E'	33.1	15	3	2			
		eG	E'	43.0	50		7			
		eLR	Z'	45.3	30			4		
		M	N'E'Z'	52	18	6	5	10		
876	10		N'E'	20 45		Feeble surface waves				USCGS 8.4 S 127.1 E H 20 25 40
										h 33 km ca
	11	e	Z	05 59 31						Local Seismic ?
		i	NE	59 32	0.5	+0.03	+0.06			
877	11		Z'	22 59		Feeble waves masked by microseisms				USCGS 6.3 S 131.2 E H 22 42 59.4
										h 47 km ca Mag 5.8
	12	iSg	N	04 33 57.8	0.6	-0.04				Quarry blast
		i	Z	33 58.0	0.6			+0.04		
		i	E	33 59.6	0.5		-0.14			
		m	NEZ	34 01	0.5	0.23	0.31	0.24		
	12	i	E	05 33 40.3	0.4		-			Quarry blast ?
		i	Z	33 40.5	0.4			+		
		m	EZ	33 44	0.8		0.07	0.06		
878	12	iP	Z	07 25 39.5	1.4			+0.35		Compression Microseisms present
		i	NZ	25 41.5	1.2	-0.09		+0.30		USCGS 6.9 S 150.6 E H 07 20 00.0
		e	Z	25 50	1.6			0.36		h 33 km ca Mag 5.9
		PP	EZ	26 30.5	1.3		0.29	0.19		
		ei(S)	N'	30 25	20	-7				
		e	Z'	30 30	18			5		
		e	E'	31 05	16		3			
		eL(Q)	E'	31.9	36		5			
		eL	N'	32.2	36	5				
		eL	Z'	32.6	45			6		
		L	Z'	33.6	36			9		
		M	N'E'Z'	36.3	15	15	22	17		
879	12	eL	Z'	19 59	25	Masked by microseisms				USCGS 26.1 S 175.9 W H 19 44 55.7
										h 85 km ca Mag 4.9
880	12	e	Z	23 13 51	All	records masked by micross				USCGS 5.8 S 147.1 E H 23 07 46.1
		e(S)	N'	18.3	22					h 68 km ca Mag 5.0
		e	Z'	18.5						
		eLR	Z'	21.6	33					
		M	N'E'Z'	23.4	22	7	4	7		
881	13	e	Z'	00 23.6	16	Masked by microseisms				USCGS 34.0 S 179.1 W H 00 13 40
		e	E'	23.9	13		2			h 112 km ca Mag 5.3
		e	N'	24.2	18	3				
		eL	E'Z'	25.3	32			5		
		M	N'Z'	28.2	17	4		9		
		M	E'	28.9	16		7			
882	13	iP	EZ	06 42 11.0	0.9		+0.04	-0.15		Dilatation
										USCGS 15.0 S 167.2 E H 06 37 07.3
										h 131 km ca Mag 5.2
883	13	e(S)	E'	13 34.3		Masked by microseisms				USCGS 20.1 N 122.0 E H 13 15 49.8
		e	N'	34.4	(30)					h 33 km ca Mag 4.8
		e(L)	E'	45.7	(30)					
		eL	N'	46.7	30					
		M	N'Z'	52	20	2		3		
	13	(P)	Z	19 18 34		Masked by microseisms				USCGS 10.7 S 165.0 E H 19 12 57.1
										h 33 km ca Mag 5.3
884	13	eL	Z'	22 44.4		Masked by micross & 1 p wanderings				
		M	Z'	49.6	19			2		
	14	i	EZ	02 01 52.2	0.5		+0.08	+0.03		Nearby blast
		i	N	01 53.3	0.5	-0.22				
		m	NEZ	01 54	0.3	2.05	0.68	0.32		

No	Date	Phase & Component	Time (G.M.T.)	Per	Amplitude AN	Amplitude AE	Amplitude AZ	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km	
885	Dec 14	(P) Z'	02 11 59	4					All records masked by microseisms
		e Z'	12 37	7			4		L P wanderings on N' E'
		iS E'	22 55	10		+7			USCGS 54.3 S 2.4 W H 01 59 05.6
		i E"	23 00	7		-9*			h 33 km ca
		eSS N'	29 02	15					
		e E'	35.3	22					
		i! E'	35 47	30		+16			
		e Z'	35.8	30					
		eG E'	37.3	45		13			
		M N'Z'	44.7	27	8		10		
		M Z'	46.8	23			11		
		M N'E'Z'	49	19	12	6	14		
	14	P NEZ	11 54 36½	(0.4)					Local
		i NEZ	54 37.7	0.6	+0.02	-0.02	+0.07		
		iS N	54 50	0.6	-0.06				
		i Z	54 52.6	0.5			+0.06		
		m NE	54 53½	0.5	0.10	0.08			
		m Z	55 05½	0.7			0.10		
886	14	e N'E'	21 02.5						
		eL Z'	10.4	26					
	15	i EZ	05 42 14.0	0.4		+0.03	+0.03		Local Seismic ?
		m EZ	42 22	0.7		0.05	0.08		
	15	e NE	05 53 12½						Local Seismic ?
	15	e NEZ	06 28 59						Local Seismic ?
		m N	29 03	0.7	0.06				
	15	i N	06 47 44.8	0.3	-				Local Seismic ?
		i N	47 49	0.5	+0.02				
		m E	47 49	0.5		0.04			
	15	i Z	06 52 00.5	0.5			+		Local Seismic ?
		m NEZ	52 04	0.7	0.05	0.03	0.06		
	15	e NEZ	07 07 45	0.4					Local Seismic
		m N	07 47½	0.6	0.05				
887	15	e E'	12 40 31						(USCGS 14.7 N 91.7 W H 12 13 25.8
		e E'Z'	43.5	20					h 118 km ca Mag 5.4)
		e E'	50.4	28					
		eL N'	13 04.2	38					
		eLR Z'	08.7	32					
		LR E'Z'	09.6	32		2	3		
	15	i E	21 33 09.8	0.3		+0.05			Local blasting ?
		i NZ	33 10.2	0.3	+0.03		+0.11		
888	16	eL E'	02 35.8	33	Masked by micross & l p wanderings				
		eL Z'	36.4	38					USCGS 3.2 S 147.5 E H 02 21 30.7
		M N'E'Z'	40	18	2	3	2		h 33 km ca Mag 4.9
889	16	e(S) N'	03 19.6	Masked by micross & l p wanderings					USCGS 3.2 S 147.3 E H 03 08 12.1
		eL E'Z'	22.8	36					h 33 km ca Mag 4.8
		M N'E'Z'	27.0	17	2	3	2		
890	16	iP Z	04 03 37.4	1.0			+0.10		Micross present. Also l p wanderings
		e(S) N'	10.3						USCGS 6.0 N 125.3 E H 03 55 17.4
									h 121 km ca Mag 5.6
	16	iSg N	06 25 01.8	0.5	+0.04				Quarry blast
		i EZ	25 02.2	0.5		+0.02	+0.03		
		m N	25 04	0.7	0.30				
		i Z	25 04.7	0.6			-0.06		
		m EZ	25 06½	0.7		0.10	0.13		
	16	i NE	06 51 51.5	0.5	+0.02	+0.02			Local Quarry blast ?
		i NE	51 57	0.7	-0.08	-0.08			
891	16	(iP) Z	12 25 28			+	+		Microseisms present
		e Z'	29.4						USCGS 21.7 S 169.6 E H 12 20 44.2
		e(L) Z'	31.2	18					h 21 km ca Mag 4.3
892	16	Z'	18 59	Feeble waves					(USCGS 20.1 N 126.0 W H 18 26 39.0
									h 19 km ca Mag 4.4)

No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude AN	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
893	Dec 16		N'E'Z'	19 36		Feeble bng waves				USCGS 21.8 S 175.3 W H 19 20 26.3 h 33 km ca Mag 5.4
894	17	i	Z	01 16 29		Masked by microseisms				USCGS 7.8 S 117.4 E H 01 08 51
		M	Z'	35.9	15			½		h 33 km.ca.
	17	iP	NZ	04 34 15.5	0.5	(+)		+0.02		Local
		iS	NE	34 36.4	0.5	+0.07	+0.10			
895	17	(eP)	Z'	05 30 41		Masked by microseisms				USCGS 45.4 N 150.1 E H 05 18 34.8
		eS	E'N'	40 40	9	1	1			h 17 km ca Mag 5.3
		eSS	N'	45.8	22	1				
		eL	Z'	56.0	27					
		L	N'E'	58	24	1	1	1		
	17	Pg	NZ	06 02 05.8	0.5	+		+		Quarry blast
		i	Z	02 08.7	0.3			+0.07		
		iSg	NE	02 08.9	0.4	-0.10	+0.06			
		m	NEZ	02 11	0.5	0.12	0.11	0.16		
	17	ePg	Z	06 12 47.3						Quarry blast
		iSg	N	12 51.0	0.5	+0.02				
		i	EZ	12 51.2	0.5		-0.04	+0.05		
		m	NEZ	12 54	0.7	0.08	0.14	0.16		
	17	i	Z	06 38 00.5	0.5			+		Quarry blast ?
		m	EZ	38 05	0.7		0.04	0.06		
	17	iSg	NE	06 45 30.5	0.5	+0.03	+0.02			Quarry blast
		i	Z	45 30.7	0.5			+0.03		
		m	N	45 34½	0.7	0.21				
		m	EZ	45 37½	0.7		0.08	0.07		
896	17	eL	E'	06 50.0	28					USCGS 3.2 S 147.2 E H 06 35 36.9
		eL	Z'	50.6	34					h 33 km ca Mag 4.8
		L	N'E'Z'	51.7	28	1	2	1		
		M	N'E'	54.4	16	1	1			
		M	Z'	57.2	9			2		
	17	eL	E'Z'	13 51.3	26					
	17		N'E'Z'	17 24		Feeble surface waves				
897	18	iP	Z	00 16 06.5	0.7			+0.02		Compression
		m	NEZ	16 07	0.7	0.02	0.03	0.07		USCGS 18.8 S 168.9 E H 00 10 59.6
		e	N'	23.6						h 69 km ca Mag 4.4
		e(L)	Z'	25.3						
		M	N'Z'	29	28	1		1		
	18	e	N	01 06 24½	0.7					Local Quarry blast ?
		m	N	06 26	0.7	0.04				
	18	m	E	05 10 49	0.7		0.04			Quarry blast ?
	18	i	EZ	05 45 52½	0.4					Local Seismic ?
	19	iSg	N	01 23 11.0	0.4	+0.04				Quarry blast
		i	EZ	23 11.4	0.4		-0.07	+0.05		
		m	NEZ	23 15	0.7	0.24	0.08	0.10		
	19	iSg	NE	01 55 05.5	0.4	+0.04	+0.04			Quarry blast
		i	Z	55 06.0	0.5			+0.05		
		m	NEZ	55 12	0.7	0.47	0.08	0.12		
	19	e	N	02 11 24½						Quarry blast ?
		m	NEZ	11 28	0.7	0.06	0.04	0.04		
898	19	ipP	Z	06 47 21.5	1.2			+0.18		Preceded by microseisms
	19	eP	Z	16 44 57	0.3					USCGS 32.8 S 177.6 W H 06 41 27.3 Local h 203 km ca Mag.4.4
		iS	N	45 31.0	0.5	+0.05				
		iS	E	45 31.3	0.5		+0.05			
		i	Z	45 31.7	0.6			+0.07		
		m	NEZ	45 37	0.6	0.14	0.10	0.09		
899	19	e	N'	18 41		Feeble				USCGS 9.9 S 118.8 E H 18 18 31
		eL	Z'	43						h 336 km ca Mag 4.4
900	19	eL	E'Z'	20 25		Feeble				

No	Date	Phase & Component	Time (G.M.T.)	Per	Amplitude A_N	Amplitude AE	Amplitude A_Z	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km	
901	Dec 20	(P) Z	11 32 11	1.2			0.20		Microseisms present
		e Z'	39 41	(16)					USCGS 20.1 S 177.7 W H 11 26 32.6
									h 463 km ca Mag 4.8
	21	i EZ	00 48 09.8	0.2		+	+		Blasting ? No N record Dec 21
		m EZ	48 10	0.2		0.20	0.36		
	21	i E	02 20 04.8	0.7		+			Local Seismic ?
		i Z	20 09.2	0.7			+		
902	21	e Z'	07 39.7						USCGS 5.9 S 154.3 E H 07 28 48.1
		eL Z'	42.6	27			2		h 40 km ca Mag 4.8
	22	(iPKP) Z	00 42 34½				+		USCGS 9.5 S 71.3 W H 00 24 48.7
					Microseisms present				h 614 km ca Mag 5.3
	22	i E	01 55 24½	(0.5)					Local blasting ?
		m NEZ	55 26½	0.4	0.12	0.06	0.03		
	22	i Z	02 36 33				+		Superposed on micross Seismic ?
903	22	e(S) N'	05 02 57	13	Masked by micross & l p				No N record after 05 h
		e(PS) Z'	04 53	20	wanderings on N' E'				USCGS 28.2 N 57.0 E H 04 36 34.7
		eLR Z'	30.1	28					h 42 km ca Mag 5.5
		M N'E'Z'	38	21	2	4	6		
	22	e Z	05 44 24	0.5					Quarry blast ?
		m E	44 26	0.5		0.07			
	22	i EZ	06 29 19.4	0.4		-0.06	+0.08		Quarry blast ?
		m EZ	29 23½	0.6		0.08	0.07		
904	22	ePKP Z	08 20 25½	0.7					Microseisms present
		i Z	20 26.8	0.7			+0.12		USCGS 18.4 N 68.8 W H 08 01 12.6
		i E	20 27	0.7		+0.03			h 115 km ca Mag 5.6
		e Z	20 32	0.8					6 Pas
		m Z	20 35	0.8			0.11		
		i(sPKP) Z	21 06.5	1.2			+0.13		
		i E	21 07	1.0		+0.06			
		i E	21 47	1.0		+0.06			
		i E	21 56	1.0		+0.06			
	22	(P) Z	12 03 18½		Masked by microseisms				USCGS 22.2 S 179.7 W H 11 58 10.1
									h 600 km ca Mag 5.0
906	22	e(PS) Z'	21 23.2		Micross & l p wanderings present				USCGS 31.9 N 117.1 W H 20 54 35.3
		e(SS) E'	29.3						h 14 km ca Mag 6.3
		eLR E'Z'	44.6	32		1½	2		5.3 Pas
		M N'E'Z'	48.5	20	1	1	1		6-6½ Pal
	23	ePg E	06 09 49						Quarry blast
		iSg EZ	09 53	0.3		+0.08	-0.08		
		m NEZ	09 57	0.7	0.06	0.07	0.10		
907	23	e(S) E'E"	06 10 14	7	Masked by microseisms &				USCGS 59.4 S 26.9 W H 05 46 45
		e Z	37.4	(17)	l p wanderings				h 33 km ca Mag 6.0
	23	i EZ	06 50 04	0.4		-	+		Quarry blast ?
		m NZ	50 07	0.7	0.05		0.04		
908	23	e(S) E'	07 47.7						USCGS 7.1 S 129.4 E H 07 36 02.9
		e N'	50.5						h 111 km ca Mag 5.0
		M Z'	57.7	12			1		
909	23	eS N'	20 07 36						USCGS 30.3 N 131.1 E H 19 47 59.3
		eL Z'	20.7	(30)					h 33 km ca Mag 5.4
		M N'E'Z'	25.3	20	1	1	1		
	23	e Z	22 49 27						Quarry blast
		m NEZ	49 33	0.7	0.13	0.03	0.03		
	24	e EZ	00 56 04	0.4					Quarry blast
		i N	56 05	0.7	-0.03				
		m N	56 06	0.7	0.08				
	24	m N	01 07 45	0.7	0.06				Quarry blast
	24	e E	01 43 51½	0.3					Local Seismic ?
		e N	43 54	0.3					

No	Date	Phase & Component	Time (G.M.T.)	Per	Amplitude A_N	Amplitude A_E	Amplitude A_Z	Δ	Remarks
	1964		h m s	s	μ	μ	μ	km	
910	Dec 24	iP Z	18 51 41.5	1.0			+0.12		USCGS 4.4 S 153.1 E H 18 45 45.5
		i Z	51 46	1.0			-0.12		h 93 km Mag 6.1
		e N'	51 58	15	1				
		e Z'	52 07	10			2		
		e Z'	52 42	8			2		
		e N'	52 46	18	1				
		eS N'	56 24	9	2				
		e N'	56 33	24	5				
		e Z'	56 48	18			4		
		eL E'Z'	59.3	34					
		M N'E'Z'	19 01	26	6	4	7		
911	25	iP Z	08 07 33	0.8			+0.04		Microseisms present
		e N'Z'	15		Feeble				USCGS 9.9 S 159.8 E H 08 02 08.5
									h 35 km.ca. Mag 5.2
912	25	eL E'	14 22		Feeble				
913	25	L N'E'Z'	17 32		Feeble				USCGS 38.4 N 139.3 E H 17 01 32.2
									h 33 km ca Mag 5.1
914	25	L E'Z'	20 20		Feeble				
915	26	eP Z	14 42 54	1.4			0.17	9600	No N record (faulty contact)
		e N'Z'	53.2					86°.4	h 0.015 ca H 14 30 25
		iS E'E"	53 17	8		+4			USCGS 51.8 N 156.8 E H 14 30 29.1
		esS E'	54 15	20		2			h 136 km ca Mag 5.7
		e N'	15 00.2	20					
		eG E'	06.4	43		3			
		eL N'Z'	10.5	35					
		M Z'	16.3	20					
916	26	eL Z'	18 46.9	20	Masked by micross & l p wanderings				
		M N'Z'	49.3	16	2		2		
917	27	iP Z	17 52 37.5	2.0			+0.58	5900	Compression
		e Z	52 45	2.0			0.58	53°.1	h 0.00 H 17 43 21
		e Z'	52 51	7			2		USCGS 12.9 N 125.4 E H 17 43 21.4
		iS N'E'Z'	18 00 05	9	-7	-5	-3		h 33 km ca Mag 5.9
		e(ScS) N'	02 29	9	2				5¼-5½ Pal
		e(SS) E'	03.5	14		2			
		e Z'	03.9	14					
		e N'	03 59	8	4				
		e Z'	04.6	17					
		eL E'	07.7	35					
		L E'	09.1	27		4			
		M N'E'Z'	13	17	3	2	3		
		M N'E'Z'	29.7	15	4	4	6		
918	28	eP Z	16 21 19					3140	N E Z and Galitzin records masked by
		m NEZ	21 23	0.5	0.05	0.13	0.25	28°.3	very large microseisms
		esP E'Z'	24 05	9		6			USCGS 22.1 S 179.6 W H 16 16 11.0
		i Z'Z"	24 10	9			+11		h 611 km ca Mag 6.2
		iPcP Z	24 14.5	0.9			+0.25		6¼-6½ Pas
		iS N'Z'	25 25½	7	-82		-13		
		i N	25 26½	2.5	+8.3				h 0.09 H 16 16 11
		i N'E'	25 33	7	+19	15			
		i N'	25 44	7	-25				
		i(PcS) Z'	27 28	7			+11		
		i(sS) E'	28 27	7		+			
		i E'	28 35	7		+17			
		X N'Z'	28 37	16	24		19		
		iScS N'	30 50	11	+45				
		i E'E"	30 56	8		+21			
		i N'	35 04	(9)	+				
		i N'	35 18	(9)	-				
	29	i N	07 00 22.5	0.7	+0.06				Local Quarry blast ?
	29	i NE	07 21 06	0.5	-	+			Local Quarry blast ?
		m NEZ	21 13	0.7	0.08	0.12	0.10		
919	29	iP Z	23 05 06.0	1.2			+0.09		Compression

RIVERVIEW COLLEGE OBSERVATORY
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No	Date	Phase & Component		Time (G.M.T.)	Per	Amplitude A_N	Amplitude AE	Amplitude A_Z	Δ	Remarks
	1964			h m s	s	μ	μ	μ	km	
920	Dec 29	(P)	Z	23 28 33½		Masked by microseisms				USCGS 6.2 S 155.5 E H 23 22 42.1
		i	Z	28 35	1.0			+0.06		h 50 km ca Mag 5.2
		M	N'Z'	39		Feeble				
	30	iPg	E	05 45 44.5	0.4		+			Quarry blast
		i	Z	45 45.7	(0.4)			+		
		iSg	EZ	45 48.5	0.4		-0.09	+0.09		
		m	NEZ	45 52	0.7	0.06	0.16	0.21		
921	30	L	E'Z'	10 43		Feeble	Masked by micross			(USCGS 8.7 S 109.3 W H 09 58 01
										h 33 km ca Mag 4.6)
922	30	e(SS)	N'	13 27.4		Masked by large micross				USCGS 12.4 N 142.0 E H 13 08 52.0
		e	N'	30.7						h 100 km ca Mag 4.9
		e	E'	31 02	15					or
		iL	N'E'	32.4	18	8	-15			USCGS 6.6 S 165.8 E H 13 19 47.4
		eL	Z'	32.9	38					h 33 km ca Mag 5.2
		A_{max}	Z'	33.9	26			10		
923	30	iP	Z	15 37 45.6	1.0			+0.10		Compression
		L	E'	54		Feeble				USCGS 31.3 N 138.8 E H 15 27 25.8
										h 261 km ca Mag 5.4
924	30		N'E'Z'	16 46		Feeble long waves				
925	30	iP	EZ	21 36 03.5	1.0		+0.02	-0.08		Dilatation
		i	EZ	36 05	1.0		+0.04	-0.14		N' E' Z' masked by microseisms
		i	Z	41 56	0.8			+0.05		USCGS 23.3 S 179.9 W H 21 30 58.8
		e	N'E'Z'	43.1						h 547 km ca Mag 5.2
	31	i	N	03 30 48.7	0.5	+0.02				Local Quarry blast ?
		m	E	30 53	0.7		0.08			
		e	N	30 56½	0.7					
		m	NZ	30 57½	0.7	0.06		0.06		
926	31	e	Z	23 19 35		Microseisms present				USCGS 4.6 S 153.0 E H 23 13 30.9
		e(S)	N'	24 20	23	2				h 77 km ca Mag 5.1
		e	Z'	24 30	20			2		
		eLR	Z'	27.9	28			2		
		M	N'E'Z'	30	20	2	1	3		

P.F. Rheinberger

Lawrence Drake S.J. Director
L. Hession S.J.

RIVERVIEW COLLEGE OBSERVATORY

We announce with regret the death of Fr Antony Fynn S.J. 2.2.65 R.I.P.
Fr Lawrence Drake has been appointed Director in his place 27.2.65