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# SEISMOLOGICAL BULLETIN



**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
					- do -	Z	To=15 Tg=70			15
Bombay	18.54°N, 72.40°E		4	Deccan Trap	Milne-Shaw	N	12 350	13:1		16
					Milne-Shaw	E	12 350	23:1		8
					Sprengnether	E	To=Tg=7 secs			30
Bokaro	23.50°N, 85.49°E			Rock	Milne-Shaw	N	12 250	20:1		16
					Milne-Shaw	E	12 250	20:1		16
					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		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	26.50°N, 87.10°E		151	Sand Stone	Milne-Shaw	E	12 250	20:1		16
					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	17.26°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		8
Madras	13.00°N, 80.11°E		15	-	Sprengnether	E	To=Tg=7.2 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=1.6	Critical		30
					Wood-Anderson	E	4 1000	20:1		16
					Milne-Shaw	N	12 280	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
Vizianagram	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	M. T.	REMARKS
				h. m. s. km.	
April, 1963.					
01	Dehra Dun	Z	iP	01 45 04	Tremor, rarefaction.
01	Shillong	Z	iP	02 30 23	Slight, distant, compression.
01	Shillong	Z	eP	03 31 43	Slight, near.
01	Shillong	Z	iP	03 56 26	Slight, distant, rarefaction.
01	Shillong	Z	eP	04 02 09	Slight, distant.
01	Epc:- 44.8°N, 141.1°E, Off west coast of Hokkaido, Japan. h = about 255 km. (USCGS). -H = 04h. 28m. 44.3s. Mag: 5.6 (CGS).				
	Shillong	Z	iP	04 36 26	Rarefaction.
	Chatra	Z	iP	04 36 49	4830 Rarefaction.
		NE	iS	43 18	
	Dehra Dun	Z	iP	04 37 23	Rarefaction.
	Madras	E	eP	04 38 28	
			e	40 45	
	Poona	Z	iP	04 38 35	Rarefaction.
	Bombay	NZ	eP	04 38 37	
01	Chatra	Z	e	07 40 39	Slight.
	Chatra	Z	eP	09 17 11	430 Slight.
		NE"	eS	17 58	
	Dehra Dun	Z	eP	09 18 05	Slight.
01	Epc:- 35.4°N, 69.8°E, Hindukush (USCGS) H = 09h. 22m. 51.8s. h = about 100 kms. Mag: 4.8 (CGS) Epc:- 36.5°N, 69.0°E (Shillong). H = 09h. 22m. 30s.				
	Dehra Dun	Z	iP	09 24 54	1120 Rarefaction.
			PP	25 03	
			PPP	25 09	
			i	25 48	
		EN	i	26 28	
		ENZ	LQ	26 39	
		EN	iS	26 49	
		ENZ	SS	27 02	
			LR	27 07	
			SSS	27 13	
			S	27 30	
			M	28 00	



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	$\Delta$ km.	REMARKS
<u>April, 1963.</u>						
01	Bombay	NZ	eP	09 26 40	1900	
			PPP	27 04		
		E	eS	29 50		
		NE	M	32 -		
	Chatra	Z	iP	09 26 47	2020	Rarefaction.
		N	i	29 41		
		NE	iS	30 08		
		E	SS	30 29		
	Poona	NZ	eP	09 26 48		Initial ground motion
		E	e	32 21		East, North and rarefaction.
	Hyderabad	N	iP	09 27 16	2220	Initial ground motion
			PP	27 35		towards North.
			PPP	27 45		
			iS	30 56		
			i	31 15		
			LR	32 03		
			M	33 15		
						Period= 9secs. $\mu = 3$ .
	Bokaro	N	eP	09 27 29		
			i	30 05		
			i	30 28		
			i	30 49		
			i	31 07		
			i	32 44		
			i	33 00		
	Shillong	Z	iP	09 27 33	2500	Rarefaction.
		E	iS	31 36		
	Visakhapatnam	E	eP	09 27 54		
	Madras	E	eP	09 28 24	29 50	
			i	29 04		
			iS	32 57		
			LQ	33 50		
			LR	35 06		
			SS	36 03		
			M	37 25		
	Sehore	EW	e	09 28 42		
			i	29 04		
			i	29 07		
	Port Blair	N	eP	09 29 40	4100	
		E	i	34 46		
			iS	35 25		
	Calcutta	N	i	09 31 38		
	Kodaikanal	E	i	09 33 21		Distant.
			i	36 39		



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	$\Delta$ km.	REMARKS
<u>April, 1963.</u>						
01	Shillong	Z	eP	11 58 30		Slight, near.
01	Epc:- 39.1° N 77.5° E, Sinkiang Province, China. h = about 203 Km. -H= 16 h 31 m 28.6 s (USCGS). Mag: = 4.0 (CGS).					
	Dehra Dun	Z	eP	16 33 34	1020	
			iS	35 19		
		EN	i	35 22		
	Shillong	Z	iP	16 35 28		Distant, rarefaction.
01	Shillong	Z	eP	17 55 45		Slight, distant.
	Epc:- 36.5° N 71.4° E, Hindukush. h = about 244 Km -H= 18 h 36 m 25.7 s (USCGS). Mag : 4.3 (CGS).					
	Dehra Dun	Z	eP	18 38 24	870	
			iS	40 03		
	Shillong	Z	eP	18 40 47		
01	Shillong	Z	iP	20 08 52		Slight, distant, rarefaction.
02	Shillong	Z	eP	00 13 50		Slight, near.
02	Dehra Dun	Z	eP	04 17 11		Tremor.
02	Dehra Dun	Z	iP	05 24 50		Slight, compression.
			i	25 27		
02	Shillong	Z	iP	05 42 35		Slight, distant, rarefaction.
02	Shillong	Z	eP	11 07 20		Slight, near.
02	Shillong	Z	iP	11 42 22		Slight, near.
02	Dehra Dun	Z	iP	13 13 15		Slight, rarefaction.
			i	14 41		
02	Shillong	Z	iP	16 17 50		Slight, distant, rarefaction.
02	Shillong	Z	iP	16 28 59		Slight, distant, compression.
02	Shillong	Z	iP	16 30 11		Slight, distant, rarefaction.
	Chatra	Z	iP	16 30 25		Slight, distant, rarefaction.



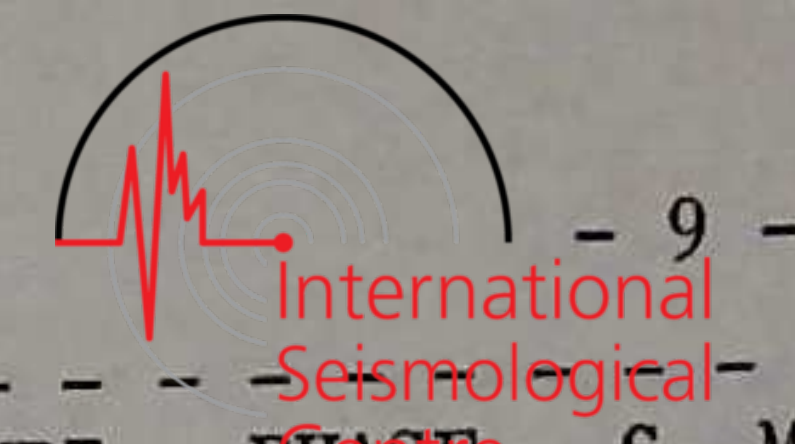
DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
<u>April, 1963.</u>						
02	Dehra Dun	Z	iP i	16 30 46 31 26		Slight, rarefaction.
	Port Blair	N	i	16 31 10		Slight.
	Bokaro	E	iP	16 31 42		Slight, distant.
02	Shillong	Z	iP	16 55 19		Slight, near.
	Dehra Dun	Z	eP	16 57 39		Slight.
02	Shillong	Z	eP iSg	18 09 15 09 57	290	Slight.
02	Port Blair	NE	e	18 31 08		Slight, near.
02	Shillong	Z	iP	19 54 09		Slight, near, compression.
02	Shillong	Z	eP	22 00 44		Slight, near.
02	Shillong	Z	iPr iSg	23 12 58 13 28	220	Slight.
03	Dehra Dun	EN	e i E EN	07 05 27 10 29 11 06 15 58		Slight.
03	Shillong	Z	iP	09 51 59		Slight, near.
	Shillong	Z	iP	11 52 13		Slight, distant, compression.
	Dehra Dun	Z	iP	11 53 42		Slight.
03	Shillong	Z	eP	12 03 54		Slight, distant.
03	Shillong	Z	iP	12 07 07		Slight, distant, compression.
03	Shillong	Z	iP	12 11 40		Slight, near.
03	Shillong	Z	iP	15 05 16		Slight, distant, rarefaction.
	Chatra	Z	eP	15 07 22		Slight, distant.
	Dehra Dun	Z	eP	15 07 39		Slight.
	Madras	E	eP e PPP SKS SKYS eS/ScS	15 10 36 11 03 16 27 21 13 21 40 22 06	11060	Slight.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
<u>April, 1963.</u>						
03	Madras (Contd.)	E	SS LQ LR M	15 29 03 38 13 43 07 51 24		
	Bombay	ES	eP SS	15 11 02 28 22		Slight.
03	Shillong	Z	eP	15 29 05		Slight, distant.
03	Hyderabad	N	M	16 05 15		Period = 21 secs. Gr. dis. = 2 μ.
03	Dehra Dun	Z	eP	16 07 04		Slight.
03	Dehra Dun	Z	eP	20 55 46		Slight.
04	Port Blair	N	iPg iSg	00 40 51 40 55	40	Slight.
04	Chatra	Z	eP Sg	09 52 18 52 30	110	Slight.
04	Delhi	N	e	12 43 39		Initial ground movement towards North, slight.
04	Chatra	Z	eP Sg	14 27 42 27 57	130	Slight.
04	Shillong	Z	eP	15 43 18		Slight, distant.
04	Shillong	Z	iPg Sg	16 10 34 10 47	100	Slight, rarefaction.
	Delhi	NZ	i	16 11 05		Initial ground movement towards North, slight, compression.
04	Shillong	Z	iP iSg	19 00 08 00 18	90	Slight, rarefaction.
04	Shillong	Z	eP	19 12 08		Slight, near.
04	Shillong	Z	iP	21 03 35		Slight, distant, rarefaction.
04	Shillong	Z	eP	23 43 56		Slight, distant.
04	Shillong	Z	iP	23 57 44		Slight, distant, compression.
	Delhi	Z	iP	23 59 25		Slight, compression.
	Dehra Dun	Z	eP	23 59 25		Slight.
05	Shillong	Z	iP	00 14 57		Slight, distant, compression.



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April, 1963.						
05	Delhi	Z	eP	01 01 15		Slight, rarefaction.
05	Shillong	Z	iP	01 59 57		Slight, distant, rarefaction.
05	Dehra Dun	Z	iP	11 15 01		Slight.
05	Delhi	ENZ	i	12 22 13		Initial ground movement towards North East Slight, compression.
05	Dehra Dun	Z	eP	19 25 03		Slight.
06	Port Blair	NE	i	03 05 20		Slight.
06	Bokaro	NE	iP	09 17 01		Slight, local.
06	Bokaro	NE	iP	10 47 43		Slight, local.
06	Dehra Dun	Z	iP	11 31 25		Slight, compression.
06	Shillong	Z	iP	11 31 26		Slight, distant, compression.
06	Delhi	NZ	iP	12 04 18		Initial ground movement towards North. Slight, compression.
06	Dehra Dun	Z	iP	12 19 09		Slight.
06	Shillong	Z	eP	12 40 39		Slight, distant.
06	Port Blair	NE	iPg iSg	13 48 13 48 19	60	Slight.
06	Delhi	NZ	iP	16 35 19		Initial ground movement towards North. Slight, compression.
06	Epc:- 33.6°N 82.8°E, Tibet. h = about 33 km. -H= 17 h 48 m 53.3 s (USCGS).					
06	Epc:- 33° N 83° E -H= 17 h 48 m 55 s (Shillong).					
06	Dehra Dun	ENZ	eP PPP i iS SS SSS	17 50 15 50 26 50 34 51 15 51 39 51 49	580	Slight.
06	Delhi	ENZ	iP PP iS	17 50 35 50 36 51 52	720	Initial ground movement towards North West. Slight, rarefaction.



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April, 1963.						
06	Chatra	Z	iP i	17 50 48 51 25		Slight, compression.
06	Bokaro	NE	iP eS SS LR SSS M	17 51 24 53 17 53 32 53 38 53 43 54 27	1100	Slight.
06	Shillong	Z	iP iS	17 51 33 53 35	1190	Slight, compression.
06	Sehore	E	eP eS	17 51 39 54 02	1610	
06	Hyderabad	E	eP eS LR M M	17 52 42 55 39 57 30 59 08 59 10	1760	Slight. Period = 8 secs. $\mu = 3$ . Period 9 secs. $\mu = 3$ .
06	Poona	Z E Z	eP eS M	17 52 50 55 50 59 30	1800	Slight, compression. Initial ground movement towards South, East.
06	Visakhapatnam	NE	eP	17 52 51		Slight.
06	Madras	E	eP iS LQ LR M	17 53 56 57 20 57 35 58 42 18 00 23	2060	Slight.
06	Calcutta	E	e	17 54 02		Slight.
06	Bombay	EZ E	eP e	17 56 07 56 19		Slight.
06	Delhi	E	e	18 04 29		Slight.
06	Dehra Dun	Z	eP	19 56 43		Slight.
06	Delhi	Z	iP i	19 56 54 56 55		Slight, rarefaction.
06	Shillong	Z	eP	21 45 56		Slight, distant.
06	Delhi	Z	iP	22 47 09		Slight, compression.
07	Delhi	NZ	i	02 45 56		Slight.
07	Dehra Dun	Z	eP	07 40 37		Slight.
07	Delhi	ENZ	iP i	08 46 53 48 34		Slight, compression.





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<u>April, 1963.</u>						
07	Dehra Dun	Z	eP	08 47 49		Slight.
07	Delhi	Z	iP	09 29 31		Slight, rarefaction.
	Dehra Dun	Z	iP	09 29 34		Slight.
	Dehra Dun	Z	eP	11 26 21		Slight.
	Delhi	Z	eP	11 26 30		Slight.
	Shillong	Z	iP	11 27 15		Slight, distant, compression.
07	Delhi	Z	e	12 38 54		Slight.
	Dehra Dun	Z	iP	13 12 01		Slight, rarefaction.
	Delhi	EZ	iP	13 13 06		Slight, compression. Initial ground movement towards East.
07	Shillong	Z	eP	15 14 13		Slight, distant.
07	Dehra Dun	Z	eP	15 15 48		Slight.
	Delhi	EZ	eP	15 15 53		Slight.
07	Delhi	ENZ	e	15 22 35		Slight.
07	Epc:- 53.7° N 170.1° W, Fox Islands, Aleutian Islands region. h = about 202 Kms. -H= 15 h 28 m 01.8 s (USCGS). Mag : 6.0 (CGS).					
	Shillong	Z	iP	15 39 18		Rarefaction.
	Dehra Dun	Z	iP	15 39 32		Compression.
	Delhi	ENZ	iP	15 39 47		Initial ground movement towards North, West, rarefaction.
07	Dehra Dun	ENZ	iP	18 43 53	4660	Initial ground movement towards North, West, compression.
		NZ	i	44 12		
		ENZ	PP	45 33		
			PPP	46 04		
			iS	50 12		
			PS	50 24		
			PPS	50 32		
		EN	SS	53 13		
			LQ	53 25		
			i	53 48		
			LR	55 27		
			M	58 53		


07 Epc:- 4.9° S 103.2° E Near South-west coast of Sumatra.  
h = about 72 km. -H= 22 h 36 m 03.4 s (USCGS).  
Mag : 6.1 (CGS).

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<u>April, 1963.</u>						
07	Epc:- 4.5° S 102.5° E (Shillong). -H= 22 h 36 m 00 s					
	Port Blair	E	iP	22 40 26	2000	
			PP	40 36		
			PPP	40 50		
			i	41 08		
			i	43 15		
			iS	43 45		
			SS	44 34		
			i	46 22		
	Madras	E	iP	22 42 00	3290	Initial ground motion towards West.
			e	42 08		
			PP	42 57		
			PPP	43 12		
			e	44 33		
			iS	46 55		
			i	47 12		
			LQ	48 12		
			SS	48 23		
			SSS	48 49		
			LR	49 34		
			M	52 04		
			ScS	52 38		
	Kodaikanal	E	iP	22 42 04	3220	
			PP	42 58		
			iS	46 55		
			LQ	48 16		
			SSS	48 46		
			LR	49 37		
			M	54 50		
	Visakhapatnam	NE	iP	22 42 09	3270	Initial ground movement South East.
			eS	47 03		
	Calcutta	E	iP	22 42 13	3380	
			PP	43 11		
			PcP	45 08		
			iS	47 13		
	Shillong	Z	iP	22 42 25	3490	Compression.
			iS	47 33		
	Tocklai	E	eP	22 42 30	3480	
			iS	47 37		
	Hyderabad	E	iP	22 42 33	3660	Initial ground movement towards West.
			PP	43 35		
			PPP	43 59		
			i	44 47		
			iS	47 51		
			SS	49 47		
			LR	51 11		
			M	54 11		

Period=12 secs. n=3.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
07	Bokaro	NE	iP	22 42 36	3610	Initial ground movement towards West.
		E	PP	43 45		
			PPP	44 03		
			i	45 15		
		NE	eS	47 51		
		E	PcS	49 00		
		NE	SS	49 49		
			SSS	50 12		
		E	i	52 53		
			M	54 05		
✓	Chatra	Z	iP	22 42 53	3830	Compression .
			PcP	45 23		
		NE	iS	48 21		
✓	Poona	Z	iP	22 43 09	4050	Initial ground movement West, compression
		E	PP	44 36		
			PPP	44 59		
			iS	48 54		
			SS	51 28		
			Lq	51 36		
			SSS	51 59		
			Lr	53 17		
			M	56 28		
		✓	Sehore	EN		
E	i			43 30		
NE	PP			44 48		
N	i			49 02		
E	eS			49 12		
N	ScS			53 21		
	LR			53 49		
✓	Bombay	ESZ	eP	22 43 19	4270	
		EN	PP	44 43		
			PPP	45 04		
			iS	49 15		
			i	49 34		
			i	49 50		
			i	52 15		
			LQ	52 31		
			ScS	53 17		
		✓	Delhi	ENZ		
	i			44 01		
	SP			44 07		
	PP			45 21		
EZ	PcP			45 37		
ENZ	iS			49 58		
EZ	SS			50 22		
ENZ	i			50 44		
E	i			51 46		
	SS			52 48		
EZ	LQ			53 06		
E	SSS			53 40		
EN	LR			54 24		



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
08	Visakhapatnam	NE	iP	00 05 06	670	Slight. Initial ground movement towards North-east.
			iS	06 16		
08	Delhi	ENZ	iP	03 26 31	1730	Slight. Initial ground movement towards North West. Rarefaction.
			Z	26 39		
			PPP	26 56		
			N	27 22		
	ENZ	iS	27 48			
✓	Dehra Dun	Z	eP	03 26 37	820	Slight.
			i	27 59		
		ENZ	iS	28 02		
08	Epc:- 41.9°N 72.8° E, Kirghiz S.S.R. h = about 33 km. -H= 06 h 43 m 21.0 s (USCGS). Mag:4.7 (CGS)					
✓	Dehra Dun	Z	iP	06 46 10		Rarefaction.
			i	49 32		
✓	Delhi	ENZ	iP	06 46 27	1390	
			iS	48 48		
✓	Delhi	Z	iP	12 05 07		Slight, rarefaction.
✓	Dehra Dun	Z	eP	12 05 07		Slight.
08	Delhi	N	iP	12 55 52	950	Slight. Initial ground motion towards North.
			iS	57 29		
09	Epc:- 22.2° N 85.6° E, India. h = about 33 Km. -H= 00 h 03 m 35.6 s (USCGS).					
	Epc:- 23.0° N 85.5° E, (Shillong). Felt at Calcutta, Baripadar, Ranchi and Jamshedpur.					
✓	Bokaro	NE	iP	00 04 05	160	Slight. Initial ground movement towards South-east.
		NE	eS	04 25		
✓	Calcutta	E	iP	00 04 15	250	Slight.
			iS	00 04 45		
✓	Chatra	Z	eP	00 04 42	510	Slight.
		NE	SS	05 46		
			eS	05 51		
			SSS	05 57		
		i	06 02			
✓	Shillong	Z	iP	00 05 12		Slight.
✓	Delhi	ENZ	iP	00 05 57	950	Slight. Initial ground motion towards South East. Rarefaction.
			PP	06 00		
		EN	iS	07 35		
			i	07 45		



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	Δ km.	REMARKS.
April, 1963.						
09	Dehra Dun	Z ENZ N	iP iS i	00 06 06 08 01 09 31	1100	Slight, rarefaction.
	Madras	E	eP PP LQ e iS SS LR M	00 06 06 06 16 07 58 08 04 08 08 08 18 08 28 09 19	1190	Slight.
	Poona	Z E Z	iP iS M	00 06 21 00 08 28 00 09 30	1230	Slight, compression.
	Tocklai	E	eP i	00 06 22 07 24		Slight.
	Bombay	Z ESZ	eP eS	00 06 35 08 47	1290	Slight.
	Sehore	N	eP PPP	00 07 01 07 46		Slight.
	Hyderabad	E	i M	00 07 53 08 25		Slight. Period = 6 secs. Gr. dis = 5 μ.
09	Delhi	Z	iP	01 52 33		Slight, rarefaction.
09	Chatra	Z	iP	18 14 00		Slight, distant, rarefaction.
09	Delhi	ENZ	iP	18 50 09		Tremor. Initial ground motion towards South- east. Rarefaction.
	Dehra Dun	Z	iP	18 50 13		Tremor, rarefaction.
09	Delhi	Z	iP	21 25 39		Slight, compression.
10	Bokaro	NE	iP	05 58 54		Slight, local.
10	Chatra	Z	iP	07 09 33		Slight, distant; rarefaction.
10	Epc: - 9.2° S 125.0° E . Timor. h = about 33 Km. -H = 07 h 50 m 38.2 s (USCGS). Mag: = 5.2 (CGS).					
	Poona	Z	eP	07 59 15		



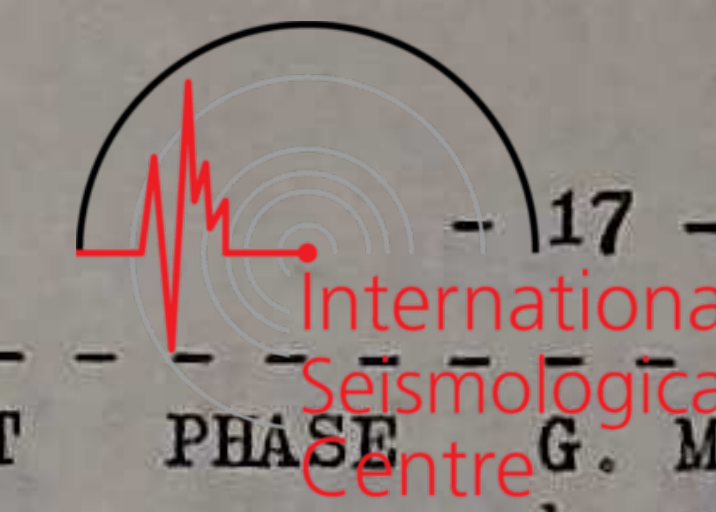
DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	Δ km.	REMARKS
April, 1963.						
10	Madras	E	eP PPP eS PPS ScS LQ LR M	07 59 20 08 02 20 06 42 06 59 09 10 12 19 15 26 19 44	5750	
	Bokaro	E	iP	07 59 25		Distant.
	Dehra Dun	Z	iP	08 00 32		Rarefaction.
	Bombay	E	e e	08 03 33 08 44		
	Hyderabad	E N	M M	08 16 11 16 14		Period = 21 secs. Gr. dis = 6 μ. Period = 24 secs. Gr. dis = 11 μ.
10	Dehra Dun	ZE ENZ	iP i	09 03 46 04 10		Slight, rarefaction.
10	Poona	Z	eP	09, 08 32		Slight.
	Chatra	Z	iP	11 49 24		Feeble, distant, compression.
	Dehra Dun	Z	iP	11 50 15		Slight, compression.
10	Tocklai	E	e i	14 16 47 17 12		Slight.
	Chatra	Z	e i i e	14 17 32 18 19 18 43 18 47		Slight.
	Dehra Dun	Z	iP	14 19 20		Slight, compression.
	Delhi		iP	14 19 21		Slight, compression.
11	Delhi	EZ	iP	03 08 15		Tremor, compression. Initial ground movement towards East.
11	Chatra	Z	eP i i	09 21 55 23 04 23 20		Feeble, near.
11	Delhi	Z	iP	09 26 28		Slight, rarefaction.
	Dehra Dun	Z	eP	09 26 35		Slight.
	Chatra	Z	eP	09 41 34		Slight, distant.



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April, 1963.

11	Delhi	ENZ	iP	09 42 28		Slight. Initial ground motion towards North east. Compression.
	Dehra Dun	Z	eP	09 42 32		Slight.
11	Dehra Dun	Z	eP	10 14 42		Slight.
11	Chatra	Z	iP	17 14 05		Slight, near, rarefaction.
			i	14 20		
			i	14 46		
12	Epc:- 31.9° N, 78.8° E, Northern India. h = about 33 Km. -H= 00 h 41 m 27.9 s (USCGS). Mag. ∴ = 5.4 (CGS). Epc:- 30.2° N 77.7° E (Shillong) -H= 00 h 41 m 50 s .					
✓	Dehra Dun	ENZ	iPn	00 42 00	200	Initial ground movement towards South-West. Compression.
			P*	42 01		
			Pg	42 04		
			PP	42 08		
			LQ	42 10		
			PPP/LR	42 14		
			e	42 22		
			iSg	42 28		
✓	Delhi	ENZ	iPn	00 42 23	360	Initial ground movement towards North-east. Rarefaction.
			iP	42 27		
		NZ	i	42 30		
		E	Sn	43 02		
			S*	43 09		
✓	Chatra	Z	eP	00 43 36		
		ZNE	i	00 45 24		
		NE	i	00 46 23		
✓	Bokaro	NE	iP	00 43 54	1120	
			LQ	45 40		
			eS	45 49		
			SS	46 01		
		E	LR	46 12		
		NE	SSS	46 16		
			M	47 02		
✓	Visakhapatnam	NE	eP	00 44 33	1480	
			eS	47 03		
✓	Sehore	E	eP	00 44 35		
			i	44 40		
			i	45 36		
✓	Poona	Z	eP	00 44 44	1470	Rarefaction.
		E	iS	47 13		
		Z	SS	47 37		
			SSS	47 55		
			Lr	48 21		



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12	✓ Hyderabad	N	eP	00 44 45	1550	Period = 8 secs. Gr. dis = 3 μ.
		E	eS	47 21		
			M	49 05		
	✓ Bombay	Z	eP	00 44 48	1600	
		ESZ	eS	47 29		
	✓ Madras	E	eP	00 45 52	1890	
			PP	46 06		
			iS/LR	49 01		
			SS	49 26		
			LR	49 47		
			M	51 14		
	✓ Calcutta	E	e	00 46 32		
	✓ Kodaikanal	E	e	00 50 10		Distant.
			i	52 39		
12	Chatra	Z	eP	05 38 29		Slight.
12	Dehra Dun	Z	eP	08 57 01		Slight.
12	Dehra Dun	Z	eP	13 49 50		Slight.
12	Chatra	Z	eP	14 49 39		Slight.
12	Dehra Dun	Z	eP	15 24 22		Slight.
	Delhi	Z	iP	15 24 37		Slight, rarefaction.
12	Delhi	Z	iP	16 47 32		Slight, compression.
12	Dehra Dun	Z	eP	19 57 45		Slight.
	Delhi	Z	eP	19 57 53		Slight, compression.
12	Dehra Dun	Z	eP	22 47 58		Slight.
			i	48 23		
13	Delhi	EZ	iP	00 07 29		Slight. Initial ground movement towards West. Rarefaction.
13	Chatra	Z	e	01 28 17		Slight.
13	Delhi	ENZ	iP	02 33 18		Slight. Initial ground movement towards North West. Compression.
13	Epc:- 6.2° S 76.5° W, Central Peru. h = about 125 Km. -H= 02 h 20 m 57.5 s (USCGS). Mag.: 6 <sup>3</sup> / <sub>4</sub> -7 (Pas). 6.3 (CGS).					



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
13	✓ Delhi	ENZ	e iPKP	02 39 21 40 25	15980	Rarefaction. Initial ground movement towards South-east.
		Z	i	40 59		
		E	PP	43 42		
	✓ Dehra Dun	ENZ	iP	02 40 25		Rarefaction. Initial ground movement towards North West.
	✓ Bombay	EN	ePKP e e	02 40 28 43 57 51 36		Distant.
	✓ Poona	Z	iPKP	02 40 29		Rarefaction.
	✓ Sehore	E	PKP	02 40 31		
	✓ Chatra	Z	iPKP	02 40 38		Distant.
	✓ Bokaro	NE	iPKP i	02 40 39 41 07		Distant.
		E	i	52 14		
	✓ Madras	E	ePKP	02 40 52		
	✓ Port Blair	NE E	iPKP i i	02 40 27 45 51 53 29		
	✓ Madras	E	e	02 46 12		Moderate.
13	Dehra Dun	Z	iP	06 34 29		Slight, compression.
	Delhi	NZ ENZ	iP iS	06 34 48 36 04	720	Slight.
13	Visakhapatnam	E	eP	13 40 59		Slight.
13	Epc:- 3.4° S 135.4° E, Near North coast of New Guinea. h = about 31 Km. -H= 14 h 31 m 21.0 s (USCGS). Mag:= 5.6 (CGS).					
	✓ Port Blair	E	eP eS	14 39 48 46 21	4890	
		NE	SSS	49 52		
	✓ Bokaro	NE E	iP i	14 40 56 48 40		Distant.
	✓ Chatra	Z NE	iP i	14 40 57 48 40		Distant.
	✓ Madras	E	eP i PP PPP eS	14 41 10 41 23 43 20 44 42 49 02	6300	

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
13	✓ Madras (Contd.)	E	PS PPS e e e	14 49 15 49 25 50 28 53 14 55 42		
	✓ Poona	Z	iP	14 41 56		Rarefaction.
	✓ Tocklai	E	e	14 41 14		
	✓ Dehra Dun	Z EN ENZ EN	iP e i i	14 41 56 41 59 42 12 51 13		Rarefaction.
	✓ Delhi	ENZ	iP i	14 41 57 42 09	7030	Rarefaction. Initial ground movement towards East.
		EN	iS	50 29		
	✓ Bombay	NEZ NE	eP PP PPP	14 42 04 44 50 46 24	7190	
		NEZ	eS PS	50 44 51 06		
13	Dehra Dun	Z	eP	14 51 34		Slight.
	Delhi	ENZ	iP iS	14 51 44 53 19	920	Slight, rarefaction. Initial ground movement towards North, West.
	Chatra	Z	eP i	14 53 23 56 19		Slight, distant.
13	Dehra Dun	Z	eP	15 10 53		Slight.
13	Dehra Dun	Z	eP	15 51 01		Slight.
13	Dehra Dun	Z	eP i	20 25 16 25 39		Slight.
13	Delhi	ENZ	iP	22 13 53		Slight, compression. Initial ground movement towards South, East.
14	Delhi	Z	eP	13 26 23		Slight, compression.
14	Delhi	Z	iP iS	17 42 15 43 55	970	Slight, rarefaction.
14	Delhi	Z	iP	19 07 50		Slight.
14	Delhi	Z	iP	20 46 06		Slight, compression.
14	Chatra	Z	eP iS	22 57 31 58 33	480	Slight.
15	Delhi	EZ	eP	04 33 44		Slight, rarefaction. Initial ground movement towards West.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
<u>April, 1963.</u>						
15	Delhi	Z	eP	06 00 15		Slight, rarefaction.
15	Delhi	Z	iP	07 45 24		Slight, rarefaction.
15	Dehra Dun	Z	iP	08 48 08		Slight, rarefaction.
	Delhi	ENZ	iP iS	08 48 29 49 41	690	Slight, rarefaction. Initial ground movement towards North, East.
15	Bokaro	NE	i	12 11 39		Tremor.
15	Dehra Dun	Z	eP i	15 46 05 46 29		Slight.
	Delhi	Z	iP	15 46 37		Slight, rarefaction.
15	Chatra	Z	eP eS	18 28 30 29 48	740	Slight.
15	Port Blair	NE	i	20 02 37		Slight, near.
15	Chatra	Z	iP	20 27 51		Slight, near, compression.
	Delhi	Z	iP	20 29 03		Slight, rarefaction.
	Dehra Dun	Z	iP	20 29 05		Slight, compression.
15	Port Blair	NE	i	20 58 52		Slight, near.
15	Tocklai	E	e e	21 24 11 24 41		Slight.
15	Chatra	Z NE	iP iS	21 24 28 26 07	960	Slight.
	Delhi	NZ	iP i	21 26 25 29 34		Slight, compression. Initial ground move- ment towards North.
	Dehra Dun	Z	eP eS	21 26 30 29 27		Slight.
15	Bombay	EN	e e	21 31 50 35 02		Slight.
15	Delhi	Z	iP	22 05 55		Slight, rarefaction.
16	Dehra Dun	Z	eP	00 25 16		Slight.
16	Delhi	ENZ	iP iS	00 25 34 26 25	0480	Slight, rarefaction. Initial ground move- ment towards North.

16 Epc:- 0.8° S 128.0° E, Halmahara Region.  
h = about 33 km.  
-H- 01 h 29 m 11.4 s (USCGS). Mag: = 7(Pas)6.1 (CGS).  
Epc:- 1° S 128° E  
-H- 01h 29 m 15 (Shillong)

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
<u>April, 1963.</u>						
16	Port Blair	NE E	iP PP PPP	01 36 35 37 50 38 13	4090	Initial ground move- ment towards South.
		NE E	iS SS SSS	42 20 44 31 45 05		
			LR	46 23		
	Tocklai	E	M	01 50 24		Slight.
	Chatra	ZNE	e iP iS	01 38 18 37 58 44 39	5390	Rarefaction. Initial ground movement towards South, East.
	Visakhapatnam	NE	iP iS	01 37 58 44 56	5340	Initial ground move- ment towards South, East.
	Bokaro	NE	iP PcP PcS S PS PPS ScS SS LQ SSS LR M	01 37 59 39 15 43 06 44 56 45 00 45 06 47 31 48 09 49 24 49 32 51 35 55 19	5310	Initial ground motion towards West.
	Madras	E	eP	01 38 12		
	Kodaikanal	E	iP eS M	01 38 27 45 45 - - -	5690	Initial ground move- ment towards West. Actual movement = 290 μ. Period = 21 secs.
	Hyderabad	EN E N E	iP i iS iS SS LR LR M	01 38 33 42 17 45 55 45 58 49 22 53 02 53 19 57 10	5810	Initial ground motion towards North, West.  Period = 21 secs. Gr. dis = 89 μ. Period = 20 secs. Gr. dis = 69 μ.
	Sehore	NE	iP eS	01 38 57 46 30	5960	
	Delhi	ENZ Z EN E ENZ	iP i i PcP PP PPP iS	01 39 01 39 04 39 32 39 48 41 30 42 22 46 52	6280	Compression. Initial ground motion towards North, West. Mag : 7.2.



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 h. m. s. km.

April, 1963.

16	Poona	Z EN E	iP iS PcP PP PPP PcS PS PPS ScS SS SSS Lq Lr M	01 39 02 46 54 39 59 41 19 42 39 43 55 47 06 47 14 48 44 50 43 52 39 52 47 54 38 59 55	6290	Compression. Initial ground movement towards North, West.
	Dehra Dun	ENZ  EN	iP PcP PP PPP PcS iS PS PPS ScS SS SSS LQ LR M	01 39 07 40 07 41 15 42 30 44 09 46 54 47 05 47 17 49 00 50 45 52 45 52 57 55 38 02 00 16	6200	Rarefaction. Initial ground movement towards South East.
	Bombay	NEZ E  N NE  E  N  E	eP PcP PP PcS i iS PS PPS ScS LR M  M	01 39 12 40 19 43 18 44 40 47 00 47 12 47 28 47 50 49 28 54 58 02 06 00  06 24	6450	Period = 19 secs. Gr. dis = 53 $\mu$ . Period = 23 secs. Gr. dis = 182 $\mu$ .
16	Epc:- 0.7° S 128° E. Halmahera Region. (USCGS). h = 32 km. -H= 01 h 55 m 10.9 s . Mag : 6.0 (CGS). Epc:- 4° N 130° E -H= 01 h 55 m 10 s (Shillong).					
	Port Blair	NE	eP	02 02 21		
	Chatra	Z NE	iP e	02 03 50 10 58		
	Bokaro	NE	iP	02 03 51		Distant.



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 h. m. s. km.

April, 1963.

16	Visakhapatnam	NE	iP iS	02 03 51 10 49	5330	Initial ground movement South-east.
	Madras	E	eP PcP PP PcP iS ScS SS LQ SSS LR M	02 04 09 05 31 06 05 07 04 11 19 13 52 14 52 16 03 16 17 18 18 22 41	5550	
	Sehore	NE N	eP iS	02 04 43 12 28	6170	
	Delhi	ENZ	iP iS	02 04 52 12 40	6220	
	Dehra Dun	EN E N EN	eP i i i	02 04 58 05 23 05 26 13 13		
	Bombay	Z	eP	02 05 00		
16	Delhi	Z	iP	02 26 25		Slight.
16	Dehra Dun	Z	eP	03 42 06		Tremor.
16	Chatra	Z	eP eS	03 52 30 53 58	840	Slight.
	Tocklai	E	e	03 52 39		Tremor.
16	Delhi	Z	iP	03 56 13		Slight, compression.
16	Dehra Dun	Z	eP	04 07 16		Slight.
Epc:- 0.8° S 128.9° E, Halmahera Region . h = about 33 Km. -H= 04 h 10 m 16.3 s (USCGS).						
	Delhi	Z	eP	04 19 55		Slight, compression.
	Dehra Dun	Z	eP	04 19 57		Slight.
16	Delhi	Z	eP eS	05 28 14 29 55	980	Slight, compression.
	Dehra Dun	Z Z	eP iS	05 28 16 29 58	990	Slight.
16	Calcutta	E	iP i	07 37 35 44 15		Slight.



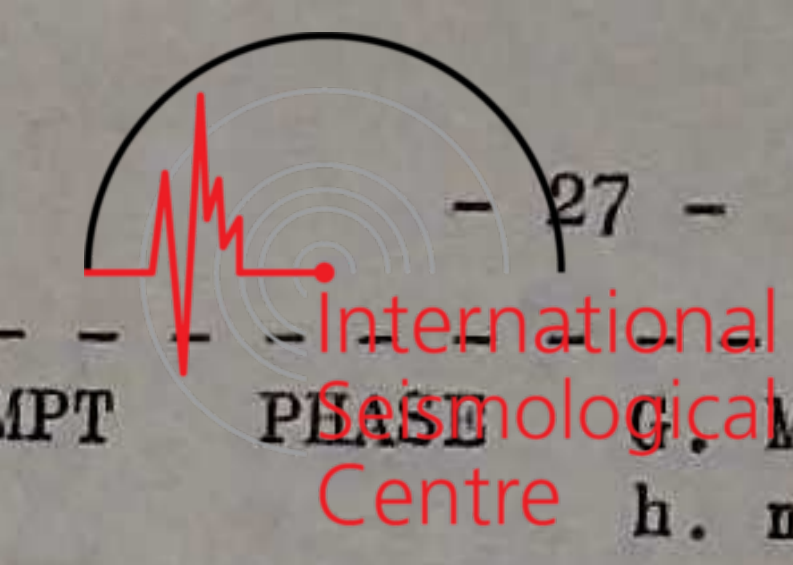
DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
<u>April, 1963.</u>						
16	Epc:- 0.9° S 128.5° E, Halmahera Region. h = about 33 Km. -H= 09 h 10 m 29.0 s (USCGS). Mag := 4.4 (CGS).					
	Delhi	Z	eP	09 20 14		Compression.
	Dehra Dun	Z	iP	09 20 16		Compression.
16	Port Blair	E	e	12 11 00		
			e	12 54		
			i	16 31		
16	Epc:- 1.0° S 127.6° E, Halmehara Region. h = about = 33 Km. -H= 12 h 03 m 42.5 s (USCGS). Mag:= 4.7 (CGS).					
	Epc:- 1° S 127.5° E (Shillong). -H= 12 h 03 m 35 s					
	✓ Visakhapatnam	NE	iP	12 12 16	5330	Initial ground movement South-east.
			iS	19 14		
	✓ Bokaro	NE	iP	12 12 17	5300	Initial ground movement towards East.
			eS	19 13		
	✓ Chatra	ZNE	iP	12 12 20	5310	Initial ground motion towards South-east.
			iS	19 17		Rarefaction.
	✓ Madras	E	iP	12 12 27	5480	Initial ground motion towards East.
			PP	14 24		
			iS	19 33		
			e	20 53		
			SS	22 53		
			LQ	24 21		
	✓ Kodaikanal	E	iP	12 12 40	5680	Distant.
			iS	19 58		
	✓ Poona	Z	iP	12 13 20		Slight, rarefaction.
	✓ Delhi	ENZ	iP	12 13 22	6190	Slight, rarefaction.
			i	13 23		Initial ground movement towards North, East
			eS	21 08		
	✓ Dehra Dun	Z	iP	12 13 23	6320	Slight, rarefaction.
			eS	21 16		
	✓ Bombay	ES	eP	12 13 29	6310	Slight.
			eS	21 21		
16	Chatra	Z	iP	16 54 18		Slight, distant, compression.
16	Epc:- 35.4° N 44.3° E, Iraq. h= about 104 Km. -H= 18 h 47 m 08.8 s (USCGS) Mag:= 5.2 (CGS).					



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
<u>April, 1963.</u>						
16	✓ Delhi	Z	eP	18 50 08	6610	
			eS	58 17		
	✓ Dehra Dun	Z	iP	18 53 01		Compression.
		EN	e	58 00		
16	Madras	E	e	19 05 55		Slight.
			e	11 00		
16	Delhi	Z	eP	19 11 15		Slight, compression.
	Dehra Dun	Z	eP	19 11 17		Tremor.
16	Delhi	ENZ	iP	19 32 24		Tremor, compression. Initial ground movement towards South, West.
16	Epc:- 1.3° S 128.9° E, Halmahera region. h = about 33 Km. -H= 20 h 00 m 47.2 s (USCGS). Mag : 4.6 (CGS).					
	Chatra	Z	iP	20 09 33		Distant, compression.
	Delhi	ENZ	eP	20 10 35		Compression.
	Dehra Dun	Z	eP	20 10 39		
17	Delhi	Z	iP	00 05 39		Slight, rarefaction.
17	Chatra	Z	iP	01 10 34	230	Slight, rarefaction.
			iS	11 01		
17	Epc:- 0.6° S 128.1° E, Halmahera Region. h = about 89 Kms. -H= 01 h 10 m 16.6 s (USCGS).					
	✓ Port Blair	E	eP	01 17 27		Slight.
			e	18 27		
			i	19 01		
			i	19 30		
	✓ Visakhapatnam	E	eP	01 18 45	5340	Slight. Initial ground movement towards South East.
			iS	25 43		
	✓ Chatra	Z	eP	01 18 49		Slight, distant.
	✓ Bokaro	E	iP	01 18 49	5280	Slight. Initial ground movement towards East.
			PP	20 41		
		NE	eS	25 44		
		E	ScS	28 33		
			LQ	30 03		
17	Madras	E	eP	01 19 00	5420	Slight.
			PP	20 54		
			PPP	21 47		



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
17	Madras(Contd.)	E	iS PS PPS e SS SSS LR M	01 26 03 26 09 26 16 27 29 29 30 30 56 33 06 37 22		
	Delhi	EZ Z E	iP e eS	01 19 51 21 33 27 38	7330	Slight, East, compression.
	Poona	Z	eP	01 19 51		Slight.
	Dehra Dun	EZ N E	eP eS i	01 19 52 27 43 27 46	5250	Slight.
	Bombay	EZ E NE E	eP PPP eS SS	01 20 00 23 20 27 59 31 52	6430	Slight.
17	Epc:- 19.6° S 178.6° E, Fiji Islands. h = about 33 Km. -H= 02 h 11 m 26.1 s (USCGS). Mag: = 6 $\frac{1}{2}$ -6 $\frac{3}{4}$ (Pas)b(Berk) 5.9 (CGS).					
	Madras	E	eP e eS e e	02 25 21 29 29 36 09 38 32 46 57	11220	Distant.
	Bombay	EZ NEZ E NEZ E N	e e eS e M M	02 30 12 30 27 36 42 37 46 40 03 03 21 - 23 -		
	Kodaikanal	E	i	02 36 18		Slight, distant.
17	Dehra Dun	Z	eP	04 12 57		Tremor.
17	Delhi	Z	iP	06 50 27		Slight, rarefaction.
17	Bokaro	NE	iP	09 23 36		Feeble, local.
17	Epc:- 1.1° S 128.0° E, Halmahera region. h = about 33 Km. -H= 10 h 28 m 08 s (USCGS).					
	Dehra Dun	Z	eP	10 29 48		Slight.
	Delhi	Z	iP	10 29 49		Slight.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
17	Epc:- 36.2° N 70.7° E, Hindukush. h = about 140 Km. -H= 10 h 45 m 21.1 s (USCGS).					
	Dehra Dun	Z N EN	eP i i	10 47 22 49 16 50 01		Slight.
	Delhi	ENZ	iP i iS	10 47 32 47 34 49 33	1180	Slight, compression. Initial ground movement towards South, East.
	Poona	Z	eP	10 48 46		Slight.
	Chatra	Z	eP	10 49 10		Slight, distant.
	Bokaro	E	eP i i	10 49 27 53 21 55 27		Slight, distant.
	Madras	E	eP e LQ LR	10 50 48 51 47 56 25 57 45		Slight.
17	Delhi	Z	iP	12 43 42		Slight, rarefaction.
17	Epc:- 3.5° S 135.4° E (Western New Guinea). h = about 39 Km. -H= 17 h 03m 02.4 s (USCGS). Mag : 5.5 (CGS).					
	Shillong	ZN	iP	17 12 04		Distant, compression.
	Delhi	Z	eP	17 13 36		
	Dehra Dun	Z	iP	17 13 37		Rarefaction.
17	Shillong	ZN	iP i	18 43 30 45 35		Slight, distant, compression.
17	Bombay	ES	e e	18 53 30 19 29 -		Slight.
17	Shillong	ZN	iP	20 12 19		Slight, distant, rarefaction.
17	Shillong	ZN N	iP eS	21 29 02 29 15	100	Slight.
17	Chatra	Z	eP eS	23 09 06 09 38	280	Slight.
	Shillong	ZN	eP	23 09 59		Slight, distant.
17	Shillong	ZN N	iP iS	23 43 59 44 15	120	Slight, compression. Initial ground movement towards South.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	Δ km.	REMARKS.
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17	Shillong	ZN N	iP eS	23 57 05 57 23	140	Slight.
18	Shillong	ZNE	iPg iSg	11 01 29 01 34	40	Slight. Initial ground movement towards South.
18	Shillong	ZNE	iP	11 30 10		Slight, distant, compression. Initial ground movement towards East.
18	Poona	Z	iP iS	14 48 57 49 14	140	Slight, rarefaction.
	Bombay	Z	eP	14 49 29		Slight, near.
18	Shillong	ZNE	iP	18 25 21		Slight, distant. Initial ground movement towards West. Compression.
	Chatra	Z	eP	18 25 56		Slight, distant.
	Dehra Dun	Z	eP	18 27 05		Slight.
	Delhi	EZ	eP	18 27 11		Slight. Initial ground movement towards East. Rarefaction.
18	Shillong	ZNE	iP iS	18 30 39 31 25	420	Slight, compression. Initial ground movement towards West.
18	Delhi	Z	eP	18 36 35		Slight, rarefaction.
18	Delhi	Z	eP	20 21 48		Slight, compression.
18	Epc:- 1.3° S 128.8° E, Halmahera Region. h = about 33 Km. -H= 22 h 01 m 07.7 s (USCGS). Mag: 4.7 (CGS).					
	Shillong	ZNE Z E ZNE	iP PPP LQ iS	22 09 19 09 37 11 29 11 38	1370	Initial ground movement towards South. Rarefaction.
	Chatra	Z	iP	22 09 23		Distant, rarefaction.
	Delhi	Z	eP	22 10 55		Rarefaction.
	Dehra Dun	Z	iP	22 10 57		
18	Delhi	Z	iP	22 13 11		Slight, compression.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	Δ km.	REMARKS.
April, 1963.						
18	Epc:- 1.7° S 128.1° E, Halmahera Region. h = about 63 Kms. -H= 22 h 09 m 56.9 s (USCGS).					
	Shillong	ZNE	iP	22 18 04		Slight, distant, rarefaction. Initial ground movement towards East. Slight, distant.
	Chatra	Z	eP	22 18 40		Slight. Initial ground movement towards North West. Compression.
	Delhi	NZ	eP	22 19 43		
	Dehra Dun	Z	eP	22 19 45		Slight.
18	Shillong	ZE	iP	22 40 24		Slight, distant. Initial ground movement towards West.
19	Chatra	Z	eP eS	00 57 34 57 55	160	Slight.
19	Delhi	EN Z	iP iS	02 56 25 58 04	960	Slight. Initial ground movement towards North West. Rarefaction.
19	Tocklai	E	e	06 16 10		Tremor.
19	Chatra	Z	eP	06 16 37		Slight, distant.
19	Epc:- 35.8° N 96.9° E, Tsinghai Province (China). h = about 33 Km. -H= 07 h 35 m 23.7 s (USCGS). Mag := 7(Pas). 6 <sup>3</sup> / <sub>4</sub> -7(Berk) 6.1 (CGS).					
	Epc:- 36.0° N 97.4° E in Tsinghai Province, China. -H= 07 h 35 m 15 s (CSO Shillong)					
	Chatra	ZNE NE	eP PP PPP LQ eS SS LR/SSS	07 38 12 38 20 38 29 40 18 40 29 40 39 40 54	1350	Initial ground movement towards North, East. Rarefaction.
	Delhi	Z ENZ EN ENZ EN E N EN	i iP PP iS LQ LS LR, SSS PcP	07 38 25 39 25 39 44 42 47 42 59 43 07 43 42 43 51	1990	Initial ground movement towards North, East. Rarefaction.
	Tocklai	E	eP iS	07 38 32 41 00	1460	



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
19	Bokaro	NE	iP e	07 38 51 42 17		Initial ground movement towards North, east.
	Calcutta	N	iP iS M	07 38 53 41 39 43 29	1650	Period = 7 secs. Gr.dis = 250 $\mu$ .
	Dehra Dun	ENZ	iP PP PPP iS/LQ SS	07 39 12 39 27 39 36 42 08 42 28	1780	Initial ground movement towards North-east. Rarefaction.
	Sehore	E	iP PP iS LQ SS	07 40 06 40 35 44 06 44 35 44 54	2460	
	Visakhapatnam	NE N	iP iPP iPPP eS SS	07 40 11 40 37 40 45 44 11 44 59	2460	Initial ground movement towards North, Ea
	Port Blair	NE E  NE E	iP PP PPI iS LQ SS SSS LR M	07 40 39 41 19 47 30 45 00 45 38 45 56 46 16 46 56 48 48	2770	Initial ground movement towards North, We
	Poona	NEZ E  EZ E	iP PP PPP PcP iS LQ SS SSS PcS LR M ScS	07 40 58 41 54 42 06 44 48 45 28 46 52 47 08 47 24 47 36 48 12 50 44 51 38	2920	Initial ground movement towards North-east. Rarefaction.
	Bombay	ZES Z	iP iS	07 41 02 45 41	3030	
	Madras	E	iP PP PPP i	07 41 05 41 53 42 03 42 25	3070	Initial ground motion towards East.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
19	Madras(Contd.)	E	PcP iS LQ SS SSS LR M	07 44 20 45 46 46 49 47 03 47 23 48 08 50 27		
	Kodaikanal	E	iP iS SS M	07 41 35 46 41 48 41 -	3450	Initial ground movement towards East. Period = 20 secs.
19	Dehra Dun	Z	eP	10 54 43		Tremor.
19	Chatra	Z	eP eS	15 12 15 13 12	530	Slight.
19	Epc:- 1.3° S 128.8° E, Halmahera region. h = about 33 Km. -H= 16 h 28 m 52.3 s (USCGS). Mag:= 4.7 (CGS).					
	Dehra Dun	Z	eP	16 36 39		
	Chatra	Z	iP	16 36 42		Distant, compression.
	Delhi	Z	iP	16 37 35		Rarefaction.
	Madras	E	eP PP PPP eS PS PPS	16 37 49 39 46 40 42 45 05 45 15 45 22	5640	
19	Delhi	Z	iP	16 39 40		Slight, rarefaction.
19	Dehra Dun	Z	eP	19 51 20		Slight.
19	Delhi	Z	eP	20 52 26		Slight, rarefaction.
20	Chatra	Z	iP	00 39 15		Slight, distant, rarefaction.
20	Delhi	Z	iP	01 00 53		Slight. Initial ground movement towards North West. Rarefaction.
20	Epc:- 1.2° S 128.9° E, Halmahera region. h = about 28 Km. -H= 01 h 07 m 57.8 s (USCGS). Mag:= 5.1 (CGS).					
	Chatra	Z	iP	01 16 44		Distant, rarefaction.
	Delhi	Z	iP	01 18 46		Initial ground movement towards South, West. Compression.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
20	Bokaro	NE E	iP eS	03 28 43 29 05	180	Slight.
20	Delhi	Z	iP	06 07 55		Slight, compression.
20	Shillong	ZNE	iP	07 13 26		Slight, distant, compression.
20	Shillong	ZNE	iP	09 30 04		Slight, near, rarefaction.
	Chatra	Z	iP iS	09 30 28 31 10	490	Slight, compression.
20	Shillong	ZNE	eP	15 44 19		Slight, distant.
20	Delhi	Z	iP	17 15 07		Slight, compression.
20	Shillong	ZNE	iP	20 41 57		Slight, distant, compression.
	Delhi	Z	eP	20 42 42		Slight, rarefaction.
20	Delhi	ENZ	eP eS	22 46 34 48 19	1020	Slight. Initial ground movement towards South West. Compression.
	Chatra	Z	eP eS	22 48 08 50 09	1170	Slight.
	Shillong	ZNE	iP	22 48 55		Slight, distant, compression. Initial ground movement towards East.
21	Shillong	NE	iP	00 16 48		Slight, distant.
21	Shillong	ZNE NE Z	iP iS eSg	01 43 38 44 10 44 20	280	Slight, compression.
	Delhi	EZ	iP	01 49 16		Slight. Initial ground movement towards East. Rarefaction.
21	Epc:- 24.1°N 122.1°E, Near east coast of Formosa. h = about 33 Km. -H= 04 h 38 m 21.7 s (USCGS). Mag: 5.2 (CGS).					
	Shillong	ZNE ZE	iP i eS e e	04 44 07 49 16 49 44 52 30 55 00	3000	Compression. Initial ground movement towards West.
	Chatra	Z NE	iP e	04 44 45 48 27		Compression.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
21	Bokaro	E	iP	04 44 58		Distant. Initial ground movement towards West.
	Delhi	EZ EZ N NZ	iP e eS e	04 45 58 47 36 52 02 55 04	4400	Initial ground movement towards South West. Compression.
	Madras	E	eP e M	04 46 07 59 08 05 04 24		
	Poona	Z	iP	04 46 38		Rarefaction.
	Port Blair	E	M	04 57 -		Period = 17 secs. Gr. dis = 10 μ.
21	Shillong	ZNE	iP	05 24 08		Slight, distant, rarefaction.
21	Delhi	EZ	eP i	06 18 33 18 55		Slight. Initial ground movement towards North-east. Compression.
21	Shillong	Z	iP	08 12 36		Slight, distant, rarefaction.
21	Shillong	ZNE Z	iPg eP* iSg	08 55 43 55 45 55 48	40	Slight.
21	Epc:- 26.8°N 128.5°E, Ryuku Islands h = about 28 Km. -H= 09 h 17 m 05.2 s (USCGS).					
	Shillong	ZNE	iP PP iS	09 23 38 24 46 28 54	3630	Slight, compression. Initial ground movement towards South-east.
	Chatra	Z	iP	09 24 13		Slight, distant, compression.
	Delhi	ENZ	iP	09 25 21		Slight. Initial ground movement towards North West. Compression.
21	Port Blair	NE	i	10 01 25		Slight, near.
21	Epc:- 3.2° S 146.9° E, Bismark Sea. h = about 33 Km. -H= 10 h 38 m 30 s (USCGS). Mag: = 6.0 (CGS).					
	Shillong	ZNE	iP	10 48 38		Compression.
	Chatra	Z	iP	10 49 09		Compression.
	Delhi	Z	iP	10 50 03		Rarefaction.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
21	Shillong	Z	iP	11 58 35		Slight, distant, rarefaction.
21	Chatra	Z	iP	15 44 40	160	Slight, compression.
		ZNE	iS	45 01		
21	Shillong	ZNE	iP	15 45 06	470	Slight, compression. Initial ground movement towards West.
			iP*	45 15		
			iPg	45 14		
			iS	45 57		
21	Delhi	Z	iP	20 11 48		Slight, compression.
21	Shillong	ZNE	iP	21 26 05		Slight, distant, rarefaction. Initial ground movement towards South, West.
21	Bokaro	E	iP	23 23 00		Slight, near.
						Slight, compression.
	Shillong	ZNE	iP	23 25 02		
22	Shillong	Z	iP	00 36 33		Slight, distant, rarefaction.
22	Epc:- 31.5°N, 74.0°E. West Pakistan. Felt Lahore. H = 00h. 51m. 09.0s. h = about 37 km. (CGS) (USCGS).					
	Delhi	ENZ	iP	00 52 10	410	Slight, Southeast compression.
			SSS	53 09		
	Chatra	Z	eP	00 54 11		Slight, distant.
		NE	e	00 57 50		
	Shillong	ZNE	iP	00 55 04		Slight, distant, rarefaction. Initial ground movement East.
	Poona	Z	eP	00 55 09		Slight.
	Bokaro	E	iP	00 56 04		Slight.
			i	56 23		
			e	58 06		
	Bombay	ES	e	00 57 44		Slight.
	Madras	E	e	01 00 40		Slight.
			e	01 03		
22	Delhi	Z	iP	01 58 11		Initial ground movement towards West. Compression., tremor.
22	Delhi	Z	iP	08 42 30		Slight.
22	Delhi	Z	iP	10 32 58		Tremor, Compression.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
April, 1963.						
22	Delhi	Z	iP	11 45 31		Slight, compression.
22	Madras	E	e	11 47 33		Surface 'M' waves.
22	Epc:- 41.3°N 39.0° E, Black Sea. h = about 33 Km. -H= 15 h 38 m 10.1 s (USCGS). Mag : = 5.3 (CGS).					
	Delhi	Z	eP	15 44 58		Slight, compression.
	Chatra	Z	iP	15 46 09		Slight, distant, compression.
	Shillong	ZNE	iP	15 46 41		Slight, distant, rarefaction. Initial ground movement towards South East.
22	Shillong	ZNE	eP	19 40 24	320	Slight.
			iS	41 00		
22	Delhi	ENZ	iP	23 58 43	970	Slight. Initial ground movement towards South East. Compression. Slight, distant.
			iS	00 00 23		
23	Shillong	Z	iP	01 10 12		
23	Epc:- 46.9°N 103.7°E Outer Mongolia. h = about 33 Km. -H= 02 h 51 m 17.2 s (USCGS). Mag : 5.1 (CGS).					
	Chatra	ZNE	iP	02 56 27	2580	Initial ground motion towards South East and Compression.
		NE	iS	03 00 36		
	Delhi	E	iP	02 56 58		Slight. Initial ground movement towards North East. Compression.
		NZ	eP	03 01 50		
		EN	e			
	Bokaro	NE	iP	02 57 05	2970	Slight.
			PP	57 49		
			PPP	58 03		
			eS	03 01 40		
			LQ	02 42		
			SSS	03 16		
		M	06 14			
23	Delhi	Z	eP	06 45 07		Slight.
23	Delhi	Z	eP	07 38 33		Slight, distant, rarefaction.
23	Delhi	NZ	eP	08 40 26		Slight, compression.
		N	i	40 29		
		EZ	i	41 05		
23	Bokaro	NE	iP	09 00 14		Slight, local.





DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
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23	Epc:- 25.7° N 99.5° E, Yunnan Province, China. h = about 33 Km. -H= 09 h 55 m 06.8 s (USCGS). Mag : = 5.1 (CGS).					
23	Tocklai	E	eP Pg LQ iS SS SSS	09 56 23 56 42 57 08 57 17 57 27 57 38	520	Slight.
	Shillong	ZNE Z	iP iS	09 56 46 57 50	610	Compression. Initial ground movement towards West.
	Chatra	Z NE	iP eS	09 57 44 59 36	1090	Rarefaction.
	Bokaro	NE E	eP i e e	09 58 03 10 00 54 01 02 02 59		
	Port Blair	NE	eP eS e iS	09 58 42 01 30 10 01 42 03 01	1670	
	Sehore	E	eP	09 59 12		
	Delhi	EZ N EZ Z NZ ENZ Z	iP eP eP iS SS LR i M	09 59 39 59 58 10 03 26 04 00 05 44 07 09 07 38	2410	Initial ground movement towards West. Compression. Probable depth = 100  Period = 16 secs. Amp: 18 mm.
	Madras	E	eP e e iS LQ M	10 00 11 00 42 01 18 04 15 04 38 07 57	2510	
	Poona	Z E	eP eS	10 00 30 04 59	2890	Rarefaction.
	Bombay	NEZ EN	eP eS M	10 00 38 05 11 10 -	2950	
23	Kodaikanal	E	i	10 05 19		Slight, distant.
23	Shillong	Z	eP	11 02 00		Slight, distant.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
23	Shillong	ZNE	iP	11 43 50		Slight, distant, compression. Initial ground movement towards West.
	Delhi	EZ	iP	11 45 40		Slight. Initial ground movement towards East. Compression.
23	Chatra	Z	iP	12 44 30		Slight, compression.
23	Shillong	Z	eP	14 10 10		Slight, distant.
	Chatra	Z	iP	14 12 35		Slight, distant, rarefaction.
23	Port Blair	NE	iPg iSg	16 02 16 02 25	80	Slight.
23	Shillong	ZNE	iP Pg iS	18 35 25 35 29 35 52	230	Slight. rarefaction. Initial ground movement towards South-east.
23	Epc:- 5.1° S 146.1° E, Near Northeast coast of New Guinea. h = about 134 Km. -H= 18 h 52 m 24.4 s (USCGS).					
	Shillong	ZNE	iP	19 02 25		Slight, distant, rarefaction. Initial ground movement towards South-east.
	Chatra	Z	iP	19 02 56		Slight, distant, rarefaction.
	Delhi	NEZ	iP	19 03 47		Slight. Initial ground motion North East. Rarefaction.
23	Delhi	Z EN	eP i	19 46 29 46 36		Slight.
23	Delhi	ENZ EZ N	eP eS i	20 12 57 13 49 13 51	490	Slight.
23	Shillong	ZNE	iP	22 50 30		Slight, distant, rarefaction. Initial ground movement towards East.
23	Delhi	Z	eP	23 07 02		Slight.
23	Delhi	ENZ	iP	23 14 01		Slight. Initial ground movement towards North, West. Compression.
23	Shillong	ZNE	eP	23 52 53		Slight, distant.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
24	Shillong	Z	eP	04 49 49		Slight, distant.
24	Chatra	Z	eP	05 00 21		Slight, distant.
24	Shillong	ZNE ZE	iP eLQ iS	05 59 45 06 01 25 01 33	1050	Slight, initial ground motion towards South.
		E	eSS	01 48		
24	Delhi	NZ	iP	06 01 23		Slight. Initial ground movement towards North Compression.
24	Bokaro	NE	iP	08 21 06		Slight, local.
24	Delhi	Z	i	09 41 42		
24	Bokaro	NE	iP	09 47 49		Slight, local.
24	Delhi	Z	iP	12 43 51		Slight, rarefaction.
24	Epc:- 27.0° N 128.8° E, Ryukyu Islands region. h = about 33 Km. -H= 13 h 32 m 12.2 s (USCGS). Mag : = 5.1 (CGS).					
	Shillong	ZNE ZE NE	iP PcP iS	13 38 46 41 29 44 04	3660	Distant. Initial ground movement towards South East. Rarefaction.
	Chatra	Z	eP	13 39 22		Distant.
	Delhi	ENZ	eP	13 40 29		Slight. Initial ground motion South West. Compression.
24	Delhi	NE	eP	13 47 08		Slight.
24	Shillong	ZNE	eP P* iS Sg	16 29 36 29 39 30 08 30 14	280	Slight.
24	Shillong	ZNE	iP	16 34 20		Slight, distant, rarefaction. Initial ground movement towards East.
24	Epc:- 36.3° N 71.4° E (Hindu kush region). h = about 125 Km. -H= 20 h 31 m 08.9 s (USCGS).					
	Delhi	ENZ	iP iS	20 33 15 34 53	950	Initial ground movement towards North West. Slight, rarefaction.
	Shillong	ZNE	iP	20 35 40		Slight, distant, rarefaction. Initial ground movement towards South.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
24	Chatra	Z	eP	20 35 52		Slight, distant.
24	Shillong	ZNE	iP	21 55 23		Slight, distant, rarefaction.
24	Shillong	ZNE	iP	22 05 00		Slight, distant, Initial ground motion towards South East.
25	Bombay	NE	e	04 37 15		Slight.
	Madras	E	iP eS LQ LR M	04 37 35 41 30 41 48 42 50 44 37	2400	Slight. Initial ground motion towards East.
25	Chatra	Z	iP	06 15 09		Slight, distant, compression.
25	Epc:- 4.7° N 122.4° E, Celebes Sea. h = about 610 Km. -H= 08 h 12 m 57.2 s (USCGS). Mag : 5.5 (CGS).					
	Bokaro	E	iP i i i	08 19 44 21 35 25 10 20 35		
	Chatra	Z NE	iP i	08 19 46 25 11		Rarefaction.
	Visakhapatnam	E	iP i	08 19 47 21 37	1070	Initial ground motion towards West.
	Madras	E	iP e	08 20 05 20 40		Initial ground motion towards East.
	Delhi	ENZ Z EN	iP i eS e	08 20 52 25 02 27 13 29 37	5140	Initial ground movement towards South East. Rarefaction.
	Poona	Z	iP	08 20 55		Rarefaction.
25	Chatra	Z	iP iS	09 13 52 14 13	170	Feeble, rarefaction.
25	Epc:- 4.3° N 62.4° E, Maldives Islands region. h = about 33 Km. -H= 11 h 09 m 29.5 s (USCGS).					
	Bombay	NEZ	e eS	11 13 32 17 24	2360	Slight.
	Poona	Z	iP	11 13 36		Slight, rarefaction.



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

April, 1963.

DATE	STATION	COMPT	PHASE	G. M. T.	$\Delta$	REMARKS	
				h. m. s.	km.		
25	Madras	E	iP	11 13 56	2400	Slight. Initial ground motion towards East.	
			iS	17 51			
			LQ	18 09			
			LR	19 13			
			M	20 59			
Hyderabad	EN E EN E EN E N	iP PP iS LQ SS LR M	iP	11 14 06	2450	Slight. Initial ground movement towards North East.	
			PP	14 33			
			iS	18 06			
			LQ	18 33			
			SS	18 52			
			LR	19 56			
			M	21 02			
			M	21 16			Period = 18 secs. Gr. dis = 6 $\mu$ .
			M	21 16			Period = 18 secs. Gr. dis = 5 $\mu$ .
			M	21 16			
25	Delhi	NZ	eP	11 15 20		Slight. Initial ground movement towards South. Compression.	
25	Shillong	ZNE	iP	11 16 23		Slight, distant. Initial ground movement towards South.	
25	Kodaikanal	E	i	11 17 16		Slight, distant.	
25	Chatra	NE	e	11 24 12		Feeble, distant.	
25	Delhi	EZ	iP	11 28 40		Slight. Initial ground movement East. Rarefaction.	
25	Tocklai	E	eP	11 45 15		Slight.	
25	Shillong	ZNE	eP	11 45 33		Slight, distant.	
25	Chatra	Z	eP	11 48 13		Slight.	
25	Shillong	ZNE	iP	11 57 09		Slight, distant, rarefaction.	
25	Shillong	Z	eP	12 02 31		Slight, distant.	
25	Shillong	ZNE	eP	12 07 18		Slight, distant.	
Epc:- 35.8° N 69.6° E, Hindu kush region. h = about 210 Km. -H= 12 h 14 m 01.1 s (USCGS).							
25	Delhi	ENZ EZ ENZ	iP	12 16 21	1900	Slight. Initial ground movement towards South East. Rarefaction.	
			e	18 16			
			iS	19 31			
25	Chatra	Z	iP	12 18 02		Slight, distant, compression.	



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

April, 1963.

DATE	STATION	COMPT	PHASE	G. M. T.	$\Delta$	REMARKS
				h. m. s.	km.	
25	Shillong	ZNE	iP	12 18 46		Slight, distant, compression.
	Dehra Dun	N	e	12 19 18		Slight.
	Bokaro	E	e	12 22 25		Slight, distant.
25	Epc:- 1.3° S 128.7° E, Halmahera region. h = about 33 km. -H= 16 h 35 m 56.2 s (USCGS). Mag: 5.3 (CGS).					
25	Shillong	ZNE N	iP	16 44 08	4910	Compression. Initial ground movement towards North West.
			PP(PcP)	45 55		
			ScP	49 46		
		ZNE	iS	50 43		
	Bokaro	E	iP	16 44 43	5300	
			iS	51 40		
	Chatra	Z	iP	16 44 43		Compression.
	Delhi	Z EN	iP eS	16 45 45	6310	Slight. Initial ground movement towards South. Compression.
			eS	53 38		
	Bombay	E	eP	16 45 55	6410	Slight.
			eS	53 53		
	Madras	E	eP	16 44 56	5490	
			e	45 24		
			eS	52 03		
	Dehra Dun	N	e	16 53 42		Slight.
	Hyderabad	N	M	16 55 04		Period = 9 secs. Gr. dis = 2 $\mu$ .
25	Shillong	ZNE	iP	17 55 06		Slight, distant, rarefaction.
25	Delhi	ZNE	iP	19 33 04		Slight. Initial ground movement towards South East. Compression.
25	Chatra	Z	iP Sg	22 07 33	160	Slight, compression.
				07 53		
26	Tocklai	E	eP	03 01 57		Slight.
26	Shillong	ZNE	iP	03 02 21		Slight, near, rarefaction. Initial ground movement towards North, East.
26	Shillong	ZNE	iP	04 39 27		Slight, near, compression. Initial ground movement towards West.
26	Delhi	ENZ	ePg iSg	06 02 27	110	Slight, compression.
				02 42		



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

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DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	$\Delta$ km.	REMARKS.
26	Shillong	ZNE	iP	07 42 13		Slight, distant, compression.
26	Shillong	ZNE	iP	08 01 55		Slight, distant, compression.
26	Bokaro	NE	iP	09 41 12		Slight, local.
	Dehra Dun	Z	eP	12 38 07		Slight.
	Delhi	NZ	i <sub>e</sub> P	12 38 07		
26	Shillong	ZNE	iP <sup>i</sup>	13 39 52		Slight, distant, compression.
26	Shillong	ZNE	iPg Sg	14 12 30 12 38	70	Slight, rarefaction.
26	Shillong	ZNE	ePn Sg	16 03 23 03 56	230	Slight.
26	Delhi	Z	iP	17 03 42		Slight, compression.
		EN	e	03 44		
		Z	i	04 19		
			i	07 05		
	Dehra Dun	Z	iP	17 03 43		Slight, rarefaction.
		Z	e	07 13		
26	Epc:- 24.1° N 122.5° E, Off east coast of Formosa. h = about 33 Km. -H= 23 h 45 m 01.2 s (USCGS). Mag : 4.9 (CGS).					
	Shillong	ZNE	iP	23 50 50		Distant, compression. Initial ground movement towards West.
	Chatra	Z	iP	23 51 28		Distant, compression.
	Delhi	EZ N	iP i	23 52 39 52 41		Compression. Initial ground motion towards West.
	Dehra Dun	Z	iP	23 52 44		Compression.
27	Shillong	ZNE	eP	00 44 38	510	Slight.
27	Visakhapatnam	E	eP PP eS PS PPS SS SSS	07 51 00 52 56 57 57 58 07 58 16 08 01 30 02 44	5310	Moderate, distant.
27	Bokaro	E	iP	08 18 28		Slight, local.

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

April, 1963.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	$\Delta$ km.	REMARKS.
27	Epc:- 0.6° S 128.4° E, Halmehara Region. h = about 33 Km. -H= 08 h 42 m 58 s (USCGS). Mag : 4.9 (CGS). Epc:- 2.6° N 130° E. -H= 08 h 42 m 55 s (Shillong).					
	Shillong	ZNE NE	iP iS LQ Lr	08 51 05 57 35 09 01 20 03 20	4840	
	Bokaro	E	iP PcP PP PPP eS	08 51 39 52 59 53 23 54 14 58 35	5290	Initial ground movement towards West.
	Chatra	Z	iP	08 51 40		Distant, compression.
	Madras	E	eP PP PPP iS PS PPS SS LQ LR	08 51 52 53 47 54 45 59 02 57 09 59 18 09 02 33 03 52 06 20	5550	
	Kodaikanal	E	e iS	08 52 01 59 34		Distant.
	Hyderabad	EN E	eP PP PPP iS SS LR M	08 52 16 54 04 55 17 59 33 09 03 22 06 22 10 16	5660	Period = 18 secs. Gr.dis = 6 $\mu$ . Period = 15 secs. Gr.dis = 4 $\mu$ .
	Delhi	Z E ENZ Z ENZ E Z Z	iP i i PcP eS SS e SSS	08 52 42 52 43 52 49 53 38 09 00 36 04 26 05 16 06 45	6200	Rarefaction. Compression. Initial ground movement towards West.
	Dehra Dun	EZ E EN	eP e eS	08 52 43 53 41 09 00 45	6230	Slight, compression.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
27	Poona	Z	eP	08 52 44		Slight.
27	Bombay	E	eP eS	08 52 51 09 00 51	6450	Slight.
27	Delhi	EZ	eP	10 23 56		Slight, compression.
27	Shillong	ZNE	iPg iSg	11 16 41 16 51	90	Slight.
27	Tocklai	E	eP	11 17 03		Slight.
	Chatra	Z	eP iS	11 17 40 18 49	650	Slight.
	Delhi	ENZ Z	iP i	11 18 52 18 54		Slight. Initial ground movement towards North West. Compression.
	Dehra Dun	Z	iP i	11 18 52 23 23		Slight, compression.
27	Delhi	NZ	iP i	15 11 56 12 28		Slight, compression.
27	Shillong	ZNE	iP iS	15 47 54 48 36	390	Slight, rarefaction. Initial ground motion towards South East.
27	Shillong	ZNE	eP iS	16 34 28 35 21	490	Slight.
27	Delhi	Z	eP	19 49 36		Slight, compression.
	Shillong	Z	eP	19 49 44		Slight, distant.
	Dehra Dun	Z	eP	19 49 52		Slight.
27	Shillong	ZNE	iP iS	21 15 05 15 43	340	Slight.
	Dehra Dun	Z	eP e	21 16 52 18 26		Slight.
	Delhi	NZ EZ ENZ	eP e iS	21 17 03 17 35 17 39	320	Slight, rarefaction.
27	Shillong	Z	iP iS	23 24 55 25 47	490	Slight.
28	Shillong	ZNE	iP	04 11 46		Slight, distant, compression. Initial ground movement towards North East.
	Delhi	ENZ	iP	04 13 23		Slight. Initial ground movement towards South East. Rarefaction.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
28	Dehra Dun	Z	eP	04 35 09		
	Delhi	NZ EN	iP iS	04 35 25 37 13	1060	Slight. Initial ground movement towards North. Rarefaction.
28	Shillong	ZNE	eP	04 46 52		Slight, near.
28	Delhi	Z	iP	06 50 39		Slight, compression.
28	Delhi	EZ	iP	07 04 43		Tremor. Initial ground movement towards East.
28	Delhi	ENZ	eP	08 00 52		Slight, compression.
28	Bokaro	NE	iP	08 19 00		Slight, local.
28	Calcutta	E	iP iS	08 51 19 58 07	5180	Slight.
28	Dehra Dun	E	e	12 08 01		Tremor.
28	Chatra	Z	iPg eSg	15 24 23 24 34	90	Slight, compression.
28	Delhi	ENZ	iPg iSg	16 02 30 02 42	100	Slight. Initial ground movement towards North east. Compression.
	Port Blair	NE	e i i	16 15 00 15 19 15 22		Slight, near.
28	Epc:- 0.6° S 128.5° E, Halmahera region. h = about 33 km. -H= 17 h 28 m 20 s (USCGS).					
	Shillong	ZNE	iP	17 36 30		Slight, distant. Initial ground movement towards South, West. Compression.
	Delhi	Z	eP	17 38 06		Slight, compression.
28	Shillong	ZNE	iP	18 25 12		Slight, distant, compression. Initial ground movement towards West.
28	Epc:- 36.1° N 71.3° E, Hindukush. h = about 150 km. -H= 19 h 50 m 11.4 s (USCGS). Mag := 4.8 (CGS).					
28	Epc:- 34.6° N 70.0° E. (Shillong). h = 200 km. -H= 19 h 50 m 14 s					



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
28	Dehra Dun	Z	iPn PP PPP P* Pg LQ	19 52 07 52 14 52 21 52 26 52 47 53 27	870	Compression.
		ENZ	iSn SS LR SSS S* Sg,M	53 37 53 49 53 50 53 59 54 05 54 27		
	Delhi	ENZ	iP iS	19 52 16 53 53	930	Slight. Initial ground movement towards East. Compression.
	Chatra	Z ZNE	iP iS	19 53 53 56 48	1630	Slight, rarefaction.
	Bokaro	E	eP	19 54 52		Slight, near.
	Shillong	ZNE	iP iS	19 54 41 58 17	2350	Slight, rarefaction. Initial ground movement towards North.
	Sehore	E	eP	19 55 46		
	Poona	Z	eP	19 57 27		Slight.
	Madras	E	eS e e e	19 59 57 20 01 02 01 48 03 03		Slight. Initial phase not clear.
28	Shillong	ZNE	eP	20 58 16		Slight, near.
28	Shillong	ZNE	eP S Sg	22 58 41 59 23 59 39	390	Slight.
28	Shillong	ZNE	iP	23 02 37		Slight, distant, compression. Initial ground movement towards South, East.
29	Shillong	ZNE	iP	03 02 22		Slight, near.
29	Shillong	ZNE	iP	04 48 14		Slight, distant, rarefaction. Initial ground movement towards East.
29	Shillong	ZNE	iP	05 08 51		Slight, distant, compression.
	Delhi	EZ	iP	05 11 05		Slight, compression.
29	Bokaro	NE	iP	08 17 44		Slight, local.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
29	Bokaro	E	iP	08 31 46		Slight, local.
29	Dehra Dun	E EN	i i	13 41 39 42 31		Slight.
29	Shillong	ZNE E	iPg iSg	16 21 25 21 48	190	Slight, compression.
	Chatra	Z	iPg iSg	16 21 26 22 37	90	Slight, rarefaction.
29	Chatra	Z	iPg Sg	18 07 50 08 10	250	Slight, compression.
29	Shillong	ZNE	iP	19 41 00		Slight, near, rarefaction.
Epc:- 51.4° N 178.6° E, Andrean of Islands, Aleutian Islands. h = about 60 km. -H = 21 h 44 m 17.1 s (USCGS). Mag: = 6(Pas) 5-5 1/4 (Berk), 6(Pal), 5.6 (CGS).						
Epc:- 51° N 178° E -H = 21 h 44 m 10 s (Shillong).						
	Shillong	ZNE	iP NE ZNE NE	21 55 15 57 50 22 04 16 08 40 13 30	7590	Compression. Initial ground movement towards South West.
	Chatra	ZNE NE	iP iS	21 55 26 22 04 44	7860	Compression. Initial ground motion towards South West.
	Dehra Dun	ENZ N E	iP iS i	21 55 44 22 05 08 05 19	8050	Initial ground movement towards North, East. Compression.
	Bokaro	NE E	iP PcP PP PPP NE eS SKS PS PPS SS SSS	21 55 46 56 00 58 15 22 00 18 05 17 05 41 05 52 06 08 07 47 12 54	8200	Initial ground movement towards East.
	Delhi	Z	iP i NZ NE ENZ i EN	21 55 52 56 04 58 43 22 05 32 10 42 14 26 16 10 19 16 20 38	8380	Initial ground movement towards South West. Compression.
		Z	M			

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 h. m. s. km.

April, 1963.

29	Port Blair	E	eP e	21 56 17 22 06 19	8850	
	Hyderabad	E	iP PP SKS iS SS SSS LR M	21 56 40 22 00 10 06 55 07 10 12 49 16 37 24 55 32 07	9460	Initial ground movement towards Westward.  Period = 18 secs. Gr. dis. = 10 $\mu$ .
	Poona	Z N	iP iS	21 56 46 22 06 54	9330	Initial ground movement North East and compression.
	Bombay	NES ES NE N	eP e eS M	21 56 48 00 08 22 07 18 35 -	9280	Slight.
	Madras	E	eP PP PPP SKS/iS ScS PS P+S LQ LR M	21 56 52 22 00 09 02 04 07 18 07 31 08 05 08 22 19 33 23 46 30 37	9380	
29	Shillong	ZNE	iP	22 23 32		Slight, compression, distant.
29	Shillong	ZNE NE	eP Sg	23 04 44 05 20	260	Slight.
29	Shillong	ZNE NE	ePn Sg	23 21 44 22 19	250	Slight.

Epc:- 0.7° S 129.0° E, Halmahera region.  
 h = about 33 km.  
 -H= 00 h 58 m 18.3 s (USCGS).  
 Mag:= 6 $\frac{3}{4}$ (Pas) 6 $\frac{1}{2}$ (Pal).  
 Epc:- 1° S 129° E.  
 -H= 00 h 58 m 11 s (Shillong).

30	Port Blair	NE E	i i PP PPP i eS i i i	01 05 38 06 27 07 01 07 30 08 33 11 35 12 10 13 14 16 06	4300	Slight, distant, compression.
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DATE STATION COMPT PHASE G. M. T.  $\Delta$  REMARKS.  
 h. m. s. km.

April, 1963.

30	Shillong	ZNE	iP iS	01 06 28 13 05	4970	Moderate, compression. Initial ground movement towards North West.
	Calcutta	E	eP e	01 06 38 10 48		
	Bokaro	NE E	iP PcP PP PPP PcS eS PS ScS SSS	01 07 01 08 23 08 55 09 44 12 03 14 00 14 30 16 37 18 41	5810	Initial ground movement towards East.
	Chatra	ZNE NE	iP PP PPP PcS iS i SS SSS/LQ LR M	01 07 03 08 30 09 44 12 13 14 09 17 03 17 29 18 39 20 39 24 25	5470	Initial ground motion towards North West and compression.
	Visakhapatnam	E	iP iPP ePPP ePcS iS iPs iPPS eSS eSSS	01 07 03 08 56 10 04 12 00 14 09 14 13 14 27 17 39 19 14	5470	First ground movement towards East.
	Madras	E	iP e PP e PPP e PcS, ScP iS PS PPS e ScS SS LQ LR M	01 07 13 07 56 09 04 09 42 10 04 10 42 12 23 14 26 14 31 14 38 15 22 17 00 17 55 19 16 22 11 27 13	5590	Initial ground movement towards West.
	Kodaikanal	E	iP i iS	01 07 28 08 14 14 55	5850	





DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
30	Hyderabad	E	iP	01 07 31	5880	Initial ground movement towards West-ward.
			PP	09 17		
			iS	15 00		
			ScS	17 22		
			SS	18 57		
			SSS	20 34		
			LR	23 00		
			M	27 37		
						Period=15 secs. Gr. dis = 6 μ.
	Delhi	ENZ	iP	01 08 05	6390	Compression. Initial ground movement towards North, West.
		Z	i	08 09		
			PcP	08 43		
			P P	10 10		
			PPP	11 00		
			ScS, ScP	11 40		
		NEZ	iS	16 02		
			PS	16 11		
		N	ScS	17 24		
		Z	SS	19 46		
			i	20 46		
		EZ	SSS	21 32		
		EN	LQ	22 24		
		NZ	LR	25 34		
	Poona	Z	iP	01 08 06	6460	Initial ground movement towards West, North and compression.
		EN	eS	16 07		
		N	M	30 33		
	Dehra Dun	ENZ	iP	01 08 06	6420	Initial ground movement towards North. East. Compression.
		ENZ	PcP	09 02		
		EN	PP	10 14		
		E	PiP	11 33		
			PcP	13 03		
		EN	iS	16 05		
			PS	16 18		
			PPS	16 31		
			ScS	18 01		
			SS	19 57		
			SSS	22 09		
			LQ	22 20		
			LR	25 05		
			M	29 53		
	Bombay	ENZ	eP	01 08 14	6390	
		ES	e	15 03		
			eS	16 11		
30	Shillong	ZNE	iP	01 35 54		Slight, near, compression.
	Delhi	ZN	iP	01 37 31		Slight, rarefaction.
		NZ	i	41 44		
	Dehra Dun	Z	eP	01 37 32		Slight.
			i	41 35		

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
30	Shillong	ZNE	iP	02 42 07		Slight, near, compression.
	Port Blair	NE	eP	03 27 03	200	Slight.
			eS	27 27		
		E	i	30 10		
	Shillong	ZNE	iP	03 29 59		Slight, distant, compression.
	Delhi	NZ	iP	03 31 48		Slight, compression.
30	Epc:- 51.2°N 178.6°E, Rat Islands. Aleutian Islands. h = about 50 Km. -H= 03 h 26 m 04.2 s (USCGS). Mag : 4.9 (CGS).					
	Shillong	ZNE	iP	03 37 03		Distant, compression.
	Chatra	Z	iP	03 37 14		Distant, compression.
	Dehra Dun	Z	iP	03 37 32		Rarefaction.
	Delhi	ENZ	iP	03 37 40		Initial ground movement towards North East. Slight, compression.
30	Dehra Dun	Z	eP	06 51 56		Slight.
		E	e	54 26		
	Delhi	Z	iP	06 52 13	990	Initial ground movement towards North. Slight, compression.
			iS	53 55		
	Shillong	ZNE	eP	06 54 28		Slight, distant.
30	Epc:- 51.6°N 178.4°E, Rat Islands, Aleutian Islands. h = about 64 Km. -H= 07 h 07 m 55.9 s (USCGS), Mag : 5.1 (CGS).					
	Dehra Dun	Z	eP	07 17 41		
	Delhi	EZ	iP	07 17 43	600	Initial ground movement towards East.
		ENZ	iS	18 46		
	Shillong	ZNE	iP	07 18 52		Distant, rarefaction.
	Chatra	Z	iP	07 19 05		Distant, compression.
	Delhi	Z	iP	07 29 52		Slight, rarefaction.
	Bokaro	E	iP	08 20 27		Slight, local.
	Shillong	ZNE	eP	09 34 11		Slight, near.
	Port Blair	NE	iP	09 52 42	200	Slight.
			eS	53 06		
		E	i	55 45		



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
30	Shillong	ZNE	iP	09 55 39		Slight, distant, rarefaction.
	Chatra	Z	eP	09 56 11		Slight.
	Delhi	ENZ	iP	09 57 27		Slight. Initial ground movement towards North East. Compression.
	Dehra Dun	Z	eP	09 57 33		Slight.
	Bokaro	E	e	09 58 55		Slight, distant.
30	Port Blair	NE	e	10 05 25		Slight, near.
30	Shillong	ZNE	iP	10 10 49		Slight, distant, compression.
30	Madras	E	eP eS? e LR T	10 08 11 11 45 12 10 12 49 24 10	2170	Slight.
	Bombay	NES NE	eP eS M	10 08 37 12 25 16 -	2310	Slight.
	Hyderabad	E	eP iS LR M	10 08 43 12 39 14 04 15 50	2410	Moderate.  Period = 9 secs. Gr. dis = 6 μ.
30	Delhi	Z	eP	10 10 15		Slight, tremor.
	Kodaikanal	E	i	10 10 30		
	Chatra	Z	eP	10 10 45		Slight.
	Shillong	ZNE	iP	10 10 49		Slight, distant, compression.
30	Dehra Dun	N	e	10 18 09		Slight.
30	Epc:- 10.6°N 94.4° E, Andaman Islands region. h = about 33 km. -H= 10 h 20 m 54 s (USCGS).					
	Port Blair	NE E	iP iS i	10 21 23 21 47 24 27	200	Slight.
	Shillong	ZNE	iP	10 24 18		Slight, rarefaction.
	Chatra	Z	iP	10 24 46		Slight, rarefaction.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
April, 1963.						
30	Poona	Z	iP	10 25 38		Slight, compression.
	Delhi	ENZ Z	iP i	10 26 07 26 15		Slight, compression. Initial ground moveme- nt towards North West.
	Dehra Dun	Z	iP	10 26 13		Slight, rarefaction.
30	Port Blair	NE	e	10 54 41		Slight, near.
30	Port Blair	NE	e	11 04 07		Slight, near.
30	Shillong	ZNE	iP	12 01 30		Slight, distant, compression.
	Bokaro	E	iP	12 02 26		Slight, near.
30	Port Blair	NE E	eP iS i	13 17 37 17 59 20 40	190	Slight.
30	Port Blair	NE E	i i	13 26 39 29 23		Slight, near.
	Shillong	ZNE	iP	13 29 44		Slight, distant.
	Delhi	NZ Z	iP i	13 31 22 31 30		Slight, rarefaction. Initial ground movement towards South.
30	Chatra	Z ZNE	iP eS	14 01 06 01 24	140	Slight, rarefaction.
	Shillong	ZNE NE	iP iS	14 01 55 03 00	610	Slight, rarefaction.
30	Dehra Dun	Z	eP eS	14 02 05 03 19	710	Slight.
	Delhi	Z ENZ	iP iS	14 02 11 03 27	720	Slight, rarefaction.
30	Shillong	ZNE	iP iS	15 27 20 27 55	310	Slight, rarefaction.
	Chatra	Z	eP eS	15 28 14 29 30	720	Slight.
30	Dehra Dun	Z	eP	19 02 56		Slight.
	Delhi	Z	iP	19 02 56		Slight, rarefaction.
	Shillong	ZNE	iP	19 03 10		Slight, distant, compression.
30	Shillong	ZNE	iP	20 53 31		Slight, distant, compression.
	Delhi	Z	iP	20 55 14		Slight.
30	Shillong	ZNE	iP	21 02 22		Slight, distant, compression.



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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April, 1963.

Station: Madras.

01	00	2	0.2	4.6	07	00	2	0.4	6.6
	03	2	0.3	4.6		03	2	0.4	6.4
	06	2	0.3	4.4		06	3	0.1	1.7
	12	2	0.2	4.5		12	2	0.4	6.4
	18	2	0.3	2.5		12	3	0.1	1.7
		3	0.2			18	2	0.4	6.3
						18	3	0.3	3.0
02	00	2	0.3	4.4		18	2	0.4	6.5
		3	0.2	2.5			1	0.3	3.1
	03	2	0.4	4.9	08	00	1	0.3	3.2
	06	2	0.2	2.8		03	1	0.3	3.1
	12	2	0.2	2.8		06	1	0.3	3.1
	18	2	0.3	4.9		12	1	0.3	3.2
		3	0.2	2.8		18	1	0.4	3.3
03	00	2	0.3	4.7	09	00	1	0.3	3.3
		3	0.2	3.0		03	1	0.3	3.1
	03	2	0.3	4.9		06	1	0.3	3.2
		3	0.2	2.9		12	1	0.3	3.1
	06	3	0.2	2.8		18	1	0.3	3.2
	12	3	0.2	2.8	10	00	1	0.3	3.2
	18	2	0.3	5.0			3	0.4	4.3
		3	0.3	3.0		03	3	0.4	4.3
04	00	2	0.3	5.0		06	1	0.3	3.1
		3	0.2	2.9		12	3	0.4	4.5
	03	3	0.1	1.2		18	1	0.3	3.1
	06	2	0.3	4.7		18	3	0.4	4.8
		3	0.2	2.9			3	0.3	3.0
	12	2	0.3	4.6	11	00	3	0.4	4.9
	18	3	0.2	3.0			3	0.2	2.6
		3	0.2	2.8		03	3	0.3	2.9
05	00	2	0.3	5.5		06	3	0.2	2.2
		3	0.2	2.6		12	3	0.2	2.8
	03	2	0.3	5.9		18	3	0.2	2.8
		2	0.3	4.3			3	0.4	4.3
	06	3	0.2	2.8			3	0.3	3.0
		2	0.3	6.2			3	0.2	1.7
	12	2	0.2	2.6	12	00	3	0.4	4.4
		2	0.4	5.9			3	0.3	2.7
		3	0.3	4.3		03	3	0.1	1.7
	18	2	0.2	2.5		06	3	0.3	2.8
		2	0.4	6.0		12	3	0.2	1.9
		3	0.3	4.3		18	3	0.2	2.8
06	00	2	0.4	1.1			3	0.3	1.9
		2	0.3	6.2		03	3	0.2	2.8
	03	3	0.1	4.3		06	3	0.3	1.9
	06	2	0.3	1.3		12	3	0.2	2.7
	12	2	0.3	6.4		18	1	0.4	1.9
	18	2	0.4	6.4			3	0.2	2.7
		2	0.4	6.9			3	0.4	1.9
				6.7					



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: Madras (Contd.)

April, 1963.

13	00	1	0.4	2.6	19	00	2	0.5	6.3
	03	1	0.4	2.6		03	3	0.2	2.6
	06	1	0.4	2.5		03	3	0.1	1.3
	12	1	0.4	2.7		03	2	0.5	6.0
	18	1	0.3	2.9			3	0.2	2.5
14	00	3	0.4	3.7		06	3	0.1	1.3
		3	0.3	2.9		12	3	0.3	2.6
	03	3	0.3	2.3		18	3	0.3	2.8
	06	1	0.3	2.5			2	0.5	6.2
	12	1	0.4	2.4			3	0.3	2.8
	18	1	0.4	2.5	20	00	2	0.5	5.7
15	00	2	0.4	4.5			3	0.3	3.0
		3	0.3	2.2		03	...	No record.	
	03	2	0.4	4.6		06	...	No record.	
		3	0.3	2.3		12	2	0.4	5.3
	06	2	0.4	4.5			3	0.3	2.3
		3	0.2	2.1		18	2	0.4	5.4
	12	2	0.4	4.7			3	0.2	2.4
		3	0.1	1.9	21	00	2	0.3	5.3
	18	2	0.4	4.9			3	0.2	2.1
		3	0.1	1.7		03	2	0.3	5.3
16	00	2	0.4	5.1			3	0.2	2.2
		3	0.1	1.8		06	3	0.2	2.2
	03	...	Earthquake.			12	3	0.2	2.1
	06	2	0.3	4.4		18	2	0.3	5.1
		3	0.2	2.0			3	0.2	2.4
	12	2	0.3	4.5	22	00	2	0.2	4.4
		3	0.1	1.8			3	0.1	2.4
	18	2	0.4	4.6		03	2	0.3	4.9
		3	0.1	1.8			3	0.1	2.4
17	00	2	0.4	4.9		06	2	0.3	5.0
		3	0.2	1.9		12	2	0.3	4.9
	03	...	Earthquake.			18	2	0.3	5.1
	06	2	0.4	4.6			3	0.2	2.3
		3	0.2	2.1	23	00	2	0.4	5.8
	12	2	0.4	5.1			1	0.2	2.1
		3	0.2	2.0		03	1	0.3	2.1
	18	2	0.5	5.8		06	1	0.5	2.1
		3	0.2	2.0		12	1	0.5	2.5
18	00	2	0.6	6.3		18	1	0.5	2.9
		3	0.2	2.3	24	00	3	0.3	2.9
	03	2	0.6	6.3			3	0.2	1.6
		3	0.1	1.6		03	3	0.3	3.0
	06	2	0.6	6.4		06	3	0.2	2.8
		3	0.2	2.3		12	3	0.2	2.8
	12	3	0.2	2.3		18	3	0.2	2.7
		3	0.2	2.3			2	0.4	5.9
	18	2	0.6	6.2					
		3	0.2	2.4					



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: Madras (Contd.)					April, 1963.				
25	00	2	0.4	6.2	30	12	2	0.3	4.7
		3	0.2	2.8			3	0.3	2.9
	03	2	0.4	5.8		18	2	0.3	5.0
		3	0.2	2.8			3	0.3	3.0
	06	3	0.3	2.9	.....				
	12	3	0.3	3.0	Station : Bombay.				
	15	2	0.5	6.3	01	00	1	0.6	2.5
		3	0.3	2.8		03	1	0.6	2.5
26	00	2	0.5	6.7		06	1	0.6	2.5
		3	0.3	2.8		09	1	0.6	2.6
	03	2	0.5	6.7		12	1	0.5	2.5
		3	0.3	2.9		15	1	0.6	2.4
	06	2	0.5	6.7		18	1	0.5	2.5
		3	0.3	3.0		21	1	0.5	2.5
	12	3	0.3	3.0	02	00	1	0.6	2.3
	18	2	0.5	6.8		03	1	0.6	2.5
		3	0.3	2.9		06	1	0.7	2.6
27	00	2	0.5	6.4		09	1	0.6	2.5
		3	0.2	2.7		12	1	0.6	2.5
	03	2	0.5	6.7		15	1	0.6	2.5
		3	0.3	2.9		18	1	0.6	2.5
	06	3	0.2	2.8		21	1	0.6	2.4
	12	3	0.2	2.9	03	00	1	0.6	2.5
	18	2	0.5	6.6		06	3	0.7	2.6
		3	0.2	2.8		12	3	0.5	2.0
28	00	2	0.5	6.3		18	3	0.5	4.9
		3	0.2	2.7				0.4	2.0
	03	2	0.4	6.2		04	00	3	0.5
		3	0.2	2.7				0.5	2.2
	06	2	0.2	2.6		06	3	0.5	5.1
	12	3	0.2	2.7				0.5	2.5
	18	2	0.4	6.0		12	3	0.5	4.7
		3	0.2	2.7		18	3	0.5	2.3
		3	0.1	1.4				0.6	2.2
29	00	2	0.4	5.9		05	00	3	0.5
		3	0.1	1.7				0.5	4.8
	03	2	0.4	5.9		06	3	0.6	5.5
		3	0.1	1.5				0.7	2.5
	06	2	0.4	5.9		12	3	0.6	2.5
		2	0.3	4.3		18	3	0.7	2.6
		3	0.1	2.4				0.5	2.2
	12	2	0.3	4.5		05	00	3	0.5
		3	0.1	2.4				0.5	4.8
	18	2	0.3	5.9		06	3	0.6	5.5
		2	0.3	4.4				0.7	2.5
		3	0.1	2.3		12	3	0.6	5.5
30	00	2	0.3	5.0		18	3	0.7	2.6
		3	0.2	2.4				0.5	2.2
	03	2	0.3	5.1		06	00	3	0.5
		3	0.2	2.5				0.5	5.1
	06	2	0.3	4.7		06	06	3	0.5
		3	0.2	2.8				0.5	2.0
								0.5	5.1
								0.5	2.5

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: Bombay(Contd.)					April, 1963.				
06	12	3	0.5	5.0	12	12	3	0.4	5.0
			0.5	2.4				0.4	2.5
	18	.	.	.		18	3	0.4	4.3
								0.3	1.9
07	00	3	0.6	5.5	13	00	3	0.3	4.4
			0.7	2.3				0.4	2.3
	03	1	0.7	2.3		06	3	0.3	5.2
	06	1	0.7	2.4				0.4	2.5
	09	1	0.8	2.5		12	3	0.3	5.2
	12	1	0.8	2.6		18	1	0.4	2.5
	15	1	0.7	2.5		21	1	0.5	2.5
	18	1	0.6	2.5				0.4	2.5
	21	1	0.6	2.5	14	00	1	0.7	2.6
08	00	.	.	.		03	1	0.6	2.5
	03	1	0.8	2.5		06	1	0.7	2.6
	06	1	0.8	2.5		09	1	.	.
	09	1	0.7	2.7		12	3	0.4	5.0
	12	3	0.5	5.3				0.4	2.5
			0.7	2.7		18	1	0.5	2.3
	18	3	0.5	5.2				0.5	4.9
			0.6	2.6		06	3	0.5	5.0
09	00	3	0.5	4.8		12	3	0.5	2.5
			0.6	2.5		18	3	0.5	5.0
	06	3	0.6	5.0				0.5	2.5
			0.5	2.4		16	00	3	0.5
	12	3	0.4	5.0				0.6	4.9
	18	3	0.4	2.7		06	1	0.5	2.2
			0.5	5.0		12	3	0.4	2.5
			0.5	3.0		18	3	0.4	5.5
10	00	3	0.5	5.0				0.4	2.0
			0.6	1.6		18	3	0.4	5.0
	06	3	0.5	5.2				0.4	1.8
			0.5	2.0		17	00	3	0.4
	12	3	0.4	5.0				0.4	5.0
			0.4	1.5		06	.	.	.
	18	3	0.4	4.0		12	3	0.4	7.0
			0.5	1.8		18	3	0.5	1.8
	06	3	0.5	5.0				0.5	6.0
			0.5	3.0		18	00	3	0.5
	12	3	0.4	2.4				0.5	2.3
	18	3	0.4	4.0		06	3	0.6	6.0
			0.5	1.8				0.6	2.3
	21	1	0.7	1.9		12	.	.	.
11	00	1	0.9	2.2		18	3	0.5	6.5
	03	1	0.7	2.3				0.5	2.3
	06	.	.	.		06	3	0.6	6.0
	09	.	.	.				0.6	2.3
	12	1	0.5	2.3		12	.	.	.
	15	1	0.6	2.3		18	3	0.5	6.4
	18	1	0.5	2.3				0.6	2.3
	21	1	0.4	2.3				0.6	2.3
12	00	1	0.4	2.0				0.5	6.4
	03	1	0.4	2.3				0.6	2.3
	06	3	0.4	5.2				0.6	2.3
			0.4	2.0					



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.
Station: Bombay(Contd.)					April, 1963.				
19	00	3	0.6	6.4	25	18	3	0.8	2.5
			0.5	2.2				0.4	1.6
	06	3	0.7	6.4	26	00	3	0.7	2.5
			0.6	2.3				0.3	1.6
	12	3	0.7	6.0		06	3	0.6	2.5
			0.6	2.2				0.3	1.9
	18	3	0.6	6.7		12	3	0.5	5.6
			0.7	2.6				0.5	2.6
20	00	3	0.7	6.4		18	3	0.5	5.3
			0.6	2.3				0.4	1.5
	06	3	0.7	5.8	27	00	3	0.5	5.0
			0.5	2.5				0.5	2.5
	12	3	0.7	7.0		06	3	0.5	5.1
			0.5	2.7				0.4	2.3
	18	3	0.6	6.1		12	3	0.5	5.7
			0.5	2.5				0.4	2.5
21	00	3	0.5	5.9		18	3	0.5	5.3
			0.5	2.5				0.6	2.2
	06	.	.	.	28	00	3	0.5	6.8
	12	.	.	.				0.5	2.5
	18	.	.	.		06	3	0.5	5.9
22	00	.	.	.				0.4	2.3
	06	3	0.4	5.1		12	3	0.6	5.8
			0.4	2.1				0.4	1.8
	12	.	.	.		18	3	0.5	6.4
	18	3	0.5	5.3				0.4	2.0
			0.4	2.0	29	00	3	0.5	5.7
25	00	3	0.4	4.6				0.5	2.5
			0.4	2.0		06	3	0.5	6.0
	06	3	0.5	5.0				0.4	2.5
			0.5	2.2		12	3	0.6	5.8
	12	3	0.5	5.0				0.4	1.8
			0.4	2.0		18	3	0.6	5.6
	18	3	0.5	5.0				0.4	2.2
			0.4	2.0	30	00	3	0.4	5.5
24	00	3	0.5	5.2				0.4	2.2
			0.4	2.0		06	3	0.6	5.9
	03	3	0.5	5.0				0.5	2.5
			0.5	2.2		12	3	0.6	6.0
	12	3	0.5	5.3				0.6	2.5
			0.5	2.2		18	3	0.5	5.3
	15	1	0.7	2.3				0.6	2.5
	18	1	0.8	2.4				0.5	5.3
	21	1	1.0	2.6				0.6	2.5
5	00	1	0.9	2.7					
	03	1	0.8	2.6					
	06	1	0.8	2.7					
	09	1	0.7	2.9					
	12	3	0.7	2.7					
			0.3	1.5					

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: Visakhapatnam.					April, 1963.				
01	00	00	-	-	12	00	00	-	-
	06	2	0.4	4.8		06	2	0.3	4.7
	12	2	0.4	4.9		12	2	0.3	4.9
	18	2	0.4	5.0		18	2	0.3	4.8
02	00	00	-	-	13	00	00	-	-
	06	00	-	-		06	2	0.3	4.5
	12	3	0.2	2.0		12	2	0.2	4.9
	18	3	0.3	2.2		18	2	0.2	4.9
03	00	3	0.4	3.1	14	00	00	-	-
	06	3	0.4	3.0		06	2	0.3	3.8
	12	3	0.4	3.4		12	2	0.3	3.7
	18	00	-	-		18	2	0.2	2.1
04	00	00	-	-	15	00	00	-	-
	06	2	0.4	5.0		06	2	0.3	5.0
	12	2	0.4	5.2		12	2	0.3	5.0
	18	2	0.4	4.9		18	2	0.3	5.1
05	00	00	-	-	16	00	00	-	-
	06	2	0.4	4.8		06	00	-	-
	12	2	0.4	4.2		12	00	-	-
	18	00	-	-		18	00	-	-
06	00	00	-	-	17	00	00	-	-
	06	2	0.4	5.1		06	00	0.2	3.0
	12	2	0.4	5.2		12	2	0.2	3.0
	18	00	-	-		18	2	0.2	0.3
07	00	00	-	-	18	00	2	0.2	3.0
	06	2	0.4	5.3		06	2	0.2	3.0
	12	2	0.4	5.5		12	2	0.2	3.0
	18	00	-	-		18	00	-	-
08	00	00	-	-	19	00	00	-	-
	06	2	0.4	5.2		06	00	-	-
	12	2	0.4	5.4		12	2	0.2	3.0
	18	00	-	-		18	00	-	-
09	00	00	-	-	20	00	3	0.8	2.0
	06	2	0.3	5.1		06	3	0.8	3.0
	12	2	0.3	5.0		12	2	0.4	3.1
	18	00	-	-		18	2	0.4	3.1
10	00	00	-	-	21	00	2	0.4	3.2
	06	2	0.3	5.0		06	2	0.3	2.9
	12	2	0.3	5.0		12	2	0.5	2.9
	18	2	0.3	5.0		18	2	0.3	3.2
11	00	00	-	-	22	00	00	-	-
	06	2	0.3	4.5		06	00	-	-
	12	2	0.3	5.1		12	00	-	-
	18	00	-	-		18	2	0.3	2.9



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: Visakhapatnam(Contd.)					April, 1963.				
23	00	00	-	-	03	12	...	-	-
	06	00	-	-		18	...	-	-
	12	00	-	-					
	18	00	-	-	04	00	...	-	-
						06	3	0.3	4.6
						12	3	0.3	5.3
24	00	00	-	-		18	3	0.2	5.0
	06	2	0.4	4.5					
	12	2	0.4	4.2					
	18	00	-	-	05	00	3	0.2	5.4
						06	3	0.2	5.5
						12	3	0.2	5.0
25	00	00	-	-		18	3	0.3	4.9
	06	2	0.4	4.8					
	12	00	-	-	06	00	3	0.3	5.2
	18	00	-	-		06	3	0.2	4.2
						12	3	0.2	6.0
						18	...	-	-
26	00	00	-	-	07	00	3	0.2	5.6
	06	2	0.4	4.9		06	3	0.2	5.5
	12	2	0.4	4.8		12	3	0.2	4.6
	18	00	-	-		18	3	0.2	5.7
27	00	00	-	-	08	00	3	0.3	6.0
	06	00	-	-		06	3	0.1	3.8
	12	2	0.4	4.9		12	3	0.3	5.0
	18	2	0.4	4.8		18	3	0.3	6.0
28	00	00	-	-	09	00	3	0.3	5.4
	06	00	-	-		06	3	0.3	5.0
	12	00	-	-		12	3	0.3	5.0
	18	00	-	-		18	3	0.3	5.7
29	00	00	-	-	10	00	1	0.2	4.0
	06	2	0.4	4.6		06	1	0.2	4.7
	12	2	0.4	4.5		12	2	0.1	2.0
	18	2	0.4	4.2		18	2	0.1	2.2
30	00	00	-	-	11	00	1	0.2	4.0
	06	2	0.4	4.8		06	1	0.2	4.9
	12	2	0.4	4.9		12	1	0.3	5.0
	18	00	-	-		18	2	0.2	2.6
Station: Bokaro.					12	00	2	0.2	2.4
						06	3	0.2	3.0
01	00	...	-	-		12	3	0.3	5.3
	06	...	-	-		18	3	0.2	4.8
	12	...	-	-	13	00	3	0.2	4.5
	18	3	0.2	5.0		06	3	0.2	4.7
02	00	3	0.2	4.7		12	3	0.2	4.8
	06	3	0.2	4.2		18	3	0.2	4.7
	12	3	0.2	4.4	14	00	1	0.2	4.9
	18	1	0.2	4.5		06	3	0.3	5.3
03	00	1	0.2	5.3		12	3	0.3	5.4
	06	...	-	-		18	3	0.3	5.2

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: Bokaro(Contd.)					April, 1963.				
15	00	3	0.3	5.4	26	00	3	0.1	3.8
	06	3	0.2	5.0		06	3	0.2	4.9
	12	3	0.3	4.8		12	3	0.2	6.0
	18	2	0.4	2.8		18	3	0.2	5.0
16	00	2	0.3	2.9	27	00	3	0.2	5.0
	06	3	0.3	5.0		06	3	0.2	5.0
	12	3	0.3	4.5		12	3	0.2	6.8
	18	3	0.3	2.4		18	3	0.3	6.0
17	00	1	0.3	5.2	28	00	3	0.3	5.5
	06	1	0.2	4.1		06	3	0.3	5.4
	12	1	0.3	5.0		12	3	0.3	5.4
	18	1	0.3	5.0		18	3	0.3	5.6
18	00	3	0.3	4.7	29	00	3	0.2	5.7
	06	3	0.3	5.3		06	3	0.2	5.0
	12	3	0.3	5.5		12	3	0.3	5.0
	18	3	0.3	5.0		18	2	0.4	2.9
19	00	1	0.3	4.1	30	00	2	0.4	2.9
	06	1	0.3	5.8		06	2	0.2	2.6
	12	...	-	-		12	3	0.2	5.0
	18	...	-	-		18	3	0.2	4.3
20	00	...	-	-	.....				
	06	1	0.3	5.2	-----				
	12	3	0.3	5.0	Date	Hour GMT	K	Mean simple amplitude in micron	Mean period in sec.
	18	3	0.3	6.0	-----				
21	00	1	0.3	4.0	Station: Port Blair. April, 1963.				
	06	3	0.2	4.6	01	00	1	0.4	7
	12	3	0.2	6.0		06	1	0.4	7
	18	1	0.3	5.5		12	1	0.4	7
22	00	1	0.3	5.0		18	1	0.4	7
	06	3	0.2	4.2	02	00	1	0.4	7
	12	...	-	-		06	...	-	-
	18	3	0.2	4.0		12	1	0.4	7
23	00	1	0.3	5.0		18	1	0.4	7
	06	3	0.2	5.8	03	00	1	0.8	7
	12	3	0.2	5.0		06	1	0.4	7
	18	3	0.2	6.0		12	1	0.4	7
24	00	3	0.2	4.5		18	1	0.4	7
	06	3	0.3	6.3	04	00	1	0.4	7
	12	3	0.3	6.3		06	...	-	-
	18	...	-	-		12	1	0.4	7
25	00	3	0.2	5.4		18	1	0.4	7
	06	3	0.3	4.6		06	...	-	-
	12	3	0.3	6.4		12	1	0.4	7
	18	3	0.2	5.6		18	1	0.4	7



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.
Station: Port Blair(Contd.)					April, 1963.				
05	00	1	0.4	7	16	00	1	0.2	6
	06	1	0.4	7		06	1	0.2	6
	12	1	0.4	7		12	1	0.2	6
	18	1	0.4	7		18	1	0.2	6
06	00	1	0.4	7	17	00	1	0.2	6
	06	1	0.4	7		06	1	0.2	6
	12	1	0.4	7		12	1	0.2	7
	18	...	-	-		18	1	0.2	6
07	00	1	0.4	7	18	00	1	0.2	7
	06	1	0.8	7		06	1	0.8	7
	12	1	1.2	7		12	1	0.8	7
	18	1	1.2	7		18	1	0.8	7
08	00	...	-	-	19	00	1	1.2	7
	06	1	1.2	7		06	1	0.8	7
	12	1	1.2	7		12	1	1.2	7
	18	1	0.8	7		18	...	-	-
09	00	1	1.2	7	20	00	...	-	-
	06	3	1.2	3		06	1	1.2	7
			0.8	7		12	1	0.8	7
	12	...	-	-		18	1	0.8	7
	18	2	0.8	3					
10	00	2	0.8	3	21	00	1	0.8	7
	06	2	0.8	3		06	1	0.8	7
	12	...	-	-		12	1	0.8	7
	18	...	-	-		18	1	0.8	7
11	00	...	-	-	22	00	1	0.8	7
	06	...	-	-		06	1	0.4	7
	12	...	-	-		12	1	0.4	6
	18	1	0.4	3		18	1	0.4	7
12	00	1	0.2	3	23	00	1	0.4	7
	06	1	0.2	3		06	1	0.4	7
	12	1	0.2	3		12	1	0.4	7
	18	1	0.2	3		18	1	0.4	7
13	00	0,0	-	-	24	00	1	0.4	6
	06	0,0	-	-		06	1	0.4	6
	12	0,0	-	-		12	1	0.4	7
	18	1	0.2	6		18	1	0.8	7
14	00	1	0.2	6	25	00	1	0.8	7
	06	1	0.2	7		06	1	0.8	7
	12	...	-	-		12	...	-	-
	18	1	0.2	5		18	...	-	-
15	00	1	0.2	6	26	00	...	-	-
	06	1	0.2	6		06	1	0.8	7
	12	1	0.2	6		12	1	0.8	7
	18	1	0.2	6		18	1	0.8	7

Date	Hour GMT	K	Mean simple amplitude in micron	Mean period in sec.	Date	Hour GMT	K	Mean simple amplitude in m.m.	Mean period in sec.	
Station: Port Blair(Contd.)					April, 1963.					
27	00	1	1.2	7	Station: Shillong.					
	06	...	-	-		01	00	3	0.4	4.4
	12	...	-	-			06	0..	-	-
	18	...	-	-			12	0..	-	-
28	00	...	-	-			18	0..	-	-
	06	1	1.2	7		02	00	0..	-	-
	12	1	1.2	7			06	3	0.4	4.0
	18	1	1.2	7			12	3	0.4	4.2
29	00	1	0.8	7			18	0..	-	-
	06	1	1.2	7		03	00	3	0.4	3.8
	12	1	0.8	7			06	3	0.4	4.0
	18	1	0.8	7			12	3	0.4	4.0
30	00	1	0.8	7			18	...	-	-
	06	1	0.4	7		04	00	3	0.4	4.2
	12	1	0.8	6			06	3	0.4	4.6
	18	1	0.8	6			12	3	0.4	4.4
							18	3	0.4	4.2
						05	00	3	0.4	4.4