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# SEISMOLOGICAL BULLETIN

DEC 1963

**GOVERNMENT OF INDIA  
METEOROLOGICAL DEPARTMENT**

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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		1	Deccan Trap	Milne-Shaw	N	12 350	13:1		16
					Milne-Shaw	E	12 350	23:1		8
Bokaro	23.50°N, 85.49°E			Rock	Sprengnether	E	To=Tg=7 secs			30
					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
Calcutta	22.32°N, 88.22°E	(1) 7		Alluvium	Milne-Shaw	N	2 870	Critical		30
					Wood-Anderson	N	15 32			25.4
					Omor-Ewing	N	15 32			25.4
					Omor-Ewing	E	21 30			25.4
Chatra	25.50°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
Colombo	06.54°N, 79.52°E		7	Beach Sand	Wenner-Accelerograph	ZNE	-	-		-
					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	0.8 950	Critical		60
Hyderabad	17.25°N, 78.27°E		536	Granite	Milne-Shaw	N	12 250	20:1		8
					Milne-Shaw	E	12 250	20:1		8
Kodaikanal	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=1.5	Critical		30
					Wood-Anderson	E	4 1000	20:1		15
					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			60
					Sprengnether	E	To=Tg=6.3	Critical		30
Tocklai	23.45°N, 94.45°E			Alluvium	Wenner Accelerograph	ZNE	-	-		-
					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.	△ km.	REMARKS.
December, 1963.						
01	Madras	E	e	01 28 49 28 58		Slight, near.
01	Shillong	ENZ	iP	04 04 58 05 21		Slight, near.
01	Shillong	ENZ	iP	04 32 53		Slight, distant, rarefaction.
01	Delhi	NZ	eP	04 33 19		Slight, rarefaction.
01	Delhi	NZ	P	04 53 03		Slight.
01	Shillong	ENZ	iP	09 39 08		Slight, distant, compression.
01	Chatra	Z	eP	09 39 47		Slight.
	Delhi	Z	eP	09 40 25		Slight, compression.
01	Shillong	ENZ	iP	12 03 05		Slight, distant, rarefaction.
	Delhi	Z	iP	12 04 19		Slight, compression.
01	Shillong	ENZ	eP	13 20 56 21 08		Slight, near.
01	Shillong	ENZ	iP	13 42 55		Slight, distant, compression.
	Delhi	Z	iP	13 43 54		Slight, compression.
01	Chatra	Z	eP	16 06 36		Slight.
	Delhi	Z	P	16 07 12		Slight.
01	Shillong	ENZ	iP	16 21 43		Slight, distant, compression.
01	Chatra	Z	eP	16 22 22		Slight, distant.
	Delhi	Z	iP	16 23 22		Slight, rarefaction.
01	Shillong	ENZ	iP	17 53 21		Slight, distant, compression.
	Delhi	Z	iP	17 54 32		Slight, compression.
02	Delhi	Z NZ	iPg iSg	02 32 45.6 32 47	10	Slight, rarefaction.
02	Shillong	N	iPg iSg	02 33 06.6 33 08.2	10	Slight.
02	Delhi	Z	eP	09 55 28		Slight, rarefaction.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
<u>December, 1963.</u>						
02	Dehra Dun	ENZ	eP	10 42 16		Slight.
02	Shillong	ENZ	eP	11 25 39		Slight, near.
02	Shillong	ENZ	iP	11 54 58		Slight, distant, compression.
	Delhi	Z	iP	11 55 50		Slight, compression
02	Dehra Dun	Z	iP	21 05 55		Tremor, rarefaction.
02	Epc:- 80.1° N 6.6° W in Savalbard region. h = about 33 km. -H= 20 h 55 m 58.8 s Mag: = 5.1 S.D. 0.3 (CGS)					
	Delhi	NZ	iP	21 06 04		Initial ground motion towards North. Rarefaction.
		Z	i	06 13		
	Shillong	ENZ	iP	21 06 39	7330	Compression.
		NE	PP	09 05		
			PPP	10 39		
			eS	15 26		
	Bombay	NZ	eP	21 06 58	7730	
		Z	e	07 06		
		NZ	e	07 32		
		N	e	09 25		
		EN	eS	16 06		
			e	16 18		
02	Shillong	ENZ	eP	21 33 48		Slight, near.
			e	34 19		
03	Shillong	ENZ	iP	00 04 07		Slight, distant, compression.
	Dehra Dun	Z	iP	00 04 30		Slight, compression.
	Delhi	Z	iP	00 04 39		Slight, compression
03	Shillong	ENZ	eP	01 51 05		Slight, near.
			e	52 00		
03	Shillong	ENZ	iP	03 53 43		Slight, distant, compression.
	Delhi	Z	eP	03 54 41		Slight, compression
03	Chatra	Z	eP	04 24 44		Slight, distant.
	Delhi	ENZ	iP	04 25 38		Slight. Initial ground motion towards North West. Compression.
03	Delhi	Z	iP	04 31 36		Slight, rarefaction.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
<u>December, 1963.</u>						
03	Shillong	ENZ	iP	05 18 35		Slight, distant, compression
	Delhi	NZ	iP	05 19 31		Slight, rarefaction.
03	Bokaro	EN	iP	08 03 20		Feeble, local.
03	Shillong	ENZ	iP	08 48 19		Slight, distant, compression.
	Dehra Dun Cha	Z	e	08 49 08		Slight.
	Delhi	NZ	eP	08 49 16		Slight, compression.
03	Delhi	Z	eP	12 41 58		Slight, rarefaction.
03	Chatra	Z	eP	12 42 49		Slight, distant.
	Shillong	ENZ	iP	14 42 49	130	Slight.
			iSg	43 05		
	Chatra	Z	eP	14 43 13		Slight.
			i	43 51		
03	Delhi	Z	i	15 59 22		
	Dehra Dun	Z	e	15 59 01		Slight.
			i	59 17		
		ENZ	i	16 00 01		
	Delhi	NZ	ePn	15 59 31	500	Slight.
		Z	iSn	16 00 25		
	Chatra	Z	eP	16 00 50		Slight, distant.
			i	03 21		
	Poona	Z	eP	16 01 41		Slight (near).
	Shillong	ENZ	eP	16 01 49		Slight, distant.
			i	02 06		
03	Bokaro	E	eP	16 03 38		Slight, distant.
	Bombay	Z	e	16 04 18		Slight.
			e	04 51		
	Visakhapatnam	EN	eP	16 05 26	660	Slight, distant.
			iS	06 35		
03	Epc:- ( 28.8° N 79.1° E). -H= 17 h 08 m 35 s.					
	Delhi	ENZ	iPg	17 08 39	30	Initial ground motion towards North East. Rarefaction Mag 3.6.
			iSg	08 42.9		
	Dehra Dun	Z	iP	17 09 03		Slight, compression.
		ENZ	i	09 21		

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December, 1963.

03	Delhi	Z	i	17 09 27		
			i	09 31		
	Chatra	Z	eP	17 10 45	950	Slight
			eS	12 22		
03	Bombay	Z	e	17 13 32		Slight.
			e	14 08		
03	Bombay	Z	e	17 14 16		
			e	14 25		
			e	14 33		
03	Delhi	Z	eP	17 31 33		Slight, compression.
03	Delhi	NZ	iPn	18 13 59	480	Slight. Initial ground motion towards South.
			Sn	14 51		Rarefaction.
		Z	i	15 14		
03	Shillong	ENZ	eP	21 27 27	9200	Slight.
			eS	37 45		
03	Delhi	ENZ	iPg	21 38 56	50	Slight. Initial ground motion towards North East. Rarefaction.
			iSg	38 59		
	Shillong	ENZ	iP	21 41 32		Slight, compression.
03	Bombay	ENZ	e	23 23 20		Near, tremor.
			e	23 41		
		Z	e	23 52		
03	Poona	Z	iP	23 23 22		Slight, rarefaction.
03	Epc:- 22.4° S 69.3° W in Northern Chile. h about 18 km. -H= 23 h 03 m 41.6 s (USCGS). Mag: 6.4 (Pas), 6.1 S.D. 0.3 (CGS).					
	Delhi	NZ	ePKP	23 23 28	16480	Initial ground motion towards South.
		Z	i	23 34		Compression.
		NZ	ePP	27 04		
	Dehra Dun	Z	eP	23 23 32		
			i	23 47		
	Chatra	Z	eP	23 23 42		
	Shillong	ENZ	iP	23 23 47		Rarefaction.
			i	23 56		
			i	24 37		
			i	24 46		
			PP	28 23		
04	Delhi	Z	i	00 03 03		
04	Shillong	ENZ	iP	01 36 48		Slight, near, compression.



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04	Bokaro	E	iP	01 37 28		Slight, distant.
04	Dehra Dun	Z	eP	01 37 38		Tremor.
04	Delhi	NZ	eP	01 37 45		Slight, South, compression.
	Bombay	ENZ		01 38 40		Slight.
	Poona	Z	iP	01 38 45		Slight, rarefaction.
04	Delhi	Z	eP	02 34 38		Slight.
04	Shillong	EN	iP	02 52 42		Slight, distant, compression.
	Delhi	Z	iP	02 53 39		Slight, compression.
04	Shillong	ENZ	iP	03 02 19		Slight, distant, compression.
04	Delhi	Z	i	03 33 04		Slight.
04	Chatra	Z	eP	04 48 52		Slight.
04	Shillong	ENZ	iP	07 55 00		Slight, distant, compression.
04	Delhi	NZ	iPg	08 21 26	33	Slight, Initial ground motion towards North.
		ENZ	iSg	21 29.4		Rarefaction.
04	Shillong	ENZ	iP	08 33 29		Slight, distant, compression.
04	Chatra	Z	eP	08 35 52		Slight, distant.
04	Dehra Dun	Z	iP	08 34 18		Slight, compression.
	Delhi	NZ	iP	08 34 26		Slight. Initial ground motion towards South. Compression.
	Poona	Z	eP	08 35 23		Slight, compression.
04	Delhi	Z	iPg	14 59 28	30	Slight, compression
		NZ	iSg	59 32		
04	Shillong	ENZ	iP	15 54 05		Slight, distant, compression.
	Chatra	Z	iP	15 54 26		Compression.
	Dehra Dun	Z	iP	15 54 54		Slight, compression.
	Delhi	NZ	iP	15 55 02		Slight. Initial ground motion towards South
			i	55 09		

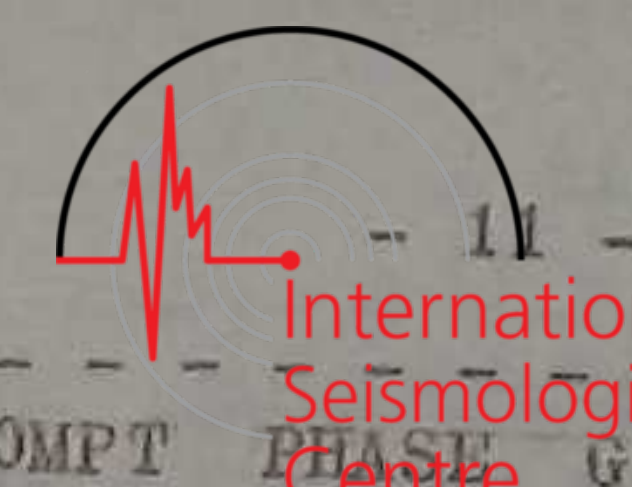


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<u>December, 1963.</u>						
04	X Delhi	Z	P	15 59 57		Slight.
04	Delhi	Z	P	16 19 55		Slight, distant.
04	Shillong	ENZ	eP e	25 46 47 47 37		Slight, near.
05	Epc:- 36.8° N 72.7° E in Hindukush region. -H= 00 h 30 m 04 s					
	Dehra Dun	Z	eP iS	00 32 10 37 45	920	Slight.
	Delhi	N NZ N	P i iS	00 32 19 32 29 34 03	1010	Slight.
	Shillong	ENZ	iP	00 34 42		Slight, distant, rarefaction.
05	Chatra	Z	S	00 36 50		Slight.
05	Epc:- 17.3° N 80.1° E in Southern India. h about 33 km. -H= 04 h 07 m 42.8 s (USCGS).					
	Epc:- 17.0° N 80.0° E in east of Hyderabad (India). -H= 04 h 07 m 39 s (CSO Shillong).					
	Madras	E	P P* iS M	04 08 15 08 17 08 40 08 51	200	Slight.
	Hyderabad	E	eP eS	04 08 16 08 40	200	Slight, intensity.
	Visakhapatnam	EN	iP iS	04 08 29 09 09	370	Slight, near. Initial ground movement N.W.
	Poona	Z	eP eS	04 09 11 10 21	670	Slight, near.
	Bombay	Z	eP e P eSn	04 09 27 09 30 10 41 10 46	760	Slight.
	Kodaikanal	E	i	04 10 32		Slight, near.
	Delhi	Z N NZ Z	eP e S i	04 10 36 10 37 12 53 14 35	1350	Slight, compression.
	Chatra	Z	eP eS e i	04 10 37 12 53 13 51 14 07	1330	Slight.

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<u>December, 1963.</u>						
05	Shillong	ENZ	iP eS	04 10 58 13 32	1520	Slight.
	Debra Dun	Z E N	eP e e	04 11 01 15 00 15 17		Slight.
	Bokaro	E	eP i	04 11 36 12 25		Slight, distant.
	Shillong	ENZ	iP	06 16 43		Slight, near.
05	Bokaro	EN	iP	08 16 26		Slight, local.
05	Bokaro	EN	iP	09 54 41		Slight, local.
05	Shillong	ENZ	iP	10 34 17		Slight, distant, rarefaction.
05	Chatra	Z	eP	10 36 29		Slight, distant.
05	Shillong	ENZ	iP	11 49 28		Slight, distant, rarefaction.
05	Shillong	ENZ	eP e	14 49 42 50 17		Slight, near.
05	Delhi	Z NZ	ePg iSg	18 56 29 56 32	30	Slight.
05	Shillong	ENZ	iP	19 36 17		Slight, near.
06	Shillong	ENZ	iP	01 04 05		Slight, near.
06	Shillong	ENZ	iP	02 07 17		Slight, distant, rarefaction.
06	Shillong	ENZ	iP	03 23 20		Slight, distant, compression.
06	Delhi	Z	eP e	05 27 05.5 27 19.0		Slight.
06	Delhi	Z	iP	07 02 02		Slight, compression.
07	Delhi	Z	eP i	07 55 04 55 20		Slight.
06	Delhi	Z	eP	09 34 58		Slight, compression.
06	Delhi	Z	iPg iSg	11 14 11 14 15	30	Slight, compression.
06	Chatra	Z	ePg eSg	17 57 55 58 17	190	Slight.

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December, 1963.						
06	Shillong	ENZ	eP i	17 58 03 58 39		Slight, near.
06	Shillong	ENZ	eP e	22 05 52 06 23		Slight, near.
06	Shillong	ENZ	iP i	22 44 55 45 16		Slight, near.
07	Shillong	ENZ	iP	04 05 33		Slight, distant, rarefaction.
07	Delhi	Z	eP	04 25 24		Slight, rarefaction.
07	Port Blair	E	i	04 29 42		
07	Delhi	Z	P	05 38 16		Slight.
07	Shillong	Z	iP	08 09 14		Slight, compression.
07	Bokaro	EN	iP	08 27 33		Slight, local.
07	Shillong	ENZ	iP	09 13 39		Slight, distant, rarefaction.
07	Delhi	ENZ	iPg iSg	13 00 31 00 40	80	Slight, compression.
07	Delhi	Z	iP	15 17 09		Slight, compression.
07	Shillong	ENZ	iP	15 26 57		Slight, distant, rarefaction.
	Chatra	Z	iP	15 27 28		Slight, distant, rarefaction.
	Delhi	Z	eP	15 28 31		Slight, rarefaction.
07	Shillong	ENZ	eP	16 54 21		Slight, near.
07	Shillong	ENZ	eP	20 22 43		Slight, near.
08	Shillong	ENZ	eP	00 11 34		Slight, near.
08	Delhi	Z	iP	01 26 47		Slight, compression.
08	Delhi	NZ	iP iS	05 36 09 37 48	960	Slight. Initial ground motion towards South. Compression.
08	Shillong	ENZ	iP	08 02 28		Slight, distant, compression.
08	Dehra Dun	Z	eP	08 03 16		Slight.
08	Delhi	Z	eP iP	08 03 25 03 26		Slight, compression.



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December, 1963.						
08	Shillong	ENZ	iP i	08 21 53 22 07		Slight, near, rarefaction.
08	Delhi	NZ	iPg	09 08 48.5 08 53	40	Slight.
08	Delhi	NZ	iP	11 13 42		Slight, compression.
	Shillong	ENZ	iP	11 15 32		Slight, compression.
08	Chatra	Z ENZ	iPg iSg	14 59 13 59 30	140	Slight, compression.
	Shillong	ENZ	iP	14 59 49		Slight, distant, compression.
	Delhi	NZ	eP i	15 02 41.5 02 43		Slight.
08	Dehra Dun	Z	iP i	15 20 12 22 03		Slight, compression.
	Delhi	NZ	iP iS	15 20 22 22 01	960	Slight. Initial ground motion towards South. Compression.
	Shillong	ENZ	i i	15 21 02 21 30		Slight, rarefaction.
	Chatra	Z	iP i	15 21 57 23 17		Slight, rarefaction.
08	Delhi	ENZ	iPg iSg	15 43 53 43 56	30	Slight. Initial ground motion towards North. Rarefaction.
08	Delhi	NZ	iP	18 41 48		Slight, compression.
	Shillong	ENZ	iP	19 59 10		Slight, compression.
	Chatra	Z	iP	19 59 52		Slight, distant, rarefaction.
08	Shillong	ENZ	iP	20 40 48		Slight, distant, compression.
	Chatra	Z	iP	20 41 08		Slight, distant, compression.
08	Dehra Dun	Z	e	20 41 38		Slight.
08	Shillong	ENZ	iP	20 48 40		Slight, distant, compression.
	Chatra	Z	iP	20 49 00		Slight, distant, compression.

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December, 1963.						
08	Dehra Dun	Z	eP	20 49 30		
	Delhi	NZ	iP	20 49 40		Slight, compression.
09	Dehra Dun	Z	e	00 00 19		Slight.
	Delhi	NZ	iP iS	00 00 30 02 09	960	Slight.
09	Delhi	NZ	iP iS	01 33 05 34 44	960	Slight. Initial ground motion towards South. Compression.
09	Delhi	Z	iP	02 07 34		Slight, compression.
09	Shillong	ENZ	iP	02 33 08		Slight, distant, compression.
09	Shillong	ENZ	iP	05 08 47		Slight, distant, rarefaction.
09	Shillong	ENZ	iP	05 50 34		Slight, distant, compression.
	Delhi	Z	eP	05 50 54		Slight, distant, compression.
09	Port Blair	EN	iPg iSg	06 20 08 20 11	20	Slight.
09	Delhi	Z	eP	06 52 23		Slight, rarefaction.
09	Shillong	ENZ	iP	08 42 53		Slight, distant, rarefaction.
	Dehra Dun	Z	eP	08 43 47		Slight.
	Delhi	Z	eP	08 43 56		Slight, rarefaction.
09	Bokaro	EN	iP	08 55 35		Slight, local.
09	Chatra	Z	eP eS	10 00 27 01 40	700	Slight.
09	Shillong	ENZ	eP	10 59 26		Slight, near.
09	Shillong	ENZ	iP	11 29 31		Slight, distant, compression.
09	Shillong	ENZ	eP e	12 09 25 09 55		Slight, near.
09	Shillong	ENZ	iP	12 31 43		Slight, distant, compression.
	Chatra	Z	iP	12 32 03		Slight, distant, compression.



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December, 1963.						
09	Dehra Dun	Z	iP	12 32 34		Slight, compression.
09	Delhi	NZ	iP	12 32 42		Slight. Initial ground motion towards South. Compression.
09	Shillong	ENZ	iP	12 38 02		Slight, distant, rarefaction.
09	Shillong	ENZ	eP	16 13 45		Slight, near.
09	Shillong	ENZ	iP	16 20 27		Slight, distant, rarefaction.
09	Epc:- 35.0° N 76.6° E . -H= 18 h 01 m 52 s (New Delhi).					
09	Dehra Dun	Z	eP	18 03 49	865	Slight.
		ENZ	eS	05 17		
	Delhi	ENZ	eP iS	18 03 58 05 35	830	Slight.
	Chatra	Z	iP eS	18 05 35 08 27	1710	Slight, rarefaction.
	Shillong	ENZ	iP	18 06 25		Slight, distant, compression.
09	Dehra Dun	Z	eP eS	19 04 33 06 04	880	Slight.
	Delhi	ENZ	eP iS	19 04 48 06 31	1000	Slight. Initial ground motion towards South. Compression.
	Shillong	ENZ	iP	19 06 49		Slight, rarefaction.
09	Delhi	NZ	e	20 43 59		
	Shillong	ENZ	iP	20 44 28		Slight, rarefaction.
	Chatra	Z	iP	20 45 15		Slight, distant, rarefaction.
	Madras	E	e	20 45 56		Surface waves. Earlier phases not recorded.
09	Delhi	EZ	e	21 18 17		
09	Shillong	ENZ	iP	21 21 57		Slight, compression.
10	Shillong	ENZ	eP	01 03 33		Slight, near.
10	Delhi	NZ	eP	01 12 35.5	950	Slight.
		ENZ	iS	14 13.5		

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

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10 Epc:- 6.2° S 128.1° E in Banda Sea.  
 h about 366 km. -H= 03 h 31 m 21.1 s.  
 Mag: 5.6 (CGS). Felt Darwin.

Epc:- 5.3° S, 122.3° E.  
 -H= 03 h 31 m 22 s (C.S.O. Shillong).

✓ Shillong	ENZ	iP iS	03 39 21 45 44	4720	Rarefaction.
✓ Calcutta	E	eP e PcP iS SS	03 39 29 40 44 41 20 45 57 48 47	4810	
✓ Port Blair	E	eP i i i	03 39 31 39 57 40 12 43 51		
10 ✓ Bokaro	E	iP PcP PPP i S LR	03 39 48 41 16 42 27 43 47 46 33 53 15	5110	
✓ Madras	E	iP i e e iS PS PPS e ScS SS LQ LR M	03 39 52 41 07 41 50 43 16 46 49 46 50 46 58 49 03 49 39 49 53 50 42 53 00 57 18	5190	Initial ground motion towards East.
✓ Chatra	Z EN	iP iS	03 39 53 46 42	5180	Rarefaction.
✓ Poona	Z N	eP iS	03 40 44 48 13	5890	
✓ Bombay	ENZ EZ E EZ E EN	eP PcP e PP PPP e iS	03 40 51 42 05 45 52 45 02 46 41 48 29	6055	(Deep focus)

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10	Bombay	E	e ScS e SS SSS	03 49 21 50 53 51 09 52 41 54 14		
	✓ Delhi	NZ N	eP iS i SS	03 40 51 48 29 50 00 52 36	6050	Slight. Initial ground motion towards North West. Rarefaction.
	✓ Dehra Dun	Z EN N	iP iS i SS	03 40 54 48 34 50 06 52 43	6100	Rarefaction.
	✓ Hyderabad	E	i e	03 41 31 49 26		Period = 9 secs. Amp: = 3 u.
10	Shillong	ENZ	eP iSg	04 09 41 10 04	180	Slight.
10	✓ Delhi	NZ	iP	06 49 33.5		Slight. Initial ground motion towards North. Rarefaction.
	✓ Dehra Dun	Z	i	06 49 39		Slight.
10	✓ Shillong	ENZ	iP i	06 49 45 51 40		Slight, distant, rarefaction.
10	Shillong	ENZ	eP	13 15 17		Slight, distant.
	Delhi	Z	P	13 17 03		Slight.
10	Delhi	Z	P	15 09 20		Slight.
10	Delhi	NZ ENZ	eP	17 59 27 18 01 03	930	Slight.
11	Delhi	NZ ENZ	eP iS	01 52 06 53 46	970	Slight.
11	Shillong	ENZ	iP	03 56 10		Slight, distant, rarefaction.
11	Shillong	ENZ	iP	04 02 56		Slight, distant, rarefaction.
	Delhi	ENZ	iP	04 04 24		Slight, rarefaction.
	Delhi	Z	iP	04 11 54 11 54		Slight, distant.
11	Delhi	EZ	eP	06 16 58		Slight, rarefaction.



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11	Shillong	ENZ	iP	09 21 10		Slight, distant, rarefaction.
11	Bokaro	EN	iP	11 18 38		Slight, local.
11	Delhi	ENZ	iP	09 22 10		Slight. Initial ground motion towards North East. Compression.
11	Chatra	Z	iP	17 18 35		Slight, distant, compression.
11	Epc:- 51.2° N 179.3° W in Andreanof Islands, Alutian Islands. h about 32 km. -H= 17 h 08 m 12.3 s (USCGS). Mag: 5.3 S.D. 0.3 (CGS).					
	Shillong	ENZ	iP	17 19 21		Distant, compression.
	Dehra Dun	ENZ N	eP eS	17 19 49 29 35	8510	
	Delhi	ENZ	eP	17 19 58		Compression.
11	Poona	Z N	eP eS	17 20 52 31 39	9890	
11	Shillong	ENZ	iP	17 23 21		Slight, distant, compression.
11	Madras	E	e	17 31 40		
11	Shillong	ENZ	iP	17 36 21		Slight, distant, compression.
	Chatra	Z	eP	17 36 32		Slight, distant.
11	Shillong	ENZ	iP	17 54 26		Slight, distant, compression.
11	Dehra Dun	Z E	eP e	18 17 34 19 09		Slight.
	Delhi	ENZ	eP	18 17 54		Slight.
	Chatra	Z	eP	18 19 00		Slight.
11	Shillong	ENZ	iP	19 24 05		Slight, distant, compression.
	Chatra	Z	iP	19 24 20		Slight, distant, compression.
11	Shillong	ENZ	iP	20 36 21		Slight, distant, tremor compression.
11	Dehra Dun	Z	iP	21 22 49		Slight, compression.



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 h. m. s.

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11	Delhi	EN ENZ	iP eS	21 23 00 24 39	960	Slight, compression.
11	Shillong	ENZ	iP	22 46 47		Slight, distant, rarefaction.
	Delhi	ENZ	eP	22 48 27		Slight.
	Dehra Dun	Z	e	22 48 28		Slight.
12	Delhi	ENZ	eP	01 30 07		Slight.
12	Delhi	Z	iP	03 37 02		Slight, rarefaction.
12	Delhi	Z	iP	04 22 40		Slight, rarefaction.
12	Bokaro	EN	iP	05 07 29		Slight, local.
12	Delhi	Z	P	07 63 21		Slight.
12	Delhi	Z	P	08 48 34		Slight.
12	Delhi	Z	iP	08 51 18		Slight, rarefaction.
12	Shillong	ENZ	eP	13 45 13		Slight, distant.
12	Shillong	ENZ	iP	14 13 04		Slight, distant, compression.
12	Shillong	ENZ	eP	14 41 35		Slight, distant.
12	Chatra	Z	eP	15 02 19		Slight, distant.
	Port Blair	E	i i	15 06 13 08 45		
	Madras	E	eP PP e eS	15 06 52 07 16 09 59 10 39	2300	Slight.
12	Shillong	ENZ	eP	15 07 37		Slight, distant.
	Delhi	Z	P	15 08 46		Slight, distant.
12	Chatra	Z	iPg iSg	19 45 53 46 08	130	Slight.
12	Shillong	ENZ	iP i	19 46 39 47 34		Slight, near, rarefaction.
12	Chatra	Z	eP eS	20 32 25 33 53	840	Slight.
	Shillong	ENZ	iP	20 32 30		Slight, distant, rarefaction.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
December, 1963.						
12	Delhi	ENZ	eP	20 38 17		Slight. Initial ground motion towards West.
12	Shillong	ENZ	iP	21 14 02		Slight, distant, compression.
12	Chatra	Z	iP	23 23 50		Slight, distant, rarefaction.
12	✓ Dehra Dun	Z	iP	23 34 18		Slight, compression.
	✓ Delhi	Z EZ	iP i	23 34 28 34 29		Slight, rarefaction. Initial ground motion towards North.
	✓ Poona	Z	iP	23 35 27		Slight, rarefaction.
13	Bokaro	EN	iP	08 29 41		Slight, local.
13	Dehra Dun	Z	eP i	12 56 11 57 47		Slight.
	Delhi	ENZ Z ENZ	iP i iS	12 56 24 56 25 58 10	1030	Slight. Initial ground motion towards South West. Compression.
	Chatra	Z	e	13 00 46		Slight.
13	Dehra Dun	Z ENZ	eP i	15 23 48 23 56		Slight.
	Delhi	ENZ	eP iS	15 24 14 24 42	230	Slight.
13	Shillong	ENZ	iP	16 09 14		Slight, distant, compression.
	Delhi	Z	eP	16 10 14		Slight, compression.
13	Shillong	ENZ	iP	17 34 29		Slight, distant, compression.
13	Shillong	ENZ	eP	19 57 35		Slight, local.
13	Shillong	ENZ	eP iSg	20 27 33 27 50	130	Slight.
13	Chatra	Z	e	20 28 12		Slight.
13	Shillong	ENZ	iP	21 19 47		Slight, distant, compression.
13	Delhi	Z	P	22 30 03		Slight, distant.
14	✓ Shillong	ENZ	iP	00 25 15		Slight, distant, compression.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
December, 1963.						
14	Delhi	Z	P	03 52 34		Slight.
	Shillong	ENZ	iP	03 52 59		Slight, distant, tremor, compression.
	Delhi	ENZ	iP	03 53 57		Slight. Initial ground motion towards North East. Rarefaction.
14	Shillong	ENZ	iPg iSg	05 45 26 45 43	140	Slight.
14	Delhi	Z	iP	06 59 45		Slight, rarefaction.
14	Delhi	Z	iP	06 59 58		Slight, compression.
14	Bokaro	EN	iP	07 41 28		Slight, local.
14	✓ Chatra	Z	eP	08 03 11		Slight, distant.
14	✓ Dehra Dun	Z	i	08 03 12		Slight.
14	✓ Delhi	Z ENZ Z	P i i	08 03 16 03 20 03 35		Slight.
14	Shillong	ENZ	eP e	10 29 43 30 08		Slight, near.
14	Chatra	Z	ePg eSg	12 15 32 15 51	150	Slight.
14	Delhi	Z	P	12 30 15		Slight.
14	Chatra	Z	iPg iSg	13 10 16 10 26	90	Slight, rarefaction.
14	Delhi	Z	eP	15 18 22		Slight, distant, compression.
14	Chatra	Z	iP	21 26 15		Slight, distant, compression.
14	Delhi	Z	eP	23 12 39		Slight, rarefaction.
15	Shillong	ENZ	iP i	00 28 02 28 35		Slight, near, rarefaction.
15	Shillong	ENZ	iP	07 09 19		Slight, distant, compression.
15	Delhi	EZ	iP	07 10 57		Slight. Initial ground motion towards East. Rarefaction.
15	Chatra	Z EN	iP i i	07 35 16 35 48 38 05		Slight, distant, rarefaction.

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15	Shillong	ENZ	iP	07 35 33	Slight, distant, rarefaction.
	Dehra Dun	Z EN	e e	07 35 47 38 48	Slight.
15	Poona	Z	e	07 38 02	Slight.
15	Madras	E	e e	07 42 04 46 13	
15	Chatra	Z	e e	11 07 59 08 30	Slight.
15	Chatra	Z	iP	15 12 07	Slight, distant, compression.
	Delhi	ENZ	iP	15 13 00	Slight. Initial ground motion towards South-West. Compression.
15	Delhi	Z	iP i	17 42 34 42 35	Slight, compression.

15 Epc:-  $4.8^{\circ}$  S  $108.0^{\circ}$  E in Java Sea. h about 650 km.  
-H= 19 h 34 m 45.5 s (USCGS).  
Felt Djakarta, Mag: 6.4 (CGS).

Epc:-  $2.0^{\circ}$  S  $107.0^{\circ}$  E in east of Sumatra.  
-H= 19 h 34 m 50 s (C.S.O. Shillong)

✓	Port Blair	Z EN E	iP i PP PPP i iS SS SSS LR M	19 38 58 38 59 39 08 39 24 41 26 42 19 42 37 42 52 43 16 44 43	2410 Rarefaction.
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✓	Madras	E	iP i PP PPP i iS e Lq SS SSS LR i	19 40 31 40 56 41 22 41 33 42 13 45 03 45 46 46 15 46 38 47 00 47 51 48 29	3670
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✓	Calcutta	E	iP PP iS	19 40 37 41 22 45 14	3650
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December, 1963.

15	✓ Tocklai	E	iP i i iS	20 40 42 40 57 43 57 45 27	3810
	✓ Shillong	ENZ EN	iP PcP iS LQ SS SSS LR	19 40 42 43 48 45 32 46 02 46 14 46 32 47 18	3880
	✓ Kodaikanal	E	e iS	19 40 48 45 30	
	✓ Bokaro	EN	iP PcP iS LQ M ScS	19 40 55 43 57 45 49 47 07 50 56 51 21	4000 Initial ground motion towards South East.
	✓ Chatra	ENZ EN	iP i PP PPP PcP iS ScP i SS SSS i	19 41 09 42 11 42 43 43 10 43 43 46 13 46 56 48 07 48 57 49 40 50 06	4190 Initial ground motion towards South-East. Rarefaction.
	✓ Poona	ENZ EN	iP i pP PP eS	19 41 37 41 53 43 20 43 30 46 58	4570 Initial ground movement South East and rarefaction.
	✓ Sehore	EN	iP iS SS	19 41 37 47 05 50 30	4570
	✓ Bombay	ENZ EZ Z E ENZ E	iP e PPP e eS PcS SS SSS e e	19 41 44 43 24 43 42 46 26 47 08 47 34 49 39 50 30 50 46 53 10	4700

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 h. m. s. km.

December, 1963.

15 Delhi ENZ iP 19 42 03 4970 Initial ground motion  
 NZ i 42 26 towards South East.  
 i 43 46 Rarefaction.  
 N pP 43 57  
 NZ sP 45 07  
 i 45 51  
 iS 47 48  
 N i 48 03  
 SS 50 44

15 Dehra Dun ENZ iP 19 42 09 5040 Initial ground movement  
 PcP 43 34 towards South East.  
 pP 44 03 Rarefaction.  
 sP 45 15  
 iS 48 03

Bokaro EN iP 19 42 42 4980  
 PPP 44 57  
 PcS 48 22  
 S 49 08  
 SS 52 18  
 LR 54 45  
 M 58 31

15 Port Blair Z i 19 48 52

15 Delhi Z P 20 12 03 Slight.

15 Delhi Z P 20 18 00 Slight, near.

15 Port Blair Z e 22 58 23 Slight, near.

16 Port Blair Z i 01 34 00 Slight, near.

16 Epc:- 2.2° S 105.9° E near east coast of Sumatra.  
 h about 33 km. -H= 01 h 51 m 44.6 s (USCGS).  
 Mag: 5.7 (CGS).

Port Blair ZE eP 01 56 19  
 E i 56 57  
 i 02 07 26

Bokaro EN eP 01 58 26

Chatra Z eP 01 58 39 4180  
 PcP 02 00 48  
 EN iS 04 29  
 LQ 07 15  
 LR 08 58  
 M 12 05  
 E Mn 20 -  
 N Mn 20 -

Poona Z iP 01 58 59  
 N i 02 06 00 Initial movement  
 towards North East.  
 Rarefaction.

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16 Kodaikanal E iP 01 59 10 Slight, distant.  
 i 02 00 25 Initial ground motion  
 i 04 13 towards East.

Bombay EN eP 01 59 14 4490  
 PP 02 00 50  
 E e 07 45  
 e 02 40  
 eS 05 22  
 SS 08 13  
 LQ 08 34  
 SSS 08 43  
 LR 10 54  
 M 15 03  
 Period = 19 secs.  
 Amp. = 21  $\mu$ .

Delhi ENZ iP 01 59 34 4720 Initial ground motion  
 iS 02 05 57 towards North-West.  
 NZ PS 06 11 Rarefaction.  
 PPS 06 18  
 i 07 03  
 N LR 10 51  
 Z M - - -  
 Period = 23 secs.  
 Amp. = 95  $\mu$ .

Dehra Dun ENZ eP 01 59 40 4920  
 E e 02 07 44 495  
 PPP 02 13  
 EN eS 06 15  
 PS 06 23  
 PPS 06 40  
 SS 09 49  
 LQ 10 21  
 SSS 10 35  
 LR 12 33  
 M 16 22

16 Delhi Z iP 02 14 44 Slight. Initial ground  
 14 45 motion towards North-  
 West. Compression.

16 Shillong ENZ eP 04 23 25 Slight, distant.

Delhi Z iP 04 24 46 Slight, compression.

16 Delhi E i 04 31 17

16 Shillong ENZ iP 05 17 12 Slight, distant,  
compression.

16 Calcutta E e 07 29 15 Slight.

16 Shillong ENZ iP 11 17 23 Slight, distant,  
rarefaction.

16 Delhi ENZ iP 11 18 25 Slight. Initial ground  
motion towards North-  
East. Rarefaction.

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<u>December, 1963.</u>						
16	Delhi	EZ	iP	11 25 29		Slight. Initial ground motion towards East. Compression.
16	Epc:- 37.1° N 20.9° E in Iranian Sea. h about 15 km. -H= 13 h 47 m 56.4 s (USCGS). Mag: 5.6 S.D. 0.1 (CGS).					
	✓ Delhi	Z	iP	13 56 30	5220	Rarefaction.
		ENZ	eS	14 03 22		
	✓ Bombay	ENZ	eP	13 56 40	5450	
		EN	iS	03 45		
	✓ Poona	Z	eP	13 56 49		Compression.
	✓ Chatra	Z	iP	13 57 34	6220	Rarefaction.
		EN	iS	14 05 22		
	✓ Bokaro	E	iP	13 57 39	6190	
		E	S	14 05 25		
	✓ Shillong	ENZ	iP	13 58 05		Compression.
16	Shillong	ENZ	iP	14 30 19		Slight, distant, rarefaction.
	Poona	Z	eP	14 30 25		Slight.
	Chatra	Z	iP	14 30 34		Slight, distant.
	Delhi	Z	P	14 31 00		Slight, distant.
16	Delhi	Z	iP	15 14 24		Slight, rarefaction.
16	Shillong	ENZ	iP	16 04 34		Slight, near, compression.
		i		05 13		
16	Shillong	ENZ	iP	16 13 21		Slight, distant, rarefaction.
	Chatra	Z	iP	16 13 47		Slight, distant, compression.
	Poona	Z	iP	16 14 05		Slight, compression.
	Delhi	ENZ	eP	16 14 40		Slight, compression.
		Z	i	14 41		
16	Delhi	ENZ	iP	16 21 13		Slight. Initial ground motion towards South-West. Compression.
16	Shillong	ENZ	eP	19 09 53		Slight, near.
16	Shillong	ENZ	eP	20 08 10		Slight, local.
		i		08 20		

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
<u>December, 1963.</u>						
16	Shillong	ENZ	eP	21 06 02		Slight, local.
	Poona	Z	eP	21 06 22		Slight (near).
17	Shillong	ENZ	iP	01 13 44		Slight, local.
		e		14 07		
17	Shillong	ENZ	eP	01 37 30		Slight, local.
17	Delhi	Z	eP	04 22 38		Slight, compression.
17	Bokaro	EN	iP	09 47 11		Slight, local.
17	Delhi	ENZ	P	10 30 52		Slight.
	Poona	Z	eP	10 30 58		Slight, compression.
17	Dehra Dun	Z	iP	11 00 15		Slight, rarefaction.
		i		01 53		
17	Delhi	ENZ	iP	11 00 25	930	Slight. Initial ground motion South-East. Compression.
		EZ	iS	02 01		
17	Poona	Z	eP	11 01 12		Slight, rarefaction.
	Chatra	Z	iP	11 01 57		Slight, distant, rarefaction.
17	Delhi	ENZ	P	11 11 00		Slight.
17	Chatra	Z	eP	23 34 13		Slight, distant.
	Dehra Dun	Z	iP	23 34 23		Slight, compression.
	Delhi	ENZ	iP	23 34 31		Slight. Initial ground motion towards South-West. Rarefaction.
		i		34 42		
		i		34 53		
	Poona	Z	eP	23 35 21		Slight, rarefaction.
18	Epc:- 24.8° S 176.6° W in Touga Islands. Felt Touga, Fiji and Karmadee Islands. h about 40 km. -H= 00 h 30 m 02.6 s (USCGS). Mag: 6.5 S.D. 0.3 (CGS).					
	✓ Port Blair	EZ	iP	00 43 22	10550	Rarefaction.
		ENZ	i	47 14		
		NZ	iSKS	53 52		
		E	i	53 55		
	✓ Shillong	ENZ	iP	00 43 51	11110	Compression.
		EN	PP	48 10		
			SKS	54 22		
			S	55 07		
	✓ Calcutta	E	eP	00 44 02	11320	
			pP	48 13		
			i	48 45		
			iSKS	54 40		

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
December, 1963.						
18	Hyderabad	E	eP SKS	00 44 08 54 44	11550	
	Bokaro	EN E	iP PP PPP	00 44 13 48 26 50 40	11670	
	Chatra	Z ENZ EN	eP PP SKS	00 44 13 48 26 54 43	11670	
	Madras	E	eP SKS i iS	00 44 19 54 50 55 10 55 49	11840	
	Kodaikanal	E	eP SKS iS i	00 44 31 54 55 55 55 56 54		
	Bombay	EN E	eP PP e SKS	00 44 38 48 51 52 44 55 05	12450	
	Delhi	EN E	e iSKS iS	00 44 50 55 19 56 28		
	Dehra Dun	Z E EN	e SKS iS	00 44 51 55 20 55 30		Moderate shock.
	Poona	Z N	e eSKS1	00 44 53 55 22		
	Delhi	ENZ Z	iP i	00 47 40 59 20		Slight.
	Sehore	E	e e	00 49 33 55 15		Distant shock.
18	Dehra Dun	Z	iP	00 59 22		Tremor, rarefaction.
18	Chatra	Z	iP	02 39 55		Slight, distant, compression.
18	Shillong	ENZ	iP	02 59 35		Slight, distant, compression.
	Dehra Dun	Z	iP	03 00 25		Slight, compression.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
December, 1963.						
18	Delhi	ENZ	iP	03 00 35		Slight. Initial ground motion towards North-West. Compression.
18	Epc:- 41.7°N 82.5° E in Sinkiang Province, China. h about 33 km. -H= 06 h 40 m 05.9 s (USCGS). Mag: 5.2 S.D. 0.2 (CGS).					
	Dehra Dun	Z	eP iS	06 42 56 45 10	1310	
	Delhi	ENZ E	iP iS	06 43 19 45 47	1460	Initial ground motion towards North-West. Rarefaction.
	Chatra	Z	eP	06 43 39		Slight.
	Shillong	ENZ EN	iP iS	06 44 13 47 35	2030	Rarefaction.
	Bokaro	E	eP S	06 44 19 47 42	2030	
	Bombay	ENZ EN	eP eS	06 45 24 49 42	2710	Slight.
18	Poona	Z	iP	06 45 26		Slight, rarefaction.
18	Madras	E	e	06 50 53		
18	Hyderabad	E	M	06 55 00		Period = 9 secs. Amp. = 3 μ.
18	Epc:- 35.2° N 70.5° E. -H= 17 h 24 m 45 s (New Delhi).					
	Dehra Dun	Z	eP iS	17 26 45 28 17	890	Slight.
	Delhi	ENZ	iP iS	17 26 54 28 33	960	Slight. Initial ground motion towards North-East. Rarefaction.
	Shillong	ENZ EN	iP iS	17 29 17 33 05		Slight, distant, rarefaction.
18	Shillong	ENZ	iP	18 21 19		Slight, distant, compression.
18	Delhi	Z	iP	18 22 29		Slight, rarefaction.
18	Shillong	ENZ	iP	18 38 45		Slight, local.
	Chatra	Z EN	iP eS	18 39 34 40 36	590	Slight.
18	Shillong	ENZ	iP	19 39 09		Slight, distant.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
<u>December, 1963.</u>						
18	Delhi	Z	iP	19 40 08		Slight, rarefaction.
18	Shillong	ENZ	eP	20 27 34		Slight, local.
18	Delhi	Z	P	23 35 51		Slight.
19	Delhi	ENZ	iP	01 19 35		Slight. Initial ground motion towards South-East. Rarefaction.
19	Delhi	ENZ	P	04 13 25		Slight.
19	Bokaro	EN	iP	07 26 59		Slight, local.
19	Epc: - 31.5° N 90.5° E. -H= 08 h 18 m 50 s.					
	Chatra	Z	eP	08 20 12		Slight, distant.
		EN	i	21 16		
	Shillong	ENZ	iP	08 20 24		Slight, local.
	Dehra Dun	Z	e	08 21 32		Slight.
			i	23 24		
	Delhi	ENZ	P	08 21 43		Slight.
19	Delhi	Z	iP	17 23 51		Slight, compression.
		E	i	23 59		
	Dehra Dun	Z	e	17 23 53		Slight.
	Shillong	ENZ	iP	17 24 05		Slight, distant, compression.
			i	24 52		
			i	25 04		
	Chatra	Z	iP	17 24 11		Slight, distant, rarefaction.
19	Madras	E	eP	17 34 41		
			e	35 10		
19	Madras		e	18 31 46		
19	Delhi	EZ	iP	20 16 50		Slight, rarefaction.
19	Delhi	Z	eP	20 53 34		Slight, rarefaction.
19	Delhi	Z	iP	20 53 38		Slight. Initial ground motion towards West. Compression.
19	Dehra Dun	Z	i	20 53 45		Slight.
	Shillong	ENZ	iP	20 53 48		Slight, distant, rarefaction.
			i	54 30		

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
<u>December, 1963.</u>						
19	Shillong	ENZ	iP	21 01 18	100	Slight.
			iSg	01 28		
19	Shillong	ENZ	iP	22 46 38		Slight, distant, compression.
	Delhi	Z	iP	22 47 08		Slight, rarefaction.
20	Shillong	ENZ	iP	00 35 27		Slight, distant, compression.
	Delhi	Z	eP	00 36 34		Slight, distant, compression.
20	Delhi	ENZ	iP	04 18 48		Slight. Initial ground motion towards North-West. Rarefaction.
20	Shillong	ENZ	iP	09 05 56		Slight, near.
			i	07 19		
20	Chatra	Z	eP	09 06 26		Slight, distant.
20	Delhi	ENZ	iP	09 07 24		Slight. Initial ground motion towards South-West. Compression.
	Dehra Dun	Z	iP	09 07 29		Slight, compression.
20	Delhi	Z	iP	09 54 52		Slight, compression.
20	Dehra Dun	Z	eP	10 46 53	230	Slight.
		ENZ	eS	47 21		
		Z	i	47 29		
	Delhi	Z	iP	10 47 14	390	Slight, rarefaction.
		ENZ	iS	47 59		
20	Delhi	Z	iP	11 07 45		Slight, distant, rarefaction.
	Bombay	N	e	15 26 29		Slight.
20	Port Blair	E	i	15 34 33		
	Shillong	ENZ	iP	15 34 40		Slight, distant, compression.
	Madras	E	e	15 37 19		Slight.
			e	40 29		
20	Delhi	NZ	iP	15 40 35		Slight. Initial ground motion towards South. Rarefaction.
	Dehra Dun	N	e	15 41 09		Slight.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
December, 1963.						
20	Shillong	ENZ	iP	15 46 04		Slight, distant, compression.
20	Shillong	ENZ	iP	15 52 19		Slight, distant, rarefaction.
20	Bombay	Z N	eP e M	15 56 09 57 29 16 10 21		Slight. Period = 15 secs. Amp. = 3 μ.
20	Delhi	ENZ	eP	15 57 39		Slight, distant, compression.
	Chatra	Z	iP	15 57 55		Slight, distant, compression.
	Dehra Dun	Z	e?	15 57 58		Slight.
	Shillong	ENZ	iP	15 58 05		Slight, distant, compression.
	Madras	E	e M	16 00 57 03 45		Slight.
20	Hyderabad	E	e	16 07 39		Period = 9 secs. Amp. = 4 μ.
20	Bombay	NZ	e e M	16 30 31 35 43 44 39		Slight. Period = 15 secs. Amp. = 3 μ.
20	Delhi	NZ N	eP eS	16 32 00 38 22	4900	Slight. Initial ground motion towards North. Rarefaction.
	Shillong	ENZ	iP	16 32 25		Slight, distant, compression.
	Madras	E	e M	16 35 15 38 20		Slight.
	Hyderabad	E	e	16 42 58		
20	Delhi	NZ	eP	16 54 07		Slight, distant. Initial ground motion towards North. Compression.
	Shillong	ENZ	iP	16 54 34		Slight, distant, rarefaction.
21	Chatra	Z	ePg eSg	03 37 05 37 20	130	Slight.
21	Delhi	ENZ	eP	04 55 35		Slight, compression.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
December, 1963.						
21	Chatra	Z	eP eS	05 35 17 35 36	150	Slight.
21	Shillong	ENZ	iP	05 36 13		Slight, distant, rarefaction.
	Dehra Dun	Z	eP e	05 36 31 37 50		Slight.
	Bokaro	EN	eP iS	05 36 39 37 16	330	Slight.
	Delhi	ENZ	i	05 37 53		
21	Chatra	Z	eP	05 43 36		Slight, distant.
21	Delhi	ENZ	iPg iSg	06 55 32 55 36.5	40	Slight.
21	Shillong	ENZ	iP	08 43 12		Slight, distant, rarefaction.
21	Shillong	ENZ	eP	12 13 41		Slight, local.
21	Epc:- 16.1° N 119.7° E near west coast of Luzon P.I. Felt Manila. h about 49 km. -H- 13 h 09 m 09.6 s (USCGS). Mag: 5.6 S.D. 0.2 (CGS).					
21	Port Blair	E	i i	13 14 56 22 32		
	Shillong	ENZ	iP	13 14 57		Rarefaction.
	Calcutta	E	e	13 15 31		
	Chatra	Z	iP	13 15 35		Rarefaction.
	Bokaro	E	iP i	13 15 39 26 07		
	Hyderabad	E	eP M	13 15 39 33 04		Period = 23 secs. Amp. = 9 μ.
	Madras	E	e eS	13 16 30 22 35	4420	
	Dehra Dun	Z EN	iP eS	13 16 47 22 51	4400	Rarefaction.
	Delhi	EZ	eP eSS	13 16 48 25 24		Slight, rarefaction.
	Bombay	ENZ EN	iP e	13 17 19 24 25		Slight.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
December, 1963.						
21	Shillong	ENZ	iP	16 19 22		Slight, distant, compression.
21	Delhi	Z	iP	16 20 19		Slight, rarefaction.
21	Delhi	ENZ	iP	16 32 44		Slight. Initial ground motion towards East. Rarefaction.
21	Shillong	ENZ	eP e	17 13 26 13 35		Slight, local.
22	Shillong	ENZ	eP	05 33 09		Slight, local.
22	Delhi	Z	iP	06 16 18		Slight, rarefaction.
22	Shillong	ENZ	iP	08 39 21		Slight, distant, rarefaction.
22	Shillong	ENZ	iP	10 44 57		Slight, distant, compression.
22	Shillong	ENZ	iP i	12 07 42 08 12		Slight, distant, compression.
22	Delhi	EZ Z	iP i	12 09 01 09 30		Slight. Initial ground motion towards West. Rarefaction.
22	Shillong	ENZ	eP	15 10 57		Slight, near.
22	Shillong	ENZ	eP e	16 00 05. 00 40		Slight, near.
22	Delhi	Z	iP	23 47 57		Slight, rarefaction.
22	Delhi	Z Z	iP i	23 51 13 51 29		Slight, rarefaction.
23	Shillong	ENZ	eP	12 13 14		Slight, near.
23	Shillong	ENZ	iP	13 51 25		Slight, distant, rarefaction.
23	Delhi	EZ	iP	13 52 23		Slight. Initial ground motion towards West. Compression.
23	Chatra	Z	e	16 00 57		Slight, distant.
23	Shillong	ENZ	iP	16 30 25		Slight, distant, compression.
23	Shillong	ENZ	iP	18 48 41		Slight, distant, compression.
	Chatra	Z	iP	18 48 56		Slight, distant, compression.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
December, 1963.						
23	Dehra Dun	Z	eP	18 49 29		Slight.
23	Delhi	ENZ	iP i	18 49 39 49 50		Slight. Initial ground motion towards South. Compression.
24	Shillong	ENZ	iP i	01 05 18 06 23		Slight, near, compression.
24	Chatra	Z	eP	01 08 05		Slight, near.
24	Delhi	Z	iP	01 23 57		Slight, rarefaction.
24	Shillong	ENZ	iP	02 35 07		Slight, distant, compression.
24	Dehra Dun	Z	i	02 35 53		Slight.
24	Delhi	ENZ	iP	02 36 03		Slight. Initial ground motion towards South-East. Rarefaction.
24	Shillong	ENZ	iP	03 10 03		Slight, near, compression.
	Chatra	ENZ	iP	03 10 15		Slight, distant, compression.
	Dehra Dun	Z	iP	03 10 49		Slight, compression.
	Delhi	EZ	iP	03 10 58		Slight. Initial ground motion towards West. Compression.
24	Port Blair	Z	iP	03 37 02		Slight, distant, compression.
	Dehra Dun	Z	iP	03 37 14		Slight, compression.
	Delhi	ENZ	iP	03 37 23		Slight. Initial ground motion towards South-West. Compression.
24	Delhi	Z	eP	05 10 50		Slight.
24	Bokaro	EN	iP	07 22 33		Slight, local.
24	Shillong	ENZ	iP	11 30 39		Slight, distant, compression.
	Delhi	Z	eP e	11 31 35 31 47		Slight, distant, compression.
24	Dehra Dun	Z	i	11 31 37		Slight.

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DATE	STATION	COMPT	PHASE	G. M. T.			REMARKS
				h.	m.	s.	
December, 1963.							
24	Chatra	Z	iP	11	31	53	Slight, distant, compression.
24	Madras	E	eP e	12	49	51 49 55	Slight, near, tremor.
24	Shillong	ENZ	iP	13	03	38	Slight, distant, compression.
24	Dehra Dun	Z	e	13	04	47	Slight.
24	Delhi	EZ	iP	13	04	54	Slight, compression.
24	Shillong	ENZ	eP i	13	36	45 37 03	Slight, near.
24	Delhi	Z	iP	18	10	51	Slight, compression.
24	Port Blair	Z	e	19	31	07	
25	Port Blair	Z ENZ	iPg iSg	00	20	26 20 31	50 Slight, rarefaction.
25	Delhi	Z	P	00	26	11	Slight.
25	Delhi	EZ	eP	02	08	07	Slight. Initial ground motion towards West. Rarefaction.
25	Delhi	Z	iP	03	31	24	Slight, compression.
25	Delhi	ENZ	iP	05	49	54	Slight. Initial ground motion towards East-North. Rarefaction.
25	Shillong	ENZ	iP	07	11	45	Slight, distant, compression.
25	Bokaro	EN	iP	08	23	53	Slight, local.
25	Shillong	ENZ	iP i	16	17	32 17 56	Slight, distant.
	Chatra	Z	eP	16	17	57	Slight, distant.
	Delhi	Z	iP	16	19	04	Slight, compression.
25	Delhi	NZ	eP	19	06	27	Slight, distant, rarefaction.
25	Tocklai	E	eP i	19	48	40 48 45	Slight, near.
	Shillong	ENZ	eP i i	19	48	42 48 53 49 52	Slight, near.

DATE	STATION	COMPT	PHASE	G. M. T.			REMARKS
				h.	m.	s.	
December, 1963.							
25	Chatra	Z	eP eS	19	49	12 50 35	800 Slight.
25	Shillong	ENZ	eP	20	36	27	Slight, distant.
25	Chatra	Z	e	20	37	23	Slight.
26	Shillong	ENZ	iP	01	37	24	Slight, distant, compression.
	Delhi	EZ ENZ	iP i	01	38	35 38 36	Slight. Initial ground motion towards East. Compression.
26	Dehra Dun	Z	iP	01	38	45	Slight.
26	Port Blair	Z	i	03	08	15	
26	Delhi	NZ	iP	08	07	48	Slight, rarefaction.
	Chatra	Z	iP	08	08	14	Slight, distant, rarefaction.
	Shillong	ENZ	iP	08	08	28	Slight, distant, compression.
26	Shillong	ENZ	iP	10	55	14	Slight, distant, compression.
26	Delhi	Z	eP	10	56	17	Slight, rarefaction.
26	Shillong	ENZ	iP	11	22	35	Slight, distant, rarefaction.
26	Chatra	Z	iP eSg	14	12	48 13 09	170 Slight, compression.
26	Shillong	ENZ	iP	16	31	35	Slight, distant, rarefaction.
26	Chatra	Z	iP	16	32	10	Slight, distant, compression.
26	Delhi	EZ	iP	16	33	14	Slight, compression.
26	Dehra Dun	Z	eP	16	33	17	Slight.
26	Chatra	Z	iP	16	49	12	Slight, distant, rarefaction.
26	Shillong	ENZ	iP	16	49	29	Slight, distant, rarefaction.
26	Shillong	ENZ	iP	18	54	27	Slight, distant, compression.
26	Chatra	Z ENZ	iP eS	19	54	08 56 59	1700 Slight, compression.

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DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
December, 1963.						
26	Chatra	Z	iP	20 03 45		Slight, near, compression.
26	Shillong	ENZ	iP	20 40 24		Slight, distant, rarefaction.
26	Epc:- 36.4° N 71.5° E in Hindu Kush. h about 140 km. -H= 20 h 50 m 21.2 s (USCGS). Mag : 4.9 (CGS).					
	Dehra Dun	Z	iPn	20 52 23	830	Compression.
			PP	52 30		
			PPP	52 37		
			P*	52 41		
			Pg	53 01		
			LQ	53 42		
		NZ	iSn	53 49		
		Z	i?	53 51		
			LR	54 00		
			SS	54 01		
			SSS	54 11		
			S*	54 17		
			Sg,M	54 39		
	Delhi	ENZ	iP	20 52 30	970	Rarefaction.
			iS	54 10		
	Shillong	ENZ	eP	20 53 59	1810	Rarefaction.
			eS	56 49		
26	Bombay	Z	eP	20 54 19	1980	
			e	55 03		
			eS	57 32		
26	Bokaro	E	eP	20 54 23	2000	
			iS	57 35		
27	Delhi	ENZ	e	00 14 10		
27	Delhi	NZ	eP	01 42 47	970	Slight.
		ENZ	eS	44 27		
27	Port Blair	Z	i	02 33 35		
27	Epc:- 12.0° N 91.5° E in Andaman Island region. -H= 02 h 51 m 55 s (New Delhi).					
	Port Blair	ENZ	iPg	02 52 08	100	Slight Rarefaction. Initial ground motion towards North East.
			iSg	52 19		
	Shillong	ENZ	iP	02 54 59		Slight, near, compression.
	Bokaro	E	eP	02 55 01		Slight, near.
	Chatra	Z	iP	02 55 32		Slight, distant, compression.
			e	58 19		



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
December, 1963.						
27	Delhi	EZ	iP	02 56 46		Slight.
		Z	i	56 54		
	Dehra Dun	Z	eP	02 56 55		Slight.
27	Shillong	ENZ	eP	02 57 22		Slight, near.
27	Port Blair	EZ	i	03 16 51		
27	Delhi	Z	iP	05 41 08		Slight, compression.
27	Port Blair	EZ	i	07 46 37		
27	Bokaro	EN	iP	09 32 01		Slight, local.
27	Delhi	EN	iP	11 07 51		Slight. Initial ground motion towards South-West. Rarefaction.
27	Bokaro	EN	iP	11 33 42		Slight, local.
27	Shillong	ENZ	iP	12 57 45		Slight, distant, compression.
			i	57 57		
	Dehra Dun	Z	eP	12 58 35		Slight.
	Delhi	EZ	iP	12 58 44		Slight. Initial ground motion towards East. Compression.
27	Shillong	ENZ	eP	14 18 41		Slight, near.
27	Chatra	Z	iP	15 45 18		Slight, distant, rarefaction.
27	Shillong	ENZ	iP	15 45 37		Slight, distant, rarefaction.
27	Shillong	ENZ	eP	18 47 35		Slight, near.
			e	48 09		
27	Shillong	ENZ	eP	23 23 36		Slight, near.
			e	24 13		
28	Epc:- 25.5° N 67.5° E. -H= 01 h 44 m 08 s ( New Delhi )					
28	Delhi	ENZ	iP	01 46 21	990	Slight. Initial ground motion towards South-West. Rarefaction.
		Z	PP	46 29		
		ENZ.	iS	48 03		
	Dehra Dun	Z	iP	01 46 36	1110	Compression.
			eS	48 30		
	Chatra	Z	eP	01 47 49		Slight, distant.
		EN	e	51 06		
	Bombay	Z	e	01 48 00		Slight.
	Shillong	ENZ	iP	01 48 40	2390	Slight, rarefaction. 200 km. depth.
			iS	52 23		

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
December, 1963.						
28	Delhi	ENZ	P	04 57 21		Slight.
28	Epc:- 5.1'S 153.5°E in New Ireland region. h about 70 km. -H= 05 h 45 m 20.2 s (USCGS) Mag: 5.5 S.D. 0.4 (CGS).					
	Shillong	ENZ	iP PP iS SSS	05 56 09 58 48 06 05 00 12 18	7420	Rarefaction.
	Port Blair	EZ E	e i	05 56 10 06 04 05		
	Chatra	Z EN	iP iS i	05 56 36 06 05 50 06 30	7860	Rarefaction.
	Bokaro	E	iP PcP PP PPP iS SKS PPS	05 56 38 57 02 59 25 06 01 08 05 55 06 30 06 37	7910	
	Madras	E	eP PcP PP PPP iS PS PPS	05 56 57 57 14 59 38 06 01 22 06 30 07 04 07 20	8240	
	Delhi	EZ ENZ	iP iS	05 57 26 06 07 26	8800	Slight. Initial ground motion towards East. Rarefaction.
	Dehra Dun	EZ EN E	eP iS PS	05 57 27 06 07 23 08 24	8710	
	Bombay	ENZ EN	eP SKS	05 57 36 07 45	8970	
28	Poona	E	i	06 07 43		
28	Delhi	Z	iP	09 22 31		Slight, rarefaction.
28	Delhi	Z	eP	09 33 04		Slight, rarefaction.
28	Shillong	ENZ	iP	14 30 20		Slight, distant, rarefaction.
28	Chatra	Z	iP iS	14 30 50 31 46	520	Slight, rarefaction.



DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS
December, 1963.						
28	Chatra	Z	e	16 52 24		Slight, distant.
28	Chatra	Z	iP eS	17 45 34 45 48	100	Rarefaction.
28	Dehra Dun	Z	e	18 08 52		Slight.
	Delhi	ENZ	eP	18 09 00		Slight.
	Chatra	Z	eP	18 10 44		Slight, distant.
	Shillong	ENZ	iP	18 11 29		Slight, distant, rarefaction.
28	Delhi	ENZ	eP	18 17 42		Slight, distant.
28	Shillong	ENZ	iP	18 17 52		Slight, distant, compression.
28	Shillong	ENZ	iP	19 33 14		Slight, distant.
28	Delhi	NZ	iP	23 17 21		Slight. Initial ground motion towards North. Compression.
28	Delhi	Z	eP	23 19 03		Slight, rarefaction.
29	Shillong	ENZ	iP	00 12 36		Slight, distant, compression.
29	Chatra	Z	eP	00 14 51		Slight, distant.
29	Delhi	Z	eP	00 15 03		Slight, distant.
29	Shillong	ENZ	eP e	08 50 01 50 17		Slight, local.
	Delhi	ENZ	iPg iSg	09 51 09 51 40	40	Slight. Initial ground motion towards South-East. Compression.
29	Dehra Dun	Z	e	09 51 31		Slight.
29	Chatra	Z	eP	11 53 15		Slight, distant.
29	Shillong	ENZ	iP e e	11 53 36 54 47 55 15		Slight, distant, compression.
29	Shillong	ENZ	iP	13 02 38		Slight, distant.
29	Delhi	ENZ E	iP i	13 57 05.6 57 06.4		Tremor, near. Initial ground motion towards North-West. Compression.
	Delhi	NZ	eP	15 57 21		Slight.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	REMARKS.
December, 1963.					
29	Epc:- 18.5° S 69.7° W in Northern Chile. h about 113 km. -H= 17 h 15 m 39.2 s (USCGS). Mag: 5.5 S.D. 0.2 (CGS).				
29	Delhi	Z	iPKP	17 35 13	Initial ground motion towards North-West. Compression.
	/ Dehra Dun	Z	iPKP	17 35 16	Compression.
	/ Madras	E	ePKP	17 35 28	Rarefaction.
	/ Shillong	ENZ	iPKP	17 35 32	
	/ Chatra	Z	ePKP	17 35 50	
29	Delhi	Z	i	17 39 09	Slight.
29	Delhi	Z	eP	18 11 49	Slight, near, compression.
29	Shillong	ENZ	iP	19 18 51	Slight, near. Initial ground motion towards North.
29	Delhi	N EN	iP i	20 10 55.5 10 56.4	Slight, distant, compression.
29	Shillong	ENZ	iP	21 47 00	Slight, distant.
29	Shillong	ENZ	iP	23 17 20	Slight. Initial ground motion towards North East. Rarefaction.
29	Delhi	ENZ	iPg iSg	23 26 58.6 27 02.0	Slight, distant, compression.
30	Shillong	ENZ	iP	01 06 32	Slight, rarefaction.
30	Delhi	Z	eP	01 08 03	Slight, distant, rarefaction.
30	/ Shillong	ENZ	iP	01 23 56	Slight, distant, rarefaction.
	/ Chatra	Z	iP	01 24 25	Slight. Initial ground motion towards South-East. Compression.
	/ Delhi	ENZ	iP	01 25 23	Slight. Initial ground motion towards North. Distant.
30	Delhi	EN	eP	01 33 27	Slight.
30	Delhi	Z	P	05 20 18	Slight.
	Dehra Dun	Z ENZ	e e	05 20 29 22 31	Slight.

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	REMARKS.
December, 1963.					
30	Delhi	ENZ	iP iS	08 25 55 27 35	960 Slight. Initial ground motion towards North-East. Rarefaction.
30	Epc:- 45.5° N 150.6° E in Kurile Islands. h about 40 km. -H= 13 h 29 m 25.3 s (USCGS). Mag: 5.7 S.D. 0.2 (CGS).				
30	/ Shillong	ENZ	iP PP EN iS	13 38 23 40 20 45 34	5550 Compression.
	/ Chatra	Z	iP iS	13 38 42 46 08	5840 Initial ground motion towards South-West. Compression.
	/ Dehra Dun	Z	iP i N eS	13 39 12 39 25 47 04	6285 Compression.
	/ Delhi	ENZ	iP eS	13 39 23 47 23	6450 Initial ground motion towards South-West. Compression.
	/ Port Blair	Z	iP	13 39 26	Compression.
	/ Madras	E	iP PP e	13 40 19 42 46 42 52	Initial ground motion towards East.
	/ Bombay	ENZ Z N EN	iP PcP eS PS	13 40 24 40 49 49 21 49 39	7480
30	Shillong	ENZ	eP	14 44 19	Slight, local.
30	Epc:- 9.4° N 126.0° E near east coast of Mindanao. h about 102 km. -H= 15 h 04 m 14.2 s. Mag: 5.6 (CGS).				
	/ Port Blair	Z	iP	15 10 39	Rarefaction.
	/ Shillong	ENZ	iP PP i iS i	15 11 09 12 29 13 32 16 39 17 06	3890
	/ Chatra	Z	iP i	15 11 46 17 22	Rarefaction.
	/ Madras	E	iP e eS e	15 12 24 13 01 18 54 19 48	4860 Initial ground motion towards West.

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

December, 1963.

30	Delhi	Z	iP i	15 12 54 14 15		Slight. Initial ground motion towards South-East. Rarefaction.
	Dehra Dun	Z EN	iP eS	15 12 55 19 50	5300	Rarefaction.
	Bombay	Z	iP	15 13 16		
30	Delhi	NZ	iP S	15 52 41 54 22	980	Initial ground motion towards North. Compression.
30	Shillong	ENZ	iP	20 40 31		Slight, distant, compression.
	Chatra	Z	eP	20 40 53		Slight, distant, compression.
	Dehra Dun	Z	e	20 41 29		Slight.
	Delhi	ENZ	iP	20 41 39		Slight. Initial ground motion towards South-west. Compression.

30 Epc:- 6.9° N 94.7° E in Nicobar Islands.  
 h about 64 km. -H= 22 h 06 m 07.1 s. Mag. 5.6 (CGS).

	Port Blair	Z	iP	22 07 30		Slight, distant, compression.
30	Madras	E	iP PP PPP LQ iS M	22 09 48 09 58 10 06 12 25 12 40 14 10	1720	Initial motion towards East.
	Shillong	ENZ	iP i	22 10 23 18 12		Rarefaction.
	Chatra	Z	eP	22 10 48		
	Bombay	Z	iP e	22 11 25 11 54		
	Delhi	ENZ	iP	22 11 47		Initial ground motion towards North East. Rarefaction.
	Dehra Dun	Z	eP SSS	22 11 56 16 30		
	Bombay	Z	e	22 15 50		
	Chatra	Z	iP	22 22 22		Rarefaction.
30	Chatra	Z	eP iS	22 51 13 51 28	110	Slight.

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

December, 1963.

31	Shillong	ENZ	eP	00 35 31		Slight, distant.
31	Shillong	ENZ	eP	00 55 14		Slight, near.
31	Shillong	ENZ	iP	04 37 09		Slight, distant, compression.
31	Delhi	Z	P	04 38 09		Slight.
31	Delhi	Z	eP	10 47 39		Slight.
31	Shillong	ENZ	iP	10 54 20		Slight, distant, compression.
31	Delhi	EZ	iP	10 55 19		Slight. Initial ground motion towards North. Rarefaction.
31	Delhi	Z	iP	15 24 03		Slight, compression.
	Chatra	Z	iP	15 25 17		Slight, distant, compression.
31	Shillong	ENZ	iP	15 25 51		Slight, distant, compression.

31 Epc:- 56.5° S 26.0° W in Sandwich Islands.  
 h about 30 km. -H= 17 h 37 m 32.1 s (USCGS).  
 Mag: 5 1/4 (Pal), 5.3 (CGS).

	Kodaikanal	E	ePKP1 i	17 55 56 18 02 08		
	Delhi	Z	ePKP1 PP N i NZ Z NZ SS N SSS	17 56 21 57 58 18 04 12 05 36 07 43 09 16 10 19 14 00 17 44 19 38	13530	
	Dehra Dun	Z	iPKP1	17 56 27		
	Chatra	Z	iPKP1	17 56 30		Rarefaction.
	Madras	E	ePKP1	17 56 30		
	Shillong	ENZ	PKP1 PP i i	17 56 32 58 30 18 03 35 05 19		Compression.
	Poona	N	ePKP1	17 56 33		

DATE	STATION	COMPT	PHASE	G. M. T. h. m. s.	△ km.	REMARKS.
December, 1963.						
31	Port Blair	E	ePKP1	17 57 21		
31	Calcutta	E	ePKP1	17 57 59		
31	Bokaro	EN	ePKP1	17 58 01		
31	Bombay	ENZ	iPKP1	18 56 43		
31	Shillong	ENZ	iP	19 07 20		Slight, distant, compression.
31	Chatra	Z	eP	19 07 51		Slight, distant.
31	Delhi	ENZ	iP	19 08 50		Slight. Initial ground motion towards North. Compression.

A list of felt earthquake reports for the month of December, 1963.

S.No.	Station	Date (GMT)	Time (GMT)	No. of shocks.	Duration (Secs.)	Intensity (R.F. Scale)	RKS.
1.	Qazigund	3.12.63	15 56	I	3	V	
2.	Qazigund	3.12.63	15 57	I	7	V	
3.	Qazigund	3.12.63	18 12	I	3	V	
4.	Banihal	3.12.63	15 59	I	30	VIII	
5.	Banihal	3.12.63	16 16	I	15	VIII	
6.	Banihal	3.12.63	18 14	I	10	VIII	
7.	Nellore	5.12.63	04 10	I	50	VIII	Appears to come from North.
8.	Nellore	21.12.63	17 57	I	3	VIII	Appears to come from North.

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.					December, 1963.				
01	00	3	0.3	4.2	20	00	3	0.3	4.3
	06	3	0.2	4.3		06	3	0.3	4.4
	12	3	0.3	4.5		12	...	-	-
	18	3	0.2	4.0		18	...	-	-
02	00	3	0.3	4.5	21	00	...	-	-
	06	3	0.2	4.3		06	3	0.3	4.2
	12	3	0.2	4.0		12	3	0.3	4.3
	18	3	0.2	4.0		18	...	-	-
03	00	3	0.2	4.1	22	00	...	-	-
	06	0..	-	-	to	06	...	-	-
	12	3	0.2	4.2	23	12	...	-	-
	18	3	0.2	4.1		18	...	-	-
04	00	...	-	-	24	00	...	-	-
to	06	...	-	-		06	...	-	-
13	12	...	-	-		12	3	0.4	4.8
	18	...	-	-		18	3	0.3	5.0
14	00	...	-	-	25	00	3	0.3	5.0
	06	3.	0.3	4.5		06	3	0.3	5.0
	12	3.	0.3	4.3		12	3	0.3	4.7
	18	...	-	-		18	3	0.4	5.0
15	00	...	-	-	26	00	3	0.3	4.6
	06	...	-	-		06	3	0.4	4.6
	12	...	-	-		12	3	0.4	4.4
	18	...	-	-		18	3	0.3	4.8
16	00	...	-	-	27	00	3	0.3	4.8
	06	1	0.6	5.0		06	3	0.4	5.4
	12	1	0.5	5.0		12	3	0.5	5.3
	18	1.	0.4	5.1		18	...	-	-
17	00	1	0.4	5.1	28	00	...	-	-
	06	3	0.4	5.0		06	...	-	-
	12	1	0.6	6.0		12	3	0.4	4.5
	18	1	0.5	5.7		18	3	0.3	4.4
18	00	1	0.5	5.5	29	00	3	0.3	4.5
	06	3	0.4	5.0		06	3	0.5	5.2
	12	3	0.3	4.9		12	3	0.3	5.0
	18	3	0.3	4.8		18	3	0.3	4.6
19	00	1	0.4	5.0	30	00	3	0.3	4.5
	06	3	0.4	4.8		06	3	0.4	5.1
	12	3	0.3	4.6		12	3	0.3	4.6
	18	3	0.3	4.5		18	3	0.2	4.0
					31	00	3	0.2	4.2
						06	0..	-	-
						12	...	-	-
						18	...	-	-

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.)					December, 1963.				
23	00	3	0.3	5.5	02	00	1	1.0	3.3
	06	3	0.3	4.5		03	1	0.9	3.3
	12	3	0.2	4.7		06	1	0.9	3.3
	18	3	0.2	5.0		12	1	0.8	3.4
						18	1	0.8	3.5
24	00	3	0.2	4.8			1	0.2	1.9
	06	3	0.2	4.5	03	00	1	0.9	3.6
	12	3	0.2	4.5			1	0.7	2.8
	18	3	0.3	4.5			1	0.3	2.1
25	00	3	0.2	5.0	03		1	1.0	3.7
	06	3	0.2	4.5			1	0.7	2.9
	12	3	0.2	4.6			1	0.3	1.9
	18	3	0.2	4.3	06		1	1.0	3.9
26	00	3	0.2	4.4			1	0.7	2.7
	06	3	0.2	3.3			1	0.3	2.2
	12	3	0.2	4.6	12		1	1.0	3.9
	18	3	0.2	4.6			1	0.8	2.8
27	00	3	0.2	4.5			1	0.3	2.0
	06	3	0.3	5.0	18		1	1.2	3.9
	12	3	0.3	5.0			1	0.9	2.7
	18	3	0.3	5.0	04	00	1	1.2	3.8
28	00	3	0.3	5.2			1	0.9	2.9
	06	...	-	-	03		1	1.3	4.2
	12	3	0.3	5.2			1	0.9	2.8
	18	3	0.3	5.0			1	0.4	2.0
29	00	3	0.2	4.5	06		1	1.4	4.2
	06	3	0.3	4.9			1	0.8	2.8
	12	3	0.3	5.0			1	0.4	1.9
	18	3	0.3	4.8	12		1	1.4	4.2
30	00	3	0.2	5.0			1	0.7	2.7
	06	3	0.2	5.0	18		1	1.5	4.2
	12	3	0.2	5.0			1	0.7	2.8
	18	3	0.2	5.0	05	00	1	1.4	4.0
31	00	3	0.2	4.7			1	0.9	2.8
	06	3	0.2	4.5	03		1	1.4	4.2
	12	3	0.2	4.5			1	1.1	2.9
	18	...	-	-	06		1	1.3	4.2
							1	1.2	3.1
					12		1	1.3	4.0
							1	1.3	3.2
					18		1	1.1	3.9
							1	1.3	3.4
							1	1.0	3.0
					06	00	1	1.1	3.9
							1	1.3	3.3
							1	1.0	3.0
					03		1	1.3	3.5
					06		1	1.2	3.4
					12		1	1.2	3.4
					18		1	1.1	3.2
Station: Madras.									
01	00	1	0.6	3.0					
	03	1	0.6	3.1					
	06	1	0.6	3.1					
	12	1	0.8	3.3					
	18	1	0.9	3.2					



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

December, 1963.

07	00	1	1.0	3.1	14	00	2	0.3	4.7
	03	1	0.9	3.2		03	2	0.2	4.5
	06	1	0.9	3.2		06	2	0.2	4.5
	12	1	0.8	3.1		12	2	0.2	4.4
	18	1	0.7	3.2		18	2	0.3	4.5
		1	0.3	2.0					
					15	00	2	0.3	4.6
08	00	1	0.7	3.1		03	2	0.3	4.5
		1	0.3	2.1		06	2	0.3	4.4
	03	1	0.6	3.1		12	2	0.4	5.1
		1	0.2	1.9		18	2	0.5	6.0
	06	1	0.6	3.2					
	12	1	0.5	3.1	16	00	2	0.6	6.6
	18	1	0.5	3.2		03	...	No record.	
09	00	1	0.4	2.9		06	...	-do-	
	03	2	0.3	2.8		12	...	-do-	
	06	2	0.3	4.2		18	...	-do-	
		2	0.3	2.9	17	00	...	No record.	
	12	2	0.3	4.3		03	...	-do-	
		2	0.3	2.8		06	...	-do-	
	18	2	0.3	4.4		12	2	0.5	5.8
		3	0.2	2.7			3	0.2	2.3
10	00	2	0.3	4.2		18	2	0.5	6.0
		3	0.2	2.5			3	0.2	2.5
	03	2	0.3	4.2	18	00	2	0.4	5.7
		3	0.2	2.3			3	0.2	2.7
	06	2	0.3	4.5		03	...	Earthquake.	
		3	0.2	2.3		06	3	0.2	2.7
	12	2	0.3	4.6		12	2	0.3	2.8
		3	0.1	2.4		18	2	0.4	2.9
	18	2	0.3	4.7	19	00	2	0.4	3.0
		3	0.1	2.4		03	2	0.3	3.0
11	00	2	0.3	4.4			3	0.2	1.9
		3	0.1	2.4		06	2	0.3	3.1
	03	2	0.3	4.5		12	2	0.3	3.0
	06	2	0.3	4.5		18	2	0.4	3.1
	12	2	0.3	4.5	20	00	2	0.4	3.1
	18	2	0.3	4.9			3	0.1	1.7
12	00	2	0.3	5.1		03	2	0.4	3.1
	03	2	0.3	5.1		06	2	0.5	3.1
	06	2	0.3	5.0		12	2	0.5	3.2
	12	2	0.3	4.8		18	2	0.5	3.2
	18	2	0.3	4.8	21	00	2	0.6	3.0
13	00	2	0.3	4.8		03	2	0.6	3.1
	03	2	0.3	4.5		06	2	0.6	3.3
	06	2	0.3	4.5		12	2	0.6	3.1
	12	2	0.3	4.6			3	0.3	2.0
	18	2	0.3	4.8		18	2	0.6	3.2
							3	0.2	1.8



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

December, 1963.

22	00	2	0.5	3.1	28	06	2	0.5	3.3
		3	0.2	1.9		12	2	0.5	3.3
	03	2	0.5	3.0		18	2	0.5	3.3
	06	2	0.5	3.1			2	0.3	2.7
	12	2	0.4	3.0	29	00	2	0.5	3.5
	18	2	0.4	3.0			2	0.4	2.8
23	00	2	0.4	3.0		03	2	0.5	3.2
	03	2	0.4	3.0		06	2	0.5	3.2
	06	2	0.3	3.0		12	2	0.4	3.2
	12	2	0.3	2.9		18	2	0.4	3.0
	18	2	0.3	3.0	30	00	2	0.4	2.9
24	00	2	0.3	2.9		03	2	0.4	2.8
	03	2	0.3	2.9		06	2	0.4	2.8
	06	3	0.3	2.7		12	2	0.3	2.8
	12	3	0.3	2.7		18	2	0.3	2.9
		3	0.1	1.7	31	00	2	0.3	2.8
	18	3	0.3	2.8		03	2	0.3	2.8
		3	0.1	1.7		06	2	0.3	2.8
25	00	3	0.3	2.7		12	2	0.3	2.8
		3	0.1	1.7		18	...	Earthquake.	
	03	3	0.3	2.8					
		3	0.1	1.6					
	06	3	0.3	2.9					
	12	3	0.3	2.8					
	18	3	0.3	2.8					
26	00	3	0.3	2.7					
		3	0.1	1.7					
	03	2	0.3	2.9					
		3	0.1	1.6					
	06	2	0.3	2.7					
		3	0.1	1.6					
	12	2	0.4	2.9					
		3	0.1	1.5					
	18	2	0.5	2.9					
		3	0.1	1.4					
27	00	2	0.5	3.1					
		3	0.1	1.5					
	03	2	0.5	3.1					
		3	0.1	1.3					
	06	2	0.5	3.0					
		3	0.1	1.4					
	12	2	0.5	3.1					
	18	2	0.5	3.2					
28	00	2	0.5	3.2					
		3	0.1	1.5					
	03	2	0.5	3.4					
		3	0.1	2.0					

Station: Visakhapatnam.

01	00	1	0.5	3.0
	06	1	0.5	3.3
	12	1	0.5	3.0
	18	1	0.5	3.0
02	00	1	0.5	3.0
	06	1	0.5	3.3
	12	1	0.4	3.0
	18	1	0.5	3.0
03	00	1	0.5	3.2
	06	1	0.7	3.0
	12	1	0.7	3.1
	18	1	0.7	3.2
04	00	1	0.6	3.1
	06	1	0.6	3.0
	12	1	0.5	3.1
	18	1	0.6	3.0
05	00	1	0.5	3.1
	06	1	0.6	2.9
	12	1	0.6	2.8
	18	1	0.6	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.
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Station: Visakhapatnam(Contd.) December, 1963.

06	00	1	0.5	2.9	04	00	3	1.2	3.8
	06	1	0.5	3.0				0.4	1.5
	12	1	0.6	3.2		06	3	0.9	3.7
	18	1	0.5	3.0				0.5	1.9
						12	3	1.0	3.8
07	00	1	0.5	2.6				0.5	2.7
	06	1	0.5	2.7				0.4	2.0
	12	1	0.6	2.9		18	3	0.4	1.9
	18	1	0.7	3.0				1.3	4.0
08	00	1	0.5	2.9	05	00	3	1.0	3.9
	06	2	0.4	2.9				0.5	2.0
	12	2	0.4	3.0		03	1	1.1	4.0
	18	2	0.4	2.5		06	1	0.9	4.0
09	00	2	0.5	2.5		09	1	1.0	4.0
Onward no observations because the Seismograph was dismantled to facilitate construction of additional pillar on 9.12.63.						12	1	1.0	4.0
						15	1	0.9	4.0
						18	3	1.0	3.7
								0.5	2.0

Station: Bombay (Colaba).

01	00	3	1.5	3.0	06	00	3	1.0	3.7
			0.7	2.1				0.4	2.0
	03	1	0.5	3.0		06	3	0.6	3.8
	06	1	1.5	3.2				0.4	2.0
	09	1	1.4	3.0	07	00	3	0.6	3.0
	12	1	1.4	3.0				0.5	2.0
	15	1	1.4	3.3		06	3	0.6	4.0
	18	1	1.4	3.0				0.3	1.7
	21	1	1.4	3.0				0.5	2.8
02	00	1	1.4	3.0		12	3	0.3	1.3
	06	3	0.9	3.1				0.6	3.8
			0.5	2.0		18	3	0.4	1.8
	12	3	0.9	3.2				0.6	4.0
			0.5	2.0	08	00	3	0.5	3.9
	18	3	0.6	1.8				0.3	1.7
			1.1	3.2		06	3	0.5	3.2
								0.6	4.8
03	00	3	0.9	3.4				0.3	2.0
			0.5	1.9		12	3	0.4	3.0
	06	3	0.9	3.2				0.6	6.0
			0.4	1.6		18	3	0.4	2.9
	12	3	1.0	3.7				0.5	4.1
			0.8	2.9	09	00	3	0.5	3.7
	18	3	1.2	3.8				0.4	2.0
			0.3	1.4		06	3	0.5	5.3
								0.2	1.8

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.) December, 1963.

09	12	3	0.5	4.8	16	00	3	0.5	2.4
			0.3	1.3				0.6	6.9
	18	3	0.5	4.7		06	3	0.5	2.4
			0.4	3.0				0.6	6.0
						12	3	0.4	2.4
10	00	3	0.5	5.8				0.5	6.0
			0.2	2.0		18	3	0.5	2.1
	06	3	0.5	4.9				0.5	5.0
			0.3	1.4					
	12	3	0.5	5.0	17	00	3	0.5	2.0
			0.3	1.7				0.6	6.1
	18	3	0.6	5.0		06	3	0.4	2.0
			0.4	1.5				0.6	7.0
11	00	3	0.6	5.8		12	3	0.3	1.5
			0.5	3.7				0.6	6.0
	06	3	0.4	5.4		18	3	0.4	1.4
			0.5	5.8				0.6	6.5
	12	3	0.5	5.8					
			0.4	4.0	18	00	3	0.4	1.8
	18							0.6	5.9
						06	3	0.4	1.9
12	00	1	0.5	1.8				0.5	6.2
	03	1	0.5	5.3		12	3	0.4	2.0
	06	1	0.4	5.1				0.5	5.8
	09	1	0.1	5.1		18	3	0.4	1.8
	12	1	0.5	4.9				0.5	5.8
	18	3	0.5	4.8					
			0.4	1.2	19	00	3	0.5	1.9
								0.6	6.0
13	00	3	0.5	5.0		06	3	0.4	1.8
			0.4	1.4				0.5	5.3
	06	3	0.4	1.9		12	3	0.5	2.0
			0.5	4.3				0.5	5.5
	12	3	0.4	1.9		18	3	0.6	1.7
			0.5	3.8				0.6	5.0
	18	3	0.4	1.8					
			0.5	4.0	20	00	3	0.6	1.9
								0.5	4.0
14	00	3	0.5	1.9		06	3	0.4	1.8
			0.6	3.8				0.5	4.6
	06	3	0.6	2.3		12	3	0.4	2.0
			0.6	3.8				0.5	4.0
	12	3	0.5	2.0		18	3	0.5	1.9
			0.6	4.0				0.6	4.0
	18	3	0.5	2.0					
			0.6	3.8	21	00	3	0.6	2.0
								0.6	3.7
15	00	3	0.6	2.0		06	3	0.4	2.1
			0.7	2.9				0.5	3.9
	06	3	0.5	2.0		12	3	0.5	2.4
			0.6	3.4				0.5	3.5
	12	3	0.5	2.0		18	3	0.4	2.0
			0.5	5.3				0.5	3.5
	18	3	0.5	2.0					
			0.6	6.6					

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.)      December, 1963.

22	00	3	0.6	2.4	27	18	3	0.6	4.0
			0.5	6.0				0.5	1.5
	06	3	0.6	2.5	28	00	3	0.7	4.5
			0.5	6.6				0.6	3.0
	12	3	0.5	2.5				0.5	1.5
			0.5	6.4	06				
	18	3	0.4	2.0	12	3	0.6	4.1	
			0.6	3.0				0.5	3.0
23	00	3	0.5	2.0	18				
			0.5	5.6	29	00	3	0.6	4.0
	06	3	0.5	2.5				0.3	1.6
			0.5	5.0	06	3	0.6	3.6	
	12	3	0.5	2.5				0.5	2.0
			0.5	4.7				0.6	5.0
	18	3	0.5	2.4	12	3	0.5	2.9	
			0.5	5.0				0.6	4.6
24	00	3	0.5	2.4	18	3	0.6	4.0	
			0.4	5.0				0.5	3.0
	06	3	0.4	2.4	30	00	3	0.6	4.0
			0.5	3.9				0.5	2.9
	12	3	0.5	2.3	06	3	0.5	3.0	
			0.5	5.0				0.6	4.0
	18	3	0.4	2.4				0.4	2.0
			0.6	4.0	12	3	0.4	1.8	
25	00	3	0.5	2.3				0.5	4.0
			0.5	5.0	18	3	0.5	2.0	
	06	3	0.4	2.2				0.5	4.0
			0.5	4.0	31	00	3	0.6	3.0
			0.5	7.0				0.6	4.0
	12	3	0.4	2.3				0.5	2.0
			0.4	4.5	06	3	0.6	3.3	
	18	3	0.4	2.4				0.4	1.9
			0.5	4.3	12	3	0.5	3.4	
26	00	3	0.4	2.5				0.4	1.8
			0.5	3.8	18				
	06	3	0.3	1.5					
			0.5	3.7					
	12	3	0.5	3.7					
			0.3	2.0					
	18	3	0.3	1.5					
			0.5	3.8					
			0.5	7.0					
27	00	3	0.5	3.9					
			0.3	1.9					
	06	3	0.6	4.0					
			0.5	2.5					
			0.5	6.5					
	12	3	0.6	4.0					
			0.7	6.0					

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

01	00	3	0.4	2
	06	3	0.4	3
	12	3	0.8	3
	18	3	0.8	3

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.)      December, 1963.

02	00	3	0.8	3	12	00	3	0.2	3
	06	3	0.8	3				0.4	7
	12	3	1.2	3	06	3	0.2	3	
	18	3	1.2	3				0.4	7
03	00	3	1.6	3	12	3	0.2	3	
	06	3	1.2	3				0.8	7
			0.4	7	18	3	0.2	3	
	12	3	1.2	3				0.8	7
	18	3	1.2	3	13	00	3	0.2	3
			0.4	7				0.8	7
04	00	3	0.8	3	06	3	0.8	7	
	06	3	1.2	3	12	1	0.8	7	
	12	3	1.2	3	18	1	0.4	7	
	18	3	1.2	3	14	00	1	0.2	7
05	00	3	1.2	3				0.2	5
	06	3	0.8	3	06	1	0.2	5	
	12	3	0.8	3	12	1	0.2	5	
	18	3	0.8	3	18	0,0	-	-	
06	00	3	0.8	3	15	00	0,0	-	-
	06	3	0.4	3				-	-
	12	3	0.4	3	06	...	-	-	-
	18	3	0.4	3	12	0,0	-	-	-
07	00	3	0.4	3	18	1	0.4	6	
	06	1	0.2	3	16	00	1	0.4	6
	12	1	0.2	3				0.4	6
	18	1	0.2	3	06	1	0.4	7	
08	00	1	0.2	3	12	1	0.4	7	
	06	...	-	-	18	0,0	-	-	
	12	1	0.2	3	06	3	0.4	6	
	18		0.2	3	12	3	0.4	7	
09	00	1	0.2	3	18	00	3	0.4	7
	06	3	0.4	7				0.4	3
	12	3	0.4	7	06	3	0.4	6	
	18	3	0.4	7	12	3	0.4	3	
10	00	3	0.4	7	18	3	0.4	3	
	06	3	0.8	7	19	00	3	0.4	3
	12	3	0.8	7				1.2	3
	18	...	-	-	06	3	0.8	3	
11	00	...	-	-	12	3	0.8	3	
	06	3	0.4	3	18	3	0.8	3	
	12	3	0.4	3	20	00	3	0.8	3
			0.4	7				0.8	3
	18	3	0.2	3	06	3	0.4	3	
			0.4	7	12	3	0.4	3	
					18	3	0.4	3	



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.)

December, 1963.

21	00	3	0.4	3	27	00	3	0.2	3
	06	1	0.4	3				0.8	7
	12	1	0.4	3		06	3	0.4	3
	18	1	0.4	3				0.8	7
						12	3	0.8	3
22	00	1	0.4	3				0.8	7
	06	...	-	-		18	3	0.8	3
	12	1	0.4	3				0.8	7
	18	1	0.4	3					
					28	00	3	0.8	3
23	00	3	0.2	3				0.8	7
			0.2	6		06	...	-	-
	06	3	0.2	6		12	3	0.8	3
	12	3	0.2	6		18	3	0.8	3
	18	3	0.2	6					
					29	00	1	0.8	3
24	00	...	-	-		06	...	-	-
	06	3	0.4	7		12	1	0.8	3
	12	0,0	-	-		18	3	0.8	3
	18	0,0	-	-				0.4	7
					30	00	3	0.4	3
25	00	0,0	-	-				0.4	7
	06	3	-	-		06	3	0.4	3
	12	3	0.8	8		12	3	0.4	3
	18	3	0.8	8				0.4	7
						18	3	0.4	3
26	00	3	0.8	8				0.4	7
	06	3	1.2	7					
	12	3	1.2	7	31	00	3	0.2	3
	18	3	0.2	3				0.4	7
			1.2	7		06	3	0.2	3
								0.4	7
						12	3	0.4	7
						18	...	-	-

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