

Pakistan, Quetta, Vol. 4 No. 1, January 1958

# SEISMOLOGICAL BULLETIN OF PAKISTAN

JANUARY 1958

No. 1

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Printed at  
Bolan Muslim Press,  
QUETTA.

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*Issued under the authority of the Director, Meteorological Service*  
PAKISTAN METEOROLOGICAL SERVICE  
GEOPHYSICAL INSTITUTE  
QUETTA

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The Seismological Bulletin of Pakistan is a monthly publishing data of seismological stations in Pakistan.

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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
<b>Quetta (Central Station)</b>				
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 "	—	—
<b>Lahore</b> Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
<b>Karachi</b> Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
<b>Chittagong</b> Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	4,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
<b>Warsak</b> 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) 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
1	Qt	ePZ	05 37 34 <sup>c</sup>	2	Qt	ePZ	15 49 22
1	Ch	ePZ	15 18 02			eSN*E*	52 32
	Wr	ePZ	08 <sup>c</sup>		Wr	ePZ	49 53
	Lh	ePZ	11		Lh	ePZ	50 22
	Qt	ePZ	38 <sup>c</sup>			USCGS H 15 45 22	
		ePPZ	21 54			34 1/2 N 48 E	
		eSN*E*	28 54			Iran	
		eLN*	40.3	2	Lh	ePZ	21 22 06
		USCGS H 15 06 08			Wr	ePZ	10
		52 N 171 1/2 W			Qt	ePZ	46 <sup>c</sup>
		Fox Islands,				epPZ	23 00
		Aleutian Islands				USCGS H 21 12 07	
2	Lh	ePZ	00 33 47			45 N 151 E	
		eSE	43 53			Kurile Islands	
	Qt	ePZ	34 17			depth about 60 km	
		eSKSNE*	44 45	2	Qt	ePZ	22 18 38
		ePSE*	46 08			eSN*	21 50
		USCGS H 00 21 22			Lh	ePZ	19 39
		5 S 152 E				Iran aftershock	
		New Britain		2	Qt	ePZ	23 11 50
2	Qt	ePZ	02 15 32		Lh	iPZ	12 10 d
		ePPN	17 02	3	Wr	ePZ	06 37 22
		eXN*E*	21 03		Qt	ePZ	23 d
		eSN	22			eSN*	48 08
		eLE*N*	23 38			Mu Sec	
		e!ScSN	25 44		PZ	0.3 1.8	
	Wr	ePZ	15 50		Lh	ePZ	06 37 43
	Lh	ePZ	16 15			USCGS H 06 24 31	
		USCGS H 02 08 15				32 N 41 1/2 W	
		36 1/2 N 22 E				North Atlantic Ocean	
		Off south coast of		3	Qt	ePZ	07 02 54
		Greece				eSN*E*	13 44
		Mag 5.7 (Up, Ki)			Lh	ePZ	03 14

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				Major Shocks					
Date	Station	Phase	h m s	Date	Station	Phase	h m s		
3	Qt	USCGS H 06 49 56		3	Kr	ePZ	17 55 49		
		31 N 40½ W				Qt	ePZ	56 25 d	
		North Atlantic Ocean					ePcPZ	57 38	
		ePZ	07 15 05				eSN	18 03 43	
		eSKSN*	25 36			iSE*N*	47		
		iSN*E*	56			eScSNN*	06 15		
3	Qt	USCGS H 07 02 07		3	Lh	iPZ	17 56 40 d		
		31 N 40½ W				Wr	ePZ	55	
		North Atlantic Ocean						USCGS H 17 47 12	
		ePZ	08 08 36					22 S 65 E	
USCGS H 07 55 40			Mascarine Islands region						
		31½ N 41 W		3	Lh	ePZ	22 11 52 d		
		North Atlantic Ocean				Qt	ePZ	12 31	
3	Qt	ePZ	08 46 23	4	Qt	ePZ	06 52 38		
		eSE*	57 07				eSNN*	07 03 23	
3	Qt	USCGS H 08 33 31				Mu	Sec		
		32½ N 41 W				PZ	0.5 2.5		
		North Atlantic Ocean				USCGS H 06 39 45			
		ePZ	09 38 41			31½ N 40½ W			
		eSE*	49 25			North Atlantic Ocean			
3	Qt	USCGS H 09 25 47		4	Qt	ePKPZ	08 21 36		
		31½ N 40½ W					USCGS H 08 02 20		
		North Atlantic Ocean					17 N 99½ W		
		ePZ	10 25 28				Guerrero, Mexico		
		eSN*E*	36 20			Mag 5¼ (Pas)			
3	Qt	USCGS H 10 12 33		4	Ch	ePZ	08 28 51		
		31½ N 41 W				Lh	ePZ	31 43	
		North Atlantic Ocean						e(S)Z	34 31
		ePZ	13 43 31					e(SS)E	49
		eSN*	54 16				eLE	37.0	
3	Wr	ePZ	17 50 48	3	Wr	ePZ	32 16		
		Lh	eXZ			51 22	Qt	ePZ	54 d
	Qt	ePZ	59	Kr	ePZ	59			

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				Major Shocks				
Date	Station	Phase	h m s	Date	Station	Phase	h m s	
		USCGS H 08 27 53			Kr	esSN*	24 48	
		27 N 92 E				ePZ	15 47 c	
		India-Tibet border					H 08 05 06	
							depth about 500 km	
4	Ch	ePZ	13 14 07 c	5	Qt	ePZ	08 43 37	
		Wr	ePZ			16 33 c	5	Wr
4	Qt	ePZ	47 c	Ch	Lh	ePZ		
		Qt	ePZ			15 46 46	Lh	iPZ
		USCGS H 15 33 54		Qt	Qt	ePE		42 17
		32 N 41 W				Kr	Wr	ePZ
4	Lh	eXZ	18 11 52	Wr	Qt			ePPZ
		Qt	ePZ			12 26 c	Qt	Qt
4	Lh	ePE	23 30 41	Qt	Qt	eSNE*		
		Wr	ePZ			54	Qt	Qt
4	Wr	ePZ	31 10	Qt	Qt	iXN*E*		
		Qt	eSZ			39 01	Qt	Qt
4	Qt	ePZ	31 15 c	Qt	Qt	PZ		
		epPZ	32 05			Kr	Kr	ePZ
5	Ch	eSN	39 08	Kr	Kr			eSN
		USCGS H 23 21 38				Kr	Kr	USCGS H 11 30 44
5	Lh	8½ S 112 E		Kr	Kr			56½ N 121 E
		Off south coast of Java				Kr	Kr	Stanovoi Mountains
5	Ch	ePZ	08 11 27	Kr	Kr			region, Siberia
		Lh	ePZE			13 46	Kr	Kr
5	Lh	epPZ	15 19	Kr	Kr	6.5 (Up, Ki)		
		iISE	20 45			Kr	Kr	iPZ
5	Wr	eScSN	22 44	Kr	Kr			iSZ
		ePZ	14 09			Kr	Kr	eSE
5	Qt	eSZ	21 26	Kr	Kr			ePNE
		ePZ	14 23			Kr	Kr	eSNE
5	Qt	epPZN	16 00	Kr	Kr			
		eSNN*E*	21 54			Kr	Kr	

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		H 21 09 29					Qt	ePZ			23
		36½ N 71¼ E						ePPZ			23 43
		Hindukush						eSKSN			30 47
		depth about 200 km						USCGS H 09 07 40			
5	Wr	ePZ	22	42	37 d			54½ N 161 W			
		eSZ		43	04			Unimak Islands region			
	Lh	ePZ			23	6	Qt	ePZ	09	58	09
		iSNE		44	24		Kr	ePZ			36
	Qt	iPZN		43	29 d			USCGS H 09 54 13			
		esPZ		44	05			West Central Iran			
		iSNE			38	6	Kr	iPZ	10	00	39
		H 22 42 01					Wr	iPZ			59
		35¾ N 70 E					Qt	ePZ			01 01
		Hindukush						USCGS H 09 51 40			
		depth about 150 km						Near south coast of			
6	Wr	iPZ	01	55	26 d			Java			
	Lh	iPZ		56	08	6	Ch	ePZ	11	25	37
	Qt	iPZ			27 d		Lh	ePZ		28	52
		esPZN			52			eSE		32	27
		eSNZN*		57	48			eLE		33	5
		iXE*N*		58	09		Wr	ePZ		29	23
	Kr	ePZ		57	30			eSZ		33	35
		iSN		59	41		Kr	ePZ		29	53
	Ch	iPZ			39 d		Qt	ePZ			53 d
		ePPZ		02	00 10			eSNN*			34 26
		H 01 54 43						USCGS H 11 24 11			
		37 N 71 E						26 N 96½ E			
		Hindukush						Burma			
		depth about 100 km						Mag 6.0 (Up)			
		USCGS H 01 54 30									
		37½ N 71 E				7	Wr	ePZ	06	06	28
		Hindukush						eSZ			07 38
6	Qt	ePZ		08	19 48		Lh	ePZ			11
6	Lh	ePZ		09	20 03						

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		i!PgZ			47			iSE			45 53
	Qt	ePZ			24		Qt	iPZ			44 06 c
		eSNE		09	10			i!XZN*			40
		eXNN*			26			i!SNN*E*			47 51
	Kr	ePZ		08	37			Mu Sec			
		eSE		11	28			PZ 2.0 1.5			
		H 06 05 07						PN 1.6 1.5			
		39½ N 70 E					Ch	ePZ		17	44 33
		Tadzhikistan, U.S.S.R.					Kr	iPZ			51 c
		USCGS H 06 05 08						iSE			49 19
		39 N 70 E						USCGS H 17 39 24			
		Tadzhikistan, U.S.S.R.						44½ N 85 E			
		Mag 6.1 (Up, Ki)						Sinkiang Province			
7	Wr	ePZ		21	47 49			China			
		eSZ			48 32			Mag 6.1 (Qt)			
	Lh	eXZ			27	9	Wr	ePZ		21	47 47
		eSE			49 33			eSZ			48 31
	Qt	ePZN			48 57		Qt	ePZ			51
		eSNE			50 31		10	Wr	ePZ		00 19 27
		H 21 46 53					Qt	ePZ			20 05
		37¾ N 72½ E					10	Ch	ePZ		13 49 10
		Pamirs, Tadzhikistan					Qt	ePZ			44
		U.S.S.R.						eSNN*			14 00 01
8	Wr	ePZ		16	58 30			USCGS H 13 37 14			
	Qt	ePZ			35			52 N 171 W			
9	Lh	ePZ		01	25 27			Fox Islands, Aleutian			
	Wr	iPZ			30 d			Islands			
	Qt	ePZ			26 19	10	Wr	ePZ		15	20 18
9	Wr	ePZ		10	17 19		Qt	ePZ			36
		eSZ			18 13		10	Lh	ePE	23	07 04±
	Qt	ePZ			17 53			ePPPE			10 31
		e(S)N			19 02			eSE			14 52
9	Wr	ePZ		17	42 57			eScSE			16 39
	Lh	ePZ			43 05 c		Wr	ePZ			07 07

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	ePZ			44	13	Ch	ePZ	00	13	37
		eSNN*E*			16 07		Wr	ePZ			13 40
		USCGS H	22	57	12			eSZ			22 52
		44½ N 148 E					Lh	ePZ			13 43
		Kurile Islands						ipPZ			14 14
11	Lh	iPKPZ	13	37	34			iSE			22 55
		ePPZ			38 42			esSE			23 35
		e(SKS)E			44 08		Qt	ePZ			14 12
	Wr	ePKPZ			37 38			epPZ			40
	Qt	ePKPZ			46			iSN*E*			23 51
		ePPZN			39 26			isSN*E*			24 40
		iSKSNE*			44 33		Kr	ePZ			14 33
		eSKKSE			46 07			epPZ			15 00
		USCGS H	13	18	47			eSE			24 36
		23½ S 177 W						USCGS H	00	02	24
		Tonga Islands region						52½ N 177 E			
11	Lh	ePZ	23	30	29 d			Rat Islands, Aleutian			
	Qt	ePZ			31 09			Islands			
		USCGS H	23	21	00			depth about 100 km			
		45½ N 143 E						Mag 6.5 (Up, Ki)			
		Near north coast of				13	Lh	ePZ	03	08	04
		Hokkaido, Japan						ePPZ			11 59
12	Qt	ePZ	15	08	03		Wr	ePZ			08 16
		ePPZ			11 38		Qt	ePZ			33
		eSN*			18 43			eSKSN*			19 03
		Mu Sec						iSKSN*			14
		PZ 0.4 2.0						eSPE*			21 50
	Lh	ePZ			08 23			e(SS)E*			27 24
	Ch	ePZ			09 01			USCGS H	02	54	37
		USCGS H	14	55	09			11 S 166 E			
		31½ N 41 W						Santa Cruz Islands			
		Atlantic Ocean						depth about 100 km			

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
13	Qt	ePZ	13	29	15			H	21	22	35
		USCGS H	13	19	49			35½ N 77 E			
		27½ N 130 E						Near K2, Karakorum			
		Ryukyu Islands				14	Qt	ePZ			01 45 56
13	Ch	ePZ	20	17	04			USCGS H	01	33	55
		iSZ			18 59			51½ N 178½ E			
	Lh	iPZ			20 06			Rat Islands, Aleutian			
		iXZ			18			Islands			
	Kr	iPZ			22 d			depth about 100 km			
	Wr	iPZN			37 d	14	Qt	ePKPZ			06 13 52
		Mu Sec						USCGS H	05	54	48
		PN 0.8 1.9						22 S 175 W			
	Qt	iPZ	20	20	45 d			Tonga Islands			
		iXZ			57	14	Qt	ePKPZ			07 38 47 d
		ePPZ			21 45			epPKPZN			40 15
		eSNN*E*			25 43			eSKSNE*			45 19
		eLNN*			26.7			USCGS H	07	20	25
		Mu Sec						29 S 179 W			
		PZ 1.0 1.6						Kermadec Islands			
		PPZ 0.9 1.9						depth about 350 km			
		USCGS H	20	14	27	14	Qt	ePZ			13 39 58
		11½ N 92½ E						eSN*E*			44 13
		Andaman Islands						ePZ			40 13
		Mag 6.3 (Qt)						Lh			43
13	Qt	ePZ	20	31	12			USCGH H	13	34	40
		eSEN			33 03			39½ N 41 E			
13	Lh	ePZ	21	23	46			Eastern Turkey			
		iSE			24 39			ePZE			04 20 25
		ePZ			23 51	15	Qt	eXNE			27 47
	Wr	eSZ			24 51			USCGS H	04	10	45
		ePZ			25 01			43 N 136 E			
	Qt	eSNE			26 53			Near coast of Siberia			

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
15	Qt	ePZ	13	19	21	16	Qt	ePZ	02	07	42
	Wr	ePZ			29		Wr	ePZ			57
		USCGS H 13 15 31					Kr	ePZ			08 24
		40 N 51½ E					Lh	ePZ			47
		Caspian Sea						USCGS H 02 04 24			
15	Qt	ePKPZ	19	33	47			Northern Iran			
		epPKPZ			34 21	16	Qt	ePZ	04	25	10
		ePPZN			37 00		Wr	ePZ			27
	Wr	ePKPZ			33 56		Kr	ePZ			36±
	Kr	ePKPZ			58		Lh	ePZ			55
	Lh	ePKPZ			34 04			USCGS H 04 18 10			
		ipPKPZ			31			39½ N 25 E			
		iPPE			37 34			Aegean Sea			
	Ch	ePKPZ			34 29	16	Qt	eXZ	11	21	13
		USCGS H 19 14 29						ePPZ			22 03
		16½ S 71½ W						eSKSE*			28 19
		Southern Peru						USCGS H 11 03 32			
		depth about 100 km						14 S 167 E			
		Mag 7 (Pas), 6¾ (Berk),						New Hebrides Islands			
		7.3 (Up, Ki)				17	Lh	ePZ	04	24	10 d
15	Ch	ePZ	22	28	05			iPcPZ			53
	Lh	ePZ			29 31		Wr	ePZ			34
		ePPE			33 37			eSZ			32 58
	Wr	ePZ			29 40		Kr	ePZE			24 39 d
	Kr	ePZ			58		Qt	ePZ			47
	Qt	ePZ			59			eXN*			22 56
		ePPZE*			34 25			eSN*			33 28
		eSKSEE*			40 39			USCGS H 04 14 02			
		USCGS H 22 15 44						1 S 127 E			
		13½ S 167 E						Spice Islands			
		New Hebrides				17	Qt	ePKPZ	05	42	17
		Islands					Wr	ePKPZ			29
		Mag 6.5 (Up, Ki)					Lh	ePKPZ			36

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		epPKPZ	43	20				ePKSZ	30	11	
		USCGS H 05 23 08					Qt	ePKPZ	26	43	
		Tucuman Province,						ePPZN*	29	22	
		Argentina						ePKSZN	30	11	
		depth about 150 km						iPKSN*	20		
17	Wr	ePZ	07	29	30			Mu	Sec		
	Qt	eXZ			50			PPZ	3.6	3.7	
		USCGS H 07 15 38					Lh	ePKPZ	14	26	43
		52 S 139½ E						ePKSE	30	19	
		Antarctic Ocean					Kr	ePKPZ	26	52	
18	Kr	ePZ	15	27	54			iPKSZ	30	39	
	Qt	ePZ			59		Ch	ePKPZ	27	20	
		ePPZ			31 55			USCGS H 14 07 23			
		eSKSNE*			38 37			1½ N 79½ W			
		ePSN*E*			40 43			Near coast of Ecuador			
		eSSE*			45 54			Mag 7½ (Pas), (Berk),			
	Wr	ePZ			28 28			7.3 (Up, Ki),			
	Lh	eXE			33 53			6.9 (Qt)			
		USCGS H 15 14 26				19	Qt	iPgZ	15	00	59 c
		29 S 13 W						Felt Quetta			
		North of Tristan				19	Wr	ePKSZ	15	06	19
		da Cunha					Qt	ePPZN	05	20	
18	Lh	ePZ	19	37	14			ePKSZ	06	15	
	Qt	ePZ			42			ePKSN	19		
		USCGS H 19 24 30						Mu	Sec		
		6 S 155 E						PPZ	2.9	4.0	
		Solomon Islands					Lh	ePKPZ	15	02	46
19	Qt	iPgZ	07	12	28 c		Kr	ePKPZ	53		
		iSgNZ			30		Ch	ePKPZ	03	19	
		About 15 km						USCGS H 14 43 24			
		northwest of the						1½ N 79½ W			
		observatory						Near coast of Ecuador			
		Felt Quetta						Mag 6¾ (Pas), 6.8 (Qt)			
19	Wr	ePKPZ	14	26	39						

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
19	Lh	ePZ	16	56	42 c	20	Qt	ePZ	16	30	58
	Kr	ePZ			51			eSZ			31 34
	Wr	ePZ			57 13		Wr	ePZ			31 00
	Qt	ePZ			16 c			eSZ			40
		ePPN			58 44		Lh	eXZ			55
		ePcPZ			59 42			eSZ			32 54
		USCGS H 16 50 13						H 16 30 07			
		5½ N 95 E						33½ N 67½ E			
		Near coast of Sumatra						Afghanistan			
20	Ch	ePZ	02	19	10	20	Qt	ePZ	16	45	07
	Wr	ePZ			23 15			eSZN			42
	Qt	ePZ			41		Wr	ePZ			08
20	Qt	ePKPZ	02	39	30 c			Afghanistan			
		eXZ			40 52		Qt	ePKPZ	08	26	33
		ePPZE*			42 52		Wr	ePKPZ			41
	Kr	ePKPZ			39 39	20	Lh	ePKPZ			46
	Wr	ePKPZ			40			ePKP2Z			27 00
	Lh	ePKPE			45±			USCGS H 08 06 56			
		USCGS H 02 19 53						29 S 73 W			
		30½ S 71½ W						Near coast of Chile			
		Northern Chile				21	Lh	iPZ	19	46	05
20	Lh	ePZ	07	21	14		Qt	ePZ			45
	Wr	ePZ			34	22	Ch	ePZ	18	34	42 c
	Qt	ePZ			22 01		Lh	iPZ			36 51
		epPZ			24			ePPZ			38 39
		eSN			29 14			Mu Sec			
		USCGS H 07 13 08						PZ 0.7 1.5			
		16 N 120 E					Wr	iPZ	18	37	11
		Luzon, Philippine Islands					Qt	iPZ			42
		depth about 100 km						iPcPZ			39 06
20	Qt	ePKPZ	10	15	21			ePPZE*			38
	Wr	ePKPZ			34			eSE*			44 32
		USCGS H 09 55 44						Mu Sec			
		30½ S 71½ W						PPZ 0.8 2.5			
		Northern Chile									

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Kr	ePZ	18	37	45 c			iSE			33 56
		USCGS H 18 29 11						eSgE			34 52
		23 N 121½ E					Wr	ePZ			32 52
		Near east coast of Formosa						eSZ			34 57
		depth about 200 km					Qt	ePZ			33 40
22	Lh	ePZ	21	47	09			eSE			36 24
	Wr	ePZ			43		Kr	ePZ			34 01
	Qt	ePZ			48 c			eSE			36 55±
22	Ch	ePZ	23	42	25			H 05 30 08			
	Lh	ePZ			43 c			31 N 85½ E			
	Qt	ePZ			43 14 c			Southern Tibet			
		USCGS H 23 31 43						USCGS H 05 30 10			
		54 N 170 E						30½ N 84 E			
		Komandorskie Islands						Southern Tibet			
23	Lh	iPZ	02	43	38 d		Wr	ePZ			13 43 52
		iSE			51 16		Qt	ePZ			44 05 c
		eScSE			53 06			eSNN*			51 19
	Wr	ePZ			43 42			eLN*			56.0
		eSZN			51 20		Lh	ePZ			44 19
	Qt	ePZ			44 19 d			USCGS H 13 35 03			
		epPZ			56			65 N 6½ E			
		ePPZN			46 39			Off west coast of Norway			
		iSNE*			52 32	23	Qt	ePZ			17 00 26
		esSNE*			53 38		Wr	ePZ			28
		Mu Sec						ePZ			06 04 28
		PZ 0.2 1.5				24	Wr	ePZ			31 c
		USCGS H 02 34 09					Lh	ePZ			51
		44½ N 146½ E						eXZ			51
		Kurile Islands					Qt	ePZ			05 04 c
		depth about 150 km						eSN*E*			14 06
23	Lh	ePZ	05	32	17			ePKPPKPZ			33 14
								USCGS H 05 53 58			
								56½ N 163 E			
								Near east coast of Kamchatka			



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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
24	Wr	ePZ	06	21	32	24	Wr	ePZ	23	29	31
	Lh	ePZ			38		Lh	ePZ			39 <sup>c</sup>
	Qt	ePZ			22 10			epPZ			30 00
		eSN			31 13		Ch	ePZN			29 50
		USCGS H 06 11 03						ePcPZ			58
		56½ N 163 E						eSNN*			40 03
		Near east coast of					Qt	ePZ			29 58
		Kamchatka						eSKSN			40 06
24	Qt	ePZ	07	00	44			eSE*			17
	Wr	ePZ			01 07			Mu Sec			
		USCGS H 06 48 06						PZ 0.2 1.7			
		49 S 32 E						USCGS H 23 17 29			
		About 300 miles						60 N 152 W			
		southwest of						Kenai Peninsula, Alaska			
		Prince Edward						depth about 60 km			
		Islands						Mag 6¼-6½ (Pas),			
24	Ch	ePZN	18	14	16 <sup>c</sup>			6.0 (Up, Ki),			
		ePcPZN			46			6.1 (Qt)			
		ePPZN			16 38	25	Qt	ePKPZ	00	11	21
		eSN			23 00			USCGS H 23 53 29			
	Wr	ePZ			14 31			17½ S 178½ W			
	Lh	ePZ			34 <sup>c</sup>			Fiji Islands			
	Qt	ePZ			15 06 <sup>c</sup>			depth about 550 km			
		ePPZ			17 50	25	Qt	ePZ	11	35	05
		eSN*E*			24 37			e(S)E			38 16
		USCGS H 18 03 32					Wr	ePZ			35 42
		54 N 170 E				25	Wr	ePZ	15	03	46
		Komandorskie						iSZ			04 18
		Islands					Qt	ePZ			42
24	Qt	ePZ	23	10	36			eSNZ			05 58
		USCGS H 22 58 57						H 15 03 02			
		Near Islands region						Hindukush			
		Aleutian Islands				25	Ch	iPZ	18	09	08 <sup>c</sup>

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	ePZ			40			ePPZ			40 25
25	Qt	ePZ	21	23	54		Wr	ePZ			38 51
26	Ch	ePZ	00	45	44		Qt	ePZ			39 29
	Lh	ePZ			49 05			USCGS H 07 28 33			
	Qt	ePZ			48			49½ N 155 E			
		e(S)E			56 23			Northern Kurile Islands			
26	Ch	ePZ	00	57	55	27	Qt	ePKPZ	08	03	00
26	Lh	ePZ	01	01	17			ePPN			04 50
	Qt	ePZ			59			eSKSE*			10 08
26	Ch	ePZ	01	08	39			eSKKSE*			11 41
		e(S)NZ			10 48			ePSE*			14 38
	Lh	ePZ			12 08			i!XN			21 21
	Qt	ePZ			52			USCGS H 07 43 58			
26	Lh	ePKPZ	03	55	12			15 S 174 W			
	Wr	ePKPZ			13			Samoa Islands			
	Qt	ePKPZ			18			Mag 6¾ (Pas), 6½ (Berk)			
		USCGS H 03 35 21				27	Ch	ePZ	09	03	31
		54 S 133 W					Lh	ePZ			05 17±
		South Pacific Ocean					Qt	ePZ			46
26	Ch	ePZ	06	51	53 <sup>c</sup>			USCGS H 08 52 26			
		ePcPZ			52 51			Solomon Islands			
		ePPZ			53 58	28	Ch	ePZ	06	53	52
		eSZ			59 39		Qt	ePZE			54 25
	Wr	ePZ			52 32	28	Qt	ePZ	17	17	15
	Qt	ePZ			53 09 <sup>c</sup>			eSN			18 51
		eSN*			07 02 03		Wr	ePZ			17 37
		Mu Sec					Lh	ePZ			18 20
		PZ 0.2 1.5					Ch	ePZ			21 29
		USCGS H 06 42 13						USCGS H 17 15 00			
		47½ N 154½ E						36 N 58½ E			
		Kurile Islands						Iran			
26	Ch	ePZ	07	38	18 <sup>c</sup>	28	Ch	ePZ	19	49	32
		ePcPZ			39 15		Lh	ePZ			51 43 <sup>d</sup>

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				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
	Qt	ePZ	52 21 d		Wr	ePZ	26 19
		eSN	20 00 42		Kr	ePZ	37
		USCGS H 19 41 54			Qt	ePZ	38
		3½ N 127 E				eXZ	28 23
		Molucca Passage				ePPZN	30 18
29	Ch	ePZ	00 24 52			eSKSNE*	37 12
	Lh	ePZ	26 05			iSN*	39
	Wr	ePZ	14			ePSN*	38 55
	Qt	ePZ	50			iSSN*	44 00
		USCGS H 00 16 30				Mu Sec	
		37 N 142 E				PZ 0.3 1.7	
		Off east coast of Hokkaido, Japan				USCGS H 06 13 24	
						7½ S 155½ E	
29	Kr	ePZ	17 14 12			Solomon Islands	
	Qt	ePZ	17 c			Mag 6½ (Pas),	
		i!PgZN	28			6.5 (Up, Ki), 6.4 (Qt)	
		eSN	56	31	Wr	ePKPZ	06 51 26
	Wr	ePZ	15 26		Qt	ePKPZ	35
	Lh	ePZ	27			USCGS H 06 32 39	
		eSE	16 57			40 S 176½ E	
		H 17 13 29				North Island	
		27½ N 66½ E				New Zealand	
		Kalat, West Pakistan		31	Qt	ePZ	21 18 40
30	Qt	ePKPZ	05 17 07	31	Wr	ePZ	23 24 47
		USCGS H 04 58 01				eSZ	28 21
		19 S 172½ W			Qt	ePZE	25 26
		Tonga Islands				eSZN	29 40
30	Ch	ePZ	06 24 35 c			USCGS H 23 20 15	
		ePcPZ	59			Sinkiang Province	
		eSN*	33 41			China	
		eScSN*	34 34				
	Lh	ePZ	26 09				
		eSKSE	36 39				

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Date	Phase	h m s	Date	Phase	h m s
	Quetta			e(S)E	27 01
			9	ePZ	14 53 15
1	iPZ	23 28 53 d	11	ePZ	20 27 16
	iSZ	29 23	12	ePN	00 07 42
2	ePZ	05 36 47		eSN	08 15
3	ePZ	02 05 05	12	ePN	01 12 39
	eSE	06 56	12	ePZN	01 18 49
3	ePZ	05 25 18	13	ePZ	04 09 52
	eSE	41	13	ePZ	12 06 59
3	ePZ	06 51 52	13	ePZ	14 05 48
3	ePZ	09 49 47		eSE	06 41
3	ePZ	11 44 28	13	ePZ	14 15 35
3	ePZ	23 22 11		eSZ	38
4	ePZ	02 12 15	14	iPZ	18 19 55 c
4	ePZ	05 51 21		iSN	20 06
	eSZNE	47	14	ePZ	20 34 55
4	ePZ	18 50 38 d		eSN	35 06
	eXZN	51	15	ePZ	20 10 05
	eSN	51 30	16	ePZ	02 18 29
5	ePNE	14 27 51		eSE	58
	eSNE	28 14	18	ePZ	22 31 37
6	ePN	21 38 35	19	ePZ	01 59 02
	eSN	39 33		eSN	02 00 32
7	ePN	13 06 38	19	ePN	15 00 52
	eSN	07 05		iSN	54
8	ePN	11 00 43	21	ePZ	18 02 40
	eSE	01 08	21	ePZ	23 33 06
8	ePNE	06 20 25	23	ePZ	01 56 49
	eSNE	50	23	ePZ	04 20 17
9	ePZ	08 02 15 c	23	ePZ	04 33 56
9	ePZ	10 17 53	24	ePZ	10 29 33
	e(S)N	19 02		eSE	43
9	ePZ	11 26 16	24	ePZ	19 00 09

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Date	Phase	h m s	Date	Phase	h m s
24	ePZ	22 57 19		iSZ	55
25	ePZ	00 34 54	6	ePZ	03 00 40
25	ePZ	20 02 21		eSZ	01 14
25	ePZ	21 36 25	6	ePZ	05 15 43
26	ePZN	20 14 28		eSZ	57
27	ePZ	09 15 39	6	ePZ	06 46 06
27	ePZ	16 31 11		eSZ	27
28	ePZ	18 07 10	6	ePZ	20 01 19
29	ePZ	10 34 12	6	ePZ	21 15 58
30	ePZ	00 02 40		eSZ	16 32
31	ePE	19 09 10	6	ePZ	21 52 53
				eSZ	53 21
	Warsak		8	ePZ	21 43 34
				eSZ	44 02
1	iPZ	23 29 18 d	10	ePZ	05 29 28
2	ePZ	01 10 50		eSZ	30 14
2	ePZ	11 15 47	10	ePZ	07 39 36
	eSZ	16 06	10	ePZ	08 35 05
2	ePZ	12 21 41		eSZ	43
2	iPZ	12 58 03 d	10	ePZ	19 43 56
	iSZ	28	10	ePZ	21 17 16
2	iPZ	17 22 50 c	12	ePZ	00 21 45
2	ePZ	21 48 19		eSZ	22 30
3	iPZ	09 48 21 d	12	ePZ	01 11 41
3	ePZ	14 32 32		eSZ	12 36
	eSZ	33 17	12	ePZ	01 36 59
3	iPZ	17 40 04 d	12	ePZ	07 29 43
3	iPZ	22 53 44 c	12	ePZ	15 34 14
	iSZ	54 42		eSZ	48
4	iPZ	02 11 32	12	ePZ	15 48 06
4	iPZ	08 32 16		eSZ	42
4	iPZ	17 39 25 c	12	ePZ	22 31 49
	iSZ	40 06		eSZ	32 24
5	iPZ	11 35 14 c	13	ePZ	04 08 54

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Date	Phase	h m s	Date	Phase	h m s
	eSZ	09 24	15	ePZ	17 02 25
13	ePZ	05 39 42		eSZ	42
	eSZ	40 09	16	ePZ	08 35 30
13	ePZ	06 06 17		iSZ	59
	eSZ	07 01	16	ePZ	15 07 48
13	ePZ	06 18 16	16	ePZ	19 57 28
	eSZ	52		eSZ	58 17
13	ePZ	12 06 22 d	17	ePZ	02 57 09
13	ePZ	23 08 49	17	ePZ	11 10 08
	eSZ	09 22	18	ePZ	00 53 51
14	ePZ	04 32 01		eSZ	54 15
	eSZ	21	18	iPZ	20 42 29 d
14	ePZ	04 44 37		eSZ	58
	eSZ	48	19	ePZ	00 33 25
14	ePZ	06 28 44		eSZ	34 11
14	ePZ	11 47 46	19	iPZ	01 57 58 d
	eSZ	49 13		iSZ	58 40
14	ePZ	13 24 31	19	ePZ	05 41 04
	eSZ	25 13		eSZ	29
	ePZ	13 40 13	19	ePZ	17 42 33
14	ePZ	18 20 22		eSZ	43 06
14	ePZ	20 35 18	19	ePZ	17 47 18
14	eSZ	44		eSZ	48 08
	ePZ	22 56 11	20	ePZ	05 38 42
14	eSZ	40		eSZ	39 02
15	ePZ	09 32 48	21	iPZ	01 21 41 c
	eSZ	33 26		eSZ	22 13
15	ePZ	12 13 25	21	iPZ	05 58 06 c
	eSZ	58	21	ePZ	17 12 32
15	ePZ	12 23 50		eSZ	13 05
	eSZ	24 17	21	ePZ	20 09 04
15	ePZ	16 03 46		eSZ	10 11
	eSZ	04 37			

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Date	Phase	h m s	Date	Phase	h m s
22	ePZ	02 37 27	28	ePZ	18 13 10
22	iPZ	04 16 17 d		iSE	47
	eSZ	45	29	ePZ	00 34 39
22	ePZ	13 35 53		eSZ	35 08
	eSZ	36 25	29	ePZ	10 34 12
22	iPZ	14 49 21 d	29	iPZ	12 54 07
23	ePZ	01 45 01		iSZ	40
	eSZ	28	29	ePZ	13 36 00
23	ePZ	16 02 25	29	ePZ	16 06 18
24	ePZ	04 43 09		eSZ	54
24	ePZ	09 41 49	29	ePZ	20 20 18
	iSZ	42 39	30	iPZ	03 12 06
25	iPZ	07 30 41		iSZ	31
	iSZ	31 03	30	ePZ	05 11 07
25	iPZ	07 47 49 d		iSZ	40
	eSZ	48 18	30	iPZ	07 48 54 d
25	ePZ	19 07 11		iSZ	49 20
26	ePZ	07 52 12	30	ePZ	19 20 43
26	iPZ	08 44 57 c	31	ePZ	00 35 02
26	iPZ	08 53 10 c		iSZ	34
26	ePZ	23 12 16	31	ePZ	05 03 59
	eSZ	50		eSZ	05 40
27	iPZ	01 58 25 d	31	ePZ	19 09 46
27	ePZ	11 13 15	31	iPZ	21 43 42
27	ePZ	11 41 24		iSZ	44 21
	iSZ	42 04			
27	ePZ	12 55 56			
	iSZ	56 54			
28	ePZ	00 02 36	1	eXZ	23 30 20
	iSZ	03 08	2	ePZ	12 21 12
28	ePZ	17 54 03	2	ePnZ	21 47 35
	eSZ	29		ePgZ	46

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Date	Phase	h m s	Date	Phase	h m s
	eSnN	48 21	5	eXZ	20 57 23
3	eXZ	09 48 47	7	eXZ	01 42 27
4	ePZ	02 12 41	7	eXZ	06 11 33
	eSE	14 13	9	e(P)Z	01 22 56
9	eXZ	11 26 29	9	eXZ	21 45 48
12	ePZ	16 13 43	10	eXZ	15 17 42
	eSE	14 07	10	e(P)Z	23 08 03
12	ePZ	17 34 46 d	17	ePZ	06 17 23
15	eXZ	04 19 42	22	ePZ	14 04 46
15	ePZ	19 25 51		eSZ	05 09
	eSZ	26 47	22	eXZ	23 01 24
16	ePZ	23 59 39	23	ePZ	01 50 46
17	eXZ	18 42 51		eSZ	51 04
	eSZ	57	24	ePZN	16 45 38
18	ePZ	00 16 58	25	eXZ	11 36 59
	iSZE	17 23	25	ePZ	21 19 42
19	ePZ	01 58 30		eXZ	20 08
27	eXZ	08 03 41	27	ePZ	07 04 50
29	iPZ	20 20 16		eSN	05 55
	eSE	21 01	27	eXZ	08 03 28
31	eXZ	21 19 48	28	ePZ	08 39 51
31	eXZ	23 24 13	31	ePZN	23 21 57
	<b>Karachi</b>				
9	ePZ	08 02 05			
9	ePZ	11 26 56			
18	ePE	09 10 05			
	eSE	19			
25	ePZ	15 38 01			
	eSE	16			
	<b>Chittagong</b>				
3	iPZ	09 45 08			
3	eXZ	17 53 49			

*Seis. Bull. Pakistan, Quetta, Vol. 4 No. 2, February 1958*

# SEISMOLOGICAL BULLETIN OF PAKISTAN

*Vol. 4*

FEBRUARY 1958

*No. 2*

*Printed at*  
Bolan Muslim Press,  
QUETTA.



*Issued under the authority of the Director, Meteorological Service*  
PAKISTAN METEOROLOGICAL SERVICE  
GEOPHYSICAL INSTITUTE  
QUETTA

## SEISMOLOGICAL BULLETIN

of

### PAKISTAN.

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
<u>Quetta (Central Station)</u>				
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.)

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The Seismological Bulletin of Pakistan is a monthly publishing data of seismological stations in Pakistan.

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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 "	—	—
<b>Lahore</b> Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
<b>Karachi</b> Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
<b>Chittagong</b> Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	4,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo=1 sec. Galvo = 1/4 "	—	—
<b>Warsak</b> 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) 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
1	Wr	ePKPZ	16 29 26			eSKSPN*	36 58
	Qt	ePKPZ	36 c			eSSN*	46 20
		ePPZN*E*	32 07			USCGS H 18 02 39	
		iPKSZN*E*	33 07			2 N 79 W	
		Mu Sec				Ecuador aftershock	
		PPZ 2.0 3.0				Mag 6 3/4 7 - (Pas),	
	Lh	ePKPZ	16 29 38			6 1/2 (Berk), 6.6 (Qt)	
		iPKSZ	33 05		Ch	ePZ	19 37 52 ±
	Kr	ePKPZ	29 41 c			eSN*	43 07
		ePKSZ	33 14		Lh	ePZ	40 16 d
	Ch	ePKPZN	30 09 c			ePPZ	42 10
		ePPEN*	34 12			Mu Sec	
		eSKKSN*	41 01			PZ 0.5 1.5	
		eSKSPN*	44 29		Wr	ePZ	19 40 39
		USCGS H 16 10 15			Kr	ePZ	57 d
		2 N 79 W			Qt	ePZN	41 02 d
		Near coast of Ecuador				ePPZ	43 09
		Mag 6 3/4 - 7 (Pas), (Berk),				eSN	48 41
		6.9 (Up, Ki), 6.7 (Qt)				Mu Sec	
1	Wr	ePKPZ	18 21 51			PZ 0.4 2.0	
	Qt	ePKPZ	22 01 c			H 19 31 29	
		ePPZN	24 33		1	Wr	ePKPZ 21 04 58
		ePKSZ	25 30		Qt	ePKPZ	05 08 c
		Mu Sec				ePPZN*E*	07 39
		PPZ 1.2 2.5				ePKSZ	08 38
	Lh	ePKPZ	18 22 07 ±			iPKSN*E*	43
		ePPZ	24 48			Mu Sec	
		ePKSZ	25 31			PPZ 0.5 2.2	
	Kr	ePKPZ	22 07		Lh	ePKPZ	21 05 07 ±
		ePKSZ	25 38		Kr	ePKPZ	13
	Ch	ePKP1ZN	22 34		Ch	ePKPZ	35
		ePKP2N*	58			USCGS H 20 45 45	
		ePPZ	26 36			1 1/2 N 79 W	
		eSKSN	29 35			Ecuador aftershock	
		iSKKSN*	33 21				

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Mag $6\frac{3}{4}$ (Pas), $6\frac{1}{2}$ (Berk), 6.3 (Qt)						eSN*	31	31	
1	Ch	ePZN	22	11	26			eScSN	32	37	
		ePcPZ		52			Kr	ePKPPKZ	51	11	
		ePPZ	14	01				ePZ	23	08 c	
		iSNN*	25	31				USCGS H	08	11	53
		ePSNN*		54				48 $\frac{1}{2}$ N 154 $\frac{1}{2}$ E			
		eScSN	21	24				Northern Kurile Islands			
		eSSN*	24	59		2	Qt	Mag $6\frac{1}{2}$ - $6\frac{3}{4}$ (Pas), 6.5 (Ch)			
	Lh	iPZ	13	02 d				ePKPZ	09	08	38
	Wr	ePZ		14			Ch	ePPZ		11	09
		eSZ	23	54				ePKPZ	09	19 c	
	Qt	ePZ	13	30				USCGS H	08	49	13
		eSKSN	23	54				2 N 79 W			
		eSN	24	32		2	Kr	Ecuador aftershock			
		USCGS H	22	00	15			ePgZ	17	03	09
		7 S 156 E						eSZ		40	
		Solomon Islands					Qt	eSgZ		56	
2	Qt	ePKPZ	02	54	22			ePZ		51	
		USCGS H	02	34	59			eSN		05	17
		1 $\frac{1}{2}$ N 79 $\frac{1}{2}$ W				2	Qt	ePZ	21	02	07
		Near north coast of						esPZ		03	17
		Ecuador						eSN		09	19
2	Ch	ePZN	08	21	29 c			USCGS H	20	53	08
		ePcPZN		22	28			27 $\frac{1}{2}$ N 127 E			
		ePPZN		23	33			Ryukyu Islands region			
		iSNN*		29	12	3	Qt	depth about 200 km			
		Mu Sec						ePKPZ	08	44	24
		PZ 0.5 1.0						USCGS H	08	25	19
		SN 0.3 2.4						21 S 174 W			
	Lh	ePZ	08	22	09	3	Wr	Tonga Islands			
		Mu Sec						ePZ	19	19	09
		PZ 0.5 1.5					Lh	eXZ		20	38
	Qt	ePZ	08	22	45 c			eSZ		54	
		ePcPZ		23	16		Qt	ePNE		14	
								eSNE		21	44

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		H 19 18 16					Ch	ePZ		41	
		Afghanistan - Tadzhik						ePcPZ		48	
		border						eSN*	20	07	44
3	Qt	ePZ	19	29	38			eScSN*		08	02
		eXZ		30	18		Lh	ePZ	19	57	45
		iSE*		31	47		Qt	ePZ		58	08
	Wr	ePZ		30	25			eSN*	20	08	36
	Lh	ePZ		56				USCGS H	19	45	27
		ePPZ		31	18			54 N 164 W			
		eSZ		34	09			Unimak Islands			
		H 19 26 51						Aleutian Islands			
		31 $\frac{1}{2}$ N 54 E				4	Ch	ePZ	23	46	18 c
		Central Iran					Lh	ePZ		47	28
4	Qt	ePZ	00	15	24		Qt	ePZ		48	12
		USCGS H	00	02	16			USCGS H	23	37	50
		6 $\frac{1}{2}$ S 155 E						Near east coast of			
		Solomon Islands						Honshu, Japan			
4	Ch	ePPZN	02	26	29	5	Wr	ePZ	01	55	07
		iSNN*		31	32			eSZ		56	22
	Lh	ePZ		26	48 c		Lh	ePZ		55	31
	Wr	ePZ		27	09			iPgZ		56	03
		eSZ		36	06			eSN		57	00
	Qt	ePZ		27	23 c		Qt	ePZ		56	17
		eSNN*		36	35			eSNE		58	24
		USCGS H	02	16	00			H	01	53	30
		6 S 131 $\frac{1}{2}$ E						39 $\frac{3}{4}$ N 75 E			
		Banda Sea						Western Sinkiang			
4	Qt	ePZE	10	54	18 $\pm$			province, China			
	Wr	ePZ		55	11	5	Qt	ePZ	03	18	59
	Ch	e(P)Z		59	31		Wr	ePZ		19	05
4	Qt	ePZ	15	26	01 c			USCGS H	03	15	17
4	Lh	ePZ	18	37	49 $\pm$			40 $\frac{1}{2}$ N 53 E			
	Qt	ePZ		38	16 c			Turkmen, S. S. R.			
4	Wr	ePZ	19	57	40	5	Ch	ePZ	08	17	42



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**Major Shocks**

Date	Station	Phase	h	m	s
		ePcPZ	18	47	
		ePPZN	19	48	
		eSN*	25	19	
	Lh	ePZ	18	24c	
	Wr	ePZ		26c	
	Qt	ePZ	19	03c	
		eSN*	27	49	
		Mu	Sec		
	PZ	0.4	1.6		
	USCGS H	08 08 10			
		47 N 153 E			
		Kurile Islands			
5	Ch	ePZ	15	58	18
	Lh	e(P)Z		25	
	Qt	ePZN		54	
5	Wr	ePZ	20	37	35
		eSZ		38	08
	Lh	ePZ		13	
		eSZ		39	16
	Qt	ePZ		38	32
		eSNE		39	50
		H	20	36	52
		36½ N 71 E			
		Hindukush			
		depth about 200 km			
5	Ch	ePZ	01	48	09
		ePPZ		53	
		eSEN		52	49
	Lh	ePZ		50	09
	Wr	ePZ		30	
	Qt	ePZ		51	03c
		eSNN*		58	10
		Mu	Sec		
	PZ	0.2	1.5		

Date	Station	Phase	h	m	s
	Kr	ePZ	01	51	09
		USCGS H	01 42 09		
		24½ N 122½ E			
		Near northeast coast			
		of Formosa			
		Mag 5.9 (Qt)			
6	Wr	ePZ	14	23	20
		eSZ		49	
	Lh	ePZ		55	
		eSZ		24	55
	Qt	ePZ		21	
		eSNE		25	42
		H	14	22	37
		36½ N 71½ E			
		Hindukush			
		depth about 200 km			
6	Ch	e(PKP)Z	16	17	09
	Qt	ePKPZ		18	45
		epPKPZ		19	51
		ePPZ		20	36
		USCGS H	16 00 12		
		27½ S 178 W			
		Kermadec Islands region			
		depth about 250 km			
7	Ch	ePZN	00	37	05
		iSNN*		40	50
		eSSNN*		41	20
	Lh	ePZ		39	19
	Wr	ePZ		50	
	Qt	ePZ		52	
		eSNN*		45	41
		USCGS H	00 32 25		

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Date	Station	Phase	h	m	s
		Near northwest coast of			
		Sumatra			
7	Lh	ePKPZ	01	29	17 c
	Qt	ePKPZ		29	c
		ePPZ		31	13
		USCGS H	01 10 31		
		31 S 179 W			
		Kermadec Islands			
7	Ch	ePZ	04	48	00 ±
	Lh	ePZ		21	
	Qt	ePZ		52	
		ePPZ		51	31
		eSN*		58	06
		USCGS H	04 37 33		
		55 N 167 E			
		Komandorskie Islands			
7	Lh	ePZ	07	08	29
	Qt	ePZ		09	20 c
		USCGS H	06 59 53		
		27½ N 128½ E			
		Ryukyu Islands			
7	Wr	ePZ	15	38	02 c
		eSZ		34	
	Lh	ePZ		42	
		iSZ		45	
	Qt	iPZ		39	01 c
		esPN		30	
		iSNE		40	19
		H	15	37	21
		36½ N 71 E			
		Hindukush			
		depth about 150 km			
7	Ch	ePZ	23	26	54
		eSN		29	34
	Lh	ePZ	23	29	00 c
		Mu	Sec		
	PZ	0.5	1.0		

Date	Station	Phase	h	m	s
	Wr	ePZ	23	29	11
	Qt	ePZ		30	00 c
		eSN*		35	10
		Mu	Sec		
	PZ	0.5	1.8		
	Kr	ePZ	23	30	11
		USCGS H	23 23 30		
		31½ N 104 E			
		Szechwan province,			
		China			
		Mag. 6.2 (Qt, Lh),			
		7.0 (Up, Ki)			
8	Wr	ePZ	19	20	56
	Lh	iPZ		21	33
	Qt	ePNE		22	00
		eSNE		23	19
		H	19	20	16
		Hindukush			
8	Lh	ePZ	21	58	22
	Qt	ePZ		59	10
9	Wr	ePZ	00	04	21
		eSZ		52	
	Lh	ePZ		05	01 ±
		eSZ		59	
	Qt	ePZN		25	
		eSNE		06	45
		H	00	03	40
		Hindukush			
9	Qt	ePZ	01	26	24
9	Qt	ePKPZ	04	34	20
		USCGS H	04 15 05		
		8 N 79½ W			
		South of Panama			
9	Qt	ePZ	09	30	18
9	Ch	ePZN	09	31	50
		iP*ZN		54	

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		iPgZ			59			eSN*			58 26
		eSNZ	32	25		Lh		ePZ			55 07
9	Lh	iPZ	34	49				eSZ	01	02	24
		eSZ	37	42		Kr		ePZ	00	55	16
	Wr	ePZ	35	32	c	Wr		ePZ			34
	Qt	ePZ	36	02	c			eSZ	01	03	14
		eSNE	39	56		Qt		ePZ	00	55	36
	Kr	ePZ	36	04				eSN*	01	03	22
		USCGS H 09 31 03						USCGS H 00 46 02			
		25 N 90½ E						9 S 107½ E			
		East Pakistan - India border						Off south coast of Java			
		Felt Mymensingh (E. Pak)				11	Wr		ePZ	20	08 49
9	Ch	iPZ	22	35 29	c		Lh	ePZ			09 43
		ePPN*			36 24		Qt	ePZ			10 20
		iSE			40 23	12	Lh	ePZ	02	44 46	
	Lh	ePZ			37 54		Qt	ePZ			45 26
		ePPZ			39 50			USCGS H 02 34 14			
	Wr	ePZ			38 17			Mariana Islands			
	Qt	ePZ			41	12	Qt	ePZ	06	47 51±	
		ePPZ			40 30			USCGS H 06 34 59			
		eSN*			46 09			5 S 151½ E			
		eLN*			50.8			New Britain			
		USCGS H 22 29 23				12	Ch		ePZ	07	32 13
		12½ N 121 E					Lh		ePZ		33 54
		Mindoro, Philippine Islands					Qt		ePZ		34 25
		Mag 6.0 (Up, Ki)						USCGS H 07 21 37			
10	Ch	ePZ	14	50 59				6 S 151½ E			
	Lh	ePZ			52 34			New Britain			
	Qt	ePZ			53 18			depth about 100 km			
		USCGS H 14 42 30				12	Ch		ePZ	18	21 13 d
		26 N 142½ E							eSZ		24 03
		Volcano Islands					Lh		iPZ		23 40 d
11	Ch	ePZ	00	52 56				ePPPZ			24 50
								eSZ			28 29

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Mu			Sec						
		PZ	0.3		1.5			Aleutian Islands			
	Kr	ePZ	18	23 51				Mag 6 (Pas), 5½ - 6 (Berk)			
	Wr	iPZ	24	11 d				5.9 (Up, Ki), 6.4 (Qt)			
	Qt	ePZ			15 d	13	Ch	iPZ	00	12 57	
		eSNE	29	34				iSZN*			13 58
		Mu			Sec		Lh	ePZ			15 23
		PZ	0.2		1.5			iSZ			18 19
		H 18 17 35					Wr	ePZ			16 01
		8½ N 94 E					Qt	ePZ			39
		Nicobar Islands region						iSN*			20 46
		Mag 5.8 (Qt), 5.9 (Lh)					Kr	ePZ			16 46
12	Lh	ePZ	23	41 02	c			H 00 11 32			
	Qt	ePZ			44			27½ N 93 E			
		USCGS H 23 31 21						Northern Assam			
		43½ N 145½ E						USCGS H 00 11 36			
		Near east coast of Hokkaido, Japan						27½ N 92 E			
12	Ch	iPZ	23	55 29	c	13	Wr	ePZ	01	04 40	
		iSN	00	05 03			Lh	ePgZ			05 50±
	Wr	ePZ	23	55 39				eSZ			06 50
	Lh	ePZ			41 c		Qt	ePZ			05 39
		Mu			Sec			eSNE			07 25
		PZ	0.6		1.8			H 01 03 22			
	Qt	ePZ	23	56 08	c			39 N 71 E			
		iXZ			27			Tadzhikistan, S.S.R.			
		eSN,N*	00	06 21		13	Ch	ePZ	04	29 55	
		eSSN*			11 20			eSZ			39 24
		eLN*			17.8		Qt	ePZ			30 43
		Mu			Sec			USCGS H 04 18 19			
		PZ	0.4		1.6			50 N 178 W			
	Kr	ePZ	23	56 30				Andreanof Islands			
		USCGS H 23 43 45						Aleutian Islands			
		52 N 172 W					13	Ch	ePZ	09	39 43 d
		Andreanof Islands							eSN*		46 04

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Lh	iPZ	40	38			Wr	iPZ			35 c
	Qt	ePZ	41	23	d		Qt	ePZ			57 12 c
		USCGS H 09 31 46						iXZ			24
		43 N 136 E						eSN*			02 05 42
		Sea of Japan						Mu	Sec		
		Near coast of Siberia						PZ	0.3	1.3	
13	Qt	ePZ	10	29	28		Kr	ePZ			01 57 37 c
	Wr	ePZ			30 12			USCGS H 01 46 40			
14	Wr	ePZ	00	29	19			44 N 147 E			
	Lh	eXZ			30 14			Kurile Islands			
		eSZ			31 28			Mag 6-6 $\frac{1}{4}$ (Pas),			
	Qt	ePZ			30 16			6.4 (Up, Ki), 6.3 (Qt)			
		eSNE			32 03						
		Tadzhikistan, S.S.R.				15	Qt	ePZ			09 57 22
14	Qt	ePZ	09	14	41	15	Qt	iPgZ			22 39 16.8 c
14	Qt	ePZ	12	04	20			iSgE			18.4
14	Qt	ePZ	16	22	49		Wr	iPZ			40 36
14	Qt	ePZ	18	24	58		Lh	ePnZ			53 $\pm$
14	Ch	ePZ	19	37	58			eP*Z			41 11
	Wr	ePZ			38 37			ePgZ			30
	Lh	iPZ			39 14			eSnZ			42 16
	Qt	ePZ			56			eSgZ			58
15	Wr	ePZ	01	21	50		Kr	ePZ			40 37
	Lh	ePZ			22 26			H 22 39 15			
		eSZ			23 56			About 15 km			
	Qt	ePZ			22 56			northwest of the			
		eSEN			24 51			observatory			
		H 01 20 28						Felt Quetta			
		39 $\frac{1}{2}$ N 72 $\frac{1}{2}$ E									
		Tadzhikistan, S.S.R.				16	Kr	iPZ			02 15 41 d
15	Ch	iPZ	01	55	40 c		Qt	ePZ			42
		ePcPZN*			57 00			eSE			16 49
		ePPPZN*			36		Wr	iPZ			52
		eSZ			02 02 52		Lh	ePZ			17 07
	Lh	iPZ	01	56	32 c			H 02 14 14			
								27 $\frac{1}{2}$ N - 61 E			

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Southeastern Iran				16	Qt	iPZ			23 12 13 $\pm$
16	Ch	ePZ	06	12	27 c			USCGS H 23 01 59			
		ePPPZN*			14 54			67 $\frac{1}{2}$ N 19 W			
		eSN			19 07			North coast of Iceland			
		Mu	Sec			17	Ch	iPZ			00 05 48 c
		PZ	0.6	1.1			Lh	ePZ			07 24
	Lh	iPZ			06 13 36 c		Qt	ePZ			08 10 $\pm$
	Qt	ePZ			14 19 c			USCGS H 23 54 45			
		eSN*			22 31			6 S 155 E			
		eScSN*			24 03			Solomon Islands			
		Mu	Sec			17	Lh	iPZ			01 02 32 d
		PZ	0.3	1.5			Qt	ePZ			03 04 d
		MN*	6.6	20.0		17	Lh	ePZ			02 36 17 $\pm$
	Kr	ePZ			06 14 39 c		Qt	ePZ			50
		USCGS H 06 04 05						USCGS H 02 25 46			
		39 N 142 E						52 N 159 $\frac{1}{2}$ E			
		Near coast of Honshu,						Near east coast of			
		Japan						Kamchatka			
		Mag 6 - 6 $\frac{1}{4}$ (Pas),				17	Wr	iPZ			04 21 21
		6.3 (Up, Ki),						iSZ			59
		6.1 (Qt), 6.5 (Ch)					Qt	ePZ			22 26
16	Kr	ePZ			11 05 27			eSNE			23 54
	Qt	ePZ			06 15			H 04 20 31			
		eSNE			07 52			Afghanistan - Tadzhik			
16	Lh	iPZ			13 36 41 d			border			
		esPZ			37 15	17	Wr	iPZ			05 19 25
		eSZ			44 $\pm$		Qt	iPZ			20 22 d
	Qt	ePZ			05			eSN			21 40
		esPZ			38			Mu	Sec		
		eSNE			38 31			PZ	9.0	1.3	
		Afghanistan - Tadzhik					Kr	iPZ			21 27 d
		border						eSN			23 32
		depth about 100 km					Ch	iPZ			31 c
16	Qt	ePZ			19 17 08 c			epPZ			24 03
								ePPZ			10

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		esPZN*			14			Off south coast of			
		iSZN*		27	29			Formosa			
		Mu				18	Ch	ePZ	19	54	24
		Sec						eSN*		58	57
	PZ	1.0		1.0			Lh	iPZ		56	39
	H	05 18 42					Wr	ePZ		57	01
	36½ N			71½ E			Qt	ePZ			31
	Hindukush							eSN*		20	04 34
	depth about 200 km							USCGS H		19	48 43
	Felt Warsak, Kakul,							20½ N		120½ E	
	Rawalpindi and Lahore							Batan Islands region			
	USCGS H			05 18 35		18	Ch	ePZ	20	19	00
	35½ N			70 E				ePcPZ		20	21
	Hindukush							eSN*		27	17
	depth about 200 km						Lh	ePZ		20	44
	Mag 6.7 (Up, Ki),						Wr	ePZ		21	00
	6.9 (Qt), 6.4 (Ch)						Qt	ePZ			17
18	Qt	ePKPZ		07 53	13			USCGS H		20	08 43
		USCGS H		07 34 07				About 150 Miles			
		21 S		173½ W				southwest of			
		Tonga Islands				19	Qt	ePKPZ	01	40	40
18	Lh	ePZ		19 00	37			USCGS H		01 20 20	
	Qt	ePZ		01 28				37½ N		111 W	
		eSN*		08 31				South Pacific			
		USCGS H		18 52 41		19	Wr	ePZ	03	24	06
		20½ N		120½ E			Lh	ePZ			32
		Batan Islands region					Qt	ePZ		25	15
18	Ch	ePZ		19 13	49			eSNE		27	17
		eSN*		18 22				H		03 22 37	
	Lh	ePZ		16 00				39½ N		74½ E	
	Wr	ePZ		21				Tadzhik - Sinkiang			
	Qt	ePZ		49				border			
		USCGS H		19 08 05		19	Wr	ePZ	03	41	22
		21 N		120 E			Lh	iPZ			54

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eP*Z		42	09			ePKPPKPZ	20	05	04
		ePgZ			23			Mu			Sec
		eSZ		43	21			PZ	1.4		2.0
		iSgZ		44	03			USCGS H		19 25 21	
	Qt	ePZ		42	39			8 S		108 E	
		eSNE		44	43			Near south coast of Java			
		USCGS H		03 40 00				Mag 6.2 (Up, Ki), 6.6 (Qt)			
		39 N		74 E		19	Lh	iPZ		19 53 45	
		Tadzhik S.S.R.					Qt	ePZ		54 15	
19	Lh	iPZ		10 34	57	20	Ch	ePZ		04 03 22	
		iPgZ			35 28			eSNE		07 59	
		iSZ		36	27		Lh	ePZ		05 37	
		iSgZ		37	01		Qt	ePZ		06 28	
	Qt	ePZ		35	43			ePPZ		08 18	
		eSNE		37	47			eSN*		13 34	
	Kr	ePZ		36	45			USCGS H		03 57 42	
	Ch	ePZ		38	01			20½ N		120½ E	
		iSN		41	58			Batan Islands aftershock			
		H		10 33 03		29	Ch	ePZ		04 10 48	
		39½ N		74½ E			Qt	ePZ		13 55	
		Western Sinkiang						USCGS H		04 05 07	
		province China						Batan Islands aftershock			
		USCGS H		10 33 06		20	Ch	ePZ		04 44 18	
		Kirghiz						iSN		48 51	
19	Ch	ePZ		19 32	03		Wr	ePZ		46 51	
		eSN*			37 24		Qt	eSN*		54 23	
	Lh	ePZ		34	19 c			USCGS H		04 38 34	
		iPcPZ			35 41			20½ N		120½ E	
		eSZ		41	27			Batan Islands aftershock			
	Kr	iPZ		34	30 c			ePZ		09 10 32	
	Qt	iPZ			50 c	20	Ch	ePZ		12 58	
		ePPN*			36 58		Wr	ePZ		13 29	
		ePcSN*N			39 56		Qt	ePZ		20 31	
		eSNN*			42 22			eSN*			
		eLN*			47.0			USCGS H		09 04 44	

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		21 N 120 E				22	Wr	ePZ	03	06	05
		Batan Islands aftershock						eSZ		07	14
20	Lh	ePZ	21	01	02		Qt	ePZ			14
	Wr	ePZ			18			eSN		09	17
	Qt	ePZ			52	22	Ch	iPZ	11	02	06 d
21	Wr	iPZ	07	36	51			ePcPZ			19
		iSZ			37 17			ePPZ		04	55
	Qt	ePZ			50			eSN*		11	42
		eSNE			39 04			eScSZ		12	16
		Hindukush						Mu Sec			
21	Wr	iPZ	11	54	29		PZ	1-7 1-4			
		iSZ			55 05		Lh	ePZ	11	02	23
	Qt	ePZ			27		Qt	iPZ			49 d
		eSNE			56 47			ePPZ		06	02
21	Lh	iPZ	12	02	17 c			iSN*		13	09
	Wr	iPZ			26			eSSN*		18	30
	Qt	ePZ			03 02 c			eLN*		24	3
		USCGS H 11 52 50						ePKPPKZ		29	11
		36½ N 140 E						Mu Sec			
		Honshu, Japan					Kr	PZ 1-0 2-1			
21	Lh	iPZ	13	51	15			ePZ	11	03	11 d
	Wr	ePZ			17			USCGS H 10: 50 23			
	Qt	ePZ			52 05			50½ N 175 W			
21	Wr	iPZ	22	03	25 d			Andreanof Islands			
		iSZ			57			Aleutian Islands			
	Lh	iPZ			04 05 d			Mag 6¾ (Pas), 6.7 (Qt),			
		iSZ			05 07			6.9 (Ch), 7.2 (Up, Ki)			
	Qt	iPZ			04 20 d	22	Ch	iPZ	13	33	31 c
		eSNE			05 38			ePcPZ			46
		H 22 02 43						eSN*		43	07
		36½ N 70¾ E					Lh	ePZ			48 d
		Hindukush.					Qt	ePZ		34	15 d
		depth about 150 km						eSN*		44	35

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 13 21 48						USCGS H 01 22 49			
		50½ N 175 W						52 N 175 W			
		Andreanof Islands						Andreanof Islands			
		Aleutian Islands						Aleutian Islands			
22	Ch	ePZ	17	16	45 c	23	Kr	ePKPZ	08	33	08
		ePcPZ			59		Lh	iPKPZ			16 d
		eSN*			26 23		Ch	iPKPZ			34 18
		eScSN			55			USCGS H 08 14 48			
	Lh	ePZ			16 58 c			27½ S 63 W			
	Qt	ePZ			17 25 c			Santiago del Estero			
		eSEN*			27 39			Province, Argentina			
	Kr	ePZ			17 43 c			depth about 600 km			
		USCGS H 17 05 00				23	Ch	iPZ	09	19	49 d
		51½ N 174½ W						epPZ			20 58
		Andreanof Islands						isPZ			21 38
		Aleutian Islands						iSZN*			25 42
22	Lh	ePZ	17	27	13		Lh	ePZ			21 20 d
	Qt	ePZ			28 04			epPZ			23 30
22	Qt	ePZ	18	05	42		Kr	iPZ			22 17 d
22	Lh	ePZ	19	46	16			USCGS H 09 12 20			
	Qt	ePZ			42			28½ N 139½ E			
		Aleutian Islands						Bonin Islands			
22	Lh	ePZ	20	05	13			depth about 400 km			
	Qt	ePZ			39	23	Ch	ePZ	10	12	05
		Aleutian Islands						eSN*			16 39
23	Lh	ePZ	00	36	54		Lh	ePZ			14 19
	Qt	ePZ			37 26		Wr	ePZ			42
		eSN*			48 03		Kr	ePZ			15 13
		USCGS H 00 24 34						USCGS H 10 06 23			
		6 S 153 E						20½ N 120½ E			
		New Britain - Solomon						Batan Islands			
		Islands region						aftershock			
23	Lh	ePZ	01	34	47	23	Ch	iPZ	10	56	10 d
	Qt	ePZ			35 14			epPZ			57 56
		ePPPZ									58 33

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		iSZN*	11	02	45			Aleutian Islands			
		eSSN*		05	56	24	Ch	iPZN*	12	32	21 c
		Mu	Sec					ePPZN*		55	
		PZ	1.0	1.0				ePPPZN*		33	05
Lh		iPZ	10	57	48 d			ePcPN*		36	05
		eSZ	11	06	01			eSN*		36	
Wr		iPZ	10	51	01 d			eSSN*		37	26
Qt		ePZ			31 d	Lh		ePZ		32	23
		ePcPZ			58	Wr		ePZ			26 c
		ePPZ	11	00	53	Qt		ePZ		33	15 c
		iSNN*		07	13			e(PcP)N*		36	11
		eSSN*		11	33			eSPZ		38	13
		eLN*		24.6				Mu	Sec.		
		Mu	Sec					PZ	0.3	1.5	
		PZ	0.7	2.0				MN*	12.7	17.0	
Kr		iPZ	10	58	42 d	Kr		ePZ	12	33	48
		USCGS H	10	47	40			USCGS H	12	27	06
		24 N	141½	E				45 N	99	E	
		Volcano Islands						Outer Mongolia			
		Mag 6.5 (Up, Ki),						Mag 6.3 (Up, Ki),			
		6.5 (Qt, Ch)						5.9 (Qt)			
23	Lh	ePZ	14	24	27	25	Ch	ePN*	02	08	03 ±
	Qt	ePZ			25 13			eSN*		17	18
		USCGS H	14	15	10		Wr	ePZ		08	18
		34½ N	137½	E			Lh	ePZ			22
		Near south coast of					Qt	ePZ			50 c
		Honshu, Japan						ePcPZ			59
24	Ch	ePZ	08	10	59			eSN*		18	53
		eSN*			20 50			eSSN*		24	06
	Lh	ePZ			11 02	Kr		ePZ	09	12	c
	Qt	ePZ			28			USCGS H	01	56	40
		USCGS H	07	58	59			51½ N	179½	E	
		51½ N	173	W				Rat Islands			
		Andreanof Islands						Aleutian Islands			
						25	Ch	ePZ	07	39	14

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	ePZ			49		Wr	iPZ			25
		USCGS H	07	27	18		Qt	ePZ			57
		52½ N	170½	W				eSN*			54 31
		Fox Islands						USCGS H	11	35	29
		Aleutian Islands						31½ N	141½	E	
25	Lh	iPZ	15	03	00 ±			South of Honshu			
	Wr	ePZ			32 c			Japan			
	Qt	ePZ			35	26	Ch	ePZ	17	00	31
		USCGS H	14	56	20			ePcPZ			01 32
		Northern Sumatra						eSN*			08 17
25	Ch	ePZ	15	12	32 ±		Lh	iPZ	01	03	d
	Lh	ePZ			14 33		Wr	iPZ			04 d
	Qt	ePZ			15 03		Qt	ePZ			39
		eSN*			25 49			ePcPZ			02 09
		USCGS H	15	02	08			eSN*			10 30
		6 S	151½	E				USCGS H	16	50	46
		New Britain						50 N	155½	E	
25	Qt	ePZ	21	39	02			Kurile Islands			
		eSN*			44 39			ePZ	17	27	30 d
	Lh	ePZ			39 16 ±		Ch	ePcPZ			29 03
	Wr	ePZ			35		Lh	ePZ			28 30 c
26	Lh	iPZ	00	29	44 d		Wr	ePZ			36 c
		epPZ			31 18		Qt	ePZ			29 13 c
	Wr	iPZ	29	59	d			eSN			37 33
	Qt	ePZ	30	15	d			USCGS H	17	18	56
		epPZ			31 39			41 N	143½	E	
		USCGS H	00	18	05			Off south coast of			
		3½ S	152½	E				Hokkaido, Japan			
		New Ireland				27	Qt	ePZ	03	57	29
		depth about 400 km						e(S)N			59 25
26	Qt	ePZ	02	27	14		Wr	ePZ			57 42
		eXZ			28 13		Ch	ePZ	23	33	31
26	Ch	ePZ	11	43	45			ePPZ			34 19
	Lh	ePZ			45 13			iPcPZ			36 56
								e(S)Z			38 08

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
								eSEN*	59	12	
	Lh	ePZ	35	45	d		USCGS H 16	41 57			
		iXZ		59			11 N	122½ E			
	Wr	iPZ	36	07			Panay Islands				
	Qt	ePZ		35			Philippine Islands				
		eXZ		48		28	Lh	ePZ	19	19	18 c
		ePPZ	38	31			Qt	ePZ		57	c
		iSN*	43	43							
		iScSN*	46	32							
		Mu		Sec							
	PZ	0.5	1.5								
	Kr	ePZ	23	36	41						
		USCGS H 23	27	49							
		21 N	120 E								
		Batan Islands region									
		Mag 6.6 (Up,Ki), 6.4 (Qt)									
28	Wr	ePZ	07	18	35						
	Qt	ePZ		19	38						
		eSE		21	05						
		Afghanistan-Tadzhikistan border									
28	Qt	ePZ	10	08	11						
		eSKSN*		18	50						
		eSSN*		25	40						
		USCGS H 09	54	53							
		27 N	44 W								
		Mid-Atlantic Ocean									
28	Kr	ePZ	11	09	04						
	Qt	ePZ		47							
		eSE		10	55						
	Wr	ePZ		11	01						
		H 11	08	18							
		Mekran coast, West Pakistan									
28	Lh	ePZ	16	50	45						
	Wr	ePZ		51	05						
	Qt	ePZ		31							

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Date	Phase	h	m	s	Date	Phase	h	m	s
					12	ePZ	16	16	53
					13	iPZ	07	37	25
						eSE			42
					13	ePgZ	19	20	03
						eSgE			05
					13	ePZ	15	14	41
					13	ePZ	17	08	28
					13	ePZ	17	14	55
					13	ePZ	17	37	07
					13	ePZ	18	21	47
						eSE		22	37
					14	ePZ	11	26	24
					14	ePZ	11	45	34
						eSE			55
					14	ePZ	22	34	09
					14	ePZ	23	42	40
					15	ePZ	20	07	53
					15	ePZ	22	59	06
					16	ePZ	00	59	04
					16	ePZ	09	11	06
					16	ePgZ	19	56	16
						eSgN			18
					16	ePZ	21	30	58
					17	ePZ	12	37	14
					17	ePZ	17	36	28
					18	ePZ	01	02	19
					18	ePZ	05	34	44
						eSE		35	14
					18	ePN	09	56	50
						eSN		58	04
					18	PeNE	10	22	03
						eSNE		25	15
					18	eXZ	13	39	33
					19	ePZ	01	48	33

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Date	Phase	h m s	Date	Phase	h m s
19	ePZE	02 49 21	27	ePZ	09 14 48
	eSE	50 39	37	eXE	12 52 56
19	ePZE	06 40 24	28	eXE	02 02 37
	eSE	46	28	eXE	02 21 54
19	ePZ	14 10 23	28	ePZ	10 06 13
19	ePZ	14 39 47	28	ePZ	21 32 39
19	ePZ	18 40 38		eSE	57
19	iPgZ	23 24 01 d	28	ePZ	21 42 37
	iSgZ	03			
20	ePZ	15 59 17		<b>Chittagong</b>	
	eSE	16 00 13	1	ePZN	13 29 57
20	eXZ	19 09 38		eSZ	32 27
20	eXZ	20 53 41	1	ePZ	15 13 23 c
	eSE	54 26		iSZ	14 25
21	ePZ	23 19 23	12	eXZ	17 34 44
22	ePgZ	05 11 04	14	ePZ	09 11 30
	eSgE	16	14	eXZ	18 22 09
22	ePZ	05 18 27	15	eXZ	09 55 58
22	ePgZ	08 24 04	17	iXZ	06 23 42
	eSgN	14	18	ePZ	02 23 11
23	ePZ	00 48 15		eSZ	28
23	ePZ	11 07 50	18	eXZ	13 35 17
	eSZ	08 16	18	iXN*	18 59 16
23	ePZ	23 37 58	21	eXZ	12 00 07
24	ePZ	20 44 55	23	iXZ	05 54 52
25	ePZ	05 27 16	23	eXZ	14 24 53
25	ePZ	10 40 25	23	ePZ	23 28 09
25	ePZ	13 01 19	24	ePZ	11 08 49
25	ePZ	17 47 44	25	eXZ	15 01 38
25	ePZ	20 02 26	27	iPgZ	00 05 21 d
				iSgZ	32
26	eXZ	11 32 39		eXZ	03 59 53
26	ePZ	13 19 33	27	eXZ	06 27 17
26	ePZ	16 41 31	27	eXZ	06 27 17
26	ePZ	19 38 26	28	eXN*	16 50 01

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Date	Phase	h m s	Date	Phase	h m s
	<b>Karachi</b>			eSZ	47 05
			5	ePZ	04 39 32
7	eXZ	07 09 52		iSZ	40 08
9	eXZ	13 16 04	5	ePZ	08 18 26 c
9	eXZ	22 38 44	5	ePZ	09 17 23
13	ePZ	10 29 08	5	ePZ	14 17 34
21	iXZ	12 03 18		eSZ	18 01
25	ePZ	07 40 13	7	iPgZ	01 43 11
25	eXZ	15 16 55		iSgZ	25
	<b>Warsak</b>		7	iPgZ	04 23 15 d
				iSgZ	29
1	ePZ	05 29 13	7	ePgZ	16 19 28
	eSZ	48		iSgZ	43
1	ePZ	08 38 15	8	ePgZ	14 19 07
	eSZ	44		iSgZ	21
2	ePZ	07 23 06	9	ePgZ	15 59 26
2	ePZ	08 22 44		eSgZ	36
2	ePgZ	09 43 55	9	ePZ	23 18 52
	iSgZ	34 07		iSZ	19 17
3	iPZ	07 39 30 d	10	ePZ	01 52 32
3	ePZ	12 12 04		eSZ	53 10
	iSZ	53	10	ePZ	05 23 27
3	iPZ	16 09 40		iSZ	24 09
	eSZ	10 12	10	iPZ	18 12 37
4	ePZ	05 45 26		iSZ	13 10
	eSZ	46 23	10	ePZ	20 17 30
4	ePZ	06 08 06		iSZ	18 10
4	ePZ	06 51 52	10	iPZ	23 58 58 d
4	ePZ	17 38 58		iSZ	59 30
	iSZ	39 30	11	ePZ	04 54 45
4	ePZ	18 40 49	11	ePZ	07 36 28
	iSZ	41 17	11	ePZ	17 16 54
4	ePZ	19 57 40		iSZ	17 31
5	ePZ	02 46 31	12	ePZ	16 24 36



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Date	Phase	h m s	Date	Phase	h m s
	eSZ	25 06		eSg	16 00
13	ePZ	11 01 27	18	ePZ	07 23 58
	eSZ	02 03		eSZ	24 31
13	ePZ	16 50 44	18	ePZ	09 55 59
	eSZ	51 14		eSZ	56 32
13	ePZ	18 38 08	18	iPZ	10 21 04
	eSZ	54		iSZ	33
14	ePZ	10 32 40	18	ePZ	16 36 51
14	ePZ	11 27 27		eSZ	37 21
15	ePZ	02 37 00	19	ePZ	02 48 25
15	ePZ	09 41 45		eSZ	58
	iSZ	43 09	19	iPZ	19 34 14
15	ePZ	09 56 49	20	ePZ	00 50 14
15	iPZ	11 41 39 <sup>c</sup>		iSZ	51 08
15	iPZ	12 06 17	20	iPZ	12 02 53 <sup>d</sup>
	iSZ	42		eSZ	03 27
15	ePZ	14 02 24	20	iPZ	08 45 24 <sup>c</sup>
	eSZ	03 09		iSZ	46 13
15	ePZ	14 35 29	20	ePZ	15 58 19
	eSZ	36 03		iSZ	52
15	ePZ	18 10 28	21	ePZ	03 38 00
	eSZ	11 03	21	ePZ	21 15 14 <sup>c</sup>
16	ePZ	00 59 27		iSZ	48
17	ePZ	08 05 44	23	ePZ	10 14 42
	eSZ	06 13	23	iPZ	21 45 41 <sup>c</sup>
17	ePZ	10 13 51		iSZ	46 11
	iSZ	14 20	24	iPZ	06 52 18
17	ePZ	14 17 36	25	ePZ	10 03 21
	iSZ	56	25	ePZ	13 12 24
18	ePZ	00 23 03		iSZ	13 00
	eSZ	33	25	ePZ	13 01 44
18	ePZ	06 09 15	25	ePgZ	20 19 11
	eSZ	48		iSgZ	24
18	ePg 2	06 15 46	26	ePZ	08 35 48

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Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	iSZ	36 23		<b>Lahore</b>	
26	ePZ	13 21 51	5	ePZ	23 16 58 <sup>d</sup>
	eSZ	22 24		eSZ	17 23
26	iPZ	15 41 45 <sup>d</sup>	6	iPZ	22 26 30 <sup>d</sup>
26	iPZ	22 20 38 <sup>c</sup>	7	ePZ	23 16 23
	iSZ	21 08	10	ePZ	05 53 34
27	iPZ	22 34 01 <sup>d</sup>	16	ePZ	09 02 47
	iSZ	36		iSZ	03 13
28	ePZ	16 32 43	21	iPZ	03 38 11
28	ePZ	19 21 43	25	iPZ	13 01 55
				iSZ	02 53

*Seis. Bull. Pakistan Quetta, Vol 4 No 3, March 1958*

# SEISMOLOGICAL BULLETIN OF PAKISTAN

*Vol. 4*

MARCH 1958

*No. 3*

*Printed at*  
Bolan Muslim Press,  
QUETTA.



*Issued under the authority of the Director, Meteorological Service*  
PAKISTAN METEOROLOGICAL SERVICE  
GEOPHYSICAL INSTITUTE  
QUETTA

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The Seismological Bulletin of Pakistan is a monthly publishing data of Seismological stations in Pakistan.

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## SEISMOLOGICAL BULLETIN

of  
PAKISTAN.

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
<u>Quetta</u> (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.)

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Date	Station	Phase	h m s	Date	Station	Phase	h m s
1	Qt	ePZ	00 26 32				
		USCGS H	00 13 23	1	Qt	ePZ	18 45 15
		20 S	12 W		Wr	ePZ	46
		Atlantic Ocean			Lh	ePZ	46 17
		Southwest of St. Helena		2	Qt	ePZ	02 42 32
		Island					
1	Wr	ePZ	01 48 00				
	Lh	iPZ	43				
		iSZ	49 48				
	Qt	ePZ	48 56	2	Qt	ePZ	11 46 39
		eSEN	50 13		Wr	ePZ	47 12
		H 01	47 17	3	Ch	ePZ	04 18 47
		37 N	70½ E				
		Hindukush			Qt	ePZ	22 01
		depth about 100 km					
1	Qt	ePKPZ	09 25 13				
	Wr	ePKPZ	17				
	Lh	ePKPZ	27	3	Ch	ePZ	07 28 35 c
		USCGS H	09 05 40				
		13½ S	76½ W				
		Near coast of Peru			Lh	ePZ	33 19
1	Qt	ePZ	09 29 26		Lh	ePZ	30 42 c
	Kr	ePZ	31		Wr	iPZ	31 02 c
	Wr	ePZ	30 31		Qt	ePZ	34 c
	Lh	ePZ	50				
		USCGS H	09 26 46				
		28 N	54½ E				
		Southern Iran					
1	Qt	ePKPZ	16 34 56				
		USCGS H	16 16 01				
		17 S	173 W				
		Tonga Islands region					

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = ¼ "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
<b>Lahore</b>				
Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
<b>Karachi</b>				
Sprengnether	Z	1.8 sec.	Critical	5,800
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
<b>Chittagong</b>				
Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	4,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = ¼ "	—	—
<b>Warsak</b>				
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) 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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Date	Station	Phase	h	m	s
		USCGS H 08 07 30			
		51½ N 178½ W			
		Andreanof Islands			
		Aleutian Islands			
9.	Ch	e(PKP)Z	10	40	00
	Wr	ePKPZ	41	20	
	Qt	ePKPZ		26	
		ePPZ	43	16	
		eXZ	44	56	
		e(PS)N*	53	30	
		USCGS H 10 22 25			
		34 S 178½ W			
		Kermadec Islands			
		region			
		depth about 60 km			
		Mag 6½-6¾ (Pas)			
9	Wr	ePZ	11	33	48 d
	Qt	ePZ	34	04	d
		USCGS H 11 23 19			
		2 N 129 E			
		Halmahera Islands			
		region			
10	Qt	ePZ	06	13	03
10	Qt	ePZ	08	10	31
		e(S)N*	20	38	
		USCGS H 07 58 04			
		52½ N 171½ W			
		Fox Islands			
		Aleutian Islands			
10	Lh	ePZ	17	36	02±
	Qt	ePZ		53	
10	Qt	ePKPZ	21	50	25

Date	Station	Phase	h	m	s
		USCGS H 21 31 48			
		20 S 166 W			
		Tonga Islands			
		depth about 200 km			
11	Ch	iPZN	00	32	04
		ipPZ		26	
		iPPN	23	09	
		iSNZ	36	53	
		isSNZ	37	31	
		Mu Sec			
		PZ 1.4 0.8			
	Lh	iPZ	00	34	03
		iSZ	40	42	
	Wr	iPZ	34	21	
	Qt	ePZ		54	
		ePPPZ	37	54	
		eSNN*	42	11	
		e(PKPPKP)Z	01	05	15
		Mu Sec			
		PZ 1.8 1.9			
	Kr	ePZ	00	34	58
		USCGS H 00 25 56			
		25½ N 125 E			
		Ryukyu Islands			
		depth about 60 km			
		Mag 7.0 (Pas), 7.4 (Up, Ki),			
		6.8 (Qt, Ch)			
11	Ch	ePZ	14	11	27
		iPcPZ		34	
		ePPPZ	14	35	
		eSN	21	37	
		eScSN		55	

Date	Station	Phase	h	m	s
		ePSN	22	25	
		USCGS H 13 59 00			
		13 S 176 E			
		New Hebrides Islands			
12	Qt	ePKPZ	00	12	13
		ePKSN*	15	44	
		USCGS H 23 53 00			
		17 N 98½ W			
		Guerrero, Mexico			
12	Wr	iPZ	08	48	14
		iSZ		49	
	Lh	iPZ		56	
		iSN	50	01	
	Qt	ePZ	49	07	
		eSNE	50	24	
		H 08 47 28			
		37 N 70¼ E			
		Hindukush			
		depth about 150 km			
12	Lh	ePZ	14	47	16
	Wr	ePZ		29	
	Qt	ePZ		57	
		eSN*	57	15	
		USCGS H 14 36 33			
		20½ N 146 E			
		Mariana Islands			
12	Ch	ePZ	18	24	17
		eSN	30	12	
	Lh	iPZ	25	50	d
		eSZ	33	05	
	Wr	ePZ	26	03	

Date	Station	Phase	h	m	s
		Qt			35 d
		iPZ			
		eSNE			34 29
		USCGS H 18 16 50			
		27 N 139½ E			
		Bonin Islands region			
		depth about 500 km			
13	Wr	iPZ	00	56	49 d
		iSZ		57	22
	Qt	ePZ			45
		eSNE			59 02
		H 00 56 05			
		Hindukush			
13	Ch	iPZ	23	55	47 c
		ePPZ			56 53
		ePPPZ			57 08
		ePcPZ			58 39
		eSZ	00	00	58
	Lh	ePZ	23	58	08 d
		Mu Sec			
		PZ 0.8 1.8			
	Wr	iPZ	23	58	30 d
	Kr	ePZ			52 d
	Qt	ePZ			54 d
		ePPZ	00	00	58
		iSN*			06 36
		eScSN*			08 39
		eLN*			12.4
		Mu Sec			
		PZ 0.5 2.0			
		MN* 4.0 20.5			
		USCGS H 23 49 23			
		12½ N 123½ E			

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		Masbate Islands, Philippine Islands Mag 6.1 (Up, Ki), 6.2 (Qt), 6.5 (Lh)						Mag 6.0 (Up, Ki), 6.2 (Lh)			
14	Ch	iPnZ	00	10	57 d	15	Wr	iPZ	03	22	23 d
		iP*Z	11	06			Lh	iPZ	24	06	d
		iPgZ	16				Qt	eSZ	25	08	
		iSnZ	55					ePZ	24	20	
		iS*Z	12	14				eSNE	25	36	
		iSgZ	28					H 03 22 40			
	Lh	ePZ	14	19 c		15	Qt	ePZ	06	34	29
	Wr	iPZ	51	c				eSZ	40	29	
	Qt	ePZ	15	20			Wr	ePZ	34	45	
		eSNE	19	52			Kr	iPZ	54	d	
	Kr	ePZ	15	25			Lh	iPZ	35	10 d	
		USCGS H 00 09 41						USCGS H 06 27 00			
		25½ N 96 E						40 N 20½ E			
		Northern Burma						Albania-Greece border			
15	Ch	ePZ	00	29	57 c	15	Wr	ePZ	11	53	56
	Lh	ePZ	32	03				iSZ	54	44	
		Mu Sec					Qt	ePZ	55	05	
		PZ 0.9 1.8						eSNE	56	50	
	Wr	ePZ	00	32	22			H 11 52 49			
	Qt	ePZ	54					Tadzhikistan, S.S.R.			
		ePPZ	34	43		15	Lh	ePZ	19	18	34
		eSN*	40	04			Wr	ePZ	43		
		eLN*	43.6				Qt	ePZ	19	05	
	Kr	ePZ	00	33	00 d			eSN*	29	52	
		USCGS H 00 24 04						USCGS H 19 06 10			
		23½ N 122 E						50 S 152 E			
		Near east coast of Formosa				16	Ch	ePZ	02	10	39

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	Wr	ePZ	11	35				eSN*	43	55	
	Qt	ePZ	12	12				H 08 34 17			
		USCGS H 02 01 54						33¼ N 67½ E			
		Near south coast of Hokkaido, Japan				18	Wr	ePZ	18	08	17
17	Ch	ePZ	00	00	36			eSZ	09	04	
	Lh	ePZ	03	16			Qt	ePZ	25		
	Wr	ePZ	38					eSNE	11	09	
	Qt	ePZ	04	00				H 18 07 10			
17	Wr	ePZ	11	45	31			Tadzhikistan, S.S.R.			
	Qt	ePZ	46	42		18	Wr	iPZ	18	51	27 c
17	Ch	ePZ	21	10	59			iSZ	56		
		eSN*	13	55			Qt	ePZ	52	25	
	Lh	ePZ	34	d				eSNE	53	44	
	Wr	ePZ	14	04				Hindukush			
	Qt	ePZ	09	c		18	Ch	iPZ	22	31	53 d
		ePPZ	15	23				iPcPZ	32	05	
		eSN*	19	46				ePPZ	34	45	
		USCGS H 21 07 14						eSN*	41	38	
		Nicobar Islands region						eScSN*	42	06	
17	Lh	ePZ	21	52	23		Wr	ePZ	32	04	
	Wr	ePZ	48				Lh	iPZ	08	d	
	Qt	ePZ	53	03				Mu Sec			
		USCGS H 21 40 23						PZ 0.5 1.6			
		6½ S 147½ E					Qt	ePZ	22	32	34 d
		Near northeast coast of New Guinea						ePPZ	35	38	
18	Qt	ePZ	08	35	10 c			eSN*	42	59	
		eSNN*	50					eScSN*	43	08	
	Wr	iPZ	11	d				eSSN*	48	22	
	Lh	eSZ	37	03				Mu Sec			
	Ch	ePZ	39	33 c				PZ 0.3 1.5			
		USCGS H 22 20 02						USCGS H 22 20 02			
		50½ N 173 W									

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Fox Islands foreshock Mag 6.2 (Up, Ki), 6.2 (Qt)				20	Wr	ePZ	13	00	25
								iSZ		01	04
19	Wr	ePZ	00	46	50		Lh	ePZ	00	54	
		eSZ		47	20			eSZ		01	55
	Qt	ePZ			54		Qt	ePZ			34
		eSEN		49	19		Ch	eSNE	03	09	
20	Ch	ePZ	01	49	54			ePZ	04	18	
		iPcPZ		50	06			epPZ			36
		iPPZN*		52	47			eSN*	08	07	
		eSN*		59	40			H 12 59 28			
		eScSN*	02	00	09			37½ N 73 E			
	Wr	ePZ	01	50	06			Pamirs, Tadzhikistan			
		ePPZ		53	06			depth about 100 km			
	Lh	ePZ		50	09 d	20	Wr	iPZ	22	23	56 e
	Qt	ePZ			35		Lh	ePZ		24	38
		ePPZ		53	44			iSZ		25	40
		ePPPZN*		55	29		Qt	ePZ			00
		eSN*	02	00	57			eSNE		26	20
		iScSN*		01	09			H 22 23 16			
		iSSN*		06	27			36¾ N 71 E			
		eLN*		11	6			Hindukush			
		ePKPPKPZ		16	57			depth about 100 km			
		Mu Sec				21	Ch	ePZ	15	40	08
		PPZ 0.8 2.5					Qt	ePZ		42	12
		MN* 10.0 21.0						USCGS H 15 29 52			
	Kr	ePZ	01	51	02 d			4½ S 143 E			
		USCGS H 01 38 04						Northern New Guinea			
		51 N 173 W				21	Ch	ePZ	18	35	11±
		Fox Islands region						eSZN*		36	54
		Aleutian Islands					Lh	iPZ	38	18	d
		Mag 6.9 (Up, Ki), 6.8 (Qt)					Wr	ePZ		49	
							Qt	ePZ		57	d
								eXZ		39	06

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
		eSNN*		43	47		Ch	ePZ	13	13	c	
		USCGS H 18 32 54						iPPZ			50	
		13½ N 92½ E						eSN*		17	34	
		Andaman Islands						USCGS H 11 07 47				
								35½ N 67 E				
								Afghanistan				
								Mag 6.2 (Up, Ki)				
22	Lh	ePZ	01	09	50 d	23	Wr	ePZ	00	26	35 d	
	Wr	ePZ		10	13		Qt	ePZ			57	
	Qt	ePZ			28 d			eXZ		27	12	
		eSNN*		19	04			eXZN*		28	09	
22	Ch	iPZ	10	12	10 c			eSgZN*			27	
	Lh	ePZ		15	51		Lh	ePZ		27	19	
		iSZ		19	06			ePgZ			49	
	Wr	ePZ		16	28			iSgZ		29	13	
	Qt	ePZ			53 c		Ch	ePZ		31	03	
		eXZ		17	05			Afghanistan aftershock				
		eSN*		21	05		23	Ch	ePZ	10	20	28 d
		H 10 11 40						eSN		25	10	
		24 N 93½ E					Lh	ePZ		22	46	
		Burma-Pakistan					Wr	ePZ		23	10	
		border					Qt	ePZ			36	
		Felt Chittagong and						ePPZ		25	33	
		Sylhet						eSN*		30	45	
		USCGS H 10 11 27						eScSN*		33	27	
		23½ N 94½ E						eLN*		35	1	
		Burma-Pakistan border						USCGS H 10 14 42				
		Mag 6.4 (Up, Ki)						18 N 120 E				
22	Wr	iPZ	11	08	45 d			Near northeast coast				
	Qt	ePZ		09	06			of Luzon				
		eXZ			21			Philippine Islands				
		iXZ		10	17							
		iSgZN*			35							
	Lh	ePZ	09	29		23	Lh	ePZ	20	25	06 d	
		iPgZ			59		Qt	ePZ			33 d	



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Date	Station	Phase	h	m	s
		ePcPZ			40
		eSN*		35	51
		eScSN*		36	05
		USCGS H 20 13 07			
		Andreanof Islands			
		Aleutian Islands			
24	Qt	ePZ	12	04	32
		USCGS H 11 55 40			
		Near north coast of			
		Luzon, Philippine			
		Islands			
25	Ch	e(P)N*	16	02	51
	Qt	ePZ		05	38
		eSN*		12	42
		eScSN*		15	37
		USCGS H 15 56 49			
		21 N 120 E			
		Batan Islands region			
25	Qt	ePZ	21	54	45
	Wr	ePZ			55
	Lh	ePZ			59
25	Qt	ePZ	22	02	46
		e(S)N*		06	36
	Wr	ePZ		03	44
25	Qt	ePZ	22	39	35
		eSNN*		44	16
	Lh	ePZ		39	54
	Wr	ePZ		40	13
	Ch	ePZ		41	03±
		USCGS H 22 35 45			
		3 N 67 E			
		Maldivé Islands			
		region			

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Date	Station	Phase	h	m	s
		iSZN		58	22
		H 07 55 27			
		37 N 70½ E			
		Hindukush			
		depth about 200 km			
28	Wr	iPZ	04	10	20 c
	Lh	iPZ			58
		isPZ		11	43
	Qt	iPZ			18 d
		isPN*		12	07
		iSN*			35
		Mu Sec			
		PZ 1.1 1.4			
	Ch	ePZ	04	14	22
		ipPZ			15 02
		isPZ			29
		eSN			18 11
		iSN*			16
		esSN*			19 26
		Mu Sec			
		PZ 0.6 0.5			
		H 04 09 40			
		36¼ N 71¼ E			
		Hindukush			
		depth about 200 km			
		Felt Peshawar, Warsak			
		USCGS H 04 09 30			
		36½ N 71 E			
		Hindukash			
		depth about 200 km			
		Mag 5.7 (Up, Ki),			
		5.9 (Qt), 6.1 (Ch)			

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	ePZ	29	05				H 11 36 52			
		eSE	30	21				Baluchistan			
		H 01 27 26									
		36½ N 70 E				31	Qt	ePZ	15	4	11
		Hindukush						eSN*	24	43	
31	Qt	ePZ	00	51	14 c			USCGSH 15 01 30			
		ePgZ			23			52 N 167½ W			
	Lh	ePZ			40			Fox Islands			
		ePgZ	52	00				Aleutian Islands			
	W:	ePZ	51	47		31	Qt	ePZ	16	54	07
		H 00 50 27					Lh	ePZ		49	±
		28¾ N 70 E						USCGS H 16 46 15			
		West Pakistan						Ionian Sea			
31	Lh	e(P)Z	03	44	34	31	Wr	ePZ	17	40	45
		eSZ			45 42			iSZ		41	25
	Wr	ePZ			06		Qt	ePZ			49
		iSZ			46 54			eSEN		43	18
	Qt	ePZ	45	49				H 17 39 53			
		eSEN	48	09				Afghanistan-Tadzhik border			
		H 03 42 46				31	Lh	ePZ	17	58	52
		30 N 82 E					Qt	ePZ			59 35
		Nepal-Tibet border						ePcPZ	18	00	24
31	Qt	ePKPZ	10	50	00			eSN*	07	38	
		epPKPZ			32			USCGS H 17 49 38			
		ePKSZ	53	11				44½ N 141 E			
		USCGS H 10 30 56						Near west coast of Hokkaido, Japan			
		17 N 93½ W									
		Chiapas, Mexico									
		depth about 100 km									
31	Qt	iPZ	11	37	39 d						
		iSZN*			38 14						
	Wr	ePZ			54						

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Date	Phase	h	m	s	Date	Phase	h	m	s
						Quetta	5		
						ePZ	18	26	57
						ePZ	20	10	22
1	ePZ	02	18	11	5	ePZ	23	32	15
1	ePZ	13	00	07	6	ePZ	03	12	30
1	ePZ	13	08	02	6	ePZ	13	11	41
1	ePZ	13	19	43	6	ePZ	17	36	54
1	iPZ	14	52	00 d		eSNE			37 19
	iSE			11	6	ePZ	19	23	56.4
1	ePZ	19	29	27	7	ePZ	00	17	29
	eSE			30 08	7	ePZ	00	33	19
1	ePZ	19	36	59	8	ePZ	16	27	30
1	ePZ	21	04	27	9	ePZ	17	10	24
	eSE			05 12	9	eXZ	18	24.3	
1	ePZ	23	28	52	10	ePZ	07	45	35
2	ePZ	01	23	18	11	ePZ	12	54	46
	eSE			35		eSE			55 13
2	ePZ	03	37	29	11	ePZ	13	39	06
2	ePZ	15	07	48		eSN*			28
	eSZ			09 16	11	ePZ	14	12	07
2	ePZ	15	16	53	11	e(P)Z	15	00	42
	eSE			18 16	11	ePZ	19	12	11
2	ePZ	20	29	44		eSE			22
	eSE			30 07	11	ePZ	19	37	34
2	ePZ	20	38	41	11	ePZ	19	39	38
2	ePZ	23	08	46		eSEN			48
3	ePZ	02	10	25	11	ePZ	21	16	09
3	ePZ	15	39	56		eSN			17 15
	eSE			40 32	11	ePZ	21	19	06
3	ePZ	20	08	29	11	ePZ	22	25	23
4	ePZ	09	07	45		eSN			26 33
	eSE			09 04	12	ePZ	03	03	52
4	ePZ	23	54	27	13	ePZ	22	15	17
5	eSZE	03	20	22	14	ePZ	00	52	21

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Date	Phase	h m s	Date	Phase	h m s
14	ePZ	01 21 35	24	ePZ	11 44 51
15	ePZ	20 49 02	24	ePZ	16 11 30
16	ePZ	10 15 25		eSE	39
	eSZNE	16 41	24	ePZ	17 26 28
16	ePZ	21 44 30	25	ePZ	07 47 45
17	ePZ	07 14 40	25	ePZ	09 38 59
17	ePZ	10 45 40	25	ePZ	20 48 00
	eSNE	46 06	26	ePZ	04 25 46
17	ePZ	16 26 17	26	ePZ	12 35 12
18	ePZ	21 43 43	26	ePZ	17 56 58
19	ePZ	12 42 17	26	ePZ	19 05 13
	eSE	53	26	ePZ	20 32 23
19	ePZ	12 58 34	26	ePZ	22 05 44
19	ePZ	13 46 32	26	ePZ	22 05 44
	e(S)!NE	48 37	26	eSZE	46
19	ePZ	18 03 18	26	ePZ	22 07 14
19	ePZ	23 50 46		eSZE	28 29
20	ePZ	17 31 55	26	ePZ	23 06 12
	eSE	32 33		eSNE	35
20	ePZ	18 26 24	26	ePZ	23 59 50
	eSN*E	51	27	ePZ	14 01 03
20	ePZ	22 31 52	27	ePZ	15 07 43
21	ePZ	01 10 37	27	ePZ	18 31 23
21	eSN*	11 08	27	eXZ	18 37 13
21	ePZ	12 56 12	27	ePZ	21 17 20
	ePZ	22 10 00	28	ePZ	00 00 50
	eSE	28	28	eSE	01 27
23	ePZ	16 06 56	28	ePZ	00 04 10
	eSN	07 19	28	ePZ	02 19 28
23	ePZ	16 53 45	28	iPZ	02 39 17 d
	eSN	55 12	28	ePZ	15 04 26
23	eXZ	22 22 7	28	ePZ	18 56 44
24	ePZ	07 07 55			
24	ePZ	08 20 38			
24	ePZ	10 58 33			
	eSE	42			

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Date	Phase	h m s	Date	Phase	h m s
28	ePZ	19 55 30	2	ePZ	16 25 24
	eSE	56 43		iSZ	50
29	ePZ	09 18 23	2	ePZ	17 34 59
	eSE	19 41	2	ePZ	20 02 24
29	ePZ	14 02 42		iSZ	47
29	ePZ	19 56 05	3	iPZ	06 05 32 c
30	ePZ	13 55 37		iSZ	06 00
30	ePZ	16 12 11	3	ePZ	09 21 54
31	ePZ	08 32 46		iSZ	22 9
31	ePZ	11 53 15	3	iPZ	15 38 48 d
31	ePZ	12 45 37	4	ePZ	07 14 46
31	ePZ	14 08 18	4	ePZ	09 06 48
31	ePZ	14 59 43	4	ePZ	10 38 21
31	ePZ	16 23 24	4	ePZ	11 50 07
31	ePZ	21 42 07	5	ePZ	03 18 00
31	ePZ	23 13 52	5	ePZ	07 01 07
			5	ePZ	10 06 56
			6	ePZ	05 32 05
			6	ePZ	14 04 48
			7	ePZ	00 32 30
			7	ePZ	08 31 03
1	ePZ	08 39 32	8	ePZ	05 03 09 c
	iSZ	51	8	ePZ	05 24 19
1	ePZ	13 19 08	9	ePZ	01 56 29
1	ePZ	16 31 22		iSZ	57 02
1	ePZ	18 17 58	9	ePZ	21 25 50
1	eSZ	18 29	10	iPZ	13 00 25 d
1	ePZ	19 34 10	10	ePZ	16 08 13
	eSZ	58	11	iPZ	12 08 45 d
1	ePZ	22 20 07	11	ePZ	14 58 00
	eSZ	21 53	11	ePZ	22 24 25
2	iPZ	15 06 46 d	12	iPZ	02 24 48 d
	iSZ	07 26		iSZ	25 27
2	iPZ	15 15 48 d			
	iSZ	16 22			

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Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
12	ePZ	02 40 47	16	ePZ	19 10 22
12	ePZ	03 16 16		iSZ	11 12
	iSZ	18 03	17	ePZ	14 45 05
12	ePZ	16 16 04		iSZ	32
	iSZ	40	18	ePZ	00 13 12
13	iPZ	06 58 17 d		iSZ	52
	iSZ	54	18	ePZ	06 01 45
13	ePZ	11 30 10		iSZ	02 29
	eSZ	31 08	18	ePZ	09 08 45
13	ePZ	21 05 04	18	ePZ	09 18 16
	iSZ	38		iSZ	44
14	ePZ	13 21 11	18	ePZ	09 28 07
15	ePZ	02 54 28	18	ePZ	16 07 07
15	ePZ	03 49 15	19	ePZ	07 13 57
	iSZ	48	19	ePZ	12 42 54
15	iPZ	06 59 34 c	19	ePZ	13 47 34
	iSZ	07 00 17	19	ePZ	19 07 27
15	ePZ	08 30 23		iSZ	03 01
	eSZ	31 23	20	ePZ	05 08 32
15	ePZ	17 17 29		iSZ	09 31
	eSZ	18 19	20	ePZ	13 00 25
15	ePZ	22 30 59		iSZ	01 04
	iSZ	31 32	20	ePZ	16 02 19
16	ePZ	03 33 44		eSZ	50
	eSZ	34 10	20	ePZ	16 38 10
16	iPZ	10 14 22 d		iSZ	38
	iSZ	49	20	ePZ	16 45 53
16	ePZ	10 44 02	20	iPZ	17 31 56 c
16	ePZ	11 18 20	20	ePZ	18 27 14
	eSZ	19 00	20	ePZ	19 40 50
16	ePZ	14 55 39	20	iSZ	41 23
	iSZ	56 07	20	ePZ	21 54 34
16	ePZ	19 05 44		eSZ	51
	iSZ	06 44			

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Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
21	ePZ	01 10 59	26	ePZ	20 51 10
	ePZ	04 34 05		iSZ	35
21	iSZ	40	26	ePZ	22 06 42
	iPZ	15 34 54 c		iSZ	07 35
21	ePZ	16 14 07	27	ePZ	22 14 03
21	eSZ	41		eSZ	15 02
	ePZ	17 20 32	28	iPZ	00 00 52 c
21	eSZ	21 11	28	ePZ	00 03 27
	ePZ	00 04 55		iSZ	04 15
22	iSZ	05 31	28	iPZ	19 58 09 c
	ePZ	08 00 37		iSZ	58
22	ePZ	16 35 25	29	ePZ	08 38 40
22	ePZ	18 20 29		iSZ	39 07
22	ePZ	19 25 16	29	iPZ	09 17 24 c
22	iPZ	22 36 54 c		iSZ	57
22	iSZ	37 29	29	ePZ	10 38 42
	ePZ	22 51 59	29	iPZ	21 05 17 c
22	iPZ	02 19 49 d		iSZ	51
23	iSZ	20 08	30	ePZ	01 46 59
	ePZ	15 19 21	30	ePZ	10 01 17
23	iSZ	54	30	ePZ	11 19 05
	iPZ	16 52 40 d		iSZ	35
23	iPZ	22 22 22	30	iPZ	13 08 42
23	ePZ	08 11 19		iSZ	09 09
24	eSZ	12 11	31	ePZ	01 45 19
	ePZ	11 42 28		iSZ	45
24	eSZ	57	31	ePZ	05 40 22
	ePZ	15 45 02		iSZ	43
25	eSZ	56	31	iPZ	06 29 55 d
	ePZ	20 41 17		iSZ	30 28
25	iSZ	58			
	iPZ	12 08 48 c			
26	iSZ	09 08			
	ePZ	18 13 58	2	eXZ	02 41.4

Lahore

			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
2	eXZ	11 46.9	22	eXZ	11 36.1
2	eXZ	14 43.0	22	eXZ	22 39.3
2	ePZ	18 38 17 d	22	eXZ	22 58 37
3	eXZ	23 09.0	22	eXZ	23 38 1
3	eXZ	02 00.9	23	eXZ	02 21.2
4	ePZ	09 07 30	23	eXZ	22 25.0
4	eXZ	18 04.8	27	eXZ	16 18 40
4	eXZ	18 34.5	28	ePZ	18 55 58 c
4	eXZ	20 43.0	28	eXZ	19 56 18
6	eXZ	05 32.0	28	iPZ	20 29 48 d
6	eXZ	12 06.4	31	eXZ	11 39.6
7	eXZ	00 17.6	31	ePZ	20 10 24
11	eXZ	14 11.4			
11	eXZ	15 25.3		<b>Karachi</b>	
11	ePZ	19 36 58 d	6	ePZ	12 06 33
11	eXZ	21 58 25	18	e(P)Z	08 36 47
12	eXZ	00 12 19	20	eXZ	18 27 33
13	eXZ	18 10.1			
13	eXZ	23 12.7		<b>Chittagong</b>	
15	eXZ	04 53 50	1	eXN*	06 39 36
15	eXZ	11 55.5	1	eXN*	09 26 57
15	ePZ	17 07 56	1	ePN*	09 39 29
16	ePZ	02 11 37		eSN*	40 29
18	eXZ	03 35 30	1	eXN*	16 30 58
	eSZ	37 03	2	ePZ	11 39 59
18	eXZ	18 10.0	2	ePZ	23 08 54
18	eXZ	18 52.7	5	iPZ	15 15 33 c
19	eXZ	12 44.1	6	ePZ	12 19 56
20	eXZ	17 33.6	7	iPZ	07 00 24 d
20	eXZ	18 27.2	8	e(P)Z	01 09 22
21	iPZ	01 11 15 d	9	ePZ	04 53 37 c
21	eXZ	15 36.8		iXZ	54 30
			10	eXZ	06 16 51

			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
11	ePZ	07 33 40	19	ePZ	00 46 18
11	eXZ	11 53 22	19	eXZ	22 13 33
12	eXZ	03 05 51	21	eXZ	03 41 49
14	eXZ	03 33 08	23	eXN*	20 25 17
14	ePZ	01 18 16	24	eXZ	00 30 51
14	eXZ	03 00 36	24	ePZ	01 09 03
15	eXZ	06 38 25	24	eXN*	18 44 14
16	ePZ	00 00 36	24	eXN*	22 01 18
16	ePZ	02 25 10	24	ePN*	19 13 26
17	e(P)Z	00 07 11	25	eXN*	21 56 26
17	eXN*	21 58 17	25	eXN*	22 05 22
17	eXZ	02 04 50	25	eXN*	22 05 22
18	eXZ	04 29 28	27	ePZ	23 52 22
18	eXZ	18 14 08	28	ePZ	00 34 11 ±
18	e(P)Z	18 55 53	29	eXN*	14 04 52
19	eXZ	00 42 37	29	e(P)Z	19 53 01
			30	eXZ	17 46 12

*Bull. Pakistan Quetta, Vol. 4 No. 4, April 1958*

# SEISMOLOGICAL BULLETIN OF PAKISTAN

*Vol. 4*

APRIL 1958

*No. 4*

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*Printed at*  
Bolan Muslim Press,  
QUETTA.

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*Issued under the authority of the Director, Meteorological Service*  
PAKISTAN METEOROLOGICAL SERVICE  
GEOPHYSICAL INSTITUTE  
QUETTA

**SEISMOLOGICAL BULLETIN**  
of  
**PAKISTAN.**  
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
<b>Quetta (Central Station)</b>				
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.)

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The Seismological Bulletin of Pakistan is a monthly publishing data of Seismological stations in Pakistan.

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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 "	—	—
<b>Lahore</b>				
Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
<b>Karachi</b>				
Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
<b>Chittagong</b>				
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 "	—	—
<b>Warsak</b>				
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) 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
1	Wr	iPZ	14	16	45 d						
	Qt	ePZ		17	21 d						
		eSEN*		25	33						
		USCGS H 14 07 12									
		39 1/2 N 141 1/2 E									
		Northern Honshu, Japan									
1	Qt	ePZ	16	56	47 c	3	Qt	ePZ	07	25	17
		USCGS H 16 44 30									
		51 N 180					Lh	ePZ	26	05	
		Aleutian Islands					Ch	ePZ	28	12 ±	
2	Wr	ePZ	00	04	28						
	Qt	ePZ			50						
		eSN*		12	34						
2	Qt	ePZ	09	30	09	3	Qt	ePKPZ	08	45	08
2	Qt	ePZ	11	39	19						
2	Qt	ePZ	16	05	55		Ch	ePPZN*	47	40	
3	Lh	iPZ	01	41	14 d						
	Wr	ePZ			26						
	Qt	ePZ			52 d	4	Qt	ePZ	02	36	16
3	Qt	ePZ	02	31	14 c						
		ePPZ		32	47						
		ePcPZ		33	22	4	Lh	eP	07	29	19
		eSN*		37	14		Wr	ePZ			35
		eScSN*		41	20		Qt	ePZ			50
	Wr	iPZ	31	28	c						40 34
	Lh	ePZ			55						41 40
		ePcPZ		33	40						
	Ch	ePZ	34	08		4	Wr	ePZ	07	42	34
		ePcPZ			48		Qt	ePZ			50
		ePPZ		36	28						53 35
		eSZ		42	33						
		USCGS H 07 16 55									
		5 1/2 S 152 E									
		New Britain									



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**Major Shocks**

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
4	Lh	ePZ	15	50	28			eSZN		52	40
	Qt	ePZ			57			iScSN		53	03
		eSKSN*	16	01	20			eSSN		57	48
		eSN*			38			Mu	Sec		
		ePSN*	02	49				PZ	1.0	1.0	
		eLN	14.5								
	USCGS H 5 15 38 03						Qt	ePZ	15	42	44 d
	5 1/2 S 152 E							cPcPZ		55	
	New Britain							iXZ		58	
5	Qt	ePZ	05	23	11 c			ePPZ	45	45	
		ePcPZ			17			eSN*	52	41	
		eSN*	33	14				ePKPPKPZ	16	09	39
		eLN*	44.3					Mu	Sec		
	USCGS H 05 10 59							PZ	1.0	2.0	
	51 1/2 N 180							PPZ	1.6	2.4	
	Aleutian Islands						Kr	ePZ	15	43	22 ±
5	Wr	iPZ	23	01	04 c			USCGS H 15 30 38			
		iSZ			35			66 1/2 N 157 W			
	Lh	ePZ			37			Alaska			
	Qt	ePZ	11	02				Mag 7 (Pas),			
		eSZN	12	21				7 1/4 - 7 1/2 (Berk),			
	H 23 09 21							7.1 (Up, Ki), 6.6 (Qt),			
	36 1/2 N 71 1/2 E							6.8 (Lh, Ch)			
	Hindukush										
	depth about 200 km										
6	Qt	ePZ	10	48	02						
	USCGS H 10 36 30										
	Mariana Islands										
6	Lh	ePZ	19	05	17	7	Qt	ePZ	16	01	41
	Wr	iPZ			37 d	7	Qt	ePZ	16	18	13
	Qt	ePZ			53 d	7	Qt	ePZ	16	31	37
7	Wr	ePZ	00	03	23	7	Qt	ePZ	16	50	40
	Qt	ePZ			49	7	Ch	ePZ	18	13	34 c
7	Wr	ePZ	15	42	13			ePcPZ	15	12	
	Lh	ePZ			25 d			eSZ	20	20	
		iPcPZ			38			Mu	Sec		
		iPPZ	45	14				PZ	1.6	1.0	
		Mu									
		Sec									
	PZ	0.7	1.0				Lh	ePZ	18	14	41 c
	Ch	iPZ	15	42	43 c			ePPZ	16	48	
		ePcPZN			53						

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**Major Shocks**

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
	Wr	ePZ	14	47				ePPZ	50	03		
	Qt	ePZ	15	24	c		Qt	ePZ	48	40		
		iXZ	37					ePPZ	50	55		
		ePcPZ	16	14				eSNE	56	58		
		ePPZ	17	45				Near east coast of				
		ePcSZ	20	05				Honshu, Japan				
		eSNE	23	49		7	Ch	ePZ	18	55	41	
		eScSN	25	08			Lh	ePZ	56	52		
	Kr	ePZ	15	54			Qt	ePZ	57	35		
		USCGS H 18 05 02						Near east coast of				
		38 1/2 N 143 E						Honshu, Japan				
		Near east coast of					7	Ch	ePZ	18	58	14
		Honshu, Japan						Lh	ePZ	59	22	
		Mag 6.9 (Up, Ki),						Qt	ePZ	19	00	05
		7.0 (Ch)							e(PP)Z	02	20	
							7	Wr	iPZ	19	18	28 c
7	Ch	ePZ	18	38	47			Lh	ePZ	32		
		eSN	45	40					iSZ	22	50	
	Lh	ePZ	39	53	c			Ch	ePZ	18	35	
		ePPZ	41	57					iSZ	22	50	
	Wr	iPZ	39	59	c				Mu	Sec		
	Qt	ePZ	40	35	c			Qt	PZ	1.1	0.5	
		ePcPZ	41	22					ePZ	19	19	23 c
		ePPZ	42	52					iXZ	57		
		Near east of coast of							ePPZ	20	17	
		Honshu, Japan							iPcPZ	22	36	
7	Qt	ePZ	18	47	01				eSNE	24	04	
		Near east coast of							eLZ	25.6		
		Honshu, Japan							Mu	Sec		
									PZ	0.9	1.8	
7	Ch	ePZ	18	46	50				PPZ	1.5	2.2	
		e(S)N	53	53								
	Lh	ePZ	47	58				Kr	ePZ	19	20	55

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
		USCGS H 19 13 20 45 N 98 E Outer Mongolia Mag 6.7 (Up, Ki), 6.5 (Qt), 6.6 (Ch)						iPgZ iSN* iSgZN* Lh ePZ ePgZ iSgZ Kr ePZ Ch ePZ ePPZ H 09 59 14 33 3/4 N 67 1/4 E Afghanistan USCGS H 09 59 15 33 N 67 1/2 E Afghanistan Mag 5.8 (Up)				
7	Lh	ePZ	23	27	25							
	Qt	ePZ		28	09 c							
8	Wr	iPZ	00	25	51 d							
	Lh	ePZ		26	03							
	Ch	ePZ			21							
		eSN		36	16							
	Qt	ePZ		26	21							
		ePPZ		29	22							
		eSN*		36	13							
		eScSN*			38							
		USCGS H 00 14 20 66 1/2 N 155 1/2 W Alaska				8	Qt	ePKPZ	13	40	05	
8	Ch	ePZ	01	00	26							
	Lh	ePZ			26							
	Wr	ePZ			40							
	Qt	ePZ		01	33	8	Qt	ePZ	14	17	13	
8	Wr	iPZ	07	20	27 c							
	Qt	ePZ		21	02 c							
		ePcPZ			43							
		ePPZ		23	18	8	Lh	ePZ	15	36	12	
		USCGS H 07 10 45 38 N 142 1/2 E Off east coast of Honshu, Japan										
8	Wr	iPZ	10	00	09 d							
	Qt	iPZ			09 c							

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
9	Qt	ePZ	04	39	40						
		eSZN*		42	15						
	Wr	iPZ		40	36 c						
	Lh	ePZ			59	9	Wr	ePZ	19	50	02
		eSZ		44	35						
		H 04 36 20 27 1/2 N 51 1/2 E Southwest coast of Iran (Persian Gulf) USCGS H 04 36 22 Southwest coast of Iran									
9	Wr	ePZ	06	27	55						
	Lh	ePZ		28	04 ±	9	Qt	ePZ	20	03	39
	Qt	ePZ			20						
		eSKSN*		38	50						
		eSN*		39	15	10	Lh	ePZ	01	12	17
		eSSN*		45	20						
		eXN*		50.0			Wr	ePZ			34
		eLN*		52.6			Qt	ePZ			13 07 c
		Mu Sec PZ 0.4 2.0									
		USCGS H 06 15 12 56 1/2 N 139 W Gulf of Alaska Mag 6.4 (Qt)				10	Lh	ePZ	01	55	03
9	Lh	ePZ	18	07	55						
		eSZ		15	46						
	Wr	ePZ		08	16						
	Qt	ePZ			33	10	Wr	iPZ	02	50	37 c
		eSN*		17	06						
		eXN*			52		Lh	eXZ			56
		USCGS H 17 58 02 2 N 126 1/2 E Molucca Passage									
		H 19 49 15 37 N 71 1/2 E Hindukush depth about 200 km									
		USCGS H 01 03 45 17 1/2 N 128 1/2 E Ryukyu Islands									
		USCGS H 01 44 34 53 N 160 1/2 E Near east coast of Kamchatka									

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	ePZ			42			USCGS H 19 10 13			
		eSNE			53 20			18 S 174½ W			
		H 02 49 35						Tonga Island			
		37¾ N 7½ E						depth about 150 km			
		Pamirs,				10	Wr	ePKPZ	23	32	45
		Tadzhikistan					Qt	ePKPZ			50
10	Wr	ePZ	11	01	19			eXZ			36 44
	Lh	ePZ			24		Lh	ePKPZ			32 50
	Qt	ePZ			02 04			USCGS H 23 12 47			
		eXZ			09			4½ S 107 W			
		ePPZ			03 09			About 1000 miles west of			
		eSN*			07 19			Galapagos Islands			
		USCGS H 10 55 31						Mag 6 (Pas), 6 6¼ (Berk)			
		51½ N 99 E				11	Ch	ePZ	01	06	21
		Outer Mongolia						e(S)N			13 09
10	Wr	iPZ	11	59	50 c		Lh	ePZ			07 51
	Qt	ePZ			12 00 26 c			iPPZ			09 58
		epPZ			36		Wr	ePZ			07 58
		ePcPZ			01 06		Qt	ePZ			08 34 c
		ePPZ			02 42			ePPZ			10 52
		eSN*			08 48			eXN*			14 42
		USCGS H 11 50 05						eSN*			17 01
		38½ N 143 E						eScSN*			18 20
		Off east coast of									
		Honshu, Japan									
		Mag 6.0 (Up, Ki)									
10	Qt	ePKPZ	13	37	55						
		ePPZ			40 52						
	Wr	ePKPZ			38 04						
		USCGS H 13 18 47									
		Northern Chile									
		depth about 150 km									
10	Ch	ePKPZ	19	27	58						
	Qt	ePKPZ			28 51 c						

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
11	Ch	ePZ	17	38	53			Mu Sec			
	Qt	ePZ			39 25 c			PZ 3 6 2.5			
		ePcPZ			31			USCGS H 23 11 19			
		eSN*			49 41			48 N 152½ E			
		USCGS H 17 27 00						Kurile Islands			
		52 N 174 W						Mag 6½ (Pas), 7.1 (Up Ki),			
		Andreanof Islands						7.1 (Qt, Ch)			
		Aleutian Islands				11	Lh	iPZ	23	34	02
11	Qt	ePZ	18	07	09 c		Wr	iPZ			24
		ePcPZ			15		Qt	ePZ			40 c
		USCGS H 17 54 43						ePcPZ			35 17
		Andreanof Islands						eSEN*			43 02
		Aleutian Islands						USCGS H 23 24 11			
11	Qt	ePZ	18	21	10			O 125 E			
11	Ch	iPZ	23	20	48 d			Molucca Passage			
		ePcPZN			21 52			ePKPZ	12	06	03
		iPPZ			22 48			eSKSN*			14 40
		eSN			28 15			eSSN*			25 13
								USCGS H 11 46 58			
								26½ N 111 W			
								Gulf of Baja,			
								California			
								Mag 6½ (Pas), 6 (Berk)			
						12	Ch	iPZ	13	31	49
								ePPZ			32 50
								eSN			36 51
								iPZ			33 46
								eSZ			40 20
								iPZ			34 02 c
								ePZ			35 c
								ePcPZ			35 53
								iSN*			41 57

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eScSN*	44	26			Qt	ePZ	19	31	d
		eSSN*	45	34				ePcPZ		37	
		eLN*	46	9				eXZ		45	
		Mu Sec						ePPZ	22	30	
	PZ	0.4 1.5						eSEN*	29	28	
	USCGS H 13	25 22						eSSN*	34	33	
	25 N	126 E						Mu Sec			
	Ryukyu Islands						PZ	0.4 1.8			
	Mag 6.3 (Up, Ki),	6.2 (Qt)					USCGS H 09	07 21			
12	Lh	ePZ	16	11	31		66 N	156 W			
		iSZ		12	04		Alaska				
	Wr	iPZ	11	32	d	13	Ch	ePZ	12	39	17 e
	Qt	ePZ			36 d			ePcPN	40	02	
		eSNE	12	20				ePPN	41	32	
	H 16	10 38						ePPPN	42	58	
	Near Leiah							eSZN	47	30	
	West Pakistan						Lh	ePZ	39	36	
	deeper than normal							eSZ	48	06	
13	Wr	iPZ	04	14	02 c		Wr	ePZ	39	36	
	Qt	ePZ			52		Qt	ePZ	40	12 c	
		ePPZ	15	44				ePcPZ		36	
	USCGS H 04	08 56						ePPZ	42	41	
	46 N	98 E						iSN*	42	15	
	Outer Mongolia							iSSN*	53	40	
13	Wr	iPZ	09	19	01 d			eLN*	57.2		
	Lh	ePZ			11 d			Mu Sec			
	Ch	iPZ			31 c		PZ	0.4 1.5			
		iPcPZ			38		PPZ	0.4 2.2			
		ePPZ	22	31			USCGS H 12	29 07			
		eSN	29	28			53 N	161 E			
		eScSN			50		Near east coast of				
		eSSN	34	37			Kamchatka				

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Minor Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
								ePKSN*	55	27		
								iSKSN*	59	08		
14	Wr	ePZN	00	40	53			iPPSN*	22	06	38	
	Qt	ePZ		41	16			iSSN*	12	38		
14	Ch	ePZN	02	59	11			Mu Sec				
	Lh	iPZ			48 c			PPZ	0.6 2.4			
	Wr	ePZ			52		Lh	ePKPZ	21	51	54	
	Qt	ePZ	03	00	30 c		Ch	ePKPZ		52	26	
		eSN*		09	14			e(PKS)Z		55	58	
		eScSN*		10	11			ePPZ N		56	42	
		USCGS H 02	49	41				iSKKSN	22	03	29	
		47 N	152 E					eSKSPN		06	57	
		Kurile Islands						USCGS H 21	32	28		
14	Qt	ePZ	03	56	41			1 N	79½ W			
		USCGS H 03	47	16				Near coast of Ecuador				
		26½ N	128 E					Mag 6¼-7 (Pas), 6¾ (Berk),				
14	Lh	ePZ	16	32	03			6.7 (Up, Ki), 6.4 (Qt)				
	Qt	ePZ		33	04±							
		ePPZ			48	14	Qt	ePKPZ	23	07	59	
		USCGS H 16	26	55				ePPZ		10	31	
		45 N	98 E					ePKSZ		11	33	
		Outer Mongolia					Ch	ePKPZ		08	38	
14	Ch	ePZ	18	18	48			ePPZN		12	50	
	Lh	ePZ		19	12			USCGS H 22	48	33		
	Qt	ePZ			45 c			1 N	79½ W			
		eSN*		28	51			Ecuador aftershock				
		USCGS H 18	08	40				Mag 6½-6¾ (Pas)				
		53 N	161 E				15	Wr	ePKPZ	01	50	04
		Near east coast of						Qt	ePKPZ		08	
		Kamchatka							ePPZN*	52	43	
14	Qt	ePKPZ	21	51	48				ePKSZ	53	37	
		ePKPZ			53				iPKSN*		43	
		iXZ			52				ePPSN*	02	04	55
		i(PP)ZN*			54				eSSN*		10	50
		iPPN*			38							

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Date	Station	Phase	h	m	s
		Mu Sec			
	PPZ	0.4	2	5	
Lh	ePKPZ		01	50	13
Ch	ePKPZ				38
	USCGS H	01 30 43			
	1 N	79½ W			
	Ecuador aftershock				
	Mag 6¼-6½ (Pas),				
	6.3 (UP, Ki),				
	6.2 (Qt)				
15	Wr	ePKPZ	04	11	50
	Qt	ePKPZ			53
		ePPN*		14	16
		ePKSZN*		15	33
		eSSN*		31	47
	Lh	ePKPZ	12	01	
	USCGS H	03 52 39			
	9 N	84 W			
	Off west coast of				
	Costa Rica				
	Mag 6¾ (Pas), (Berk),				
	6.3 (Up, Ki)				
15	Qt	ePZ	06	19	07
15	Wr	iPZ	07	17	46 c
		iSZ		18	18
	Qt	ePZ			43
		eSNE		20	01
	H 07 17 01				
	Hindukush				
15	Wr	iPZ	09	13	47 d
		iSZ		14	19

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Date	Station	Phase	h	m	s
	Qt	ePZ	45	22	c
		eSEN*	52	33	
	USCGS H 12 36 31				
	18½ N 119½ E				
	Off northwest coast of				
	Luzon, Philippine Islands				
16	Qt	ePZ	21	40	55
17	Qt	ePZ	02	14	34
	USCGS H 02 01 26				
	6 S 154 E				
	Solomon Islands region				
17	Lh	ePZ	02	28	18
	Qt	ePZ			45
17	Lh	ePZ	06	34	27
	Qt	ePZ			51 c
		eSNN*		45	45
		ePSN*		47	05
	USCGS H 06 21 43				
	6 S 155 E				
	Solomon Islands				
17	Lh	ePZ	10	17	12
	Wr	ePZ			26
	Qt	ePZ			41
		eSKSN*		28	13
		eSN*			28
	USCGS H 10 04 46				
	5½ S 152 E				
	New Britain				
17	Lh	ePZ	11	42	16 c
	Wr	ePZ			24
	Qt	ePZ	43	01	c
		ePcPZ			45

Date	Station	Phase	h	m	s
		ePPZ	45	17	
		eSN*	51	15	
	Mu Sec				
	PZ	0.3	1	5	
	USCGS H 11 32 48				
	37 N 145½ E				
	Near east coast of				
	Honshu, Japan				
	Mag 6.0 (Up, Ki),				
	6.1 (Qt)				
18	Ch	ePZN	07	47	56
	Qt	ePZ			49 57
18	Wr	iPZ	07	50	08 c
		iSZ			29
	Qt	ePZ			51 10
		eSNE			52 25
	Hindukush				
18	Qt	ePZ	09	15	45
	USCGS H 09 03 27				
	5 S 143½ E				
	New Guinea				
18	Qt	ePZ	14	31	52
	USCGS H 14 20 44				
	53½ N 162 E				
	Off east coast of				
	Kamchatka				
18	Wr	iPZ	20	01	36 d
		iSZ			02 10
	Qt	ePZ			35
		eSN			03 56
	Hindukush				
19	Lh	ePZ	00	20	39
	Wr	iPZ			49 d

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	ePZ	21	23	d			eLN*			52.0
		eSN*	29	57				USCGS H 05 32 00			
		USCGS 00 10 50						24½ N 122 E			
		30½ N 141½ E						Near east coast of			
		South of Honshu, Japan				21	Wr	ePKPZ	20	33	35
19	Qt	ePZ	01	17	36		Qt	ePKPZ			43
	Wr	iPZ			49 c			eXN*	36	09	
	Lh	ePZ			52			ePSN*	45	16	
19	Wr	iPZ	14	24	50 c			eSSN*	51	58	
		ePZ			25 20 c			USCGS H 20 14 47			
		USCGS H 14 14 38						15 S 174½ W			
		22½ N 143 E						Samoa Islands region			
		Volcano Mariana Islands region						Mag 6½ (Pas)			
		depth about 200 km				21	Ch	ePZ	22	43	26
19	Qt	ePZ	22	53	26			e(S)N	48	10	
		USCGS H 22 42 20					Lh	iPZ	45	42 c	
		52½ N 161 E						iXZ	46	26	
		Off east coast of Kamchatka						iSZ	52	21	
								iXZ	53	21	
20	Qt	ePZ	13	05	27		Wr	iPZ	46	09 c	
		USCGS H 12 56 30					Qt	ePZ			12 c
		19 N 121½ E						epPZ			49
		Off north coast of Luzon, Philippine Islands						eXZN*	47	08	
20	Qt	ePZ	21	33	46 c			iXZN*	49	11	
		eSNN*	40	33				iSN*	53	05	
	Wr	ePZ	33	55				isSN*	54	24	
	Lh	ePZ	34	53				iXN*	56	58	
21	Ch	ePZ	05	37	49 d			Mu Sec			
	Wr	ePZ	40	16				PZ 0.4 1.5			
	Qt	ePZ	47	c				SN* 21.3 6.0			
		ePPZ	42	42				USCGS H 22 37 18			
								4½ S 104 E			
								Sumatra			

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
								eSNE			26 22
		depth about 150 km (Qt), 180 km (Up, Ki)						H 21 22 52			
		Mag 6½ (Pas), 6.4 (Qt), 6.7 (Up, Ki)						Afghanistan-Tadzhik border			
22	Ch	ePZ	00	05	52	22	Qt	e(PKP)Z	22	29	51
		eSZN			12 42			USCGS H 22 12 45			
	Lh	ePZ	07	56		23	Lh	ePZ	03	07	52
		eSZ	16	40			Wr	ePZ			55
	Wr	iPZ	08	18 c			Qt	ePZ			08 32
	Qt	ePZ			31 c			ePcPZ			09 04
		ePcPZ			51			eSN*			17 20
		eSN*	17	45				eScSN*			18 30
		USCGS H 23 57 05						eSSN*			21 42
		6½ S 131½ E						eLN*			23.3
		Banda Sea						Mu Sec			
22	Lh	ePZ	09	17	40			PZ 0.4 1.8			
	Wr	ePZ			18 02			USCGS H 02 57 40			
	Qt	ePZ			15			45 N 152 E			
		ePPZ			20 30			Kurile Islands			
		eSN*			26 17			Mag 6.3 (Qt), 6.2 (Up, Ki)			
		USCGS H 09 08 13				23	Lh	ePZ	05	02	46
		½ S 120½ E					Qt	ePZ			03 25
		Celebes						USCGS H 04 52 47			
22	Qt	ePZ	10	09	01			45½ N 152 E			
	Lh	ePZ			48			Kurile Islands			
		USCGS H 10 02 43						depth about 100 km			
		37 N 31 E				23	Lh	ePZ	06	01	44
		Southern Turkey					Wr	ePZ			46
22	Wr	iPZ	21	23	46 d		Qt	ePZ			02 28
		iSZ			24 26			USCGS H 05 53 06			
	Qt	iPZ			51 c			30½ N 130½ E			
		eXZ			25 45			Ryukyu Islands			

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23	Wr	iPZ	06	50	18 d						
	Lh	eSZ	52	03		24	Ch	ePZ	17	34	09
	Qt	ePZ	51	14							
		esPZ	53								
		eSNE	52	32							
		H 06 49 34									
		36 $\frac{3}{4}$ N 71 E				24	Qt	ePKPZ	18	28	34
		Hindukush					Ch	ePKPZ	29	13	
		depth about 200 km									
23	Qt	ePZ	11	11	38						
		USCGS H 10 58 35									
		5 $\frac{1}{2}$ S 153 $\frac{1}{2}$ E									
		New Britain region				25	Qt	ePZ	03	52	59
23	Qt	ePZ	15	03	42 c						
23	Lh	ePZ	19	24	54 c						
		epPZ	25	24		25	Wr	ePZ	08	47	11
	Wr	iPZ	09		c		Lh	ePZ	15		
	Qt	ePZ	25		c		Qt	ePZ	42		
		USCGS H 19 12 36									
		4 $\frac{1}{2}$ S 153 E									
		New Britain region									
		depth about 100 km									
24	Wr	ePZ	01	10	16						
	Qt	ePZ	11	31							
		eSN	13	56		25	Wr	iPZ	18	32	55
24	Qt	ePZ	09	55	10		Lh	ePZ	33	33	
24	Ch	ePZ	13	22	39 c						
		e(S)Z	33	36			Qt	ePZ	33	58	
	Qt	ePKPZ	28	35							
		eXN*	36	35							

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		H 18 32 15				27	Qt	ePKPZ	08	31	41
		36 $\frac{1}{2}$ N 71 $\frac{1}{2}$ E									
		Hindukush									
		depth about 150 km									
25	Lh	ePZ	19	15	25						
	Qt	ePZ	51								
		USCGS H 19 03 18				27	Lh	ePZ	09	12	39
		52 N 171 W					Wr	iPZ	13	25	c
		Fox Islands					Qt	ePZ	39		
		Aleutian Islands				27	Wr	ePZ	11	18	32
25	Wr	ePZ	21	09	01						
		iSZ	42								
	Qt	ePZ	46 $\pm$				Lh	eXZ	28		
		eSNE	11	00							
		H 21 08 08					Qt	ePZ	19	28	
		Northern Afghanistan									
26	Lh	ePZ	01	19	35						
	Wr	ePZ	39								
	Qt	ePZ	20	14							
		epPZ	40								
		eSN*	29	13							
		esSN*	30	00		27	Qt	ePZ	15	07	46
		USCGS H 01 09 30									
		44 $\frac{1}{2}$ N 152 $\frac{1}{2}$ E									
		Kurile Islands region									
		depth about 100 km									
26	Wr	iPZ	14	02	16 c						
		iSZ	45			27	Lh	ePZ	17	27	01
	Qt	ePZ	03	15							
		eSNE	04	32							
		H 14 01 34					Wr	iPZ	27	08	c
		Hindukush					Qt	ePZ	45		c
26	Wr	iPZ	18	28	07 d						
		iSZ	39								
	Qt	ePZ	29	09							
		eSNE	30	30							
		H 18 27 23									
		Hindukush									

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		depth about 100 km				28	Qt	ePZ	11	41	20
27	Lh	ePZ	18	57	28			USCGS H 11 28 14			
	Qt	ePZ		53	15			5 S 153½ E			
27	Qt	e(P)Z	19	00	34			Solomon Islands-			
27	Ch	ePZ	19	15	51			New Britain region			
	Wr	ePZ			53	28	Qt	ePKPZ	12	07	07
	Lh	ePZ			57 c			ePPZ		10	02
		ePcPZ	16	06				ePKSZN*			41
	Qt	ePZ			22 c			e(SKS)N*			13 54
		eXZ			37			eSKSPN*			19 50
		ePPZ	19	35				Mu Sec			
		eSNN*			26 45			PPZ 0.4 2.0			
		eScSN*			55		Wr	ePKPZ	12	07	09
		ePPSN*			27 51		Lh	ePKPZ			16
		eLN*			38.5		Ch	ePKSZ			10 45
		Mu Sec						ePKPZ			07 51
		PZ 0.3 1.5						USCGS H 11 47 40			
		USCGS H 19 03 50						11 S 74 W			
		52½ N 169 W						Peru			
		Fox Islands						Mag 6½ (Pas),			
		Aleutian Islands						6¼-6½ (Berk),			
		Mag 6.3 (Qt)						6.4 (Up, Ki),			
								6.3 (Qt)			
27	Qt	ePZ	19	25	48	28	Qt	ePZ	16	12	07
28	Lh	ePZ	09	12	55			USCGS H 16 00 50			
		iXZ			13 01			13 N 141½ E			
		iSZ			14			Mariana Islands region			
	Wr	ePZ			06	28	Qt	ePZ	18	19	09
		iSgZ			41		Wr	ePZ			27
	Qt	ePZ			46	28	Qt	ePZ	18	34	23
		H 09 12 28				29	Wr	iPZ	05	12	54 d
		32 N 72¼ E					Qt	ePZ			13 45
		West Pakistan						USCGS H 05 07 35			
								45 N 100 E			
								Outer Mangolia			

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
30	Wr	ePZ	08	17	30	30	Lh	ePZ	14	00	14
	Lh	iPZ			18 11 d		Wr	ePZ			28
		iXZ			58		Qt	ePZ			01 12
	Qt	iPZ			30 d			eSNE			06 21
		esPZ			19 13			USCGS H 13 54 44			
		iSZN			48			38 N 103½ E			
		Mu Sec						Kansu Province, China			
	PZ	0.3 0.7				30	Qt	ePZ	14	18	47
	Kr	ePZ	08	19	32			ePZ			19 19
		eSZ			21 41			eSN*			27 30
		H 08 16 50						eScSN*			28 40
		36½ N 71 E					Wr	ePZ			18 56 c
		Hindukush					Lh	ePZ			19 14
		depth about 100 km						USCGS H 14 08 00			
		USCGS H 08 16 30						37½ N 14 W			
		37 N 71 E						Off coast of Portugal			
		Afghanistan						Mag 5.7 (Up, Ki)			
		Mag 6.0 (Qt)				30	Qt	ePKPZ	19	46	44
30	Lh	ePZ	09	35	10			epPKPZ			47 20
		ePgZ			34			eXZ			49 35
		eSZ			36 24		Wr	ePKPZ			46 50
		eSgZ			37 02		Lh	ePKPZ			59
	Wr	ePZ			35 53			epPKPZ			47 29
	Qt	ePZ			36 33			USCGS H 19 27 32			
		eSNE			38 52			21 S 67½ W			
		H 09 33 34						Southern Bolivia			
		30 N 81½ E						depth about 150 km			
		Nepal-Tibet border						Mag 6.0 (Pas)			



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Minor Shocks

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Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	Quetta			eSgZ	35
1	ePZE	18 49 34	7	ePZ	11 38 58
	eSE	50 29	7	eXZ	20 37 22
1	ePZ	19 06 02	7	ePZ	22 24 17
1	ePZE	21 32 17	8	eSNE	49
	eSN*	53	8	ePZ	07 26 58
1	ePZ	23 44 05	8	eSNE	27 29
	eSZE	45 33	8	ePZ	07 54 45
2	ePZ	08 27 55	8	ePZ	10 10 43
2	iPgZ	19 36 47 c	8	eSNE	11 24
	iSgZE	59	8	iPZ	12 54 22
3	ePZ	18 21 36	8	iSZ	55 02
	eSgZ	46	8	ePZ	14 49 27
4	ePgZ	10 15 31	8	eSZN	50 30
	eSE	40	8	ePZ	16 56 22
4	ePZ	11 34 21	8	iPZ	18 55 20
4	ePZ	15 58 02	9	eSE	56 30
4	ePgZ	19 25 13	9	ePZ	19 47 29
	eSgE	27	9	eSE	53
5	ePZ	00 58 28	9	ePgZ	21 01 39
	eSE	59 27	9	eSgZ	41
5	ePZ	09 49 39 d	10	ePZ	04 59 20
5	ePZ	19 34 24	10	ePZ	07 49 39
	eSE	35 24	10	eSE	50 05
6	ePZ	01 39 13	10	ePZ	10 23 29
6	ePZ	19 00 05	10	eSE	24 39
6	ePZ	22 31 33	10	ePZ	15 00 45
	eSZN	32 02	10	ePZ	21 29 56
7	ePZ	00 56 23	10	eSE	30 19
	eSNE	57 28	11	ePZ	23 20 15
7	ePZ	02 01 34	11	ePZ	01 30 43
7	ePgZ	10 38 28	11	eSE	31 51
				ePZ	03 03 20

Date	Phase	h m s	Date	Phase	h m s
	eSZ	44	17	ePZ	12 52 53
11	ePZ	11 41 13	17	ePZ	16 54 32
11	ePgZ	14 37 18		eSN	55 10
	eSgE	30	17	ePZ	20 01 25
12	ePZ	14 17 16	17	ePZ	20 25 27
	eSE	43	18	ePZ	09 50 53
12	ePZ	16 55 02	18	ePZ	16 42 41
	eSNE	44	19	eSZ	06 31 20
12	ePZ	17 13 36		eSE	43
13	ePZ	14 42 05	19	ePZ	23 26 41
13	ePZ	14 53 41	20	ePgZ	08 35 48
13	ePZ	18 58 57		eSgE	50
13	ePZ	16 31 47	20	ePZ	22 39 46
14	ePZ	10 07 41		eSN	40 05
15	ePZ	15 41 19	22	ePZ	01 23 26
	eSN	51	22	ePZ	23 44 11
15	ePZ	19 40 50	23	ePZ	00 25 06
	eSE	41 13		iSN	28
15	ePZ	21 42 19	23	ePZ	08 16 39
	eSE	41	23	ePZ	14 32 01
15	ePZ	23 32 33	23	ePgZ	22 19 35 c
	eSZ	55		eSgZN	38
16	ePZ	04 54 34	24	ePZ	01 24 43
16	ePZ	06 28 32	24	ePZ	02 43 20
16	ePZ	12 22 33		eSE	35
17	ePgZ	02 35 25	24	ePZ	11 56 33
	eSgE	35		eSN	52
17	ePZ	02 54 58	25	ePgZ	08 06 30
17	ePZ	03 29 47		eSgN	40
17	ePgZ	03 32 38	25	ePZ	19 20 11
	eSgZ	40	26	ePNE	02 35 38
17	ePZ	04 22 37		eSNE	36 03

Date	Phase	h m s	Date	Phase	h m s
26	ePZ	02 56 07 c		<b>Warsak</b>	
26	ePZ	03 06 59	1	ePZ	03 43 00
26	ePZ	03 12 42		iSZ	37
	eSE	13 10	2	ePZ	08 27 58
26	ePZ	08 51 42	2	iPZ	08 55 04
	eSE	52 06		iSZ	41
26	ePZ	13 23 11	2	iPZ	09 44 14
	eSZN	28		iSZ	48
26	ePZ	18 06 34	2	iPZ	19 06 19
26	ePZ	20 41 02	2	iPZ	23 31 20
	eSN	42 22		iSZ	43
27	ePZ	09 07 30	4	ePZ	15 50 16
	eSNE	08 41	4	ePZ	15 57 09
27	ePZ	19 33 19		iSZ	55
	eSZE	49	5	iPZ	00 57 44
27	ePZ	21 11 38		iSZ	58 19
	eSZE	12 58	5	ePZ	22 58 12
27	ePZ	22 59 54	6	iPZ	05 11 56
27	ePgZ	23 46 40 c		iSZ	12 38
	eSgE	54	6	ePZ	06 29 20
28	ePZ	14 16 14		iSZ	44
28	ePZ	16 40 44	6	iPZ	16 58 28
29	ePZ	08 37 38		iSZ	55
29	ePZ	09 12 46	7	iPZ	00 55 29
29	ePZ	13 53 14		iSZ	46
29	ePZ	18 58 36	8	iPZ	08 52 53
	eSNE	55		iSZ	53 21
29	ePZ	23 07 22	8	ePZ	12 54 22
	eSN	08 02		iSZ	55 06
30	ePgZ	15 57 28	8	ePZ	15 13 04
	eSgZ	30		iSZ	33

Date	Phase	h m s	Date	Phase	h m s
9	ePZ	14 18 25	14	ePZ	12 14 13
	iSZ	40		eSZ	47
9	ePZ	15 21 09	14	ePZ	15 18 30
	iSZ	46		eSZ	19 05
9	ePZ	19 50 02	14	ePZ	16 31 49
	iSZ	33	17	ePZ	01 52 56
10	ePZ	02 21 34		iSZ	53 25
	iSZ	22 06	17	ePZ	12 52 55
10	iPZ	07 00 23	17	iPZ	13 24 21 d
	iSZ	55		iSZ	25 02
10	iPZ	10 22 05 d	17	iPZ	21 49 11 d
10	iPZ	10 33 58		iSZ	41
10	iSZ	34 43	18	ePZ	02 03 34
10	ePZ	15 05 16		iSZ	04 11
	iSZ	06 02	18	iPZ	06 00 23 d
11	ePgZ	01 29 51		iSZ	55
	iSgZ	30 02	18	ePZ	10 40 31
11	ePZ	09 43 36		iSZ	52
	iSZ	44 13	18	iPZ	12 34 58 d
11	ePZ	19 36 56		iSZ	35 31
	iSZ	37 23	18	ePZ	12 38 58
12	ePZ	13 11 58		eSZ	39 32
	eSZ	12 33	18	iPZ	17 08 33 c
12	ePZ	16 54 56		iSZ	09 30
12	ePZ	17 12 33	18	ePZ	18 33 01
12	iPZ	23 47 16		iSZ	32
	iSZ	49	18	ePZ	22 41 47
13	ePZ	06 14 47		eSZ	42 13
	eSZ	53	19	iPZ	00 45 41 d
13	iPZ	09 31 02 d		iSZ	46 10
	iSZ	30	19	ePZ	22 55 48
14	ePZ	02 59 52		eSZ	56 12

Date	Phase	h m s	Date	Phase	h m s
20	ePZ	08 21 22	25	iPZ	21 32 38
	iSZ	55		iSZ	33 09
20	ePZ	10 33 13	26	iPZ	00 34 10
	iSZ	40		iSZ	39
20	iPZ	20 35 00 c	26	iPZ	02 23 35
	iSZ	32		iSZ	24 08
21	ePZ	11 31 34	26	iPZ	07 18 36
	iSZ	32 29		iSZ	53
21	iPZ	15 33 42 d	27	ePZ	05 27 55
	iSZ	34 15		iSZ	28 10
22	ePZ	02 33 49	27	ePZ	06 12 03
	iSZ	34 16		iSZ	30
22	ePZ	16 55 00	27	ePZ	07 50 48
	eSZ	42	27	iPZ	09 06 21 d
23	ePZ	02 42 18		iSZ	54
	iSZ	59	27	ePZ	17 14 08
23	ePZ	09 29 34		iSZ	15 10
	iSZ	30 02	27	iPZ	17 59 19 c
23	iPZ	11 02 57 d		iSZ	49
	iSZ	03 29	27	ePZ	19 15 53
24	ePZ	08 38 28	27	ePZ	21 10 37
	eSZ	49		eSZ	11 08
24	ePZ	18 21 43	28	ePZ	00 20 32
	iSZ	22 08		iSZ	49
24	ePZ	22 29 04	28	iPZ	01 49 17
	eSZ	30		iSZ	52
25	iPZ	01 58 19 c	28	iPZ	12 31 55 c
	iSZ	52		iSZ	32 26
25	iPZ	18 25 29 c	28	ePZ	14 15 20
	iSZ	26 06	29	ePZ	09 44 36
25	ePZ	19 42 38		iSZ	45 08
	eSZ	43 37	29	iPZ	17 18 03

Date	Phase	h m s	Date	Phase	h m s
	iSZ	36	16	eXZ	04 55 57
29	ePZ	17 31 51	16	eXZ	20 18 44
	iSZ	32 22	16	eXZ	21 40 11
22	ePZ	20 52 05	17	eXZ	04 22 02
22	iPZ	20 58 52	21	ePZ	02 49 31
	iSZ	59 28	21	eXZ	20 33 54
30	ePZ	02 48 00	21	eXZ	03 16 47
	iSZ	19	22	ePZ	01 22 43
30	ePZ	05 59 28	22	eXZ	16 55 04
	iSZ	06 00 09	22	eXZ	22 30 00
30	ePZ	11 00 43	24	eXZ	01 12 18
	iSZ	01 96	25	eXZ	21 10 12
30	iPZ	16 13 13 d	26	eXZ	14 03 53
	iSZ	42	26	eXZ	18 29 21
30	iPZ	20 13 47 c	26	eXZ	20 43 58
	iSZ	14 20	26	eXZ	21 05 27
			27	ePZ	09 07 28
	<b>Lahore</b>		27	eXZ	19 02 56 d
			27	ePZ	19 34 38
2	eXZ	19 09 09	28	eXZ	11 40 42
2	ePgZ	23 17 52	29	eXZ	17 31 48
	iSgZ	18 00			
5	ePZ	00 58 55		<b>Chittagong</b>	
8	ePZ	14 40 55	2	eXZ	09 37 02
	eSZ	51 12	2	ePZ	11 01 54
10	ePZ	10 22 45	2	iPZ	20 13 30 d
	eSZ	23 24	2	eXZ	21 13 37
11	ePZ	01 29 53	4	ePZ	09 28 52
12	ePZ	16 55 02	5	eXZ	05 21 54
	eSZ	43	5	iXZ	07 05 23
12	ePZ	17 13 45	5	iXZ	07 20 21
14	ePZ	19 08 21	5	iXZ	22 54 08

Date	Phase	h m s	Date	Phase	h m s
5	eXZ	23 15 10	15	eXZN	04 44 17
6	eXZ	06 47 57	15	eXZ	06 23 15
7	eXZ	00 00 21	16	eXZ	06 06 23
7	eXZ	01 14 30	16	ePZ	06 12 32
7	eXZ	02 14 36		eSZN	57
7	eXZ	06 24 50	16	eXZ	12 45 16
8	ePgZ	06 20 48	17	eXN	06 35 37
	eSgZN	21 02	17	eXN	10 19 05
8	eXZ	14 19 57	17	eXN	11 45 11
8	eXZ	15 50 33	18	ePZ	14 30 19
9	eXZ	04 44 54	18	ePZN	17 05 11
9	eXZ	06 28 01	19	eXZN	14 25 14
9	eXZ	18 08 00	20	eXZ	21 36 11
11	iPZN	09 28 09 d	22	eXZ	10 13 22
	iSZN	24	23	eXZ	03 07 09
11	eXZ	18 20 33	23	eXZ	15 04 10
12	ePZ	08 18 38	23	eXN	23 10 27
12	eXZ	16 16 36	24	eXZ	16 28 15
13	eXZ	03 02 43	27	ePZ	13 35 02
13	ePZ	07 37 39	30	eXZ	04 53 27

*Seis. Bull. Pakistan Quetta, Vol. 4 No. 5, May 1958*

# SEISMOLOGICAL BULLETIN OF PAKISTAN

*Vol. 4*

*MAY 1958*

*No. 5*

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*Printed at*  
Bolan Muslim Press,  
QUETTA.

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*Issued under the authority of the Director, Meteorological Service*  
PAKISTAN METEOROLOGICAL SERVICE  
GEOPHYSICAL INSTITUTE  
QUETTA

## SEISMOLOGICAL BULLETIN

of

PAKISTAN.

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
<b>Quetta (Central Station)</b>				
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)

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The Seismological Bulletin of Pakistan is a monthly publishing data of Seismological stations in Pakistan.

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## Major Shocks

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 "	—	—
<b>Lahore</b> Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
<b>Karachi</b> Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
<b>Chittagong</b> 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 "	—	—
<b>Warsak</b> 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) stand for seismological observatories Pasadena (U.S.A.),  
 Berkeley (U.S.A.), Uppsala (Sweden) and Kiruna (Sweden) respectively.  
 All times are in Greenwich Mean Time.

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
1	Ch	ePZ	00	41	19			USCGS H	12	33	23
		eSN		51	16			25 1/2 N		141	E
	Lh	ePZ		42	38			Volcano Islands			
	Wr	ePZ			50			depth about 400 km			
	Qt	ePZ		43	06 c	2	Qt	ePZ	03	50	36
		epPZ			53	2	Wr	iPZ	15	16	33 d
		e(PPZ)		47	16			iSZ		17	05
		eSKSN*		53	38		Lh	ePZ		15	±
		eSN*		54	48			eSZ		18	22
		USCGS H	00	29	15		Qt	ePZ		17	26
		13 1/2 S		167 1/2 E				eSNE		18	43
		New Hebrides Island						H	15	15	47
		depth about 200 km						37 N		70 1/4 E	
		Mag 6 1/4 (Pas), 6 (Berk)						Hindukush			
								depth about 100 km			
1	Ch	ePN	00	57	03	2	Qt	ePKPZ	20	48	45
		ePZ		58	44			ePKSN*		52	04
1	Wr	iPZ	06	21	17 c			USCGS H	20	29	20
	Qt	ePZ			31 c			17 N		99 1/2 W	
		USCGS H	06	10	15			Mexico			
		Banda Sea						Mag 6 1/4-6 1/2 (Pas)			
1	Ch	ePZ	09	40	12	2	Qt	ePZ	21	22	45 c
	Lh	ePZ		41	16			iXN		23	17
	Wr	iPZ			30 d			eSNN*		24	38
	Qt	ePZ			43		Wr	ePZ		23	47
		eSN*		49	46		Lh	ePZ		24	08
		eScSN*		51	33		Ch	ePN		25	19
		eLN*		55	9			eSN		29	22
		USCGS H	09	31	43			USCGS H	21	20	20
		1/2 S		120	E			Southern Iran			
		Celebes									
1	Lh	e(P)Z	12	42	47	3	Wr	iPZ	06	48	10 c
	Wr	iPZ			57 d		Qt	ePZ			29
	Qt	ePZ		43	30 d			USCGS H	06	37	55
								4 N		128 1/2 E	
								Molucca Passage			

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				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
3	Qt	ePZ	07 20 00				
3	Qt	ePZ	08 13 42				
3	Lh	ePZ	09 37 52				
	Wr	iPZ	38 14 c		Wr	ePZ	05 26 36
	Qt	ePZ	26 c		Lh	ePZ	55 c
3	Wr	iPZ	18 28 07 d				
		iSZ	47				
	Lh	ePZ	41				
		eSZ	29 47				
	Qt	ePZ	11 d				
		eSZE	30 41				
		H 18 27 15					
		37½ N 72½ E					
		Pamirs, Tadzhi-kistan					
		depth about 100 km					
3	Qt	ePZ	20 25 38 c				
		eSNE	31 30				
	Wr	iPZ	25 27 c				
	Lh	ePZ	26 24 c				
		USCGS H 20 18 20					
		37 N 21½ E					
		Near west coast of Grece					
4	Wr	iPZ	01 48 52 c				
		iSZ	50 02				
	Lh	eXZ	09				
		e(S)Z	51 02				
	Qt	ePZ	49 45 c				
		eXZE	50 50				
		eSE	51 23				
		Tadzhi-kistan					
5	Qt	ePZ	05 26 01 c				
		eSN*	29 46				

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				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
6	Wr	iPZ	04 20 16 c	7	Qt	ePZ	21 53 37
	Qt	ePZ	20			eSNE	54 56
		eSEN*	24 05			Hindukush	
6	Wr	iPZ	09 58 12 d	7	Qt	ePZ	22 08 07 d
	Qt	ePZ	27			eSN*	17 05
		iXZ	39			USCGS H 21 57 03	
7	Wr	iPZ	09 59 36 d			50 N 158½ E	
		iSZ	10 00 02			Kamchatka region	
	Lh	eXZ	43	8	Qt	ePKPZ	12 59 46
		iSZ	01 17			eXZ	56
	Qt	ePZ	00 37			epPKPZ	13 00 45
		iSNE	01 52			ePPZ	02 48
		H 09 59 00				ePKSZ	03 16
		36 N 71 E				iXN*	09 44
		Hindukush				eSKSPN*	11 34
7	Qt	ePZ	13 29 42 c		Wr	ePKPZ	12 59 56
		ePgZ	50			USCGS H 12 40 46	
		iSN*	30 15			24 S 67 W	
	Wr	iPZ	29 57 c			Salta Province,	
	Lh	ePZ	30 04 c			Argentina	
		iSZ	55			depth about 100 km	
		H 13 29 01				Mag 6¼-6½ (Pas),	
		30.9 N 69.7 E				6 (Berk),	
		Eastern Baluchistan				6.3 (Up, Ki)	
7	Wr	iPZ	14 47 54 d	9	Qt	ePKPZ	01 03 47
	Lh	iPZ	48 47 d			USCGS H 00 44 12	
		iSZ	49 37			1½ N 94½ W	
	Qt	ePZ	08 d			Galapagos Islands	
		iSNE	50 16			Mag 6 (Pas)	
	Ch	ePZ	51 33	9	Qt	ePZ	02 47 26 d
		H 14 47 39				eSN	52 45
		Hindukush				eLN*	55.0
		USCGS H 14 47 30			Wr	iPZ	47 47 d
		East central					
		Afghanistan					



Minor Shocks

Date	Station	Phase	h	m	s
		USCGS H 02 40 49 37 N 27½ E Dodecanese Islands			
9	Qt	ePKPZ	04	59	30
		iXZ		41	
		iPKSZ	05	02	57
	Wr	ePKPZ	04	59	41
	Lh	ePKPZ		52	
		USCGS H 04 40 20 31 S 65½ W Cardoba-Lee Roja Province, Argentina depth about 100 km Mag 6¼ (Pas)			
10	Lh	ePZ	23	06	34
	Qt	ePZ		53	
		ePcPZ	07	00	
		eSN*	16	53	
		eLN*	26	8	
		USCGS H 22 54 40 65 N 152½ W Central Alaska Mag 6¼-6½ (Pas)			
11	Qt	ePZ	23	25	32
		USCGS H 23 13 19 64½ N 152½ W Alaska aftershock			
11	Lh	ePZ	00	45	37
		ePcPZ	46	44	
		ePPZ	47	47	
		eSZ	53	23	
	Qt	ePZ	46	15	
		USCGS H 00 36 02 Celebes			
11	Ch	ePZ	05	35	44
	Qt	ePZ	36	09	
		eSN*	46	17	
		USCGS H 05 23 54 65 N 152½ W Central Alaska Mag 6¼-6½ (Pas), 6.0 (Up, Ki)			
11	Qt	ePZ	05	49	14
		USCGS H 05 37 01 65 N 151½ W Alaska aftershock			
11	Qt	ePZ	03	46	59 d
12	Lh	ePZ	05	50	26 c
	Qt	ePZ		51 c	
		ePcPZ		57	
		e(pP)Z	51	04	
		eSN*	06	01	16
		e(sS)N*		34	
		Mu Sec			
		PZ 0.4 1.5			
		USCGS H 05 38 16 52 N 169½ W Fox Islands Aleutian Island depth about 48-50 km (Up, Ki), (Qt) Mag 6.2 (Qt)			
12	Lh	ePZ	06	33	04
	Qt	ePZ		36	

Major Shocks

Date	Station	Phase	h	m	s
12	Wr	iPN	13	00	40
		iSN		01	14
	Qt	ePZ		25	
		eSN	02	36	
	Lh	ePZ	01	25	
		eSZ	02	35	
		H 12 59 53 36 N 69½ E Afghanistan			
12	Lh	ePZ	13	23	21
	Wr	ePN		25	
	Qt	ePZ	24	13	
12	Lh	iPZ	16	59	31 d
		e(S)Z	17	07	15
	Wr	ePN	16	59	43
	Qt	ePZ	17	00	16 d
		epPZ		58	
		ePPZ	02	40	
		eSN*	08	37	
		USCGS H 16 50 05 31 N 140½ E South of Honshu, Japan depth about 150 km			
12	Lh	ePZ	18	42	23 c
		eSZ	43	46	
	Qt	ePZ	42	56	
		cSZ	44	30	
12	Qt	ePKPZ	21	31	40
	Lh	ePKPZ		43	
		USCGS H 21 12 16 6½ S 75½ W Peru depth about 150 km			
12	Qt	ePZ	22	28	40
		USCGS H 22 16 00 53½ N 168 W Aleutian Islands			
13	Qt	ePZ	10	15	59 d
13	Qt	ePZ	13	23	33
		eSNE		25	24
13	Qt	ePZ	22	20	49
		eSNE		22	05
		Hindukush			
14	Qt	ePZ	04	11	09
		eSKSN*		21	38
		eSN*		22	00
		USCGS H 03 58 09 4½ S 153 E New Ireland			
14	Ch	ePZN	12	38	28
	Lh	ePZ		41	29
	Qt	ePZ		42	09
		USCGS H 12 35 42 12½ N 95 E Andaman Islands region			
14	Wr	iPZ	19	22	03 d
		iSZ		33	
	Lh	ePZ		44	
		eSZ		23	46
	Qt	ePZ		03	
		eSNE		24	20
		H 19 21 22 36½ N 71 E Hindukush			

Major Shocks

Date	Station	Phase	h	m	s
15	Ch	ePZ	04	36	37
		ePcPZ			50
		ePPZN	39	27	
		eSN	46	15	
	Lh	iPZ	36	51	c
		ePcPZ	37	04	
	Qt	ePZ	17		c
		ePcPZ			23
		eSNN*	47	33	
		eScSZN*			50
		USCGS H	04	24	50
		51½ N			173½ W
		Andreanof Islands			
		Aleutian Islands			
15	Qt	ePZ	05	58	28
15	Qt	ePZ	06	11	43
15	Qt	ePZ	06	51	23
15	Ch	ePZ	18	52	15
	Lh	ePZ			54 40
	Wr	iPZ			55 03 c
	Qt	ePZ			26
		e(S)N*	19	02	48
16	Ch	ePZ	02	15	57
	Wr	iPZ	16	02	d
	Qt	ePZ			34
		USCGS H	02	04	(6
		52 N			173½ W
		Andreanof Islands			
		Aleutian Islands			
16	Qt	ePZ	09	23	52
		eSN*			27 57
	Wr	ePZ			24 03
16	Wr	iPZ	16	11	05 d

Major Shocks

Date	Station	Phase	h	m	s
		iSZ			40
	Qt	ePZ			12 10
		eSZE			13 36
		H	16	10	18
		Afghanistan-Tadzhik			border
16	Wr	ePZ	16	25	56
	Qt	ePZ			59
16	Wr	ePZ	18	20	19
	Qt	ePZ			21 30
		eSNE			24 42
16	Qt	ePZ	18	38	03
16	Qt	ePZ	22	44	05
17	Wr	ePZ	07	14	36
	Qt	ePZ			55
		eXN*			23 30
		eSN*			25 16
		USCGS H	07	02	25
		3 S			147½ E
		Bismarck Sea			
17	Wr	ePZ	08	32	30
	Qt	ePZ			32
17	Wr	ePZ	13	20	47
		eSZ			21 46
	Qt	ePZ			41
		eSE			23 24
		H	13	19	27
		Tadzhikistan			
17	Wr	iPZ	15	50	03 d
	Lh	ePZ			12±
	Qt	ePZ			35 c
		ePPZ			53 53
		eXN*	16	00	27
		eSN*			39
		Mu			Sec
		PZ	0.2		15
		USCGS H	15	38	20
		51 N			179 W
		Andreanof Islands			
		Aleutian Islands			
		Mag	6.1		(Qt)
17	Lh	ePZ	16	48	25
	Wr	ePZ			39
	Qt	ePZ			48
17	Wr	ePZ	23	09	06
	Qt	ePZ			10 19
		eSZE			13 20
18	Wr	ePZ	01	28	29
	Qt	ePZ			29 23
		eSE			32 44
18	Wr	ePZ	02	46	46
	Qt	eSKSN*			57 48
		USCGS H	02	32	52
		13 S			167 E
		New Hebrides Islands			
		Mag	6¼-6½		(Pas),
		6.3			(Up, Ki)
18	Wr	ePZ	04	52	01
	Qt	ePZ			53 16
		eSNE			56 13
18	Qt	eSKSN*	12	46	11
		eSSN*			54 44
		USCGS H	12	21	18
		13 S			167 E
		New Hebrides			
		Islands			
		Mag	6-6¼		(Pas),
		6.2			(Up, Ki)
19	Qt	eSKSN*	00	30	49
		eSSN*			39 27
		USCGS H	00	06	00
		13 S			167 E
		New Hebrides Islands			
		aftershock			
19	Qt	ePZ	03	02	30
19	Wr	iPZ	03	58	02 c
		iSZ			33
	Qt	ePZN			53
		eSNE			04 00 05
		H	03	57	19
		36 N			70 E
		Hindukush			
20	Wr	iPZ	04	21	37 c
	Lh	eXZ			23 12
		eSZ			22
	Qt	ePZ			22 40
		eSZNE			23 57
		H	04	21	00
		36¼ N			71 E
		Hindukush			
20	Wr	ePZ	12	30	38
	Lh	ePZ			31 19
		eSZ			32 19
	Qt	ePZ			31 38 d
		eSNE			32 56
		H	12	29	57
		36¾ N			70¾ E
		Hindukush			
		depth	about		100 km
21	Qt	ePZ	00	03	38
21	Qt	ePZ	04	54	06

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 04 45 24						USCGS H 15 08 00			
		22 N 121 E						3 S 146 E			
		Near South coast of						Bismark Sea			
		Formosa				22	Lh	ePZ	22	22	12
		depth about 100 km					Qt	ePZ			33
21	Qt	ePZ	10	19	01			eSN*			32 59
21	Qt	ePZ	15	47	20			USCGS H 22 09 56			
		iSZN			37			52½ N 167 W			
	Lh	ePZ	48	49				Fox Islands			
		H 15 46 56						Aleutian Islands			
		Southern Afghanistan-				23	Wr	ePZ	15	54	26
		Baluchistan border						iSZ			55 06
22	Lh	ePZ	05	42	44		Lh	e(S)Z			56 06
	Qt	ePZ			43 06		Qt	ePN			55 28
		eXZ			15			eSN			56 57
22	Ch	ePZ	08	15	53			H 15 53 32			
22	Ch	ePZ	08	19	34			37¾ N 71½ E			
		e(S)N			20 59			Afghanistan-Tadzhik			
	Qt	ePZ			21 27			border			
22	Qt	ePZ	11	45	18	23	Qt	ePE	20	56	01
		ePPZ			48 28		Wr	ePZ			08
		eSN*			55 33		Lh	ePZ			45
		USCGS H 11 32 50				24	Ch	ePZ	16	43	28
		50½ N 175 W					Lh	ePZ			45 12
		Andreanof Islands					Wr	iPZ			24 d
		Aleutian Islands					Qt	ePZ			40 d
22	Lh	ePZ	15	19	57			eXZ			46 07
	Qt	ePZ			20 27			USCGS H 16 33 01			
		ePPZ			23 39			6 S 146 E			
		eSN*			30 45			New Guinea			
		eScSN*			57	24	Ch	ePZ	20	08	28
		eLN*			42.1		Qt	ePZ			12 54
						24	Qt	ePZ			22 21 46

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
24	Qt	ePZ	22	31	27			eSN			15 40
24	Qt	ePZ	23	59	09		Wr	iPZ			06 19 c
		eXZ			31		Lh	iPZ			22
		eSN*	00	04	27		Qt	iPZ			50 c
		eMN*			12.5			ePcPZ			56
25	Ch	ePZ	00	46	52			eSN*			16 59
		eSN			56 19			eScSN*			17 14
	Qt	ePZ			47 39 c			eSSN*			22 20
		ePcPZ			50			eLN*			26.7
		e!XZ			48 51			Mu Sec			
		ePPZ*			50 45			PZ 0.4 1.2			
		eSN*			57 48			USCGS H 14 54 30			
		eScSN			58 06			51½ N 177 W			
		ePPSN*			48			Andreanof Islands			
		eSSN*	01	03	06			Aleutian Islands			
		eLN*			08.7			Mag 6.3 (Qt)			
								Mu Sec			
		PZ 0.5 1.5				25	Wr	ePZ			17 49 34
		USCGS H 00 35 23					Qt	ePZ			50 09
		51 N 177 W						ePPZ			52 13
		Andreanof Islands						eSN*			57 39
		Aleutian Islands						Mu Sec			
		Mag 6.3 (Qt)						PZ 0.3 1.8			
								USCGS H 17 40 47			
25	Qt	ePZ	01	38	03			31 N 129½ E			
25	Qt	ePZ	02	59	43			Near west coast of			
		eSN*	03	04	36			Kyushu, Japan			
	Lh	ePZ			00 44			Mag 5.9 (Qt)			
25	Qt	ePZ	04	39	37	25	Qt	ePKPZ	21	30	55
		eSN*			44 32			epPKPZ			31 22
25	Ch	ePZ	15	06	09			ePPZ			33 47
		ePcPZ			25			ePKSZ			34 33
		ePPZ			08 57			eSSN*			51 35

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Wr	ePKPZ	30	58							
		USCGS H 21 11 45									
		3 S 77 W									
		Ecuador-Peru border region									
		depth about 100 km									
		Mag 6½ (Pas),									
		6¼-6½ (Berk)									
26	Lh	ePZ	04	41	33	27	Qt	ePZ	05	07	51
	Wr	ePZ			55	27	Wr	iPZ	16	20	10 d
	Qt	ePZ			42 12		Lh	iSZ			41
26	Qt	ePKPZ	09	08	59		Lh	ePZ			50
		ePPZ			11 44		Qt	eSZ			21 52
		ePKSZ			12 36		Qt	ePZ			08
	Wr	ePKPZ	08	59				eSZ			22 25
		USCGS H 08 49 47						H 16 19 29			
		3 S 77 W						36½ N 71 E			
		Ecuador-Peru aftershock						Hindukush			
		depth about 100 km						depth about 150 km			
26	Ch	ePZ	11	08	26	27	Qt	ePZ	18	34	15 d
		eSN			18 05			ePPZ			35 30
	Lh	ePZ	08	35	c		Wr	e(S)N*			39 18
		epPZ			09 12		Lh	iPZ			34 35 d
	Qt	ePZ			00		Lh	ePZ			35 02 d
		epPZ			37			USCGS H 13 27 23			
		ePPZ			12 13			36½ N 27½ E			
		epPPZ			45			Dodecanese Islands			
		iSN			19 11	27	Ch	ePZ	23	43	09
		Mu Sec					Lh	ePZ			44 46
		PZ 0.2 1.0					Wr	ePcPZ			59
		H 10 56 43					Qt	ePZ			45 00 c
								eXZ			48 00

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSN*	55	43		29	Wr	ePZ	15	26	39
		USCGS H 23 32 43					Qt	ePZ			27 40
		5½ S 146 E						eSE			29 32
		North coast of New Guinea				30	Wr	iPZ	01	11	00c
	Lh	ePZ	00	23	18		Lh	iPZ			41 d
28	Wr	ePZ			48		Qt	iSZ			12 43
	Qt	ePZ			59			iPZ			11 58 d
28	Wr	ePZ	02	59	10			esPZ			12 41
	Qt	ePZ	03	00	02			eSZN			13 14
28	Qt	ePZ	12	01	24			iSN*			17
28	Qt	ePZ	17	27	14			Mu Sec			
29	Wr	iPZ	03	16	57 d			PZ 0.6 1.2			
	Lh	iPZ			17 31 d			H 01 10 20			
		esPZ			43			36½ N 71 E			
		iSZ			18 39			Hindukush			
	Qt	ePZ			02			depth about 200 km			
		esPZ			14			Mag 5.7 (Qt)			
		eXZ			19 24	30	Wr	iPZ	05	06	03 c
		eSN*			36			iSZ			38
	Ch	ePZ	20	55			Qt	ePZ			07 02
		eSN			24 54			eSZN			08 22
		H 03 16 00						H 05 05 16			
		37¼ N 72½ E						Hindukush			
		Pamirs, Tadzhikistan				30	Qt	ePZ	05	21	11
		depth about 30 km						eSN*			25 10
29	Wr	iPZ	05	30	44 d		Wr	ePZ			21 19
	Qt	iPZ			31 15 d			USCGS H 05 16 15			
		USCGS H 05 21 29						41½ N 44 E			
		27½ N 139½ E						Georgia, S.S.R.			
		Bonin Islands region				30	Qt	ePZ	06	03	35
		depth about 450 km						eSN*			14 30

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 01 50 26 7 S 154½ E Solomon Islands					Qt	ePZ iPcPZ ePPZ eSKSNEZ iSN* ePSN* eSSN* eLN*	18	17	24 c
30	Qt	ePZ	07	36	54						
30	Ch	ePZ epPZ eSN esSN	16	17	24 46 22 00 45						
	Lh	ePZ	19	28				Mu Sec			
	Wr	ePZ		46				PZ 0.4 1.5			
	Qt	ePZ epPZ eSNN* esSN*	20	19 42 27 14 55				PPZ 0.4 2.2 MN* 6.3 19.0			
	Kr	eXZ	20	50			Kr	ePZ	18	17	52 c
		USCGS H 16 11 40 25 N 122 E Near north coast of Formosa depth about 100 km Mag 5.8 (Up, Ki)						USCGS H 18 04 50 52½ N 169 W Fox Islands Aleutian Islands Mag 6-6¼ (Pas), 6.0 (Up, Ki), 6.5 (Qt, Lh,)			
30	Ch	ePZ iPZN ePPZ iSN eScSNZ ePPSN	18	16	52 57 19 58 26 50 27 14 47	30	Wr	iPZ iSZ	19	03	08 c
	Wr	ePZ	16	55							
	Lh	iPZ iPcPZ eSZ	17	01 c							
		Mu Sec PZ 0.7 1.4				30	Qt	ePZ	19	21	43
								USCGS H 19 09 09 52½ N 168½ W Fox Islands Aleutian Islands			

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
30	Qt	ePZ	19	42	09 c	31	Ch	ePZN	19	45	02
		Aleutian Islands						ePcPZN			06
30	Qt	ePKPZ	21	38	46			ePPZN			48 19
		USCGS H 21 20 05 Fiji Islands region						eSN			55 28
31	Wr	iPZ	00	06	48 d		Wr	eScSN			37
	Qt	ePE eSE	07 09	42 05			Qt	ePZ			46 44
		Hindukush						ePZ			52
31	Wr	iPZ	00	27	02			eXZ			50 26
	Qt	ePE eSNE	28 29	05± 18				ePPZ			51 09
		Hindukush						ePPZ			53 35
31	Qt	ePZ	02	57	52			ePKKPZ	20	02	17
31	Qt	ePZ	03	55	01 c			Mu Sec			
		eSN*		59	14			PPZ 0.4 2.5			
		Georgia, S.S.R.						MN* 16.0 18.0			
31	Qt	ePZ	09	36	08			USCGS H 19 32 30			
	Wr	ePZ			20			15 S 169 E			
		USCGS H 09 31 18 41½ N 44½ E Georgia, S.S.R.						New Hebrides Islands			
1	Qt	ePZ	10	34	07			Mag 7½ (Pas), 7¼ 7½ (Berk), 7.1 (Up, Ki), 6.6 (Qt)			
31	Qt	e(P)Z	20	10	10						
	Ch	ePZ			11 36						

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Date	Phase	h m s	Date	Phase	h m s
	Quetta			eSE	10 26
1	ePgZ	08 28 01	8	ePZ	15 21 43
	eSgE	12	8	iPgZ	16 48 42
1	ePZ	20 47 30		iSgE	44 c
	eSE	48 50	8	ePZ	19 10 13
2	ePZ	05 14 53		eSZE	30
2	eXZ	22 54.5	9	ePZ	15 03 26
3	ePgZ	15 35 51	9	ePZ	15 29 27 c
	eSgZE	54	9	ePZ	17 55 26
4	ePZ	01 21 40		eSE	56 00
4	ePZ	04 45 03	9	ePZ	18 25 58
	eSE	32		eSE	26 19
4	ePZ	10 20 47	10	ePZ	10 43 32
4	iPgZ	12 45 37.1		eSE	53
	iSgZ	39.5	10	ePZ	10 49 27
4	ePgZ	21 25 32	10	ePZ	11 53 16
	eSgE	46		eSE	38
4	ePZ	21 53 38	10	ePZ	20 13 58 d
6	ePZ	08 55 47		eSE	14 20
6	ePZ	04 04 46	10	ePZ	20 20 59
	eSE	06 14	10	ePZ	20 22 45
6	ePZ	14 15 41		eSE	23 07
6	ePZ	15 17 16	11	ePZ	12 16 47
	eSE	51	11	ePZ	22 17 54
6	ePZ	22 26 40		eSE	18 09
	eSE	28 07	12	ePZ	00 26 50
7	ePZ	07 36 48		eSE	27 12
	eSE	37 23 c	12	ePZ	18 07 16
7	ePZ	09 03 10		eSNE	38
7	ePgZ	15 07 07	14	eXZ	02 31 36
	eSgZ	09.5	14	eXZ	05 33 16
7	ePZ	19 08 360	14	ePZ	08 12 43

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Date	Phase	h m s	Date	Phase	h m s
	eSE	13 05	21	ePZ	21 11 19
15	ePgZ	04 31 48.4		eSN	38
	eSgZE	50.8	22	ePgE	11 06 57.5
15	ePZ	17 11 35		eSgE	59.7
	eSE	56	23	ePZ	00 04 37
15	ePZ	18 19 03		eSE	05 44
	eSZ	20 22	23	ePgZ	02 41 02
15	eXZ	18 25 57		eSgE	13
16	ePgZ	02 04 30	23	ePZ	03 00 46
	eSgE	37	23	ePZ	10 33 47
16	ePgZ	03 35 34	23	ePgZ	17 51 41
	eSgE	59		eSgE	52
16	ePZ	10 31 10	23	ePZ	19 35 36
17	eXZ	02 18 57		eSE	36 17
17	e(P)Z	05 34 11	24	ePgZ	02 13 32
17	iPgZ	22 50 08 d		eSgE	42
	eSgE	19	24	ePZ	10 14 33
18	ePgZ	10 12 06	24	ePZ	10 50 20
	eSgE	19	25	ePZ	18 15 30
18	ePZ	15 40 59		eSNE	16 04
18	eXZ	15 44 58	25	ePgZ	20 14 12.6
18	ePZE	20 52 45		eSgE	14.6
	eSE	53 10	26	ePZ	03 18 59
19	ePZ	16 21 07	28	ePZ	09 19 14
20	eXZ	01 02.0	28	ePZ	18 29 16
20	ePgZ	07 57 01	29	ePE	05 32 09
	eSgNE	11		eSE	32
20	eXZ	10 27.5	29	ePZ	18 13 12
20	ePZ	23 10 15	29	eXE	18 14.0
21	eSZ	13 35 03	31	ePgZ	12 40 15.5
	eSZ	25		eSgZ	17.5

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**Minor Shocks**

I	Date	Phase	h m s	Date	Phase	h m s
	31	ePZ	21 05 19	7	iPZ	02 54 43 d
	31	ePZ	23 09 38		iSZ	55 11 17
		eSN	10 02	8	iPZ	13 42 07 c
		<b>Warsak</b>			iSZ	44 17
				9	ePZ	10 02 06
I		iPZ	02 21 48 d		iSZ	30 18
		iSZ	22 34	9	iPZ	16 58 50 c
I		ePZ	07 59 08		iSZ	59 29 18
		eSZ	53	9	iPZ	18 17 09 c
I		iPZ	10 47 59		iSZ	41 18
		iSZ	48 26	9	ePZ	19 21 33 18
I		iPZ	11 43 31		eSZ	22 03
		iSZ	44 03	12	ePgN	23 50 28 18
2		ePZ	07 54 56		eSgN	43
2		ePZ	17 37 24	13	ePN	07 39 41 18
		eSZ	52		eSZ	40 09
2		ePZ	18 31 34	14	iPZ	17 04 44 c
		iSZ	32 06	15	iPZ	18 17 58 19
2		ePZ	22 54 04		iSZ	18 28
4		iPZ	06 50 50	15	iPZ	19 20 12 c
		eSZ	51 18		iSZ	41 20
4		ePZ	09 00 52	16	iPZ	01 42 34 20
		eSZ	01 26	16	iPZ	05 00 09 d
4		iPZ	14 04 11 c		iSZ	42 21
		iSZ	44	16	ePZ	12 06 57 21
6		iPZ	02 16 22 d		iSZ	07 38 21
		iSZ	17 05	16	iPZ	12 56 25 d
6		iPZ	14 03 47 c		iSZ	57 06 23
6		ePZ	20 20 40	16	ePZ	13 03 42 23
		iSZ	21 08		eSZ	04 15 23
6		iPZ	22 25 53 c	16	ePgZ	22 43 11 23
		iSZ	26 34			

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**Minor Shocks**

Date	Phase	h m s	Date	Phase	h m s
	iSgZ	24	23	ePZ	22 33 37
	ePZ	04 31 50	23	ePZ	23 49 58
	iSZ	32 21	24	ePZ	09 21 38
	iPZ	19 19 46 c		iSZ	22 15
	iSZ	20 13	26	ePZ	00 47 54
	ePZ	05 41 36	26	ePZ	19 28 08
	iSZ	42 13		iSZ	54
	ePZ	10 37 41	27	ePZ	06 30 00
	iPZ	15 38 39 c		iSZ	40
	iSZ	39 14	27	ePZ	18 28 41
	iPZ	16 28 49 d		iSZ	29 01
	iSZ	29 19	27	ePZ	22 33 34
	ePZ	21 29 45	27	ePZ	23 23 58
	iSZ	30 20		iSZ	24 31
	iPZ	21 33 43 c	28	ePZ	05 37 56
	iSZ	34 16		iSZ	38 24
	iPZ	02 23 34 c	28	ePZ	09 15 54
	iPZ	20 37 36 d		iSZ	16 28
	iSZ	38 17	28	ePZ	23 55 58
	ePZ	00 58 09		iSZ	56 26
	iSZ	48	30	ePZ	00 56 18
	ePZ	10 27 24	30	iPZ	16 34 25 d
	ePZ	21 07 28	31	iPZ	06 48 55 d
	iSZ	58		iSZ	49 23
	ePZ	00 14 24	51	ePZ	08 58 19
	iSZ	54		eSZ	59 00
	ePZ	06 32 49	31	ePZ	10 34 18
	ePZ	12 36 29	31	iPZ	16 54 07 d
	eSZ	57	31	ePZ	23 10 19
	ePZ	12 40 05			
	iSZ	33	1	<b>Lahore</b>	
	ePZ	19 55 07		ePZ	22 29 28
				eSZ	30 31

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Date	Phase	h m s	Date	Phase	h m s
1	eXZ	22 52 50	26	ePZ	13 55 53
2	ePZ	22 53 42		eXZ	59 24
	iSZ	54 06	27	ePZ	22 33 06
3	ePZ	02 31 55	29	ePZ	05 30 39
6	eXZ	04 27 30	30	ePZ	06 12 55
6	ePZ	14 04 24	30	ePZ	16 35 01
6	ePZ	22 26 59		eSZ	36 07
	eSZ	28 34			
7	eXZ	10 00 43			
9	eXZ	01 03 51			
12	ePZ	21 04 05	17	eXZ	06 39 11
13	eXZ	00 51 52	17	ePZ	07 14 59 ±
14	ePZ	14 05 01	17	ePZ	15 50 57
	eSZ	39	17	eXZ	16 48 50
15	ePZ	19 22 83	17	e(P)Z	23 10 45
16	ePZ	02 15 27	20	ePgZ	01 00 22
16	eXZ	16 12 42		iSgZ	32
18	ePZ	14 58 46	21	eXZ	15 49 33
19	ePZ	02 32 36	24	e(P)Z	22 31 07
21	iPgZ	30 63 19	25	iXZ	00 48 23
	eSgZ	32	25	eXZ	17 50 07
22	ePZ	16 21 51			
22	eXZ	16 31.5			
22	eXZ	17 32.5			
23	ePgZ	05 50 33	1	ePZN	13 25 07
	eSgZ	48		eSZN	24
23	ePZ	10 32 12	1	ePZ	22 39 04
				e(S)N	36
23	ePZ	22 33 31	3	e(P)N	06 47 49
24	eXZ	09 14 02	3	eXN	07 26 57
24	ePZ	09 49 33	5	eXN	05 23 08
25	ePZ	06 34 11	5	e(P)N	06 40 38
26	e(P)Z	09 08 18	6	eXN	00 06 58

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Date	Phase	h m s	Date	Phase	h m s
6	ePN	01 24 50	22	eXZ	15 19 30
6	eXN	04 24 26	33	ePZ	13 28 31
7	ePZ	22 06 43	24	e(P)Z	09 28 40
8	eXN	03 00 44	24	ePZN	18 40 16
9	eXZ	05 03 36	25	eXN	00 00 12
11	eXZ	05 50 08	25	eXZ	03 02 31
11	eXZ	09 20 23	25	e(P)Z	03 29 32
11	eXZ	12 26 52	25	ePZ	04 02 02 d
13	eXZ	10 17 34	25	ePN	17 49 17
13	eXN	11 05 10	25	eXN	21 32 32
14	eXZ	09 43 18	26	eXZ	04 43 00
15	eXN	04 53 30	26	eXN	09 09 16
15	ePZN	06 02 16 d	27	e(P)Z	18 37 20
15	ePZ	07 14 02	27	e(P)Z	19 35 59
15	ePZ	15 58 16		eSN	36 16
16	ePZ	08 05 22	28	eXZ	10 23 47
17	e(P)Z	07 11 37	30	eXN	01 15 11
21	e(P)Z	04 51 08	30	eXN	05 24 02
22	ePZ	11 44 15	30	eXN	06 06 20
			31	eXZ	00 33 04



is. Bull. Pakistan Quetta, Vol. 4 No. 6, June 1958

# SEISMOLOGICAL BULLETIN OF PAKISTAN

Vol. 4

JUNE 1958

No. 6

*Printed at*  
Bolan Muslim Press,  
QUETTA.



*Issued under the authority of the Director, Meteorological Service*  
PAKISTAN METEOROLOGICAL SERVICE  
GEOPHYSICAL INSTITUTE  
QUETTA

# Pakistan Meteorological Service

Director,  
Meteorological Service

Deputy Director,  
Geophysical Institute

Officer Incharge,  
Seismological Section

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The Seismological Bulletin of Pakistan is a monthly publishing data of Seismological stations in Pakistan.

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## SEISMOLOGICAL BULLETIN

of

PAKISTAN.

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
<b>Quetta (Central Station)</b>				
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.)

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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	0 "	—	—
<b>Lahore</b> Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
<b>Karachi</b> Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
<b>Chittagong</b> 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 "	—	—
<b>Warsak</b> Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
1	Qt	iPgZ	00	25	19.5 d		Wr	ePZ	45	17		
	Kr	ePnZ		26	36		Qt	ePZ			20	
		eP*Z			49	2	Qt	ePZ	13	31	50	
		ePgZ		27	04	3	Qt	ePZ	02	01	52	
		iSnZ			40			USCGS H 01 49 36				
		iS*Z			55			51 1/2 N 178 1/2 W				
	Wr	ePnZ		26	41			Andreanof Islands				
	Ch	ePZ		30	28 ±			Aleutian Islands				
		H 00 25 15										
		30 N 67.1 E					3	Qt	ePnZ	08	50	09
		Quetta foreshock							i!PgZ			20
		Felt Quetta							eSnN*			48
									iSgN*			51 01
1	Qt	iPgZ	03	08	16.2 d		Lh	ePnZ	50	17	c	
		iSgZ			18.8			ePgZ			30	
	Wr	ePnZ		09	38			eSnZ			51 01	
		Quetta foreshocks						eSgZ			19	
		Felt Quetta					Wr	iPnZ	50	27	c	
1	Qt	e(P)Z	11	02	19		Kr	i!PnZ			50 d	
1	Wr	ePZ	12	47	13			i!SnZ			51 58	
	Qt	ePZ			28			H 08 49 18				
		USCGS H 12 34 56						30 N 70 1/2 E				
		5 1/2 S 146 E,						Near Fort Munro,				
		Near north coast of						West Pakistan				
		New Guinea,					3	Qt	iPgZ	15	03	21.5
1	Ch	ePZ	18	33	36		Kr	ePnZ			04 39	
	Wr	ePZ			37			iP*Z			51	
	Lh	ePZ			46			iPgZ			05 03	
	Qt	ePZ			34 02 c			iSnZ			44	
		USCGS H 18 21 17					Wr	iPnZ	04	43		
		60 1/2 N 143 1/2 W					Lh	ePnZ			53	
		Alaska						eP*Z			05 08	
2	Ch	ePZ	07	42	17			ePgZ			25	
								eSnZ			06 01	

\* 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) 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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Date	Phase	h	m	s	Date	Phase	h	m	s
	H 15 03 17 30 N 67.1 E About 15 miles southeast of Quetta Observatory Felt Quetta				4	Ch ePZ	09	58	00
						Lh ePZ		59	30
						Wr iPZ			46 d
						Qt ePZ	10	00	00 d
3	Ch ePZ	19	44	25		USCGS H 09 47 39			
	ePcPZ			30		7 S 145 E			
	ePPZ		47	40		New Guinea			
	eSN		54	46		depth about 150 km			
	Wr e(PKP)Z		49	05	4	Ch ePZ	14	41	47
	Qt e(PKP)Z			49		ePcPZ			58
	ePPZN*		50	34		eSN			51 35
	eSKSN*		56	58		iScSN			58
	ePPSN	20	00	53		Wr iPZ	41	59	c
	eSSN*		05	54		Lh ePZ	42	04	c
	USCGS H 19 31 52					Qt ePZ			28 c
	15 S 168 E					e(PcP)Z			39
	New Hebrids Islands					ePPZ			45 42
	Mag 6½-6¾ (Berk),					iSZN*			52 54
	6.4 (Up, Ki)					iScSN*			53 06
						eLN*			15 03.0
						Mu Sec			
4	Qt iPgZ	07	55	49.4d		PZ 0.9 1.8			
	iSgZ			52.1		MN* 22.0 18.0			
	Quetta aftershock					Kr ePZ	14	42	51
	Felt Quetta					USCGS H 14 29 50			
4	Wr iPZ	08	41	54 c		52½ N 167 W			
	Lh ePZ		42	38		Fox Islands,			
	eSZ		43	30		Aleutian Islands			
	Qt ePZ		42	59		Mag 6-6¼ (Pas),			
	eSZE		44	09		6 (Berk),			
	H 08 41 28					6.7 (Qt)			
	35¼ N 71 E				5	Wr iPZ	02	31	42 c
	Hindukush region					iSZ			32 19

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Qt ePZ			45 c	6	Qt ePZ		12	17	34
		eSZN			34 15	6	Wr ePKPZ		19	34	47
		H 02 30 48					Qt ePKPZ				50±
		Northern Afghanistan					ePKSN				38 24
5	Qt ePZ		13	37	10	Lh ePPZ					37 40
		USCGS H 13 29 30					ePKSZ				38 31
		Mediterranean Sea				Ch ePKPZ					35 10
5	Qt ePZ		14	18	44		USCGS H 19 15 28				
		eXZ			22 24		5½ N 82½ W				
6	Wr iPZ		00	22	27 c		South of Costa Rica				
	Qt ePZ				32 c		Mag 6 (Pas)				
6	Qt ePKPZ		09	30	32	7	Qt ePZ		07	00	33
		eXZ			32 13	7	Qt ePZ		13	02	36
		ePKSZN*			34 03	7	Lh ePZ		18	39	32
		eSKKSN*			39 50		Wr ePZ				48
		eSSN*			50 18		Qt ePZ				40 04
	Wr ePKPZ		30	35		8	Ch ePZ		00	50	01
	Lh ePKPZ				42		Qt ePZ				53 14
		USCGS H 09 11 18					eSNN*				58 32
		8 N, 85 W					H 00 46 31				
		Off coast of					Nicobar Islands				
		Costa Rica				8	Wr ePZ		00	50	59 d
		Mag 6½-6¾ (Pas),					Qt ePZ				51 29 d
		6.5 (Up Ki)					eSKSN*				01 01 50
6	Wr ePZ		10	34	30		iSN*				56
	Lh ePZ				34		ePPSN*				03 14
		eSZ			35 45		ePKPPKPZ				17 36
	Qt ePZ				39		Mu Sec				
		eSNE			37 43		PZ 0.2 1.4				
		H 10 33 01					USCGS H 00 38 52				
		Kashmir-Sinkiang					53 N, 167 W				
		border					Fox Islands,				

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Aleutian Islands					Wr	ePZ	22	37	
		Mag $6\frac{1}{2}$ - $6\frac{3}{4}$ (Pas)					Lh	ePZ		46	
		6.1 (Qt),					Qt	ePZ	23	07	
		5.6 (Up, Ki),						eSN*	33	33	
8	Wr	iPZ	08	13	36 d			Mu Sec			
	Qt	ePZ		14	18			PZ 0.2 1.5			
	Lh	ePZ			45			USCGS H 00 10 30			
9	Qt	ePZ	01	29	30			53 N 167 W			
		eSZN			31 00			Fox Islands			
	Wr	ePZ			29 55 d			Aleutian Islands			
9	Qt	ePZ	07	13	48 c			Mag 6.1 (Qt)			
9	Wr	iPZ	11	01	59 c	10	Lh	ePZ	00	38	29
		iSZ			02 34		Qt	ePZ			50
	Qt	ePZ			03 04	10	Qt	ePKPZ	04	19	07
		eSZN			04 32			USCGS H 04 00 04			
		H 11 01 09						30 $\frac{1}{2}$ S 177 W			
		Northern Afghanistan						Kermadec Islands			
9	Wr	ePZ	16	11	15	10	Ch	iPZ	05	01	34
	Lh	ePZ			21		Lh	ePZ	02	33	
	Qt	ePZ			44 c		Wr	iPL		46 d	
		ePcPZ			49		Qt	iPZ	03	18 d	
		ePPZ			15 00			ePPZ	05	35	
		eSN*			22 10		Kr	iPZ	03	30 d	
		Mu Sec						USCGS H 04 53 35			
		PZ 0.2 1.2						27 $\frac{1}{2}$ N, 140 E			
		USCGS H 15 59 00						Bonin Islands region			
		52 $\frac{1}{2}$ N, 168 W						depth about 500 km			
		Fox Islands,				10	Qt	ePZ	07	07	20
		Aleutian Islands						eSZN			09 56
		Mag 6.1 (Qt)					Kr	ePZ	07	46	
10	Ch	ePZ	00	22	37		Wr	ePZ	08	11	
		eSN			32 37						

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Lh	ePZ			36			USCGS H 11 54 04			
		eSZ			12 21			7 $\frac{1}{2}$ N, 84 $\frac{1}{2}$ W			
		USCGS H 07 04 02						Off south coast			
		30 $\frac{1}{2}$ N 51 $\frac{1}{2}$ E						of Costa Rica			
		Western Iran						Mag 6.6 $\frac{1}{4}$ (Pas)			
		Mag 5.4 (Up, Ki)				12	Ch	ePZ	21	05	00
10	Qt	ePZ	20	12	58			ePPZ			08 02
		eSE			15 43			ePPPZ			09 50
10	Wr	iPZ	21	54	12			eSZ			14 59
		iSZ			47		Wr	iPZ			05 07
	Lh	ePZ			53 $\pm$		Qt	ePZ			35 c
	Qt	ePZ			55 04			ePcPZ			40
		eSNE			56 20			eXZ			54
		H 21 53 25						eXN*			08 34
		Northern Afghanistan						ePPZ			58
								eSKSNE			15 57
11	Wr	iPZ	11	01	41 d			iSN*			16 03
		iSZ			02 18			eSSN*			21 40
	Lh	ePZ			14 $\pm$			ePKPPKZ			31 44
	Qt	ePZN			43 d			Mu Sec			
		eSNE			04 11			PZ 0.6 1.9			
		H 11 00 48						MN* 20.0 20.0			
		Northern Afghanistan					Kr	ePZ	21	05	58
11	Lh	ePZ	12	29	29			USCGS H 20 52 57			
		iSZ			56			53 N 167 W			
	Wr	iPZ			59 d			Fox Islands,			
		iSZ			30 47			Aleutian Islands			
	Qt	ePE			55			Mag 6.4 (Up, Ki),			
		eSE			32 26			6.5 (Qt)			
		H 12 28 55									
		32 $\frac{3}{4}$ N 76 E									
		Northern India									
12	Qt	ePKPZ	12	13	22 $\pm$						

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	USCGS H 21 33 25						Qt	ePZ	45	37	±
	53 N 167 W							eSKSN*	56	05	
	Fox Islands							USCGS H 11 32 38			
	Aleutian Islands							9 S 150 E			
12	Qt	ePZ	22	30	43			Near east coast of			
14	Kr	iPnZ	00	36	00 c			New Guinea			
		iPgZ		02		*15	Wr	ePKPZ	15	12	19
		iSnZ		23			Qt	ePKPZ		28	
		iSgZ		26				ePPZ	13	57	
	Qt	ePnZ		34				epPKPZ	14	37	
		ePgZ		50				ePPPZ	16	52	
		iSnZN		37	23			e!XNN*	21	04	
	H 00 35 28							e!SSN*	29	37	
	26½ N 66 E							USCGS H 14 54 37			
	Near Bela,							18 S 178½ W			
	West Pakistan							Fiji Islands			
14	Qt	ePZ	18	42	56			depth about 600 km			
	USCGS H 18 29 59							Mag 6¼ (Pas)			
	12 N, 161½ E					15	Qt	e(P)Z	15	22	39
	Marshall Islands					15	Qt	ePZ	16	19	34
14	Qt	ePZ	20	55	39	15	Ch	ePZ	17	31	06
15	Qt	ePKPZ	02	59	04		Qt	ePZ	33	52	
	USCGS H 02 40 20							eSKSN*	44	13	
	18½ S 177½ W							eSN*		40	
	Fiji Islands							ePPSN*	46	06	
15	Wr	iPZ	08	50	48 d			e(SS)N*	50	55	
		iSZ		51	20			USCGS H 17 20 56			
	Qt	ePZ		49				9½ S 150 E			
		eSZN		53	09			Near north coast of			
	H 08 50 04							New Guinea			
	Hindukush					15	Wr	iPZ	20	35	23 c
15	Ch	ePZ	11	42	55			iSZ		58	

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
							Qt	ePZ	36	27	
								eSNE	37	53	
								H 20 34 35			
								Northern Afghanistan			
16	Wr	ePZ	10	51	05			eSN*	33	23	
		iSZ		40				iXN*		33	
	Qt	ePZ		52	10			eLN*		39.0	
		eSZN		53	29		Lh	ePZ	25	22	
17	Ch	ePZ	00	35	11			ePPZ	27	43	
	Wr	ePZ		36	20			USCGS H 01 15 02			
	Qt	ePZ		37	03			68½ N 16 W			
								Off north of Iceland			
						18	Qt	ePZ	04	44	09
								eSN*	52	17	
								USCGS H 04 34 04			
								69 N 16 W			
								Iceland aftershock			
						18	Wr	ePZ	08	46	17
							Lh	ePZ		55	
							Qt	iPZ	47	14	d
								esPZ	48	08	
								eSZN		36	
								H 08 45 29			
								37 N 71 E			
								Hindukush			
								depth about 200 km			
						18	Qt	ePZ	13	47	17
								eSNE	50	04	
						18	Lh	ePZ	16	27	19
							Qt	ePZ		28	
								ePPZ	31	04	
								eSN*	38	18	
								H 16 14 27			
						19	Wr	ePZ	05	28	17

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	ms
	Lh	ePZ			17			esPZ	08	09
	Qt	ePZ			54 c			eSNE		33
		ePcPZ			29 22		H 22 05 35			
		eSN*			37 40		36 N, 71 E			
		eSSN*			42 04		Hindukush			
		Mu					depth about 150 km			
	Kr	PZ	0.3	1.8		21	Qt	ePZ	08	36 00
		ePZ			05 29 25±			USCGS H 08 23 43		
		USCGS H	05 18 00					Andreanof Islands		
		49½ N	156 E					Aleutian Islands		
		Kurile Islands				21	Wr	iPZ	10	48 36 c
		Mag 6½ (Pas),					Lh	iPZ	49	16
		6-6¼ (Berk),						iSZ	50	13
		5.9 (Up, Ki),					Qt	ePZ	49	42 c
		6.2 (Qt)						eSN	51	01
19	Qt	ePZ			10 46 33			H 10 48 00		
19	Qt	cPZ			18 46 00			36 N 71½ E		
		eSNE			47 37			Hindukush		
20	Qt	ePKPZ			17 50 26			depth about 200 km		
		USCGS H	17 32 36			21	Qt	ePZ	12	31 18 c
		20½ S	179 W			21	Wr	ePZ	18	45 30
		Fiji Islands						eSZ	46	26
		depth about 600 km					Qt	ePZ		40
20	Qt	ePZ			19 26 31			eSZN	48	31
		eSN			34 04			H 18 44 16		
		USCGS H	19 17 10					38½ N 72 E		
		31½ N	129½ E					Tadzhikistan		
		East China Sea						S.S.R.		
20	Wr	ePZ			22 06 11	21	Wr	iPZ	22	09 26 c
	Lh	ePZ			51			iSZ		59
		eSZ			07 50		Qt	ePZ	10	25 c
	Qt	ePZ			15			eSNE	11	42

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		H	22	08	42			Mu			Sec
		Hindukush						PZ	0.2	1.4	
22	Lh	ePZ	05	07	26			USCGS H	05	10	03
	Wr	ePZ			30			49 N	102 E		
	Qt	ePZ			08 07			Outer Mongolia			
	Kr	ePZ			28			Mag 5.7 (Up, Ki),			
		USCGS H	04 57 38					5.8 (Qt)			
		44 N,	147 E			23	Qt	ePKPZ	19	35	28 c
		Southern Kurile						USCGS H	19	17	43
		Islands						18 S,	178 W		
22	Lh	ePZ	05	37	49			Fiji Islands			
	Qt	ePZ			38 35			depth about 650 km			
		eSN			45 55						
		USCGS H	05 29 29			24	Ch	ePZ	00	15	49
		37 N	135 E				Lh	ePZ		18	19
		Sea of Japan					Qt	ePZ			48
		depth about 350 km						e(S)NN*			26 38
22	Qt	ePZ	17	50	39			USCGS H	00	09	18
		e(S)N			52 22			8½ S	112 E		
23	Wr	iPZ	00	59	52 c			Near south coast			
	Qt	ePZ	01	01	01			of Java			
		eSNE			02 48			depth about 200 km			
		H 00 58 42				24	Wr	iPZ	04	50	25 c
		Tadzhikistan					Lh	ePnZ			37
		S.S.R.						e(Pg)Z			51 16
23	Qt	ePZ	02	30	32			iSnZ			52 26
		e(S)N			32 05		Qt	ePZ			51 36
23	Wr	iPZ	05	15	50 c			eSZN			54 10
	Lh	ePZ			51		Ch	ePZ			53 09 c
	Qt	ePZ			16 38			eSZ			57 06
		ePPZ			17 43			USCGS H	04 48 15		
		ePcPZ			19 24			30½ N	78½ E		
		eSNN*			21 52			Western Sinkiang			
		eLN*			24.0			Province, China			
								Mag 5.9 (Up, Ki)			

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24	Wr	ePZ	06	52	20			Near north coast of			
	Qt	ePZ			35			New Guinea			
34	Qt	e(P)Z	06	56	01			Mag 6 $\frac{1}{4}$ -6 $\frac{1}{2}$ (Pas)			
24	Qt	ePZ	16	29	46			6.9 (Up, Ki),			
	Wr	ePZ			59			6.6 (Qt),			
25	Qt	ePZ	01	17	14			6.5 (Lh),			
		e(S)EN*			20 05			6.7 (Ch),			
	Wr	ePZ			17 42	25	Lh	ePZ	12	56	09
	Lh	ePZ			18 08		Wr	ePZ			31
25	Ch	ePZ	09	46	33		Qt	ePZ			48
		ePPZ			48 49			USCGS H 12 43 55			
		eSZ			54 38			5 S 152 E			
		eScSZ			56 22	25	Qt	ePKPZ	23	20	36 c
		Mu Sec					Wr	ePKPZ			49
	PZ	0.9	1.0			25	Wr	ePZ	23	59	26 c
	Lh	ePZ			09 48 15	26	Ch	ePZ	04	48	11
		iPcPZ			28			epPS			43
		eSZ			57 59		Wr	ePZ			31
		Mu Sec					Lh	iPZ			33 d
	PZ	0.8	1.8				Qt	iPZ			49 07 d
	Wr	iPZ			09 48 32 c			epPZ			40
	Kr	ePZ			41			ePPZ			51 17
	Qt	ePZ			50 c			eSN*			57 47
		ePcPZ			58			esSN*			58 38
		ePPZ			51 57			eSSN*	05	02	11
		eSNN*			58 59			eLN*			06.6
		eScSN			59 14		Kr	iPZ	04	49	32 d
		ePKPPKPZ	10	15	36			USCGS H 04 38 12			
		Mu Sec						54 $\frac{1}{2}$ N 159 $\frac{1}{2}$ E			
	PPZ	1.2	2.2					Kamchatka			
	USCGS H	09	36	30				Slightly deeper than			
	3 S	144 $\frac{1}{2}$	E					normal			
								Mag 6 $\frac{1}{4}$ -6 $\frac{1}{2}$ (Pas),			
								6.0 (Up, Ki)			

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26	Qt	ePZ	05	17	27			Mag 6 (Pas).			
26	Ch	ePZ	07	45	45			5.8 (Ki)			
		eSZ			50 51	27	Qt	ePZ	18	23	01
	Lh	ePZ			47 46	28	Wr	iPZ	01	29	56 d
	Wr	iPZ			48 03 d		Qt	ePZ			31 01
	Qt	ePZ			35 d			eSZN			32 21
		USCGS H 07 39 21						Hindukush			
		14 N 125 $\frac{1}{2}$ E				28	Qt	ePZ	02	33	24
		Ryukyu Islands,				28	Qt	ePZ	17	11	04
26	Qt	ePZ	13	16	14	28	Wr	iPZ	19	42	33 d
	Wr	ePZ			46		Qt	ePZ			55 c
26	Qt	ePZ	14	35	54			USCGS H 19 29 58			
26	Qt	ePZ	20	10	04			12 N 162 E			
26	Ch	ePZ	23	37	41			Marshall Islands			
	Wr	ePZ			39 29	28	Wr	iPZ	20	47	44 d
	Qt	ePZ			40 04		Qt	ePZ			48 46
		ePcPZ			41			eSNE			50 08
		eSN*			48 37			Hindukush			
		eScSN*			49 58	29	Qt	e(PKP)Z	03	44	19
		eLN*			56 5			USCGS H 03 25 42			
		USCGS H 23 29 32						15 $\frac{1}{2}$ S 70 $\frac{1}{2}$ W			
		31 N 141 $\frac{1}{2}$ E						Southern PerU			
		South of Honshu,						depth about 150 km			
		Japan						Mag 6 $\frac{1}{2}$ (Berk)			
		Mag 6.0 (Up, Ki)				27	Lh	ePZ	04	08	35
27	Lh	ePZ	04	08	35	29	Qt	e(PKP)Z	09	33	03
	Qt	ePZ			09 11			USCGS H 09 14 37			
27	Qt	ePKPZ	06	03	43			16 $\frac{1}{2}$ S, 172 W			
		ePKSZ			06 55			Tonga Islands			
		USCGS H 05 44 28				29	Wr	ePZ	23	25	07
		13 N 88 $\frac{1}{2}$ W						USCGS H 23 14 59			
		Near east of						3 $\frac{1}{2}$ N 127 E			
		El-Salvador						Molucca Passage			
		depth about 60 km				30	Wr	iPZ	08	49	35 d



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Date	Station	Phase	h	m	s
	Kr	iPZ			37 d
		ePPZ		51	03
	USCGS H	08 42 33			
		36½ N 27½ E			
		Dodecanese Islands			
30	Wr	iPZ	18	36	15 c
	Kr	ePZ		37	01
	USCGS H	18 26 20			
		31 N 141½ E			
		South of Honshu, Japan			
		Mag 6.3 (Up, Ki)			

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Date	Phase	h	m	s	Date	Phase	h	m	s
	<b>Quetta</b>				1	ePgZ	05	07	05.8 d
1	ePgZ	00	34	22 d		eSgZ			08.5
	eSgZ			25	1	ePZ	05	09	23
1	ePgZ	00	38	15.5 d	1	iPgZ	05	38	02.3 d
	eSgZ			18.4		eSgZ			05.0
I	ePgZ	00	44	46.5 d	1	iPgZ	05	52	27.9 d
	eSgZ			49		iSgZ			30.6
1	iPgZ	00	55	56.8 d	1	ePgZ	07	43	00.7 d
	iSgZ			59.5		eSgZ			03.4
1	iPgZ	01	03	59.8 d	1	iPgZ	10	01	20.2 d
	iSZ			04 02.7	1	ePgZ	10	04	47.2
1	ePgZ	01	36	20		eSgZ			49.9
	eSgZ			22.7	1	iPgZ	11	54	56.5 d
1	ePgZ	01	48	58.0 d		iSgZ			59.0
	eSgZ			49 00.5	1	ePgZ	12	01	07.8
1	ePgZ	02	16	25.2 d		eSgZ			10.3
	ePgZ			28.0	1	ePgZ	12	21	16.1
1	ePgZ	02	17	33.2		eSgZ			18.6
1	ePgZ	03	14	27.5	1	ePZ	13	38	27
	eSgZ			30.0	1	ePZ	14	23	04
1	ePgZ	03	45	49.7	1	eSZ	14	26	59
	eSgZ			52.2		eSZ			27 27
1	ePgZ	04	08	44.0	1	ePgZ	14	53	49.5
	eSgZ			46.5		eSgZ			52.0
1	ePZ	04	11	06	1	iPgZ	14	56	54.5 d
1	iPgZ	04	20	54.5 d		iSgZ			57.0
	iSgZ			57.2	1	ePZ	15	12	45
1	ePZ	04	28	08		eSZ			13 13
1	ePZ	04	29	44	1	ePZ	15	17	49.0
1	ePZ	04	38	45		eSZ			51.5
1	ePZ	04	43	14	1	eXZ	18	31	0
1	iPgZ	04	58	23.5 d	1	eXZ	20	09	43
	iSgZ			26.0	1	eXZ	20	54	06

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
1	iPgZ	21 16 18.5 d	3	iPgZ	17 08 31.2 d
	iSgZ	21.0		iSgZ	33.7
2	ePgZ	00 24 00.4	3	iPgZ	17 11 41.4 d
	eSgZ	03.0		iSgZ	44.0
2	ePgZ	00 39 18.3 d	3	ePgZ	17 22 40.2
	eSgZ	21.0	3	ePgZ	18 12 23.5
2	ePgZ	02 48 03.2		iSgZ	26.2
	eSgZ	05.9	3	iPgZ	18 38 34.8 d
2	ePZ	04 37 53		iSgZ	37.5
2	ePZ	06 13 55	3	iPgZ	18 56 01.6 d
2	ePZ	09 36 26.5		iSgZ	04.3
2	iPgZ	12 36 57.5 d	3	iPgZ	19 30 54.7
	iSgZ	37 00.2		iSgZ	57.3
2	iPgZ	14 59 14.2 d	3	iPgZ	19 56 29.7 d
	iSgZ	16.8		iSgZ	32.3
2	ePZ	15 11 48	3	ePgZ	20 47 10.4
2	ePZ	18 34 44.9	3	iPgZ	21 00 28.4 d
2	ePZ	19 26 37	3	iPgZ	21 09 39.1 d
	eSZ	27 11	3	iPgZ	21 25 57.0 d
2	eXZ	21 07 37		iSgZ	59.6
3	ePZ	00 44 19	3	ePgZ	21 57 48.3
3	ePgZ	15 14 03.0 d		eSgZ	51.8
	eSgZ	0.57	3	ePgZ	22 06 55.6
3	ePgZ	15 18 59.8	3	iPgZ	23 59 35.0 d
	eSgZ	19 02.5		iSgZ	37.7
3	iPgZ	15 56 02.7 d	4	iPgZ	00 50 46.9 d
	iSgZ	05.4		iSgZ	49.6
3	ePZ	16 18 57	4	ePgZ	00 59 08.3
3	eXZ	16 22.0		eSgZ	11.3
3	iPgZ	16 37 44.2 d		iPgZ	04 58 01.6 d
	iSgZ	47.1	4	iPgZ	06 49 51.8 d
3	iPgZ	16 59 50.1 d	4	iPgZ	06 49 51.8 d
	iSgZ	52.8		iSgZ	53.7

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
4	iPgZ	13 37 39.3 d	8	ePZ	11 51 14
	iSgZ	41.9	8	ePZ	16 45 36
4	iPgZ	14 58 43.7 d	9	ePZ	10 12 41 c
	iSgZ	46.2	9	iPgZ	10 53 34.7 d
4	ePZ	16 26 17		iSgZ	37.5
4	ePgZ	16 57 20.5	9	ePZ	12 28 05
	eSgZ	23.0	9	ePZ	16 26 50
4	iPgZ	18 40 38.0 d	9	ePgZ	19 39 43.1
	iSgZ	40.7		eSgZ	45.8
4	ePgZ	23 22 55	10	ePgZ	03 44 03.0 d
	eSgZ	23.10		iSgZ	05.7
5	ePZ	12 31 31	10	iPgZ	03 44 57.0 d
5	ePgZ	17 52 11.4		iSgZ	59.7
	iSgZ	14.0	10	iPgZ	14 07 16.6
6	ePgZ	01 03 22		iSgZ	18.1
	eSgZ	29	10	ePgZ	19 04 21
6	ePZE	23 32 56		eSgNE	31
	eSZ	34 15	10	ePgZ	22 25 51
7	ePgZ	00 53 18		eSgZ	26 01
	eSgZ	23	11	ePZ	04 02 18
7	ePZ	09 21 36	11	ePZ	07 27 26
7	iPgZ	10 40 47.3 d		eSNZ	43
	iSgZ	50.0	12	iPgZ	19 57 22.0 d
7	ePgZ	10 50 27.1 d		iSgZ	24.7
	iSgZ	29.8	12	ePZ	27 09 09
7	iPgZ	12 14 13.4 d	13	ePgZ	00 41 08.5
	iSgZ	16.2		eSgZ	11.0
7	eXZ	19 31 31	13	ePZ	05 29 57
	ePZ	19 40 37	13	ePZ	13 02 08
7	eXZ	20 59 32	14	ePgZ	01 26 41
7	ePZ	23 10 19		eSgZ	51
8	e(P)Z	07 52 50	14	ePgZ	09 53 18

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
14	eSgNE	30	18	eSgZ	50
14	ePZ	15 41 18	18	ePZ	10 16 44
14	eSNE	42 33	18	iPgZ	19 10 04.5 d
14	ePZ	21 12 16		eSgZ	06.7
14	eSN	13 35	19	ePZ	05 47 52
14	ePZ	21 19 32	19	ePZ	07 32 11
15	eSZNE	20 49	19	ePZ	17 14 47
15	eXE	00 40 38	19	ePZ	18 46 00
15	eXZ	11 17.5		eSNE	47 37
15	ePZ	12 33 58	20	eXZ	05 41 40
15	ePZ	13 08 33	20	ePgZ	05 47 29.3
16	ePgZ	00 13 17.0		eSgZ	31.9
16	iSgNE	19.5	20	ePgNE	09 03 59
16	iPgZ	02 31 23.5 d		eSgNE	04 10
16	iSgN	26.0	20	ePZ	09 10 48
16	eXZ	08 33 06	20	iPgZ	16 14 12.0 d
16	ePZ	09 16 43		iSgZ	14.9
16	ePZ	09 59 16	21	ePgZ	15 43 06
16	eXZ	12 04 44		eSgN	11
16	ePZ	16 45 13	21	ePgZ	16 56 12
16	eXZ	18 42 39		eSgNE	14
17	ePZ	04 48 37	22	ePZ	01 44 44
17	eSN	57	22	ePZ	05 48 20
17	ePZ	13 28 17		eSNE	49 10
17	ePZ	19 13 57	22	iPgZ	11 17 21.5 d
17	eSNZ	14 16		iSgN	24.2
17	ePZ	19 21 14	22	ePZ	12 16 27
17	ePZ	20 55 57	22	ePZ	14 04 25
17	eSNE	56 17	22	iPgZ	10 56 54.1
18	ePZ	02 06 55	23	iSgZ	56.6
18	ePZ	07 36 08	23	ePgZ	19 24 30.2
18	eSZ	24		eSgZN	32.6
18	ePgZ	09 50 41			

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
4	ePgZ	04 00 06	29	ePZ	06 35 44
4	eSgN	18	29	ePZ	10 30 58
4	ePZ	06 05 08	29	ePgZ	12 43 28
5	eSE	29		eSgNE	41
5	eXZ	05 13 11	29	ePZ	11 53 18
5	ePZ	10 40 27			
5	eSNE	41 03		<b>Warsak</b>	
5	ePZNE	10 44 57	1	ePZ	01 47 15
5	ePZ	11 15 22		eSZ	49
25	eXZ	12 43 48	1	ePgZ	07 22 42
25	eXZ	20 49.2		iSgZ	49
25	eXN	21 12.8		iPZ	10 31 34 c
26	ePZ	03 54 01		iSZ	32 04
26	ePgZ	05 08 40	1	iPZ	14 35 42 d
26	eSgZ	53		iSZ	36 11
26	ePgZ	05 10 39	1	ePZ	18 04 15
26	eSgZ	52	1	ePZ	21 19 21
26	ePZ	12 46 53		eSZ	20 03
26	eSZ	47 50	2	ePZ	06 14 42
26	ePZ	18 22 46	2	iPZ	13 15 43 c
26	ePZ	10 50 19		iSZ	16 15
26	ePgZ	20 16 20	3	iPZ	03 47 11 d
27	eSgZ	32		iSZ	52
27	ePZ	01 37 23	4	iPZ	23 11 03 c
27	ePZ	01 52 49		iSZ	26
27	ePZ	19 08 04	5	iPZ	16 15 48 c
27	ePZ	22 12 43	6	ePZ	02 47 47
28	iPgZ	01 34 08 c		eSZ	48 05
28	eSgZN	13	6	ePZ	23 27 57
28	ePZ	05 10 17		iSZ	28 27
28	ePZ	19 34 58	6	iPZ	23 31 54 d
28	ePZ	21 59 41		iSZ	32 27

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Date	Phase	h m s	Date	Phase	h m s
7	iPZ	01 52 04 d	11	ePZ	21 48 03
	iSZ	38		iSZ	48
7	ePZ	09 21 34	12	ePZ	03 44 08
7	ePZ	11 12 34		iSZ	41
7	iPZ	19 08 44 d	12	ePZ	11 31 01
	iSZ	09 09		iSZ	32
7	ePZ	21 23 14	12	ePZ	12 15 15
	iSZ	48		iSZ	42
7	iPZ	23 09 52 d	12	ePZ	17 06 19
	iSZ	10 26		iSZ	07 16
7	iPZ	23 17 58 d	12	ePZ	19 07 22
	iSZ	18 37		iSZ	08 17
8	iPZ	02 10 12 c	13	iPZ	16 01 33 d
	iSZ	33		iSZ	02 20
8	ePZ	03 49 51	14	iPZ	15 40 23 c
	iSZ	50 24		iSZ	56
8	ePZ	07 51 52	14	iPZ	18 42 21 c
8	iPZ	13 51 32 c	14	ePZ	21 11 11 d
	iSZ	57		iSZ	40
9	ePZ	04 54 04	14	iPZ	21 18 18 c
	iSZ	36		iSZ	52
9	iPZ	07 37 33 c	15	iPZ	05 52 58 c
	iSZ	38 08		iSZ	53 32
9	ePZ	10 12 21	15	ePZ	17 33 12
9	iPZ	11 01 59 c	15	ePZ	19 59 29
	iSZ	02 34		iSZ	59
10	iPZ	19 27 20 c	16	ePZ	00 58 16
	iSZ	54		iSZ	59 07
11	ePZ	06 24 23	16	iPZ	10 51 05
	iSZ	52		iSZ	40
11	ePZ	09 53 13	16	ePZ	14 48 21
	iSZ	41	16	ePZ	15 20 17
			16	iPZ	19 18 07 c

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## Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	iSZ	43	25	ePZ	10 40 30
16	iPZ	19 21 49 d		eSZ	41 15
	iSZ	22 38	25	ePZ	14 59 32
16	ePZ	20 17 33	25	ePZ	17 46 50
	iSZ	18 07	25	ePZ	20 48 53
16	ePZ	23 35 16	26	ePgZ	00 11 53
	iSZ	50		iSgZ	12 07
17	ePZ	06 26 13	26	ePZ	03 47 38
	eSZ	45	26	ePZ	03 53 44
17	iPZ	06 56 54 d	26	ePZ	08 41 35
	eSZ	57 26	26	ePZ	09 45 50
18	ePZ	05 18 08	26	ePZ	21 58 34
18	ePZ	16 13 13	26	ePZ	22 08 01
19	ePZ	21 25 42	26	ePZ	22 42 52
19	ePZ	00 54 35	27	ePZ	01 58 02
19	ePZ	06 19 05	27	ePZ	06 03 35
	iSZ	36	27	ePZ	07 46 41
19	ePZ	11 50 21	27	ePZ	09 34 54
	iSZ	51 02	27	iPZ	10 58 28 c
20	ePZ	05 20 15		iSZ	52
20	ePZ	22 06 11	27	ePZ	16 21 34
21	ePZ	01 22 43	27	ePZ	21 54 57
	iSZ	23 26	28	ePZ	03 24 1
21	ePZ	15 19 32	28	iPZ	03 35 30
	eSZ	20 06		iSZ	58
21	ePZ	16 02 39	28	ePZ	06 31 05
22	ePZ	00 32 26	28	ePZ	08 28 14
22	ePZ	14 28 51		iSZ	35
24	ePZ	05 09 03	28	iPZ	19 34 13 d
25	ePZ	04 46 37	28	ePZ	21 40 12
	iSZ	47 08	28	ePZ	23 32 45
				eSZ	33 12

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Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
29	iPZ	06 35 25 c	6	ePZ	12 43 15
	iSZ	36 00	7	ePZ	19 39 54
29	ePZ	08 04 03	8	ePZ	16 12 12
	eSZ	41	9	ePZ	10 12 00
29	ePZ	20 40 33	9	eXZ	11 03 41
30	ePZ	01 49 35	11	ePZ	01 41 56
30	ePZ	04 51 09	13	eXZ	13 04 29
	eSZ	39	14	eXZ	15 42 04
30	ePZ	06 13 39	14	ePZ	20 56 39
	iSZ	14 25	14	eXZ	21 12 37
30	ePZ	07 39 43	14	eXZ	21 20 16
	eSZ	40 19	15	eXZ	17 33 24
30	iPZ	11 52 40 c	15	e(P)Z	20 30 46
30	ePZ	20 03 17	16	eXZ	09 09 17
	eSZ	04 04	16	eXZ	09 14 30
30	ePZ	21 00 54	16	eXZ	10 52 15
30	ePZ	21 17 40	16	ePZ	17 08 44
	iSZ	18 00	17	eXZ	01 11 24
30	ePZ	23 37 31	17	eXZ	09 40 22
	iSZ	38 40	17	eXZ	23 53 27
			18	ePZ	01 00 43
			18	e(P)Z	07 03 49
			18	e(P)Z	07 10 21
			19	ePZ	07 31 41
			19	eXZ	10 21 36
			20	ePZ	05 14 50
			21	ePZ	17 45 34
1	ePZ	20 09 59	22	eXZ	06 36 58
3	ePZ	10 38 48	24	e(P)Z	06 55 28
3	eXZ	15 05 45	24	eXZ	16 29 51
5	ePZ	02 26 43	29	ePZ	06 34 44
5	eXZ	02 33 11		eSZ	36 00
5	ePZ	16 07 15	30	eXZ	01 48 47
5	ePZ	16 17 06			

Lahore

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Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	<b>Karachi</b>		6	eXZ	23 03 50
1	eXZ	03 59 53	7	eXZ	03 38 02
1	eXZ	11 56 30	8	ePN	11 48 35
1	eXZ	11 59 14	9	e(P)Z	16 10 47
1	eXZ	12 27 11	10	e(P)Z	04 16 30
1	eXZ	14 38 29	10	eXZ	07 10 56
2	eXZ	15 54 39	10	eXN*	22 00 37
2	eXZ	08 12 10	11	ePZ	07 58 42
2	iXZ	08 43 03	13	ePZ	10 02 54
2	eXZ	09 10 57	13	eXZ	09 07 32
2	eXZ	12 00 45	14	eXZ	18 41 24
3	iXZ	06 50 41	15	eXZ	03 00 38
3	eXZ	08 03 39	15	ePZ	15 10 52
4	eXZ	08 41 45	16	ePZ	01 22 25
5	eXZ	10 55 39	16	ePZ	07 25 56
6	eXZ	19 34 19	16	eXZ	08 01 01
10	iPZ	05 03 30 d	18	eXZ	02 31 02
13	ePZ	21 05 58	19	ePZ	03 34 09
25	eXZ	01 18 07	21	ePZ	23 49 28
26	eXZ	07 00 15	23	ePZ	07 31 15
26	eXZ	00 00 15	23	eXZ	14 38 06
30	iPgZ	10 51 48 d	25	eXZ	13 07 59
	iSgZ	57	26	eXZ	05 17 59
			27	eXZ	06 05 43
	<b>Chittagong</b>		28	ePZ	07 11 16
1	ePZ	04 10 19	29	eXZ	09 31 40
1	eXN	08 24 43	29	eXZ	12 56 36
1	e(P)Z	12 45 33	30	ePZ	18 24 33
2	eXN	13 29 29			
3	eXN	02 06 40			
3	iXN	08 59 33			
3	eXN	15 10 23			
5	eXZ	13 42 53			
6	eXN	14 57 44			

*Bull. Pakistan Quetta, Vol 4 No 7, July 1958*

**SEISMOLOGICAL BULLETIN  
OF  
PAKISTAN**

*Vol. 4*

**JULY 1958**

*No. 7*

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*Printed at*  
Bolan Muslim Press,  
QUETTA.

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*Issued under the authority of the Director, Meteorological Service*  
**PAKISTAN METEOROLOGICAL SERVICE**  
GEOPHYSICAL INSTITUTE  
QUETTA

# Pakistan Meteorological Service

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Meteorological Service

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The Seismological Bulletin of Pakistan is a monthly publishing data of Seismological stations in Pakistan.

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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
<u>Quetta</u> (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 "	—	—
<b>Lahore</b> Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
<b>Karachi</b> Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
<b>Chittagong</b> 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 "	—	—
<b>Warsak</b> Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

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				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
1	Wr	iPZ	11 27 16 d	3	Lh	ePZ	07 48 48
	Qt	ePZ	28 21		Qt	ePZ	49 25
		eSZN	29 39	3	Lh	ePZ	12 57 05
		H 11 26 40			Qt	ePZ	45
		Hindukush				USCGS H 12 48 00	
2	Qt	ePZ	04 34 35			48 N 147 E	
2	Qt	ePZ	22 17 12			Sea of Okhotsk	
	Lh	ePZ	34			depth about 400 km	
3	Qt	ePZ	05 53 56	4	Lh	ePZ	18 43 27
		eSNE	06 00 48		Kr	ePZ	44 06
		eLN*	04.8		Qt	ePZ	10
		Mu Sec				ePPZ	46 15
	PZ	0.4 1.7				eSNN*	52 16
	Lh	ePZ	05 54 11			eLN*	58.9
	Wr	ePZ	22			Mu Sec	
		USCGS H 05 45 07				PZ 0.8 2.3	
		18 S 66 E				USCGS H 18 34 03	
		Mascarene Islands				6 N 125 E	
		region				Near south coast of	
		Mag 6.2 (Up, Ki),				Mindanao,	
		6.2 (Qt)				Philippine Island	
3	Wr	ePKPZ	06 45 55			Mag 6.0 (Up, Ki),	
	Qt	ePKPZ	57			6.3 (Qt)	
		iPKPZ	46 01	5	Qt	ePZ	01 25 22
		ePPZ	47 34	5	Qt	ePZ	02 11 15
		USCGS H 06 27 44		5	Lh	ePZ	06 25 00
		28 1/2 S 179 E			Qt	ePZ	34 c
		Kermadec Islands		5	Lh	ePZ	23 31 23
		region		6	Ch	ePN	04 53 12
		depth about 400 km			Lh	ePZ	22 ±
		Mag 6 (Pas),				USCGS H 04 40 59	
		6-6 1/4 Berk)				55 N 160 1/2 W	
						Alaska Peninsula	

\* 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) 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
6	Qt	ePZ	10	50	04	7	Qt	ePZ	13	50	12 d
6	Qt	ePZ	16	15	20			USCGS H	13	38	00
		USCGS H	16	03	14			50½ N	179½ E		
		66 N	155 W					Andreanof Islands			
		Central Alaska						Aleutian Islands			
6	Lh	ePZ	18	54	58	7	Lh	ePZ	13	57	36
	Qt	ePZ		55	04			eSZ		58	38
6	Lh	ePZ	19	57	42		Qt	iPZ		57	53 d
	Qt	ePZ		58	34			iSNZ		59	09
6	Ch	ePN	23	42	10			H	13	56	15
		ePPN		43	53			36 N	70½ E		
		eSN		48	30			Hindukush			
	Lh	ePZ		44	03			depth about 150 km			
	Qt	ePZ			47	7	Qt	ePZ	14	32	55
		eSZN*		53	17	8	Qt	ePZ	05	10	57
		USCGS H	23	34	17			Thuringerwald,			
		31 N	142 E					Germany			
		South of Honshu,				8	Qt	ePZ	23	00	28 d
		Japan						ePPZ		03	17
7	Ch	ePZ	05	27	30			eSN*		10	14
		ePcPZ			47			eLN*		19	9
	Lh	ePZ			47			Mu	Sec		
	Qt	ePZ		28	17			PZ	0.3	1.5	
		eSN*		38	21			USCGS H	22	48	36
		eScSN*			39			43 S	41½ E		
		Mu	Sec					Indian Ocean			
		PZ	0.2	1.3				North east of Prince			
		USCGS H	02	16	04			Edward Islands			
		50½ N	180					Mag 6.0 (Pas),			
		Andreanof Islands						6.2 (Qt)			
		Aleutian Islands				9	Qt	ePZ	01	19	57
		Mag 5.9 (Qt)						eSN*		29	44
							Kr	iPZ		20	06

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Major Shock

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
9	Qt	ePKPZ	15	37	28			Alaska aftershock			
		USCGS H	15	18	20	10	Lh	ePZ	08	10	46
		14½ N	91½ W				Qt	ePZ			59
		Guatemala						Alaska aftershock			
		depth about 100 km				10	Qt	ePZ	08	43	37
10	Lh	ePZ	06	28	39	10	Qt	ePZ	09	08	59
	Qt	ePZ			52			Alaska aftershock			
		eXZ		29	20	10	Qt	ePZ	10	29	22
		ePPZ		32	27			Alaska aftershock			
		eSZN		39	49	10	Lh	ePZ	12	39	15
		Mu	Sec				Qt	ePZ			29
		PZ	10.3	2.9				e(PP)Z		42	52
		PPZ	7.0	3.2				Alaska aftershock			
	Ch	ePZ	06	29	01	10	Qt	e(P)Z	15	12	22
		iPcPZ			05	11	Qt	ePZ	00	33	25
		ePPZ		32	48	11	Lh	ePZ	07	55	02
		eSKSZ		39	39		Qt	ePZ			28
		eSKKSZ			50			ePPZ		58	38
		eSZ		40	05			eSN*		08	05 40
		iPSZ		41	08			USCGS H	07	43	05
		eSSZ		46	17			51 N	175 W		
	Kr	ePZ	29	14				Andreanof Islands			
		ePPZ		33	08			Aleutian Islands			
		USCGS H	06	15	54			ePKPZ	19	29	42
		58½ N	136 W					eXZ		30	09
		Southeastern Alaska						ePKSZN*		33	20
		Mag 7¾-8 (Pas),					Lh	ePKPZ		29	47
		8 (Berk),						iXZ		30	21
		7.8 (Up, Ki),						USCGS H	19	10	20
		7.6 (Qt)						21 S	69 W		
10	Lh	ePZ	07	57	29			Northern Chile			
	Qt	ePZ			42			Mag 6¼ (Berk),			
								6½ (Pas),			

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
12	Qt	6.2 (Up, Ki) ePKPZ ePPZ USCGS H 00 48 30 5 S 106½ W Pacific Ocean Mag 6 (Pas), (Berk)	01	08	32	14	Lh	ePZ	10	20	03
							Qt	ePZ			39
						15	Qt	ePZ	01	09	54
						15	Qt	ePZ	08	06	27
								eSZN			12 12
							Ch	ePZ			09 38
12	Lh	ePZ	05	12	46			USCGS H 07 59 18			
	Qt	ePZ		13	13			35½ N 23½ E			
		eSZN		14	33			Near west coast of			
		H 05 11 28						Crete			
		Hindukush				15	Lh	ePZ	21	43	08
								eSZ			44 18
12	Lh	ePZ	23	28	55		Qt	ePZ			00
		eSZ		29	57			eSNE			45 52
	Qt	ePZ			24			H 21 41 35			
		eSZN		30	54			Tadzhikistan			
		H 23 27 27						S. S. R.			
		Afghanistan- Tadzhikistan border				16	Qt	ePZ	01	59	40
								eSN			02 09 55
13	Qt	ePZ	08	23	01			USCGS H 01 47 20			
		USCGS H 08 10 01						51½ N 176½ W			
		58 N 137 W						Andreanof Islands			
		Southeastern Alaska						Aleutian Islands			
		Mag 5½-5¾ (Berk)				16	Qt	ePZ	04	05	00
								Mu Sec			
13	Lh	ePZ	15	32	24			PZ 0.2 1.5			
	Qt	ePZ		33	26			USCGS H 03 52 39			
		eSZ		37	44			51½ N 176½ W			
		USCGS H 15 28 00						Andreanof Islands			
		24½ N 94 E						Aleutian Islands			
		India-Burma border				16	Qt	ePKPZ	13	14	38
								ePKP2Z			16 26
								ePPZ			20 16
								ePPN*			24 42
13	Qt	ePZ	23	15	51			e(SS)N*			41 18

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 12 54 18				17	Qt	ePZ	19	41	56
		29½ S 113 W						eSN			52 04
		South Pacific Ocean						Mu Sec			
		Mag 6 (Berk)						PZ 0.5 1.7			
17	Qt	ePZ	05	44	16			USCGS H 19 29 36			
		eSN*		49	53			51 N 177 W			
		eSSSN*		52	49			Andreanof Islands			
		Mu Sec						Aleutian Islands			
		PZ 0.2 1.5						Mag 6.3 (Qt)			
	Lh	ePZ	05	44	58	17	Qt	ePZ	20	40	15
		ePcPZ		46	56	17	Ch	ePZ	21	10	56
	Ch	ePZ		47	17			ePcPZ			11 12
		USCGS H 05 37 06						ePPZ			13 44
		40½ N 23 E						Wr			11 11
		Northern Greece					Qt	ePZ			42
		Mag 5.6 (Qt), 5.4 (Up, Ki)						eSN			21 48
								Mu Sec			
17	Qt	ePNE	13	10	39			PZ 0.8 1.8			
		eSNE		12	50			USCGS H 20 59 17			
17	Wr	ePZ	19	13	56±			51 N 177½ W			
	Lh	ePZ		14	06			Andreanof Islands			
	Qt	ePZ			34			Aleutian Islands			
		eSN*N		24	48			Mag 6 (Berk), 5.8 (Up, Ki), 6.4 (Qt)			
		eScSN*		25	05						
		ePSN*		44							
		eSSN*		30	17						
		Mu Sec				18	Wr	ePZ	00	51	08
		PZ 0.3 1.5					Qt	ePZ			39
		USCGS H 19 02 10						e(pP)Z			58
		51 N 176 W						iXZ			52 06
		Andreanof Islands						ePPZ			54 45
		Aleutian Islands						eSN*	01	01	52
		Mag 5¾ (Berk), 5.5 (Up, Ki), 6.1 (Qt)						eScSN*			02 07
								eSSN*			07 14

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Mu Sec					Lh	ePZ	41	22	d
		PZ 0.4 1.5						epPZ		59	
		USCGS H 00 39 18					Wr	iPZ	41	d	
		51 N 176½ W					Qt	ePZ	57	d	
		Andreanof Islands						epPZ	42	37	
		Aleutian Islands						esPZ	51		
		Mag 5¾ (Berk),						ePPZ	44	50	
		5.8 (Up, Ki)						eSN*	51	28	
		6.0 (Qt)						esSN*	52	38	
								Mu Sec			
18	Qt	ePZ	02	37	47		PZ	0.5 1.5			
18	Qt	ePZ	12	52	46 c		USCGS H 06 30 19				
18	Qt	ePZ	21	34	54		4 S 138½ E				
18	Ch	ePZ	21	44	15		New Guinea				
		ePPZ		45	13		depth about 150 km				
		ePPPZ			26		Mag 6.6 (Up, Ki),				
		eSZ		49	13		6.0 (Qt)				
	Lh	ePZ	21	46	09	19	Wr	iPZ	11	48	53 d
	Wr	ePZ			29			iSZ		49	14
	Qt	ePZ		47	01		Qt	ePZN		50	04
		ePcPZ		48	21			eSNE		51	24
		eSN*		54	05			H 11 48 19			
								Hindukush region			
		USCGS H 21 38 05				19	Lh	ePZ	15	06	59
		25½ N 124 E					Qt	ePZ		07	42
		Ryukyu Islands						eSN*		16	04
		region						USCGS H 14 57 24			
19	Ch	ePZ	06	40	44			41 N 143½ E			
		epPZ		41	22			Near south coast of			
		esPZ			40			Hokkaido, Japan			
		ePPZ		43	10		19	Lh	ePZ	17	35 15
		ePPPZ		44	47			Qt	ePZ		41
		eSZ		49	11				eSNN*		45 53
		esSZ		50	17						

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 17 23 20						H 22 21 45			
		51½ N 176 W						35 N 69 E			
		Andreanof Islands						Hindukush region			
		Aleutian Islands				19	Wr	iPZ	23	17	25 c
19	Lh	ePZ	17	47	29		Lh	ePZ			58
	Wr	ePZ			52±			eSZ			19 05
	Qt	ePZ		48	08		Qt	ePZN			18 30 c
19	Ch	ePZ	18	25	00			eSNE			20 00
		ePcPZ		26	50			H 23 16 33			
	Lh	ePZ		27	03			37¼ N 72½ E			
		iPcPZ			50			Afghanistan-			
	Wr	ePZ		30		20	Lh	ePZ	03	53	31
	Kr	ePZ		40			Qt	ePZ			58
	Qt	ePZ		46		20	Qt	eKPZ	12	03	21 c
		ePcPZ		28	15		Wr	ePKPZ			34
		ePPZ		30	17		Lh	ePKPZ			34
		iSN*		36	38			USCGS H 11 43 57			
		iSSN*		40	45			31½ S 71 W			
		eLN*		44.2				Central Chile			
		Mu Sec				21	Ch	ePZ	07	34	01
		MN* 8.0 2.0					Wr	iPZ			56 c
		USCGS H 18 16 52					Qt	iPZ			35 32 c
		0 129½ E						ePPZ			37 53
		Spice Islands						ePPPZN*			39 32
19	Lh	ePZ	19	45	59			eSN*			44 02
	Qt	ePZ		46	40			eLN*			49.1
19	Qt	ePZ	19	55	54			Mu Sec			
19	Wr	iPZ	22	22	24 d		Kr	PZ 1.1 2.0			
		iSZ			56			iPZ	07	35	52 c
	Qt	ePZE		23	05			USCGS H 07 24 58			
	Lh	ePZ		15				44½ N 147½ E			
		eSZ		24	23			Kurile Islands			
								Mag 6-6½ (Berk),			
								5.9 (Up, Ki)			
								6.6 (Qt)			

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Date	Station	Phase	h m s	Date	Station	Phase	h m s
21	Ch	ePZ	14 48 50			USCGS H	20 30 00
		ePcPZN*	49 08			Marshall Islands	
		ePPZ	52 33			region	
		eSZ	58 14	22	Lh	ePZ	22 58 11
		eScSZ	56		Qt	ePZ	31
	Wr	iPZ	49 01			USCGS H	22 45 51
	Lh	ePZ	04			53 N 160 W	
	Qt	iPZ	32 c			Gulf of Alaska	
		iSN*	59 35			depth about 100 km	
		eSSN*	15 04 50	23	Lh	iPZ	10 37 06 c
		eLN*	10-0			Mu Sec	
		USCGS H	14 37 18			PZ	0-6 1-0
		51½ N 178 W			Wr	ePZ	10 37 18
		Andreanof Islands			Qt	ePZ	51 c
		Aleutian Islands				ePcPZ	38 28
		Mag 6¼ (Berk),				ePPN*	40 09
		6.1 (Up, Ki)				eSNN*	46 23
						iXN*	33
22	Qt	ePZ	05 21 00 c			eScSN*	47 45
		USCGS H	05 08 40			eSSN*	50 30
		51 N 176 W				eLN*	54.3
		Andreanof Islands				ePKPPKPZ	11 06 52
		Aleutian Islands				Mu Sec	
22	Wr	iPZ	09 31 25 d			PZ	0.4 1.6
		iSZ	57			MN*	10 0 18.0
	Qt	ePZ	32 30			USCGS H	10 27 19
		eSNE	33 58			South of Honshu	
		H	09 30 36			Japan	
		Northern Afghanistan				Mag 6.3 (Up, Ki),	
22	Lh	ePZ	20 38 28 c			6.4 (Qt)	
	Qt	ePZ	39 15 c	23	Qt	ePZ	13 21 22 d
		ePcPZ	40 26			ePgZ	27
		ePPZ	41 13			eSN*	55

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Date	Station	Phase	h m s	Date	Station	Phase	h m s
		iSgZN*	22 04			iXZ	30
	Wr	ePZ	21 30			epPKPZN	57 48
	Lh	iPZ	53			ePPZ	58
		iPgZ	22 15			iXZ	58 08
	Kr	ePZ	28±			eSKSZ	18 01 52
		eSZ	23 58			e(SKKS)Z	03 00
		H	13 20 58		Kr	ePKPZ	17 55 25
		32 N 69 E				epPKPZ	57 52
		Afghanistan-				iPP!Z	58 09
		Baluchistan border			Ch	ePKPZ	56 06
24	Qt	ePZ	13 20 39			epPKP2Z	59 08
		eSNN*	31 01			esPKP2Z	18 00 24
		eSSN*	36 30			ePPZ	41
		eLN*	42.8			e(PPP)Z	04 15
		Mu Sec				eSKKSZ	05 51
		PZ	0.3 1.3			eSPPZ	13 00
		USCGS H	13 08 05			USCGS H	17 37 09
		52½ N 170 W				13½ S 69 W	
		Fox Islands				Peru-Bolivia border	
		Aleutian Islands				depth about 650 km	
		Mag 6.4 (Qt)				Mag 7-7¼ (Pas),	
25	Qt	ePZ	03 40 01			7½ (Berk)	
25	Qt	ePZ	18 00 52	26	Qt	ePZ	18 31 32
26	Qt	ePZ	06 25 19		Wr	ePZ	41
		ePcPZ	33	27	Qt	ePKPZ	00 40 23
		ePPZ	27 57			USCGS H	00 22 32
		USCGS H	06 13 50			20½ S 178½ W	
		40 S 45½ E				Fiji Islands	
		South Indian Ocean				depth about 600 km	
26	Qt	ePZ	15 56 29	27	Qt	ePZ	03 32 28
		e(S)Z	16 00 47			USCGS H	03 21 56
26	Qt	ePKPZN	17 55 17			45½ N 148 E	
						Kurile Islands	

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27	Qt	ePKPZ	17	19	26	30	Lh	ePZ	02	57	13
		USCGS H	17	01	29		Wr	ePZ			17 c
		15½ S 169 E					Qt	ePZ			53 c
		New Hebrides Islands						eSZ	03	06	26
27	Qt	ePZ	17	29	02 d			Mu Sec			
		PZ	0.4	1.7				PZ	0.4	1.9	
	Lh	ePZ	17	29	16 d			USCGS H	02	47	17
		USCGS H	17	19	03			44½ N 148½ E			
		28½ S 62 E						Kurile Islands			
		South Indian Ocean						Mag 6.2 (Qt)			
28	Lh	ePZ	01	35	50	30	Lh	ePZ	04	56	09 c
	Qt	ePZ		36	21		Wr	iPZ			28 c
		USCGS H	01	23	05		Qt	iPZ			45 c
		5 S 151½ E						ePPZ			59 41
		New Britain						eSE	05	06	28
		depth about 200 kms						Mu Sec			
29	Qt	ePKPZ	11	08	22			PZ	0.4	1.3	
		USCGS H	10	49	27			USCGS H	04	44	53
		20½ S 175½ W						21½ S 140 E			
		Tonga Islands						New Guinea			
29	Wr	ePZ	15	55	01	30	Qt	ePZ	07	42	55
	Lh	ePZ			08			USCGS H	07	32	28
	Qt	ePZ			54 11			30 N 141 E			
29	Qt	ePZ	21	50	33 c			South of Honshu			
		ePPZ			54 13			Japan			
		eSKSZ	22	00	59	31	Qt	ePZ	02	16	11 c
		eSZE	01	31				USCGS H	02	03	45
		Mu Sec						51½ N 174½ W			
		PZ	0.4	1.7				Andreanof Islands			
		USCGS H	21	37	25			Aleutian Islands			
		4 N 26½ W						ePZ	02	38	49 c
		Atlantic Ocean						USCGSH	02	26	23
		Mag 6.2 (Up, Ki),						51½ N 174½ W			
		6.4 (Qt)						Andreanof Islands			
								Aleutian Islands			
						31	Qt	ePZ	10	08	32

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Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
	<b>Quetta</b>				7	ePZ	16	22	56
						eSNE		23	39
1	ePgZ	17	37	50.2	8	iPgZ	05	32	28 d
	eSgZ			52.0		eSgNE			41
1	ePgZ	17	40	02.5	8	ePZ	06	33	09
	eSgZN			05.0	8	ePNE	19	16	31
1	ePgZ	17	41	50.0		eSE			17 49
1	ePgZ	17	45	27.9	10	ePZ	08	52	03
	eSgN			31.0		eSNE			29
1	ePZ	01	45	57	10	ePZ	11	02	58
	eSN			46 31		eSZ			03 01
2	ePgZ	08	11	04	10	ePZNE	11	37	19
	eSgZE			06	10	ePZ	11	39	29
2	ePZ	13	21	00	11	eXZ	02	09.5	
2	iPgZ	15	30	06.8 d	11	eXNE	06	18.0	
	iSgZ			09.0	11	eXZ	07	24	06
3	ePZ	04	32	56	11	ePZNE	10	52	43
3	eXZ	05	52	13.5		eSNE			53 01
3	eXZ	06	08.8		11	egPZ	18	44	43
3	eXZ	06	11.8			eSgZNE			56
5	eXZ	02	11	58.2	11	ePgZE	20	04	07
5	ePZ	02	41	04		eSgE			21
	eSE			30	11	ePNE	22	40	18
5	ePZ	07	57	02.3		eSNE			35
	eSZ			31.8	11	ePNE	22	41	55
5	eXZ	16	37	37.4		eSNE			42 13
6	ePZ	05	00.0		11	ePNE	22	56	20
6	ePZ	11	19	50±	12	eSNE			42
7	ePZ	15	48	32		ePNE	02	53	43
	eSN			58	12	eSNE			54 54
7	ePZ	16	11	03	12	ePZE	03	43	07
	eSNE			41	12	eXE	07	23	23
					12	eXN	08	02	40

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Date	Phase	h m s	Date	Phase	h m s
12	eXN	10 04 17		iSgZ	17
12	ePgZ	10 18 03	16	ePZ	15 06 17
	eSgE	15	16	ePZ	16 26 36
12	eXE	12 05 38		eSNE	27 54
12	eXE	13 51 48	16	ePE	17 22 28
12	ePNE	15 27 03	17	ePgNE	03 09 59
	eSgNE	29 08		eSgNEZ	10 12 9
12	eXN	17 15 26	17	ePgE	05 44 36
12	ePNE	18 21 45		eSgE	47
12	ePZNE	22 09 28	17	eXZ	06 39 5
12	ePNE	22 46 32	17	ePZ	08 25 03
12	ePNE	23 21 14	17	ePNE	13 10 39
	eSE	22 07	17	eXE	15 13 0
13	ePgNE	05 19 40	17	ePE	20 32 37
	eSgNE	42		eSE	59
13	ePZ	05 22 55	18	ePZ	02 06 44
13	eXZ	05 34 34	18	ePZNE	02 58 04
13	ePZNE	11 07 15	18	eXE	05 36 2
	eSNE	48	18	ePgNE	08 52 40
13	ePE	11 29 18		iSgN	49
	eSNE	30 34	18	ePE	11 47 50
13	ePE	17 48 29	18	ePZ	16 51 02
13	ePNE	18 36 15	18	ePE	18 49 46
	eSNE	33		eSE	50 08
14	ePNE	01 47 32	19	ePgE	00 55 54
	eSNE	48 37		eSgNE	59
14	ePZ	09 44 54	19	ePZ	04 24 08
	eSZ	45 18		eSZ	25 00
14	eXN	12 45 22	19	ePZ	05 16 53
15	ePZE	19 51 54		eSE	17 36
16	ePZ	00 41 17	19	ePZ	08 30 32.6
16	egPE	04 04 13	19	ePgN	09 40 15.1
				eSgN	16.8

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Date	Phase	h m s	Date	Phase	h m s
19	eXE	12 51.7	25	eXNE	17 52.0
19	iPgEN	14 27 27.5	26	eXE	05 51 16.2
	iSgE	28.9	26	ePZ	17 53 30
20	eXE	01 17.5	27	eXZ	01 56 23.8
20	eXE	03 55.1	27	eXZ	11 00 10.7
21	ePZE	05 10 16.1	27	eXZ	17 38 54
	eSZE	11 02	27	eXZ	20 11 54
21	ePgZE	06 22 28	27	eXE	23 27 16
	eSgZE	38	27	ePE	23 50 20
21	ePgE	15 57 57.6		eSZ	52 22
	eSgNE	58 04.1	29	ePgZ	02 49 43
22	eXgN	07 18 54.6		eSgZ	45.1
22	ePgE	11 11 24.2	29	ePZ	14 49 50.2
	eSgE	27.0	29	ePZ	20 00 47
22	eXZ	12 59 05	29	ePZ	20 06 57
22	eXZE	17 27 55	29	ePZ	23 40 32
22	ePZ	19 37 09	29	ePZ	23 47 39
	ePgZE	20	30	eXZ	05 05 02.8
	eSZ	54	30	ePgZ	07 13 37.3
23	ePgE	01 39 25		eSgZ	51.2
	eSgNE	27.7	30	ePZ	20 26 50
23	eXE	02 47 38.1	30	ePZ	22 03 45
23	ePZNE	15 08 57		eSZE	05 06
23	ePZN	16 09 33	31	ePgZ	02 09 20.3
23	ePZNE	21 59 17		eSgZ	30.4
24	ePN	07 19 53.5	31	eXZ	07 32 53.6
	eSNE	20 04.1	31	ePZ	21 29 34
24	ePgZ	07 27 54.9		eSZ	55
	eSgNE	28 09			
25	ePNE	01 48 03.7			
	eSN	20.4			
25	eXNE	11 51 58			

Warsak

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Date	Phase	h m s	Date	Phase	h m s
1	ePZ	23 22 09	25	ePZ	08 32 47
	eSZ	43		eSZ	33 15
2	ePZ	07 42 36	25	iPZ	13 50 29 d
	eSZ	43 06		iSZ	55
4	ePZ	02 32 00	25	iPZ	15 34 05 e
17	iPZ	15 58 07		iSZ	26
	iSZ	23	26	e(P)Z	17 54 17
17	ePZ	19 08 22	27	iPZ	08 03 29 d
	eSZ	53		iSZ	51
17	ePZ	22 56 00	29	ePZ	23 39 45
18	iPZ	16 46 27 c	30	iPZ	01 16 35 e
18	ePZ	18 49 16±	30	iPZ	05 52 14
18	iPZ	22 32 50 c		iSZ	43
	iSZ	33 14	30	iPZ	07 37 33 d
18	iPZ	22 35 03 d		iSZ	38 01
	iSZ	27	31	ePZ	09 17 12
18	iPZ	12 49 17			
	iSZ	45		<b>Lahore</b>	
19	ePZ	15 06 57±	1	ePZ	06 05 29
19	eXZ	17 35 33	1	eXZ	11 28 40
20	iPZ	01 15 04 d	3	ePZ	08 22 06
	iSZ	32	3	ePZ	10 43 04
20	ePZ	15 42 10	3	ePZ	16 53 40
	eSZ	42	4	ePZ	02 31 34
20	ePZ	20 56 39	4	ePZ	09 04 04
21	ePZ	01 22 57		eSZ	05 04
21	iPZ	11 44 41 c	4	ePZ	10 46 58
21	ePZ	21 40 43		eSZ	48 19
	eSZ	41 06	4	ePZ	22 25 15
22	ePZ	19 38 08	5	ePZ	08 12 20
22	ePZ	19 58 18	5	ePZ	21 33 17
22	ePZ	23 51 44		eSZ	34 37

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Date	Phase	h m s	Date	Phase	h m s
5	ePZ	22 59 30	26	eXZ	06 24 39
	eSZ	23 00 46	27	eXZ	18 42 15
5	ePZ	23 31 23	27	eXZ	19 12 16
7	ePZ	10 01 12			
7	ePZ	11 12 53		<b>Karachi</b>	
7	eXZ	12 51 29	1	e(P)Z	06 05 08
10	ePZ	11 28 50	7	iXZ	13 58 55
12	eXZ	08 03 15	10	eXZ	08 44 58
12	eXZ	10 05 07	10	eXZ	10 31 19
12	eXZ	15 27 25	12	eXZ	05 13 17
13	ePZ	23 28 55	19	ePZ	04 23 50±
	eSZ	29 57		ePgZ	59
13	eXZ	11 31 03		iSZ	24 29
13	ePZ	12 16 53	19	eXZ	06 42 49
13	ePZ	15 32 24	22	ePZ	19 36 43±
16	ePZ	06 00 21		iSN	37 08
	eSZ	01 25	30	ePZ	02 59 49
17	ePZ	02 20 20			
17	ePZ	03 43 22		<b>Chittagong</b>	
17	eSZ	44 50	1	ePN	06 05 03
17	ePZ	09 24 47	1	eXN	11 31 14
	eSZ	25 47	2	ePN	00 54 50
17	ePZ	19 11 23±	2	eXZ	05 05 16
18	ePZ	06 38 23	4	eXN	18 42 00
	eSZ	39 26	5	eXN	02 15 10
18	ePZ	18 48 54	8	eXZ	06 29 40
18	ePZ	22 36 15	8	eXZ	23 01 11
21	eXZ	07 35 48	14	eXZ	10 26 23
22	ePZ	19 38 42	15	ePZ	05 12 05
22	ePZ	19 58 02	16	e(P)Z	01 58 39
25	ePZ	11 52 04	16	eXZ	04 04 30
25	ePZ	18 00 14	16	eXZ	14 13 51
			16	ePZ	17 06 37

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Date	Phase	h	m	s	Date	Phase	h	m	s
16	ePZ	18	52	49	20	eXZ	12	02	59
17	e(P)Z	14	01	06	21	eXZ	14	23	17
17	eXZ	19	14	11	23	ePZ	10	35	16
17	ePZ	19	39	19	24	eXZ	17	37	05
18	e(P)Z	00	51	16	25	ePZ	09	46	47
18	eXZ	12	52	21	26	eXZ	09	36	43
19	e(P)Z	15	05	50	27	eXZ	23	43	28
19	ePZ	17	35	00±	28	eXZ	11	35	50
19	eXZ	22	22	06	30	iXZ	05	47	53
20	eXZ	03	54	35					



*Seis. Bull. Pakistan Quetta, Vol 4 No 8, August 1958*

# SEISMOLOGICAL BULLETIN OF PAKISTAN

*Vol. 4*

AUGUST 1958

*No. 8*

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*Printed at*  
Bolan Muslim Press,  
QUETTA.

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*Issued under the authority of the Director, Meteorological Service*  
PAKISTAN METEOROLOGICAL SERVICE  
GEOPHYSICAL INSTITUTE  
QUETTA

# Pakistan Meteorological Service

Director,  
Meteorological Service

Deputy Director,  
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The Seismological Bulletin of Pakistan is a monthly publishing data of Seismological stations in Pakistan.

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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
<b>Quetta (Central Station)</b>				
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)

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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	0 "	—	—
<b>Lahore</b> Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
<b>Karachi</b> Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
<b>Chittagong</b> 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 "	—	—
<b>Warsak</b> 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) 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.

**Major Shocks**

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
1	Lh	ePZ	12	36	41 c	3	Wr	ePZ	05	33	15
	Wr	iPZ		37	05 c		Qt	ePZ		34	23
		USCGS H 12 28 28				3	Wr	ePZ	16	25	07
		13 1/2 N 120 1/2 E						eSZ			43
		Near south coast					Qt	ePZ		26	13
		of Luzon Philippine Islands						eSZ		27	42
		depth about 150 km						H 16 24 18			
1	Wr	ePZ	17	31	09			Northern Afghanistan			
		eSZ		44		3	Wr	ePZ	23	49	23
	Qt	ePZ		32	04		Qt	ePZ		50	15
		eSZE		33	22			eSZE		51	31
		H 17 30 22						H 23 48 36			
		Hindukush						Hindukush			
2	Wr	ePZ	22	01	44	4	Ch	ePZ	04	21	41
		iSZ		02	31		Lh	ePZ		23	47
	Qt	ePZ			51			ePcPZ		24	18
		eSZE		04	33			epPZ			27
2	Wr	ePnZ	22	54	07		Wr	ePZ			07
	Lh	ePnZ		16			Qt	ePZ			21
		eP*Z		24				epPZE		25	01
		ePgZ		31				ePPZ		27	07
		eSnZ		55	04			eSE		33	22
	Qt	ePnZ		20				USCGS H 04 13 19			
		eSnEZ		57	01			6 S 130 E			
		H 22 53 12						Banda Sea			
		35 1/2 N 75 1/4 E						depth about 150 km			
		Northern Kashmir				4	Ch	ePZ	06	40	05
3	Wr	ePKPZ	01	24	09			eSZ		50	38
	Qt	ePKPZ			17			USCGS H 06 27 20			
		USCGS H 01 06 24						15 S 172 W			
		21 1/4 S 179 W						Samoa Islands			
		Fiji Islands region				4	Lh	ePZ	16	12	53
		depth about 550 km					Qt	ePZ		13	33
		Mag 6 1/4 - 6 1/2 (Pas)									

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
4	Lh	iPZ	20	49	21	6	Ch	ePZ	22	03	34
		isPZ			59			USCGS H 21 51 00			
		iSZ		50	21			12 S 167 E			
	Qt	ePZ		49	48			Santa Cruz Islands			
		eSE		51	06			depth about 150 km			
	Kr	ePZ		50	54	8	Qt	ePZ	00	47	40
		iSZ		53	03			USCGS H 00 36 13			
		H 20 48 08						55 N 166 E			
		36 N 71 $\frac{3}{4}$ E						Komandorskie Islands			
		Hindukush				8	Wr	iPZ	06	10	11
		depth about 150 km						iSZ		11	02
5	Wr	ePZ	03	55	17 $\pm$	Qt	ePZE				16
	Lh	ePZ		56	00			eSZE		12	59
		eSZ		57	04			H 06 09 02			
	Qt	ePZ		56	25			Tadzhikistan, S.S.R.			
		eSZ		57	48	8	Wr	ePZ	09	13	36
		H 03 54 39						eSZ		14	25
		36 $\frac{1}{2}$ N 71 $\frac{1}{2}$ E					Lh	ePZ			12
		Hindukush					Qt	ePZ			44
		depth about 150 km						eSZE		16	26
6	Qt	ePZ	04	03	19			H 09 12 34			
6	Ch	ePZ	14	34	43			38 N 72 $\frac{1}{2}$ E			
		USCGS H 14 23 25						Pamirs, Tadzhikistan			
		Solomon Islands						depth about 100 km			
6	Lh	ePKPZ	21	28	00	8	Wr	ePZ	12	52	53
	Qt	ePKPZ			10		Lh	ePZ		53	30 $\pm$
		USCGS H 21 09 09						eSZ		54	25 $\pm$
		17 S 173 W					Qt	iPZ		53	52 d
		Tonga Islands						iSNE		55	11
		Mag 6 $\frac{3}{4}$ (Pas),					Kr	ePZ		54	55
		6 $\frac{1}{2}$ (Berk),						eSZ		57	06
		6.1 (Up, Ki)					Ch	ePZ			08
								epPZ			36

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPZ			55		Qt	ePZ		34	46
		eSZ		13	01 09			iXZ		35	00
		H 12 52 10						ePPPZ		37	10
		36 $\frac{1}{2}$ N 70 $\frac{1}{2}$ E						USCGS H 20 26 22			
		Hindukush						3 S 100 $\frac{1}{2}$ E			
		depth about 150 km						Off coast of			
8	Ch	ePZ		14	53 18			Sumatra			
		USCGS H 14 40 55				12	Ch	ePZ		08	27 41
		59 $\frac{1}{2}$ N 139 W					Qt	ePZ			28 23
		Southeastern Alaska						USCGS H 08 15 59			
9	Qt	ePZE		07	29 39			51 $\frac{1}{2}$ N 175 W			
9	Qt	ePZ		13	43 52			Andranof Islands			
10	Ch	ePZ		18	16 25			Aleutian Islands			
	Qt	ePZ			18 47	12	Wr	iPZ		10	31 56 d
		USCGS H 18 05 53					Lh	ePZ			32 36
		3 $\frac{1}{2}$ S 150 $\frac{1}{2}$ E						eSZ			33 36
		New Britain region					Qt	ePZ			01
10	Qt	ePZ		23	52 30			eSNE			34 20
		USCGS H 23 41 37						H 10 31 20			
		21 $\frac{1}{2}$ N 144 E						36 N 71 $\frac{1}{2}$ E			
		Mariana Islands						Hindukush			
		region						depth about 200 km			
11	Ch	ePZ		08	05 53	12	Wr	ePZ		12	26 12
		USCGS H 07 53 12						eSZ			27 59
		18 S 168 $\frac{1}{2}$ E					Ch	ePZ			26 40
		New Hebrides Islands						eSZ			28 50
11	Qt	ePZ		20	17 16		Qt	ePZ			26 50
		eSZE			18 36			eSNE			29 08
11	Ch	ePZ		20	32 01			H 12 23 53			
		ePPZ			51			29 $\frac{3}{4}$ N 81 $\frac{3}{4}$ E			
		ePPPZ			33 02			Northwestern Nepal			
		eSZ			36 44			depth normal			

Date	Station	Phase	h	m	s
12	Wr	ePZ	12	42	22
	Ch	ePZ			50
		eSZ		45	00
		ePZ		43	00
		eSE		45	18
		H 12 40 03			
		29 $\frac{3}{4}$ N 81 $\frac{3}{4}$ E			
		Northwestern Nepal			
		depth normal			
12	Qt	ePKP	15	54	47
		USCGS H 15 35 40			
		Off coast of Oaxaca			
		Mexico			
		depth about 100 km			
12	Qt	ePZ	17	03	47
		ePePZ		04	25
		USCGS H 16 53 13			
		$\frac{1}{2}$ N 126 E			
		Molucca Passage			
		foreshock			
12	Ch	ePZ	19	12	13
	Wr	ePZ		15	13
	Qt	ePZ			22
		USCGS H 19 04 20			
		9 $\frac{1}{2}$ S 123 $\frac{1}{2}$ E			
		Timor Island			
12	Ch	ePZ	19	32	46
		ePPZ		34	22
		ePPPZ			47
		ePcPZ			51
		eSZ		38	53
		eSSZ		41	43
	Wr	ePZ		35	24

Major Shocks

Date	Station	Phase	h	m	s
	Kr	ePZ			31
	Qt	ePZ			39
		ePcPZ		36	12
		ePPZ		37	53
		eSZ		44	13
		USCGS H 19 25 05			
		O 126 $\frac{1}{2}$ E			
		Molucca Passage			
		Mag 6.4 (Up, Ki),			
		6 $\frac{1}{2}$ $\pm$ (Pas)			
12	Qt	ePZ	20	04	36
12	Ch	ePZ	23	22	55
	Qt	ePZ		25	08
		USCGS H 23 12 17			
		6 S 152 E			
		Near coast of			
		New Britain			
		depth about 100 km			
13	Qt	ePZ	00	24	28
		USCGS H 00 11 28			
		6 S 152 $\frac{1}{2}$ E			
		Near coast of			
		New Britain			
13	Ch	ePZ	00	22	56
	Qt	ePZ			25 09
13	Ch	ePZ	03	58	11
	Wr	ePZ	04	00	52
	Kr	ePZ			59
	Qt	ePZ		01	07
		ePcPZ			46
		eSNE		09	46
		USCGS H 03 50 35			
		$\frac{1}{2}$ N 126 E			
		Molucca Passage			

Date	Station	Phase	h	m	s
13	Wr	iPnZ	07	34	36 c
	Qt	iPnZ		35	02 c
		iP*Z			15
		iPgZE			30
		iSnZ		36	12
		iS*E			32
		iSgE			46
	Lh	ePnZ		35	25
		ePgZ			36 01
		iSgZ			37 42
	Ch	ePZ			39 02
		eSZ			43 26
		H 07 33 30			
		36 N 66 $\frac{3}{4}$ E			
		Northern Afghanistan			
		USCGS H 07 33 29			
		36 $\frac{1}{2}$ N 66 $\frac{1}{2}$ E			
		Northern Afghanistan			
		Mag 5.7 (Up, Ki)			
13	Wr	ePZ	08	33	20 c
	Qt	ePZ		34	23 c
		eSE			35 48
		H 08 32 33			
		Northern Afghanistan			
13	Qt	ePZ	10	15	47
		USCGS H 10 02 49			
		6 S 153 E			
		Off coast of			
		New Britain			
13	Wr	iPZ	17	07	21 d
		iSZ			08 11
	Qt	ePZ			30 d

Major Shocks

Date	Station	Phase	h	m	s
		esPZ			09 05
		eSE			10 13
		H 17 06 18			
		Pamirs, Tadzhikistan			
		depth about 100 km			
13	Qt	iPgZ	17	32	56 c
		eSgE			33 10
	Kr	ePnZ			47
		iSnZ			34 44
		eS*Z			55
		eSgZ			35 10
	Wr	iPnZ			34 03
		iSnZ			35 09
		H 17 32 34			
		29 $\frac{1}{2}$ N 67 $\frac{1}{2}$ E			
		Near Dadhar			
		Baluchistan			
		West Pakistan			
13	Qt	ePZ	20	25	19 d
		ePcPZ			26
		eSZE			35 35
		USCGS H 20 13 00			
		51 N 177 $\frac{1}{2}$ W			
		Andreanof Islands			
		Aleutian Islands			
		Mag 6.1 (Up, Ki),			
		6 $\frac{1}{4}$ -6 $\frac{1}{2}$ (Pas)			
13	Wr	ePZ	22	08	54
	Qt	ePZ			09 11 c
		epPZ			10 02
		eSKSE			19 22
		eSE			51

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	USCGS H 21 56 31						Kr	ePZ	07	54	
	4½ S 154 E							eSE	17	48	
	Solomon Islands region							USCGSH 14 55 10			
	depth about 200 km							62 N 175 W			
14	Qt	ePZ	02	39	40			Andreas of Islands			
	USCGS H 02 28 25							Aleutian Islands			
	19½ N 146½ E							Mag 6½ (Pas),			
	Mariana Islands							6¼-6½ (Berk),			
14	Qt	ePKPZ	10	04	17	14	Qt	ePZ	15	30	20
	USCGS H 09 45 14						Kr	ePZ		48	
	23½ S 175½ W							ePPZ	31	02	
	Tonga Islands region						Wr	ePZ	30	50	
14	Qt	ePZ	11	31	01			USCGS H 15 26 19			
	eSE		34	03				34 N 47½ E			
	ePZ		31	29				Iran			
	Wr	ePZ		31		14	Ch	ePZ	15	29	48
	Lh	ePZ		32	01			USCGS H 15 18 07			
	H 11 27 04							51½ N 175 W			
	34¼ N 47¾ E							Andreas of Islands			
	Western Iran							Aleutian Islands			
	USCGS H 11 27 00					14	Qt	ePZ	16	44	53 c
	34½ N 48 E					15	Qt	ePKPZ	06	39	40
	Iran							USCGS H 06 20 53			
14	Ch	ePZ	15	06	52			7 N 73 W			
	ePcPZ		07	07				Northern Colombia			
	ePPZ		09	40				depth about 200 km			
	ePPPZ		11	25		15	Lh	ePZ	16	01	50
	eSZ		16	27			Wr	ePZ		02	33
	eScSZ		17	03				eSZ		04	16
	Wr	ePZ		07	02		Ch	ePZ		03	02
	Qt	iPZ		33	c		Qt	ePZ		11	

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSE	05	28			Wr	iPZ	39	04	
	H 16 00 15						Kr	iPZ		12	
	29½ N 81½ E							ePcPZ		54	
	Western Nepal							epPZ	40	08	
	depth normal							ePPZ	41	31	
15	Qt	ePZ	18	39	57 e			epPPPZ	42	19	
		eXZ	41	23				ePPPZ		58	
15	Ch	ePZ	20	05	53			eSZ	47	25	
	Wr	ePZ	06	02			Qt	ePZ	39	18	
	Lh	ePZ		04				ePcPZE	40	00	
		eSZ	14	23				epPN		04	
		ePKPPKP	35	03				ePPZ	41	42	
	Qt	ePZ	06	37				epPPPZ	42	20	
		eSE	15	30				eSNE	47	29	
	Kr	ePZ	07	11				esSN	48	51	
	USCGS H 19 55 39							USCGS H 22 29 17			
	53 N 160½ E							1½ N 125 E			
	Near east coast of							Celebes			
	Kamchatka							depth about 200 km			
	depth about 60 km							Mag 6¾-7 (Pas),			
	Mag 6¾ (Pas),							6.8 (Up, Ki)			
	6.8 (Up, Ki)					16	Qt	ePZ	08	41	37
15	Qt	ePZ	20	28	11	16	Qt	ePZ	08	41	37
15	Lh	ePZ	22	24	03			eSZ	43	01	
15	Qt	ePZ		31	c	16	Ch	iPZ	13	29	34
15	Ch	iPZ	22	36	25			ePcPZ		49	
		ePPPZ	38	43				ePPZ	32	22	
		eSZ	42	23				ePPPZ	34	07	
		eSSZ	45	05				eSZ	39	13	
	Lh	iPZ	38	40				eSKSZ		37	
		epPZ	39	22				eScSZ		42	
		eSZ	46	17			Wr	ePZ	29	42	

Date	Station	Phase	h	m	s
	Lh	ePZ			45
	Qt	ePZ		30	14
		iXZ		32	26
		USCGS H	13	17	52
		51½ N			176 W
		Andreanof Islands			
		Aleutian Islands			
		Mag 6-6¼ (Pas),			
		5.8 (Up, Ki)			
16	Qt	ePZ	17	13	10
	Lh	ePZ		14	09
16	Qt	ePZ	19	17	40 d
		iSE		20	39
		iSSE			58
		iLE		22	5
	Kr	ePZ	18	09	d
		iSZ		21	37
	Wr	ePZ	18	13	d
	Lh	ePZ			42 d
	Ch	ePZ	21	24	±
		H	19	13	46
		34 N			47¾ E
		Western Iran			
		USCGS H	19	13	45
		34½ N			48 E
		Iran			
		Mag 6.7 (Up, Ki),			
		6¾ (Pas)			
16	Qt	ePZ	19	39	49
17	Wr	iPZ	03	47	46 d
	Qt	iPZ		48	46 d
		eSZ		50	00

Date	Station	Phase	h	m	s
		H	03	47	10
		Hindukush			
17	Qt	ePZ	03	54	55
17	Ch	ePZ	09	20	17
		ePcPZ			39
		ePPZ		23	07
		ePPPZ		24	51
		eSZ		29	52
		eSKSZ		30	21
		eScSZ			26
	Wr	ePZ	20	27	
	Lh	ePZ			30
	Qt	ePZ			56
		ePcPZ		21	01
		eSE		31	09
	Kr	ePZ	21	21	
		USCGS H	09	08	35
		51½ N			176 W
		Andreanof Islands			
		Aleutian Islands			
17	Ch	ePZ	11	27	50
		ePcPZ		28	09
		ePPZ		30	46
		eSZ		37	29
	Lh	ePZ	28	06	
	Qt	ePZ			32
		ePcPZ			38
		USCGS H	11	16	13
		51½ N			176 W
		Andreanof Islands			
		Aleutian Islands			
17	Qt	ePZ	11	51	17
17	Wr	ePZ	18	13	13
		USCGS H	18	01	05
		3 S			145½ E
		Bismarck Sea			
17	Qt	ePZ	18	18	30
17	Qt	ePZ	21	35	11
18	Qt	ePZ	12	35	16
		eSZ		36	50
18	Ch	ePZ	15	28	29
		ePcPZ		29	46
		ePPZ		30	36
		eSZ		35	48
	Qt	ePZ		30	15
		USCGS H	15	19	20
		48 N			155 E
		Kurile Islands			
18	Qt	iPnZ	18	58	48.5 c
		iSnNZ		59	05.7
	Kr	ePnZ			36
		eSnZ		19	00 32
	Wr	iPnZ	18	59	55 c
		iSnZ		19	01 02
	Lh	ePZ			00 04
		ePgZ			35
		H	18	58	24
		29¼ N			67¾ E
		Near Dadhar			
		Baluchistan			
		West Pakistan			
18	Lh	ePZ	21	45	12
	Qt	ePZ			46 52
19	Qt	ePZ	15	58	45
19	Lh	ePZ	16	18	13
	Qt	ePZ			40
		USCGS H	16	06	18
		51½ N			175 W
		Andreanof Islands			
		Aleutian Islands			
19	Qt	ePZ	16	40	38
		USCGS H	16	29	36
		53½ N			161 E
		Near east coast of			
		Kamchatka			
19	Lh	ePZ	22	00	09
	Wr	ePZ			25
	Qt	ePZ			40
		eSE			11 08
		USCGS H	21	48	07
		1 S			149½ E
		New Ireland			
19	Qt	ePZ	23	07	45
		USCGS H	22	55	18
		1 S			149 E
		New Ireland Islands			
		region			
		depth about 100 km			
20	Ch	ePZ	03	52	32
		ePcPZ			38
		ePPZ			55 42
		ePPPZ			57 36
		eSZ		04	02 51
		ePPSZ			03 59
	Qt	eXZ	03	57	50

Date	Station	Phase	h	m	s
		USCGS H	03	40	07
		14 S	167	E	
		New Hebrides Islands			
		Mag $6\frac{1}{4}$ - $6\frac{1}{2}$ (Berk), (Pas)			
20	Ch	ePZ	06	27	38
	Wr	ePZ			39
	Qt	ePZ		28	27
		USCGS H	06	22	23
		45 N	99 $\frac{1}{2}$	E	
		Outer Mongolia			
20	Lh	ePZ	08	54	07
	Qt	ePZ			58
		USCGS H	08	46	04
		24 N	122	E	
		Near east coast of Formosa			
20	Ch	ePZ	09	30	25
	Qt	ePZ		31	12
		USCGS H	09	20	10
		53 $\frac{1}{2}$ N	159 $\frac{1}{2}$	E	
		Kamchatka			
20	Ch	ePZ	10	01	03
		ePcPZ			09
		ePPZ		04	13
		eSZ		11	20
		USCGS H	09	48	38
		New Hebrides Islands			
20	Ch	ePZ	17	52	03

Date	Station	Phase	h	m	s
		Fox Islands			
		12 S	167	E	
		Aleutian Islands			
		Santa Cruz Islands			
21	Qt	ePKPZ	21	17	41
		ePPZ		19	11
		eSKSE		24	20
		USCGS H	20	59	10
		18 S	176	W	
		Fiji Islands			
		depth about 250 km			
22	Ch	ePZ	00	13	12
		ePcPZ			22
		ePPZ		16	05
		eSZ		23	03
	Qt	ePZ		14	29
		USCGS H	00	01	14
		48 $\frac{1}{2}$ S	115	E	
		South Indian Ocean			
22	Ch	ePZ	20	45	21
		ePcPZ			35
		ePPZ		48	08
	Qt	ePZ		45	57
		USCGS H	20	33	40
		51 N	179 $\frac{1}{2}$	W	
		Andreanof Islands			
		Aleutian Islands			
22	Qt	ePZ	22	29	21
		USCGS H	22	16	56
		6 S	149	E	
		Western New Britain			
		depth about 250 km			
23	Ch	ePZ	08	11	31
		USCGS H	07	59	09



Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
24	Lh	ePZ	20	42	53	26	Ch	ePZ	16	10	14
	Qt	ePZ		43	28			USCGS H	15	57	57
		eSZE		45	31			12 S 167 E			
	Kr	ePZ		44	37			Santa Cruz Islands			
		H 20 40 50						depth about 150 km			
		39½ N 73¼ E				26	Ch	ePZ	23	35	45
		Tadzhikistan, S.S.R.						USCGS H	23	23	20
25	Qt	ePZ	04	08	44			14 S 167 E			
	Wr	ePZ		09	15			New Hebrides Islands			
26	Ch	ePZ	05	08	58			foreshock			
	Qt	ePZ		10	43	27	Qt	ePZ	15	24	01
		USCGS H 05 00 29						eSZE		29	51
		37½ N 142 E					Wr	ePZ		24	16
		Near east coast of					Kr	ePZ			24
		Honshu, Japan						ePPZ		25	59
26	Ch	ePZ	12	33	08			ePcPZ		26	19
		USCGS H 12 20 43					Lh	ePE		24	44
		14 S 167 E						ePPE		26	22
		New Hebrides Islands						eSE		31	08
		foreshock					Ch	eLE		34	6
26	Ch	ePZ	12	57	25			ePZ		27	00
		USCGS H 12 45 02						ePcPZ			39
		New Hebrides Islands						ePPZ		29	19
		foreshock						eSZ		35	30
26	Ch	ePZ	14	47	20			USCGS H	15	16	35
		eSZ		52	50			38 N 20½ E			
		USCGS H 14 40 24						Near west coast of			
		Near west coast of Java						Greece			
								Mag 6.5 (Up, Ki),			
								6± (Pas)			
28	Qt	ePKPZ	09	55	42	28	Qt	ePKPZ	09	55	42
	Wr	ePKPZ			54		Wr	ePKPZ			54

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s		
		USCGS H	09	36	06			i!SnZ			56		
		23½ S 69½ W						iSgZ		12	06		
		Chile-Argentina border					Qt	ePZ		11	41		
28	Lh	ePZ	18	27	55			eSE		12	38		
	Qt	ePZ		28	20			H 09 10 25					
		USCGS H	18	15	49			26 N 63¼ E					
		53 N 170½ W						Mekran					
		Fox Islands						West Pakistan					
		Aleutian Islands				30	Qt	ePKPZ		18	57	20	
29	Ch	ePZ	12	36	45			USCGS H	18	38	18		
		ePcPZ			52			27½ N 112 W					
		ePPPZ		41	44			Gulf of California					
		eSZ		47	00	31	Qt	ePZ		06	22	51	
	Qt	eXZ		42	08		Wr	ePZ			23	01	
		eSKSN*		49	24		31	Qt	ePZ		09	19	34
		USCGS H	12	24	23			iXZ			20	06	
		14½ S 167 E						eSZ				26	
		New Habrides Islands					Kr	iPZ			19	39	
		Mag 5¼-6 (Pas)						i!SZ			20	33	
29	Ch	ePZ	13	04	23		Wr	ePZ				50	
		ePcPZ			30			eSZ			22	36	
		ePPZ		07	34		Lh	ePZ			20	58	
		eSZ		14	39			eSZ			22	54	
		USCGS H	12	51	57			H 09 18 28					
		14 S 167 E						27¼ N 63¼ E					
		New Hebrides Islands						Western Baluchistan					
		aftershock				29	Lh	ePZ		18	31	51	
							Qt	ePZ				59	
30	Kr	iPnZ	09	11	17			iP*Z			22		
		iPgZ			30			iPgZ			30		
								USCGS H	09	18	15		
								28½ N 62 E					
								Iran-Pakistan border					

Major Shocks

Date	Station	Phase	h	m	s
31	Qt	ePZ	15	37	08
	USCGS H		15	24	45
	63½ N 148 W				
	Central Alaska				
31	Qt	ePZ	23	12	46
		eSN	23	04	
	USCGS H		23	00	16
	63 N 144½ W				
	Central Alaska				
	Mag 6.2 (UP, Ki)				
31	Qt	ePZ	23	46	13

Date	Station	Phase	h	m	s	Date	Phase	h	m	s
	<b>Quetta</b>					4	ePgZ	07	54	29
							eSgZ			45
1		ePZ	00	59	18	4	ePZ	13	54	02
		eSZE	01	00	00		eSZE			26
1		ePZ	02	27	52±	4	ePZ	14	46	25
		eSE		29	24		eSN			43
1		eXE	10	11	0	4	ePE	14	59	51
1		eXE	12	15	0		eSE	15	00	09
1		eXE	12	21	0	4	ePE	15	12	52
1		eXE	13	08	0		eSE			13 09
1		eXE	13	30	0	4	ePZE	15	31	36
1		ePZ	16	32	16		eSE			54
		eSE			38	4	ePgZ	15	50	46
1		ePgZ	23	51	36.7		eSgE			57
		eSgZE			38.4	4	ePgZ	17	29	32
2		ePgZ	07	57	06		eSgE			47
		eSgZE			14	5	ePZ	00	17	28
2		ePgZ	09	00	20.1		eSZE			18 08
		eSgE			22.2	5	ePgZ	02	16	35
2		iPgZ	11	55	46.7d		eSgE			51
		iSgNE			49.4	5	ePgZ	06	22	58
2		ePZ	16	25	31		eSgZ			23 14
2		ePZ	18	04	12	5	ePgZ	07	40	57
		eSE			44		eSgZ			41 13
2		ePZ	20	57	00	5	ePZ	12	12	18
3		ePZ	01	34	23		eSZ			41
3		ePZ	02	34	47	6	eXZ	01	21	21
		eSE			35 06	6	ePZ	04	03	19
3		ePZ	10	08	49	6	ePgZ	07	00	59
3		ePZ	18	01	17	6	ePZ	07	07	13
		eSE			35	6	eSZE			39
							ePgZ	07	54	02

Date	Phase	h m s	Date	Phase	h m s
6	eSgZ	09	9	ePgZ	14 53 09
6	eXZ	08 35 42		eSgZ	12 13
6	ePZ	09 09 40	9	eXZ	23 38 26
	eSZE	10 04	10	ePgZ	04 25 18
6	eXZ	10 12 29		eSgE	29 13
6	iPgZ	10 37 12 d	10	ePgZ	06 35 46
	iSgZE	23		iSgE	50 13
6	iPgZ	11 35 50 d	10	ePgZ	06 55 24
	iSgZ	36 01		eSgE	33 13
6	ePgZ	13 08 16	10	ePZ	10 46 29
	eSgZ	27		eSE	47 13
6	ePgZ	21 07 20-0	10	ePZ	12 29 39
	eSgZ	22 2		eSE	30 29
7	ePZ	07 30 51	10	ePZ	13 16 39
	eSE	31 08	10	ePZ	18 57 03
7	ePZ	11 44 38		eSE	24 14
	eSZE	46 00	10	iPgZ	19 05 29
7	ePgZ	13 16 20		iSgNE	31 15
	eSgE	25	10	ePgZ	20 08 12
7	ePgZ	13 18 53-4		eSgE	23 15
	eSgE	55-6	10	iPgZ	22 07 36
7	ePgZ	18 38 14		iSgNE	47 15
	eSgE	29	10	ePZ	23 52 30
8	ePgZ	04 06 31	11	ePZ	09 16 51
	eSgZ	42		eSE	18 03 16
8	ePZ	11 33 24	11	ePgZ	14 41 01
8	ePZ	21 45 13		eSgZ	14 16
	eSE	34	11	ePZ	17 10 38
8	ePgZ	23 32 24-8		eSE	11 04 16
	iSgZ	26-5	12	ePZ	21 24 42
9	ePE	07 28 43	12	ePZ	21 29 05
	eSE	29 01	12	ePZ	22 47 04

Date	Phase	h m s	Date	Phase	h m s
17	ePZ	01 08 36	17	eXZ	06 50 37
	eXZ	06 22 42	17	eXZ	08 06 58
	ePZ	07 47 07	17	ePZ	11 03 02
	eSZ	25	17	eXZ	12 31 29
	ePZ	16 05 47	17	ePgZ	13 31 09
	eSE	06 26		eSgZ	25
	ePZ	17 41 17	17	ePZ	19 32 32
	eSZ	36	18	ePZ	04 24 29
	ePgZ	17 47 43		eSZ	25 09
	eSgZ	59	18	ePgZ	08 04 50-4
	ePZ	17 54 19		eSgZ	52-7
	ePZ	19 30 08	18	ePZ	15 27 04
	eSNE	29	18	ePZ	15 51 33
	ePgZ	2 01 06-6	18	ePZ	18 39 07
	eSgZE	09-2	18	ePZ	19 28 54
	ePZ	03 19 41		eSZ	29 15
	eXZ	04 27 01	18	ePZ	20 10 08
	ePZ	05 51 46±	18	ePZ	20 48 26
	eSZ	52 08	18	ePZ	21 12 03
	ePZ	06 00 42	18	ePZ	21 46 52
	eSZ	59	18	ePZ	22 33 22
	ePZ	15 54 20	18	ePZ	22 41 32
	ePZ	20 20 46	19	ePZ	01 30 53
	eXZ	23 07 23		eSZ	31 11
	ePZ	19 50 36	19	ePgZ	05 48 42
	ePZ	19 56 40		eSgE	53
	ePZ	20 38 10c	19	ePZ	14 14 59
	ePZ	22 19 17	19	ePZ	15 03 40
	ePZ	22 35 35		eSZ	04 17
	ePZ	23 28 27	19	ePZ	15 56 21
	eXZ	03 51 41		eSE	40
	eXZ	05 01 21	19	ePZ	16 57 24

Date	Phase	h	m	s
19	ePZ	18	19	11
19	ePZ	23	20	52
	eSE		21	10
20	ePgZ	00	47	46
	eSgZ		48	02
20	ePZ	01	50	11
20	ePZ	03	31	23
	eSZE		32	03
20	ePgZ	05	57	23
	eSgZ			33
20	ePgZ	07	15	36
	eSgE			52
20	ePgZ	07	17	14
	eSgZ			26
20	ePZ	13	05	26
20	ePZ	19	55	26
20	ePgZ	22	21	39
	eSgZ			49
20	ePgZ	23	46	34
	eSgE			38
21	ePZ	05	44	45
	eSE		45	06
21	ePZ	08	18	30
	eSE		19	25
21	ePZ	11	50	09
22	ePgZ	05	50	41
	eSgE			54
22	eXZ	08	35	49
22	ePZ	11	48	28
22	ePZ	16	10	42
	eSZ		11	03

Minor Shocks

Date	Phase	h	m	s
22	ePZ	19	38	37
23	ePZ	13	43	52
	eSNE		44	17
23	ePZ	16	12	39
	eSE			58
23	ePZ	16	33	34
	eSE			56
23	ePZ	18	26	07
24	ePZ	04	43	43
24	ePZ	13	24	18
	eSE		26	08
25	ePZ	06	04	33
25	ePZ	06	14	44
25	ePZ	06	49	21
	eSE			42
25	ePgZ	08	16	41
	eSgE			57
25	eXZ	19	38	28
25	ePZ	22	37	17
26	eXZ	11	23	0
26	ePE	16	29	43
	eSNE		30	43
26	ePgE	17	13	47
	eSgE			50
27	iPgE	22	38	30
	iSgE			32
27	ePE	23	35	12
	eSE			49
28	ePZ	04	16	00
28	ePZ	09	30	10
	eSZ		31	10
28	ePZ	12	32	05

Date	Phase	h	m	s
	eSZ			32
28	ePZ	18	28	20
28	ePZ	18	58	10
29	ePZ	04	00	06
	eSZ			33
29	ePgZ	15	18	19
	eSgZ			30
29	ePgZ	16	08	58
	eSgZ		09	09
29	ePgZ	16	22	08
	eSgZ			19
29	iPgZ	17	07	13
	iSgZN			25
30	ePZ	07	10	24
30	ePZ	09	11	41
	eSE		12	38
30	ePZ	22	21	25
	eSZ			49
30	ePZ	22	24	23
	eSZ			47
31	ePZ	03	18	23
31	ePZ	04	27	19
	eSZ			43
31	ePZ	18	52	33
	eSZ		53	07
	<b>Warsak</b>			
1	ePZ	00	59	34
1	ePZ	02	26	38
1	iPZ	07	40	21
	iSZ			53

Minor Shocks

Date	Phase	h	m	s
1	ePZ	13	08	46
1	eSZ		09	13
2	iPZ	22	47	04
	iSZ			40
3	iPZ	00	09	58
3	iPZ	17	24	55
	iSZ		25	16
3	ePZ	19	22	43
	eSZ		23	10
4	iPZ	16	21	36
	iSZ		22	06
7	iPZ	11	43	37
	iSZ		44	10
9	ePZ	07	03	05
9	ePZ	09	08	04
9	ePZ	09	44	29
9	iPZ	17	44	52
	iSZ		45	24
9	iPZ	19	21	07
10	ePZ	08	19	20
10	ePZ	10	45	23
11	ePZ	02	52	40
	iSZ		53	12
11	ePZ	04	56	19
11	ePZ	05	53	11
	iSZ		54	07
11	ePZ	09	15	57
	iSZ		16	29
11	ePZ	16	23	22
12	ePZ	03	38	15
12	iPZ	06	33	50
	iSZ		34	23

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
13	ePZ	10 41 24		iSZ	55 25
13	ePZ	11 57 08	23	iPZ	05 35 22
	iSZ	34	23	ePZ	06 35 00
13	iPZ	18 08 53		eSZ	29
	iSZ	09 23	23	ePZ	20 35 38
13	ePZ	18 14 42	24	iPZ	20 42 28
	iSZ	15 12		iSZ	43 43
13	ePZ	20 24 58	25	ePZ	19 37 18
14	ePZ	13 29 03		iSZ	38 46
14	iPZ	23 28 57	26	ePgZ	16 50 26
	iSZ	29 30		iSgZ	37
15	ePZ	03 00 28	27	ePZ	14 32 44
	eSZ	59		iSZ	33 54
15	ePZ	11 36 09	27	ePZ	15 24 16
16	ePZ	02 15 25	27	ePZ	18 08 34
	iSZ	53	27	ePZ	19 21 11
16	ePZ	05 22 43	27	ePZ	23 35 35
	eSZ	23 09	28	iPZ	09 28 58
16	ePZ	06 22 13	28	ePZ	18 57 26
17	iPZ	12 30 46		iSZ	57
	iSZ	31 32	29	ePZ	03 42 29
17	ePZ	22 58 38		iSZ	43 07
	iSZ	59 11	29	ePZ	17 08 17
18	iPZ	07 26 12		eSZ	09 14
	eSZ	45	30	ePZ	0 54 12
18	ePZ	07 50 20	30	ePZ	19 02 27
	iSZ	53	30	ePZ	21 29 43
18	ePZ	10 22 05		eSZ	30 16
18	iXZ	12 33 11	31	iPZ	11 25 08
19	ePZ	16 14 42	31	ePZ	12 19 38
20	ePZ	19 54 47	31	ePZ	17 42 16

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
31	ePZ	18 24 29	28	ePZ	18 58 56
31	ePZ	18 28 41	29	ePZ	17 08 46
	iSZ	29 15	31	eXZ	01 35 48
	<b>Lahore</b>		31	ePZ	06 23 43
2	eXZ	18 05 12		<b>Karachi</b>	
3	eXZ	00 25 11			
3	eXZ	05 34 36	2	eXZ	22 05 00
3	eXZ	16 26 48	4	eXZ	04 25 59
4	eXZ	14 48 13	9	eXZ	07 31 09
8	ePZ	03 10 31	12	eXZ	12 29 34
15	eXZ	23 07 56	17	ePZ	09 21 21 c
16	ePZ	17 40 19	19	eXZ	22 01 01
16	ePZ	21 41 55	29	eXZ	17 08 32
16	ePZ	22 34 47		<b>Chittagong</b>	
17	eXZ	03 49 09			
17	eXZ	18 11 57	3	eXZ	01 28 44
17	eXZ	19 26 52	3	eXZ	16 29 41
17	eXZ	21 29 59	4	eXZ	09 01 19
18	ePZ	07 25 55	4	eXZ	16 15 41
	eSZ	26 14	5	eXZ	17 38 38
18	ePZ	07 50 03	6	eXZ	10 15 32
	eSZ	21	9	eXZ	07 31 45
18	eXZ	12 35 42	11	ePZ	21 33 42
19	ePZ	05 18 21	12	ePZ	14 01 27
21	ePZ	12 17 28	12	eXZ	20 06 13
23	ePZ	20 34 50	12	ePZ	23 22 55
24	ePZ	05 21 34	13	ePZ	00 22 56
24	eXZ	05 46 37	13	ePZ	06 18 12
24	ePZ	06 03 19	13	eXZ	20 24 16
26	ePZ	19 52 49	13	eXZ	23 57 59
28	ePZ	09 29 45	14	eXZ	11 36 26
	eSZ	30 53	15	eXZ	23 06 06

Date	Phase	h m s	Date	Phase	h m s
17	eXZ	11 54 28	28	eXZ	09 55 27
18	eXZ	07 06 35	28	eXZ	18 28 00
19	eXZ	05 02 31	31	eXZ	18 58 54
19	ePZ	15 48 52	31	eXZ	23 12 51
19	eXZ	16 02 02			
19	eXZ	16 15 07			
19	eXZ	16 47 15			
19	eXZ	23 04 19			
20	eXZ	05 09 38			
20	eXZ	07 14 09			
20	eXZ	21 53 12			
20	ePZ	22 30 59			
20	eXZ	22 59 13			
21	eXZ	00 34 19			
21	eXZ	01 26 21			
21	eXZ	04 21 07			
21	eXZ	12 05 25			
21	eXZ	12 31 40			
21	eXZ	21 21 21			
22	eXZ	12 41 17			
24	eXZ	08 10 24			
24	eXZ	20 56 17			
26	eXZ	23 44 40			
28	eXZ	01 36 22			

*Seis. Bull. Pakistan Quetta, Vol 4 No. 9, September 1958*

# SEISMOLOGICAL BULLETIN OF PAKISTAN

*Vol. 4*

SEPTEMBER 1958

*No. 9*

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*Printed at*  
Bolan Muslim Press,  
QUETTA.

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*Issued under the authority of the Director, Meteorological Service*  
PAKISTAN METEOROLOGICAL SERVICE  
GEOPHYSICAL INSTITUTE  
QUETTA

# Pakistan Meteorological Service

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Meteorological Service

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The Seismological Bulletin of Pakistan is a monthly publishing data of Seismological stations in Pakistan.

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## SEISMOLOGICAL BULLETIN

of

PAKISTAN.

Pakistan Meteorological Service, Geophysical Institute, Quetta.

Vol. 4

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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
<b>Quetta (Central Station)</b>				
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 "	—	—
<b>Lahore</b> Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
<b>Karachi</b> Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
<b>Chittagong</b> 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 "	—	—
<b>Warsak</b> 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) 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
1	Qt	ePKPZ	01 16 14			eSEN*	45 35
		USCGS H	00 57 10			eScSN*	47 30
		24 S	175 1/2 W		Kr	iPZ	38 47 d
		Tonga Islands region				USCGS H	15 29 31
1	Qt	ePZ	08 38 16			38 N	134 1/2 E
		esPZ	30			Sea of Japan	
		eXZ	48			depth about 400 km	
		iXE	39 02	2	Qt	ePZ	01 20 17
		eSNN*	07			USCGS H	01 13 30
		iXN*	29			Near west coast of	
	Kr	i!PZ	38 21 c			Greece	
		isPZ	33			Mag 5.3 (Up, Ki)	
		i!SZ	39 14	2	Qt	ePZ	03 09 37
	Wr	iPZ	27 d			esSN*	21 19
		iSZ	41 16			USCGS H	02 56 34
	Lh	ePZ	39 40			6 1/2 S	155 E
		eSZ	41 36			Solomon Islands	
		H 08 37 09				depth about 100 km	
		27 1/4 N 63 E		2	Qt	ePZ	12 49 42
		Pakistan-Iran border		2	Lh	iPZ	14 37 31 c
		Slightly deeper than			Wr	iPZ	48 c
		normal			Kr	iPZ	59 c
1	Ch	iPZ	15 36 32 c			Mu	Sec
		epPZ	37 31			PZ	0.2 1.0
		ePPZ	38 11				
		eSZ	42 10		Qt	ePZ	38 04 c
	Lh	iPZ	37 43 d			eXEN*	41 07
		epPZ	38 59			ePPZ	13
		e(S)Z	44 19			eXZEN*	48 14
	Qt	ePZ	38 29 d			eSEN*	23
		epPZ	39 50			Mu	Sec
		ePPN*	40 42			PZ	0.2 1.2
		eXZ	42 42			SE	0.7 2.5

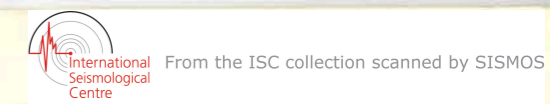
Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	USCGS H 14 25 37						Atlantic Ocean					4	Qt	ePZ	00	09	42
	5½ S 145½ E						Mag 6.3 (Up, Ki),						Wr	ePZ			16 48
	Near north coast of						6.4 (Qt)						Lh	ePZ			26 c
	New Guinea					3	Qt	ePKPZ	04	37	10			USCGS H 00 03 00			
2	Mag 6.2 (Qt, Kr)							USCGS H 04 17 50						37 N 26½ E			
	ePKPZ 20 26 16							Off coast of Guatemala						Dodecanese Islands			
	ePKSEN* 29 43					3	Ch	ePZ 08 18 52						depth about 60 km			
	USCGS H 20 07 04							epPZ 19 15						Mag 5.4 (Up, Ki)			
	15 N 92½ W							esPZ 26				4	Qt	ePZ 07 10 58			
	Near coast of Oaxaca							ePPZ 20 46						USCGS H 06 58 52			
	Mexico							ePPPZ 21 32						51½ N 177½ E			
	Mag 5.7 (Up, Ki)							eSZ 25 35						Rat Islands			
3	Qt ePZ 01 38 10							esSZ 26 15				4	Qt	ePKPZ 22 10 46			
	eSEN* 41 20						Lh	ePZ 19 54						eXZ 11 23			
	Wr ePZ 38 41							epPZ 20 07						eXZ 12 00			
	Lh ePZ 39 11							eSZ 27 39						eXZ 14 49			
	H 01 34 08							esSZ 28 03						eSKSPN* 24 21			
	35 N 47 E							iPZ 20 02						Mu Sec			
	Western Iran							ePZ 39						MN* 14.3 19			
3	Qt ePZ 03 57 05 c							ePPZ 23 08					Wr	ePKPZ 22 10 58			
	ePPZ 04 00 20							eSZEN* 28 56					Ch	ePKPZ 11 10			
	eSKSZEN* 07 25							esSN* 29 20						USCGS H 21 51 08			
	eSE 38							eScSN* 30 30						33½ S 69½ W			
	ePPSE 08 57							Mu Sec						Chile-Argentina border			
	eSSN* 13 12							PZ 0.8 2.1						Mag 6¼-7 (Pas),			
	eLN* 19.2							MN* 5.3 1.7						6.8 (Up, Ki),			
	Mu Sec							USCGS H 08 10 26						6¾ (Qt), (Berk)			
	PZ 0.6 2.0							40½ N 143 E						ePZ 13 10 38			
	Kr ePZ 03 57 08							Off northeast coast of				5	Wr				
	Wr ePZ 25							Honshu, Japan						USCGS H 13 01 55			
	USCGS H 03 44 29							depth about 60 km						5 S 102 E			
	0 18 W							Mag 6.2 (Up, Ki),						Near coast of			
								6.5 (Qt)						Sumatra			

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		e(pP)Z			58			eSN*			44 40
		iSN*		10	08			USCGS H 22 23 37			
		e(sS)N*			43			54 N 171 E			
		USCGS H 14 53 13						Near Islands			
		33½ N 131½ E						Aleutian Islands			
		Northern Kyushu				10	Ch	ePZ	03	51	58
		Japan					Qt	ePZ			53 31
8	Qt	ePKPZ	22	44	32			eSN*			56 26
		ePKSZ		48	06			eLNE			56.8
	Ch	ePKPZ		44	54			H 03 49 47			
		USCGS H 22 24 55				10	Qt	ePZ	21	41	13
		34 S 70 W				11	Wr	ePnZ	04	20	30
		Chile-Argentina					Qt	ePnZ			54
		border						eP*ZNE			21 10
9	Qt	iPgZNE	10	32	31 d			eSnZE			22 15
		iSgZNE			37			eS*NN*			39
		H 10 32 22						H 04 19 08			
		About 50 km						Northern Afghanistan			
		northeast of Quetta				11	Wr	ePZ	05	04	48
		Observatory					Qt	ePZ			05 25
9	Wr	ePZ	11	42	15	11	Wr	ePZ	05	25	01
	Qt	ePZ			51 c		Qt	ePZ			37
		eSN*			51 31		Ch	ePZ			52
		Mu Sec				11	Wr	ePZ	07	04	18
		PZ 0.2 1.3					Qt	ePZ			05 01
	Kr	ePZ			43 12	11	Wr	iPZ	10	40	01
		USCGS H 11 32 05						iSZ			39
		46 N 151 E					Qt	ePZ			41 04
		Kurile Islands						eSZN			42 32
		Mag 6.2 (Qt)						H 10 39 10			
9	Ch	ePZ	22	34	09			Northern Afghanistan			
	Wr	ePZ			43						
	Qt	ePZ			35 14 c	11	Ch	ePZ	18	10	04
		ePPZN			37 58		Wr	ePZ			11 35

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePZ			56			ePZ			54 14
	Qt	eSNE			20 07			eSZN			55 30
		eLN*			27.0			H 18 52 35			
		USCGS H 18 01 44						Hindukush region			
		7½ N 126½ E				14	Ch	iPZ	14	29	18 d
		Near east coast of						ePPZ			30 54
		Mindanao, Philippine						ePcPZ			31 17
		Islands						eSZ			35 25
								Mu Sec			
								PZ 0.8 1.0			
12	Qt	ePZ	05	49	20						
		eSN*			58 49		Wr	ePZ			29 18
		USCGS H 05 37 53					Qt	ePZ			30 02 d
		42 S 80 E						ePcPZE			31 41
		Indian Ocean						ePPZ			51
12	Kr	ePZ	13	54	32			ePcSNE			35 32
	Wr	iPZ			50 c			eSN*			36 50
	Qt	ePZ			53			eLN*			40.1
		USCGS H 13 45 46						Mu Sec			
		6 S 106 E						PZ 1.1 1.8			
		Java						PN 0.7 1.8			
12	Wr	ePZ	22	19	08			PE 0.6 1.8			
	Qt	ePZ			21 c						
		USCGS H 22 08 06									
		6½ S 129½ E									
		Banda Sea									
13	Qt	ePZ	03	42	21						
		eXZN			44 36						
		e(S)N*			50 25						
13	Wr	ePZ	18	01	36						
	Qt	ePZ			56						
		e(S)N*			07 56						
13	Wr	ePZ	18	53	21						
		eSZ			55						
						14	Qt	ePZ			19 51 42



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Major Shocks

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Date	Station	Phase	h	m	s
14	Qt	ePZE iSNN*	21	39	10 d 45 01
		Mu	Sec		
	PZ	0.9	2.0		
	PE	0.6	1.8		
	Ch	ePZ	39	12	c
	Lh	ePZ			13
		eSZN	45	09	
		Mu	Sec		
	PZ	0.9	1.6		
	USCGS H 21 31 43 8½ S 67 E Chagos Archipelago region Mag 6.0 (Qt), 6.1 (Lh)				
14	Qt	ePZ	21	51	29
15	Qt	ePZ	04	11	05
		eSN	12	47	
15	Qt	ePZ	11	53	29
		e(S)N*	55	09	
15	Qt	ePKPZ	17	07	10
	USCGS H 16 48 10 33 S 180 Kermadec Islands region				
15	Lh	ePZ	19	54	11
		epPZ	56	15	
	Wr	iPZ	54	26	c
		eSZ	20	01	23
	Kr	iPZ	19	54	31
		epPZ	56	38	
		Mu	Sec		
	PZ	1.3	1.5		

Date	Station	Phase	h	m	s
	Qt	ePZ	19	54	40 c
		ePcPE	55	24	
		epPZEN*	56	45	
		ePPZEN*	57	01	
		epPPN*	58	30	
		ePPPZEN*	46		
		esPPZE	59	46	
		iSEN*	20	01	50
		iXN*	03	03	
		iScSE	24		
		esSE	05	25	
		ePKPPKPZEN*	24	27	
		Mu	Sec		
	PZ	1.0	1.6		
	PPZ	1.1	2.0		
	SE	7.7	4.0		
	SN*	7.1	12.0		
	USCGS H 19 45 40 2½ N 120½ E Celebes Sea depth about 600 km Mag 6-6½ (Pas), 6.3 (Up, Ki), 6¼-6½ (Qt)				
15	Qt	ePZ	20	23	05
	Wr	ePZ			58
16	Qt	ePZ	04	02	22
	USCGS H 03 52 50 60½ N 136½ E Eastern Siberia				
16	Wr	ePZ	07	31	29
	Qt	ePZ			52 c

Date	Station	Phase	h	m	s
		USCGS H	07	22	20
		11½ N 123 E			
		Negros, Philippine Islands			
16	Qt	ePZ	14	24	21
		e(PPP)ZE			35
		eXNE			47
		eXZN	25	01	
		iSEN*			58
		eSSN*	26	09	
		eXZN*			14
		eLNEN	26.5		
	Wr	ePZ	24	52	
	Kr	ePZ	25	20	±
		H	14	22	14
		35 N 58½ E			
		Eastern Iran			
		USCGS H	14	22	25
		Eastern Iran			
18	Wr	iPZ	05	03	50 c
		iSZ			04 33
	Qt	ePZ			50
		H	05	02	53
		Hindukush region			
18	Qt	ePZ	07	03	08
	USCGS H 06 51 09 2½ S 141 E Near north coast of New Guinea				
18	Qt	ePZ	14	55	23 ±
		eSN*	15	06	39
	USCGS H 14 41 40 ½ N 30 W Mid-Atlantic Ocean Mag 5.9 (Up, Ki)				

Date	Station	Phase	h	m	s
18	Wr	iPZ	20	53	42 d
	Lh	iPZ			54 34 ±
		iSZ			55 40
	Qt	ePZ			54 41 d
		esPZN*			55 19
		eXZ			46
		iSEN			55
	Kr	iPZ			45 d
		isPZ			56 18
		iSZ			57 50
	Ch	iPZ			58 05 d
		epPZ			39
		iPPZ			46
		esPZ			59 01
		eSZ	21	02	06
		esSZ			03 02
		H	20	53	05
		36 N 70 E			
		Hindukush			
		depth about 160 km			
		Felt Warsak			
		USCGS H	20	53	02
		36½ N 71 E			
		Hindukush			
		depth about 150 km			
		Mag 6.1 (Up)			
18	Lh	ePZ	23	14	19
	Qt	ePZ			52
19	Ch	iPZ	08	20	09 d
	Wr	ePZ			22 47
	Kr	ePZ			58
	Qt	ePZ			23 05



Date	Station	Phase	h	m	s
	USCGS H		08	12	33
	2½ N	I27 E			
	Molucca Passage				
19	Ch	ePZ	17	30	41
	Qt	ePZ		31	15
		eSN		41	40
	USCGS H		17	18	40
	53 N	168½ W			
	Fox Islands				
	Aleutian Islands				
19	Qt	ePZ	20	46	43
20	Ch	ePZ	05	20	22
	Wr	ePZ		24	00
	Qt	ePZ			24
		eSN		29	59
	USCGS H		05	17	23
	20½ N	105 E			
	North Vietnam				
20	Kr	iPZ	09	09	18 c
		iXZ			22
		iSZ			47
	Qt	ePZ		10	18 c
		iXZ			43
		eSZN		11	34
	Mu	Sec			
	PZ	0.7	1.0		
	Wr	ePZ			28
	H		09	08	40
	24 N	64¾ E			
	Arabian Sea				
	about 100 miles				
	south of Mekran				
	coast				

Date	Station	Phase	h	m	s
21	Lh	ePZ	05	54	44
	Wr	ePZ			50
	Qt	ePZ		55	26 c
		eSN		06	03 42
	USCGS H		05	45	10
	38 N	142 E			
	Honshu, Japan				
21	Qt	ePZ	16	22	27
		eSN*			25 44
		eLN*			27.5
	Lh	ePZ			23 30
	USCGS H		16	18	20
	Western Iran				
21	Wr	iPnZ	19	40	33 d
		iSnZ			41 09
	Lh	ePnZ			40 34
		eP*Z			40
		eS*Z			41 16
		eSgZ			23
	Qt	ePnZ			40 38
		eSnZ			41 20
	H		19	39	43
	31¼ N	70¾ E			
	Near Leiah				
	West Pakistan				
22	Ch	ePZ	07	07	24
	Wr	iPZ			08 48 d
		iXZ			09 45
	Qt	ePZ			08 53
		eXZ			09 49
		eSNE			15 47

Date	Station	Phase	h	m	s
	USCGS H		07	00	14
	6 S	110 E			
	Off north coast of				
	Java				
	depth about 600 km				
22	Ch	ePZ	08	44	56
		eSZ			51 05
	Wr	iPZ			46 41 d
	Qt	ePZ			47 12 d
		epPZ			37
		eSNEN*			55 12
		esSN*			56 00
	Kr	iPZ			47 23 d
	USCGS H		08	37	06
	28 N	144 E			
	Bonin Islands				
	depth about 100 km				
22	Qt	ePZ	10	16	31
22	Ch	eXZ	19	23	34
	Wr	ePKPZ			24 42
	Kr	ePKPZ			44
	Qt	ePKPZ			47 c
		ePPZE			26 46
		eXZ			28 00
		eSKSN*			31 53
		eSKKSN*			33 34
		ePPSN*			38 18
		eSSSN*			48 13
		eLN*			57.8
	USCGS H		19	05	44
	33½ S	177½ W			
	Kermadec Islands				
	region				

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Date	Station	Phase	h	m	s
		Mag $6\frac{3}{4}$ (Pas), (Berk), 6.4 (Up, Ki)			
22	Ch	ePZ	20	17	18
	Wr	ePZ		18	09
	Qt	ePZ			50 c
		USCGS H 20 08 40 42 N 142 E Hokkaido, Japan			
24	Wr	ePZ	03	56	36
	Qt	ePZ		57	02
		eXZ			10
		ePPZ	04	00	30
		eSKSNE		07	35
		eSNN*			46
		eSSN*		13	26
	Ch	ePZ	03	57	06
		USCGS H 03 44 14 59½ N 143½ W Gulf of Alaska			
		Mag $6\frac{1}{4}$ (Berk), (Pas), 5.8 (Up, Ki)			
24	Qt	ePKPZ	14	12	43
	Lh	ePKPZ		13	00
	Ch	ePKPZ		13	18±
		USCGS H 13 53 05 Central Chile			
25	Wr	iPZ	06	54	51 c
	Lh	iPZ		55	37 d
		isPZ		56	19
		isZ			41
	Qt	ePZ		55	43 d
		esPZ		56	31
		iXZ			54

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Date	Station	Phase	h	m	s
25	Qt	ePKPZ	20	44	55
		USCGS H 20 24 44 36 S 98 W Pacific Ocean southeast of Easter Islands			
25	Ch	ePKPZ	21	14	23
	Qt	ePKPZ			55
		USCGS H 20 55 53 33 S 178 W Kermadec Islands region			
26	Qt	ePZ	07	26	52
		e(S)N*		29	54
26	Ch	ePZ	11	42	56
	Qt	ePZ		45	36
		USCGS H 11 34 24 Banda Sea			
26	Ch	ePZ	18	22	15
		ePcPZ			27
		ePPZ		25	08
		eSZ		31	55
	Lh	ePZ		22	38±
	Qt	ePZ			56
		eSN*		33	14
		USCGS H 18 10 28 50½ N 175 W Andreanof Islands Aleutian Islands			
27	Lh	ePZ	07	45	08±
		eSZ		52	17
	Kr	iPZ		45	08 c
		iXZ			19

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				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
		H 17 45 33		30	Qt	ePZ	09 28 45
		Northern Afghanistan				USCGS H 09 18 10	
29	Wr	ePZ	05 10 37			3 N 128 E	
		eSZ	11 21			Molucca Passage	
	Qt	ePZ	41				
		eSN	13 17				
		H 05 09 39					
		Afghanistan-					
		Tadzhikistan border					
29	Ch	ePZ	10 01 56				
	Wr	ePZ	04 25				
	Qt	ePZ	39 c				
		eSNN*	13 36				
		USCGS H 09 53 20					
		4½ S 130 E					
		Banda Sea					
29	Qt	ePZ	14 27 30				
		USCGS H 14 17 11					
		39½ N 143½ E					
		Off northeast coast of					
		Honshu, Japan					
29	Qt	ePZ	15 26 03				
		USCGS H 15 15 44					
		39 N 143 E					
		Near east coast of					
		Honshu, Japan					
30	Wr	iPZ	07 18 55 d				
	Qt	ePZ	19 14				
		eSNN*	27 45				
		USCGS H 07 08 37					
		3½ N 128 E					
		Molucca Passage					

				Minor Shocks			
Date	Phase	h m s	Date	Phase	h m s		
	Quetta		9	ePgZ	23 40 49		
				eSgZ	51		
1	eXZ	07 52-0	10	eXZ	06 47 00		
1	eXZ	08 50 47	10	iPgZ	09 52 30 c		
1	iPgZ	10 33 36		iSgZ	36		
	iSgZ	47	10	ePgZ	15 34 24		
2	ePZ	22 01 07		eSgZ	40		
3	ePZ	23 50 37	10	ePgZ	16 02 39		
	eSZ	51 34		eSgZ	55		
4	iPgZ	03 49 10-2c	10	ePgZ	21 36 31		
4	ePZ	09 54 04		eSgZ	42		
	eSZE	25	11	ePZ	00 28 47		
5	ePZ	21 17 36	11	ePZ	00 49 56		
	eSZ	56	11	ePZ	01 19 20		
6	ePZ	02 35 05	11	ePZ	04 00 58		
	eSZ	46	11	ePZ	04 04 40±		
6	ePZ	03 49 46	11	ePZ	16 29 56		
	eSZ	50 47		eSZ	31 09		
7	eXZ	13 00	11	eXZ	22 05 52		
7	eXZ	14 13	12	ePgZ	03 32 58		
7	ePgZ	21 01 41		eSgNE	33 06		
	iSgZ	52	12	ePgZ	13 46 20		
8	eXZ	07 55 53		eSgZ	35		
8	ePZ	14 07 15	12	ePZ	21 59 29		
8	ePZ	15 39 10		eSNE	22 00 58		
8	ePZ	20 43 12	12	ePZ	23 54 46		
	eSZN	29	13	ePgZ	06 24 37		
9	ePZ	20 20 27		eSgZ	53		
	eSZ	21 43	13	ePgZ	10 26 34		
9	ePZ	21 42 24		eSgZ	41		
9	iPgZ	22 30 39 d	14	ePZ	10 26 22		
	eSgZ	49		eSZ	44		
9	ePZ	23 07 27	14	ePgZ	17 34 19-6		
	eSZ	47		eSgZ	22-0		

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Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
14	ePgZ	18 40 23	22	ePZ	12 50 41
	eSgZ	33	23	eXZ	08 02 00
16	eXZ	10 08 00	23	ePZ	22 49 32
16	ePZ	14 29 31		eSZ	50 29
	e(S)N	31 32	24	ePZ	06 24 33
16	ePgZN	20 47 03 d		eSE	25 14
	eSgZN	15	24	eXZ	07 58 00
16	ePgZ	21 02 29	24	ePZ	21 16 53
	eSgZN	39		eSNE	17 37
17	ePgZN	19 52 47	25	eXZ	08 07 44
	eSgZ	56	25	eXZ	22 02 51
18	ePZ	05 04 50	26	ePZ	00 45 04
18	eXZ	06 41 00		eSNE	46 58
18	ePgZ	08 44 16	26	eXZ	01 44 18
	eSgZ	25	26	eXZ	06 45 00
18	ePZ	15 38 43	26	ePgZ	11 59 28
19	ePZ	07 05 57		eSgZ	3
	eSE	06 15	26	ePgZ	13 50 18
19	ePZ	07 49 11	27	e(P)Z	18 32 00
19	ePZ	12 07 33	27	ePZ	05 18 58
	eSZ	08 48	27	e(PKP)Z	14 13 47
19	ePgZ	14 10 03	27	ePgZ	21 13 52
	eSgZ	15		eSgZ	14 05
19	ePZ	21 33 15	28	ePgZ	00 06 18
	ePZ	23 27 11		eSgZ	33
21	eXZ	03 21 38	28	ePZ	02 03 06
21	eXZ	06 09 37	28	eSZ	04 17
21	ePZ	07 41 55	29	ePZ	12 39 48
21	eXZ	09 36 00	29	ePZ	03 52 08
21	ePZ	13 12 55	29	ePZ	22 12 25
21	ePZ	13 30 30		eSZEN*	51
	eSNE	31 52	30	ePZ	00 44 51
22	eXZ	09 37 00	30	e(S)E	45 27
				ePZ	07 43 22

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Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	<b>Warsak</b>		7	iPZ	04 41 46
				iSZ	42 15
1	ePZ	00 03 14	7	ePZ	06 09 32
	iSZ	48		iSZ	10 02
1	ePZ	08 50 35	7	ePZ	08 28 38
	eSZ	52 02		iSZ	29 09
1	ePZ	13 21 27	7	ePZ	17 13 14
	iSZ	22 15		iSZ	14 05
1	ePZ	17 04 57	8	ePZ	00 24 22
1	iPZ	22 54 43		iSZ	49
2	iPZ	13 20 16	8	iPZ	07 55 04
	iSZ	41		iSZ	40
2	iPZ	21 02 49	8	ePZ	16 25 24
	iSZ	03 28		iSZ	26 17
2	iPZ	22 00 11	8	ePZ	19 56 07
2	ePZ	23 00 26		iSZ	47
	eSZ	01 05	9	iPZ	04 18 00
3	ePZ	10 58 04	9	ePZ	07 28 55
	iSZ	34		iSZ	29 23
3	iPZ	16 36 13	9	ePZ	14 00 26
	iSZ	43		iSZ	56
4	ePZ	16 02 04	9	iPZ	17 05 46
5	iPZ	04 10 12		iSZ	56
6	iPZ	04 02 47	9	iPZ	20 19 26
	iSZ	03 17		iSZ	20 00
6	iPZ	14 12 04	9	iPZ	21 41 27
	iSZ	39		iSZ	42 00
6	iPZ	18 16 50	10	ePZ	06 14 01
	iSZ	17 24		iSZ	47
6	ePZ	21 04 44	10	iPZ	07 29 31 c
	iSZ	05 13		iSZ	30 00
6	iPZ	23 42 21	10	ePZ	12 41 05
	iSZ	49		iSZ	47
7	iPZ	04 28 02	10	ePZ	16 02 19



Date	Phase	h m s	Date	Phase	h m s	Date	Phase	h m s	Date	Phase	h m s
			15	iPZ	00 15 20		iSZ	38	30	ePZ	00 44 57
	iSZ	03 16		iSZ	54	22	iPZ	13 45 45	30	ePZ	10 10 29
10	ePZ	16 47 12		iPZ	03 02 43		iSZ	46 18		eSZ	11 15
	iSZ	50	15	ePZ	19 49 39	22	ePZ	15 52 56	30	ePZ	14 41 38
11	ePZ	01 19 27	15	ePZ	06 03 30		iSZ	53 30	30	ePZ	19 58 58
11	ePZ	04 03 59	16	iSZ	04 03	22	ePZ	16 32 29		iSZ	59 27
11	iPZ	16 28 53		iSZ	07 46 57		iSZ	33 20			
	iSZ	29 17	16	iPZ	42 77	22	ePZ	18 44 59		<b>Lahore</b>	
11	iPZ	18 15 22		iSZ	13 06 48	23	ePZ	13 24 09	1	ePZ	08 49 51
	iSZ	51	16	iPZ	07 26		eSZ	49		eSZ	51 02
11	ePZ	20 12 41		iSZ	12 08 46	24	ePZ	05 39 18	2	ePZ	22 00 52
	eSZ	13 17	18	ePZ	09 13		iSZ	59		eSZ	01 47
11	ePZ	22 35 51		iSZ	21 33 03	24	iPZ	09 23 28	2	ePZ	23 09 24
	eSZ	36 18	18	ePZ	44		iSZ	24 04	14	ePZ	14 29 10
12	ePZ	07 07 15		iSZ	10 09 05	25	iPZ	05 06 35	16	eXZ	14 27 51
	eSZ	49	19	ePZ	11 04 05		iSZ	07 07	18	ePZ	21 43 34
12	ePZ	13 01 38	19	ePZ	35	25	iPZ	07 52 16	19	ePZ	08 11 21
	eSZ	02 15		eSZ	11 28 31	26	iSZ	50		eXZ	13 41
12	ePZ	17 56 54	19	ePZ	29 08		iPZ	00 43 58	21	ePZ	07 41 17
	eSZ	57 22		iSZ	12 06 31	26	iSZ	44 57	24	ePZ	09 47 29
12	iPZ	21 58 25	19	ePZ	07 00	26	ePZ	01 43 15	25	eXZ	07 37 51
	iSZ	58		iSZ	17 54 22	26	ePZ	09 39 01	26	e(P)Z	18 31 41
12	iPZ	23 53 29	20	ePZ	06 33 05	26	eSZ	33	29	eXZ	05 12 22
	iSZ	54 03	21	ePZ	37		ePZ	18 21 38	29	eXZ	10 26 49
13	ePZ	12 59 21		eSZ	07 41 38	26	iSZ	22 08		<b>Karachi</b>	
13	ePZ	22 57 30	21	ePZ	13 10 42		iPZ	22 19 25			
13	iPZ	22 34 06	21	iPZ	11 19	27	eSZ	20 03	3	ePZ	03 57 08
	iSZ	41		iSZ	13 29 26	28	ePZ	18 06 01	3	iPZ	04 25 49
14	ePZ	00 06 17	21	iPZ	58	28	iPZ	02 02 04		iXZ	26 02
	eSZ	50		iSZ	16 45 18	28	ePZ	05 15 28		iSZ	05
14	iPZ	15 48 20	21	iPZ	44	28	ePZ	19 12 44	4	iXZ	05 36 40
	iSZ	53		iSZ	01 03 09	29	ePZ	01 59 13	16	ePZ	11 21 00
14	ePZ	17 22 47	22	iPZ	29	29	iPZ	07 27 49		iSZ	17
	iSZ	23 22			29	29	ePZ	15 15 15	16	iPZ	14 30 37

Date	Phase	h m s	Date	Phase	h m s
17	iPZ	06 32 30	18	eXZ	23 18 06
	iXZ	41	19	eXZ	20 47 12
	i!SZ	46	20	eXZ	09 14 14
	iXZ	55	20	e(P)Z	17 48 48
19	ePZ	08 22 58	20	eXZ	19 17 22
20	e(P)Z	17 22 43	20	eXZ	16 28 09
21	ePZ	05 55 34±	21	eXZ	19 45 29
24	e(P)Z	03 57 47	21	e(P)Z	23 04 02
	<b>Chittagong</b>		22	e(P)Z	04 10 24
2	e(P)Z	01 23 47	23	e(PKP)Z	04 10 24
2	eXZ	03 10 26	25	eXZ	01 12 06
2	eXZ	14 36 59	25	eXZ	07 39 09
2	e(PKP)Z	20 26 03	25	eXZ	08 15 08
3	eXZ	04 05 1	26	eXZ	07 28 31
3	ePZ	08 11 18	26	e(P)Z	11 51 21
8	eXZ	15 02 05	26	iXZ	12 47 12
9	ePZ	00 43 46	26	eXZ	07 48 11
9	eXZ	11 42 05	27	eXZ	10 53 07
9	ePZ	12 41 14	27	eXZ	10 19 55
9	e(P)Z	20 41 40	28	e(P)Z	10 19 55
	eXZ	44 42	28	eXZN	20 56
10	eXZ	21 44 21	28	eXZ	12 43 02
11	eXZ	04 00 01	28	eXZ	17 51 12
11	eXZ	04 10 13	29	iPnZ	15 31 08
11	e(P)Z	04 25 01	29	iSnN	37
11	eXZ	07 07 57	30	eXZ	07 18 36
12	ePZ	05 19 53			
12	eXZ	13 56 32			
13	eXZ	03 43 30			
15	eXZ	19 54 17			
16	eXZ	14 25 09			
18	ePZ	04 54 26			

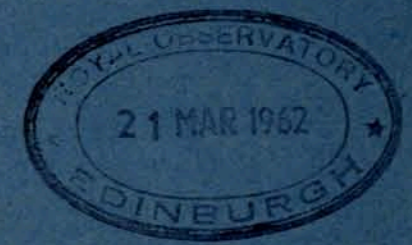
Pakistan Quetta, Vol 4 No. 10, October 1958

# SEISMOLOGICAL BULLETIN OF PAKISTAN

OCTOBER 1958

No. 10

Printed at  
Bolan Muslim Press,  
QUETTA.



Issued under the authority of the Director, Meteorological Service  
PAKISTAN METEOROLOGICAL SERVICE  
GEOPHYSICAL INSTITUTE  
QUETTA

# Pakistan Meteorological Service

Director,  
Meteorological Service

Deputy Director,  
Geophysical Institute

Officer Incharge,  
Seismological Section

Sibte Nabi Naqvi

Abdul Qadir Khan

The Seismological Bulletin of Pakistan is a monthly publishing data of Seismological stations in Pakistan.

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## SEISMOLOGICAL BULLETIN of PAKISTAN.

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
<u>Quetta (Central Station)</u>				
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 "	—	—
<b>Lahore</b> Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
<b>Karachi</b> Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
<b>Chittagong</b> 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 "	—	—
<b>Warsak</b> 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) 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	s	m
1	Ch	ePZ	05	26	58			eSNE	13	01	04
	Qt	ePZ		30	00			H 12 58 22			
		ePcPN		31	19			Hindukush region			
		ePPZ			56	1	Qt	ePZ	16	53	13
		eSN		37	08			USCGS H 16 43 36			
		USCGS H 05 21 01						71 1/2 N 3 1/2 W			
		19 1/2 N 121 E						Jan Mayen Island			
		Off north coast of						region			
		Luzon, Philippine				1	Wr	ePZ	17	59	30
		Islands					Qt	ePZ			57
1	Ch	ePnZN	06	27	54			ePcPZ	18	00	00
		eP*Z			58			ePPZ			03 14
		ePgZ		28	04			eSKSZ			10 17
		iSnZN			31			eSNE			31
		iS*Z			37			USCGS H 17 47 15			
	Qt	ePZ		32	40			53 N 165 1/2 W			
		H 06 27 04						Fox Islands			
		Burma						Aleutian Islands			
1	Qt	ePKPZ	09	47	41			Mag 6 1/4 (Pas)			
		USCGS H 09 29 43				2	Qt	ePKPZ	04	44	02
		57 S 147 E						eSKSN*			50 31
		Antartic Ocean						ePSN*			53 53
		southwest of						USCGS H 04 25 30			
		Macquarie Islands						58 1/2 S 10 W			
		Mag 6 1/4 (Pas),						Sandwich Islands			
		6.2 (Up, Ki)						region			
1	Qt	ePZ	12	10	15	2	Ch	ePZN	15	08	05
		USCGS H 11 59 55						ePPZN			09 31
		3 N 125 E						ePPPZN			46
		Celebes Sea						eSZN			13 47
1	Wr	ePZ	12	59	02			eSSN			16 11
		eSZ			28			eScSZN			18 23
	Qt	ePZ			54 d		Lh	ePZ			10 34

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Wr	ePZ			43	3	Qt	ePZ	11	37	17
	Qt	ePZ			11 05			e(S)N*			45 50
		ePPZ			13 14	4	Ch	iPZ	00	59	25 d
		eSN*			19 17			epPZ			59
		eScSN*			20 56			esPZ	01	00	10
		USCGS H 15 00 50						ePPZ	01	37	
		7½ N 127 E						ePPPZ	03	03	
		Off coast of						iSZN	07	17	
		Mindanao Philippine						esSZN	08	08	
		Islands						eScSN			58
2	Wr	ePZ	21	08	17		Wr	ePZ	01	31	d
		eSZ			46		Kr	ePZ			42 d
	Qt	ePZ			09 18			epPZE	02	11	
		eSZ			10 35			Mu	Sec		
		H 21 07 37						PZ	0.3	1.5	
		Hindukush						Δ = 81°			
3	Ch	ePZ	00	39	09		Qt	iPZ	01	01	48 d
		ePPZ			56			epPZ			02 14
		ePPPZ			40 09			eSNE			11 47
		eSZN			43 47			ePSE			12 53
	Wr	ePZ	41	56	c			Mu	Sec		
	Kr	ePZ	42	18	c			PZ	0.3	1.3	
	Qt	ePZ			21 c			Δ = 82.°2			
		ePPE			44 19			USCGS H 00 49 36			
		eSN*			49 34			4½ S 143½ E			
		eLN*			54.4			New Guinea			
		Mu	Sec					depth about 100 km			
		PZ	0.3	1.8				Mag 6.0 (Qt),			
		Δ = 58.4°						5.9 (Kr)			
		USCGS H 00 33 07				4	Lh	ePZ	10	01	53
		13½ N 120 E					Wr	ePZ			02 08
		Philippine Islands					Qt	ePZ			34
		region						ePPZN			05 07
		Mag 5.9 (Qt)						eSNEN*			11 37

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Kr	ePZ			02 45	6	Lh	ePZ	03	14	34±
		USCGS H 09 51 26						eSZ			15 46
		22½ N 144½ E					Qt	ePZ			05
		Mariana Islands						eSZNE			16 46
4	Ch	ePZ	11	41	57			H 03 12 54			
		ePcPZ			43 23			Tadzhikistan S.S.R.			
		ePPZ			51	6	Qt	ePZ	09	28	39
		eSZN			49 04		Lh	ePZ			29 36
	Lh	ePZ			43 35	6	Qt	ePZ	09	32	25
	Wr	ePZ			47			ePPZ			35
	Qt	ePZ			44 17 c			eSN			34 46
		eSZ			53 22			eLN*			35.2
	Kr	ePZ			44 27 c		Wr	ePZ			32 43
		USCGS H 11 33 09					Kr	ePZ			33 17
		23 N 144½ E						ePPE			30
		North of Mariana						eSE			36 22
		Islands					Ch	ePZ			20
4	Lh	ePZ	15	18	56			H 09 29 21			
	Qt	ePZ			19 35			37¼ N 54½ E			
		USCGS H 15 08 24						Iran-Turkmen,			
		21½ N 144 E						S.S.R. border			
		Mariana Islands						USCGS H 09 29 22			
		region						37½ N 54½ E			
5	Qt	ePZ	06	18	23			Iran-Turkmen			
		USCGS H 06 07 19						S.S.R. border			
		18½ N 145½ E				6	Wr	ePZ	19	03	13
		Mariana Islands					Lh	ePZ			16
		depth about 200 km					Qt	ePZ			49
6	Wr	ePKPZ	01	05	49			eSN*E			12 49
	Qt	ePKPZ			52			USCGS H 18 52 40			
		USCGS H 00 46 56						55½ N 162 E			
		32 S 179 W						Near east coast of			
		Kermadec Islands						Kamchatka			

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
7	Qt	ePZ	10	28	47			6 $\frac{1}{4}$ -6 $\frac{1}{2}$ (Berk),			
	Lh	ePZ		29	40			6 $\frac{1}{2}$ -6 $\frac{3}{4}$ (Pas),			
7	Qt	ePZ	10	31	37			6.6 (Qt, Kr)			
7	Ch	ePZ	12	43	26	8	Ch	ePZ	14	11	59
		ePcPZ		57			Qt	ePZ		14	01
		ePPZ		45	52			USCGS H 14 00 47			
		ePPPZ		47	26			7 S 155 $\frac{1}{2}$ E			
		eSN		52	11			Solomon Islands			
		ePSN		34		8	Qt	ePZ	14	38	02
		eScSZN		53	18			USCGS H 14 24 47			
	Lh	ePZ		45	05 c			7 S 156 $\frac{1}{2}$ E			
		ePPPE		50	07			Solomon Islands			
		eSE		55	19	9	Ch	ePZ	01	00	23
		ePSE		56	06		Qt	ePZ		03	26
	Kr	ePZ		45	32 c	9	Qt	ePKPZ	11	39	06
		eSKSE		56	00			ePPZ		40	19
		eSE		17				ePKSN*		42	39
		Mu						eSKSNN*		45	58
	PZ	0.6		1.7				eSKKSNN*		47	17
		$\Delta = 88^\circ$						ePSN*		50	03
	Qt	ePZ		12	45 36 c			ePPSN*		51	24
		ePPZ		49	02			eSSN*		56	39
		eSKSEN*		56	05		Lh	ePKPZ		39	17
		eSN*		26			Ch	ePKPZ		21	
		ePSN*		57	22			USCGS H 11 20 17			
		ePPSN*		49				55 $\frac{1}{2}$ S 27 $\frac{1}{2}$ W			
		Mu						Sandwich Islands			
	PZ	0.7		1.8				region			
		$\Delta = 8.9^\circ$						Mag 6 $\frac{1}{2}$ (Pas),			
		USCGS H 12 32 40						6.2 (Up, Ki)			
		5 S 151 $\frac{1}{2}$ E				9	Qt	ePZ	15	45	00
		New Britain				10	Ch	ePZ	08	40	25
		Mag 6.3 (Up, Ki),						ePcPZ		41	11

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPPZN		44	08	10	Ch	ePZN	11	42	49
		eSN		48	35			eSN		48	46
		ePSZN		49			Lh	ePZ		45	04
		ePPSN		58			Kr	ePZ		40	
	Lh	ePZ		40	47		Qt	ePZ		46	
		ePcPZ		41	26			ePcPZN		46	28
	Qt	ePZ		21 c				eSN*		54	04
		ePcPZ		47				eScSN*		55	34
		ePPZ		43	53			USCGS H 11 35 24			
		eSNN*		50	19			5 $\frac{1}{2}$ N 127 E			
		eScSN*		51	18			Off south coast			
		ePKPPKPZ	09	09	32			of Mindanao,			
	Kr	ePZ		08	41 46 c			Philippine Islands			
		ePcPZ		42	04						
		USCGS H 08 30 17				10	Qt	ePZ	21	17	50
		53 N 160 E						USCGS H 21 05 51			
		Near east coast of						Near Islands			
		Kamchatka						Aleutian Islands			
		Mag 6 $\frac{1}{2}$ (Pas)						region			
10	Ch	ePZN		09	18 01	11	Qt	ePZ		00	54 00
		iSZN		19	02			USCGS H 00 41 35			
	Lh	ePZ		20	33			65 $\frac{1}{2}$ N 132 $\frac{1}{2}$ W			
		eSZ		23	29			Yukon Territory			
	Qt	ePZ		21	42	11	Wr	ePZ		02	11 02
		ePPNE		22	08		Lh	ePZ		04	
		eSNE		25	44		Qt	ePZ		38	
	Kr	ePZ		21	46			ePcPZ		12	06
		ePPZ		22	13			eSN*		20	32
		H 09 16 41						USCGS H 02 00 40			
		27 $\frac{1}{4}$ N 93 E						53 N 159 $\frac{1}{2}$ E			
		Northern Assam						Near east coast			
		USCGS H 09 16 40						of Kamchatka			
		Tibet-India				11	Wr	ePZ		05	04 56
		border					Qt	ePZ		05	58

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Date	Station	Phase	h m s	Date	Station	Phase	h m s
11	Lh	ePZ	06 04 53			epPZ	27 32
	Qt	ePZ	05 36			esSZ	32 52
11	Qt	ePZ	06 07 45	Qt	ePZ	27 28	
11	Qt	ePZ	09 17 15			epPZE	28 25
		USCGS H 09 06 53				iSNN*E	34 27
		42½ N 144½ E				esSN*	36 12
		Near east coast of		Kr	ePZ	27 37	
		Hokkaido, Japan				epPZ	28 32
11	Qt	ePKPZ	14 56 41			USCGS H 15 18 42	
		esPKPNE	57 49			27½ N 125½ E	
		ePPZ	59 34			East China Sea	
	Lh	ePKPZ	57 01			depth about 250 km	
	Ch	ePKPZ	58 08			Mag 6¾ (Pas)	
		USCGS H 14 37 42		13	Lh	ePZ	08 30 01
		23½ S 65 W				eSE	31 46
		Jujuy Province			Qt	ePZ	30 42
		Argentina				eSNE	33 00
		depth about 200 km				H 08 27 44	
		Mag 6.0 (Pas)		13	Lh	ePZ	09 00 39
12	Qt	ePZ	11 27 52	Qt	ePZ	01 17	
		USCGS H 11 15 46				eSNEN*	03 37
		51½ N 178½ E		Kr	ePZ	02 26	
		Rat Islands,				ePPZ	33
		Aleutian Islands				ePPPZ	47
12	Qt	ePZ	13 00 03			iSE	05 44
		USCGS H 12 47 42		Ch	ePZ	03 31	
		4½ S 144 E				USCGS H 08 58 10	
		Near north coast				41½ N 75 E	
		of New Guinea				Kirghiz S.S.R.	
12	Ch	ePZ	15 24 51			Mag 6.0 (Up, Ki)	
		epPZ	25 46	13	Lh	ePZ	10 13 56
		eSN	29 44		Qt	ePZ	14 00
	Lh	ePZ	26 37 d	14	Qt	ePZ	09 17 27

Date	Station	Phase	h m s	Date	Station	Phase	h m s
		USCGS H 09 06 24				USCGS H 00 55 34	
		52½ N 159 E				52 N 175 W	
		Near east coast of				Andreanof Islands	
		Kamchatka				Aleutian Islands	
						Mag 5.7 (Up, Ki)	
14	Ch	ePZ	10 08 02	20	Ch	ePZ	01 19 51
14	Qt	ePZ	10 08 54			ePPPZ	21 31
16	Ch	iPZN	11 53 19 c			ePcPZ	22 22
	Lh	ePZ	57 07 c			iSN	25 31
	Kr	ePZ	59 c	Lh	iPZ		21 59 c
	Qt	ePZ	58 05			ePPZ	23 59
		USCGS H 11 52 30				eSE	29 21
		23 N 94½ E				eSSZ	32 52
		Burma		Kr	iPZ		22 10 c
17	Qt	ePZ	16 45 20			eSE	29 50
	Wr	ePZ	54			Mu	Sec
19	Qt	ePKPZ	02 12 47			PZ 1.0	1.2
		eSKSN*	19 42			Δ = 54.°8	
		USCGS H 01 53 54		Wr	ePZ		01 22 25 c
		19 S 174½ W		Qt	iPZ		30 c
		Tonga Islands				ePcPZ	23 20
19	Qt	ePKPZ	12 01 42			ePPZE	24 36
		USCGS H 14 42 42				ePPPZ	26 02
		34½ S 178 W				ePcSZN	27 16
		Kermadec Islands				i!SENN*	30 25
19	Qt	ePZ	13 16 33			eScSENN*	32 10
20	Ch	ePZN	01 07 19 c			eSSN*	34 16
		eSN	16 52			eLN*	35.9
	Lh	ePZ	07 26 c			ePKPPKPZ	52 23
	Qt	ePZ	55 c			Mu	Sec
		ePPZ	11 02			PZ 1.5	1.9
		eSNEN*	18 04			PE 1.0	1.9
		ePPSN*	19 16			PPZ 0.7	2.1
						SE 3.8	3.0
						SN 3.7	3.0
						Δ = 57.°2	



Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 01 12 30 9½ S 112½ E Off south coast of Java Mag 6½ (Pas), 6.6 (Up, Ki), 6.7 (Qt, Kr)						Mu Sec PZ 0.6 1.7 Δ = 58° USCGS H 15 40 40 11 S 111 E South of Java Mag 6.3 (Qt, Kr), 6.2 (Lh)			
21	Ch	ePZ	06	25	45	21	Qt	ePKPZ	17	51	43
	Wr	ePZ		27	08			USCGS H 17 32 45 29 S 179 W Kermadec Islands			
	Qt	ePZ			25			ePZ 18 40 54			
		ePPSN*		39	05			ePZ 19 01 10			
		USCGS H 06 14 50 5½ S 147 E Near north east coast of New Guinea				21	Lh	ePZ	19	01	10
21	Ch	ePZ	07	22	20		Qt	ePZ			40
	Wr	ePZ		24	14			USCGS H 18 48 38 6 S 154½ E Solomon Islands			
	Qt	ePZ		25	15			ePZ 02 29 32			
21	Ch	ePZ	15	48	10	22	Wr	ePZ	02	29	32
	Lh	ePZ		49	55 d		Qt	ePZ		30	32
		Mu Sec						eSZNE 31 47			
		PZ 0.4 1.4					Kr	ePZ 38			
		Δ = 52°						eSZ 33 41			
	Kr	ePZ	15	50	22 d			H 02 28 54 Hindukush			
		Mu Sec				22	Wr	ePZ	12	28	41
		PZ 0.6 1.8				22	Qt	ePZ			49
		Δ = 56°				23	Qt	ePPZEN*	00	01	33
	Wr	iPZ	15	50	34 d			ePPPZ 03 41			
	Qt	ePZ			44 d			eSKSN* 07 48			
		ePcPZE		51	33			ePSN* 10 41			
		eSNEN*		58	44			ePPSN* 11 41			
		eScSN*	16	00	32						

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 23 42 47 14½ S 168 E New Hebrides Islands						USCGS H 21 13 06 O 125 E Molucca Passage			
23	Wr	ePZ	15	16	47	25	Qt	ePZ	06	38	17
	Lh	ePZ		17	27			eSKSN*		48	45
		eSE		18	28			eSN*		49	22
	Qt	ePZ		17	50			USCGS H 06 25 06 22½ S 11 W South Atlantic Ocean			
		eSENZ		19	10			ePZN 02 23 44			
		II 15 16 08 36¼ N 71¼ E Hindukush depth about 200 km				23	Qt	ePPZ 24 43			
		ePZ 15 47 08 c						ePcPZ 26 47			
		ePPZE 21						eSZN 28 43			
		eSNEN* 50 30					Wr	ePZ 26 40			
		eLN* 51.7					Kr	ePZ 45			
		Mu Sec						USCGS H 02 17 32 5½ N 117 E Northern Borneo			
		PZ 0.9 2.4						ePZ 06 46 09			
		Δ = 18.3°						eSZ 37			
	Kr	ePZ	15	47	33 c	26	Wr	ePZ	06	46	09
		eSE		51	14			eSZ 52			
	Wr	ePZ		47	41			ePZ 47 54			
	Lh	ePZ		48	09			eSE 05			
		USCGS H 15 43 00 34½ N 47 E Iran Mag 5.6 (Qt)						ePZ 41			
		ePZ 21 20 41						eSPZ 48 23			
24	Ch	ePZ	21	20	41			H 06 45 25 36¼ N 70¼ E Hindukush depth about 200 km			
	Lh	ePZ		22	59			ePZ 12 45 08 c			
		eSE		30	53			ePPPZ 40			
	Wr	ePZ		23	20			eSN*E 48 58			
	Qt	ePZ			36	26	Qt	ePZ	12	45	08 c
		eSN		32	05			ePPPZ 40			
		eScSN*		33	24			eSN*E 48 58			

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Major Shocks

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSSN*	49	29			Lh	ePZ	27	27	
		eLN*	50	4			Wr	ePZ		55	
	Wr	ePZ	45	28			Qt	ePZ	28	24	
	Lh	ePZ	46	01				eSN	32	50	
		USCGS H 12 40 23					Kr	ePZ	28	29	
		Iraq						H 05 22 48			
26	Lh	ePZ	18	57	41			Northern Burma			
	Wr	ePZ		58	02	28	Qt	ePZ	06	00	22
	Qt	ePZ			19			eSNE		48	
		USCGS H 18 47 35					Kr	ePZ		48	
		3 N 127 E						eSE	01	38	
		Molucca Passage						H 05 59 47			
27	Qt	ePKPZ	15	23	48			Sulaiman Range			
		USCGS H 15 04 44						West Pakistan			
		23½ S 175½ W				28	Lh	ePZ	10	48	38
		Tonga Islands region					Ch	ePZ		49	03
27	Lh	ePZ	18	26	44 c			iSNZ		51	04
		eSE		34	34		Wr	ePZ		49	18
	Wr	ePZ		26	48		Kr	ePZ		50	20
	Qt	ePZ		27	25 c			iSE		53	22
	Kr	ePZ			46 c			iSSE			36
		USCGS H 18 16 53						eLE		54	6
		44½ N 147½ E						H 10 46 30			
		Kurile Islands						30¾ N 84¾ E			
27	Lh	ePZ	19	31	30			Southern Tibet			
	Qt	ePZ		32	03			USCGS H 10 46 27			
		USCGS H 19 20 55						30½ N 85 E			
		56 N 162 E						Southern Tibet			
		Near east coast						Mag 6.4 (Up, Ki)			
		of Kamchatka				28	Lh	ePZ	14	04	50
28	Ch	iPZ	05	24	04 c		Wr	ePZ		05	30
		iSZN		25	02		Qt	ePZ		06	18

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Kr	ePZ			32			eScSN		05	37
		eSSE		09	50		Wr	ePZ		07	55 48
		eLE		10	7		Lh	ePZ			49 c
		Southern Tibet						ePPZ			58 31
		aftershock						eSZ		08	05 25
28	Lh	ePZ	18	30	29		Qt	ePZ		07	56 19 c
	Qt	ePZ			59			ePePZN			28
		USCGS H 18 18 03						ePPZE			59 18
		4½ S 153½ E						ePPPZ		08	01 07
		New Britain						iSN*NE			06 19
		Solomon Islands						eScSNE			37
		region						Mu	Sec		
28	Qt	ePZ	20	55	55			PZ	0.7	1.1	
29	Wr	ePZ	00	01	45			PN	0.6	1.0	
	Lh	ePZ			50			PE	0.4	1.0	
	Qt	ePZ		02	17			SN	1.0	2.2	
		eSNN*E		12	21			SE	0.9	2.5	
		eSKSN*			33			Δ = 79.3°			
	Kr	ePZ		02	39		Kr	ePZ		07	56 42 c
		ePcPZ			43			ePcPZ			47
		USCGS H 23 50 08						eSE		08	07 06
		52 N 179½ E						Mu	Sec		
		Andreanof Islands						PZ	0.3	1.2	
		Aleutian Islands						Δ = 84°			
29	Qt	ePZ	06	19	47			USCGS H 07 44 10			
		USCGS H 06 07 34						51½ N 179½ E			
		51 N 179 E						Andreanof Islands			
		Andreanof Islands						Aleutian Island			
		Aleutian Islands				29	Ch	ePZN	07	55	33
		ePcPZN			53			Mag 6¼ (Pas), 6½ (Berk),			
		ePPN			58 12			6.6 (Up, Ki),			
		eSN		08	04 51			6½-6¾ (Qt), 6.4 (Kr).			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
29	Ch	ePZN	00	06	36			USCGS H	08	06	15
		ePcPN			56			51 N 179 E			
		ePPN	09	15				Andreanof Islands			
		eSN	15	54				Aleutian Islands			
	Wr	ePZ	06	53				Mag 6.1 (Qt, Kr)			
	Lh	ePZ			53	29	Qt	ePZ	08	20	43
		eSE	16	29			Kr	ePZ			21 06
	Qt	ePZ	07	24	c	29	Qt	ePZ	08	41	01
		ePPZ	10	23		29	Wr	ePZ	16	23	58
		eSNE	17	24			Qt	ePZ	24	59	
		Mu	Sec					eSN	26	19	
	PZ	0.3	1.3					H 16 23 14			
		$\Delta = 79.3^\circ$						Hindukush			
	Kr	ePZ	08	07	47	29	Lh	ePZ	19	37	10
		Mu	Sec				Qt	ePZ			39
	PZ	0.2	1.2					USCGS H 19 25 30			
		USCGS H	07	55	14			51 N 179 1/2 E			
		51 1/2 N	179	E				Andreanof Islands			
		Aleutian Islands						Aleutian Islands			
		Mag 6.1 (Qt),									
		6.2 (Kr)				30	Wr	ePZ	01	03	57
29	Ch	ePZN	08	17	42			iSZ	05	09	
	Wr	ePZ			57			ePZ	04	50	
	Lh	ePZ			59			eSNE	06	40	
	Qt	ePZ	18	28	c	30	Qt	H 01 02 23			
		ePcPZ			37	30	Qt	Tadzhikistan S.S.R.			
		Mu	Sec					ePZ	02	33	04
	PZ	0.4	1.9			30	Qt	ePZ	03	56	44
		$\Delta 7 = 9.3^\circ$					Kr	ePZ			57 03
	Kr	ePZ	08	18	52 c			USCGS H 03 44 32			
		Mu	Sec					51 1/2 N 179 E			
	PZ	0.2	1.4			30	Qt	Andreanof Islands			
								Aleutian Islands			
								ePZ	07	56	44

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSN*	59	00				eSENN*	13	23	
	Kr	ePZ	56	49				eS*Z		31	
	Wr	ePZ	57	49			Wr	ePZ		59	
	Lh	ePE	58	08				H 20 12 00			
		H 07 53 49						27 1/2 N 67 E			
		Iran						Near Khuzdar Kalat,			
								West Pakistan			
	Qt	ePKPZ	10	23	56	30	Qt	ePN	23	45	17
		USCGS H 10 05 00					Ch	epPN			39
		20 1/2 S 176 W						ePPN			46 20
		Tonga Islands						esSN			50 40
	Wr	ePZ	13	34	44		Wr	ePZ			47 39
	Qt	ePZ	35	25			Qt	ePZ			48 11 c
		eSZNE	37	24				epPZ			34
		H 13 32 51						esPZ			49
		India Nepal						ePcPZ			49 31
		border						ePPN			50 10
	Wr	ePZ	19	15	04	31	Wr	epPPEZ			29
	Kr	ePZ			18			ePPPZN			51 03
		eSE	25	34				eSN*N			55 11
	Qt	ePZ	15	20				esSN*			52
		ePPZ	18	32				eScSN*			57 52
		eSN*	25	37			Kr	ePZ			48 17 c
		ePSN*	26	34				eSNZ			55 23
		ePPSN*			50			USCGS H 23 39 27			
		eLN*	36.7					25 N 122 1/2 E			
		USCGS H 19 02 54						Near north coast			
		3 1/2 S 143 1/2 E						of Formosa			
		New Guinea						depth about 100 km			
	Kr	ePnZ	20	12	44	31	Kr	eSnZ			13 15
		eSnZ			15			ePnZ			12 48
	Qt	ePnZ			48			eP*Z			52
		eP*Z			52			ePgZE			58

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	<b>Quetta</b>			eSZ	50 10
1	ePZ	04 55 19	5	eXZ	22 05.1
1	eXZ	09 27 35	5	ePgZ	22 36 00
1	ePZ	10 27 37		eSgZE	05
	eSZ	54	5	ePZ	23 08 44
1	ePZ	20 12 34		eSN	09 06
1	eXZ	21 10.8	6	eXZ	00 42.2
2	ePZ	00 33 01	6	ePZ	03 10 00
2	eXZ	01 05.2		eSNEZ	11 45
2	eXZ	04 07.2	6	ePZ	07 53 13
2	ePZ	14 39 31		eSN	45
2	ePZ	21 48 59	6	eXZ	08 03.0
3	iPgZ	08 21 33.2c	6	eXZ	10 50.0
	iSgZ	35.2		ePZ	14 21 45
3	eXZ	13 18 58	6	eSE	22 10
3	ePZ	13 36 20	7	eXZ	07 23.0
3	ePZ	19 04 40	7	ePZ	19 09 45
3	ePZ	21 11 20		eSZ	10 14
	eSZNE	44	8	ePZ	05 40 57
4	eXZ	00 27.0	8	ePgZ	08 32 59
4	eXZ	00 33.0		eSgZ	33 13
4	ePgZ	02 38 12	8	ePZ	23 25 11
	eSgNE	21		eSZN	27 06
4	ePZ	06 01 08	8	ePZ	23 28 27
4	ePZ	06 54 22	9	ePgZ	03 19 18
4	ePZ	10 34 40		eSgZNE	21
4	eXZ	10 50.0	9	ePZ	03 30 01
4	ePZ	12 12 30	9	ePZ	04 45 01
4	eXZ	14 20.0	9	ePgZ	07 47 08
4	ePZ	16 03 23		eSgE	14
	eSZ	45	9	eXZ	10 46.0
5	ePZ	01 49 17	9	ePZ	11 18 58
			9	ePZ	13 01 04
			10	ePZ	04 15 50

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
0	eXZ	05 21.0	15	eXZ	17 29.0
0	ePZ	06 44 23	15	eXZ	21 31.2
	eSNE	45 35	15	ePZ	23 38 09
0	ePZ	06 52 52	16	ePZ	20 45 02
0	ePZ	09 36 25		eSNE	47 06
0	ePZ	10 17 15	17	ePZ	08 28 33
	eSZ	18 43	17	eXZ	22 37.0
0	ePZ	20 54 17	18	eXZ	09 16.0
0	ePZ	21 19 20±	18	ePgZ	11 06 23.4
	eSN	57		eSgE	27.5
1	iPgZ	04 47 22.0d	18	eXZ	13 28 56
	iSgZ	24.8	19	ePZ	02 18 18
1	eXZ	17 18.3	19	ePZ	17 08 52
2	ePZ	03 01 20		eSZ	10 10
	eSNZ	02 49	19	eXZ	20 18 25
2	eXZ	08 57.0	20	ePZ	03 08 47
2	ePZ	10 13 45	20	ePZ	17 43 41
2	eXZ	14 43.5	20	eXZ	18 37 0
2	ePgZ	17 29 00	20	ePZ	22 01 18
	eSgZ	10	21	ePZ	14 14 37
3	eXZ	07 28.7	21	ePZ	16 09 45
4	ePZ	00 17 42		eSE	10 25
4	ePgZ	02 20 06.5	21	eXZ	17 21.0
	eSgZ	11.1	21	eXZ	22 25.0
4	eXZ	10 59.0	22	ePgZ	10 19 19
4	ePZ	20 00 59		eSgZ	32
4	eSZ	01 19	23	eXZ	10 09.0
4	ePZ	21 14 38	23	ePZ	13 50 51
5	eXZ	03 38 0	24	ePZ	00 25 14
5	ePZ	08 21 57	24	eXZ	07 23.0
5	eSZ	22 17	24	eXZ	12 27.0
5	eXZ	11 01.0	24	ePZ	18 01 07
5	eXZ	11 07.0	24	ePZ	22 13 24

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Date	Phase	h m s	Date	Phase	h s m
24	ePZ	22 36 03	31	ePgZ	14 07 08
25	eXZ	11 20.0		eSgZ	20
25	ePZ	20 28 06	31	ePgZ	16 26 54
27	eXZ	06 11.0		eSgNE	27 04
27	ePZ	08 42 14			
27	ePgZ	11 16 37		<b>Warsak</b>	
	eSgZ	49			
27	ePgZ	21 50 25	1	ePZ	11 18 43
	eSgZ	36	2	ePZ	21 42 34
27	ePZ	22 29 55	3	ePZ	13 34 43
27	ePgZ	22 46 15		iSZ	36 06
	eSgNE	26	3	ePZ	19 04 52
28	ePZ	14 13 52	4	ePZ	00 01 31
28	ePZ	21 25 16	4	iPZ	02 22 44
	eSZ	26 33		iSZ	23 14
29	eXZ	00 31 01	4	ePZ	02 35 50
29	eXZ	01 05 41		eSZ	36 25
29	eXZ	01 06.0	4	ePZ	17 09 45
29	ePZ	01 42 47		eSZ	10 22
29	ePZ	05 15 22	5	ePZ	02 51 09
29	eXZ	11 29.0		eSZ	42
29	ePZ	14 08 48	5	ePZ	18 06 53
29	ePZ	14 23 53	5	ePZ	18 39 37
29	eXZ	15 44.0	5	iPZ	23 08 20
29	ePgZ	16 38 59	6	eXZ	03 14 43
	eSgZN	39 08	6	ePZ	06 40 02
30	ePZ	01 31 00	6	ePZ	17 42 32
30	ePZ	11 09 37	7	ePZ	02 29 15
30	ePZ	11 16 54		iSZ	30 18
30	eXZ	11 26.0	7	ePZ	07 55 38
30	ePZ	14 47 54		iSZ	56 11
31	ePZ	10 41 10	8	iPZ	23 24 00
	eSgZ	20		iSZ	59

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Date	Phase	h m s	Date	Phase	h m s
9	ePZ	04 34 15	20	ePZ	13 52 49
	eSZ	35 02		iSZ	53 17
10	ePZ	18 49 14	20	ePZ	22 14 00
10	iPZ	19 54 16d		iSZ	33
	iSZ	42 43	21	ePZ	00 23 32
10	ePZ	21 19 24		iSZ	24 03
	eSZ	20 14	21	ePZ	02 50 51
11	ePZ	02 59 17	21	ePZ	10 21 51
	eSZ	03 00 14		iSZ	22 26
18	ePZ	00 16 05	21	ePZ	13 59 33
	eSZ	43		eSZ	14 00 14
18	ePZ	01 55 52	21	ePZ	16 10 12
	iSZ	56 25	21	ePZ	16 31 08
18	ePZ	13 45 15		eSZ	40
	eSZ	39	21	ePZ	21 16 33
18	ePZ	16 37 17	22	ePZ	06 08 18
18	ePZ	19 03 09		eSZ	09 00
	eSZ	47	22	ePZ	08 24 09
18	ePZ	22 29 27		eSZ	42
19	ePZ	02 17 12	22	ePZ	13 25 48
19	ePZ	10 20 44		eSZ	26 20
	iSZ	21 19	22	ePZ	19 33 11
19	ePZ	12 00 38		eSZ	43
19	ePZ	17 07 54	23	ePZ	09 41 19
	iSZ	08 25		eSZ	46
19	ePZ	21 57 00	23	ePZ	09 50 12
20	ePZ	00 38 51		eSZ	46
20	eXZ	01 07 16	23	ePZ	13 48 19
20	e(P)Z	01 52 25		eSZ	56
20	ePZ	03 17 59	23	ePZ	16 09 48
	eSZ	18 24		iSZ	10 20
20	ePZ	09 45 57	23	ePZ	17 50 16
20	ePZ	10 03 53		iSZ	48
	eSZ	04 29			

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Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
24	ePZ	07 24 29		iSZ	42 22
	iSZ	53	27	ePZ	09 53 25
24	ePZ	11 27 55	27	ePZ	13 14 51
	eSZ	28 44	27	ePZ	15 39 11
24	ePZ	16 28 55		eSZ	44
24	ePZ	18 23 28	27	ePZ	20 41 49
24	ePZ	18 24 54		eSZ	42 30
	iSZ	25 20	27	ePZ	21 10 24
24	ePZ	21 49 50	28	ePZ	03 52 37
	iSZ	50 27		iSZ	58
24	ePZ	22 36 01	28	ePZ	05 51 47
24	iPZ	23 08 52		iSZ	52 27
	iSZ	09 46	28	ePZ	21 24 11
25	iPZ	01 41 55		iSZ	38
	iSZ	42 29	29	ePZ	06 15 24
25	ePZ	03 17 21	29	ePZ	11 25 53
	iSZ	18 03		iSZ	26 24
25	ePZ	05 28 59	29	ePZ	14 23 05
25	ePZ	12 40 30	29	ePZ	23 33 03
	iSZ	41 22	30	ePZ	03 05 14
25	iPZ	14 21 04		iSZ	40
	iSZ	33	30	ePZ	10 08 22
25	ePZ	14 44 23		iSZ	09 01
	iSZ	56	30	ePZ	19 07 59
25	ePZ	18 13 12	31	ePZ	00 49 42
25	ePZ	22 25 10	31	ePZ	18 41 41
	iSZ	43		eSZ	42 13
26	ePZ	17 07 19	31	ePZ	19 46 48
26	ePZ	21 50 10		iSZ	47 25
	iSZ	49	31	ePZ	22 59 27
27	ePZ	02 32 32	31	ePZ	23 27 09
	iSZ	52		eSZ	28 17
27	ePZ	08 41 02			

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Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	<b>Lahore</b>		19	ePE	17 09 47
			19	ePZ	17 41 00
1	eXZ	05 30 10	20	eXZ	21 04 05
5	ePZ	09 41 11	20	eXZ	22 00 56
	e(S)Z	42 07	21	eXZ	16 11 10
5	ePZ	12 58 25	22	eXZ	19 34 53
	e(S)Z	59 12	23	eXZ	00 00 26
8	ePZ	23 24 44±	23	ePZ	04 48 49
	eSZE	25 58±	24	eXE	11 29 52
9	eXE	01 11 04	25	ePZ	02 26 15
9	eXZ	01 26 47	27	eXZ	13 15 00
9	eXZ	03 19 55	29	ePZ	08 20 05±
10	ePZ	06 44 08	29	ePZ	16 25 03
	eSZE	45 09		e(S)Z	26 26
10	ePE	11 34 19	29	ePZ	19 37 10
11	ePZ	01 32 22	30	ePZ	01 04 48±
	e(S)Z	49	30	ePZ	13 34 11±
11	eXE	05 08 02	31	e(P)Z	19 14 59
11	eXZ	05 10 02			
11	eXZ	07 50 46		<b>Karachi</b>	
11	eXZ	15 00 16	1	eXZ	20 22 03
11	ePZ	22 25 26	8	eXZ	23 26 07
	eSZ	47	9	ePZ	08 20 24±
14	eXZ	19 29 31		eSZ	44
14	ePZ	21 31 51	9	eXZ	11 39 40
14	ePZ	23 42 05	18	iPgZ	13 27 52d
15	eXE	22 05 38		eSgZ	28 08
15	ePE	22 30 34	20	ePnZ	13 48 26
16	ePZ	11 09 26		eSnE	44
	eSZ	10 30	21	iPnZ	14 13 51 d
17	eXZ	08 30 38		iSnZ	14 08
17	ePZ	16 46 03	24	eXZ	21 23 36
	e(S)Z	47 03	25	eXZ	06 38 37
19	ePZ	14 18 17	29	ePZ	08 41 18
			30	eXZ	13 39 38

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Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	<b>Chittagong</b>		30	e(P)N	19 04 41
2	eXZ	04 35 07	30	eXN	20 33 19
2	eXZ	06 45 46	30	ePZ	22 29 44
3	eXZ	11 37 23	31	e(P)N	19 11 56
4	ePZ	04 16 17			
5	eXZ	23 01 14			
5	eXZ	23 06 58			
6	e(P)ZN	01 02 14			
6	eXN	19 02 32			
7	eXZ	10 31 54			
7	ePZ	13 12 09			
8	ePZ	11 07 56			
9	eXZ	20 32 11			
10	eXZ	07 04 10			
11	eXZ	02 12 43			
11	eXZ	06 05 55			
11	eXZ	09 16 45			
11	ePZN	10 05 41			
13	ePZN	08 06 35			
	eSZN	07 01			
13	eXZ	10 16 29			
19	iPnZN	11 56 19 d			
	iPgZN	26			
	iSnZN	49			
20	eXZ	20 15 03			
20	eXZ	21 00 19			
21	ePZ	04 25 24			
25	ePZN	16 25 20			
28	eXZ	00 28 51			
28	eXZ	01 41 58			
29	ePN	08 56 18			

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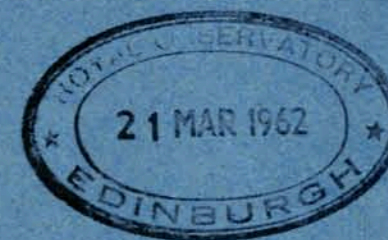
# SEISMOLOGICAL BULLETIN OF PAKISTAN

Vol. 4

NOVEMBER 1958

No. 11

*Printed at*  
Bolan Muslim Press,  
QUETTA.



*Issued under the authority of the Director, Meteorological Service*  
PAKISTAN METEOROLOGICAL SERVICE  
GEOPHYSICAL INSTITUTE  
QUETTA



# Pakistan Meteorological Service

Director,  
Meteorological Service

Deputy Director,  
Geophysical Institute

Officer Incharge,  
Seismological Section

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The Seismological Bulletin of Pakistan is a monthly publishing data of Seismological stations in Pakistan.

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## SEISMOLOGICAL BULLETIN

of  
PAKISTAN.

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
<u>Quetta (Central Station)</u>				
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 "	—	—
<b>Lahore</b> Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
<b>Karachi</b> Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
<b>Chittagong</b> 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 "	—	—
<b>Warsak</b> Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

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				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
1	Ch	ePN	03 49 05		Wr	ePZ	27 59
		ePcPN	41		Qt	ePZ	28 17
		ePPN	51 26			eSN	38 28
	Wr	ePZ	03			USCGS H 06 15 54	
	Kr	ePZ	17			About 100 km off	
		eSE	04 01 55			north coast of	
	Qt	ePZ	03 51 20			New Guinea	
		ePPZ	54 40	1	Qt	ePKPZ	12 34 31
		ePPPZ	56 39			USCGS H 12 15 43	
		eSKSNN*	04 01 44			17 1/2 S 169 E	
		eSNEN*	58			New Hebrides Islands	
		ePSN*	02 49			foreshock	
		ePPSN*	03 15	1	Qt	ePKPZ	12 35 07
		eSSN*	07 35			eSKSN*	41 45
		eLN*	13.6			USCGS H 12 16 36	
		USCGS H 03 38 36				17 1/2 S 168 E	
		3 S 150 E				New Hebrides Islands	
		Bismark Sea				Mag 6-6 1/4 (Pas)	
		Mag 6.3 (Up, Ki),		1	Wr	ePZ	14 50 24 d
		6 1/4 - 6 1/2 (Pas)			Lh	ePZ	51 13
1	Ch	ePN	06 16 50			eSZ	52 16
		ePcPN	17 39		Qt	ePZ	51 18 d
		eSN	24 59			eSN	52 26
	Wr	ePZ	18 54			H 14 49 50	
	Kr	ePZ	19 06 c			35 1/2 N 69 3/4 E	
	Qt	ePZ	11 c			Hindukush	
		eSNEN*	29 24			depth about 100 km	
		USCGS H 06 06 47		1	Qt	ePZ	15 09 56
		3 1/2 S 145 1/2 E		1	Qt	ePKPZ	16 08 44
		New Guinea				eSKSZ	15 23
		aftershock				USCGS H 15 50 10	
1	Ch	ePN	06 25 55			17 1/2 S 168 E	
		eSN	34 03			New Hebrides Islands	
						aftershock	

\* 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) 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
1	Wr	ePZ	20	56	03			USCGS H	10	44	47
		ePZ			55			51½ N 175 W			
2	Ch	ePN	05	18	20			Andreanof Islands			
		eSN		19	23			Aleutian Islands			
	Lh	ePZ	20	46		2	Qt	ePZ	13	28	34
	Wr	ePZ	21	14		2	Wr	iPZ	20	43	18 d
	Qt	ePZ			53		Lh	ePZ			58
		eSNEN*	25	52				eSZ			45 00
	Kr	ePZ	22	07			Qt	ePZ			44 15
		ePPE		35				eSZN			45 33
		eSE	26	20				H	20	42	34
		eSSE			54			36¼ N 70¾ E			
		eLE	29	0				Hindukush			
		H	05	16	53			depth about 150 km			
		27¾ N 93¼ E				3	Lh	ePZ	14	33	47
		Northern Assam						eSZ			35 27
2	Qt	ePZ	09	18	00		Ch	ePN			34 06
		e(S)NE		20	30			ePPN			15
	Wr	ePZ		18	22			iSN			36 01
	Kr	ePZ			38		Wr	ePZ			34 23
	Lh	ePZ			58		Qt	ePZ			35 10
		Iran						ePPZ			22
2	Ch	ePN	10	56	21			ePPPZ			30
		ePcPN			36			eSZE			37 54
		ePPN		59	04		Kr	ePZ			35 27
		ePPPZ	11	00	48			ePPZ			40
		eSN		05	49			ePPPE			52
		ePSN		06	18			H	14	31	39
	Lh	ePZ	10	56	43			30½ N 84½ E			
		eSE		11	06 29			Southern Tibet			
	Qt	ePZ	10	57	10 c			USCGS H	14	31	35
		eSNN*		11	07 25			30 N 84½ E			
		ePSN*			08 28			Tibet			
	Kr	ePZ	10	57	32						

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
4	Qt	ePZ	00	37	05			eSE			48 43
		USCGS H	00	24	24		Wr	ePZ			40 58
		6 S 147½ E					Qt	ePZ			41 31 d
		Near north coast of						iXZ			41
		New Guinea						ePcPZ			57
4	Kr	ePZ	05	10	07			ePPE			43 55
	Qt	ePZ			50			eSN			50 05
	Wr	ePZ		11	47			ePSN*			15
4	Wr	iPZ	08	02	51			eScSN*			51 27
	Lh	ePZ		03	28		Kr	ePZ			41 43 d
		eSE		04	32			ePPZ			44 13
	Qt	ePZ		03	45			eSE			50 28
		eSZN		05	04			USCGS H	08	31	00
		H	08	02	04			28 N 141 E			
		36¼ N 70½ E						Bonin Islands region			
		Hindukush						Mag 6.0 (Up, Ki)			
		depth about 200 km				4	Ch	ePN			12 51 40
4	Ch	ePN	08	36	43			iSN			52 08
		ePPN		38	31		Wr	ePZ			55 51
		eSN		43	27		Qt	ePZ			56 27
	Lh	ePZ		38	15		Kr	ePZ			42
	Wr	ePZ			29 d			H	12	51	02
	Qt	ePZ		39	00 d			Assam-Burma border			
		eSN*		47	36		4	Ch	ePKPZ		23 14 21
	Kr	ePZ		39	10 d			Wr	ePKPZ		45
		USCGS H	08	28	28		Qt	ePKP1Z			50
		28 N 140½ E						ePKP2Z			15 35
		Bonin Islands region						eSKSN*			21 46
4	Ch	ePN	08	39	15			USCGS H	22	54	46
		ePPN		41	00			50 S 115 W			
		eSN		45	51			South Pacific Ocean			
	Lh	ePZ		40	47			Mag 6.0 (Pas)			

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
5	Wr	ePZ	10	21	00 c			iSEnz	17	10	
		eSZ			35			esSZ		49	
	Qt	ePZ			53			eSSZ	21	23	
		eSEN	23	14				Mu Sec			
5	Wr	iPZ	22	57	17 d			PZ 36.0	2.0		
	Lh	ePZ			53			$\Delta = 64^\circ$			
		eSE	58	55		Kr		iPZ	23	08	59 c
	Qt	ePZ			22 d			i(S)ZE	17	54	
		eSNZE	59	47				esSE	18	18	
	Kr	ePZ			24 d			Mu Sec			
		eSE	23	01	42			PZ 28.4	1.9		
		H 22 56 33						$\Delta = 67^\circ$			
		36 $\frac{3}{4}$ N 72 E						USCGS H 23 58 10			
		Hindukush						44 $\frac{1}{2}$ N 148 $\frac{1}{2}$ E			
		depth about 100 km						Kurile Islands			
6	Ch	ePN	15	38	29			depth about 100 km			
	Wr	iPZ			40 38 c			Minor Seismic Sea wave			
	Kr	ePZ			38 c			Mag 8-8 $\frac{1}{4}$ (Pas), (Berk),			
	Qt	iPZ			50 c			8.0 (Up, Ki)			
		epPZ	41	44				8.0 (Qt, Kr)			
		esPZ	42	08							
		ePPZ	43	28		6	Qt	ePZ	23	24	51
		eSNEN*	49	23				Kurile Islands			
		USCGS H 15 30 06				6	Qt	ePZ	23	45	18
		6 S 128 E				6	Qt	ePZ	23	57	10
		Banda Sea				7	Qt	ePZ	00	04	07
		depth about 250 km				7	Qt	ePZ	00	06	13
6	Ch	iPN	23	07	11	7	Qt	ePZ	00	10	09
		iSN			14 22	7	Qt	ePZ	00	12	46
	Wr	ePZ			08 03	7	Qt	ePZ	00	23	08
	Qt	iPZ			40 c		Kr	ePZ			28
		esPZ	09	20				Kurile Islands			
		ePPZ	11	02		7	Qt	ePZ	00	46	48
		ipPPZ			23		Kr	ePZ			47 08

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 00 36 12						Qt ePZ	06	15	
		44 N 149 E						Kr ePZ			36
		Kurile Islands						USCGS H 01 55 33			
								44 $\frac{1}{2}$ N 149 E			
								Kurile Islands			
7	Qt	ePZ	00	48	32			7 Qt ePZ	02	20	02
	Kr	ePZ			51			Kurile Islands			
		Kurile Islands						7 Qt ePZ	02	20	51
7	Qt	ePZ	01	03	50			Kr ePZ			21 13
7	Ch	ePN	01	11	10			Kurile Islands			
		eSN			18 28			7 Qt ePZ	02	27	33 c
	Qt	ePZ			12 39			Kr ePZ			53 c
	Kr	ePZ			59			Kurile Islands			
		USCGS H 01 01 58						7 Qt ePZ	02	35	09
		44 $\frac{1}{2}$ N 148 $\frac{1}{2}$ E						Kurile Islands			
		Kurile Islands						7 Qt ePZ	03	01	29 c
7	Qt	ePZ	01	15	34			Kr ePZ			49 c
	Kr	ePZ			55			USCGS H 02 50 48			
		Kurile Islands						44 $\frac{1}{2}$ N 149 $\frac{1}{2}$ E			
7	Qt	ePZ	01	24	25			Kurile Islands			
	Kr	ePZ			46			7 Wr ePZ	03	36	55
		USCGS H 01 13 46						Qt ePZ			37 32
		45 N 149 E						Kurile Islands			
		Kurile Islands						7 Ch ePN	05	09	03
7	Qt	ePZ	01	46	18			Qt ePZ			10 32 c
		Kurile Islands						eSNEN*			19 06
7	Ch	ePN	01	52	12			Mu Sec			
		eSN			59 30			PZ 0.2 1.5			
	Wr	ePZ			52 59			$\Delta = 64^\circ$			
	Qt	ePZ			53 37			Kr ePZ	05	10	52 c
		eSN	02	02	14			USCGS H 04 59 50			
	Kr	ePZ	01	53	57			44 $\frac{1}{2}$ N 149 E			
		USCGS H 01 42 56						Kurile Islands			
		44 $\frac{1}{2}$ N 149 $\frac{1}{2}$ E						Mag 5.9 (Up, Ki)			
		Kurile Islands						6.1 (Qt)			
7	Ch	ePN	02	04	46						

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
7	Qt	ePZ	05	57	50			eSNN*	43	39	
		Kurile Islands						Mu Sec			
7	Wr	ePZ	07	50	38 c			PZ 0.4 1.8			
	Qt	ePZ		51	14 c			$\Delta = 64^\circ 6'$			
		ePPZN		53	33		Kr	ePZ	11	35	21 c
		eSZNN*		59	44			USCGS H 11 24 19			
	Kr	ePZ		51	35 c			44½ N 149½ E			
		USCGS H 07 40 36						Kurile Islands			
		44½ N 149 E						Mag 5.9 (Up,Ki),			
		Kurile Islands						6.3 (Qt)			
7	Ch	ePN	08	38	23	7	Ch	ePN	11	40	08
	Wr	ePZ		39	19		Qt	ePZ		41	42
	Qt	ePZ			55		Kr	ePZ		42	04
	Kr	ePZ		40	16			Kurile Islands			
		Kurile Islands						Kurile Islands			
7	Qt	ePZ	10	20	22	7	Qt	ePZ	14	35	14
		Kurile Islands						Kurile Islands			
7	Wr	ePZ	10	37	29 c	7	Ch	ePN	17	41	51
	Qt	ePZ		38	07		Qt	ePZ		43	18 c
		Kurile Islands						ePPZ		45	38
								eSNN*		51	51
7	Lh	ePZ	10	39	19		Kr	ePZ		43	38 c
		eSE		47	13			USCGS H 17 32 42			
	Qt	ePZ		39	52			44 N 148½ E			
		eSNEN*		48	21			Kurile Islands			
	Kr	ePZ		40	13			Mag 5.5 (Up,Ki)			
		USCGS H 10 29 17									
		44 N 148 E									
		Kurile Islands									
7	Ch	ePN	11	33	30	7	Ch	ePN	19	23	42
	Wr	ePZ		34	24		Qt	ePZ		25	11
	Qt	ePZ		35	00 c			eSN		33	42
		ePPZE		37	24		Kr	ePZ		25	31
								USCGS H 19 14 31			
								44½ N 149½ E			
								Kurile Islands			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
7	Qt	ePZ	20	40	24		Qt	ePZ	19	09	
7	Qt	ePZ	20	51	59		Kr	ePZ			29
8	Qt	ePZ	00	01	40			USCGS H 12 08 30			
		Kurile Islands						44½ N 149 E			
		Kurile Islands						Kurile Islands			
8	Ch	ePN	09	33	00	8	Qt	ePZ	13	06	18
		ePcPN			52		Kr	ePZ			39
		ePPN		35	13	8	Qt	ePZ	13	35	57
		ePPP		36	31			Kurile Islands			
		eSN		41	04	8	Wr	ePZ	17	10	30
		ePSN			11		Qt	ePZ			11 28
		eSSN		44	58			esPZ			12 07
	Wr	ePZ		33	17			eSNEZ			46
	Lh	ePZ			23		Kr	ePZ			32
		ePcPZ			59			eSE			14 44
		eSE		41	51			H 17 09 48			
	Qt	ePZ		33	57 c			36½ N 71½ E			
		ePPN*N		36	27			Hindukush			
		eSN*		42	51			depth about 200 km			
		eScSN*		43	59	8	Ch	ePZ	19	39	28
		eSSN*		47	25			ePPN			35
		eLN*		52.7				ePPP			43
		eMN*	10	05.3				iSN			41 30
		Mu Sec					Kr	ePZ			42 50 c
		PZ 0.8 2.0					Wr	ePZ			59
		$\Delta = 67^\circ$					Qt	ePZ			43 05 c
	Kr	iPZ		09	34	23 c		eSNEN*			48 05
		eSE		43	45			eSSN*			49 47
		USCGS H 09 22 53						USCGS H 19 36 48			
		53 N 159½ E						11½ N 93 E			
		Off southeast coast						Andaman Islands			
		of Kamchatka									
		Mag 6.8 (Qt)									
8	Wr	ePZ	12	18	32	8	Qt	ePZ	22	57	59
							Kr	ePZ			58 20
								Kurile Islands			
						9	Qt	ePZ	00	13	32

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Major Shocks

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
9	Ch	ePN	03	23	56			USCGS H 17 52 52			
		eSN		31	16			44 N 148 E			
	Wr	ePZ		24	48			Kurile Islands			
	Qt	ePZ		25	25	9	Ch	ePN	21	13	53
		eSNN*		34	00			eSN		21	16
	Kr	ePZ		25	46		Wr	ePZ		14	44
		USCGS H 03 14 47					Qt	ePZ		15	21
		44 N 148½ E						eSN*		23	57
		Kurile Islndds					Kr	ePZ	15	42	c
9	Wr	ePZ	08	15	59			USCGS H 21 04 46			
	Qt	ePZ		16	36			44 N 148 E			
		Kurile Islands						Kurile Islands			
9	Ch	ePN	10	26	33	10	Wr	ePKPZ	11	33	01
		eSN		33	48			ePKPZ			07
	Wr	ePZ		27	36			USCGS H 11 13 05			
	Qt	ePZ		28	13			9 S 110 W			
		eSN*		36	58			Pacific Ocean			
		USCGS H 10 17 30				11	Wr	ePZ	13	55	40
		44½ N 150 E						ePZ			56 17
		Kurile Islands				11	Qt	ePZ	17	54	35
9	Wr	iPZ	14	43	16 c			e(S)NN*	18	00	56
	Qt	ePZ			52 c	12	Qt	ePZ	02	08	03
	Kr	ePZ		44	16 c	12	Ch	ePN	04	04	12
		USCGS H 14 33 17						eSN		08	53
		44 N 148 E					Qt	ePZ		07	20
		Kurile Islands						USGGS H 03 58 21			
9	Qt	ePZ	14	57	17			19½ N 122 E			
9	Wr	ePZ	18	02	52			Off north coast of			
	Qt	ePZ		03	29			Luzon Philippine			
		eSNEN*		12	01			Islands			
		eScSN*		13	19						
	Kr	ePZ		03	50						
		eSE		12	42						

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
12	Ch	ePN	10	50	43			ePPSE		43	06	
	Wr	ePZ		52	33			eScSNE			57	
	Qt	ePZ			51			eSSNE		46	49	
		USCGS H 10 39 47						ePKPPKPZN	21	02	52	
		7 S 156 E						Mu	Sec			
		Solomon Islands						PZ	2.3	1.8		
		depth about 100 km						PN	1.4	1.9		
12	Ch	ePN	17	53	18			PE	1.9	2.0		
		eSN*		18	00	40		PPZ	1.5	2.0		
	Qt	ePZ		17	54	48		SN	13.1	3.6		
		USCGS H 17 44 11						SE	13.7	3.6		
		44 N 148½ E						Δ = 64°				
		Kurile Islands					Kr	ePZ		20	34	25 c
								eSE			43	20
12	Ch	ePZ	18	46	00			ePKPPKPZ	21	02	48	
		USCGS H 18 36 51						Mu	Sec			
		Kurile Islands						PZ	1.1	1.2		
12	Ch	ePNN*	20	32	34			Δ = 67°·3				
		ePcPN		33	53			USCGS H 20 23 26				
		ePPN		34	31			44½ N 149 E				
		ePPP		35	31			Kurile Islands				
		iSNN*		39	48			Mag 6¾-7 (Pas),				
		ePSN			58			7.0 (Up, Ki), (Kr),				
		iPPSNN*		40	05			7-7¼ (Qt)				
		eScSN*		42	23		12	Ch	ePN	21	32	29
	Lh	ePZ		33	24			Lh	ePZ		33	17
		eSZ		41	22			Qt	ePZ			57
	Qt	ePZ		34	04 c			USCGS H 21 33 20				
		ePcPZNE			38			Kurile Islands				
		ePPZ		36	26		12	Ch	ePZ	23	08	49
		ePPPZEN		37	56			Lh	ePZ		09	39 c
		iSZEN		42	40			Qt	ePZ		10	18 c
		ePSNE			56				eSN		18	57
								Kr	ePZ		10	39 c

Date	Station	Phase	h	m	s
		USCGS H	22	59	36
		45 N 149½ E			
		Kurile Islands			
12	Lh	ePZ	23	41	56
	Qt	ePZ	42	37	
		USCGS H	23	32	00
		44 N 149 E			
		Kurile Islands			
13	Ch	ePZ	03	05	34
		eSN*	12	56	
	Qt	ePZ	07	03	
		eSNEN*	15	39	
		eScSN*	16	49	
	Kr	ePZ	07	25	
		USCGS H	02	56	26
		44 N 148½ E			
		Kurile Islands			
		Mag 5.8 (Up, Ki)			
13	Ch	iPN	04	13	43
		ePcPN	15	02	
		ePPNN*	40		
		ePPPNN*	16	34	
		eSNN*	20	54	
		ePPSNN*	21	12	
	Lh	iPZ	14	32	
		eSE	22	29	
	Qt	iPZ	15	13	c
		ePcPZ	47		
		ePPZ	17	34	c
		ePPPNN*NE	18	55	
		iSN*NE	23	43	
		ePKPPKPZ	44	12	

Date	Station	Phase	h	m	s
		Mu Sec			
		PZ 1.0	1.5		
		PN 0.7	1.5		
		PE 0.6	1.5		
		Δ = 63°			
	Kr	ePZ	04	15	33
		USCGS H	04	04	37
		44½ N 148 E			
		Kurile Islands			
		Mag 5.9 (Up, Ki),			
		6.7 (Qt)			
13	Ch	ePN	05	18	40
		USCGS H	05	09	35
		Kurile Islands			
13	Ch	ePN	06	08	16
	Qt	ePZ	09	35	
		USCGS H	05	59	53
		43½ N 139 E			
		Off west coast of			
		Hokkaido, Japan			
13	Qt	ePZ	11	06	37
		USCGS H	10	55	56
		Kurile Islands			
13	Ch	ePN	16	19	52
		ePPNN*	20	04	
		ePPPNN*	11		
		iSN*	22	33	
	Lh	ePZ	25		
	Kr	ePZ	38	d	
		ePcPE	25	34	
	Wr	ePZ	22	58	d
	Qt	ePZ	23	03	d
		ePPNE	24	13	

Date	Station	Phase	h	m	s
		ePPPZ	26		
		eSN*	28	14	
		USCGS H	16	16	25
		9 S 93½ E			
		Nicobar Island			
	Lh	ePZ	18	44	16
		eSE	52	12	
	Wr	ePZ	44	21	
	Qt	ePZ	58		
		USCGS H	18	34	22
		44 N 148 E			
		Kurile Islands			
	Kr	ePZ	23	08	46
	Qt	ePZ	09	26	
	Lh	ePZ	23	18	53
	Qt	ePZ	19	34	
		USCGS H	23	08	50
		Kurile Islands			
13	Kr	ePZ	23	23	14
		ePPE	30		
	Qt	ePZ	54		
		ePPE	24	19	
		iPPPNN*	26		
		eSN*	27	50	
		eSSN*	28	25	
	Wr	ePZ	24	49	
		H 23 19 00			
		Gulf of Aden			
	Kr	ePZ	23	30	43
	Qt	ePZ	31	20	
	Lh	ePZ	32	13	
	Qt	ePZ	03	32	19
14	Wr	ePKPZ	05	24	36
	Qt	ePKP1Z	40		

Date	Station	Phase	h	m	s
		ePKP2Z	25	50	
		USCGS H	05	04	25
		36 S 102 W			
		South Pacific Ocean			
14	Ch	ePN	05	44	01
		eSNN*	51	19	
	Lh	ePZ	44	51	
		eSE	52	48	
	Wr	ePZ	44	54	
	Qt	ePZ	45	31	
		ePcPZ	46	03	
		ePPN	47	50	
		ePPPZ	49	23	
		eSN*	54	06	
		ePSN*	22		
		eScSN*	55	23	
		eSSN*	58	14	
		eLN*	06	01.1	
		ePKPPKPZ	14	24	
	Kr	ePZ	05	45	50
		USCGS H	05	34	53
		44 N 149 E			
		Kurile Islands			
		Mag 5.7 (Up, Ki)			
14	Qt	ePKPZ	06	05	35
		ePKSZNE	08	55	
		USCGS H	05	46	34
		14½ N 91½ W			
		Guatemala			
		depth about 150 km			
14	Ch	ePN	13	56	46
		ePcPN	58	22	
		ePPNN*	34		
		ePPPNN*	59	16	
		eSNN*	14	03	31

Date	Station	Phase	h	m	s
		ePPSNN*			43
		iSNN*		06	49
Lh		ePZ	13	59	11
		eSE	14	07	47
Wr		ePZ	13	59	34 c
Kr		ePZ			36 c
		eSE	14	08	37
		Mu			Sec
	PZ	0.8			1.1
		$\Delta = 68^\circ 5$			
Qt		ePZ	13	59	46 c
		ePPEZ	14	02	18
		ePPPZ		03	59
		i!SN*		08	56
		eSKSN*		09	33
		eScSN*			48
		eSSN*		13	21
		ePKPPKPZ		27	49
		Mu			Sec
	PZ	1.0			1.0
	PN	0.5			1.0
	PE	0.7			1.0
	SN	1.1			1.8
	SE	1.6			2.2
		$\Delta = 70^\circ$			
		USCGS H	13	48	20
		6 S	131		E
		Banda Sea			
		Mag 6.9 (Qt, Kr)			
15	Lh	ePZ	00	25	46
	Wr	ePZ			51
	Qt	ePZ		26	28

Date	Station	Phase	h	m	s
15	Qt	ePZ	05	49	50
	Wr	ePZ		50	18
	Kr	ePZ			20
	Lh	ePZ			28
	Ch	ePN		52	49
		USCGS H	05	42	42
		38 N	22 $\frac{1}{2}$		E
		Southern Greece			
15	Wr	iPZ	07	11	33
		iSZ		12	07
	Qt	ePZ			38
		eSN		14	04
		H	07	10	46
		Northern Afghanistan			
15	Ch	ePZ	09	09	56
		iSNN*		17	05
	Lh	ePZ		10	41
		eSE		18	37
	Wr	ePZ		10	45
	Qt	ePZ		11	22
		ePcPZ			56
		ePPZ		13	42
		iSN*NE		19	52
		ePSN*		20	18
		ePPSNN*			23
		eScSN*		21	09
		eSSN*		24	00
		ePKPPKPZ		40	19
	Kr	ePZ		11	43
		USCGS H	09	00	45
		44 N	149		E
		Kurile Islands			
		Mag 6 $\frac{1}{2}$ -6 $\frac{3}{4}$ (Pas)			

Date	Station	Phase	h	m	s
15	Wr	ePZ	10	02	56
	Qt	ePZ		03	32
		USCGS H	09	52	58
		44 $\frac{1}{2}$ N	148 $\frac{1}{2}$		E
		Kurile Islands			
15	Qt	ePnZ	18	23	31
		ePgZNE			42
		eSnN*		24	10
		eS*NEZ			17
		iSgN*			24
	Lh	ePnZ		23	42
		eS*E		24	39
	Wr	ePZ		23	50 c
	Kr	ePZ		24	11 d
		H	18	22	40
		30 N	70 $\frac{1}{2}$		E
		Near Fort Munro			
		West Pakistan			
15	Qt	ePnZ	18	37	40
		iPgZEN*			52
		eSnNN*		38	20
		eS*ZE			27
		eSgN*			31
	Lh	ePnZ		37	48
		ePgZ		38	04
		eSnE			32
		eSgE			49
	Wr	ePZ		37	59
	Kr	ePZ		38	19
		eSE		39	24
		H	18	36	47
		29 $\frac{3}{4}$ N	70 $\frac{3}{4}$		E
		Near Fort Munro			
		West Pakistan			

Date	Station	Phase	h	m	s
15	Lh	ePZ	23	30	12
		eSE			38 09
	Qt	ePZ			30 54
		USCGS H	23	20	18
		44 N	148		E
		Kurile Islands			
16	Qt	iPZ	00	41	26.5d
		iSNEN*			46.0
	Wr	ePZ			42 16
		eSZ			43 18
		Southern Afghanistan			
16	Ch	ePN	04	56	40
		eSN		05	03 55
	Wr	ePZ		04	57 32
	Qt	ePZ			58 08
		USCGS H	04	47	31
		44 $\frac{1}{2}$ N	149		E
		Kurile Islands			
16	Lh	ePZ	06	25	25
	Wr	ePZ			30
	Qt	ePZ			26 06
		USCGS H	06	15	30
		44 N	148 $\frac{1}{2}$		E
		Kurile Islands			
16	Qt	ePKPZ	18	03	52
		USCGS H	17	44	48
		16 S	172		W
		Samoa Islands region			
		Mag 6 $\frac{1}{4}$ (Pas)			
16	Ch	ePN	18	10	10
		eSNN*			16 16
		USCGS H	18	02	25
		20 S	169		E
		Loyalty Islands			



Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
16	Ch	ePN	20	29	14			ePcPE	45	15	
		eSN		33	29		Wr	ePZ	44	26	
	Lh	ePZ	29	42			Qt	ePZ	45	02	
	Wr	ePZ		52				USCGS H	15	34	23
	Qt	ePZ	30	39				44½ N 148½ E			
		USCGS H	20	23	56			Kurile Islands			
		42 N 106 E				17	Lh	ePZ	16	25	42 d
		Outer Mongolia-China					Wr	ePZ		26	07 d
		border					Qt	ePZ		31	d
16	Ch	ePN	21	21	33	17	Qt	ePZ	22	13	16
		USCGS H	21	12	24	18	Ch	ePN	07	56	39
		44½ N 147½ E						ePcPN		56	
		Kurile Islands						ePPN		59	19
16	Ch	ePN	21	53	17			ePPPN*N	08	01	02
		epPN*		54	49			eSNN*		05	55
		ePPN*		55	05			eScSNN*		06	50
		ePPPN*		56	01		Wr	ePZ	07	57	01
		iSN*		59	08		Qt	ePZ		32	c
		esSN*	22	02	01			ePPZ	08	00	30
	Lh	ePZ	21	54	52			eSNN*		07	35
		eScSZ	22	03	45			eSKSN*		49	
	Wr	ePZ	21	55	07			ePSN*	08	24	
	Qt	ePZ		38				USCGS H	07	45	20
		eSZNE	22	03	24			50½ N 179 E			
		eScSNE	04	29				Andreanof Islands			
		USCGS H	21	46	00			Aleutian Islands			
		28 N 139½ E				18	Qt	ePZ	08	08	44
		Bonin Islands region						USCGS H	07	56	31
		depth about 500 km						51½ N 178½ E			
17	Wr	ePZ	09	59	59			Aleutian Islands			
		USCGS H	09	46	30			aftershock			
		10½ S 162 E									
		Solomon Islands									
17	Lh	ePZ	15	44	23	18	Qt	ePZ	08	12	00

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
		USCGS H	07	59	48	19		ePN	09	32	50	
		Aleutian Islands						eSN		40	07	
		aftershock					Lh	ePZ	33	45	c	
18	Ch	ePN	18	42	09			eSE	41	45		
		eSN*		49	29		Wr	ePZ	33	48	c	
	Lh	ePZ	43	03			Qt	ePZ	34	25	c	
		eSE	51	15				ePcPNE	35	00		
	Wr	ePZ	43	05				ePPZ	36	40		
	Qt	ePZ		41				eSNEN*	43	00		
		eSN*	52	22				ePSN*		18		
		USCGS H	18	33	00			eSSN*	47	02		
		44 N 149 E					Kr	iPZ	34	48	c	
		Kurile Islands						USCGS H	09	23	45	
19	Qt	ePKPZ	01	53	15			44 N 149 E				
		epPKPZ		55	40			Kurile Islands				
		epPPZ		57	07							
	Wr	ePKPZ	53	27		19	Wr	ePZ	15	14	18 d	
	Lh	ePKPZ		36			Lh	ePZ		26	d	
		ePKSE	57	18				epPZ		45		
		USCGS H	01	35	06		Qt	ePZ		44	d	
		Santiago del						epPZ		15	00	
		Estero Province						USCGS H	15	02	15	
		Argentina						60½ N 150½ W				
		depth about 600 km						Kenai Peninsula				
19	Qt	ePZ	03	19	35			Alaska				
		USCGS H	03	08	54			depth about 60 km				
		44 N 149 E										
		Kurile Islands					19	Wr	ePZ	18	44	29
19	Wr	ePZ	05	28	51		Qt	ePZ		45	41	
	Qt	ePZ		29	26			ePN	05	46	44	
		USCGS H	05	18	52		20	Ch	ePZ	47	38	
		43½ N 148 E						eSN*		56	42	
		Kurile Islands						eSSN*	06	01	10	

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H	05	36	33	20	Ch	ePN	23	15	15
		52 N 159½ E						eSN	24	43	
		Off east coast of					Qt	ePZ	15	56	
		Kamchatka						USCGS H	23	03	40
20	Lh	ePZ	06	41	25			52 N 177 W			
	Qt	ePZ		42	06			Andreanof Islands			
		ePPZ		44	27			Aleutian Islands			
		USCGS H	06	31	20	21	Wr	iPZ	05	00	46
		44 N 149 E					Lh	iPZ		01	27
		Kurile Islands						iSE		02	31
20	Qt	iPnZ	10	31	55 c		Qt	iPZ		01	42
		iPgZNN*		32	00			esPZ		02	22
		iSnZN			25			iSNEN*			59
		eS*NE			28		Kr	ePZ			46
		iSgZN			33			eSE		04	50
	Kr	ePnZ			08			H	05	00	04
		ePgZ			20			36 N 70½ E			
		eS*E			54			Hindukush			
	Wr	ePZ			33 00			depth about 200km			
		H	10	31	14			Felt Kabul			
		28 N 67¾ E				21	Qt	ePnZ	23	33	39
		West Pakistan						eP*ZN			46
20	Lh	ePZ	14	27	59 c			ePgZE			52
		epPZ			28 15			iSnNN*		34	20
	Wr	ePZ			03			eS*NE			28
	Qt	ePZ			39 c			iSgZN*			36
		epPZ			49			ePnZ			30
		eSN*			37 17		Kr	iSnE			35 48
	Kr	ePZ			29 00 c			H	23	32	45
		epPZ			10			Near Fort Munro			
		USCGS H	14	18	04			West Pakistan			
		45 N 149½ E									
		Kurile Islands									
		depth about 60 km									

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePN	00	11	46	22	Ch	ePN			
		ePPN		13	16			eSNN*			
		eSNN*		17	42			ePZ			
		ePZ		13	58 d		Lh	eSZ			
		eSZ		21	45			ePZ			
		ePZ		14	08 d		Kr	ePZ			
		ePZ			23		Wr	ePZ			
		ePZ			28 d		Qt	ePZ			
		ePcPZ		15	17			ePPZN*			
		ePPZN*		16	41			eSNN*			
		eSNN*		22	36			eXN*			
		eXN*		23	16			eScSN*			
		eScSN*		24	16			eSSN*			
		eSSN*		26	35			USCGS H	00	04	20
		USCGS H	00	04	20			10½ S 112½ E			
		10½ S 112½ E						South of Java			
		South of Java				22	Ch	ePN	02	05	31
		ePN						ePcPN			07 03
		ePcPN						ePPN			24
		ePPN						ePPP			08 09
		ePPP						eSNN*			12 22
		eSNN*						ePSN*			28
		ePSN*						ePPSN			38
		ePPSN						ePZ			07 44
		ePZ					Lh	eSE			16 22
		eSE						ePZ			08 03
		ePZ					Wr	ePZ			08
		ePZ					Kr	ePPZ			10 44
		ePPZ						eSE			17 12
		eSE						ePZ			08 17
		ePZ					Qt	ePcPZ			39
		ePcPZ						ePPZ			10 50
		ePPZ						eSNEN*			17 28
		eSNEN*									

Date	Station	Phase	h	m	s
23	Ch	ePN	23	49	18
	Qt	ePZ			56 c
	Kr	ePZ		50	21 c
	USCGS H 23 37 30 51½ N 174½ W Andreanof Islands Aleutian Islands				
24	Qt	ePKPZ	07	08	14
		ePKSZ		11	49
	Wr	ePKPZ	08	27	
	USCGS H 06 48 57 57½ S 65½ W Drake Passage				
24	Lh	ePZ	17	51	46 c
	Wr	ePZ		52	07 c
	Qt	ePZ			29
	USCGS H 17 42 20 8 N 127 E Near east coast of Mindanao Philippine Islands				
25	Wr	iPZ	01	48	28 d
		iSZ		49	00
	Qt	ePZ			29
		eSZ		50	47
	H 01 47 46 Hindukush				
25	Ch	ePZ	04	01	52
		eSNN*		03	02
	Lh	ePZ		02	51
		eSZ		04	53
	Qt	ePZ			12
		eSNN*		07	18
	Kr	ePZ		04	16
		eSE		07	28

Date	Station	Phase	h	m	s
		H 04 00 12			
		27 N 86½ E			
	Southeastern Nepal Felt Patna, & Monghyr				
25	Lh	ePZ	09	22	23
	Qt	ePZ		23	08
	USCGS H 09 12 44 36½ N 141½ E Near east coast of Honshu, Japan				
25	Ch	ePN	13	22	16
	Lh	ePZ		24	18
	Wr	ePZ			43
	Qt	ePZ			48
		ePcPZ		25	37
		eSN*		32	56
	USCGS H 13 14 40 10½ S 113 E Off south coast of Java				
26	Qt	ePZ	00	16	48
	Lh	ePZ	00	26	47
		ePPZ		28	55
	Wr	ePZ		27	13
	Qt	ePZ			18
	USCGS H 00 17 09 10½ S 112½ E South of Java				
26	Lh	ePZ	09	23	34
	Qt	ePZ		24	14
	USCGS H 09 13 37 45 N 149 E Kurile Islands				

Date	Station	Phase	h	m	s
26	Qt	ePZ	10	59	59
	Qt	ePZ	12	02	17
		eSNZ		03	35
26	Lh	ePZ	22	14	45
	Qt	ePZ		15	03
27	Qt	ePZ	04	15	28
		eSNEZ		16	42
28	Lh	ePZ	13	07	20
	Wr	ePZ			47
	Qt	ePZ		08	32
29	Qt	ePZ	03	45	27
		USCGS H 03 34 47 Kurile Islands			
29	Qt	ePKPZ	05	05	37
		USCGS H 04 46 36 28 S 177½ W Kermadec Islands			
30	Ch	ePN	01	41	02
		ePcPN		42	43
		ePPN			49
		iSNN*		47	44
		ePSN*		51	
		ePPSN*		59	
		eSSN*		51	05
	Lh	ePZ		42	30 d
		eSZ		50	23
	Wr	ePZ		42	41 d
	Qt	ePZ		43	14 d
		ePcPZ			48
		ePPN		45	30
		ePPP		47	06
		iSNEN*		51	46
		ePSN*		52	06

Date	Station	Phase	h	m	s
		eScSN*		53	10
		eSSN*		55	55
		eLN*		57	5
		ePKPPKZ	02	12	19
	Kr	ePZ		43	29 d
		eSE		52	16
	USCGS H 01 32 41 32 N 137½ E South of Honshu Japan Mag 6.0 (Pas), 6.5 (UP, Ki)				
30	Ch	ePN	02	03	53
	Lh	ePZ		05	17
		eSE		13	10
	Wr	ePZ		05	26
	Qt	ePZ		06	02
	Kr	ePZ			16
	USCGS H 01 55 28 32 N 137½ E Honshu aftershock				
30	Wr	ePZ	09	44	19
	Qt	ePZ		45	04

Date	Phase	h m s	Date	Phase	h m s
	<b>Quetta</b>		7	ePZ	04 29 53
1	ePZ	08 34 30	7	ePZ	14 01 21
1	ePZ	09 20 45	7	eXZ	16 01-0
1	iPgZ	17 05 27-4c	7	e(P)Z	16 24 11
	iSgZNE	29-0	7	ePZ	17 06 51
1	ePZ	20 56 55	7	eXZ	18 57-0
2	ePZ	05 43 21	7	eXZ	23 19-0
	eSN	45	8	e(P)Z	08 48 00
3	ePgZ	11 24 01	8	ePZ	11 27 19
	eSgZN	14	8	eXZ	17 14-0
3	ePZ	11 30 52	8	e(P)Z	15 14 32
	eSZNE	31 15	8	eXZ	15 18-0
3	eXZ	16 39-0	9	ePZ	08 20 47
3	eXZ	20 32-0	10	eXZ	07 22 17
4	ePZ	01 17 16	10	ePZ	20 31 10
	eSZN	43		eSN	40
4	ePgZN	06 28 48	11	ePZ	01 28 56
	iSgNE	59	11	ePZ	11 40 12
4	eXZ	11 17-0	11	ePZ	13 10 24
4	ePZ	17 56-0		eSNE	12 15
4	ePZ	18 41 08	12	ePZ	17 01 21
4	ePgZ	22 05 47	12	ePZ	17 54 43
	eSgN	53		eSZN	56 00
5	eXZ	05 21-0	12	eXZ	20 45-0
5	ePZ	05 23 37	12	iPgZNE	23 37 12
	eSZN	54		iSgZNE	23-8
5	eXZ	11 21-0	13	eXZ	07 28-0
5	ePZ	22 40 45	13	eXZ	07 43-0
	eSN	42 05	13	ePZ	11 50 31
7	ePZ	00 43 43		eSN	51 00
7	ePZ	00 45 05	14	ePZ	02 16 46
7	ePZ	02 53 50	15	ePZ	05 43 10
7	ePZ	03 29 14	15	ePnZ	18 37 17
				ePgZ	28

Date	Phase	h m s	Date	Phase	h m s
15	ePnZ	20 33 17	22	ePgZ	09 12 31
	ePgZ	28		eSgNE	42
15	eXZ	22 08-0	22	ePZ	14 34 45
15	ePZ	22 16 21	22	ePZ	16 08 20
16	ePZ	01 42 28	22	ePZ	17 15 09
16	ePZ	07 56 49	23	ePZ	02 02 48
16	ePZ	11 32 48	23	ePZ	11 14 55
	eSN	33 19	23	ePZ	19 08 17
17	ePZ	02 33 32		eSZN	43
	eSN	34 03	24	ePZ	08 36 00
17	ePZ	10 22 38	25	ePZ	14 46 56
	eSZNE	23 09	26	ePgZ	19 35 14
17	eXZ	16 25 11		eSgZN	16
18	ePZ	05 24 03	26	eXZ	21 46-3
	eSE	25 21	27	ePZ	00 01 01
18	ePgZ	07 40 44		eSN	56
	iSgZN	48	27	ePgZ	04 11 47
18	eXZ	11 32-0		eSgN	12 02
18	ePZ	18 42 43	29	eXZ	21 32-0
	eSN	43 04	29	eXZ	23 32-0
18	ePZ	21 03 28	30	ePZ	04 21 14
	eSN	51		eSN	40
20	ePZ	10 06 01	30	ePZ	04 51 06
20	ePZ	11 30 58		eSN	54
	eSN	31 40	30	eXZ	07 14-0
20	ePZ	11 50 06	30	eXZ	08 55-0
20	ePZ	14 20 23	30	eXZ	09 55-0
20	ePZ	17 52 54			
21	ePZ	02 54 22			
21	ePZ	12 58 37			
	eSNE	59 18			
21	ePZ	15 05 34	1	iPZ	00 28 10 c
	eSN	51		iSZ	44

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
1	ePZ	02 03 04	4	ePZ	12 09 58
	iSZ	53	4	iPZ	16 01 49
1	iPZ	05 32 26		iSZ	02 26
	iSZ	58	4	iPZ	18 40 04
1	iPZ	09 20 42	5	iPZ	22 39 43
1	ePZ	12 33 54		iSZ	40 16
1	ePZ	13 38 49	6	iPZ	09 44 21
	iSZ	39 14		iSZ	55
1	eXZ	16 10 37	6	ePZ	11 45 44
1	iPZ	23 34 20 d	6	ePZ	14 00 22
	iSZ	53	6	iSZ	01 02
2	ePZ	00 05 29	6	ePZ	18 31 05
	iSZ	59		eSZ	36
2	ePZ	00 13 29	6	ePZ	20 43 05
2	ePZ	04 27 48		eSZ	34
	iSZ	28 12	6	ePZ	21 56 46
2	ePZ	11 11 37	7	ePZ	04 42 13
2	ePZ	12 16 38		ePZ	52
	eSZ	17 03	7	eXZ	05 09 46
2	iPZ	18 58 15 d	7	ePgZ	09 48 55
	iSZ	45		iSgZ	49 06
2	iPZ	20 43 13 d	7	eXZ	17 42 14
2	iPZ	23 27 54 d	7	ePZ	17 55 05
	iSZ	28 37		eSZ	38
3	ePZ	08 29 50	7	eXZ	19 24 19
	eSZ	30 41	7	eXZ	20 39 30
3	iPZ	14 49 51 c	8	iPZ	06 59 03 d
	iSZ	50 26	8	iPZ	08 46 07 d
3	ePZ	22 18 51		iSZ	47
	eSZ	19 54	8	ePZ	20 04 28
4	ePZ	01 17 52		eSZ	56
4	iPZ	02 36 02 d	8	iPZ	20 45 57 d
4	iPZ	04 34 32 c		iSZ	46 34
	iSZ	35 05			

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
8	iPZ	22 26 46 d	13	ePZ	16 22 53 d
	iSZ	27 13	13	ePZ	22 22 28
9	iPZ	04 15 22 d		iSZ	23 40
	iSZ	56	14	iPZ	00 45 22 c
9	ePZ	05 16 06		iSZ	46 04
	iSZ	49	14	iPZ	18 57 08 c
9	iPZ	13 07 05 c	14	iPZ	21 15 45 c
	iSZ	37	15	iPZ	02 56 15 d
9	ePZ	13 20 17		iSZ	52
	iSZ	52	15	ePZ	20 33 36
10	ePZ	02 51 11	16	ePZ	02 56 19
10	ePZ	19 08 32	16	ePZ	09 49 14
10	ePgZ	23 30 44		eSZ	48
	iSgZ	55	16	ePZ	23 36 06
11	ePZ	07 59 01		eSZ	41
	eSZ	40	17	ePZ	01 43 35
11	cPZ	13 09 37	17	ePZ	20 13 53
11	ePZ	17 55 06		iSZ	14 27
11	ePZ	22 57 25	17	iPZ	21 42 15 d
	iSZ	58 17		iSZ	51
12	ePZ	00 31 28	18	ePZ	05 33 10
	iSZ	52		iSZ	44
12	ePZ	07 13 10	18	ePZ	06 53 12
	iSZ	39		eSZ	43
12	ePZ	15 45 54	18	iPZ	06 57 01 c
	eSZ	47 02		iSZ	58 03
12	ePZ	17 53 35	18	iPZ	10 23 42 d
	iSZ	54 07		iSZ	24 22
13	ePZ	14 44 43	18	ePZ	14 46 09
13	ePZ	15 27 29		iSZ	47 37
	iSP	28 23			

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
18	iPZ	18 23 45 d	24	ePZ	16 50 28
	iSZ	24 16	24	ePZ	17 35 51
19	ePZ	05 20 17		iSZ	36 25
	iSZ	58	24	iPZ	18 29 31
19	iPZ	05 28 51 c		iSZ	30 05
20	ePZ	11 12 50	24	iPZ	19 17 05
	iSZ	13 16		iSZ	41
20	iPZ	11 49 25 d	25	iPZ	20 51 42
20	iPZ	20 29 53 d	25	ePZ	23 51 01
	iSZ	30 24		iSZ	31
21	ePZ	16 09 53	26	ePZ	00 14 53
	iSZ	10 32		iSZ	15 23
21	ePZ	17 37 14	26	iPZ	00 16 25
	eSZ	56		iSZ	57
21	iPZ	23 33 56	27	ePZ	04 43 36
22	iPZ	06 20 50 d		iSZ	44 00
22	iPZ	14 33 39 d	27	iPZ	14 58 32
	iSZ	34 07		iSZ	59 00
22	ePZ	16 07 39	27	iPZ	18 35 01
	iSZ	08 09		iSZ	26
23	ePZ	02 02 46	27	iPZ	21 17 36
23	iPZ	18 03 54 d		iSZ	18 07
23	ePZ	19 00 07	28	ePZ	11 04 40
	iSZ	01 00		iSZ	05 14
23	iPZ	20 46 49 d	28	iPZ	17 24 28 c
23	iPZ	21 00 18 c		iSZ	57
23	iPZ	23 23 11 c	28	ePZ	21 37 58
	iSZ	46		iSZ	38 27
23	iPZ	23 45 42 d	29	iPZ	04 12 08 c
	iSZ	46 15		iSZ	47
24	ePZ	12 38 45	29	ePZ	07 47 44
24	ePZ	14 55 35		iSZ	48 19
	iSZ	56 07	29	ePZ	11 26 53

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	eSZ	27 37	11	ePZ	17 55 56
	iPZ	14 50 00 c	11	ePZ	22 02 20
29	iSZ	28	11	ePZ	22 55 28
29	ePZ	15 34 32	12	ePZ	19 26 25
29	ePZ	22 24 48	13	eXZ	21 47 05
	eSZ	25 54	13	eXZ	22 23 40
29	ePZ	23 09 35	13	ePZ	23 24 26
	eSZ	10 36		eXZ	49
30	ePZ	01 16 31	13	ePZ	23 56 27
	iSZ	17 14	14	ePZ	00 52 13
30	ePZ	04 40 32	14	eXZ	01 01 16
	iSZ	41 18	14	ePZ	18 56 40
			11	eXZ	06 00 37
			55	ePZ	20 33 39
				eSE	34 24
			16	e(P)Z	00 43 05
1	ePZ	06 13 38	16	eXZ	07 57 44
1	eXZ	08 58 40	16	eXZ	18 04 50
1	eXZ	12 34 46	16	ePZ	21 22 15
1	ePZ	16 12 13	16	eXZ	05 34 56
4	ePZ	18 40 43	18	eXZ	07 56 52
	eSE	41 44	18	eXZ	18 44 30
4	eXZ	23 14 32	19	eXZ	05 46 49
5	eXZ	10 22 41	20	eXZ	08 26 33
6	eXZ	23 08 13	20	eXE	10 33 30
7	eXZ	07 50 42	20	ePZ	11 50 22
7	eXZ	11 34 30		e(S)E	52 04
7	eXE	17 41 46	21	ePZ	23 34 02
7	ePE	20 37 49	22	eXE	06 12 35
10	ePZ	23 31 05	22	eXE	14 35 20
	eSE	32 04	22	ePZ	16 08 46
11	ePZ	13 08 40	22	ePZ	21 56 30
	eSE	09 45	22	eXZ	18 32 44
11	eXE	14 04 29			

Date	Phase	h m s	Date	Phase	h m s
23	ePZ	19 01 48	20	eXZ	05 40.6
24	ePZ	20 28 57	21	eXZ	05 48 02
	eSZE	29 27	21	eXZ	10 35.1
24	e(P)Z	20 58 37	21	eXZ	22 08 0
25	ePZ	23 23 17	22	ePZ	03 02 20
26	ePZ	00 17 31		e(S)E	03 27
26	eXZ	12 02 38	22	ePZ	17 14 36
27	eXE	04 16 05	23	eXZ	09 38.5
27	ePZ	16 18 22	24	eXE	06 29 23
	eSZE	42	25	ePE	04 07 28
28	ePZE	18 07 20	26	eXZ	10 59 10
29	ePZ	20 19 41			
30	ePZ	01 17 42			
	<b>Karachi</b>			<b>Chittagong</b>	
1	eXZ	12 35 28	1	ePZ	06 15 49
1	eXE	16 15 09		e(S)N	23 36
4	eXZ	23 14 59	1	eXZ	12 21 19
7	eXZ	10 38 14	1	ePN	12 29 24
7	ePZ	20 42 01 ±	1	eXN	16 03 49
8	ePgZ	08 00 59	1	eXN	16 09 20
	eSgZ	01 13	2	ePZ	09 36 45
10	eXZ	11 33 31		eSN	37 20
10	ePZ	14 39 17	4	eXN	00 38 45
	eSE	50	4	ePN	20 07 29
11	eXZ	13 14 33	5	ePN	04 40 11
11	eXZ	17 53 56	5	ePN	05 37 27
12	eXZ	23 39 48	5	eXN	08 21 15
12	eXZ	23 43 08	5	ePN	09 16 34
14	eXZ	02 32 53	6	ePN	10 09 55
14	eXZ	23 19 12		iSN	10 17
15	eXZ	23 31 35	7	eXN	00 45 31
16	eXZ	00 43 21	7	eXN	01 23 25
			7	eXN	03 00 23
			7	eXZ	07 49 56
			7	ePE	21 42 31

Date	Phase	h m s	Date	Phase	h m s
8	eXN	12 18 35	18	iPgN	23 01 55
8	ePN	15 10 21		iSgNE*	02 03
10	eXN	11 24 55	19	ePN	01 09 58
11	ePZ	11 46 03	19	eXN	09 32 04
11	eXN	22 58 46	19	eXN	15 15 17
12	ePN	15 48 42	20	eXN	06 40 19
	eSN	49 50	20	eXN	14 28 16
13	ePN	03 12 50	21	eXN	23 41 12
	eSN	13 53	21	eXN	23 45 26
13	ePN	16 22 07	23	ePN	08 08 52
	eSN	24 48	24	eXN	07 10 40
13	ePN	16 59 14	24	e(P)N	10 22 37
13	eXN	18 43 51	26	ePN	00 24 46
13	eXN	23 17 53	27	ePN	06 50 20
14	eXN	04 14 48	28	eXN	05 05 28
14	eXN	06 06 45	29	eXN	04 31 11
14	eXN	15 43 52	29	eXN	07 29 38
16	eXN	10 00 36	30	eXN	09 43 10
15	ePN	18 47 43			
15	eXN	23 29 53			
16	ePN	05 04 36			
	eSN	05 01			
16	e(P)N	05 50 01			
16	eXN	06 25 22			
16	eXN	17 56 19			
16	ePN	22 54 16			
17	eXN	10 01 27			
17	eXN	15 44 35			
17	e(P)N	18 52 05			
18	eXN	08 14 11			
18	ePN	14 22 39			
	i(S)SN*	24 23			
18	ePN	17 43 07			

Il. Pakistan Quetta, Vol 4 No. 12, December 1958

# SEISMOLOGICAL BULLETIN OF PAKISTAN

4

DECEMBER 1958

No. 12

Printed at  
Bolan Muslim Press,  
QUETTA.



Issued under the authority of the Director, Meteorological Service  
PAKISTAN METEOROLOGICAL SERVICE  
GEOPHYSICAL INSTITUTE  
QUETTA



SEISMOLOGICAL BULLETIN

of  
PAKISTAN.

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
<u>Quetta (Central Station)</u>				
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)

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The Seismological Bulletin of Pakistan is a monthly publishing data of Seismological stations in Pakistan.

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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 "	—	—
<b>Lahore</b> Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
<b>Karachi</b> Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
<b>Chittagong</b> 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 "	—	—
<b>Warsak</b> 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) 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.

Seismological Bulletin of Pakistan  
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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
1	Wr	iPZ	23	28	39 d		Kr	ePZ			28 00
		iSZ		29	47			USCGS H 02 23 40			
	Qt	ePZN			46			27 N 86 E			
		eSEZ		31	43			Nepal			
		H 23 27 10				3	Ch	ePN		09	54 17
		Tadzhik-Kirghiz border						ePPNN*			55 04
2	Wr	iPZ	00	07	38 d			ePPPNN*			16
		eSZ		08	05			ePcPN*			57 39
	Qt	ePZ			40			eSNN*			58 54
		eSE		09	53			eSSN*		10	00 16
		H 00 07 04						eScSN*			05 06
		Hindukush region					Lh	ePZ		09	56 36
2	Lh	ePE	01	22	22			eSE		10	02 58
	Wr	iPZ			25 c		Wr	ePZ		09	56 56
	Qt	ePZ		23	02 c		Qt	ePZ			57 25
		ePcPZ			37			eSENN*		10	04 30
		ePPZ		25	25			Mu Sec			
		USCGS H 01 12 22						PZ 0.6 2.0			
		44 N 149 E					Kr	ePZ		09	57 26 ±
		Kurile Islands						USCGS H 09 48 26			
2	Qt	ePZ	04	04	25			19 N 121 1/2 E			
2	Qt	ePZ	09	17	44			Near north coast of Luzon, Philippine Islands			
		e(S)NN*			21 00			Mag 6.0 (Up, Ki), 6.3 (Qt)			
2	Qt	ePZ	19	04	48						
3	Ch	ePnZ	02	25	18	3	Wr	iPnZ		10	16 45
		eSnNN*			26 31			iSnZ			17 10
		eS*NN*			52		Qt	ePNZ			14
		eSgN*			27 07			ePgNE			30
	Lh	ePE			26 33			eSgNN*			18 25
	Wr	ePZ			27 08		Lh	ePZ			17 31 ±
	Qt	ePZ			51		Kr	ePZ			18 19 ±
		eSNEN*			31 12			eSE			19 50

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		H 10 16 11						USCGS H 19 19 23			
		33½ N 69 E						11½ N 86½ W			
		Eastern Afghanistan						Near coast of			
		Felt Bannu						Nicaragua			
		West Pakistan						depth about 100 km			
3	Wr	ePZ	16	09	50 c	5	Wr	iPZ	23	42	01
	Qt	ePZ	10	22	c		Qt	ePZ			29
		USCGS H 16 00 58				6	Wr	ePKPZ	09	53	05
		South of Honshu,					Qt	ePKPZ			08
		Japan						ePKSN*			56 40
		depth about 550 km					Ch	ePKPN			53 42
3	Wr	iPZ	21	35	05 d			ePKSN*			57 15
		iSZ			37			ePPN*			56
	Lh	ePZ			46			eSKSN*	10	00	49
	Qt	ePZ			04 d			eSSN*			17 44
		eSE			36 47			USCGS H 09 33 45			
		eSNE			37 23			6½ N 83 W			
	Kr	ePZ			07 d			South of Panama			
		H 21 34 23						Mag 6-6¼ (Pas)			
		36¼ N 71 E				6	Qt	ePZ	23	00	06 d
		Hindukush						iSNEN*			32
		depth about 200 km					Wr	ePZ			42
4	Kr	ePZ	10	30	06			H 22 59 31			
		eSE			33 27			Southern Afghanistan			
	Qt	ePZ			30 39	7	Lh	ePN	00	17	07
		eSN*			34 36		Qt	ePZ			37
								eSN*			26 59
	Wr	ePZ			31 32			USCGS H 00 06 07			
	Lh	ePZ			37			54 N 169 E			
		H 10 25 44						Komandorskie Islands			
		Coast of Aden				7	Ch	ePN	01	15	15
4	Qt	ePKPZ	19	38	32		Lh	ePN			17 17
	Ch	ePKPZ			39 10		Wr	ePZ			41 c

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Qt			18 10			ePZ			
		USCGS H 01 09 18						eScSN*			06 03
		21½ N 121 E						eLN*			10·7
		Off south coast of						USCGS H 02 45 49			
		Formosa						4 N 127 E			
								Taland Islands			
7	Wr	ePZ	06	34	04	7	Wr	ePZ			
	Qt	ePZ			21		Qt	ePZ			
		USCGS H 01 43 51						USCGS H 06 21 46			
		21½ N 121½ E						Bismarck Sea			
		Off south coast of						Qt	ePKPZ		18 17 13
		Formosa						Kr	ePKPZ		38±
7	Wr	iPZ	02	47	23 d			USCGS H 17 58 08			
		eSN			49			18 N 105 W			
	Lh	ePZ			48 04			Off coast of Mexico			
		iSZN			49 01			depth about 100 km			
	Qt	ePZ			48 28			Mag 6 (Berk)			
		eSNE			49 45			7	Qt	ePnZ	20 23 00 c
		H 02 46 48									03
		36 N 71½ E									33
		Hindukush									42
		depth about 150 km									14
		USCGS H 02 46 38									26
		Hindukush									59
7	Lh	ePZ	02	55	33 c						24 17
		eSN			03 03 16						
		eScSN			05 19						
	Wr	ePZ			02 55 54						
	Kr	ePZ			56 07 c						
		eSE			03 04 23						
	Qt	ePZ			02 56 13 c						
		ePcPZ			56						
		eSN*N			03 04 31						

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
8	Wr	ePZ	07	21	44		Kr	ePnZ			45
	Qt	ePZ		22	29			iSE		49	46
		USCGS H 07 17 19					Wr	ePnZ		48	50
		38 N 97½ E						iSnZ		49	53
		Tsaidam Basin China					H	12 47 27			
8	Qt	ePZ	11	52	54			29½ N 68½ E			
		USCGS H 11 42 10						Eastern Baluchistan			
		44 N 149 E						West Pakistan			
		Kurile Islands									
8	Ch	ePN	12	17	34	8	Qt	ePZ	12	49	58
		ePcPNN*		18	46			eSE		50	15
		ePPN*		19	34			Eastern Baluchistan			
		ePPPNN*		20	33	8	Qt	ePZ	12	55	51
		eSNN*		24	53			eSN		56	08
	Wr	ePZ		18	25 c			Eastern Baluchistan			
	Qt	ePZ		19	02 c	8	Qt	ePZ	12	57	43
		ePcPZ			36			eSZNE		58	00
		ePPZ		21	25			Eastern Baluchistan			
		eSNN*		27	36	8	Qt	iPnZ	14	06	18
		eScSN*		28	51			ePgZN			26
		eSSN*		31	52			iSnNN*			50
		Mu Sec					Lh	ePnZ			40
		PZ 0.4 1.9						eS*N		07	44
		Δ = 63°.7					Kr	ePnZ		06	43
	Kr	ePZ	12	19	23 c			eSnE		07	35
		USCGS H 12 08 23					Wr	iPnZ		06	54
		44 N 149½ E						H 14 05 30			
		Kurile Islands						29 N 70 E			
		Mag 6.0 (Up, Ki),						West Pakistan			
		6.3 (Qt)									
8	Qt	ePZ	12	47	53						
		iSNEN*		48	12						

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
8	Qt	ePZ	14	35	11						
		ePgZNE			19						
		eSZN*			43						
	Lh	ePZ			36						
		eS*N		36	39						
	Wr	ePZ		35	47						
		H 14 34 27									
		29½ N 70 E									
		West Pakistan									
8	Wr	iPZ	15	43	56 d						
		eSN		44	30						
	Qt	ePZ		45	01						
		eSEZ		46	26						
		H 15 43 10									
		Northern Afghanistan									
9	Ch	ePN	08	08	07						
		eSN*		14	10						
	Wr	ePZ		10	43						
	Kr	ePZ			43						
	Qt	ePZ			50						
		eSN*		19	13						
		eLN*		26.4							
		USCGS H 08 00 30									
		8 S 118 E									
		Flores Sea									
9	Ch	ePN	12	30	17						
		eSN*		40	38						
		USCGS H 12 17 47									
		14½ S 167 E									
		New Hebrides Islands									
9	Kr	ePZ	20	48	24						
	Wr	ePZ			26						

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
10	Ch	ePN	07	16	02			eSNE	56	55	
	Lh	ePKPZ	21	14	±			eScSN*	58	12	
	Wr	ePKPZ	16					Mu Sec			
	Kr	ePKPZ	20					PZ 0.2 1.2			
	Qt	ePKPZ	23					Δ=61°			
		epPKPZN*	22	41				USCGS H 14 39 00			
		ePPZN*	23	00				5 N 126 E			
		epPPZN*	24	10				Off south coast			
		eSKSN*	28	05				of Mindanao			
		eSSN*	39	13				Phillippine Islands			
		USCGS H 07 02 59						depth about 200 km			
		37 S 176½ E						Mag 5.7 (Qt)			
		Off north island,									
		New Zealand									
		depth about 300 km									
		Mag 6¼ (Pas),									
		6½-6¾ (Berk),									
		6.9 (Up,Ki)									
10	Qt	ePZ	07	31	22	11	Ch	ePZ	15	41	35
	Kr	ePZ	33				Qt	ePZ	43	50	
10	Ch	iPZ	14	45	55 c			USCGS H 15 33 25			
		ipPZ	46	39				30½ N 140 E			
		ePPZ	47	26				South of Honshu,			
		ePPPZ	48	03				Japan			
		ePcPZ	11								
		eSZN*	51	25							
		esSN*	52	47							
	Lh	ePZ	48	14							
	Wr	ePZ	37								
	Kr	ePZ	47 c								
		epPZ	49	34							
		eSE	56	43							
	Qt	ePZ	48	54 c							
		epPZE	49	44							

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Wr	ePZ	32	53				ePPZ	57	29	
13	Qt	ePZ	01	28	56 c			eSZ	12	02	51
13	Qt	ePZ	06	25	53		Lh	ePZ	11	56	19
13	Ch	ePZ	09	16	25			eSN	12	04	16
	Wr	ePZ	18	39			Wr	ePZ	11	56	21
	Qt	ePZ	56				Qt	ePZ	57	01	
		USCGS H 09 05 55						ePPNZ	59	20	
		4½ S 153½ E						eSN*N	12	05	40
		Solomon Islands						USCGS H 11 46 20			
		region						44½ N 149 E			
13	Qt	ePKPZ	09	26	19			Kurile Islands			
		USCGS H 09 07 30									
		55½ S 22 W									
		Sandwich Islands									
		region									
13	Qt	ePZ	14	39	14			USCGS H 02 32 24			
		USCGS H 14 28 33						44½ N 148½ E			
		44½ N 149 E						Kurile Islands			
		Kurile Islands									
14	Qt	iPZ	07	10	12 d						
		iSNEN*	30								
	Wr	ePZ	11	29							
	Lh	ePZ	43±								
		H 07 09 47									
		Afghanistan-									
		Baluchistan border									
14	Ch	ePKPZ	07	30	27						
	Wr	ePKPZ	31	35							
	Qt	ePKPZ	41								
		USCGS H 07 11 28									
		35 S 108½ W									
		South Pacific Ocean									
		Mag 6 (Pas)									
15	Ch	ePZ	11	55	30						

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
17	Ch	ePZ	15	40	54		Qt	ePZ			15
		eSN*		46	15			eSNZ			38 18
	Lh	ePZ		42	39 c		Lh	ePZ			37 35
	Wr	ePZ			54			H 07 33 36			
	Qt	ePZ		43	30 c			Near southern coast			
		eSN*			51 02			of Iran			
	Kr	ePZ		43	41 c	18	Ch	ePKPZ			19 40 17
		USCGS H 15 34 08					Qt	ePKPZ			42 55
		27½ N 128 E						USCGS H 19 23 53			
		Ryukyu Islands						16 S 173 W			
		Mag 5.8 (Up, Ki)						Tonga Islands region			
17	Ch	ePZ	20	44	38	19	Qt	ePZ			03 33 52
	Wr	ePZ		46	26 c			USCGS H 03 27 26			
	Kr	ePZ			40 c			38 N 30 E			
	Qt	ePZ			43 c			Western Turkey			
		USCGS H 20 33 58				19	Qt	ePZ			11 18 26
		4½ S 153½ E				19	Kr	ePZ			11 18 25
		New Ireland region					Qt	ePZ			19 17
18	Wr	ePZ	07	28	35			ePPZ			55
	Qt	ePZ			41			eSNN*			23 42
		USCGS H 07 18 05						eSSNN*			24 43
		11 S 117½ E						eLN*			25.7
		South of Sumbawa					Lh	ePN			19 53
		Island					Wr	ePZ			20 02
18	Lh	ePZ	07	34	22		Ch	ePZ			48
	Wr	ePZ			44			eSN*			26 18
	Qt	ePZ			35 12			H 11 13 42			
		USCGS H 07 26 16						5¾ N 59 E			
		18 N 120½ E						Indian Ocean			
		Near north coast of				19	Qt	ePKPZ			11 34 06
		Luzon, Philippine						epPPZ			37 59
		Islands					Wr	ePKPZ			34 07
18	Kr	ePZ	07	36	14		Lh	ePKPZ			17

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Ch	ePKPZ			41 ±	20	Ch	ePZ			19 27 21
		USCGS H 11 14 40						ePPZ			28 32
		16 S 72 W						ePcPZN*			30 01
		Southern Peru						eSN*			32 42
		depth about 100 km					Lh	ePZ			29 08 d
19	Ch	iPZ		18	47 58		Wr	ePZ			23 d
		iPcPZ			48 13		Qt	ePZ			58 d
		eSN*			57 27			eSNN*			37 26
		eScSN*			58 04			USCGS H 19 20 43			
	Wr	ePZ			48 10			28½ N 127½ E			
	Lh	ePZ			15			Ryukyu Islands			
	Qt	ePZ			42			region			
		ePcPZ			49			Mag 6.1 (Up, Ki)			
		eSEN			58 53	20	Ch	ePZ			21 21 57
		Mu Sec					Lh	ePZ			22 41
		PZ 0.3 1.4					Wr	ePZ			23 05
		Δ = 82°					Qt	ePZ			13 c
	Kr	ePZ		18	49 04	21	Qt	ePZ			04 21 08
		USCGS H 18 36 23						eSEN			23 16
		51½ N 177½ W				21	Wr	iPZ			05 49 17 d
		Andreanof Islands						Mu Sec			
		Aleutian Islands						PN 2.0 1.6			
		Mag 6.2 (Qt)					Lh	iPZ			05 49 44 d
	Qt	ePZ		23	57 10		Qt	iPZ			50 37 d
19	Kr	ePZ		00	01 30			ePPZ			50
20	Qt	ePZ			02 21			ePPPZ			51 01
		ePPZ			03 01			iSN*NE			53 59
		eSNN*			06 49			eSEN*			54 23
	Lh	ePN			02 56			eLN*			55.4
	Wr	ePZ			03 07			Mu Sec			
	Ch	ePZ			52			PZ 2.2 1.7			
		H 23 56 46						PN 2.7 1.7			
		5¾ N 59 E						PE 1.7 1.7			
		Indian Ocean						Δ = 18°3			

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Date	Station	Phase	h	m	s
	Kr	ePZ	05	51	29
	Ch	ePZ		51	43
		ePPZ		52	18
		ePPPZN*			29
		ePcPZN*		55	25
		iSZN*		56	00
		eSSN*			55
	H	05 46 20			
		44½ N 80¼ E			
		Western Sinkiang Province China			
	USCGS H	05 46 26			
		44½ N 81 E			
		Western Sinkiang Province China			
		Mag 6.4 (Up,Ki),			
		66-¼ (Qt)			
21	Wr	ePZ	18	27	32
	Qt	ePE			48
22	Wr	ePZ	03	22	50 d
	Qt	ePZ		23	06
22	Wr	iPZ	22	08	13 c
		iSZ			45
	Qt	ePZ		09	12
		eSEnz		10	33
	H	22 07 26			
		Hindukush			
23	Qt	ePZ	03	30	39
		eSNE		32	33
23	Wr	iPZ	07	51	01 d
		iSZ			28
	Qt	ePZ		52	05
		eSZE		53	23
	H	07 50 23			
		Hindukush			

Date	Station	Phase	h	m	s
24	Ch	ePZ	01	24	09
	Qt	ePZ		25	58
		USCGS H	01	13	17
		6½ S 150½ E			
		Near south coast of New Britain			
		depth about 100 km			
24	Wr	iPZ	05	07	57
		iSZ		08	29
	Qt	ePZ			59
		iSNEZ		10	19
	H	05 07 14			
		Hindukush			
25	Ch	ePZ	08	16	13
	Lh	ePZ		17	55
	Wr	ePZ		18	10
	Kr	ePZ			23
	Qt	ePZ			27
		eSKSN*		28	48
	USCGS H	08 05 33			
		5½ S 151½ E			
		New Britain			
		Mag 6¼ (Pas),			
		6.3 (Up,Ki)			
25	Ch	ePZ	09	23	26
	Wr	ePZ			43
	Qt	ePZ		24	15
	USCGS H	09 11 46			
		51½ N 175 W			
		Andreanof Islands			
		Aleutian Islands			
25	Kr	ePZ	18	36	15
	Qt	ePZ			15

Date	Station	Phase	h	m	s
	Wr	eSNE		38	15
		ePZ		37	18
	Lh	ePZ			38
	H	18 33 40			
		27 N 55¼ E			
		Near southern coast of Iran			
26	Wr	ePKPZ	06	08	48
	Qt	ePKPZ			56
	USCGS H	05 51 04			
		South of Fiji Islands			
		depth about 600 km			
26	Wr	iPZ	20	16	04 d
		iSZ			32
	Lh	ePN			46
		eSN		17	46
	Qt	ePZ			08
		eSNE		18	27
	H	20 15 27			
		36 N 71¼ E			
		Hindukush			
28	Lh	ePZ	05	35	58
		eSN		36	55
	Wr	ePN			41
		eSN		38	14
	Qt	ePZ		37	20
		iPPZNE			26
		iSNN*		39	19
		iSSN*			32
	Kr	ePZ		37	37
		iSE		39	53
	Ch	ePZ		37	45
		ePPZ			54
		iPPPZN*		38	02

Date	Station	Phase	h	m	s
		iSZN*		40	04
		eSZN*			17
		eSSSZN*			30
	H	05 34 40			
		29½ N 80 E			
		India-Nepal border			
		Felt Moradabad, Delhi, Lucknow, Almora, Pilibhit, Ambala and Simla			
	USCGS H	05 34 36			
		29½ N 80 E			
		Western Nepal-India border			
		Mag 6.9 (Up,Ki)			
28	Wr	ePZ	08	28	16
	Qt	ePZ			56
		eSEN			30 58
	H	08 26 19			
		India-Nepal border			
28	Wr	ePZ	21	42	25 d
		eSZ			43 18
	Qt	ePZ			33
		eSNEZ			45 19
	H	21 41 15			
		Tadzhik S.S.R.			
29	Lh	ePZ	22	45	37
	Kr	ePZ			46
	Wr	ePZ			46 06
	Qt	ePZ			12
	USCGS H	22 38 22			
		2½ N 99 E			
		Northern Sumatra			

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
30	Kr	ePKPZ	08	58	09			eLE	51	4	
	Qt	ePKPZ		10			Ch	ePZ	48	26	
	Wr	ePKPZ		10				H 03 45 18			
		USCGS H 08 37 56						30 N 80 E			
		35½ S 105½ W						India-Nepal border			
		South Pacific Ocean						USCGS H 03 45 55			
		Mag 6 (Pas)						Southern Sinkiang			
								Province			
30	Qt	ePZ	10	33	37	31	Lh	ePN	10	40	57
31	Wr	iPZ	01	29	00 d		Wr	ePZ	41	01	
		iSZ		34			Qt	ePZ		37	
	Qt	ePZE		30	00			USCGS H 10 30 49			
		eSZE		31	18			46½ N 154 E			
		H 01 28 18						Kurile Islands			
		Hindukush						depth about 100 km			
31	Wr	ePKPZ	02	03	57						
	Qt	ePKPZ		04	06						
		epPKPZ		05	37						
		USCGS H 01 45 52									
		23 S 178½ W									
		Tonga Islands region									
		depth about 400 km									
31	Lh	ePnN	03	46	36						
		eP*N		45							
		eS*N		47	51						
	Wr	ePZ		19	c						
		eSN		48	48						
	Qt	ePZ		47	59						
		ePPE		48	08						
		ePPPE		14							
		eSZNE		50	03						
		eLN*		50	9						
	Kr	ePZ		48	14						
		ePPZ		25							
		eSE		50	27						

Date	Phase	h	m	s	Date	Phase	h	m	s
	Quetta				10	eXZN*	06	22	49
					10	eXZ	17	10	0
1	ePZ	09	27	57	11	ePgZ	12	21	37
	eSE		28	22		eSgNE			40
2	ePZ	22	22	05	12	ePZ	17	03	30
	eSNE		36	04	13	eXZ	07	15	0
3	ePZ	19	14	08	13	eXZ	07	31	0
	eSNE			29	13	eXZ	10	00	0
4	ePZ	09	52	33	13	ePZ	11	18	0
4	ePgZ	20	50	53	13	eXZ	11	33	0
	eSgE		51	02	13	ePZ	22	09	15
5	ePZ	04	20	40		eSNE			57
5	ePZ	11	11	57	14	ePZ	11	23	43
5	ePZ	11	29	56		eSZNE			24 00
	eSN		30	34	14	ePZ	11	25	40
5	ePZ	13	57	51		eSZ			26 07
	eSN		58	20	14	ePZ	20	58	49
6	ePZ	12	34	34		eSZ			59 06
6	eXZ	19	24	7	16	ePZ	03	25	10
6	ePZ	19	28	26		e(S)NE			43
	eSZ			46	16	ePZ	10	57	18
7	ePgZ	00	53	49		e(S)Z			45
8	ePZ	08	56	51	16	ePZ	18	09	49
	e(S)Z		58	31	16	ePZ	20	53	21
8	eXZ	13	02	0	17	ePZ	01	16	06
8	eXZ	13	42	0	18	ePZ	00	42	18
8	eXZ	19	16	0	18	ePZ	04	22	49
8	ePgZ	20	54	06		eSZN			23 15
	eSgZ			16	18	ePZ	10	58	23
9	ePZ	13	42	32		eSZ			54
	eSN			50	18	ePZ	18	55	24
9	ePZ	20	48	31 ±	19	e(S)NE			56 10
9	ePZ	22	53	10	20	ePZ	10	09	49
	e(S)N*			43	21	ePZ	17	14	54
10	ePZ	02	31	41		ePZ	12	17	49
						e(S)N			19 23



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Date	Phase	h m s
22	ePgE	01 17 02
	eSgE	17
22	ePgE	01 37 57
	eSZE	38 14
22	ePZ	02 30 22
22	ePZ	06 28 25
	e(S)N*	31 20
22	ePZ	07 42 12
22	ePZE	10 53 12
22	ePZ	11 26 12
22	ePZE	11 30 33
23	ePZ	14 32 56
	eSZE	33 50
24	ePZ	21 10 42
	eSE	12 03
25	ePZ	03 20 30
	eSE	50
25	eXZ	04 29 0
25	ePZ	06 28 58
	eSE	26 10
25	ePE	10 42 04
25	ePZ	11 37 25
	eSNE	44
25	eXZ	13 34 0
25	ePZ	20 43 45
	eSZN	44 19
26	ePZ	07 27 09±
	eSZNE	38
26	eXZ	07 30 0
26	eXZ	07 40 0
26	eXZ	08 13 0
26	eXZ	08 29 0

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Date	Phase	h m s	Date	Phase	h m s	Date	Phase	h m s
27	ePgZ	07 06 3	27	ePgZ	07 06 3		ePZ	00 14 28
	eSgZNE	4		eSgZNE	4		iSZ	15 00
28	ePZ	02 01 4	28	ePZ	02 01 4	8	ePZ	01 44 25
	ePZ	02 24 5	28	ePZ	02 24 5	8	iPZ	08 55 44 c
28	ePZN	06 05 0	28	ePZN	06 05 0	9	iSZ	56 31
28	ePZ	08 40 3	28	ePZ	08 40 3	9	ePZ	10 29 40
28	ePZ	12 02 5	28	ePZ	12 02 5	9	ePZ	14 48 48
	eSZNE	04 1	28	ePZ	12 02 5	9	iSZ	49 07
29	ePZ	19 41 1	29	eSZNE	04 1	10	ePZ	08 31 55
	e(S)E	5	29	ePZ	19 41 1	10	iSZ	32 40
30	ePNE	01 03 2	30	e(S)E	5	10	ePZ	14 17 59
30	ePE	02 25 1	30	ePNE	01 03 2	10	iPZ	21 42 47 d
30	eXN	02 41 0	30	ePE	02 25 1	11	iSZ	43 21
30	ePZ	05 54 4	30	eXN	02 41 0	11	iPZ	05 49 49 d
30	ePZ	21 06 0	30	ePZ	05 54 4	13	iSZ	50 28
	eSE	07 3	30	ePZ	21 06 0	13	ePZ	02 52 24
31	ePZ	00 57 5	30	eSE	07 3	13	eSZ	03 00 16
31	ePZ	18 46 3	31	ePZ	00 57 5	13	iPZ	10 04 19
31	ePE	20 03 4	31	ePZ	18 46 3	13	iSZ	53
	eSNE	04 1	31	ePE	20 03 4	13	iPZ	21 16 33 d
	Warsak		31	eSNE	04 1	15	iSZ	17 03
1	ePgZ	03 01 1		Warsak		15	ePZ	00 33 18
	iSgZ	1				15	iSZ	39
1	iPZ	05 15 3	1	ePgZ	03 01 1	15	ePZ	09 14 35
1	ePZ	11 56 3	1	iSgZ	1	15	eSZ	15 10
2	ePZ	00 42 4	1	iPZ	05 15 3	16	ePgZ	23 16 50
	eSZ	43 3	1	ePZ	11 56 3	16	iSgZ	17 01
2	ePZ	03 52 4	2	ePZ	00 42 4	16	ePZ	02 30 06
2	iPZ	20 17 3	2	eSZ	43 3	16	ePZ	05 20 15
2	iSZ	18 1	2	ePZ	03 52 4	16	ePZ	12 48 35
2	ePZ	21 45 4	2	iPZ	20 17 3	16	iSZ	49 08
2	iSZ	46 0	2	iSZ	18 1	17	iPZ	21 43 20 d
			2	ePZ	21 45 4	17	ePZ	15 51 49
			2	iSZ	46 0	18	iSZ	52 15
			7	ePZ	21 45 4	18	ePZ	03 15 03
			7	iSZ	46 0		iSZ	36

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Date	Phase	h m s	Date	Phase	h m
18	iPZ	08 18 15 d	21	iPZ	01 14 4
	iSZ	42		iSZ	15 1
18	ePZ	11 38 58	21	ePZ	12 16 5
	iSZ	39 29		iSZ	17 4
18	ePZ	17 11 59	21	ePZ	15 04 4
18	iPZ	18 55 21 d		iSZ	05 2
	iSZ	55	21	ePZ	23 22 1
19	ePZ	01 02 44	22	ePZ	01 39 0
	iSZ	03 22	22	ePZ	06 33 5
19	iPZ	10 08 58 c		iSZ	34 1
	iSZ	09 23	22	iPZ	10 51 4
19	iPZ	11 11 35 d		iSZ	52 1
	iSZ	12 07	22	iPZ	11 25 1
19	iPZ	13 51 41 d	22	iPZ	16 21 4
	ePZ	02 06 08	22	iSZ	22 1
20	iSZ	52	22	iPZ	18 45 1
	ePZ	09 59 58	23	iSZ	5
	iSZ	10 00 21	23	ePZ	06 46 4
20	ePZ	10 35 27		ePZ	10 50 4
	iSZ	36 01	23	iSZ	51 1
	ePZ	13 02 30		ePZ	12 00 14
20	ePZ	14 56 59		iSZ	4
	iSZ	57 49	23	ePZ	13 27 5
20	iPZ	14 58 20 d		iSZ	28 1
	iSZ	59 49	23	iPZ	14 32 24
20	iPZ	15 36 28 c		iSZ	49
	iSZ	27 02	23	ePZ	17 19 44
20	ePZ	19 29 23 d		iSZ	20 0
	iPZ	21 03 11 d	23	ePZ	17 32 5
	iSZ	53	23	ePZ	08 22 4
20	iPZ	22 05 17 d		iSZ	23 0
	iSZ	48	24	ePZ	08 50 3
20	ePZ	23 24 02		iSZ	51 2
			24	ePZ	10 57 2
				iSZ	58 0

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Date	Phase	h m s	Date	Phase	h m s
24	iPZ	18 33 48 d	28	iPZ	07 58 59 d
	iSZ	34 16	28	iPZ	12 01 57 d
24	iPZ	20 09 48 c		iSZ	02 24
	iSZ	10 17	28	ePZ	12 23 57
25	ePZ	03 33 28		eSZ	24 29
	iSZ	34 09	28	iPZ	12 41 01 d
25	ePZ	05 01 54		iSZ	40
	iSZ	02 24	28	ePZ	13 58 01
25	iPZ	17 38 55 c		iSZ	33
25	ePZ	18 16 30	28	iPZ	19 46 09 c
	iSZ	48		iSZ	40
25	ePZ	18 37 18	28	ePZ	20 11 57
25	ePZ	20 44 18		iSZ	12 26
26	iPZ	03 30 17 d	29	ePZ	02 01 35
26	iPZ	03 48 15 d		iSZ	02 17
	iSZ	47	29	ePZ	06 28 03
26	ePZ	07 19 28	29	iPZ	18 00 47 c
26	ePgZ	16 02 05		iSZ	01 22
	iSgZ	16	29	ePZ	20 46 15
26	ePZ	16 22 44	30	iPZ	01 24 10
	iSZ	23 18		iSZ	31
26	ePgZ	18 48 23	30	iPZ	08 52 08 d
	iSgZ	36		iSZ	48
26	ePgZ	21 51 30	30	ePZ	13 09 32
	iSgZ	45		iSZ	10 12
27	ePZ	00 04 35	30	iPZ	21 04 58 d
27	ePZ	01 54 30		iSZ	05 35
27	iPZ	07 45 33 c	31	iPZ	18 45 53 c
	iSZ	46 14		iSN	46 33
27	iPZ	12 37 15			
	iSZ	43			
27	ePZ	18 32 41	2	eXZ	00 07 58
28	iPZ	03 02 00 d	2	eXE	02 23 31
28	iPZ	06 04 07 d	3	eXZ	13 07 02

Date	Phase	h m s	Date	Phase	h m s
3	eXZ	16 16 36	5	ePZ	13 07 50
6	eXN	10 59 36		iSE	08 09
6	eXZ	23 01 38	6	eXE	23 01 33
9	eXN	13 45 55	7	eXE	02 51 35
12	eXN	13 35 23	8	eXE	12 58 27
17	ePN	20 46 20 <sup>±</sup>	8	eXE	13 00 26
18	ePgZ	15 12 53	8	eXZ	14 35 47
	eSgZ	56	9	eXZ	04 13 8
18	ePN	18 55 31	9	eXZ	13 43 43
	iSN	56 10	10	ePZ	15 18 29
20	ePZ	10 31 01	12	eXZ	13 32 13
20	eXZ	14 59 28	14	eXZ	07 11 03
22	ePZ	10 53 32	18	ePZ	00 41 59
22	ePZ	11 24 44		eSE	42 26
24	eXZ	05 08 50	18	eXZ	18 56 04
26	ePN	18 47 36	19	eXZ	11 37 24
28	ePZ	06 56 47	24	eXZ	05 21 46
	eSN	04 51	28	eXZ	08 31 27
28	eXN	00 27 37	30	eXZ	01 28 20
28	ePN	10 03 30	30	eXZ	02 47 07
28	eXZ	21 41 38			
30	ePN	01 24 53			
	eSN	25 41			
30	eXN	08 59 53			
31	eXN	01 34 30			
31	ePN	18 47 04			
	eSN	56			
	<b>Karachi</b>				
1	ePZ	00 56 03			
	eSE	44			
2	eXE	00 11 55			
3	eXZ	20 42 46			

Date	Phase	h m s	Date	Phase	h m s
4	ePN	21 12 50	25	ePZ	08 45 04
5	ePN	20 24 10	25	ePZ	09 23 26
7	eXN	02 53 10	25	eXN*	18 42 30
7	eXE	06 56 42	28	ePZ	14 44 07
7	eXN	06 34 11	28	eXN*	08 31 38
7	eXZ	18 20 11	28	eXN*	21 45 08
8	ePgN	11 27 12	29	e(P)Z	22 43 27
	eSgN	28	30	eXN*	08 58 58
8	eXN*	14 16 59	31	eXZ	01 47 23
8	eXN*	14 46 46	31	eXZ	02 02 57
9	eXN	20 50 10	31	ePZ	03 42 44
10	eXN	07 19 56	31	ePZ	10 40 34
11	ePZ	01 22 02			
	eSZ	23 24			
11	ePZ	03 06 06			
11	eXN*	20 55 53			
14	ePZ	22 20 58			
15	ePZ	08 14 13			
15	e(P)Z	18 55 59			
18	ePZN*	07 32 00			
18	eXN*	17 13 05			
19	eXZ	03 34 42			
19	ePZ	10 54 01			
20	eXZ	17 35 17			
20	ePZ	19 21 22			
20	ePZ	19 24 50			
20	eXZ	19 36 02			
20	ePZ	20 42 05			
21	eXN*	13 20 51			
21	ePZ	22 54 36			
24	eXZ	07 25 06			
24	ePN	22 23 06			

