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# SEISMOLOGICAL BULLETIN

Fl- OCT 1963

**GOVERNMENT OF INDIA  
METEOROLOGICAL DEPARTMENT**

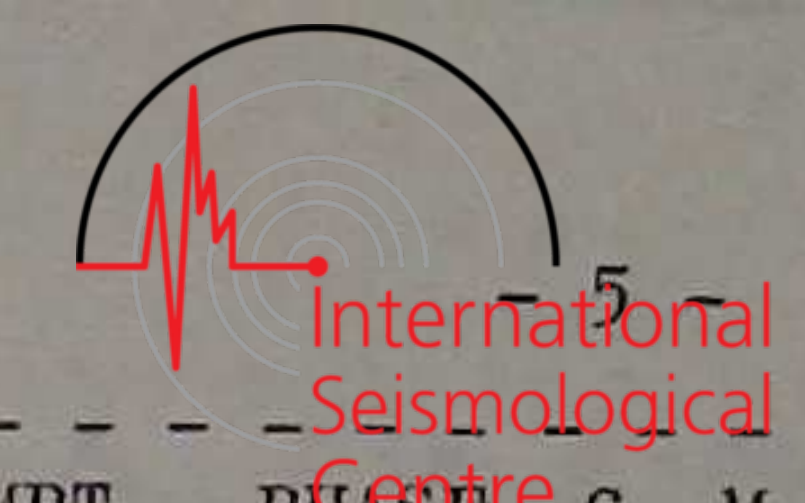
PUBLISHED UNDER THE DIRECTION OF  
SHRI P. R. KRISHNA RAO  
DIRECTOR GENERAL OF OBSERVATORIES

## List of Seismograph Stations with their Instruments and Constants

Station	Latitude	Longitude	Height a. s. l. (Metres)	Lithographic foundation	Instrument	Compt	Period in secs.	Static Magnifi- cation	Damping ratio	Paper speed mm/min
Agra					Columbia	E	To=15 Tg=100			15
					Long Period	N	To=15 Tg=85			15
Bombay	18.54°N, 72.40°E		4	Deccan Trap	Milne-Shaw	N	12 350	13:1		15
					Milne-Shaw	E	12 350	23:1		30
					Sprengnether	E	To=Tg=7 secs			15
Bokaro	23.50°N, 85.49°E			Rock	Milne-Shaw	N	12 250	20:1		15
					Milne-Shaw	E	12 250	20:1		15
					Wood-Anderson	E	0.8 950	h=0.8		60
					Wood-Anderson	N	0.8 1000	h=0.8		60
Calcutta	22.32°N, 88.22°E (1) 7 (2) 6			Alluvium	Milne-Shaw	E	12 250	20:1		8
					Wood-Anderson	N	2 870	Critical		30
					Omori-Ewing	N	15 32			25.4
					Omori-Ewing	E	21 30			25.4
Chatra	25.50°N, 87.10°E		151	Sand Stone	Milne-Shaw	E	12 250	20:1		15
					Wood-Anderson	N	1 1000	30:1		60
					Benioff	Z	To=0 Tg=0.45 secs	Critical		60
					Wenner-Accelerograph	ZNE				
Colombo	06.54°N, 79.52°E		7	Beach Sand	Milne-Shaw	E	12 250	20:1		
Dehra Dun	30.19°N, 78.02°E		582	Gravel	Wood-Anderson	N	0.8 950	Critical		60
					Wood-Anderson	E	0.8 850	Critical		60
					Milne-Shaw	N	12 250	20:1		8
					Milne-Shaw	E	12 250	20:1		8
Hyderabad	17.25°N, 78.27°E		536	Granite	Milne-Shaw	E	12 250	20:1		8
					Milne-Shaw	E	12 250	20:1		8
Kodalkanal	10.14°N, 77.28°E		2345	Rock	Milne-Shaw	E	10 250	20:1		9
Madras	13.00°N, 80.11°E		15		Sprengnether	E	To=Tg=72 secs	Critical		30
New Delhi	28.35°N, 77.12°E		207	Massive Quartzite						
Poona	18.32°N, 73.51°E		560	Deccan Trap	Sprengnether	Z	To=Tg=1.5	Critical		30
					Wood-Anderson	E	4 1000	20:1		15
					Milne-Shaw	N	12 250	20:1		8
Port Blair	11.49°N, 92.43°E				Wood-Anderson	N	2 1000	20:1		30
					Wood-Anderson	E	0.8 1000	66:1		30
					Milne-Shaw	N	12 350	20:1		8
Sehore	23.10°N, 77.08°E				Wood-Anderson	N	0.8 980	Critical		30
Shillong	25.34°N, 91.53°E		1500	Quartzite Sand Stone (Shillong Quartzite)	Wood-Anderson	N	0.8 1000	h=0.8		30
					Wood-Anderson	E	0.8 1000	h=0.8		30
					Milne-Shaw	N	12 250	20:1		8
					Benioff	Z	To=1.0 Tg=18			50
					Sprengnether	E	To=Tg=5.3	Critical		30
					Wenner Accelerograph	ZNE				
Tocklai	28.45°N, 94.45°E			Alluvium	Wood-Anderson	E	0.8 970	h=0.8		60
Vizianagaram	18.07°N, 83.27°E				Wood-Anderson	E	0.8 1000	h=0.8		30
					Wood-Anderson	N	2 1000	20:1		30

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	Δ km.	REMARKS.
October, 1963.						
01	Shillong	ZNE	iP Sg	04 47 27 47 52	190	Slight, rarefaction.
01	Delhi	Z	iP	17 30 13		Slight, compression.
01	Shillong	ZNE	iP	20 36 54		Slight, distant.
01	Shillong	ZNE	iP Sg	22 18 16 19 00	300	Slight.
02	Port Blair	Z	iP	01 07 12		Slight, rarefaction.
02	Shillong	ZNE	iP	03 42 08		Slight, distant, compression.
	Delhi	Z EN	eP e	03 42 25.5 42 26		Slight, distant. Initial ground motion towards South-East. Compression.
	Chatra	Z	iP	03 42 35		Slight, rarefaction.
02	Poona	Z	eP	04 19 03		Slight.
02	Port Blair	E	i	06 11 17		
02	Shillong	ZNE	iP	07 19 57		Slight, distant, compression.
02	Delhi	ENZ	iP	21 13 30		Slight, Initial ground motion towards North-East. Compression.
	Shillong	ZNE	iP	21 15 07		Slight, distant.
03	Shillong	ZNE	iP	05 37 56		Slight, distant, rarefaction.
03	Shillong	ZNE	iP	12 10 38		Slight, near, compression.
	Chatra	Z	eP eS	12 11 39 15 46	2550	Slight.
03	Chatra	Z	eP e	13 44 40 45 40		Slight.
	Delhi	NZ	i e	13 46 31 46 32		
03	Shillong	ZNE	eP	16 07 15		Slight, distant.
03	Port Blair	E	Mn	16 44 -		Period =22.5. Amp.=7sec.
03	Shillong	ZNE NE	iP Sg	17 09 05 09 43	270	Slight, rarefaction.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
03	Bokaro	E	iP	17 38 39		Slight, near.
	Chatra	Z	eP i	17 39 15 40 01		Slight, distant.
03	Chatra	Z	e	19 09 29		Slight.
03	Shillong	ZNE	iP	19 24 02		Slight, distant, rarefaction.
	Delhi	Z	eP	19 25 21		Slight, rarefaction.
03	Port Blair	E	Mn	19 39 -		Period = 12 secs. u = 2.
03	Delhi	NZ EZ	eP iS	20 09 47 11 24	940	Slight.
03	Epc:- 32.2°N 131.6°E in Kyushu, Japan. h = about 33 km. -H = 23 h 24 m 34.7 s (USCGS). Mag: 6½(Pas), 6(Pal), 5.7 SD 0.2 (CGS).					
	Epc:- 31.0° N 135.0° E in South of Japan. -H = 23 h 24 m 18.0 s (CSO Shillong ) .					
	Shillong	ZNE	iP PP PPP S SS SSS LR M	23 31 28 32 56 33 13 37 13 39 31 40 00 41 18 44 41	4070	Moderate.
	Calcutta	E	iP PP i iS M	23 32 00 33 40 37 49 38 03 46 33	4380	
	Chatra	ZNE NE	iP PP PPP iS	23 32 00 33 33 34 12 38 12	4540	Initial ground motion towards West. Compression.
	Bokaro	NE	iP PP, PeP i iS	23 32 17 33 57 38 08 38 47	4840	Initial ground motion towards West.
		E	PS PPS	38 54 39 02		
		NE	i	41 19		
		E	SS	41 58		
	Dehra Dun	ENZ EN	eP PP PPP iS	23 32 52 36 11 38 09 43 22	9467	Initial ground movement towards South-West. Rarefaction.
		N	SS SSS	49 03 52 31		



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
03	Visakhapatnam	E	iP ePP ePPP eS eSS eSSS eM	23 32 56 34 53 35 58 40 04 43 31 45 04 52 02	5510	Initial ground movement East. Period = 15.0 secs. Amp. = 5 .1.
	Delhi	EZ	iP i PsP PP PPP Pc cP	23 33 02 33 09 34 22 34 50 35 41 38 26	5360	Initial ground motion towards South. Compression.
		ENZ	iS ScS SS SSS LR	40 01 42 40 43 12 44 12 46 47		
	Sehore	EW	iP	23 33 16		
	Madras	E	iP PcP PP PPP PCS, ScP iS PS PPS ScS SS LQ LR M	23 33 30 34 37 35 32 36 38 38 32 41 04 41 12 41 22 43 20 44 42 46 31 49 20 53 42	5980	Initial ground motion towards East.
	Poona	EZ E	iP eS	23 33 52 41 39	6217	Initial ground movement West. Compression.
	Bombay	EN	iP e e PP PPP NS ES E N E N M	23 33 55 35 00 35 18 35 52 36 59 41 31 41 39 44 01 45 12 45 25 59 09	6155	Period = 16 secs. Amp. = = 12 u. Period = 15 secs. Amp. = 09 u.
		E	M	59 33		
	Kodaikanal	E	iP i PS	23 34 01 37 20 41 40		Initial ground movement towards West.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
03	Hyderabad	N	eS LR M	23 42 59 50 47 54 59		Period = 14 secs. Amp: = 7 μ.
04	Shillong	ZNE	iPg Sg	00 30 37 30 50	110	Slight.
04	Delhi	Z Z EN	iP i	00 36 24 36 34 36 35		Slight.
04	Port Blair	E	i	03 11 39		
04	Shillong	ZNE	iP	03 23 02		Slight, near.
	Shillong	ZNE	iP	03 46 23		Slight, distant, compression.
04	Bokaro	NE	iP	08 09 57		Slight, local.
04	Delhi	ENZ	eP	13 14 04	2140	Slight. Initial ground motion towards South- West. Rarefaction.
04	Bombay	EN N E N E	e e e M M	15 29 54 31 42 35 44 38 42 42 00		Slight. Period = 15 secs. Amp: = 3 μ.
04	Epc:- 18.1°N 60.1° E Arabian Sea. h = about 33 km. -H= 13 h 29 m 44.6 s (USCGS). Mag: 5.3 (CGS).					
	Madras	E	eP PP iS LR M	15 34 18 34 41 38 11 39 25 41 13	2370	
	Dehra Dun	ENZ EN	eP e	13 34 22 38 19		
	Bokaro	E	eP	13 35 08		
	Shillong	ZNE	iP	13 35 56		Compression.
	Hyderabad	N	e M	13 37 08 44 14		Period = 12 secs. Amp. = 4 μ.
04	Shillong	ZNE	iP Pg Sg/Sn	17 18 42 18 43 19 02	150	Slight.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
04	Shillong	ZNE	eP	18 39 04		Slight, near.
04	Port Blair	ZNE	iPg iSg	23 33 17 55 33 24		Slight, compression.
05	Delhi	ENZ	iPg iSg	01 04 27.3 40 04 32.0		Slight. Initial ground motion towards South- West. Compression.
05	Shillong	ZNE	iPg Sg	02 46 35 60 46 41		Slight.
05	Delhi	Z	eP	04 31 52		Slight.
05	Delhi	Z	eP	04 48 23		Slight.
05	Shillong	ZNE	iP	06 48 35		Slight, distant, compression.
	Delhi	Z	iP	06 50 42		Slight.
05	Shillong	ZNE	iP	07 39 31		Slight, distant, rarefaction.
	Chatra	Z	iP	07 40 01		Slight, rarefaction.
	Delhi	ENZ	iP	07 40 59		Slight. Initial ground motion towards South- east. rarefaction.
05	Bokaro	NE	iP	08 11 57		Slight, local.
05	Bokaro	NE	iP	09 21 07		Slight, local.
05	Epc:- 11.6°N 42.8°E French Somaliland, Felt Djibouti. h = about 33 km. -H= 14 h 57 m 47.4 s (USCGS). Mag: 5.3 (CGS).					
	Bombay	E	eP PP e e PcP eS e e SSS M N	15 03 54 04 46 05 03 05 32 07 12 08 55 09 18 09 38 10 37 19 35 17 32	3380	Period = 15 secs. Amp. = 3 μ. Period = 13 secs. Amp. = 5 μ.
	Poona	Z E	iP eS	15 04 01 09 23	3829	
	Delhi	ENZ EN	iP eS SS	15 04 49 10 30 13 04	4030	Initial ground motion towards South-West. Compression.

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October, 1963.						
05	✓ Madras	E	iP PP iS LQ LR M	15 04 52 06 25 10 39 13 25 15 14 18 25	4120	Initial ground motion towards East.
	✓ Dehra Dun	EZ NE	eP iS i	15 05 01 10 57 23 16	4265	
	✓ Bokaro	E	iP PP S eS SS	15 05 43 07 26 12 14 12 22 15 25	4860	Initial ground motion towards West.
	✓ Chatra	Z NE	iP eS e	15 05 55 12 37 16 11	5050	Rarefaction.
	✓ Calcutta	E	eP iS	15 06 00 12 41	5035	
	✓ Shillong	ZNE	iP S LR	15 06 27 13 32 21 11	5660	Rarefaction. Initial ground motion towards South-West.
	✓ Port Blair	ZE E	iP iS	15 06 33 13 39	5480	Rarefaction.
05	Delhi	Z	eP	15 25 52		Slight, compression.
05	Delhi	Z	eP	15 56 11		
05	Shillong	ZNE	iP	17 06 30		Slight, distant, rarefaction.
05	Delhi	Z	iP	17 25 29		Slight, compression.
05	Madras	E	e	17 31 18		
	Dehra Dun	N	e i	17 31 39 41 25		Tremor.
05	Port Blair	Z	i	19 15 25		
05	Shillong	ZNE	iP	20 30 48		Slight, distant, rarefaction.
05	Shillong	ZNE	iP	20 43 55		Slight, distant, compression.
	Delhi	Z	iP	20 45 19		Slight, rarefaction.
05	Delhi	Z	iP	21 50 02		Slight, compression.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
05	Chatra	Z	e	22 00 17		Slight, distant.
	Shillong	ZNE	iP	23 59 40		Slight, distant, compression.
	Chatra	Z	e	23 59 59		Slight, distant.
06	Delhi	ENZ	iP	00 00 40		Slight. Initial ground motion towards South-West. Compression.
06	Shillong	ZNE	eP	00 42 09		Slight, near.
06	Port Blair	Z	i i i	02 05 20 05 39 05 45		Slight, near.
06	Dehra Dun	Z	eP i	05 50 49 52 24		Slight.
	Delhi	ENZ	eP iS	05 51 05 52 44	980	Slight. Initial ground motion towards South-West.
06	Delhi	ENZ	iP	09 48 54		Slight. Initial ground motion towards South-east. Compression.
06	Port Blair	Z	e	13 01 27		Slight, near.
06	Delhi	ENZ	iP	14 08 56		Slight. Initial ground motion towards North-east. Compression.
06	Chatra	Z	iP	16 56 28		Slight, near. Rarefaction.
06	Shillong	ZNE	eP S	16 57 16 58 18	590	Slight.
	Delhi	ENZ	i	16 59 12		
06	✓ Shillong	ZNE	iP	17 35 26		Slight, distant, rarefaction.
06	Delhi	ENZ	iP	19 44 38		Slight. Initial ground motion towards South-West. Rarefaction.
06	Shillong	ZNE	iP	21 36 07		Slight, distant, compression.
07	Shillong	ZNE	eP	02 49 27		Slight, near.
07	Chatra	Z	iP eS	05 07 11 07 48	330	Slight, rarefaction.

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<u>October, 1963.</u>						
07	Bokaro	NE	iP	08 57 33		Slight.
07	Dehra Dun	Z	e	11 07 14		Tremor.
07	Shillong	ZNE	iP	11 24 24		Slight, distant, compression.
07	Delhi	Z	eP	13 03 35		Compression.
07	Dehra Dun	Z	e	13 03 36		Slight.
	✓ Shillong	ZNE	iP	13 27 05		Rarefaction.
	✓ Chatra	ZNE NE	e iS i	13 31 45 37 13 37 54		Distant.
	✓ Visakhapatnam	E	eP eS	13 31 45 37 15		
	✓ Madras	E	eP iS LR	13 31 47 37 20 41 10	3910	
	✓ Bokaro	E	iP S PcS LQ/SS LR	13 31 51 37 12 37 55 39 23 41 04	3710	
	✓ Delhi	Z	eP	13 31 58		Compression.
	✓ Dehra Dun	Z E	e e i i	13 32 44 33 07 37 49 38 52		
07	Delhi	Z EN	iP e e	13 34 40 37 48 38 50		Compression.
07	Shillong	ZNE	iP Sg	15 28 43 29 03	160	Slight, compression.
	Shillong	ZNE	iP Sg	17 28 58 29 40	290	Slight.
07	Shillong	ZNE	iPg Sg	19 00 00 00 16	130	Slight.
07	Port Blair	Z	i	19 23 36		Slight, near.
07	Shillong	ZNE	iP	20 48 55		Slight, distant, rarefaction.
07	Shillong	ZNE	iP Sg	20 57 54 58 31	260	Slight, compression.



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<u>October, 1963.</u>						
07	Shillong	ZNE	iP Sg	23 14 36 14 56	160	Slight.
07	Epc:- 42.7° N 110.5° E in outer Mongolia - inner Mongolia border. h = about 33 km. -H= 23 h 34 m 26.6 s (USCGS). Mag: 4.9 S.D. 0.3(CGS).					
	✓ Shillong	ZNE	iP S	23 39 30 43 41	2610	Compression. Initial ground motion South- West.
	✓ Chatra	Z NE	iP eS	23 39 48 44 18	2900	Compression.
	✓ Bokaro	E	eP	23 40 22		
	✓ Dehra Dun	Z E	eP e	23 40 24 45 33		
	✓ Delhi	Z	eP	23 40 34		
	✓ Poona	Z	eP	23 41 49		
07	✓ Madras	E	e	23 56 34		
08	Shillong	ZNE	iP	00 12 37		Slight, distant, compression.
08	Delhi	Z	eP	01 14 54		Slight, compression.
08	Delhi	Z	eP	01 47 26		Slight, rarefaction.
08	Epc:- 28.6° N 95.1° E in Assam, India. h = about 24 km. -H= 02 h 51 m 06.0 s (USCGS). Mag: 5.4 (CGS).					
	Shillong	ZNE	iP iS Sg i	02 52 09 52 57 53 17 53 38	450	Rarefaction.
	Chatra	Z NE	iP i	02 52 54 54 55		
	Bokaro	E	eP eS SSS	02 53 23 55 09 55 32	1720	
	Dehra Dun	Z EN	iP e	02 54 35 59 25		Compression.
08	Delhi	ENZ	iP	02 54 43		Initial ground motion towards South-West. Compression.
08	Visakhapatnam	E NE	eP e	02 55 05 59 04	2445	

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October, 1963.						
08	Sehore	E	eP e	02 55 06 03 00 04		
	Madras	E	eP eS e	02 55 54 59 49 03 04 53	2500	
08	Poona	Z	eP	02 56 01		Slight.
08	Bombay	N EN	e e	03 01 54 14		
08	Hyderabad	E	M	03 02 55		Period = 9 secs. Amp. = 3 u.
08	Shillong	ZNE	iP	06 33 10		Slight, distant, compression.
	Delhi	Z	eP	06 34 58		Slight, rarefaction.
	Dehra Dun	Z	eP	06 34 59		Slight.
08	Delhi	Z	eP	06 48 41		Slight, rarefaction.
08	Port Blair	Z	e	06 57 06		Slight, near.
08	Delhi	Z	iP	10 48 45		Slight, rarefaction.
08	Chatra	Z	e	13 24 55		Slight, distant.
08	Shillong	ZNE	iP Sg	15 30 04 30 19	170	Slight.
08	Dehra Dun	Z	e	16 09 09		Tremor.
08	Shillong	ZNE	iP Sg	19 43 50 44 02	110	Slight, rarefaction.
08	Dehra Dun	Z	eP	20 00 49		Tremor.
	Delhi	ENZ	eP	20 01 11		Slight.
	Shillong	ZNE	eP	20 02 42		Slight, distant.
08	Shillong	ZNE	eP	21 06 56 07 45	330	Slight.
08	Shillong	ZNE	iP	21 14 52		Slight, near.
08	Delhi	EZ ENZ	iP iS	21 48 43 50 23	970	Slight. Initial ground motion towards East. Compression.
08	Delhi	EZ NZ	iP iS	23 31 34 33 20	1030	Slight. Initial ground motion towards East. Compression.



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October, 1963.						
09	Delhi	ENZ	iPg iSg	05 14 13 14 17	40	Slight, compression.
09	Delhi	ENZ EN	iP iS	06 33 07 34 49	990	Slight. Initial ground motion towards North- West. Rarefaction.
09	Bokaro	NE	iP	07 24 11		Local.
09	Bokaro	NE	iP	08 06 20		Local.
09	Delhi	Z	eP	08 07 25		Slight.
09	Chatra	ZNE	iSg iS	10 38 41 38 50	70	Slight. Initial ground motion towards North- West. Compression.
	Shillong	ZNE	eP	10 39 24		Slight, near.
	Bokaro	E	eP	10 39 53		Slight, near.
	Delhi	Z	iP i	10 40 42 42 25		Slight, rarefaction.
09	Chatra	Z	eP eS	11 57 34 58 02	240	Slight.
09	Chatra	Z	eP eS	12 36 21 36 38	130	Slight.
09	Shillong	ZNE	iP	22 27 39		Slight, near, compression.
	Chatra	Z	eP eS	22 28 48 29 47	56	Slight.
09	Delhi	EZ	eP	22 57 21		Slight.
09	Delhi	Z	eP	23 26 24		Slight.
09	Shillong	ZNE	iP	23 49 11		Slight, distant, rarefaction.
09	Chatra	Z	e	23 49 42		Slight, distant.
09	Shillong	ZNE	iP	23 59 13		Slight, distant, rarefaction.
10	Delhi	ENZ	iP	00 00 29		Slight, rarefaction.
10	Shillong	ZNE	iP	01 00 39		Slight, distant, rarefaction.
	Chatra	Z	iP	01 00 49		Slight, distant, rarefaction.
	Delhi	ENZ	iP	01 02 01		Slight, rarefaction.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
10	Bokaro	NE	iP	07 31 42		Slight, local.
10	Shillong	ZNE	iP	08 52 39		Slight, near, rarefaction.
	Chatra	Z	iP iS	08 55 35 56 58	800	Slight, compression.
10	Bokaro	E	iP	09 25 19		Slight, near.
10	Shillong	ZNE	iP	10 24 30		Slight, distant, compression.
	Delhi	ENZ	iP	10 25 27		Slight, distant, rarefaction.
10	Shillong	ZNE	iP Sg	12 40 04 40 29	190	Slight, compression.
10	Port Blair	Z	iP	12 51 32		Slight, distant, compression.
10	Shillong	ZNE	iP	16 58 50		Slight, distant, rarefaction.
11	Delhi	Z	iP	04 40 47		Slight, compression.
11	Shillong	ZNE	eP	10 17 35		Slight, near.
11	Shillong	ZNE	iP	17 02 36		Slight, near.
11	Delhi	EZ	eP	20 31 47		Slight, rarefaction.
11	Shillong	ZNE	iP	22 42 07		Slight, distant, compression.
11	Delhi	ENZ	iPg iSg	23 19 38 19 42.5	40	Slight. Initial ground motion towards South-East. Compression.
12	Port Blair	ZNE	iP	08 29 54		Slight, near, rarefaction. First ground motion North-East.
12	Epc:- 12.7°N 92.5° E near Port Blair. -H= 08 h 29 m 39 s (New Delhi).					
	Shillong	ZNE	eP S	08 32 48 35 15	1450	Slight.
	Delhi	ENZ	eP	08 34 32		Slight.
12	Dehra Dun	Z	eP	09 11 25		Tremor.
12	Delhi	ENZ	eP	10 47 15		Slight.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
12	Epc:- 44.8° N 149.0° E in Kurile Islands region. h = about 40 km. -H= 11 h 26 m 57.9 s (USCGS). Mag: 6 <sup>3</sup> / <sub>4</sub> -7(Pas), 7 (BKS), 6 <sup>3</sup> / <sub>4</sub> -7(Pal ).					
	Epc:- 44.0° N 153.0° E in Kurile Islands region. -H= 11 h 26 m 29 s ( Shillong ).					
	Shillong	ZNE	iP iS	11 35 46 43 12	5520	Initial ground motion South-West. Compression.
	Chatra	NE	iP PP iS PPS SS SSS/Lq LR M	11 36 07 38 09 43 47 45 56 47 18 49 17 51 47 56 15	6090	Initial ground motion towards East, West.
		N	Mn	12 12 -		Period = 15 secs. Amp. = 25 μ.
	Calcutta	E	iP iS	11 36 19 43 56	6010	
	Bokaro	NE E NE	iP PcP PP PPP	11 36 27 37 11 38 39 39 59	6253	Initial ground motion towards West.
		E NE	PcS S PS SS	41 07 44 17 44 37 48 19		
	Dehra Dun	ENZ	iP PcP PP PPP PcS iS PS PPS ScS SS SSS LQ LR M	11 36 38 37 41 38 48 40 02 41 43 44 27 44 38 44 50 46 32 48 17 50 17 50 28 53 06 57 43	6242	Initial ground motion towards South-West. Compression.
		EN	PPS ScS SS SSS LQ LR M	44 27 44 38 44 50 46 32 48 17 50 17 50 28 53 06 57 43		
	Delhi	ENZ	iP iS PS	11 36 49 44 46 45 09	6390	Initial ground motion South-West. Compression.
		N Z	SS M	49 31 -		Period = 25 secs. Amp. = 142 μ.





DATE STATION COMPT PHASE G. M. T.  $\Delta$  REMARKS  
h. m. s. km.

October, 1963.

DATE	STATION	COMPT	PHASE	G. M. T.	$\Delta$	REMARKS
				h. m. s.	km.	
12	Port Blair	ZE E	iP	11 36 50	6478	Initial ground motion towards West. Compression.
			PP	39 04		
			i	39 55		
			iS	44 52		
			PS	45 04		
			PPS	45 10		
			SS	48 52		
			LQ	51 08		
			LR	53 45		
			M	57 11		
Mn	12 00 -	Period = 24 secs. Amp. = 290 $\mu$ .				
12	Visakhapatnam	NE E	iP	11 37 08	7166	Initial ground movement towards North-East.
			iPP	39 33		
			ePPP	41 08		
			iS	45 47		
			iPS	46 00		
12	Sehore	NS E	iP	11 37 12	6817	
			i	37 22		
			i	37 34		
			PcP	37 46		
			eS	45 32		
12	Hyderabad	E	iP	11 37 30	7500	Initial ground motion towards South-West.
			PP	40 00		
			eS	46 26		
			PS	46 50		
			SS	50 44		
12	Madras	E	iP	11 37 43	7310	Initial ground motion towards East.
			e	38 02		
			PcP	38 13		
			PP	40 12		
			PPP	41 48		
12	Poona	NZ E	PcS &	42 20	7948	Initial ground movement West. Compression. Epicentre Kurile Islands Region.
			ScP			
			iS	46 29		
			PS	46 49		
			PPS	46 59		
			SKS/ScS	47 43		
			e	48 01		
			SS	? 40 47		
			LQ	54 31		
			LR	58 13		
M	12 04 09					

DATE STATION COMPT PHASE G. M. T.  $\Delta$  REMARKS  
h. m. s. km.

October, 1963.

DATE	STATION	COMPT	PHASE	G. M. T.	$\Delta$	REMARKS															
				h. m. s.	km.																
12	Poona (Contd.)	E	ScS	11 47 53																	
			SS	51 32																	
			SSS	54 32																	
			iQ	56 02																	
			LR	59 25																	
			M	12 05 19																	
			12	Bombay			NEZ N E	iP	11 37 53	7815											
								PcP	38 09												
								PP	40 16												
								PPP	42 08												
eS	47 06																				
SKS1	47 41																				
SS	51 12																				
e	54 15																				
SSS	54 48																				
LQ	56 23																				
12	Kodaikanal	E	iP	11 38 05	8050	Initial ground movement towards West.															
			PP	40 56																	
			PPP	11 42 26																	
			iS	47 29																	
			PS	47 59																	
12	Delhi	ENZ	iP	11 51 29		Slight. Initial ground motion East. Compression.															
			12	Dehra Dun			Z	iP	12 02 41		Slight, rarefaction.										
								12	Delhi			ENZ	iP	12 02 49		Slight. Initial ground motion towards North-East. Compression.					
													12	Port Blair			Z	i	12 06 46		
																		i	07 01		
12	Dehra Dun	Z			e	12 12 02													Slight.		
			12	Delhi	EZ	iP	12 12 12				Slight. Initial ground motion towards East. Compression.										
						12	Shillong	ZNE	iP			12 41 26				Slight, distant, compression.					
									12			Dehra Dun	Z	e			12 42 17				Slight.
														12			Delhi				
12	Shillong	ZNE																iP	13 15 56		
			12	Dehra Dun	Z					iP	13 16 48								Slight, compression.		
						12	Delhi	ENZ		iP	13 16 59					Slight. Initial ground motion towards South-West. Compression.					



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	Δ km.	REMARKS.
October, 1963.						
12	Dehra Dun	Z	iP	13 39 17		Tremor, compression.
	Delhi	ENZ	eP	13 39 27		Slight. Initial ground motion towards South-East.
12	Shillong	ZNE	iP	14 03 57		Slight, distant, compression.
	Dehra Dun	Z	iP	14 04 49		Slight.
	Delhi	Z	eP	14 04 59		Slight, compression.
12	Delhi	Z	iP	14 25 59		Slight.
12	Port Blair	Z NE	iPg eSg	14 33 16 33 26	90	Slight.
12	Shillong	ZNE	iP	16 20 44		Slight, distant, compression.
12	Dehra Dun	Z	iP	16 21 37		Slight, compression.
12	Delhi	ENZ	iP	16 21 46		Slight. Initial ground motion towards North-West. Compression.
12	Shillong	ZNE	iP	16 36 59		Slight, distant, compression.
	Dehra Dun	Z	iP	16 37 41		Slight, compression.
	Delhi	Z	iP	16 38 02		Slight, compression.
12	Delhi	Z EN	iP ePG	18 15 41		Slight, rarefaction.
12	Shillong	ZNE	iP	18 57 24		Slight, distant, compression.
	Dehra Dun	Z	eP	18 58 16		Slight.
	Delhi	Z	iP	18 58 26		Slight, compression.
12	Delhi	Z	iP	19 56 46		Slight, rarefaction.
12	Shillong	ZNE	iP	20 05 50		Slight, distant, compression.
	Dehra Dun	Z	iP	20 06 42		Slight, rarefaction.
12	Delhi	Z	eP	20 13 07		Slight.
12	Delhi	Z	eP	20 18 25		Slight, rarefaction.
12	Shillong	ZNE	iP	20 29 52		Slight, distant, compression.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	Δ km.	REMARKS.
October, 1963.						
12	Dehra Dun	Z	iP	20 30 45		Slight, compression.
12	Delhi	Z	iP	20 59 22		Slight, compression.
12	Shillong	ZNE	iP	22 10 52		Slight, distant, compression.
	Delhi	ENZ	iP	22 11 23		Slight. Initial ground motion towards North-East. Compression.
	Dehra Dun	Z	iP e	22 11 43 17 11		Slight, compression.
12	Delhi	Z	iP	22 17 21		Slight, rarefaction.
12	Delhi	ENZ	eP	23 50 04		Slight.
13	Shillong	ZNE	iP	01 35 26		Slight, distant, rarefaction.
13	Delhi	ENZ EZ	eP eS	01 36 26 44 27	6840	Slight, compression.
13	Shillong	ZNE	iP	01 45 45		Slight, distant, compression.
13	Delhi	Z	eP	02 22 10		Slight.
13	Delhi	Z	i	03 15 45		
13	Shillong	ZNE	iP	04 14 41		Slight, distant, rarefaction.
13	Epc:- 44.8° N 149.5° E in Kurile Islands Region. h = about 60 km. -H= 05h 17 m 57.1 s (USCGS). Felt Hokkaido and Honshu, Japan, light damage to U.S.N. ship, General Hugh J Gaffey positioned at 44° 21' N 152° 01' E . Seismic Sea Waves. 40 ft. Hokkaido; 2.5 ft. Oahu, Hawaii 2.2 ft, Crescent City, California, 1.5 ft. Attu Alleutians. Mag : 8 $\frac{1}{4}$ (Pas), 7 $\frac{3}{4}$ -8 (Pal).					
	Epc:- 44.0° N 151.0° E in east of Hokkaido, Japan. -H= 05 h 17 m 40 s.					
	Shillong	ZNE	iP S	05 26 45 33 50	5450	Initial ground motion South. Compression.
	Chatra	ZNE NE	iP iS	05 27 06 34 32	5850	Initial ground motion towards South, West. Compression.
	Calcutta	E	iP	05 27 18		
	Bokaro	NE	iP	05 27 30		



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
13	Dehra Dun	ENZ	iP PcP i PP PPP ScP, PcS iS PS PPS ScS SS SSS LQ LR M	05 27 39 28 28 28 39 29 49 31 09 32 23 35 32 35 45 35 51 37 12 39 25 41 51 42 04 44 58 48 58	6509	Initial ground movement towards South-West. Compression.
	Delhi	ENZ EN N  EN N	iP i PcP PPP iS PS PPS ScS SS SSS LQ i	05 27 47 27 53 28 19 31 14 35 51 36 06 36 15 37 13 39 40 41 59 42 55 44 36	6520	Initial ground motion towards South-West. Compression.
	Port Blair	Z	iP	05 27 51		Compression.
13	Visakhapatnam	N	eP iPP iPPP iS	05 28 10 30 31 32 04 36 45	7089	
	Sehore	E	eP eS	05 28 12 36 50	7140	
	Hyderabad	E	iP iS PS M	05 28 33 37 06 37 49 52 13	7050	Initial ground motion towards South-West. Period = 18 secs. Amp. = 410 μ.
	Madras	E	iP PcP PP PPP iS PS PPS SKS/ScS	05 28 45 29 08 31 12 32 48 37 38 37 59 38 13 38 37	7450	Initial ground motion towards East.
	Poona	NEZ N	iP PcP PP PPP	05 28 47 29 17 31 20 32 58	7638	Initial ground motion towards South-West. Compression.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
13	Poona	N NE N	PcP iS PS PPS ScS/SKS e SS SSS LQ e PKP1 LR PKKS1 Mn SKKS2 SKKKS	05 33 13 37 50 38 13 38 28 38 47 39 45 41 45 44 44 46 09 47 16 48 15 49 08 51 46 54 55 55 18 06 00 33		Period 14.5 secs. Amp. = 257.5 μ.
	Bombay	ENZ NE	iP PP PPP iS SS	05 28 54 31 25 33 24 38 12 43 00	7935	
	Kodaikanal	E	iP PP iS	05 29 08 31 41 38 32	8050	Initial ground motion towards West.
13	Bombay	NE	eP iS	05 41 21 50 39	7935	
13	Port Blair	Z	i	05 52 18		
13	Port Blair	Z	iP	06 07 16		Slight, distant, compression.
13	Delhi	Z	iP	06 43 06		Slight, rarefaction.
13	Dehra Dun	Z	iP	06 56 26		Tremor, compression.
	Chatra	Z	eP	06 57 48		Slight, distant.
	Dehra Dun	Z	iP	06 58 20		Slight, compression.
13	Port Blair	Z	i	06 58 33		
13	Port Blair	Z	e	07 06 46		
13	Chatra	Z	iP	07 12 42		Slight, distant, compression.
	Dehra Dun	Z	iP	07 13 12		Slight, compression.
	Delhi	ENZ	iP	07 13 22		Slight, rarefaction.
	Port Blair	Z	iP	07 13 25		Slight, distant, rarefaction.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km	REMARKS
October, 1963.						
13	Delhi	Z	eP	07 19 21		Slight, compression.
13	Delhi	Z	i	07 26 42		
	Chatra	Z	iP	07 28 31		Slight, distant, rarefaction.
	Dehra Dun	Z	eP	07 29 01		Slight.
13	Chatra	Z	iP	07 41 11		Slight, distant, compression.
13	Dehra Dun	Z	eP e	07 41 42 45 27		Slight.
13	Delhi	Z	iP	07 41 52		Slight, rarefaction.
13	Chatra	Z	iP	07 44 57		Slight, distant, compression.
13	Delhi	EZ N	iP i	07 45 36 07 45 38		Slight, rarefaction.
13	Delhi	ENZ	iP	07 46 45		Slight, compression.
13	Delhi	ENZ	iP	07 48 56		Slight, compression.
13	Delhi	ENZ	iP	07 58 26		Slight, compression.
13	Delhi	ENZ	eP	08 05 59		Slight, rarefaction.
13	Delhi	ENZ	eP	08 08 48		Slight.
13	Delhi	Z	eP	08 12 11		Slight, compression.
13	Chatra	Z	iP i	08 16 01 20 54		Slight, distant, compression.
	Dehra Dun	Z	iP i	08 16 29 21 28		Slight.
	Delhi	ENZ	iP	08 16 41		Slight, compression.
13	Delhi	ENZ	iP	08 21 34		Slight, rarefaction.
13	Port Blair	E	Mn	08 25 -		Period- 17.3 secs. Amp. = 59 μ.
13	Delhi	ENZ	iP	08 29 16		Slight, rarefaction.
13	Chatra	Z	e	08 43 59		Slight, distant.
13	Delhi	ENZ	iP	08 47 01		Slight, compression.
13	Delhi	Z	eP	08 57 42		Slight, compression.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km	REMARKS
October, 1963.						
13	Delhi	Z	iP	09 04 01		Slight, rarefaction.
13	Dehra Dun	Z	e e	09 20 00 21 55		Slight.
	Delhi	ENZ	iP	09 20 11		Slight, compression.
	Chatra	Z	i	09 21 21		Slight, distant.
13	Delhi	Z	eP	09 21 56		Slight, rarefaction.
13	Delhi	Z	i	09 22 06		
13	✓ Shillong	ZNE	iP	09 25 17		Slight, distant, rarefaction.
	✓ Chatra	Z	eP	09 25 36		Slight, distant, compression.
	✓ Dehra Dun	Z	iP e	09 26 04 32 31		Slight, compression.
	✓ Delhi	ENZ	iP	09 26 18		Slight. Initial ground motion towards South- West. Compression.
	✓ Port Blair	Z	iP	09 26 19		Slight, distant, compression.
	✓ Poona	Z	iP	09 27 16		Slight.
13	Shillong	ZNE	iP	09 31 43		Slight, distant, rarefaction.
	Chatra	Z	e	09 32 03		Slight, distant.
	Poona	Z	eP	09 33 42		Slight.
13	Delhi	Z	iP	09 37 10		Slight, compression.
13	Delhi	ZN	eP	09 40 50		Slight. Rarefaction. Initial ground motion towards South.
13	Shillong	ZNE	iP	09 53 46		Slight, distant, compression.
	Delhi	Z	eP	09 54 47		Slight, compression.
13	Delhi	Z	eP	10 06 46		Slight, compression.
13	Shillong	ZNE	iP	10 15 17		Slight, distant, compression.
	Chatra	Z	i	10 15 40		Slight, distant.
	Dehra Dun	Z	e e	10 16 11 20 12		Slight.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
13	Delhi	ZN	iP	10 16 21		Slight, rarefaction. Initial ground motion towards North.
13	Shillong	ZNE	iP	10 19 21		Slight, distant, compression.
	Chatra	Z	iP	10 19 42		Slight, distant, compression.
	Delhi	ENZ	iP	10 20 22		Slight, rarefaction. Initial ground motion towards South-West.
13	Delhi	ZN	eP	10 39 22		Slight, compression.
13	Dehra Dun	Z	eP	10 42 45		Slight.
	Delhi	EZN	iP i	10 43 54 44 08		Slight, compression.
	Chatra	Z	eP	10 44 14		Slight, distant.
13	Delhi	Z	iP	10 57 20		Slight, compression.
13	Delhi	Z	iP	11 17 33		Tremor, compression.
13	Delhi	Z	iP	11 18 24		Slight, rarefaction.
13	Delhi	ZN	iP	11 23 16.5		Tremor, compression.
13	Dehra Dun	Z	eP	11 25 31		Slight.
	Delhi	Z	eP	11 25 41		Slight.
13	Dehra Dun	Z	eP	11 32 47		Slight.
	Delhi	Z	iP	11 32 57		Slight.
13	Dehra Dun	Z	iP i	11 45 13 48 42		Slight, rarefaction.
	Delhi	EZN	iP	11 45 23		Slight. Initial ground motion towards North- East. Compression.
13	Delhi	EZN	iP	11 48 52		Slight, rarefaction.
13	Delhi	Z	iP	11 58 05		Slight, compression.
13	Delhi	Z	iP	12 07 20		Slight, rarefaction.
13	Chatra	Z	iP	12 12 34		Slight, distant.
13	Delhi	Z	iP	12 15 50		Slight, rarefaction.
13	Delhi	Z	iP	12 30 38		Slight, rarefaction.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
13	Chatra	Z	iP	12 39 05		Slight, distant, compression.
	Dehra Dun	Z EN Z	iP eP e	12 39 34 39 39 50 32 51 54		Slight, compression.
	Delhi	EZN	iP	12 39 44		Slight. Initial ground motion towards South- West. Compression.
	Port Blair	Z	eP	12 39 47		Slight, distant.
13	Delhi	Z	eP	12 44 12		Slight.
13	Delhi	ENZ	iP	12 50 41		Slight. Initial ground motion towards North- West. Compression.
	Delhi	ENZ	iP	12 52 03		Slight. Initial ground motion towards North- East. Compression.
	Port Blair	Z	iP	12 52 03		Slight, distant, compression.
13	Delhi	Z	eP	13 02 23		Slight, compression.
13	Delhi	ENZ	iP	13 03 52		Slight NE compression.
13	Epc:- 45.6° N 150.1° E in Kurile Islands. h = about 50 km. -H = 12 h 58 m 21.6 s (USCGS). Mag: 5.4 S D 0.4 (CGS).					
	Dehra Dun	Z	iP e	13 07 05 16 00		Compression.
	Shillong	ZNE	iP	13 07 14		Compression.
	Chatra	Z	iP	13 07 35		Distant, compression.
	Calcutta	E	iP iS	13 07 49 15 34	6170	
	Port Blair	Z E	iP i	13 08 18 08 13		Compression.
	Poona	Z	iP	13 09 13		Compression.
	Bombay	EZN N	eP PcP PS e e M	13 09 18 09 39 18 15 19 15 23 09 42 21		Period = 15 secs Amp. = 2 u.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
October, 1963.						
13	Madras	E	eP	13 09 22	7360	
			PcP	09 47		
			PP	11 53		
			eS	18 10		
			PS	18 27		
			PPS	18 41		
			SKS, ScS	19 00		
			LQ	26 31		
			LR	29 52		
			M	35 36		
13	Delhi	Z	iP	13 14 57		Rarefaction.
13	Port Blair	Z	e	13 16 30		Tremor.
13	Dehra Dun	Z	e	13 30 41		Slight.
	Delhi	ENZ	iP	13 30 52		Slight. Initial ground motion towards South-East. Compression.
13	Delhi	Z	iP	13 46 50		Slight, rarefaction.
13	Delhi	Z	iP	13 51 36		Slight. Initial ground motion towards East. Compression.
13	Delhi	Z	P	13 53 25		Slight.
13	Delhi	Z	eP	14 03 04		Slight, rarefaction.
	Shillong	ZNE	iP	14 03 30		Slight, distant, compression.
	Chatra	Z	eP	14 03 50		Slight, distant.
13	Dehra Dun	Z	e	14 04 20		Tremor.
	Delhi	ENZ	eP	14 04 28		Slight. Initial ground motion towards South-East. Compression.
	Port Blair	Z	e	14 04 38		Slight.
13	Chatra	Z	iP	14 13 18		Slight, distant, compression.
	Dehra Dun	Z	iP	14 13 49		Slight, rarefaction.
	Delhi	Z	i	14 14 09		Slight.
13	Shillong	ZNE	iP	14 35 03		Slight, distant, compression.
	Chatra	Z	iP	14 35 24		Slight, distant, compression.
	Dehra Dun	Z	iP	14 35 46		Slight, rarefaction.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
October, 1963.						
13	Delhi	ENZ	iP	14 36 05		Slight. Initial ground motion towards South-West. Compression.
	Port Blair	Z	iP	14 36 06		Slight, distant, compression.
	Poona	Z	eP	14 37 02		Slight.
13	Delhi	ENZ	eP	14 44 06		Slight, North, distant.
13	Delhi	NZ	P	15 37 18		Slight.
13	Delhi	Z	iP	15 59 58		Slight, rarefaction
		E	eP			
13	Delhi	Z	P	16 05 46		Slight.
13	Epc:- 45.6° N 150.5° E in Kurile Islands. h = about 35 km. -H= 15 h 59 m 52.9 s (USCGS). Mag: 6.1 S.D. 0.3 (CGS).					
	Shillong	ZNE	iP	16 08 51		Distant, compression. Initial ground motion towards South.
	Chatra	ENZ	iP	16 09 11	5870	Initial ground motion towards West.
		EN	iS	16 39		
	Calcutta	E	iP	16 09 24	6120	
			iS	17 06		
	Dehra Dun	ENZ	iP	16 09 41	6254	Initial ground motion towards South-West. Compression.
		EN	iS	17 32		
		N	PPS	17 49		
		E	i?	18 17		
	Delhi	NEZ	iP	16 09 51	6450	Slight. Initial ground motion towards South-West. Compression.
			iS	17 51		
	Port Blair	ZE	iP	16 09 53	6500	Initial ground motion towards West. Slight, compression.
		E	iS	17 56		
	Visakhapatnam	NE	iP	16 10 13	6856	Distant. Initial ground motion towards North-East.
			iS	18 34		
			PS	18 52		
			PPS	19 06		
	Hyderabad	E	iP	16 10 33	7190	
			PP	12 58		
			iS	19 14		
			PS	19 36		
			SS	23 37		
			LR	29 48		
			M	35 43		
						Period = 18 secs. Amp. = 6 μ.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	Δ km.	REMARKS.
October, 1963.						
15	Madras	E	iP	16 10 45	7450	Initial ground motion towards East.
			e	11 02		
			PP	13 12		
			eS	19 38		
			PS	19 57		
			PPS	20 04		
			SKS/ScS	20 31		
			SS	24 00		
			LQ	27 46		
			M	36 30		
	Poona	Z	iP	16 10 48	7480	Initial ground movement towards South-West. Compression.
		N	eS	19 43		
	Bombay	ENZ	iP	16 10 52	7555	
		N	e	12 09		
		ZN	PP	13 22		
		N	PPP	15 07		
		NE	eS.	19 51		
		EN	PS	20 07		
		N	e	20 37		
		EN	SKS	21 09		
		N	SS	24 11		
			SSS	27 07		
			LQ	28 35		
			LR	31 18		
15	Chatra	Z	e	16 21 53		Slight, distant.
	Dehra Dun	Z	i	16 22 54		Slight.
	Delhi	ENZ	iP	16 22 33		Slight. Initial ground motion towards North-West. Compression.
15	Epc:- 44.9° N 150.3° E in Kurile Islands. h = about 40 km. -H= 16 h 28 m 58.2 s (USCGS). Mag: 5.2 S.D. 0.2 (CGS).					
	Shillong	ZNE	iP	16 37 54		Distant, rarefaction.
	Dehra Dun	Z	iP	16 38 45		Compression.
			i	42 30		
	Delhi	EZ	iP	16 38 54		Slight. Initial ground motion towards North-West. rarefaction.
	Port Blair	Z	iP	16 39 07		Distant, compression.
	Chatra	Z	iP	16 39 14		Distant, rarefaction.
15	Chatra	Z	iP	16 42 00		Slight, distant, compression.
	Delhi	NZ	iP	16 42 40		Initial ground motion towards North. Slight, rarefaction.

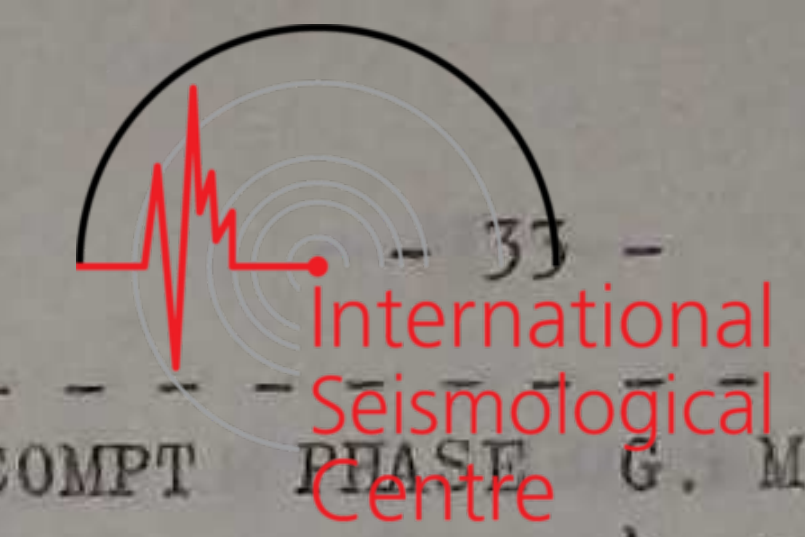
DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	Δ km.	REMARKS.
October, 1963.						
13	Delhi	ENZ	eP	16 50 39		Slight. Initial ground motion towards South-West. Rarefaction.
15	Shillong	ZNE	eP	16 58 39		Slight, distant.
15	Chatra	Z	eP	17 01 00		Slight, distant.
15	Port Blair	Z	iP	17 04 58		Slight, distant, compression.
15	Epc:- 44.5° N 150.8° E in Kurile Islands. h = about 45 km. -H= 17 h 25 m 55.4 s Mag: 4.6 S.D. 0.3 (C.G.S.).					
	Shillong	ZNE	iP	17 34 54		Compression.
	Chatra	Z	iP	17 35 53		Compression.
	Calcutta	E	eP	17 35 41	6050	
			eS	43 18		
	Dehra Dun	Z	eP	17 35 45		
			i	41 02		
	Delhi	Z	iP	17 35 59	6570	Initial ground motion towards South-West. Compression.
		ENZ	iS	44 02		
	Port Blair	Z	iP	17 35 56		Compression.
	Poona	Z	eP	17 36 52		
	Madras	E	eP	17 37 04	7360	
			PcP	37 34		
			eS	45 52		
			PS	46 14		
			PPS	46 26		
			SS	50 11		
			SSS	52 57		
			LQ	54 04		
			LR	57 08		
	Bombay	EN	eP	17 37 28	8030	
		N	eS	46 51		
		EN	PPS	47 35		
13	Shillong	ZNE	iP	17 40 08		Slight, distant, rarefaction.
	Delhi	Z	iP	17 41 10		Slight. Initial ground motion towards South-West.
		EN	eP			
13	Delhi	Z	iP	18 06 24		Slight, rarefaction.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
13	Shillong	ZNE	iP	18 16 38		Slight, distant, compression.
	Delhi	EZ N	iP eP	18 17 39		Slight, Initial ground motion towards East. Rarefaction.
13	Epc:- 44.0° N 150.0° E in Kurile Islands. h = about 45 km. -H= 18 h 10 m 55.2 s (USCGS). Mag: 4.7 S.D. 0.2 (C. G. S.).					
	Shillong	ZNE	iP	18 19 50		Distant, compression.
	Chatra	Z	eP	18 20 11		Distant.
	Dehra Dun	Z	eP i i	18 20 43 23 27 24 46		
	Delhi	NZ E	iP eP	18 20 52		Initial ground motion towards South-East. Compression.
	Port Blair	Z	iP	18 20 53		Compression.
13	Chatra	Z	i	18 22 25		Slight, distant.
13	Delhi	ENZ	iP	18 23 36		Slight, Initial ground motion towards North-East. Compression.
13	Chatra	Z	iP	18 24 16		Slight, distant, compression.
13	Delhi	Z	eP	18 44 22		Slight, compression.
	Shillong	ZNE	iP	18 45 35		Slight, distant, compression.
13	Delhi	Z	eP	18 46 39		Slight, compression.
13	Delhi	Z	eP	18 55 26		Slight, compression.
13	Delhi	ENZ	iP	19 21 17		Slight, Initial ground motion towards South-East. Rarefaction.
13	Shillong	ZNE	iP	19 35 08		Slight, distant, rarefaction.
13	Chatra	S	iP	19 35 27		Slight, distant, rarefaction.
	Dehra Dun	Z	iP i e	19 35 57 37 30 45 29		Slight.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
13	Delhi	ENZ	iP	19 36 07		Slight, Initial ground motion towards South-West. Rarefaction.
	Port Blair	Z	iP	19 36 22		Slight, distant, compression.
13	Chatra	Z	iP	19 37 01		Slight, distant.
	Delhi	ENZ	iP	19 37 40		Slight, Initial ground motion towards South. Rarefaction.
	Port Blair	Z	iP	19 37 45		Slight, distant, rarefaction.
	Madras	E	eP? iS	19 28 35 47 33	7530	
	Poona	Z	eP	19 38 39		Slight.
13	Delhi	ENZ	eP	19 45 47		Slight, Initial ground motion towards West. Rarefaction.
13	Shillong	ZNE	iP	19 50 23		Slight, distant, rarefaction.
	Chatra	Z	iP	19 50 42		Slight, distant, rarefaction.
	Dehra Dun	Z	eP	19 51 10		
	Delhi	EZ	iP	19 51 22		Slight, Initial ground motion towards South-East. Compression.
13	Delhi	Z	P	20 02 18		Slight.
13	Delhi	Z	iP	20 04 57		Slight, rarefaction.
13	Delhi	Z	P	20 23 15		Slight.
13	Shillong	ZNE	iP	20 36 44		Slight, distant, rarefaction.
	Dehra Dun	Z	iP	20 37 33		Tremor, compression.
	Delhi	E	iP	20 37 42		Slight, Initial ground motion towards South-West. Rarefaction.
13	Delhi	Z	P i	20 45 51 45 57		Slight.
13	Delhi	Z	eP	20 48 36		Slight.





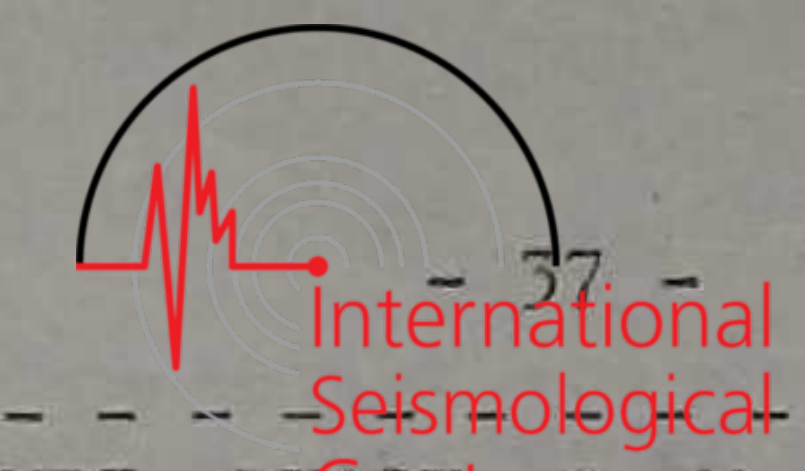
DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
13	Shillong	ZNE	iP	21 26 46		Slight, distant, compression.
13	Delhi	Z	iP	21 27 45		Slight, rarefaction.
13	Shillong	ZNE	iP	21 44 41		Slight, distant, compression.
	Chatra	Z	eP	21 45 00		Slight, distant, compression.
13	Dehra Dun	Z	eP	21 45 30		Slight.
	Delhi	Z	iP i	21 45 40 45 53		Slight. Initial ground motion towards North-East. Compression.
13	Delhi	Z	iP	21 57 55		Slight. Initial ground motion towards North-East. Compression.
13	Delhi	Z	iP	22 00 02		Slight, rarefaction.
13	Delhi	Z	eP	22 02 53		Slight.
13	Shillong	ZNE	iP	22 04 04		Slight, distant, rarefaction.
	Chatra	Z	iP	22 04 25		Slight, distant, rarefaction.
	Dehra Dun	Z	iP	22 04 55		Slight, rarefaction.
	Poona	Z	iP	22 05 01		Slight.
	Delhi	ZN	iP	22 05 05		Slight. Initial ground motion towards North-East. Rarefaction.
	Port Blair	Z	iP	22 05 05		Slight, distant, compression.
13	Shillong	ZNE	iP	22 11 57		Slight, distant, compression.
	Chatra	Z	eP	22 12 17		Slight, distant, compression.
	Dehra Dun	Z	iP	22 12 48		Slight, compression.
	Delhi	ZNE	iP	22 12 57		Slight. Initial ground motion towards South-West. Compression.
	Madras	E	e e e	22 15 04 16 51 42 10		Slight.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
13	Delhi	EZ	iP	22 35 29		Slight. Initial ground motion towards South-East. Compression.
13	Delhi	EZ	eP	22 39 41		Slight.
13	Delhi	NZ	iP	23 15 38		Slight. Initial ground motion towards North. Compression.
13	Shillong	ZNE	iP	23 34 16		Slight, distant, compression.
	Chatra	Z	e	23 34 38		Slight.
	Dehra Dun	Z	eP	23 35 03		Slight.
	Delhi	Z	iP	23 35 13		Slight, compression.
13	Epc:- 44.5° N 150.1° E in Kurile Islands. h = about 50 km. -H= 23 h 52 m 22.8 s (USCGS). Mag: 5.5 (C.G.S.).					
	Shillong	ZNE	iP	00 01 17		Distant, compression.
	Chatra	Z	eP	00 01 38		Distant, compression.
	Calcutta	E	eP eS	00 01 59 09 39	6100	
	Poona	Z	eP	00 02 06		
	Dehra Dun	ENZ NE Z	eP eS e	00 02 09 10 12 12 52	6501	
	Delhi	ENZ	eP	00 02 18		Initial ground motion towards North-West. Compression.
	Port Blair	Z	iP	00 02 34		Distant, compression.
	Bombay	N	eP PPP e	00 03 23 07 35 12 20	7620	
		EN N	eS PPS	12 27 13 06		
	Madras	E	e eS	00 03 24 12 06		
14	Shillong	ZNE	iP	00 12 02		Slight, distant, compression.
	Chatra	Z	eP	00 12 21		Slight, distant, compression.
	Delhi	Z	iP	00 13 02		Slight, compression.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
October, 1963.						
14	Delhi	Z	P	00 29 15		Slight.
14	Shillong	ZNE	iP	00 39 07		Slight, near, rarefaction.
14	Delhi	Z ENZ	P iS	01 02 00 10 24	6890	Slight.
14	Shillong	ZNE	iP	01 28 15		Slight, distant, rarefaction.
	Delhi	Z	eP	01 29 17		Slight, rarefaction.
14	Delhi	Z	eP	02 00 50		Slight.
14	Chatra	Z NE	iP iS	02 03 18 04 27	650	Slight, compression.
14	Delhi	Z ENZ	P iS	02 05 08 08 04	1750	Slight.
14	Delhi	Z	iP	02 25 37		
14	Delhi	ENZ	iP	03 25 13		Slight, rarefaction.
14	Delhi	ENZ	eP	03 32 03		Slight, compression.
14	Shillong	ZNE	iP	03 40 14		Slight, distant, rarefaction.
14	Epc:- 44.9° N 150.2° E in Kurile Islands region. h = about 50 km. -H= 04 h 06 m 01.7 s (USCGS) . Mag: 4.1 (C.G.S.).					
	Shillong	ZNE	iP	04 14 55		Distant, compression.
	Chatra	Z NE	iP e	04 15 15 20 21		Rarefaction.
	Bolero	E	iP i i	04 15 35 20 50 22 05		Distant.
	Dehra Dun	Z	iP i i	04 15 47 21 03 22 40		Rarefaction.
	Port Blair	Z E	iP e	04 15 55 16 01		Compression.
	Delhi	NZ ENZ	iP i	04 15 58 21 12		Compression.
	Madras	E	eP PcP e eS PS PPS	04 16 49 17 13 22 33 25 43 26 01 26 19	7470	



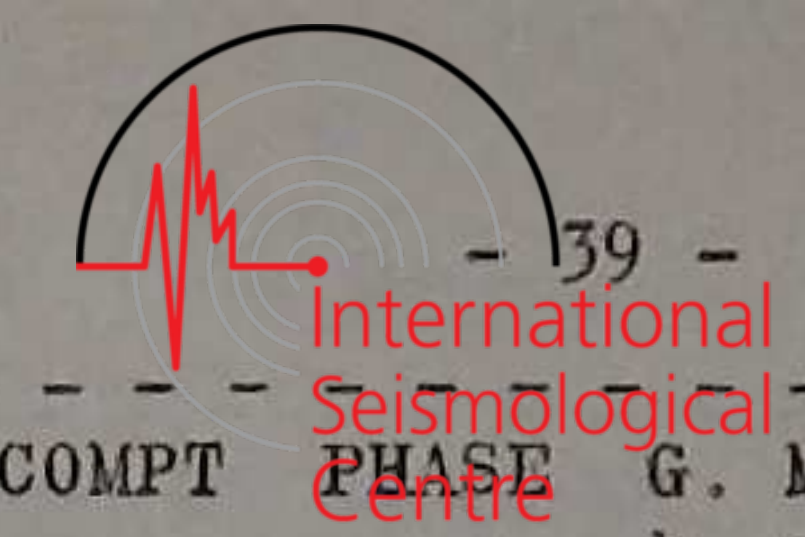
DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
October, 1963.						
14	Madras (Contd.)	E	SKS/ScS	04 26 44		
			e	31 00		
			SSS	32 53		
			LQ	33 53		
			LR	36 56		
			M	42 51		
	Poona	Z	eP	04 16 55		Rarefaction.
Epc:- 44.7° N 150.6° E in Kurile Islands. h = about 45 km. -H= 04 h 11 m 14.0 s (USCGS). Mag: 5.3 S.D. 0.3 (CGS).						
14	Shillong	ZNE	iP PP	04 20 11 22 02		Compression.
	Chatra	Z	iP	04 20 31		Rarefaction.
	Calcutta	E	e eS	04 21 00 28 30		
	Port Blair	Z	iP	04 21 13		Compression.
14	Delhi	ENZ	iP eS	04 21 25 29 19	6335	
14	Bombay	NZ N	eP PP eS PS E N SS M	04 22 11 24 40 31 12 31 22 31 31 34 10 35 33 50 12	7445	Period = 15 secs. Amp. = 2 μ.
	Port Blair	E	M	53 20		
	Port Blair	Z	iP	04 23 16		Compression.
14	Shillong	ZNE	iP	05 33 10		Distant, rarefaction.
	Chatra	Z	eP	05 33 31		Slight, distant.
	Delhi	ENZ	eP e	05 34 12 42 20		Slight, rarefaction.
	Port Blair	Z	iP	05 34 15		Slight, distant, compression.
14	Delhi	Z	eP	05 52 52		Slight, rarefaction.
14	Delhi	Z	eP	05 58 52		Slight, compression.
14	Port Blair	Z	iP	06 20 37		Slight, local.
14	Chatra	Z	e	06 38 07		Slight, distant.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
14	Delhi	NZ	eP	06 38 25		Slight, rarefaction.
14	Shillong	ZNE	iP	07 24 53		Slight, distant, compression.
	Chatra	Z	e	07 25 13		Slight, distant.
	Delhi	ENZ	eP	07 25 54		Slight, rarefaction.
14	Shillong	ZNE	iP	08 03 33		Slight, distant, rarefaction.
	Chatra	Z	iP	08 03 53		Slight, distant, rarefaction.
	Delhi	E	eP	08 04 33		Slight, rarefaction.
14	Delhi	ENZ	eP	09 19 54		Slight, compression.
14	Port Blair	Z	iP	09 36 21		Slight, local, rarefaction.
14	Shillong	ZNE	iP	09 38 09		Slight, distant, compression.
14	Shillong	ZNE	iP	10 33 36		Slight, distant, compression.
	Delhi	ENZ	iP	10 34 36		Slight, compression.
14	Shillong	ZNE	iP	11 22 18		Slight, near, compression.
14	Delhi	ZNE	iP	11 23 18		Slight, compression.
14	Delhi	Z	eP	12 06 29		Slight, rarefaction.
14	Shillong	ZNE	iP	12 20 49		Slight, distant, compression.
	Delhi	ENZ	iP	12 21 48		Slight, compression.
14	Delhi	ENZ	iP	12 37 35		Slight, Initial ground motion towards South-East. Rarefaction.
14	Epc:- 44.8° N 151.0° E in Kurile Islands. h = about 60 km. -H= 13 h 21 m 45.2 s .Mag: 5 <sup>3</sup> / <sub>4</sub> (BKS), 5.9 S.D. 0.3 (CGS).					
	Shillong	ZNE	iP	13 30 42	5610	Initial ground motion towards North-East. Rarefaction.
	Chatra	Z	iP	13 31 03	5890	Compression.
		NE	iS	38 32		
		Z	i	38 53		

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
14	Calcutta	E	eP	13 31 23	5910	
			eS	38 53		
	Bokaro	E	iP	13 31 23	6220	
			iS	39 11		
			e	41 08		
			i	45 52		
	Dehra Dun	Z	iP	13 31 34	6335	Compression.
		E	e	32 04		
		EN	iS	39 28		
	Delhi	EZ	iP	13 31 43	6531	Slight. Initial ground motion towards South-West. Compression.
		ENZ	i	31 44		
		EN	iS	39 48		
	Port Blair	Z	iP	13 31 44	6610	Rarefaction.
		E	iS	39 53		
	Sehore	E	i	13 32 20		
	Madras	E	eP	13 32 37	7470	
			PcP	35 04		
			PP	35 05		
			PcS/ScP	37 09		
			iS	41 31		
			PS	41 52		
			SKS/ScS	42 34		
	Poona	Z	iP	13 32 42	7480	Compression.
		N	eS	41 38		
	Bombay	ENZ	eP	13 32 48	7445	
		NE	e	35 26		
			eS	41 41		
		N	e	42 29		
		NE	e	42 41		
		E	M	14 01 19		
		N	M	07 14		
14	Delhi	Z	eP	14 01 13		Slight.
	Port Blair	Z	eP	14 01 16		Slight, distant.
	Chatra	Z	eP	14 02 39		Slight.
14	Delhi	ENZ	eP	14 03 19		Slight, compression.
14	Shillong	ZNE	iP	14 55 39		Slight, distant.
	Chatra	Z	eP	14 56 13		Slight, distant, compression.
	Delhi	EZ	eP	14 57 15		Slight.
14	Delhi	Z	eP	15 32 11		Slight.
14	Shillong	ZNE	iP	15 58 13		Slight, distant, compression.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	Δ km.	REMARKS
October, 1963.						
14	Port Blair	Z	iP	17 02 46		Slight, distant, rarefaction.
14	Port Blair	Z ZNE	ePg iS	17 12 41 12 47	55	Slight.
14	Shillong	ZNE	iP	17 59 15		Slight, distant, compression.
14	Chatra	Z	iP	17 59 35		Slight, distant, compression.
14	Dehra Dun	Z	iP	18 00 05		Compression.
14	Delhi	EZ NZ	eP i	18 00 14 00 15		Slight, compression.
14	Port Blair	Z	iP	18 00 18		Slight, distant, compression.
14	Poona	Z	eP	18 01 13		Slight, rarefaction.
14	Shillong	ZNE	iP	18 05 21		Slight, distant.
	Chatra	Z	iP	18 05 40		Slight, distant.
	Delhi	ENZ	iP	18 06 21		Slight, SE Rarefaction.
14	Chatra	Z	iP	18 38 58		Slight, distant, rarefaction.
	Delhi	ENZ	iP	18 39 55		Slight, compression.
14	Chatra	Z	eP iSg	20 31 29 31 49	150	Slight.
14	Dehra Dun	Z	eP PP EZ Z ENZ	21 14 42 14 49 14 56 15 03 15 25	945	Slight shock.
			LQ iS SS LR SSS S*	16 09 16 19 16 31 16 35 16 42 16 51		
			Sg, M	17 16		
	Delhi	EZ N	eP e	21 14 54 29 46 29 47		Slight, West, compression.
	Chatra	Z NE	iP iS i	21 16 25 19 16 19 25	1720	Slight, compression.
	Bokaro	E	iP S	21 16 45 19 49	1840	Slight.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	Δ km.	REMARKS
October, 1963.						
14	Poona	Z	eP	21 16 52		Slight, compression.
	Shillong	ZNE	eP i	21 16 57 20 48		Slight.
	Visakhapatnam	NE	eP iS	21 17 27 21 27	2456	Slight.
	Madras	E	eP eS LQ LR e M	21 18 28 22 45 23 14 24 20 25 27 26 11	2700	Slight.
	Port Blair	Z	iP	21 18 56		Slight, distant, compression.
14	Shillong	ZNE	iP	21 52 34		Slight, distant, compression.
14	Delhi	ENZ	eP	21 53 36		Slight, compression.
14	Delhi	ENZ	eP	22 16 09		Slight.
14	Shillong	ENZ	iP	22 44 28		Slight, distant, compression.
	Chatra	Z	eP	22 44 55		Slight, distant, rarefaction.
	Dehra Dun	Z	eP	22 45 20		Slight.
	Delhi	EN Z	eP eP	22 45 30 45 32		Slight, compression.
14	Dehra Dun	Z	eP	23 07 34		Slight.
14	Delhi	NZ	eP	23 07 51		Slight, compression.
15	Delhi	Z ENZ	e eP	00 48 45 52 51		Slight, compression.
15	Delhi	ENZ NZ	eP e	00 57 25 59 10		Slight, South-east. Rarefaction.
15	Madras	E	iP e	04 18 03 21 54	2350	Slight, Initial ground motion towards East.
15	Shillong	ZNE	eP	04 18 24		Slight, distant.
15	Delhi	ENZ	iP	04 19 48		Slight, Initial ground motion towards North-West. Compression.
15	Delhi	Z	iP	05 06 19		Slight, compression.
15	Delhi	Z	eP	05 46 26		Slight, distant.



DATE STATION COMPT PHASE G. M. T.  $\Delta$  REMARKS.  
h. m. s. km.

October, 1963.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	$\Delta$ km.	REMARKS.
15	Chatra	ZE	e	06 58 53		Slight, distant.
	Delhi	ENZ	eP	06 59 35	6700	Slight, distant, compression.
	Bombay	E	eP	07 01 36		Slight.
	Madras	E	e	07 05 16		Slight.
	Delhi	EN	eS	07 07 49		
15	Port Blair	Z	iPg	07 15 28	35	Slight, compression.
		ZNE	iSc	15 31		
15	Dehra Dun	Z	eP	08 01 03		Tremor.
15	✓ Shillong	ZNE	eP	08 09 12		Slight, distant.
	✓ Delhi	ENZ	eP	08 10 12		Slight. Initial ground motion towards North East. Rarefaction.
15	✓ Shillong	ZNE	iP	09 11 03		Slight, distant, rarefaction.
	✓ Chatra	Z	iP	09 11 23		Slight, distant, compression.
	✓ Dehra Dun	Z	iP	09 11 55		Slight, compression.
		ENZ	i	12 05		Initial ground motion towards East. Rarefaction.
	✓ Port Blair	Z	iP	09 12 07		Slight, distant, compression.
15	✓ Poona	Z	iP	09 13 03		Slight, compression.
15	Delhi	Z	eP	09 24 29		Slight, rarefaction.
15	✓ Shillong	ZNE	iP	09 41 04		Slight, distant, rarefaction.
	✓ Chatra	Z	iP	09 41 24		Slight, distant, rarefaction.
	✓ Dehra Dun	Z	iP	09 41 55		Slight, rarefaction.
	✓ Delhi	ENZ	iP	09 42 05		Slight. Initial ground motion towards North East. Rarefaction.

15 Epc:- 67.2° N 18.4° W in North of Iceland.  
h = about 33 km.  
-H= 09 h 59 m 30.1 s (USCGS). Mag: 5 $\frac{1}{2}$ (Pal), 5.2 S.D. 0.3 (CGS).  
Delhi NZ1 eP 10 10 10  
N e 19 11  
Initial ground motion towards North. Compression.

DATE STATION COMPT PHASE G. M. T.  $\Delta$  REMARKS.  
h. m. s. km.

October, 1963.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	$\Delta$ km.	REMARKS.
15	Dehra Dun	NZ	eP	10 10 11	7310	
		N	eS	18 57		
			e	38 11		
	✓ Chatra	Z	iP	10 10 51		Distant, rarefaction.
15	✓ Bombay	E	eP	10 11 02	8220	
			PP	14 56		
			PPP	15 40		
			eS	20 34		
			PS	21 20		
	✓ Shillong	ZNE	iP	10 11 06		Rarefaction.
	✓ Madras	E	e	10 14 16		
			e	22 42		
			e	27 31		
			e	42 07		
15	✓ Shillong	ZNE	iP	10 56 00		Slight, distant, compression.
	✓ Chatra	Z	iP	10 56 22		Slight, compression.
	✓ Dehra Dun	Z	iP	10 56 54		Slight, compression.
	✓ Delhi	ENZ	iP	10 57 03	6590	Slight. Initial ground motion towards South-West. Compression.
			eS	11 05 00		
	✓ Poona	Z	eP	10 58 00		Slight.
15	Shillong	ZN	iP	12 02 49		Slight, distant, compression.
	Chatra	Z	e	12 05 08		Slight, distant.
	Dehra Dun	Z	iP	12 03 41		Slight, rarefaction.
			e	14 45		
	Delhi	NZ	eP	12 03 49		Slight, compression.
		EZ	i	03 50		
	Poona	Z	eP	12 04 48		Slight, rarefaction.
15	Shillong	ZNE	iP	12 12 54		Slight, near, compression.
	Chatra	Z	e	12 13 09		Slight, distant.
	Delhi	Z	iP	12 13 53		Slight, compression.
		EN	eP			
15	Delhi	Z	iP	16 26 05		Tremor, rarefaction.
15	Delhi	ENZ	eP	17 09 31		Slight.
15	Delhi	Z	iP	17 25 47		Slight, rarefaction.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
15	Shillong	ZNE	iP Sg	17 32 01 32 29	210	Slight, compression
15	Chatra	Z	eP eS	17 33 01 34 20	750	Slight.
15	Shillong	ZNE	iP	18 03 08		Slight, distant, compression.
	Chatra	Z	eP	18 03 27		Slight, distant, compression.
	Delhi	ENZ	eP	18 04 07		Slight. Initial ground motion towards South West. Rarefaction.
15	Bombay	E	e	18 31 06		
15	Epc:- 45.3° N 151.0° E in Kurile Island region. h = about 35 km. -H= 18 h 23 m 57.8 s (USCGS). Mag: 4.9 S.D. 0.3 (CGS).					
	Shillong	ZNE	iP	18 32 58		Distant, compression
	Chatra	Z	iP	18 33 18		Distant, rarefaction
	Dehra Dun	ENZ N	eP eS	18 33 50 41 46	6370	
	Delhi	ENZ	iP eS	18 33 59 42 07	6590	Initial ground motion towards South-West. Rarefaction.
	Madras	E	eP PcP iS PS PPS SKS/ScS	18 34 53 35 18 43 51 44 17 44 27 44 46	7530	
	Poona	Z	eP	18 34 57		
	Calcutta	E	e	18 37 00		
15	Port Blair	Z	i	19 18 34		Slight.
15	Delhi	Z	eP	20 14 42		Slight, near.
15	Epc:- 45.4° N 151.1° E in Kurile Islands. h = about 50 km. -H= 20 h 41 m 30.2 s . Mag: 4.9 S.D. (CGS).					
	Shillong	ZNE	iP	20 50 30		Distant, compression
	Chatra	Z NE	eP e	20 50 49 57 22		Slight, distant, compression.
15	Dehra Dun	Z N	eP eS	20 51 22 59 18	6370	

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
15	Delhi	Z	iP i eS	20 51 29 51 30 59 37	6590	Initial ground motion towards North. Compression.
	Madras	E	eP eS	20 52 37 21 01 33	7500	
15	Epc:- 3.0° S 129.9° E in Coram. h = about 27 km. -H= 21 h 44 m 58.0 s . Mag. 5.2 (CGS).					
	Port Blair	Z E	iP i iS i	21 52 33 55 23 58 46 22 00 31 08 58	4555	Distant, compression.
	Bombay	E	eP	21 53 03		
	Shillong	ZNE	iP	21 53 27		Compression.
	Calcutta	E	e e	21 53 40 22 00 37		
	Bokaro	E	i	21 53 57		
	Chatra	Z NE	iP e	21 54 00 59 20		
	Madras	E	iP PcP PP PPP iS PS PPS ScS LQ LR	21 54 07 55 12 56 12 57 13 22 01 32 01 38 01 47 04 03 06 49 09 20	5810	Initial ground motion towards East.
	Poona	Z	iP	21 54 58		Rarefaction.
	Delhi	Z	iP	21 55 01		Compression.
	Dehra Dun	Z N	iP iS	21 55 05 22 03 12	6675	Rarefaction.
15	Delhi	Z	eP	22 16 17		Slight.
15	Shillong	ZNE	iP	22 50 53		Slight, distant, rarefaction.
15	Delhi	NZ	iP	23 18 54		Tremor. Initial ground motion towards North. Compression.
16	Delhi	ENZ	iP	01 35 09		Tremor. Initial ground motion towards North. Compression.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
16	Delhi	Z	eP	01 57 46		Slight, compression.
16	Delhi	ENZ	iP	02 35 21		Tremor. Initial ground motion towards South West. Compression.
16	Port Blair	Z	e i i	03 19 08 19 27 19 32		Slight, near.
16	Shillong	ZNE	iP	05 24 34		Slight, distant, compression.
	Chatra	Z	e	05 24 54		Slight, distant.
	Delhi	ENZ	eP	05 25 34		Slight. Initial ground motion towards North East. Compression.
16	Port Blair	Z	iPg iSg	07 33 30 20 33 32		Slight, rarefaction.
16	Shillong	ZNE	iP	08 42 47		Slight, distant, compression.
	Delhi	Z EN	iP eP	08 43 46		Slight, compression.
16	Delhi	Z	iP	09 40 13		Tremor, rarefaction.
16	Delhi	ENZ	iP	10 10 53		Slight. Initial ground motion towards North East. Compression.
16	Shillong	ZNE	iP	10 39 52		Slight, distant, compression.
16	Delhi	Z	eP	11 56 12		Slight, compression.
16	Port Blair	Z	i	12 25 51		Slight, near.
16	Shillong	ZNE	iP	12 32 20		Slight, near.
16	Shillong	ZNE	iP	12 55 52		Slight, distant, compression.
	Chatra	Z	eP	12 56 26		Slight, distant, compression.
	Delhi	Z EN	iP eP	12 57 27		Slight, distant, compression.
16	Chatra	Z	eP iSg	13 23 25 180 23 48		Slight.
16	Port Blair	Z	ePg eSg	14 44 20 50 44 26		Slight.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
16	Shillong	ZNE	iP	15 08 39		Slight, distant, compression.
16	Delhi	ENZ	eP	15 45 06		Initial ground motion towards South. Compression.
16	Epc:- 38.6°N 73.4° in Tadzik S.S.R. h = about 33 km. -H= 15 h 43 m 0.8 s (USCGS). Mag: 5.9 S.D.0.3(CGS).					
	Dehra Dun	ENZ	iP PP PPP LQ iS SS LR SSS M	15 45 11 989 45 17 45 24 46 44 46 53 47 06 47 10 47 20 47 53		Initial ground movement towards North-West. Rarefaction.
	Delhi	ENZ N ENZ EN ENZ Z	iP PPP i i S M	15 45 30 1160 45 47 46 20 46 44 47 28		Initial ground motion towards North-West. Rarefaction.  Period = 11 secs. Amp. = 123 u.
	Chatra	Z	e	15 46 27		
	Sehore	N E	eP PP PPP LQ iS SS LR PcP/M	15 46 37 1740 46 48 47 00 49 29 49 32 49 52 50 22 51 26		
	Chatra	ZNE NE	iP eP PPP iLQ iS SS SSS LR M	15 46 47 1830 46 57 47 10 49 44 49 50 50 04 50 19 50 27 51 48		Initial ground motion towards North. Rarefaction.
		N	Mn	15 56 -		Period = 6 secs. Amp. = 39 u.
		E	MN	15 57 -		Period = 6 secs. Amp. = 62 u.
	Bokaro	NE	iP iS SS SSS LR	15 47 11 2143 50 43 51 06 51 20 51 40		



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DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
16	Bokaro (Contd.)	NE	M	15 53 11		
			PcS	54 33		
			ScS	58 44		
	Bombay	ENZ	iP	15 47 28	2300	
		EN	PP	48 04		
			iS	51 15		
			SS	51 36		
			SSS	52 10		
		N	M	55 17		Period = 10 secs. Amp. = 6 μ.
		E	M	55 -		
	Shillong	ZNE	iP	15 47 34	2310	Rarefaction. Initial ground motion towards North-West.
			S	51 22		
		NE	M	54 15		
	Poona	NEZ	iP	15 47 34	2310	Initial ground movement North-East and rarefaction.
		N	PP	48 00		
			PPP	48 11		
			iS	51 22		
			PcS	51 30		
			LQ	51 39		
			SS	51 57		
			SSS	52 12		
			LR	52 36		
			M	54 26		
	Calcutta	E	iP	15 47 36	2350	
			iS	51 28		
			M	53 56		
	Visakhapatnam	NE	eP	15 48 05	2633	
			eS	52 18		
	Madras	E	iP	15 48 37	2990	Initial ground motion towards East.
			e	49 09		
			PP	49 22		
			PPP	49 43		
			PcP	51 53		
			iS	53 13		
			e	53 26		
			LQ	54 02		
			SS	54 22		
			SSS	54 46		
			LR	55 30		
			LQ	56 58		
			M	57 43		
	Kodaikanal	E	e	15 48 52	3270	Distant. Initial ground movement of S phase towards West.
			iS	53 46		
	Port Blair	ZNE	iP	15 49 29	3610	Initial ground motion towards South-West. Compression.
		E	PP	50 35		
			iS	54 44		
			SS	56 33		
			M	16 01 22		

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
16	Delhi	E NZ	iP eP	16 23 15		Slight. Initial ground motion towards South-West. Rarefaction.
16	Delhi	ENZ	eP	18 25 12		Slight.
16	Delhi	EZ Z	iP e	19 06 19 09 22		Slight. Initial ground motion towards East. Compression.
	Poona	Z	eP	19 06 33		Slight.
16	Chatra	Z	e	19 07 55		Slight, distant.
16	Delhi	NZ	P	19 17 09		Slight.
16	Epc:- 38.6° N 73.1° E in Tadzhik S.S.R. h = about 70 km. -H = 20 h 31m 15 s (USCGS).					
	Dehra Dun	Z E	eP SS	20 33 24 36 52	1445	Slight.
	Delhi	EZ	iP	20 33 39		Slight. Initial ground motion towards North. Compression.
	Chatra	Z	e	20 34 57		Slight, distant.
	Poona	Z	eP	20 35 43		Slight.
	Shillong	ZNE	eP	20 35 44		Slight, distant.
	Madras	E	e e e	20 44 19 46 14 47 37		Slight.
16	Chatra	Z	iP iS	21 00 08 00 30	180	Slight, rarefaction.
16	Delhi	N EZ	iP i	21 03 07 03 09		Slight, North
16	Shillong	ZNE	iP	21 39 49		Slight, distant, compression.
	Delhi	ENZ Z ENZ	iP e iS	21 40 50 40 53 48 59	6610	Slight. Initial ground motion towards North-East. Compression.
16	Delhi	Z	iP	22 10 43		Tremor, rarefaction.
17	Delhi	ENZ	eP	00 14 41		Slight. Initial ground motion towards South.
17	Shillong	ZNE	iPg Sg	00 33 28 33 45	140	Slight, rarefaction.





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DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
October, 1963.						
17	Shillong	ZNE	iP	03 14 24		Slight, distant, compression.
17	Shillong	ZNE	iP	03 54 09		Slight, distant, compression.
17	Shillong	ZNE	eP	04 28 53		Slight, distant.
	Delhi	Z	eP	04 29 52		Slight.
17	Port Blair	Z	iPg i	05 37 52 37 53		Slight, local, rarefaction.
17	Shillong	ZNE	iP	08 19 39		Slight, distant, compression.
17	Chatra	Z	e	08 20 05		Slight, distant.
17	Dehra Dun	Z	eP	08 20 37		Tremor.
17	Delhi	ENZ	eP	08 20 47		Slight. Initial ground motion towards South. West. Compression.
17	Epc:- 38.8° N 73.4° E in Tadzik S.S.R. h = about 40 km. -H= 09 h 33 m 24.0 s (USCGS). Mag. 4.4 (CGS).					
	Dehra Dun	Z	eP	09 55 35		
		E	SS e	37 26 38 17		
	Delhi	NZ ENZ	iP iS	09 35 53 37 47	1100	Initial ground motion towards South. Compression.
	Chatra	Z	eP	09 37 12		Distant.
	Shillong	ZNE	eP	09 37 59		Distant.
	Madras	E	e e e	09 45 06 47 38 53 23		Slight.
17	Shillong	ZNE	iP	10 25 45		Slight, distant, rarefaction.
	Chatra	Z	eP	10 26 19		Slight, distant.
	Delhi	Z	eP	10 26 47		Slight.
17	Shillong	ZNE	iP	13 07 26		Slight, distant, compression.
	Delhi	ENZ	eP e i	13 08 27 10 18 27 59		Slight, distant, compression.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
October, 1963						
17	Shillong	ZNE	iP	14 15 22		Slight, distant, compression.
	Chatra	Z	e	14 15 43		Slight, distant.
17	Delhi	ENZ	eP	14 16 25		Slight. Initial ground motion towards North-East. Compression.
17	Shillong	ZNE	iP	14 21 00		Slight, distant, compression.
	Chatra	Z	e	14 21 40		Slight, distant.
	Madras	E	eP e e	14 22 18 28 57 39 59		
17	Chatra	Z	e	14 30 39		Slight, distant.
	Shillong	ZNE	eP	14 31 18		Slight, distant.
	Delhi	ENZ	eP	14 32 16		Slight, compression.
17	Delhi	ENZ	eP	15 13 04		Slight, compression.
17	Port Blair	Z	e	15 33 54		Slight, near.
17	Port Blair	Z	e i	15 46 11 46 14		Slight, near.
17	Delhi	ENZ	eP	19 12 34 5		Tremor, compression.
17	Shillong	ZNE	iP	22 44 44		Slight, distant.
	Delhi	Z	eP	22 45 43		Slight.
17	Delhi	Z	eP	23 08 23		Slight.
17	Epc:- 44.6° N 149 0° E in Kurile Islands. h = about 45 km. -H= 23 h 24 m 34.4 s (USCGS). Mag: 5.4 S.D. 0.3 (CGS).					
	Shillong	ZNE	iP PS	23 33 22 40 40	5560	Initial ground motion towards South. Compression.
	Chatra	Z	iP	23 33 43		Compression.
	Calcutta	E	eP eS	23 33 54 41 31	6050	
	Bokaro	E	iP iS	23 34 05 41 44	6080	Initial ground motion towards East.
	Dehra Dun	Z ENZ N	iP i eS	23 34 13 34 19 42 01	6220	Compression.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
October, 1963.						
17	Delhi	ENZ	iP	23 34 25	6360	Initial ground motion towards South-West. Compression.
		EZ	iP	34 46		
		E	PP	36 36		
		ENZ	eS	42 20		
		N	PS	42 38		
		ENZ	PPS	42 48		
			ScS	44 28		
		EN	SS	46 33		
		E	SSS	49 08		
			LR	52 16		
		Z	M			Period = 44 secs. Amp. = 20 μ.
	Port Blair	Z	iP	23 34 42	6620	Rarefaction.
			i	36 09		
			iS	42 52		
			M	57 57		
			Mn	58 00		Period = 22.5 secs. Amp. = 20 μ.
	Madras	E	eP	23 35 18	7420	
			PcP	35 47		
			PP	37 44		
			eS	44 10		
			PS	44 30		
			SKS/ScS	45 04		
			SS	48 22		
			SSS	51 09		
			LQ	52 06		
			M	00 01 02		
	Poona	NZ	iP	23 35 23	7774	
		N	iS	44 33		
	Bombay	ENZ	eP	23 35 25	7835	
		N	PP	37 57		
			e	41 04		
		EN	eS	44 38		
		N	e	46 07		
			M	00 08 18		
		E	M	07 21		Period = 15 secs. Amp. = 3 μ.
18	Shillong	ZNE	iP	00 03 45		Slight, distant, compression.
	Dehra Dun	Z	iP	00 04 37		Slight, compression.
	Delhi	ENZ	eP	00 04 47		Slight, Initial ground motion towards South-East. Compression.
18	Chatra	Z	eP	02 08 48		Slight, distant, compression.
	Dehra Dun	Z	iP	02 09 20		Slight, compression.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
October, 1963.						
18	Delhi	ENZ	iP	02 09 30		Slight, Initial ground motion towards North-West. Compression.
18	Shillong	ZNE	iP	03 31 55		Slight, near, Initial ground motion towards North-East. Rarefaction.
	Chatra	Z	eP	03 32 50	540	Slight.
			iS	33 48		
18	Shillong	ZNE	iP	04 10 18		Slight, distant, rarefaction.
	Chatra	Z	iP	04 10 38		Slight, distant, rarefaction.
	Dehra Dun	Z	iP	04 11 09		Slight, rarefaction.
	Delhi	EZ	eP	04 11 18		Slight, compression.
		ENZ	i	11 30		
18	Port Blair	Z		05 05 49		Slight, local.
18	Delhi	Z	eP	05 25 24		Slight, compression.
18	Shillong	ZNE	iP	06 29 15		Slight, distant, compression.
	Chatra	Z	iP	06 29 36		Slight, distant, compression.
	Dehra Dun	Z	eP	06 30 06		Slight.
	Delhi	Z	iP	06 30 17		Slight, Initial ground motion towards South-West. Compression.
	Poona	Z	iP	06 31 16		Slight, compression.
18	Dehra Dun	Z	eP	07 03 17		Tremor.
18	Shillong	ZNE	iP	07 14 13		Slight, distant, compression.
	Chatra	Z	e	07 14 33		Slight, distant.
	Delhi	ENZ	eP	07 15 13		Slight, compression.
18	Port Blair	Z	i	07 30 24		Slight, local.
18	Bokaro	NE	iP	08 02 01		Slight, local.
18	Delhi	Z	eP	08 05 06.5		Slight, rarefaction.
18	Shillong	ZNE	iP	08 24 14		Slight, distant, rarefaction.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
October, 1963.						
18	Delhi	Z	eP	08 25 15.5		Slight, rarefaction.
18	Epc:- 44.8° N 150.2° E in Kurile Islands. h = about 60 km. -H= 08 h 53 m 33.9 s (USCGS). Mag: 5.0 S.D. 0.3 (CGS).					
	Chatra	Z	e	09 02 46		Slight, distant.
	Delhi	ENZ	eP	09 03 27.5	6530	Compression.
		EN	e	03 31		
		ENZ	eS	11 32		
	Madras	E	eP	09 04 23		
			M	34 54		
	Poona	Z	iP	09 04 24		Slight, rarefaction
18	Delhi	ENZ	eP	10 28 05		Slight, rarefactio
18	Delhi	Z	e	17 47 24		
18	Epc:- 45.6° N 150.6° in Kurile Islands. h = about 40 km. -H= 17 h 55 m 00.2 s Mag. 5.2 S.D. 0.3 (CGS)					
	Shillong	ZNE	iP	18 03 57		Slight, distant, compression.
	Chatra	Z	iP	18 04 17		Slight, distant, compression.
	Dehra Dun	Z	iP	18 04 47		Slight, compressio
	Delhi	ENZ	iP	18 04 57		Slight. Initial gro motion towards West. Compression.
	Poona	Z	eP	18 05 55		Slight, compression
18	Delhi	Z	eP	18 55 52		Slight, rarefaction
		ENZ	e	56 04		
18	Shillong	ZNE	iP	20 14 30		Slight, distant, compression.
	Chatra	Z	eP	20 14 48		Slight, distant, compression.
	Dehra Dun	Z	eP	20 15 16		Slight.
	Delhi	ENZ	eP	20 15 25		Slight. Initial gro motion towards Nort East. Compression.
18	Shillong	ZNE	iP	21 51 52		Slight, distant, rarefaction.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
October, 1963.						
18	Chatra	Z	iP	21 32 13		Slight, distant, rarefaction.
	Dehra Dun	Z	iP	21 32 43		Slight.
			i	32 55		
	Delhi	ENZ	iP	21 32 53		Slight. Initial ground motion towards North- East. Rarefaction.
		Z	i	33 03		
	Poona	Z	eP	21 33 52		Slight, rarefaction.
18	Delhi	ENZ	eP	21 44 48		Slight, compression.
			i	45 00		
	Port Blair	S	iP	22 06 43		Slight, near, rarefaction.
		E	i	06 49		
		NE	i	06 54		
		E	i	07 21		
18	Madras	E	eP	22 09 29		Slight. Phases could not be identified due to microseisms.
			e	14 38		
			e	18 07		
			e	20 56		
	Chatra	Z	e	22 10 03		Slight, distant.
	Poona	Z	eP	22 10 57		Slight, rarefaction.
18	Port Blair	Z	i	22 23 56		Slight, near.
		ZE	i	24 17		
18	Shillong	ZNE	iP	23 01 58		Slight, distant, compression.
18	Delhi	Z	eP	23 02 57		Slight, rarefaction.
			e	03 11		
18	Shillong	ZNE	iP	23 52 24		Slight, distant, compression.
	Dehra Dun	Z	iP	23 53 17		Slight, compression.
	Delhi	ENZ	iP	23 53 26		Slight. Initial ground motion towards South- West. Compression.
19	Delhi	ENZ	eP	00 00 52		Tremor.
19	Delhi	Z	i	02 16 12		
19	Epc:- 46.8° N 153.7° E in Kurile Islands. h = about 45 km. -H= 02 h 18 m 37.9 s . Mag. 5.2 S.D. 0.4 (CGS).					
	Shillong	ZNE	iP	02 27 52		Compression.
	Chatra	ZNE	eP	02 28 10		Compression.



DATE STATION COMPT PHASE G. M. T. / km. REMARKS.  
 h. m. s.

DATE STATION COMPT PHASE G. M. T. / km. REMARKS.  
 h. m. s.

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19	✓ Bokaro	E	iP	02 28 31					
	✓ Dehra Dun	Z	iP	02 28 37					Compression.
	✓ Delhi	ENZ	eP	02 28 47.5					Initial ground motion towards South-West. Compression.
	✓ Madras	E	eP	02 29 44	7890				
			PP	32 25					
			eS	39 00					
			e	39 18					
			PS	39 30					
			PPS	39 48					
			LR	52 01					
			M	57 54					
	✓ Poona	Z	eP	02 29 47					Rarefaction.
	✓ Bombay	EN	eP	02 29 49	8050				
		N	PP	32 15					
			PPP	34 06					
			e	38 15					
			eS	39 04					
			SSS	46 22					
			M	03 03 22					Period = 15 secs. Amp. = 2 u.

19	✓ Bokaro (Contd.)	NE	PPS	03 52 45					
			SS	56 13					
	✓ Dehra Dun	Z	iP	03 44 20					Rarefaction.
		N	e	44 24					
			PS	52 47					
	✓ Delhi	ENZ	iP	03 44 30					Initial ground motion towards North-West. Compression.
			i	44 33					
	✓ Bombay	N	e	03 45 22	8110				
			eP	45 32					
			PP	48 11					
			eS	54 49					
			e	58 11					
			SSS	04 02 03					
			M	19 37					Period = 17 secs. Amp. = 3 u.
	✓ Madras	E	eP	03 45 28	7890				
			PP	48 10					
			eS	54 44					
			e	55 00					
			PPS	55 32					
			LQ	04 03 58					
			LR	07 30					
			M	13 37					

19 Epc:- 46.5° N 153.9° E in Kurile Islands.  
 h = about 40 Km.  
 -H= 03 h 15 m 02.5 s (USCGS).  
 Mag: 5.1 S.D. 0.3 (C.G.S.).

19 Epc:- 46.8° N 153.8° E in Kurile Islands.  
 h = about 25 km.  
 -H= 03 h 47 m 07.7 s (USCGS. Mag. 5.2 S.D. 0.5 (CGS)).

	Shillong	ZNE	iP	03 24 18					Compression.
	Chatra	Z	eP	03 24 37					
	Dehra Dun	Z	iP	03 25 03					Compression.
	Delhi	ENZ	iP	03 25 14					Slight. Initial ground motion towards S E. Compression.
	Poona	Z	eP	03 26 19					Slight, compression.

	✓ Shillong	ZNE	iP	03 56 25					Compression.
	✓ Chatra	Z	iP	03 56 43					Compression.
	✓ Dehra Dun	Z	iP	03 57 10					Compression.
	✓ Delhi	ENZ	iP	03 57 21					Initial ground motion towards South-West. Compression.
	✓ Poona	Z	iP	03 58 20					Compression.
19	Delhi	N	iP	04 17 45					Slight. Initial ground motion towards South.
		EZ	i	17 46					

19 Epc:- 46.6° N 153.8° E in Kurile Islands.  
 h = about 33 km.  
 -H= 03 h 34 m 19.6 s (USCGS).  
 Mag: 5½ (Pal), 5.4 S. D. 0.4 (C.G.S.).

19 Epc:- 44.6° N 149.1° E in Kurile Islands.  
 h = about 40 km.  
 -H= 05 h 41 m 18.1 s . Mag. 4.2 (C.G.S.).

	✓ Shillong	ZNE	iP	03 43 34					Compression.
	✓ Chatra	Z	eP	03 43 54	6220				
		NE	eS	51 42					
			e	51 54					
	✓ Bokaro	NE	iP	03 44 15	6555				
			iS	52 21					
			PS	52 37					

	Delhi	ENZ	iP	05 51 09					Rarefaction.
	Delhi	Z	iP	06 49 12					Rarefaction.



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20 Dehra Dun  
ENZ eP 01 02 59 6611  
E PcP 03 44  
E PP 05 14  
E PPP 06 40  
PcS 07 48  
i? 10 47  
EN iS 11 08  
PS 11 20  
PPS 11 31  
ScS 12 45  
SS 15 04  
SSS 17 34  
LQ 17 53  
LR 20 44

Delhi  
ENZ iP 01 03 07 6720 Initial ground motion  
N PPP 05 47 towards South west  
ENZ S 11 22 compression.  
N PS 11 47

Port Blair  
ZE iP 01 03 10 6720 Initial ground motion  
E PP 05 23 towards west.  
PPP 06 55 compression.  
iS 11 25  
PS 11 37  
PPS 11 48  
SS 15 14  
i 16 11  
SSS 17 33  
LQ 18 04  
LR 21 03  
M 25 28

Sehore  
E iP 01 03 33 7092  
PcP 03 59  
i 04 18  
i 04 27  
i 04 37  
iS 12 08

Visakhapatnam  
NE iP 01 03 35 7335 Initial ground motion  
E ePP 06 03 north east  
PPP 07 35  
NE iS 12 22  
E eM 32 35

Hyderabad  
E iP 01 03 51 8170 Initial ground motion  
PP 06 30 towards east.  
iS 13 21  
SS 17 42  
LR 26 57  
M 33 24

Madras  
E iP 01 03 59 7640 Initial ground motion  
PcP 04 24 towards east.  
PP 06 34  
PPP 08 11  
iS 13 03  
PS 13 06

Period 20 secs.  
Amp: 92 u.



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20 Madras  
(Contd.) (Contd.)  
E PPS 01 13 37  
SKS 13 57  
SS 17 30  
SSS 20 27  
LQ 21 38  
LR 25 16  
M 31 06

Bombay  
EN eP 01 04 02 7645  
N PP 06 40  
EN eS 13 06  
N PS 13 42  
SKS 14 06  
LQ 21 40  
LR 24 48  
M 36 14

Period = 15 secs.  
Amp: 10  
Period = 17  
Amp: 10

Poona  
E eP 01 04 06 8496  
iS 13 52

Kodaikanal  
E iP 01 04 28 8800 Distant.  
PPP 09 22  
iS 14 28  
SS 19 37  
SSS 22 52  
M

Period = 18 secs.  
Amp: 71 u.

20 Delhi  
ENZ iP 01 32 51 Initial ground motion  
towards North-east.  
Slight, compression.

20 Delhi  
EZ iP 01 42 52 Slight ground motion  
towards East Rarefaction.

20 Chatra  
Z eP 02 18 44 Slight, distant.

Delhi  
ENZ eP 02 19 24 Slight.

20 Delhi  
NE eP 02 27 26 Slight.

20 Delhi  
Z iP 03 08 46 Slight, Rarefaction.

20 Delhi  
Z eP 03 26 51 Slight, compression.

20 Delhi  
Z iP 03 44 48 Slight, compression.

20 Delhi  
Z eP 04 05 20 Slight, compression.

20 Delhi  
ENZ iP 04 07 13 Slight, Initial ground  
motion towards North  
east, compression.

20 Delhi  
Z eP 04 41 31 Slight.

20 Delhi  
Z P 04 50 03 Slight



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20	Delhi	Z	iP	04	56	53	Slight, compression.
20	Port Blair	Z	e i	05	04	09 04 12	Slight, local.
20	Shillong	ZNE	iP	05	07	49	Slight, distant, Rarefaction.
	Delhi	ENZ	iP	05	08	50	Slight, Initial ground motion towards North east, Rarefaction.
20	Delhi	Z	P	05	14	10	Slight
20	Delhi	Z	P	05	30	16	Slight
20	Delhi	ENZ Z	iP i	05	50	57 50 58	Slight, Initial ground motion towards North east Compression.
20	Delhi	Z	iP	06	02	23	Slight, compression.
20	Shillong	ZNE	iP	06	19	21	Slight, distant, Rarefaction.
	Chatra	Z	iP	06	19	41	Slight, distant. Rarefaction.
	Dehra Dun	Z	i	06	20	13	Slight.
20	Delhi	ENZ	iP	06	20	23	Rarefaction. Initial ground motion towards North east.
20	Delhi	Z	iP	06	28	37	Slight, Rarefaction.
20	Shillong	ZNE	iP	07	29	14	Slight, distant, compression.
	Delhi	Z	iP	07	30	15	Slight, compression.
20	Shillong	ZNE	iP	08	35	04	Slight, distant, compression.
	Chatra	Z	e	08	35	24	Slight, distant.
	Dehra Dun	Z	eP	08	35	56	Slight.
	Delhi	ENZ	iP	08	36	06	Slight, Initial ground motion towards South west, compression.
	Poona	Z	eP	08	37	05	Slight
20	Delhi	Z	eP	08	44	06	Slight, distant, compression.

DATE	STATION	COMPT.	PHASE	G. M. T.			REMARKS
				h.	m.	s.	
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20	44.4°N, 150.2°E in Kurile Islands H = 09h. 10 m. 43.9s, h about 40 km (USCGS) Mag: 5.5 SD 0.3 (CGS).						
	Shillong	ZNE	iP	09	19	37	Rarefaction.
	Chatra	Z NE	iP iS	09	19	58 27 27	5890 Rarefaction.
	Calcutta	E	eP	09	19	58	
	Bokaro	E	iP	09	20	19	
	Dehra Dun	Z EN	iP eP iS	09	20	30 20 30 28 25	6345 Rarefaction.
	Delhi	ENZ	iP iS	09	20	39 28 45	6560 Initial ground motion towards North east compression.
	Madras	E	eP iS PS PPS	09	21	37 30 30 30 51 31 05	7450
	Poona	Z	iP	09	21	40	Rarefaction.
20	Bombay	N	e e e M M	09	30	43 33 01 34 43 55 - 56 21	Period 13 secs. Amp: 2 u.
20	Hyderabad	E	M	09	50	35	Period = 15 secs. Amp: = 4 u.
20	Shillong	ZNE	eP	11	08	56	Slight, distant.
20	Kodaikanal	E	i	11	14	55	Slight, distant.
	Hyderabad	E	M	11	16	35	Period = 9 secs. Amp: = 4 u.
	Shillong	ZNE	iP	11	17	50	Slight, distant, compression.
	Delhi	Z	P	11	18	51	Slight.
20	Bombay	N	e	11	22	25	Slight.
20	Delhi	Z	eP	11	25	32	Slight, Rarefaction.
	Dehra Dun	Z	iP	11	45	07	Slight, compression.

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20	Poona	Z	iP	11 54 24		Slight, compression.
20	Epc:- 44.7°N, 150.2°E in Kurile Islands H=11h. 52m. 20.7°S. h about 45 kms (USCGS) Mag: 5.1 SD 0.5 (CGS).					
	/Shillong	ZNE	iP S	12 01 15 08 33	5690	Compression
	/Chatra	Z	iP	12 01 36		Compression.
	/Calcutta	E	e	12 01 50		
	/Bokaro	E	iP	12 01 55		
	/Dehra Dun	ENZ EN	eP iS	12 02 12 10 10	6335	
	/Delhi	ENZ	iP iS	10 02 16 10 21	6530	Initial ground motion towards South west, compression.
	Port Blair	ZE	eP	12 02 21		
20	Bombay	N	eSP	12 17 17		
20	Shillong	ZNE	iP	12 18 20		Slight, distant, compression.
	Delhi	ENZ	iP	12 19 21		Slight, initial ground motion towards north west compression.
20	Hyderabad	E	M	12 25 42		Period 21 secs. Amp: 8
20	/Delhi	Z	iP	13 10 23		Slight, compression.
	/Chatra	Z	e	13 11 34		Slight, distant.
	/Shillong	ZNE	iP	13 11 56		Slight, distant, compression.
20	Epc:-45.1°N, 150.5°E in Kurile Islands H = 13h. 21m. 141s, h about 45 km (USCGS) Mag: 5.2(CGS).					
	Shillong	ZNE	iP	13 30 11		Distant.
	Chatra	Z	iP	13 30 31		Distant, compression.
	Dehra Dun	Z	iP	13 30 59		Rarefaction.
	Delhi	ENZ	iP	13 31 11		Initial ground motion towards north east, rarefaction.
20	Delhi	Z	P i	14 15 34 15 47		
20	Shillong	ZNE	iP	15 20 22		Distant, rarefaction.

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20	Chatra	Z	iP	15 20 43		Distant, compression
(Contd.)	Delhi	N	iP	15 21 24		Initial ground motion towards South west, Rarefaction.
20	Chatra	Z	e	16 02 28		Slight, distant.
20	Delhi	Z	eP	16 10 09		Slight, compression.
20	Epc:- 44.2°N, 149.6°E in Kurile Island H = 17h. 41m. 27.3s. h about 45 kms (USCGS). Mag: 4.8 SD 0.3 (CGS).					
20	/Shillong	ZNE	iP	17 50 18		Distant, compression.
	/Chatra	Z	eP i	17 50 39 50 47		Distant.
	/Dehra Dun	Z N	iP eS	17 51 12 59 10	6400	Rarefaction.
	/Delhi	ENZ Z EN	eP i eS	17 51 20 51 29 59 30	6630	Compression.
20	/Shillong	ZNE	iP	18 07 50		Slight, distant, compression.
	/Chatra	Z	eP	18 08 10		Slight, distant.
	/Dehra Dun	Z	eP	18 08 43		Slight.
	/Delhi	ENZ ENZ	eP eS	18 08 51 16 53	6480	Slight. Initial ground motion towards north east, compression.
20	Port Blair	Z	iP	18 31 45		Slight, distant, Rarefaction.
20	Shillong	ZNE	iP	19 56 05		Slight, distant.
	Chatra	Z	e	19 56 27		Slight, distant.
	Delhi	EZ Z	eP i	19 57 07 57 30		Slight, compression.
	Chatra	Z	iP	20 59 19		Slight, distant, compression.
20	Shillong	ZNE	iP	21 17 13		Slight, distant.
	Chatra	Z	e	21 17 34		Slight, distant.
	Delhi	Z	eP	21 18 15		Slight
	Epc: 21.9°N, 94.7°E in Burma H = 21h. 49m. 36.0s. h about 115 kms (USCGS).					



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20	Shillong (Contd.)	ZNE	iP Sg	21 50 44 51 31	330	Slight, Rarefaction
	Chatra	Z ZNE	iP iS	21 51 37 53 06	860	Slight, rarefaction.
	Port Blair	Z	eP	21 51 39 53 54		Slight.
	Delhi	ENZ E	P eS	21 53 31 56 25	1630	Slight.
	Chatra	Z	iP	22 55 49		Slight, distant.
	Shillong	ZNE	iP	23 01 12		Slight, distant, compression.
	Chatra	Z	e	23 01 31		Slight, distant.
	Delhi	Z	eP	23 02 10		Slight, compression.
21	Delhi	Z	eP	02 26 29		Slight, compression.
21	Delhi	Z	eP	02 57 50		Slight, compression.
21	Chatra	Z	e	05 17 05		Slight, distant.
21	Delhi	EZ	eP	05 52 43		Slight, initial ground motion towards east, compression.
21	Bokaro	NE	iP	08 23 39		Slight, local.
21	Bokaro	NE	iP	08 53 06		Slight, local.
21	Delhi	Z	eP i	09 50 11 50 25		Slight, Rarefaction
21	Delhi	Z	eP	10 17 47		Slight, compression.
	Shillong	ZNE	iP	13 18 09		Slight, distant, compression.
	Chatra	Z	eP	13 18 28		Slight, distant, compression.
21	Delhi	ENZ	iP	13 19 08		Slight, Initial ground motion towards North east, compression.
21	Delhi	Z	iP	13 50 32		Slight, Rarefaction.
21	Dehra Dun	Z ENZ	iP i	14 51 24 53 03		Slight, compression
	Delhi	ENZ	iP iS	14 51 41 53 27	1030	Slight, initial ground motion towards south west compression.

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21	Chatra (contd.)	Z ZNE	eP i	14 52 59 55 46		Slight, distant, compression.
21	Shillong	ZNE	iP S	14 53 47 57 18	2130	Slight, Rarefaction. Initial ground motion NW
21	Epc:- 44.1°N, 150.3°E in Kurile Islands H = 17h. 20m. 46.0s, h about 65 kms (USCGS) Mag: 5.0 SD 0.3 (CGS).					
	Shillong	ZNE	iP	17 29 47		Compression.
	Chatra	Z	eP	17 29 59		
	Dehra Dun	Z	eP	17 30 33		
	Delhi	ENZ EN	eP eS	17 30 41 38 48	6580	
21	Delhi	NZ	iP	17 43 27		Slight, compression.
21	Shillong	ZNE	iPP Sg/Sn	18 17 39 17 54	130	Slight, Rarefaction.
	Chatra	Z	eP eS	18 18 24 19 04	370	Slight.
21	Shillong	ZNE	iP	20 48 38		Slight, distant, Rarefaction.
	Chatra	Z	e	20 48 58		Slight, distant.
	Dehra Dun	Z	iP	20 49 30		Tremor, compression
	Delhi	ENZ	iP	20 49 39		Slight, initial ground motion towards south west. Rarefaction.
21	Shillong	ZNE	iP	23 27 35		Slight, distant, Rarefaction.
	Dehra Dun	Z	iP i	23 28 28 39 07		Rarefaction.
	Delhi	ENZ	iP	23 28 37		Slight, initial ground motion towards north east rarefaction.
21	Shillong	ZNE	iP i	23 38 14 42 05		Slight, distant. Rarefaction.
21	Chatra	Z	iP	23 38 29		Slight, distant.
21	Delhi	ENZ	iP	23 39 17		Slight, initial ground motion towards South, rarefaction.
21	Chatra	Z	i	23 42 25		Slight, distant.

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21	Dehra Dun	Z	iP	23 42 57		Slight, compression.
(Contd.)	Delhi	ENZ	iP	23 43 07		Slight, Initial ground motion towards South east
		Z	i	43 19		Compression.
22	Shillong	ZNE	iP	01 07 29		Slight, distant. Rarefaction.
	Chatra	Z	iP	01 08 08		Slight, distant, Rarefaction.
22	Delhi	ENZ	iP	02 39 10		Slight. Initial ground motion towards South West. Rarefaction.
22	Epc:- 45.0°N, 150.2°E in Kurile Islands H = 03h. 17m. 15.2s. h about 45 kms (USCGS). Mag: 5.2 (SD 0.3 (CGS)).					
	Shillong	ZNE	iP	03 26 10		Compression.
	Dehra Dun	Z	iP	03 27 03		Rarefaction.
		EN	eP	27 03		
			e	34 56		
	Delhi	Z	eP	03 27 11		Compression.
		ENZ	i	27 12		
	Port Blair	Z	iP	03 27 28		
	Chatra	Z	e	03 27 30		
22	Shillong	ZNE	iP	03 34 34		Slight, distant. Rarefaction.
22	Chatra	Z	i	03 34 55		Slight, distant.
22	Delhi	Z	eP	03 35 36		Slight.
22	Shillong	ZNE	iP	04 40 17		Slight, distant, Compression.
	Chatra	Z	iP	04 40 30		Slight, distant. Compression.
	Delhi	Z	iP	04 40 54		Slight. Rarefaction.
22	Delhi	ENZ	iP	04 59 09		Slight, compression.
22	Shillong	ZNE	iPg	06 32 49	110	Slight. Rarefaction.
			Sg	33 02		
22	Delhi	Z	iP	09 19 42		Slight. Rarefaction.
22	Shillong	ZNE	eP	10 27 09		Slight. Distant.



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22	Dehra Dun	Z	eP	10 28 01		Tremor.
(Contd.)	Delhi	ENZ	iP	10 28 11		Slight, Initial ground motion towards north west. Rarefaction.
22	Port Blair	Z	e	11 15 09		Slight, near.
			i	15 12		
	Shillong	ZNE	iP	12 14 35		Slight, distant, compression.
	Delhi	Z	eP	12 15 35		Slight.
22	Shillong	ZNE	iP	12 28 24		Slight, distant, compression.
	Delhi	Z	eP	12 29 24		Slight, compression.
22	Delhi	Z	iP	13 36 58		Slight, compression.
22	Shillong	ZNE	iP	15 47 36		Slight, distant. Compression.
22	Chatra	Z	e	15 47 59		Slight, distant.
			i	48 12		
22	Delhi	Z	eP	16 10 36		Slight, compression.
22	Shillong	ZNE	iPg	17 10 43	140	Slight, compression.
			Sg	11 17		
22	Delhi	Z	iP	19 24 12		Slight.
22	Delhi	Z	eP	19 36 22		Slight. Rarefaction.
22	Dehra Dun	Z	eP	20 44 16	355	Slight.
		ENZ	eS	44 55		
22	Delhi	NZ	ePn	20 44 22	370	Slight.
			iPg	44 32		
		N	iSn	45 02		
22	Chatra	Z	iP	20 44 58	630	Slight. Rarefaction.
			iS	46 05		
22	Shillong	ZNE	iP	20 45 55		Slight, distant.
22	Dehra Dun	Z	iPn	21 22 55	122	Slight, mere shock.
		EN	ePn	22 55		Rarefaction.
		NZ	i	22 57		
		ENZ	LQ	23 00		
			LR	23 01		
			PP	23 03		
			M	23 07		
			PPP	23 09		
			iSn	23 11		
			SS	23 21		
			SSS	23 22		

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22	Delhi (Contd.)	ENZ NZ	ePn i iSn	21 23 20 23 25 23 52	280	Slight. Initial ground motion towards south, Rarefaction.
	Chatra	Z	iP i	21 24 41 26 22		Slight. Rarefaction.
	Shillong	ZNE	eP	21 25 57		Slight. Distant.
23	Shillong	ZNE	iP	00 15 15		Slight, distant, Compression.
	Chatra	Z	i	00 15 36		Slight, distant.
	Dehra Dun	Z	eP	00 16 06		Slight.
23	Shillong	ZNE	iP	02 47 15		Slight, distant, compression.
23	Poona	Z	iP	03 28 11		Slight, Rarefaction.
23	Delhi	Z	iP	04 43 43		Slight.
23	Shillong	ZNE	iP	05 41 55		Slight, distant. Compression.
	Delhi	ENZ	eP	05 42 34		Slight.
23	Delhi	NZ	eP	07 13 49		Slight.
23	Shillong	ZNE	iP	08 08 21		Slight, distant. Compression.
	Chatra	Z	iP	08 08 43		Slight, distant. Compression.
	Delhi	Z	eP	08 09 13		Slight.
	Delhi	Z	eP	08 09 48		Slight.
23	Delhi	ENZ	iP	08 25 07		Slight.
23	Bokaro	NE	iP	09 27 27		Slight, local.
23	Shillong	ZNE	iP	09 55 27		Slight, Distant, Rarefaction.
	Chatra	Z	iP	09 55 50		Slight, Distant, Rarefaction.
	Dehra Dun	Z	iP	09 56 29		Tremor, Compression.
	Delhi	ENZ	iP	09 56 37		Slight. Initial ground motion towards North east. Rarefaction.
23	Shillong	ZNE	iP	10 27 11		Slight, Distant, Compression.

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23	Delhi	Z	eP	10 28 30		Slight.
23	Delhi	Z	i	11 28 11		
23	Delhi	Z	eP	11 52 34		Slight.
23	Chatra	Z	eP iS	12 50 08 50 31	190	Slight.
23	Chatra	Z	e	16 52 53		Slight, distant.
23	Chatra	Z ZNE	eP iS	18 42 26 42 29	190	Slight.
	Shillong	ZNE	eP	18 42 41		Slight, near.
	Delhi	Z	iP	18 44 42		Slight.
24	Port Blair	Z	e i	01 01 57 02 09		Slight, near.
Epc:- 24 44.5°N, 150.3°E in Kurile Islands H = 01h. 06m. 25.9s. h about 45 km. (USCGS) Mag: 5.0 SD 0.4 (CGS).						
	Shillong	ZNE	iP	01 15 22		Compression.
	Chatra	Z	iP	01 15 41		Compression.
	Delhi	ENZ	iP iS	01 16 23 24 28	6530	Initial ground motion towards South-west. Compression.
	Madras	E	eP PcP PP eS PS SKS e	01 17 31 17 59 20 08 26 24 26 48 27 20 29 52	7450	
	Bombay	N	e	01 20 41		
24	Poona	Z	iP	01 47 22		Slight, compression.
24	Delhi	ENZ	iPg iSg	06 21 32.7 21 41.2	70	Slight. Initial ground motion towards north east. Rarefaction.
24	Shillong	ZNE	eP	07 03 09		Slight, distant.
24	Chatra	Z	e	07 03 47		Slight, distant.
24	Dehra Dun	E	i	07 11 06		Slight.
Epc:- 4.9°S, 102.9°E. Off Coast of Sumatra H = 07h. 26m. 23.9s. h about 50 km (USCGS) Mag: 6.0(Pal) 6.1 SD 0.3 (CGS)						
Epc:- 4°S, 103°E off Coast of Sumatra H = 07h. 26m. 25s. (CSO Shillong)						

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				h. m. s.		
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24	Port Blair	ZN	iP	07 30 51	2270	
(Contd.)		Z	PP	31 12		
			PPP	31 23		
		ZN	iS	34 35		
	Madras	E	eP	07 32 20	3180	
			PP	33 19		
			PPP	33 34		
			eS	37 08		
			e	37 42		
			LQ	38 32		
			LR	40 09		
			M	42 44		
			ScS	43 03		
	Kodaikanal	E	eP	07 32 25	3310	
			iS	37 22		
			LQ	40 19		
			M	43 07		
	Visakhapatnam	E	iP	07 32 30	3231	Initial ground motion towards South east
			iS	37 22		
	Shillong	ZNE	iP	07 32 49	3490	Initial ground motion towards North West. Compression
			S	37 57		
			LR	41 40		
			M	43 14		
	Hyderabad	EN	iP	07 32 57	3550	Intensity Northward Eastward
		N	PP	34 18		
			PPP	34 32		
		EN	iS	38 09		
		N	SS	39 48		
			LR	41 57		
		E	LR	42 14		
			M	43 48		
		N	M	44 18		Period = 11 secs. Amp: 4 μ Period = 15 secs. Amp: 3 μ
	Bokaro	NE	iP	07 32 58	3680	
		E	PP	34 15		
		NE	S	38 17		
		E	PcS	39 19		
	Chatra	Z	iP	07 33 14	3860	Slight. Compression.
			i	35 46		
		NE	iS	38 44		
			i	43 30		
	Poona	Z	iP	07 33 30	4041	Initial ground motion towards West. Compression
			PP	34 52		
			PPP	35 09		
			PcP	35 47		
			eS	39 11		
			PcS	39 26		
			SS	41 38		
			LQ	41 44		
			ScS/LR	43 17		
			e	43 41		
			M	46 38		



DATE	STATION	COMPT.	PHASE	G. M. T.	Δ km.	REMARKS
				h. m. s.		
October, 1963.						
24	Bombay	NE	iP	07 33 40	4140	
(Contd.)			PP	33 52		
	Delhi	ENZ	iP	07 34 07	4570	Initial ground motion towards North-West. Compression.
			pP	34 21		
			iS	40 21		
			sS	40 40		
		NE	SSS	44 05		
		N	LR	46 19		
	Dehra Dun	ENZ	iP	07 34 15	4600	Slight, distant. Initial ground motion towards North east. Compression.
		N	iS	40 31		
		EN	sS	40 53		
	Chatra	Z	eP	08 09 25	160	Slight.
			iS	09 44		
24	Delhi	Z	iP	09 03 37		Slight. Rarefaction.
24	Chatra	Z	e	13 54 29		Slight, distant.
	Dehra Dun	Z	e	13 55 00		Slight.
	Delhi	Z	iP	13 55 12		Slight. Initial ground motion towards South West. Compression.
24	Delhi	ENZ	iP	15 23 57		Slight. Initial ground motion towards North-east. Rarefaction.
24	Shillong	ZNE	iP	15 32 55		Slight, distant. Compression.
24	Chatra	Z	e	15 33 14		Slight, distant.
24	Port Blair	Z	i	18 03 15		Slight, near.
			i	03 22		
			i	03 25		
24	Chatra	Z	eP	18 07 48	280	Slight.
			eS	08 20		
24	Chatra	Z	e	18 51 50		Slight, near.
24	Dehra Dun	Z	eP	19 05 47		Slight.
	Delhi	E	eP	19 06 07	1150	Slight. Initial ground motion towards West.
		NZ	P	08 05		
		ENZ	S			
	Chatra	Z	e	19 07 29		Slight. Distant.
	Shillong	ZNE	iP	19 08 14		Slight. Distant.
29	Port Blair	Z	i	19 11 42		Slight. Near.

DATE	STATION	COMPT.	PHASE	G. M. T. h. m. s.	REMARKS
				km.	
October, 1963.					
24	Shillong	ZNE	iP	19 23 49	Slight, distant. Compression.
24	Delhi	NZ	P	19 26 23	Slight. Distant.
24	Shillong	ZNE	iP	19 53 21	Slight, distant.
24	Shillong	ZNE	iP	20 27 06	Slight, Distant, Rarefaction.
24	Dehra Dun	Z	e	20 27 57	Slight.
24	Delhi	Z	iP	20 28 08	Slight. Initial ground motion towards North East. Rarefaction.
24	Delhi	Z	eP	22 03 26	Slight, distant. Compression.
25	Delhi	NZ	iP	01 18 26	Slight. Initial ground motion towards North. Compression.
25	Shillong	ZNE	iP	06 12 46	Slight, distant.
25	Chatra	Z	e	06 12 56	Slight, distant.
25	Shillong	ZNE	iP	06 36 53	Slight, distant, compression.
25	Delhi	Z	eP	06 37 54	Slight, Compression.
25	Chatra	Z	e	07 38 22	Slight, distant.
25	Delhi	ENZ	eP	07 39 05	Slight. Rarefaction.
25	Delhi	Z	P	08 18 13	Slight, compression.
25	Port Blair	Z	i	10 22 15	Slight, Near.
25	Shillong	ZNE	iP	10 26 53	Slight, distant. Rarefaction.
	Chatra	Z	eP	10 27 11	Slight, Distant.
	Dehra Dun	Z	iP	10 27 43	Tremor, Rarefaction.
	Delhi	ENZ	iP	10 27 53	Slight, Initial ground motion towards South east. Rarefaction.
25	Shillong	ZNE	iP	12 42 02	Slight, Distant.
	Chatra	Z	iP	12 42 19	Slight, distant, Rarefaction.
25	Delhi	ENZ	P	12 43 02	Slight.
25	Delhi	Z	eP	16 51 53	Slight, compression.
25	Dehra Dun	Z	e	18 31 01	Tremor
25	Dehra Dun	Z	e	18 36 08	Tremor.

DATE	STATION	COMPT.	PHASE	G. M. T. h. m. s.	REMARKS
October, 1963					
25	Delhi	ENZ	P	18 36 39	Slight.
25	Chatra	Z	iP	20 03 02	Slight, local, Compression.
25	Epc:- 12.3°N, 144.5°E in Mariana Islands H = 19h. 58m. 58.3s. h about 29 km. Mag: 5.4 SD 0.4 (CGS).				
	Shillong	ZNE	iP	20 08 01	5700 Compression.
		NE	S	15 20	
	Chatra	Z	iP	20 08 31	6250
		NE	iS	16 21	
	Port Blair	E	e	20 08 53	
	Madras	E	eP	20 09 25	7020
			e	09 46	
			PcP	10 00	
			PP	11 48	
			PPP	13 15	
			iS	17 56	
			e	18 57	
			e	20 39	
			LQ	25 41	
			LR	28 35	
			M	34 02	
	Dehra Dun	Z	eP	20 09 29	7000
		EN	iS	17 59	
	Delhi	Z	eP	20 09 31	7080 Compression.
		EN	eS	18 05	
	Poona	Z	iP	20 09 57	Compression.
	Calcutta	E	e	20 10 18	
			i	16 03	
	Bombay	Es	eP	20 10 24	
	Chatra	Z	i	21 34 30	Slight, distant.
25	Shillong	ZNE	iP	22 50 29	Slight, distant, Rarefaction.
25	Epc:- 36.9°N, 95.2°E in Tsinghai Province, China H = 22h. 49m. 42s h about 33 km. Mag: 5.1 (CGS).				
	Chatra	Z	eP	22 52 37	1780
		NE	SS	56 47	
	Delhi	EZ	iP	22 53 41	Initial ground motion towards East. Compression.
	Bombay	N	e	22 59 36	

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DATE STATION COMPT. PHASE G. M. T. h. m. s. km. REMARKS

October, 1963.

25	Delhi	ENZ	P	23 29 24	Slight.
25	Chatra	Z	iP	23 31 07	Slight, distant. Rarefaction.
26	Epc: 44.5°N, 150.1°E in Kurile Islands H = 03h. 55m. 39.7s. h about 55 kms (USCGS) Mag: 5.1 SD 0.2 (CGS)				
	Shillong	ZNE	iP	04 04 33	Compression.
	Chatra	Z	iP	04 04 53	Rarefaction.
	Dehra Dun	Z	eP	04 05 25	
		EN	e	12 16	
	Delhi	ENZ	eP	04 05 34	6480 Compression.
			eS	13 36	
	Poona	Z	eP	04 06 33	Rarefaction.
26	Port Blair	Z	ePg iSg	05 02 00 02 04	35 Slight.
26	Shillong	ZNE	iP	05 10 29	Slight, distant. Rarefaction.
	Delhi	ENZ	eP	05 11 32	Slight. Rarefaction.
26	Epc: - 44.5°N, 149.8°E in Kurile Islands H = 05h. 59m. 44.2s. h about 60 km. (USCGS) Mag: 5.1 SD 0.1 (CGS)				
	Shillong	ZNE	iP	06 08 37	Rarefaction.
	Chatra	Z	iP	06 08 57	Rarefaction.
	Dehra Dun	Z	iP	06 09 28	Rarefaction.
	Delhi	ENZ	iP	06 09 38	6535 Rarefaction.
		N	eS	17 43	
	Poona	Z	iP	06 10 36	Rarefaction.
26	Delhi	Z	e	06 34 57	
		Z	e	37 56	
26	Shillong	ZNE	iP	07 35 45	Slight, distant. Compression.
26	Epc: 44.7°N, 149.7°E in Kurile Islands H = 11h. 21m. 47.6s. h about 55 kms (USCGS) Mag: 5 (Pal), 5.4 SD 0.2 (CGS)				
	Shillong	ZNE	iP	11 30 40	Compression.
	Chatra	Z	eP	11 30 59	
	Delhi	ENZ	eP	11 31 41	6480 Compression.
		ENZ	eS	39 43	
	Poona	Z	iP	11 32 41	Compression.

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October, 1963.

26	Epc: 44.6°N, 149.8°E in Kurile Islands H = 11h. 31m. 53.0s. h about 55 km (USCGS) Mag: 5.1 SD 0.3 (CGS)				
	Shillong	ZNE	iP	11 40 46	Compression.
	Chatra	Z	iP	11 41 26	Compression.
	Delhi	ENZ	eP	11 41 48	Compression.
	Poona	Z	eP	11 42 46	Rarefaction.
26	Delhi	ENZ	ePg eSg e	12 36 10 36 14.5 36 19	40 Slight
	Shillong	ZNE	iPg Sg	15 24 00 24 13	110 Slight. Compression.
26	Shillong	ZNE	iP	18 02 44	Slight, distant, rarefaction.
	Delhi	NZ	eP	18 03 44	Slight, compression.
26	Calcutta	N	iP iS	18 18 35 18 59	200 Slight.
	Chatra	Z NE	iP iS	18 18 40 19 17	330 Slight, compression.
	Shillong	ZNE	iP	18 18 52	Slight, near, rarefaction.
	Delhi	Z	e	18 22 35.5	
26	Chatra	Z	eP iS	18 30 08 30 43	310 Slight
26	Delhi	NZ	e	19 00 42 01 00	
26	Shillong	ZNE	iP	19 04 16	Slight, distant, compression.
	Chatra	Z	iP	19 04 46	Slight, distant, compression.
	Delhi	ENZ	P	19 05 45	Slight.
26	Delhi	ENZ	eP e	19 15 51 16 03.5	Slight, compression
26	Dehra Dun	Z	iP i	20 00 09 00 18	Tremor, rarefaction
26	Chatra	Z	e	22 16 21	Slight, distant
26	Shillong	ZNE	iP	22 52 11	Slight, distant, compression.

DATE	STATION	COMPT.	PHASE	G. M. T. h. m. s.	km.	REMARKS
October, 1963.						
26	Chatra	Z	iP	22 52 38		Slight, distant, compression.
(Contd.)	Delhi	ENZ	eP	22 53 28	8710	Slight, compression.
		N	eS	23 03 24		
27	Shillong	ZNE	iP	00 07 59		Slight, distant, rarefaction.
	Chatra	Z	e	00 08 17		Slight, distant.
	Delhi	ENZ	iP	00 09 01		Slight, compression.
27	Delhi	ENZ	iP	05 50 37	950	Slight, initial ground motion towards South, compression.
			eS	52 14		
27	Delhi	Z	eP	05 59 04		Slight.
27	Chatra	Z	e	13 06 32		Slight, distant.
	Delhi	ENZ	eP	13 06 41		Slight, rarefaction.
	Shillong	ZNE	iP	13 06 52		Slight, distant, compression.
27	Delhi	Z	iP	14 24 10		Tremor, initial ground motion towards South, compression.
27	Shillong	ZNE	iP	18 13 20		Slight, near
27	Epc: 44.5°N, 150.1 in Kurile Islands H = 20h. 05m. 38.1s, h about 50 km (USCGS). Mag: 5-5¼(Pal), 5.2 SD 0.3 (CGS).					
/	Shillong	ZNE	iP	20 14 31		Slight, distant, rarefaction.
/	Chatra	Z	eP	20 14 50		Slight, distant, rarefaction.
/	Dehra Dun	Z	iP	20 15 21		Slight, rarefaction.
/	Delhi	ENZ	iP	20 15 32		Slight, initial ground motion towards North-east, rarefaction.
/	Poona	Z	iP	20 16 29		Slight, compression.
27	Delhi	ENZ	iP	20 23 33		Slight, initial ground motion towards North west, compression.
27	Delhi	ENZ	P	20 51 23		Slight.
28	Shillong	ZNE	iP	00 44 32		Slight, distant, rarefaction.



DATE	STATION	COMPT.	PHASE	G. M. T. h. m. s.	km.	REMARKS
October, 1963.						
28	Chatra	Z	iP	00 45 06		Slight, distant, rarefaction.
(contd.)	Delhi	EZ	P	00 46 11		Slight, compression.
28	Dehra Dun	Z	i	00 54 58		Slight.
28	Delhi	NZ	P	00 55 32		Slight.
		EZ	i	56 22		
28	Shillong	ZNE	iPg	03 20 33	120	Slight, rarefaction.
			Sg	20 47		
28	Chatra	Z	iP	04 48 07	170	Slight, compression.
			iSg	48 32		
28	Shillong	ZNE	iP	05 07 44		Slight, distant, compression.
	Chatra	Z	i	05 08 03		Slight, distant.
	Dehra Dun	Z	eP	05 08 33		Slight.
28	Delhi	Z	eP	05 08 43		Slight, initial ground motion towards North-east, compression.
		EN	iP			
28	Epc: 52.8°N, 159.8°E Off Coast of Kamchatka H = 12h. 03m. 19.8s, h about 33 kms (USCGS). Mag: 5-5¼(Bka), 5-5¼(Pal), 5.7 SD 0.3 (CGS).					
/	Shillong	ZNE	iP	12 13 03		Compression.
/	Chatra	Z	iP	12 13 17		Compression.
/	Dehra Dun	Z	iP	12 13 36		Rarefaction.
/	Delhi	EZ	iP	12 13 46		Initial ground motion towards east, rarefaction.
/	Port Blair	Z	iP	12 14 11		Compression.
/	Poona	Z	iP	12 14 26		Compression.
/	Bombay	Z	eP	12 14 50		
		N	e	15 02		
28	Dehra Dun	EN	e	12 23 23		Tremor.
28	Delhi	ENZ	iPg	12 40 01.5		Slight, initial ground motion towards south east, compression.
			iSg	40 05.2		
28	Chatra	Z	eP	14 11 57		Slight, distant.
28	Shillong	ZNE	iP	14 22 33		Slight, distant, compression.
	Chatra	Z	i	14 22 52		Slight, distant.

DATE	STATION	COMPT.	PHASE	G. M. T.			REMARKS
				h	m	s	
<u>October, 1963.</u>							
28	Delhi (Contd.)	ENZ	eP	14	23	31	Slight, initial ground motion towards North east, compression.
28	Shillong	ZNE	iP	14	45	13	Slight, distant, compression.
	Delhi	EZ	iP	14	46	13	Slight, initial ground motion towards East, compression.
28	Dehra Dun	Z EN	iP e	16	59	43 59 55	Tremor, rarefaction.
	Delhi	ENZ	iP i iS	17	00	05 00 32 00 39.2	Slight, compression.
	Chatra	Z	e	17	01	21	Slight, distant.
28	Delhi	NZ	iP	18	15	10	Slight, initial ground motion towards North rarefaction.
28	Delhi	Z	eP	20	20	23	Slight, rarefaction
28	Shillong	ZNE	iP	20	45	48	Slight, distant, compression.
	Chatra	Z	iP	20	46	08	Slight, distant, compression.
	Dehra Dun	Z	eP	20	46	40	Slight.
	Delhi	Z	iP	20	46	49	Slight, initial ground motion towards compression.
28	Shillong	ZNE	iP	21	57	40	Slight, distant, rarefaction.
	Chatra	Z	e	21	57	52	Slight, distant.
29	Delhi	Z	iP	02	33	52	Slight, initial ground motion towards South compression.
29	Delhi	Z	iP	07	18	56	Slight, compression.
29	Delhi	EZ	iP	11	35	49	Slight, initial ground motion towards west rarefaction.
29	Bombay	ENZ	e	12	43	14	Slight, near.

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DATE	STATION	COMPT.	PHASE	G. M. T.			REMARKS
				h	m	s	
<u>October, 1963.</u>							
29	Poona (Contd.)	Z	eP eS	12	45	18 45 31	98 Slight, near.
29	Dehra Dun	Z	eP iS	15	20	56 21 49	490 Slight.
	Delhi	Z ENZ	eP iS	15	21	06 22 02	530 Slight
	Chatra	Z	iP iSg	15	21	35 22 44	440 Slight, rarefaction
	Shillong	ZNE	eP	15	22	32	Slight, distant.
29	Delhi	E	iP iS	15	51	46 52 38	490 Slight.
29	Chatra	Z	e	15	52	15	Slight, distant.
29	✓ Poona	Z	iP	16	08	39	
	✓ Delhi	Z EZ Z	iP i e i i i	16	08	50 08 53 09 20 09 21 09 24 09 50	Slight, rarefaction
	✓ Dehra Dun	Z	eP i	16	08	52 08 56	Slight.
	✓ Chatra	Z	i	16	09	02	Slight, distant.
	✓ Shillong	ZNE	iP	16	09	07	Slight, distant, rarefaction.
29	Delhi	ENZ	iP	17	55	21	Slight, initial ground motion towards South east compression.
29	✓ Dehra Dun	ENZ EN	eP i	22	28	29 32 20	
	✓ Chatra	Z NE	eP eS i	22	28	35 32 27 32 36	2360 Slight.
	✓ Shillong	ZNE	iP S M	22	28	46 32 45 35 59	2410 Slight, initial ground motion towards South, compression.
	✓ Delhi	ENZ	eP eS	22	28	47 32 51	2510 Slight, initial ground motion towards north east, Rarefaction.
	✓ Poona	Z	eP	22	30	25	Slight.





DATE STATION

COMPT PHASE G M T  
h m s km.

REMARKS

October, 1963.

DATE	STATION	COMPT	PHASE	G	M	T	km.	REMARKS
				h	m	s		
29	Madras	E	e	22	34	17		Slight.
(Contd.)			e		39	38		
			e		41	53		
			e		43	09		
29	Delhi	E	iP	23	17	41		Slight, initial ground motion towards west.
30	Shillong	ZNE	iP	00	44	32		Slight, distant.
30	Dehra Dun	Z	iP	01	37	12		Tremor.
	Delhi	Z	iP	01	37	12		Slight, rarefaction.
30	Chatra	Z	eP	02	39	34	210	Slight.
		ZNE	iSg		40	03		
30	Shillong	ZNE	eP	02	40	33	670	Slight.
			S		41	42		
			Sg		42	15		
30	Shillong	ZNE	iP	03	36	44	140	Slight.
			Sg		37	02		
30	Delhi	Z	iP	06	59	53		Slight, compression.
30	Delhi	Z	iP	09	38	19		Slight, rarefaction.
30	Shillong	ZNE	iP	11	00	41		Slight, distant, compression.
30	Delhi	Z	eP	11	01	42		Slight, compression.
30	Delhi	ENZ	iP	12	31	52		Slight, initial ground motion towards South east, compression.
30	Delhi	Z	iP	15	21	03		Slight, compression.
30	Shillong	ZNE	iP	15	30	02		Slight, distant.
	Chatra	Z	e	15	30	21		Slight, distant.
30	Shillong	ZNE	eP	18	54	51		Slight, distant.
30	Shillong	ZNE	iP	22	51	24		Slight, distant, rarefaction.
	Chatra	Z	e	22	51	44		Slight, distant.
	Delhi	Z	eP	22	52	27		Slight, rarefaction.
31	Port Blair	Z	eP	03	31	10	9670	Slight.
		E	iS		41	48		
	Shillong	ZNE	iP	03	31	36		Slight, distant.

DATE STATION

COMPT. PHASE G M T  
h m s km.

REMARKS

October, 1963

DATE	STATION	COMPT.	PHASE	G	M	T	km.	REMARKS
				h	m	s		
31	Delhi	Z	eP	03	36	22		Slight, compression.
31	Shillong	ZNE	iP	05	29	43	210	Slight.
			Pg		29	46		
			Sg		30	12		
31	Delhi	N	iP	08	44	50		Slight, initial ground motion towards south.
		NZ	i		44	56		
31	Chatra	Z	iP	09	51	20		Slight, distant, compression.
31	Poona	Z	eP	10	01	22		Slight, rarefaction.
31	Delhi	Z	eP	10	01	22		Slight, rarefaction.
31	Chatra	Z	iP	10	02	52		Slight, distant, rarefaction.
31	Bombay	Z	e	15	21	48		Slight.
31	Shillong	ZNE	iP	16	10	23	210	Slight, initial ground motion towards north east, rarefaction.
			Sg		10	52		
	Chatra	Z	iP	16	11	17		Slight, distant.
		NE	i		12	54		
	Delhi	Z	eP	16	13	13		Slight, compression.
	Port Blair	Z	eP	16	44	00	55	Slight.
			P*		44	02		
			Sg		44	07		
			S*		44	12		
			S		44	15		
	Chatra	Z	eP	16	48	27	150	Slight, rarefaction.
			iS		48	46		
31	Shillong	ZNE	eP	18	06	06		Slight, near.
31	Epc: 37.2°N, 70.0°E in Hindukush region H = 20h. 10m. 54.2s. h about 105 kms (USCGS) Mag: 4.5 (CGS).							
	Dehra Dun	Z	eP	20	13	10		
		EN	i		16	09		
	Delhi	ENZ	eP	20	13	22	1080	
			iS		15	13		
	Chatra	Z	eP	20	14	54		
		NE	SSS		18	36		
			i		21	53		
	Poona	Z	eP	20	15	11		Rarefaction.

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h. m. s.

October, 1963.

31 (Contd.)	Shillong	ZNE	iP S	20 15 42 19 45	2570	
	Visakhapatnam	E	eP eS	20 15 50 20 23	2946	Distant.
	Sehore	E	e i i	20 17 24 18 59 19 14		
	Madras	E	e	20 23 40		

A list of felt earthquake reports for the month of October, 1963

SN.	Station	Date (GMT)	Time (GMT)	No. of shocks	Duration (Seconds)	Intensity (R.F. Scale)	REMARKS
1.	Mohanbari	8.10.63	02 54	1	2	V	
2.	Darjeeling	9.10.63	10 40	1	3	V	Appears to come from north
3.	Shillong	14.10.63	02 00	1	2	V	
4.	Lumding	14.10.63	02 02	1	2	VI	
5.	Shillong	19.10.63	07 35	1	3	V	
6.	Lumding	19.10.63	07 37	1	4	V	
7.	Kum-bhirgram	19.10.63	07 33	1	2	V	Appears to come from east.
8.	Shillong	20.10.63	21 50	1	3	V	
9.	Shillong	31.10.63	16 10	1	5	V	
10.	Chaparmukh	31.10.63	16 20	1	15	V	

Date Hour GMT K Mean simple amplitude in m.m. Mean period in sec. Date Hour GMT K Mean simple amplitude in m.m. Mean period in sec.

Station: Shillong.				October, 1963.			
01	00	3	0.3	4.0	12	00	...
	06	3	0.3	4.0		06	...
	12	...	-	-		12	...
	18	...	-	-		18	...
02	00	...	-	-	13	00	...
	06	...	-	-		06	...
	12	...	-	-		12	...
	18	...	-	-		18	...
03	00	...	-	-	14	00	...
	06	...	-	-		06	...
	12	...	-	-		12	...
	18	...	-	-		18	...
04	00	...	-	-	15	00	...
	06	...	-	-		06	3 0.4
	12	...	-	-		12	3 0.4
	18	...	-	-		18	3 0.3
05	00	...	-	-	16	00	1 0.3
	06	...	-	-		06	1 0.3
	12	...	-	-		12	1 0.4
	18	...	-	-		18	3 0.4
06	00	...	-	-	17	00	1 0.4
	06	...	-	-		06	...
	12	...	-	-		12	...
	18	...	-	-		18	...
07	00	...	-	-	18	00	...
	06	...	-	-		06	1 0.3
	12	3	0.3	3.8		12	3 0.3
	18	3	0.4	3.6		18	3 0.3
08	00	...	-	-	19	00	3 0.3
	06	1	0.3	4.0		06	1 0.3
	12	1	0.3	4.2		12	1 0.4
	18	1	0.2	3.8		18	1 0.4
09	00	1	0.3	4.2	20	00	1 0.4
	06	...	-	-		06	3 0.3
	12	...	-	-		12	...
	18	...	-	-		18	3 0.3
10	00	...	-	-	21	00	3 0.4
	06	...	-	-		06	1 0.3
	12	...	-	-		12	1 0.3
	18	...	-	-		18	...
11	00	...	-	-	22	00	3 0.2
	06	...	-	-		06	0,0 -
	12	...	-	-		12	0,0 -
	18	...	-	-		18	0,0 -

Date	Hour GMT	K	Mean simple amplitude in m.m.	Mean period in sec.
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October, 1963.

Station: Shillong (Contd.)

23	00	0,0	-	-	01	12	1	0.4	3.5
	06	0,0	-	-			3	0.2	2.6
	12	...	-	-		18	3	0.4	4.0
	18	...	-	-			3	0.2	2.7
24	00	...	-	-	02	00	3	0.4	4.5
	06	0,0	-	-			3	0.2	2.6
	12	0,0	-	-		03	3	0.4	4.6
	18	0,0	-	-			3	0.2	2.5
25	00	0,0	-	-		06	3	0.4	4.5
	06	0,0	-	-			3	0.2	2.5
	12	0,0	-	-		12	3	0.4	4.8
	18	...	-	-			3	0.2	2.3
26	00	...	-	-		18	3	0.4	4.5
	06	...	-	-			3	0.1	2.0
	12	...	-	-	03	00	3	0.3	4.4
	18	...	-	-			3	0.1	1.9
27	00	...	-	-		03	3	0.3	4.2
	06	1	0.5	4.0			3	0.2	2.3
	12	1	0.5	4.0		06	3	0.4	4.2
	18	1	0.5	4.0			3	0.2	2.4
28	00	1	0.4	3.8		12	3	0.4	4.8
	06	...	-	-			3	0.2	2.3
	12	...	-	-		18	2	0.4	5.1
	18	...	-	-			3	0.2	2.5
29	00	...	-	-	04	00	...	Earthquake.	
	06	0,0	-	-		03	2	0.4	5.6
	12	0,0	-	-			3	0.2	2.7
	18	0,0	-	-		06	2	0.4	5.5
30	00	0,0	-	-		12	3	0.2	2.6
	06	...	-	-			2	0.5	6.0
	12	...	-	-		18	3	0.1	1.5
	18	...	-	-			3	0.1	1.5
31	00	...	-	-		18	2	0.5	6.4
	06	0,0	-	-			3	0.2	2.3
	12	0,0	-	-	05	00	2	0.5	6.2
	18	0,0	-	-			3	0.3	2.4
							3	0.2	1.8
						03	2	0.5	6.8
							3	0.2	2.4
						06	2	0.2	2.4
							2	0.5	6.4
						12	3	0.2	2.1
							2	0.6	6.7
						18	3	0.2	2.4
							2	0.5	6.6
							3	0.2	2.6

Station: Madras.

01	00	1	0.4	3.5	06	00	2	0.5	6.8
		3	0.2	2.5			3	0.3	2.8
	03	1	0.4	3.5		03	2	0.5	6.9
		3	0.2	2.5			2	0.3	3.0
	06	1	0.4	3.6		06	1	0.3	3.0
		3	0.2	2.6			2	0.5	6.4
							1	0.3	2.9

International Seismological Centre

Date	Hour GMT	K	Mean simple amplitude in m.m.	Mean period in sec.
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Station: Madras (Contd.)

October, 1963.

06	12	2	0.4	6.2	13	00	2	0.4	5.5
		1	0.3	3.0			3	0.3	2.5
	18	2	0.4	5.7		03	2	0.4	6.2
		1	0.3	3.0			3	0.2	2.5
07	00	2	0.4	5.9	06	...	Earthquake.		
		1	0.3	2.9		12	2	0.4	6.3
	03	1	0.3	3.0			3	0.2	2.6
	06	1	0.3	3.1	18	...	Earthquake.		
	12	1	0.3	3.0	14	00	2	0.3	5.9
	18	1	0.3	3.0			3	0.1	2.4
08	00	1	0.4	3.0		03	2	0.4	5.7
	03	1	0.4	3.1		06	2	0.4	6.3
	06	1	0.4	3.1		12	2	0.5	6.5
	12	1	0.4	3.1		18	2	0.6	7.2
	18	1	0.5	3.1	15	00	2	0.6	6.8
09	00	1	0.4	3.0		03	2	0.5	6.9
		1	0.2	1.6		06	2	0.5	6.3
	03	1	0.4	3.1		12	2	0.4	6.2
		1	0.1	1.4		18	2	0.4	5.7
	06	1	0.4	3.2	16	00	2	0.4	5.7
	12	1	0.4	3.1			2	0.3	4.0
	18	1	0.4	3.0		03	2	0.4	5.8
10	00	1	0.3	2.9			2	0.3	4.5
		2	0.4	4.5		06	2	0.4	5.9
	03	1	0.3	2.9			2	0.3	4.3
		3	0.1	1.3		12	2	0.4	5.9
	06	3	0.3	2.9			2	0.3	4.1
		1	0.2	1.7		18	2	0.5	6.0
	12	1	0.3	2.9	17	00	2	0.5	6.3
		3	0.1	1.5			2	0.4	5.9
	18	3	0.2	2.9		03	2	0.4	6.2
11	00	3	0.2	2.7		06	2	0.5	6.2
		3	0.1	1.6		12	2	0.5	6.3
	03	3	0.2	2.6	18	00	...	Earthquake.	
		3	0.1	1.5		03	2	0.5	6.0
	06	3	0.2	2.6		06	2	0.5	6.2
	12	3	0.2	2.7		12	2	0.5	6.3
	18	2	0.4	5.3		18	2	0.5	6.3
		3	0.2	2.6			3	0.3	4.1
12	00	2	0.3	5.0			3	0.2	2.6
		3	0.1	2.2	19	00	2	0.4	5.6
	03	2	0.3	5.3			3	0.4	4.1
		3	0.1	2.1			3	0.3	2.8
	06	2	0.3	4.9		03	...	Earthquake.	
		3	0.2	2.2		06	2	0.5	5.3
	12	...	Earthquake.				1	0.4	3.1
	18	2	0.3	4.9		12	2	0.6	5.7
		3	0.2	2.5			1	0.4	3.0
						18	2	0.5	5.5
							1	0.4	3.0







Date	Hour GMT	K	Mean simple amplitude in m.m.	Mean period in sec.	Date	Hour GMT	K	Mean simple amplitude in m.m.	Mean period in sec.
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Station : Bombay (Contd.)

October, 1963.

22	18	3	1.0 0.3	3.9 2.0	29	00	3	0.5 0.5 0.3	3.0 4.0 2.0
23	00	3	0.9 0.4	3.5 2.0	06	06		Record doubtful.	
	06	3	0.8 0.4	3.8 2.3	12	12			
	12	3	0.8 0.3	3.0 1.9	18	18			
	18	3	0.7 0.4	3.4 2.0	30	00	3	0.5	3.7
24	00	3	0.6 0.3	3.0 1.9	06	06	3	0.4 0.5	2.2 3.1
	06	3	0.5 0.4	3.3 2.0	12	12	3	0.5 0.4	3.5 2.0
	12	3	0.6 0.4	3.0 2.0	18	18	3	0.5 0.5	1.6 3.1
	18	3	0.6 0.4	3.0 2.0	31	00	3	0.5	3.1
25	00	3	0.7 0.5	3.0 2.0	06	06	3	0.5 0.3	1.9 2.0
	06	3	0.6 0.4	2.8 2.0	12	12		Record doubtful.	
	12	3	0.6 0.4	3.3 2.0	18	18			
	18	3	0.8 0.3	3.0 1.8					

Date	Hour GMT	K	Mean simple amplitude in micron	Mean period in sec.
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Station : Port Blair.

26	00	3	0.6 0.4	2.9 2.0	01	00	3	0.2	3
	03	1	0.9	3.0		06	3	0.4	6
	06	1	1.0	3.0		12	3	0.2	3
	09	1	1.0	3.5		18	3	0.4	6
	12	1	1.0	3.5		02	00	3	0.4
	15	11	1.0	3.5		06	06	1	0.4
	18	1	1.0	3.5		12	1	0.4	3
	21	1	1.0	3.5		18	1	0.4	5
27	00	1	1.0	3.7	03	00	1	0.2	5
	03	1	1.0	3.7		06	1	0.4	6
	06	3	0.9 0.3	3.7 3.5		12	1	0.4	3
	12	3	0.8 0.4	2.0 3.4		18	1	0.4	3
	18	3	0.7 0.4	2.4 3.1		04	00	...	-
28	00	3	0.8 0.3	3.0 2.0		06	1	0.4	5
	06	3	0.5 0.2	3.5 2.2		12	1	0.4	7
	12	3	0.5 0.6	3.0 4.0		18	1	0.4	6
	18	3	0.5 0.6	3.0 4.0			1	0.4	6

Date	Hour GMT	K	Mean simple amplitude in micron.	Mean period in sec.	Date	Hour GMT	K	Mean simple amplitude in micron.	Mean period in sec.
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Station: Port Blair (Contd.)

October, 1963.

05	00	1	0.4	6	15	12	1	0.4	7
	06	1	0.8	7		18	1	0.4	7
	12	1	0.8	7	16	00	1	0.8	7
	18	1	1.2	7		06	1	0.8	7
06	00	1	1.2	7		12	1	0.8	7
	06	1	1.2	7		18	1	1.2	7
	12	1	1.6	7	17	00	1	1.2	7
	18	1	1.6	7		06	1	1.2	7
07	00	1	1.2	7		12	1	1.2	7
	06	1	0.4	7		18	1	1.2	6
	12	...	-	-	18	00	...	-	-
	18	...	-	-		06	1	2.0	7
08	00	1	0.2	7		12	3	1.6	7
	06	3	0.4	3		18	3	0.8	3
	12	3	0.2	7				1.6	7
	18	1	0.4	3	19	00	3	1.2	3
09	00	3	0.4	3		06	3	1.2	3
	06	...	-	-		12	3	1.2	3
	12	...	-	-		18	3	1.2	3
	18	...	-	-				1.2	7
10	00	...	-	-	20	00	3	0.8	3
	06	1	0.2	6		06	3	0.8	3
	12	1	0.2	6				0.4	7
	18	1	0.2	6		12	1	1.2	3
11	00	3	0.4	7		18	...	-	-
	06	1	0.4	6	21	00	3	1.2	3
	12	1	0.4	6		06	3	1.2	4
	18	1	0.4	7		12	3	1.2	4
12	00	1	0.4	6		18	3	0.8	3
	06	1	0.4	6	22	00	3	0.8	4
	12	...	-	-		06	1	0.8	5
	18	1	0.4	7		12	1	0.8	5
13	00	1	0.4	7		18	...	-	-
	06	...	-	-	23	00	...	-	-
	12	1	0.4	7		06	...	-	-
	18	...	-	-		12	...	-	-
14	00	1	0.8	7		18	...	-	-
	06	1	0.8	7	24	00	...	-	-
	12	1	0.8	7		06	1	0.2	3
	18	1	0.8	7		12	...	-	-
15	00	1	0.8	7		18	...	-	-
	06	1	0.8	7				-	-