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PAKISTAN METEOROLOGICAL SERVICE

GEOPHYSICAL INSTITUTE

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Particulars of Stations and Instruments

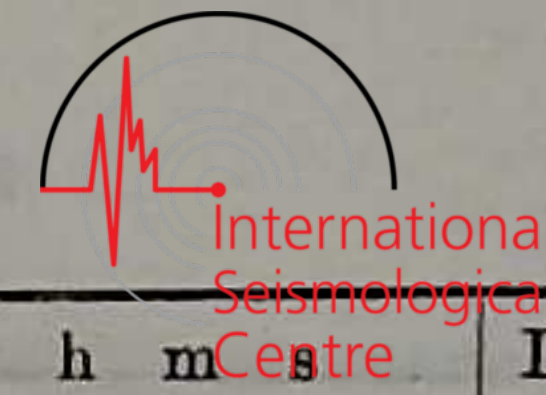
(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11' N	66° 57' E	1721 meters	Cretaceous Limestone
Lahore	Lh	31° 33' N	74° 20' E	210 "	Alluvium
Karachi	Kr	24° 50' N	67° 02' E	30 "	Alluvium
Chittagong	Ch	22° 21' N	91° 49' E	35 "	Alluvium
Warsak	Wr	34° 09' N	71° 25' E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Quetta (Central Station)				
Sprengnether	Z	1.9 sec.	Critical	5,500
"	N	1.95 "	"	4,500
"	E	1.95 "	"	5,800
"	N	15.8 "	"	15,000
"	E	19.5 "	"	16,000

(Contd.)



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Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N, & E	Seismo = 1 sec. Galvo = 1/4 "	—	—
Sprengnether Pen recorder	E		1.0 "	—
Lahore				
Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi				
Sprengnether	Z	1.8 sec	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong				
Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak				
Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X = unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki), (Pal), stand for seismological observatories Pasadena (U.S.A.), Berkly (U. S. A.), Uppsala (Sweden), Kiruna (Sweden) & Palisade (U. S. A.) respectively.
 All times are in Greenwich Mean Time.

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
1	Wr	ePZ	01	29	53			H 07 07 06				
		iSN		30	22			36.1 N 70.0 E				
	Qt	ePZNE			54			Hindukush				
		eSNE		23	14			depth about 200 km				
	Lh	eSE		31	30	3 ✓	Qt	ePZ		15	15	56
		H 09 29 12					Wr	ePZ			16	00
		36 1/2 N 71 1/2 E						USCGS H 15 02 25.5				
		Hindukush						22.4 N 45.2 W				
		depth about 200 km						North Atlantic Ocean				
		USCGS H 09 29 08.6						depth about 25 km				
		36.6 N 71.3 E				4	Qt	ePZ		15	22	35 d
		Hindukush						eSE			23	01
		depth about 201 km					Lh	ePZ			22	57
							Wr	ePZ				58.3
1	Wr	iPZ	09	57	09.6			H 15 21 55				
		iSZ			23.4			30.2 N 69.8 E				
	Qt	ePZ			58 05			Fort Munro				
		eSE			59 02			West Pakistan				
2	Wr	ePZ	05	47	34			USCGS H 15 21 56.9				
	Qt	ePZNE			52			30.3 N 70.0 E				
		USCGS H 05 35 36.1						West Pakistan				
		3.5 S 145.3 E						depth about 50 km				
		Bismark Sea										
		depth about 42 km				5	Wr	ePZ		10	52	45
								eSZ			53	55
2 ✓	Lh	ePZ	17	23	49							
	Qt	ePZNE			24 37		Qt	ePZ				56
		USCGS H 17 15 08.7						eSNE				56 01
		29.8 N 130.6 E						USCGS H 10 51 19.7				
		Kyushu, Japan						38.9 N 75.5 E				
		depth about 15 km						Sinkiang Province, China				
								depth about 140 km				
3	Wr	iPZ	07	07	52.2 d	5 ✓	Wr	ePZ		16	53	34
		iSZ			08 27.3		Qt	ePZNE				54 46
	Lh	ePZ			36			eSNE				17 03 38
		eSE			09 44			USCGS H 16 43 44.8				
	Qt	ePZ			08 43 ±			7.1 S 129.2 E				

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
17	Wr	iPZ	04	40	30 c	18	Lh	ePZ	00	32	24
	Qt	ePZE	41	28				eSNE		52	
	Lh	eSNE	43	02			Wr	ePZ		53.4	
		iPZ	40	07	d			eSZ		33	46.6
		eSZ	34				H	00 31 44			
		H	04	39	27			Kashmir region			
		33½ N	76½ E			18	Ch	ePZ	12	38	31
		Kashmir region						USCGS H	12	27	02.7
		depth about 60 km						52.4 N	174.6 W		
		USCGS H	04	39	26.6			Andreanof Islands			
		33.3 N	76.2 E					Aleutian Islands			
		Kashmir region						depth about 65 km			
		depth about 22 km				18	Ch	iPZ	23	53	08
17	Wr	ePZ	14	30	16			ipPZ		17	
	Qt	ePE	31	23				ePcPZ		42	
		USCGS H	14	26	29.7			ePPZ		55	33
		43.2 N	88.0 E					eSN	00	01	38
		Sinkiang Province, China						Mu			
		depth about 50 km						Sec			
17	Lh	ePZ	16	36	27			PZ	1.0	1.5	
		eSNE		55				$\Delta = 64^\circ.7$			
	Wr	ePZ		51.8			Wr	ePZ	23	55	01
		eSZ		37	48.9		Qt	ePZNE		18	
		H	16	35	48			eSKsZNE	00	05	41
		Kashmir region						eSZNE		53	
17	Qt	ePE	22	40	07			USCGS H	23	42	31.3
		USCGS H	22	28	04.1			4.8 S	151.8 E		
		51.7 N	177.0 E					New Amxain region			
		Andreanof Islands						depth about 47 km			
		Aleutian Islands						Mag 6¼ (Pas)			
		depth about 22 km				19	Wr	ePZ	08	15	18.0
								iSZ		16	23.1
							Qt	ePZ		15	54
								eSE		17	33
								H	08	13	46
								Tadzhik S. S. R.			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
19	Wr	ePZ	13	12	21.7							
	Qt	ePZ		13	35							
		e(S)E		15	59							
20	Lh	ePZ	06	25	45	21	Qt	ePKPZ	19	17	57	
	Wr	ePZ		26	45.0 d			epPKPZ		18	12	
	Qt	ePZ		48				USCGS H	18	58	18.6	
		epPNE		28	20			38.8 S	72.9 W			
		USCGS H	06	16	22.6			Near coast of Chile				
		6.9 S	126.6 E					depth about 40 km				
		Banda Sea				21	Wr	ePZ	23	03	56	
		depth about 272 km					Qt	ePZNE		04	09	
20	Wr	ePZ	21	20	17.8			USCGS H	22	52	52.0	
	Qt	ePZ		21	16			7.4 S	130.1 E			
		eSE		22	48			Tanimbar Islands region				
		H	21	19	16			depth about 52 km				
		Hindukush region				22	Wr	ePZ	11	59	00	
20	Wr	iPZ	21	30	37.1 d		Qt	ePZ		24		
		iSZ		31	06.8			eSNE		12	07	55
	Qt	ePZ		42				USCGS H	11	48	55.3	
		eSE		33	05			32.2 N	142.4 E			
		H	21	29	52			Off coast of Honshu, Japan				
		Hindukush region						depth about 25 km				
21	Ch	ePZ	03	29	27	22	Qt	ePZ	15	08	09	
		eSZE		34	14			epPNE		38		
	Wr	iPZ		32	08 d			USCGS H	14	55	39.8	
	Qt	ePZNE		24				6.9 S	147.0 E			
		USCGS H	03	23	21.0			Near north coast of				
		4.9 N	122.7 E					New Guinea				
		Celebes Sea						depth about 70 km				
		depth about 600 km				23	Qt	ePZ	05	08	35	
							Wr	ePZ		09	22	
21	Wr	ePKPZ	05	03	04			USCGS H	05	04	57.6	
	Qt	ePKPZ		06				29.7 N	49.1 E			
		USCGS H	04	43	43.3			Persian Gulf				
		5.7 N	82.6 W					depth about 25 km				
		South of Panama				23	Ch	ePZ	09	51	18	

Date	Station	Phase	h m s	Date	Station	Phase	h m s
✓	Lh	iPZ	53 12	✓	Lh	ePZ	26 34
		iSN	10 00 02	✓	Wr	iPZ	59 d
	Wr	iPZ	09 53 29 c	✓	Qt	ePZE	27 30 d
		eSN	10 00 34			USCGS H 01 21 18.2	
	Qt	ePZ	09 54 02			25.6 N 101.1 E	
		eSNE	10 01 35			Yunnan Province China	
		USCGS H 09 44 37.7				depth about 35 km	
		25.7 N 128.5 E		24	Qt	ePZE	15 13 35
		Ryukyu Islands			Wr	ePZ	14 24
		depth about 36 km				USCGS H 15 08 15.5	
		Mag 5 $\frac{3}{4}$ (Brk)				12.5 N 48.6 E	
23	Ch	ePZ	10 04 14			depth about 47 km	
	Lh	ePZ	06 32			Gulf of Aden	
	Wr	iPZ	53 d	25	Qt	ePZ	06 45 19 ±
	Qt	ePZE	07 21			e(S)E	46 34
		eSNE	14 33		Wr	ePZ	40.8
		USCGS H 09 58 26.0			Lh	ePZ	43
		19.1 N 121.4 E		25	Ch	ePZE	11 16 20
		Near coast of Luzon,				eSE	21 07
		Philippine Islands			Lh	ePZ	18 24 c
		depth about 40 km			Wr	iPZ	44 c
23	Qt	ePZ	11 07 43 ±	✓	Qt	ePZ	19 15
		e(S)E	08 29			USCGS H 11 10 23.3	
	Wr	ePZ	07 47.7 c			24.3 N 122.6 E	
23	Qt	ePKPZ	15 22 52			Off Coast of Formosa	
	Lh	ePKPZ	23 08			depth about 33 km	
		USCGS H 15 03 15.4				Mag 5 $\frac{3}{4}$ (Pas), 5 $\frac{1}{2}$ (Brk)	
		33.5 S 71.8 W		25	Lh	ePZ	12 59 24
		Near coast of Chile			Wr	iPZ	46 d
		depth about 40 km			Qt	ePZ	13 00 02
24	Ch	ePZE	01 23 32			USCGS H 12 49 41.8	
		ePPZ	39			3.7 N 126.6 E	
		esPZ	47			Molucca Passage	
		eSZ	25 13			depth about 25 km	
		iSSE	21				

Date	Station	Phase	h m s	Date	Station	Phase	h m s
26	Wr	ePZ	10 07 02.1	✓		epPZ	58 04
		USCGS H 09 54 35.1				ePPZE	59 25
		7.1 S 149.6 E				ePcPZN	19 00 01
		New Britain region				eSNE	03 47
		depth about 59 km			Lh	ePZ	00 06
27	Wr	iPZ	08 51 47.4			eSN	07 53
		iSZ	52 17.1	✓	Wr	ePZ	00 30
	Qt	ePZ	50			eSN	08 37
		eSZ	54 08		Qt	ePE	00 51
		H 08 51 06				eSE	09 12
		Hindukush region				USCGS H 18 50 27.5	
27	Wr	ePZ	13 51 05.8			0.2 S 124.3 E	
		USCGS H 13 38 30.6				North Celebes	
		48.0 S 99.6 E				depth about 58 km	
		Indian Ocean		29	Wr	ePZ	14 00 03.4
		Southwest of Australia				USCGS H 13 49 16.9	
		depth about 25 km				7.9 S 127.3 E	
27	Wr	iPZ	21 32 23.9 d			Banda Sea	
		iSZ	56.8			depth about 80 km	
	Qt	ePZ	33 13	29	Wr	ePZ	16 39 58
		eSZ	34 22		Qt	ePN	40 32
		H 21 31 40				USCGS H 16 28 04.4	
		Hindukush region				62.3 N 152.4 W	
27	Wr	ePZ	23 35 00.8			Alaska	
		USCGS H 23 26 48.2				depth about 39 km	
		23.7 S 123.0 E				Mag 4 $\frac{3}{4}$ - 5 (Pal)	
		Off Coast of Formosa		29	Wr	ePZ	21 10 03.9 d
		depth about 76 km				USCGS H 20 58 16.6	
28	Wr	ePZ	11 27 03			41.8 S 79.7 E	
	Qt	ePZE	12			South Indian Ocean	
		USCGS H 11 17 48.6				depth about 33 km	
		7.7 S 107.9 E		29	Qt	ePN	22 39 28
		Near coast of Java			Wr	ePZ	40 02
		depth about 94 km			Lh	ePZ	30 d
28	Ch	ePZ	18 57 49				



Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
20 08	USCGS H		22	35	40.5	1 20 30 01					
22 05	32.1 N	48.4 E				1 22 12 00					
10 00 01	Iran					1 24 10 00					
74 20	depth about 25 km					1 24 15 00					
30 00	Qt	ePZE	09	47	57	1 24 15 20					
03 00	Wr	ePZ	49	06		1 24 15 30					
05 00	USCGS H		09	45	50.2	1 24 15 40					
12 00	27.6 N	57.7 E				1 24 15 50					
13 00	Iran					1 24 16 00					
21 00	depth about 25 km					1 24 16 10					
30 00	Ch	ePZ	19	36	05	1 24 16 20					
		epPZ			20	1 24 16 30					
	Lh	ePZ	19	38	16	1 24 16 40					
	Wr	ePZ			35	1 24 16 50					
	Qt	ePE	39	06		1 24 17 00					
	USCGS H		19	29	51.0	1 24 17 10					
	16.5 N	122.0 E				1 24 17 20					
	Near coast of Luzon					1 24 17 30					
	Philippine Islands					1 24 17 40					
	depth about 40 km					1 24 17 50					

Date	Phase	h	m	s	Date	Phase	h	m	s
	Quetta				7	ePZE	15	59	16
1	ePgZNE	13	02	18	7	ePZE	20	12	07
	eSgNE		28		8	eXNEZ	00	38	45
1	ePNE	14	12	18	8	eXZ	10	14	.8
	eSE		14	16	8	eXE	12	33	36
1	ePZE	23	45	47	8	ePZE	18	03	27
1	ePZNE	23	53	07		eSNE			50
2	eXZ	05	46	58	8	ePgZNE	21	24	13
2	ePZ	11	08	32		eSgE			27
	eSZNE			50	9	ePZE	01	09	22
3	ePgZNE	04	36	54		eSNE			51
	eSgZNE			56	9	ePZN	21	38	13
3	ePZE	18	20	25	10	ePE	00	34	29
	eSNE		21	48		eSN			36 53
3	ePZN	20	00	25	10	ePNE	04	34	53
3	ePZN	22	08	16	11	ePZE	12	41	56
4	ePNE	00	36	47		eSNE			43 14
4	eXE	04	28	00	11	ePZE	15	59	03
4	eXE	09	00	50	11	ePZE	16	58	26
4	eXE	14	00	00	12	ePZE	09	26	55
4	ePZ	15	13	27		eSNE			28 44
	eSNE		14	00	12	ePgZN	13	09	04.7
5	ePZ	09	36	58		eSgNE			06.9
5	ePZE	15	17	26	13	ePE	20	02	37
	eSNE			48		eSE			03 03
5	eXZ	16	14	06	13	ePgZ	22	27	28
5	eXE	18	26	01		eSgE			35
5	eXE	19	43	34	14	ePgE	08	34	06
6	eXE	11	26	11		eSgE			08
6	ePZE	19	57	17	14	ePZE	15	24	53
	eSE		58	00		eSE			25 06
7	ePZE	00	18	10	16	ePZE	23	20	23
	eSE			40	17	eXE	16	39	37
7	ePE	00	23	37	18	ePE	00	35	16
	e(S)E		24	12	18	ePE	01	14	27
7	eXZE	07	16	46	18	ePgE	01	31	29

Date	Phase	h m s	Date	Phase	h m s
	eSgE	43		eSgE	33
18	ePE	03 13 46	30	ePE	04 58 20
20	ePgZE	19 01 57	30	ePE	07 53 39
	eSgE	02 13	30	ePE	18 42 35
21	ePZ	05 15 50		eSNE	43 14
21	ePgZE	11 07 38	30	ePE	19 15 19
	eSgNE	47		eSNE	41
21	eXE	18 04 00	30	ePE	19 16 42
21	ePZE	23 24 50		eSNE	17 03
23	eXZ	06 19.3 00	30	ePE	20 43 56
23	ePZ	12 49 40 ±			
23	ePZE	23 28 09		Warsak	
24	ePZE	00 18 02	2	iPN	14 25 01 d
	eSE	19 53		iSN	37
24	ePZ	06 53 26	4	ePZ	00 58 04
	eSNE	52		eSZ	59 24
25	ePZ	06 40 19	4	ePZ	10 21 59
	eSE	34		eSZ	22 31
26	ePgZ	16 44 13	4	ePZ	22 09 08
	eSgZ	21	5	ePZ	03 57 39
26	ePgZ	17 37 27		eSZ	58 13
	eSgZ	36	5	ePgZ	12 46 20
26	ePgZ	19 24 08		iSgZ	26
	eSgZ	24	5	ePZ	17 03 13
26	ePZ	23 13 24		ePZ	09 53 47
27	ePZ	00 21 38	6	ePN	04 08 17
27	ePZ	00 24 34		eSN	47
27	ePgZ	16 43 49	7	ePN	07 14 34
	eSgZ	54		eSN	15 07
27	ePgZ	17 58 27	8	ePN	00 36 34
	eSgZ	40		eSN	37 07
27	ePgZ	18 01 42	8	ePZ	06 35 24
	eSgZ	57		eSZ	44
28	ePE	18 58 19	8	ePZ	08 17 39
28	ePgE	23 43 20	8	eSZ	18 09
			9	ePN	21 35 54



Date	Phase	h m s	Date	Phase	h m s
	eSN	36 24	27	ePZ	02 52 27
10	ePZ	04 32 49		iSZ	49
	iSZ	33 19	27	ePZ	13 51 06
10	ePZ	17 12 24	27	ePZ	18 42 28
	iSZ	13 05		iSZ	52
10	ePZ	18 27 45	28	ePZ	04 45 48
	eSZ	26 13	28	ePZ	11 19 42
11	ePZ	16 58 54	28	iPZ	12 55 18
13	ePZ	19 32 46		iSZ	58
14	iPZ	14 48 05	28	ePZ	23 24 32
	iSZ	34	30	ePZ	05 27 58
16	ePZ	11 28 08	30	iPZ	18 42 35 d
16	ePZ	11 59 55			
	eSZ	12 00 27		Lahore	
17	ePZ	12 30 20	11	e(P)Z	07 22 57
18	ePZ	05 02 01	11	eXZ	16 59 49
	eSZ	32	17	i(P)Z	04 41 07
18	ePZ	20 23 27		eSZ	34
19	ePZ	02 39 50	17	ePZ	15 10 57
	eSZ	40 27		eSZNE	11 24
20	iPZ	06 27 40 e	25	ePZ	17 59 24
	iSZ	28 30	27	ePZ	20 06 49
21	ePZ	02 12 43			
	eSZ	13 23		Chittagong	
21	ePZ	23 22 28	3	eXNE	13 48 24
	eSZ	55	5	iPZNE	01 59 20
22	iPZ	15 22 53		iSNE	31
	ePZ	20 46 52	7	ePZNE	20 07 11
22	ePZ	23 28 02		eSNE	31
23	iSZ	50	16	eXZ	06 35 27
	iPZ	04 54 55 d	17	eXN	04 46 28
24	iSZ	55 07	17	ePZ	11 39 40
	ePZ	12 05 47		eXZE	47
25	ePZ	10 48 04		iSNE	40 02
26	eSZ	49	20	eXZ	13 14 16
	ePZ	02 06 11	30	ePZ	14 53 48
27				eSZE	54 04