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PAKISTAN METEOROLOGICAL SERVICE

GEOPHYSICAL INSTITUTE

QUETTA

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Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 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	16.5 "	"	16,000

(Contd.)

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
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.
Se=Period of the indicated phase in seconds.
(Pas), (Berk), (Up), (Ki) stand for seismological observatories Pasadena (U.S.A.),
Berkley (U.S.A.), Uppsala (Sweden) and Kiruna (Sweden) respectively.
All times are in Greenwich Mean Time.

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
X 1	Qt	ePZ	00	56	59	X 1	Qt	ePZ	10	14	11
1	✓ Kr	ePZ	06	28	12		Wr	ePZ			24
	✓ Qt	ePZ			16 d	X 1	Qt	ePKPZ	12	49	13 c
		ePoPZ			19			USCGS H	12	29	31.6
		ePPZE			31 38			38.5 S	75.0 W		
		USCGS H	06	15	29.4			Near coast of Chile			
		11.1 S	12.7 W					depth about 64 km			
		Ascension Islands region						Mag 5-5 1/4 (Pal)			
		depth about 35 km				X 1	Qt	ePZ	16	10	24
		Mag 5 (Pal)				X 1	Qt	ePZ	19	16	55
1	✓ Kr	iPKPZ	09	05	36 d			USCGS H	19	06	22.7
		iPKPZ			51			50.1 N	153.9 E		
		isPKPZ			06 13			Near coast of Kamchatka			
		e(SK P)Z			08 59			depth about 162 km			
	✓ Qt	iPKPZ			05 40 d	X 2	Wr	ePZ	08	19	34
		iPKP ₂ ZE			58			iSZ			20 07
		isPKPZ			06 15		Qt	ePZ			33
		iXZN			30			eSNE			21 53
		e(SK P)Z			09 03			H	08	18	48
		ePKSZE			33			Afghanistan			
		eSKSEN*			12 36	X 2	Qt	ePZ	15	42	21
		eSKSPN*			19 10			USCGS H	15	29	48.8
		iSSN*			28 25			57.6 N	153.8 W		
	✓ Wr	ePKPZ			05 46			Kodiak Islands, Alaska			
		USCGS H	08	46	01.9			depth about 96 km			
		38.4 S	74.4 W			2	✓ Lh	ePZ	16	36	09
		Near coast of Chile					✓ Wr	iPZ			44 d
		depth about 97 km						eSN			40 43
		Mag 6 1/2-6 3/4 (Pal), 6 3/4-7					✓ Kr	ePZ			37 07
		(Berk), 7 1/4-7 1/2 (Pas)					✓ Qt	ePZ			10 d

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePcPZ			20			Mag 5-5½ (Berk), 5½ (Pal)			
		epPZ			24			6.6 (Qt)			
		esPZ			28	7	✓ Wr	ePZ	13	32	01
		ePPZN*	25	10			✓ Qt	ePZ			37
		ePPPN*	27	03				USCGS H 13 23 05.1			
		eSN*	32	04				32.2 N 131.5 E			
		eScSN*			27			Kyushu, Japan			
		ePSN*			54			depth about 25 km			
		ePPSN*	33	13		×7	Wr	ePZ	18	55	13 c
✓ Wr		ePZ	22	10				iSZ			46
✓ Lh		ePZ			17 c			Qt			56 12
✓ Qt		iPZ			40 c			iSNE			57 33
		esPZNE	23	00				H 18 54 26			
		ePPZN*	26	05				Afghanistan			
		ePPPN	27	53		×7	Qt	ePKPZ	22	38	05
		eSNEN*	33	03				USCGS H 22 18 22.7			
		ePSE	34	10				40.4 S 73.3 W			
		ePPSN			30			Southern Chile			
		eSSN*	38	43				depth about 25 km			
		eLN*	45.2			×8	Qt	ePKPZ	00	15	35
		Mu			Sec			USCGS H 23 56 32.2			
		PZ	0.5		1.2			30.6 S 177.5 W			
		Δ = 84° 8						Kermadec Islands region			
✓ Kr		ePZ			22 23 02	×8	Wr	ePZ	00	26	12
		USCGS H	22	10	06		Qt	ePZ			59
		52.7 N			168.0 W			USCGS H 00 20 17.5			
		Fox Islands,						41.1 N 105.5 E			
		Aleutian Islands,						China-Mangolia border			
		depth about 42 km						depth about 51 km			



Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
×8	Qt	ePZ	05	30	40		✓ Lh	ePKPZ			36 49
8	✓ Wr	ePZ	05	32	12		✓ Wr	ePKPZ			52
	✓ Lh	ePZ			16		✓ Ch	ePKPZ			54
	✓ Qt	ePZ			49			USCGS H 03 17 58.5			
		USCGS H 05 22 09.4						60.7 S 24.8 W			
		45.2 N 149.8 E						Sandwich Islands			
		Kurile Islands						depth about 37 km			
		depth about 25 km						Mag 6½-6½ (Pal)			
×8	Wr	ePZ	05	37	24	×9	Qt	ePZ	03	47	09
	Lh	ePZ			26	9	✓ Ch	ePZN*	10	47	09
	Qt	ePZ			38 01		✓ Lh	ePZ			49 05
		USCGS H 05 27 21.7						eSZ			53 38
		45.2 N 149.7 E					✓ Wr	ePZ			49 22
		Kurile Islands					✓ Qt	ePZ			50 02
		depth about 25 km						ePPZN			51 03
×8	Qt	ePZ	06	29	10			ePPPE			18
		eSZ			30 49			eSNN*			55 16
×8	Wr	ePZ	19	08	01			Mu		Sec	
	Lh	ePZ			12			PZ	0.3	1.5	
	Qt	ePZ			09 07			PPZ	0.2	2.2	
		e(S)E			12 35			PN	0.3	1.5	
9	✓ Lh	ePZ	01	36	06			PE	0.4	2.0	
	✓ Qt	ePZ			55			Δ = 32° 4			
×9	Qt	ePZ	01	39	43		✓ Kr	ePZ			10 50 20±
9	✓ Qt	ePKPZ	03	36	42			H 10 43 28			
		ePPZNE			37 56			32½ N 104½ E			
		eSKSNN*			43 35			Szechwan Province, China			
		eSKKSN*			44 59			USCGS H 10 43 43.1			
		ePSN*			47 38			32.7 N 103.4 E			
		eSSN*			54 14			Szechwan Province, China			

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		depth about 47 km						Hindukush region			
		Mag $6\frac{1}{4}$ - $6\frac{1}{2}$ (Pal), 6 - $6\frac{1}{4}$ (Qt)						depth about 64 km			
9	✓Qt	ePKPZ	20	25	43	×10	Qt	ePZ	05	44	29
		ePPZE	28	52				USCGS H 05 31 30.1			
		ePKSZ	29	26				30.2 N 40.4 W			
	✓Wr	ePKPZ	25	53				North Atlantic Ocean			
	✓Lh	ePKPZ	59					depth about 28 km			
	✓Ch	ePKPZ	26	19		10	✓Ch	iPZ	14	15	54 04 c
		USCGS H 20 06 16.2						ePoPZN*	55	13	
		23.2 S 70.6 W						ePPZ	56	02	
		Near coast of Chile						ePPPZ	57	08	
		depth about 52 km						✓Lh	iPZ	56	03 c
		Mag $5\frac{1}{2}$ - $5\frac{3}{4}$ (Pal)						✓Wr	iPZ	56	22 c
10	✓Wr	iPZ	01	55	32 c			eSN	05	46	
		iSN	56	03				✓Kr	iPZ	32	c
	✓Lh	ePZ	17						Mu	Sec	
		eSZ	57	04				PZ	1.6	1.3	
	✓Qt	ePZ	56	35 d				Δ = 75°·0			
		esPZ	57	13				✓Qt	iPZ	14	56 38 c
		iSNE	50						ePcPZNE	49	
	✓Kr	iPZ	38 d						ipPZE	57	03
		esPZ	58	18					esPZNE	11	
		iSE	59	36					ePPZE	59	31
	✓Ch	ePZ	50						eXZ	15	00 42
		H 01 54 59							ePPPNE	01	14
		$35\frac{3}{4}$ N $70\frac{3}{4}$ E							eSNEN*	06	14
		Hindukush							isSNEN*	07	04
		depth about 200 km							eSSNN*	11	06
		USCGS H 01 54 46.8							ePKPPKPZ	23	47
		36.6 N 71.1 E									

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
		Mu	Sec									
		PZ	2.2	1.5		×12	Qt	ePZ	08	57	11	
		PN	1.0	1.5		×12	Lh	ePZ	18	46	54	
		PE	1.4	1.5				Wr	ePZ	55		
		Δ = 76°·4						Qt	ePZ	47	31	
		H 14 44 58				×12	Wr	iPZ	18	47	33 d	
		depth about 100 km						iSN	48	02		
		USCGS H 14 44 47.3						Qt	ePZ	38		
		2.6 S 139.4 E							eSZN	49	56	
		Near coast of New Guinea							H 18 46 56			
		depth about 25 km							Hindukush			
		Mag $6\frac{3}{4}$ (Pas), 6.7 (Qt, Kr)				×13	Qt	ePnZ	00	59	32 d	
								iPgZE	39			
	×10	Qt	ePZ	15	43	05		iSnNE	58			
	×10	Qt	ePZ	20	11	57		iSgNE	01	00	05	
	11	✓Qt	ePZ	05	38	54		Wr	ePnZ	09		
			ePPZ	40	34				H 00 58 55			
			eSNE	44	51				Eastern Baluchistan			
			eSSN*	47	42				ePZN*	06	44 45 d	
			ePZ	39	12				epPZ	45	05	
	✓Wr		ePZ	41	52				esPZN*	14		
	✓Ch								ePPZN*	46	19	
			USCGS H 05 31 34.1						iSN*	50	40	
			39.5 N 21.1 E						eSN*	58		
			Greece Albania region									
			depth about 39 km						✓Lh	ePZ	47	01 d
	×12	Qt	ePKPZ	08	16	00				eSZ	54	50
			ePKP ₂ Z	10					✓Wr	iPZ	47	20 d
			USCGS H 07 56 16.9							eSN	55	31
			43.4 S 74.1 W						✓Kr	iPZ	47	27 d
			Near coast of Chile							eSE	55	46
			depth about 25 km									

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Mu			Sec			ePPSN*			55
		PZ 1.8			1.0			eSSN*			47 48
		$\Delta = 62^\circ \cdot 8$					✓Wr	iPZ			32 42
✓Qt		ePZ	06	47	37 d			eSN			42 45
		epPZ			50		✓Lh	ePZ			32 48
		ePcPZ			48 11			eSZ			42 58
		ePPZE			50 02		✓Qt	ePZ	33	10	d
		eSNEN*			56 01			epPZ			28
		ePSNE			35			ePPZ			36 32
		ePPSNE			47			ePPPZ			38 28
		i(SS)N*	07	00	00			eSNE			43 36
		ePKPPKPZ			16 17			iScSE			51
		Mu			Sec			esSNE			44 01
		PZ 1.5			1.8			eSSNE			49 16
		$\Delta = 64^\circ \cdot 4$						ePKPPKPZ			50 12
		USCGS H 06 37 05.7						Mu			Sec
		1.4 N 127.2 E						PZ 2.6			1.6
		Molucca Passage						PPZ 4.3			3.0
		depth about 59 km						$\Delta = 85^\circ \cdot 7$			
		Mag 6.7 (Qt)						✓Kr	ePZ		09 33 29
13	✓Ch	ePN*	09	32	35			eSE			44 18
		ePcPN*			42			USCGS H 09 20 36.8			
		epPN*			33 00			51.1 N 168.8 W			
		esPN*			11			Fox Islands,			
		ePPN*			35 41			Aleutian Islands			
		ePPPn*			37 36			depth about 65 km			
		iSN*			42 32			Mag 7 (Pas), 7½ (Berk),			
		eSKSN*			39			6¾ (Pal), 7¼ (Qt)			
		eScSN*			49		×13	ePZ			10 45 36
		esSN*			43 16		×13	Ch			12 37 41

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Qt			ePZ	38	14	×13	Qt	ePZ	17 31 00
		USCGS H 12 25 40.2						×13	Qt	ePZ	20 57 00
		51.7 N 168.5 W						Ch	ePN*		58 59 ±
		Fox Islands, Aleutian							USCGS H 20 45 09.1		
		Islands							39.5 N 30.4 W		
		depth about 37 km							Azores, North Atlantic		
									Ocean		
×13	Qt	ePZ	13	37	06				depth about 25 km		
		USCGS H 13 24 25.6									
		51.1 N 158.6 W						×14	Ch	ePZ	15 57 00
		Fox Islands, Aleutian							eSN*		50
		Islands							Lh	ePZ	16 00 46 c
		depth about 25 km							Wr	ePZ	01 06 c
×13	Qt	ePZ	13	40	44				Qt	ePZ	34
		USCS H 13 28 11.5								ePPE	02 14
		51.6 N 168.1 W								ePPPZE	23
		Fox Islands,								eSNEN*	06 13
		Aleutian Islands								eLN*	06.9
		depth about 50 km								H 15 55 54	
×13	Qt	ePZ	14	05	04					24 N 95¼ E	
		USCGS H 13 52 28.9								Burma	
		51.3 N 168.6 W								USCGS H 15 55 57.2	
		Fox Islands, Aleutian								24.3 N 96.2 E	
		Islands								Burma	
		depth about 46 km								depth about 58 km	
×13	Qt	ePZ	14	41	51			×14	Qt	ePKPZ	18 11 23
		USCGS H 14 29 21.1								USCGS H 17 53 24.6	
		51.9 N 167.8 W								20.5 S 177.7 W	
		Fox Islands, Aleutian								Fiji Islands region	
		Islands								depth about 536 km	
		depth about 46 km						14	✓Qt	ePKPZ	20 18 39

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPNE	21	12				eSN	06	06	
		ePKSZNEN*	22	06		✓Ch		ePZ	03	39	
	USCGS H 19 59 31.8							ePPZ		52	
	14.5 N 92.8 W							ePPPZ		58	
	Near coast of Chiapas,							eSN*	06	40	
	Mexico							eSSN*		56	
	depth about 100 km					✓Qt		ePZ	04	27	
	Mag 5-5½ (Pal)							ePPZ		45	
15	✓Ch	iPZ	09	06	40			eSNN*	08	08	
		iSN*	07	02				H 22 59 49			
	✓Lh	ePZ	09	59				37½ N 89 E			
	✓Wr	ePZ	10	55				Sinkiang Province, China			
	✓Qt	ePZ	11	21				USCGS H 22 59 47.6			
		ePPZNE		48				38 N 89.5 E			
		ePPPZNE	12	03				Sinkiang Province, China			
		eSNN*	15	31				depth about 24 km			
		eLNN*	16.0			✗17	Qt	ePKPZ	01	48	22
	H 09 06 05							ePKP ₂ Z		34	
	23½ N 93½ E							iPKP ₂ Z		35	
	Assam							Lh ePKP ₂ Z		37	
✗15	Qt	ePZ	19	50	24			USCGS H 01 28 39.6			
		eSNN*		52	15			38.5 S 73.6 W			
16	✓Qt	ePKPZ	01	41	05			Near coast of Chile			
		USCGS H 01 23 11.1						depth about 25 km			
		23.7 S 179.3 E				✗17	Qt	ePKPZ	04	26	58
		South of Fiji Island						USCGS H 04 08 03.1			
		region						30.8 S 177.7 W			
		depth about 552 km						Kermadec Islands region			
16	✓Lh	ePZ	23	03	10			depth about 71 km			
	✓Wr	ePZ		23		✗17	Qt	ePKPZ	05	35	46



Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
		ePKP ₂ Z			56			6.3 S 130.0 E				
	Wr	ePKP ₂ Z			59			Banda Sea				
	Lh	ePKP ₂ Z			57			depth about 68 km				
		USCGS H 05 16 10.3				19	✓Ch	ePZ	12	25	11	
		43.5 S 74.4 W						epPZ		21		
		Near coast of Chile						ePPZ		27	02	
		depth about 123 km						ePPPZ		46		
✗17	Qt	ePZ	12	01	57			eSN*		31	58	
		eSNE		05	07			esSN*		32	14	
17	✓Ch	ePZ	19	58	43		✓Wr	ePZ		27	27	
	✓Wr	ePZ		49			✓Qt	ePZ		52		
	✓Qt	ePZ		59	18 c			USCGS H 12 16 44.5				
	✓Kr	ePZ		40 c				8.6 N 137.6 E				
		USCGS H 19 46 46.2						Caroline Islands region				
		52.3 N 170.3 W						depth about 27 km				
		Fox Islands, Aleutian				✗19	Qt	ePnZ	13	13	30 c	
		Islands						iXZNE		45		
		depth about 16 km						i!SgZNE		14	23	
✗17	Lh	ePZ	20	04	55		Lh	ePZ		13	40	
	Qt	ePZ		05	24		Wr	ePZ		57		
17	✓Qt	ePKPZ	21	42	34		Kr	ePgZ		14	15	
		USCGS H 21 22 45.6						eSnE		15	07	
		56.2 S 122.6 W					Ch	ePZ		17	44	
		South Pacific Ocean						H 13 12 37				
		depth about 38 km						29 N 70½ E				
✗18	Ch	ePN*	15	31	11			West Pakistan				
	Lh	ePZ		33	40	✗19	Qt	ePZ		19	28	20
	Wr	iPZ		54		✗20	Qt	ePnZ		02	59	34
	Qt	ePZ		34	07			ePgZNE		39		
		USCGS H 15 22 55.3						eSnZN		03	00	05

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Lh	eSgNE		13				eSKSNEN*	51	11	
		ePnZ		05				USCGS H 04 29 04.7			
		H 02 58 52						3.4 S 152.3 E			
		Suleman Range						New Ireland region			
		West Pakistan						depth about 371 km			
20	Ch	ePZ	03	58	58	22	✓Qt	ePZ	06	32	44d
	Qt	ePZ	04	02	11			eXZ		33	21
		USCGS H 03 52 49.0						ePPZN		35	17
		26.8 N 128.2 E						ePPPZN		36	47
		Ryuku Islands						ePcSZ		37	14
		depth about 25 km						eSNE		41	44
20	Qt	ePZ	04	51	03±		✓Ch	ePZ		32	54
20	✓Qt	ePKPZ	22	21	23			ePcPZ		33	18
		esPKPZ		22	03			ePPZN*		35	27
		ePPZE		24	49			ePPPZN*		37	05
		ePKSZE		25	04			eSN*		42	04
		eSKSNE		28	21			eScSN*		54	
	✓Wr	ePKPN		21	24		✓Lh	ePZ		33	01
	✓Kr	ePKPZ		31			✓Wr	ePZ		13	
		ePPE		24	57			H 06 21 40			
	✓Lh	ePKPZ		21	34			Indian Ocean			
		USCGS H 22 01 59.9				22	✓Kr	ePKPZ	12	48	29
		6.8 S 80.7 W					✓Qt	ePKPZ		34	c
		Near coast of Peru						ePKP ₂ ZNE		53	
		depth about 93 km						epPKPZNE		49	03
		Mag 6½ (Berk), 6½ (Pal),						esPKPNEN*		14	
		6¾ (Pas)						ePPZN		52	13
21	✓Ch	ePZ	04	39	07			ePKSZN*		19	
	✓Qt	ePZ		41	17d			epPPZN		36	
		epPZ		42	40			ePPPZNE		55	37

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSSN*	13	10	54			ePKPZ		23	
	✓Wr	ePKPZ	12	48	41			eXZ		34	
	✓Lh	ePKPZ		44				e(PP)Z		32	52
	✓Ch	ePKPZ		50				eSKSE		38	15
		USCGS H 12 28 58.4						eSKKSNE		40	13
		40.0 S 74.3 W						USCGS H 14 12 21.1			
		Near coast of Southern						24.2 S 176.1 W			
		Chile						South of Tonga Islands			
		depth about 107 km						region			
		Mag 6½ (Pas), 5½-5¾ (Pal)						depth about 28 km			
22	Lh	ePZ	17	57	49			Mag 6¾ (Pas), (Berk),			
	Wr	ePZ		58	23			6¾-7 (Pal)			
	Qt	ePZ		28	c	23	✓Ch	ePZ	16	59	19±
		ePPZ		59	45		✓Lh	ePZ	17	01	37
		USCGS H 17 51 36.5					✓Wr	ePZ		57	
		7.3 N 95.7 E					✓Qt	ePZ		02	16 c
		Nicobar Islands region						eSNE		10	20
		depth about 25 km				23	✓Qt	ePKPZ	18	15	36
23	Qt	ePZ	01	24	15			USCGS H 17 56 38.0			
23	Qt	ePZ	01	37	22			24.0 S 176.3 W			
		USCGS H 01 24 30.1						South of Tonga Islands			
		5.0 S 153.3 E						region			
		New Britain region						depth about 51 km			
		depth about 79 km				23	Qt	ePKPZ	20	30	07
23	✓Ch	ePZ	04	21	41±			USCGS H 20 11 03.2			
		eSN*		30	00			24.1 S 175.7 W			
	✓Wr	ePZ	04	23	28			South of Tonga Islands			
	✓Qt	ePZ		44	c			region			
		eSNE		33	37			depth about 25 km			
23	✓Wr	ePKPZ	14	31	17	23	Lh	ePZ	23	23	56

Major Shocks

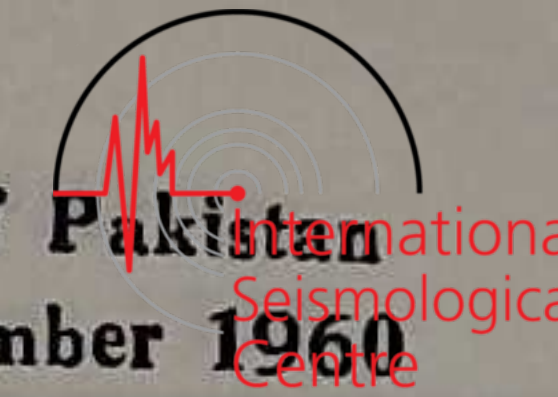
Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	ePZ	24	41		✓ Qt	ePKPZ		45	c	
	USCGS H 23 15 38.4						ePPZNN*		13	43	
	13.1 N 120.2 E						e(PKS)NEN*		15	10	
	Near coast of Mindoro						ePPPZNE		16	16	
	Philippine Islands						eSKSNN*		20	29	
	depth about 89 km						eSSNE		30	35	
24	✓ Ch	ePZ	05	00	57 c		USCGS H 06 52 41.1				
		esPZ		01	36		24.2 S 176.1 W				
		ePPZNN*		03	26		South of Tonga Islands				
		ePPPZNN*		05	05		region				
		eSN*		09	36		depth about 23 km				
		esSN*		10	26		Mag 7 (Pas), 7 1/4 - 7 1/2 (Berk)				
	✓ Lh	ePZ		02	35 c	✗ 24	Qt	ePKPZ	08	45	17
	✓ Wr	iPZ			48 c		USCGS H 08 26 14.4				
	✓ Qt	ePZ		03	05 c		24.5 S 175.9 W				
		ePPZ		06	33		South of Tonga Islands				
		eSKSNEN*		13	33		region				
		eSEN*			41		depth about 25 km				
		ePSNE		14	50	✗ 24	Qt	ePZ	22	51	08
		Mu Sec				✗ 25	Wr	ePZ	00	05	23
		PZ 0.3 1.0					Lh	ePZ			26
		Δ = 88° 1					Qt	ePZ			06 34
		USCGS H 04 50 15.8				✗ 25	Wr	iPZ	01	03	59 d
		4.6 S 153.0 E					Qt	ePZ			04 54
		New Britain region						eSNE			06 03
		depth about 87 km						H 01 03 23			
		Mag 6 1/4 (Pas), 6.5 (Qt)						Hindukush			
24	✓ Lh	ePKPZ	07	11	36 ±	✗ 25	Wr	iPZ	12	30	35 c
	✓ Wr	ePKPZ			36			iSZ			31 07
	✓ Kr	ePKPZ			42		Lh	ePZ			20

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	ePZ			30						depth about 157 km
		eSNE			32 47						Mag 6.4 (Qt)
	H 12 29 52					26	✓ Ch	ePZ			07 45 07
	36 1/4 N 70 E						✓ Qt	ePZ			47 08
	Hindukush										USCGS H 07 37 02.2
	depth about 150 km										36.6 N 141.0 E
25	✓ Ch	ePZN*	22	02	16						Near coast of Honshu, Japan
		epPZ			57						depth about 100 km
		esPZN*			03 18	✗ 26	Qt	ePZ			16 58 12
		ePcPZ			52						USCGS H 16 45 45.1
		ePPZ			04 06						51.8 N 168.1 W
		ePPPZNN*			55						Fox Islands, Aleutian Islands
		eSZN*			08 43						depth about 85 km
		ePSN*			09 23	✗ 27	Qt	ePZ			13 22 34
		esSN*			54						USCGS H 13 10 11.0
	✓ Lh	ePZ			03 29						5.6 S 146.4 E
	✓ Wr	ePZ			34						Near coast of New Guinea
	✓ Qt	ePZ			04 09 d						depth about 100 km
		epPZN			49	✗ 27	Qt	ePZ			15 24 51
		ePcPZNE			57		27	✓ Qt	ePZ		15 27 19 c
		ePPZNE			06 30						USCGS H 15 17 15.2
		ePPPNE			07 55						42.8 N 143.3 E
		eSNEN*			12 17						Near coast of Hokkaido, Japan
		eScSN*			13 51						depth about 122 km
		Mu Sec									
		PZ 0.5 1.5									
		Δ = 59° 5									
		USCGS H 21 54 13.8				27	✓ Qt	ePZ			20 46 13 c
		38.0 N 140.5 E									USCGS H 20 37 26.4
		Honshu, Japan									3.1 S 29.1 E

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Belgian Congo					29	✓ Wr	ePZ	14	15	27
	depth about 60 km						✓ Qt	ePZ		16	02
×27	Qt	ePKPZ	21	44	10 c		USCGS H	14 07 02.2			
	Wr	ePKP ₂ Z		23			26.5 N	126.1 E			
	Lh	ePKP ₂ Z		25			Ryukyu Islands				
	USCGS H	21 24 32.8					depth about 147 km				
	37.3 S	72.5 W				×29	Qt	ePZ	19	30	59
	Near coast of Chile					×29	Qt	ePZ	20	25	18
	depth about 100 km					×29	Wr	ePN	13	17	40
	Mag 5 $\frac{1}{4}$ -5 $\frac{1}{2}$ (Pal)						Qt	ePZ		18	55
×28	Qt	ePZ	19	58	41	×30	Wr	ePN	18	54	41
	USCGS H	19 47 16.9					Qt	ePZ		55	27
	47.4 N	27.6 W									
	Azores, North Atlantic										
	Ocean										
	depth about 17 km										
×28	Qt	ePnZ	20	04	50.7 c						
		ePgZE			54.6						
		eSnNE		05	13.9						
	Wr	ePnZ			37						
	H	20 04 20									
	Eastern Baluchistan										
29	✓ Qt	ePKPZ	09	51	40						
	✓ Wr	ePKPZ			42						
	USCGS H	09 32 01.5									
	44.0 S	74.9 W									
	Near coast of Southern										
	Chile										
	depth about 86 km										
	Mag 5 $\frac{1}{4}$ (Pal)										



Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
	Quetta				6	ePZ	20	24	41
1	ePZ	10	14	11		eSNE		25	04
1	ePZ	10	29	50	6	ePZ	20	37	34
1	ePZ	15	33	11	7	ePgZ	03	29	01
	eSNE		34	35		eSgNE			15
2	ePZ	11	59	21	7	ePZ	12	50	31
2	eXZ	15	07	0		eSN			50
2	ePZ	16	21	08	8	ePZ	09	45	30
	eSE			37	9	ePgZ	00	07	35
2	ePZ	23	58	35		eSgN			53
	eSNE			46	9	eXZ	02	29	10
3	ePgZ	04	20	01	9	ePgZ	11	49	29
	eSgNE			12		eSgN			43
3	ePgZ	06	40	03	9	ePgN	14	08	28
	eSgNE			14		eSgN			41
3	eXZ	09	39	0	9	ePgZ	17	21	57 d
3	ePgZ	16	26	38.8		eSgN			22 11
	eSgZNE			42.3	9	ePgN	19	13	19
4	ePZ	07	14	33		eSgN			33
	eSNE			53	10	ePgZ	04	17	16.8
5	ePZ	13	45	10		eSgN			24.1
5	ePZ	17	12	00	10	iPgZ	05	52	14 d
	eSN			20		iSgZNE			26
6	ePZ	06	48	05	10	ePgZ	07	40	38.7
6	ePZ	13	14	38		eSgN			46.2
	eSN			55	10	ePgZ	11	30	49 d
6	ePgZ	15	18	23.3		iSgNE			56
	eSgE			30.5	10	ePgZ	12	14	52
6	ePgZ	17	46	11.4		eSgN			15 07
	eSgNE			17.6	10	iPgZ	15	22	09

Minor Shocks

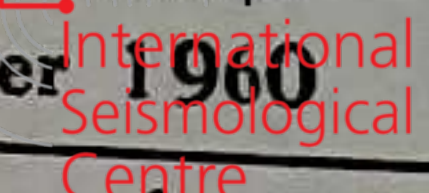
Date	Phase	h m s	Date	Phase	h m s
10	eSgNE	20	14	eSNE	35 23
10	iPgZ	15 33 26 d	14	eXZ	07 44.0
10	iSgNEN	38	14	ePZ	11 53 18
10	iPgZ	19 50 53 d	14	eSN	43
10	iSgNE	51 05	14	ePZN	13 48 07
10	ePgZ	20 55 21.4	14	ePN	14 09 57
12	eSgN	28.7	14	eSN	10 32
12	ePZ	04 24 55	14	ePZ	14 23 52
12	eSZNE	25 21	14	ePZ	20 48 03
12	eXZ	08 49 11	14	eSNE	49 09
13	ePZ	01 29 33	14	ePZ	23 36 56
13	eSNE	58	15	ePZ	00 46 53
13	ePZ	05 46 58	15	eSN	47 14
13	eSN	47 23	15	ePgZ	03 37 26
13	ePZ	05 59 39	15	eSgN	31
13	eSN	06 00 04	15	ePgZ	07 07 10
13	ePZ	08 24 18	15	eSgN	11
13	eSN	43	15	ePZ	21 33 57
13	ePgZ	09 11 11	15	eSN	34 23
13	eSgN	23	15	ePZ	21 56 54
13	ePZ	12 00 43	16	eSN	57 21
13	ePZ	15 14 24	16	ePZ	01 29 52
13	eSE	49	16	ePgZ	11 37 14
13	ePZ	15 30 33	16	eSgN	25
13	eSE	58	16	ePZ	18 33 09
13	ePgZ	21 02 33.4	16	eSE	34 43
14	eSgE	35.2	16	ePZ	18 48 27
14	ePZ	07 00 24	17	eSN	49 03
14	eSNE	50	17	ePZ	11 40 35
14	ePZ	07 34 58		eSZN	54

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
17	ePZ	12 45 38	21	eXZ	08 21.0
17	eSN	46 03	21	eXZ	08 25.1
17	ePZ	20 31 56	21	ePZ	11 09 01
18	e(P)Z	06 10 07	21	ePZ	11 10 02
18	eXZ	15 06 06	21	eSN	24
18	ePgZ	22 14 36	21	ePZ	12 28 48
18	eSgN	46	21	eSN	29 13
18	ePgZ	23 39 23	21	eXZ	15 12
18	eSgNE	33	21	ePgZ	15 43 24
18	ePgZ	23 54 25	21	eSZNE	56
19	eSgNE	37	21	ePZ	17 35 56
19	ePgZ	06 54 42	21	iSNE	36 29
19	eSN	55 08	21	ePZ	18 11 35
19	eXZ	12 56 03	21	eSN	12 55
19	ePZ	13 29 20	21	ePZ	18 42 45
19	eSN	46	21	eSN	44 30
19	ePZ	13 40 37	21	ePgZ	23 10 26
19	ePZ	14 44 51	21	eSgNE	38
19	e(S)E	45 44	21	ePgZ	23 25 01
19	ePZ	16 00 34	21	eSgNE	13
19	eSZNE	01 05	21	ePgZ	23 58 03
19	ePZ	17 11 58	21	eSgNE	14
20	ePZ	07 06 12	22	ePgZ	00 19 59
20	eSN	53	22	eSgNE	20 11
20	ePZ	22 00 41	22	iPgZ	00 36 31 d
20	eSE	02 58	22	iSgNE	42
20	ePZ	23 07 01	22	eXZ	03 50.0
21	eSN	57	22	eXZ	07 01 11
21	eXZ	06 30 20	22	ePZ	07 20 15
21	eXZ	08 05.0	22	eXZ	09 40.0

Date	Phase	h m s	Date	Phase	h m s
22	ePZ	10 00 39	29	eSN	40
	eSZN	01 01	29	eXZ	07 20 02.0
22	eXN	14 02.0	29	eXZ	09 30.0
22	ePZ	14 39 11	29	eXZ	09 41.0
22	ePZ	14 54 32	29	eXZ	10 27.0
	eSNE	52	29	ePZ	14 45 24
22	eXZ	17 37.0	29	ePZ	19 02 38
22	ePZ	20 07 48		eSgNE	49
	eSZN	08 08.0	29	ePZ	19 51 27
22	ePZ	21 43 48		eSNE	52 07
	eSN	44 15	29	ePgZ	21 37 28
22	ePgZ	22 22 43		eSgNE	32
	eSgN	54	29	ePgZ	22 27 17
22	ePZ	22 55 58 c		eSgN	28
	ePgZ	00 57 15	30	ePZ	00 45 03
	eSgN	27	30	ePZ	01 23 19
23	eXZ	01 19.0	30	ePZN	01 38 55
23	eXZ	01 22.0	30	ePZ	02 58 58
25	eXZ	08 34.7		e(S)E	16 00
25	eXZ	11 58.8	30	eXZ	07 02 46
25	ePgE	20 44 07		Warsak	
	eSgE	18	1	iPZ	10 29 32 d
26	ePgZ	09 51 43.0		iSZ	30 01
	iSgN	45.3	1	ePZ	15 32 06
27	ePZ	05 12 01		iSZ	43
	eSNE	24	1	ePZ	22 16 20
27	ePZ	05 56 07		iSZ	17 05
27	ePZ	22 21 59	1	iPZ	22 25 38 d
28	ePZ	16 07 15		iSN	59
29	ePZ	03 52 15	2	ePZ	13 13 42
				iSZ	14 29

Date	Phase	h m s	Date	Phase	h m s
2	iPZ	18 01 24 c		iSZ	56
	iSZ	58	11	ePZ	01 52 38
2	iPZ	18 42 05 d		iSZ	53 14
2	ePZ	19 40 21	11	ePZ	05 39 12
3	ePZ	07 39 12	11	ePZ	11 38 13
	eSZ	40 03		iSZ	49
3	ePZ	07 49 12	11	iPZ	18 04 09 c
3	ePZ	09 36 42		iSZ	44
4	iPZ	12 33 18 d	11	ePgZ	18 28 01
	iSZ	52		iSgZ	06
4	iPZ	13 00 20 d	11	ePZ	19 27 08
	iSZ	52		iSZ	49
4	iPZ	14 25 19 d	11	ePZ	23 40 05
	iSZ	57	12	ePZ	04 25 34
4	iPZ	14 26 37 c	12	ePZ	21 05 24
	ePZ	16 00 04		iSZ	06 29
4	ePZ	22 21 30	13	ePZ	10 59 18
	iSZ	22 02		iSZ	11 00 03
5	ePZ	02 51 28	13	iPZ	19 29 56 d
	iSZ	48	13	ePZ	20 16 05
5	iPZ	12 14 28 d		iSZ	42
	iSZ	59	13	ePZ	20 57 02
5	ePZ	13 44 07	14	ePZ	07 00 56
5	ePZ	15 06 29	14	ePZ	11 45 10
5	iPZ	21 57 26 c	14	ePZ	13 48 44
6	iPZ	03 56 57 d	14	ePZ	14 24 28
	iSZ	57 30	14	iPZ	20 46 52 c
6	iPZ	16 08 00	14	iSZ	47 07
	iSZ	32	14	iPZ	23 35 38 d
7	ePZ	16 41 10	16	ePZ	16 28 31
	iSZ	51		iSZ	29 17
7	ePZ	22 44 50			
9	ePN	02 28 16			
10	iPZ	13 00 23			



Date	Phase	h m s	Date	Phase	h m s
16	ePZ	18 32 14	24	ePZ	22 50 43
	iSZ	33 15	26	ePZ	07 46 33
17	ePZ	13 06 41	26	iPZ	15 11 24 d
17	ePZ	19 49 30		iSZ	57
	eSZ	50 19	27	ePZ	00 54 41
18	ePZ	12 20 32	27	ePZ	12 12 54
18	ePZ	13 46 49		iSZ	13 34
	eSZ	47 17	27	ePZ	15 26 44
18	ePZ	22 06 19	27	ePZ	22 19 25
	iSZ	42		iSZ	20 05
19	ePZ	12 33 11	27	iPZ	22 22 05 d
	iSZ	43		iSZ	46
20	eXN	03 01 02	27	ePZ	22 45 24
21	iPgZ	10 39 00		iSZ	50
	iSgN	04	28	ePZ	15 11 33
21	ePZ	15 12 22		iSZ	12 08
	iSZ	52	28	ePZ	16 57 16
21	ePZ	17 36 18	29	ePZ	01 14 05
21	iPZ	18 10 35 d		eSZ	22
	iSZ	11 08	29	ePZ	05 50 57
22	ePZ	06 07 35		iSZ	51 25
	iSZ	08 08	29	ePZ	08 22 17
22	iPZ	06 33 13 d	29	ePZ	09 51 42
22	iPZ	09 39 07 c	29	ePZ	19 15 27
22	iPZ	14 52 47 d			
	iSZ	53 20			
23	iPZ	08 53 26 c	5	eXZ	21 30 26
23	ePZ	16 28 03	5	eXZ	21 57 43
24	ePZ	22 26 09	7	ePZ	18 55 51
	iSZ	32	10	eSZ	56 52
				ePZ	02 04 38

Lahore

Karachi

Date	Phase	h m s	Date	Phase	h m s
11	eXZ	22 43 32		eSE	29 16
13	eXZ	13 36 44	19	eXZ	13 39 59
13	eXZ	14 04 42	19	eXE	16 54 54
13	eXZ	20 57 24	20	eXZ	03 01 49
14	ePZ	13 49 03	20	eXE	03 02 32
14	ePZ	14 23 48	22	eXZ	06 32 02
14	ePZ	20 48 16	22	eXE	14 55 56
14	ePZ	23 36 42	24	eXZ	07 11 42
17	ePZ	19 58 48	25	ePZ	22 04 27
17	eXZ	21 42 29		iPZ	28
19	eXZ	02 49 11		eXZ	51
19	eXZ	13 29 42	29	eXZ	14 45 00
19	eXZ	13 41 18			
19	eXZ	14 45 36			
19	eXZ	16 00 57	6	ePZ	15 34 29
22	eXZ	17 34 41		eSZN	59
22	eXZ	17 57 49	7	eXZ	13 32 53
22	ePZ	22 53 56 ±	11	eXZ	06 50 59
23	e(P)Z	16 27 26	12	eXZ	08 18 04
27	ePZ	15 26 37 c	13	eXN	13 46 36
27	ePZ	20 46 57 c	14	ePZ	02 18 07
27	ePZ	22 22 40	14	eXZ	20 20 01
28	eXZ	20 06 05	15	eXZ	23 23 47
29	e(P)Z	09 52 28	17	eXN	21 45 54
29	ePZ	14 51 15	22	eXZ	17 56 52
			23	eXN	14 27 14
1	ePZ	10 14 24	26	eXZ	16 58 06
2	eXZ	17 45 14	27	eXN	12 13 30
5	eXZ	20 47 08	27	eXN	15 26 08
8	ePZ	06 28 44	29	eXN	14 15 36

Chittagong