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PAKISTAN METEOROLOGICAL SERVICE

GEOPHYSICAL INSTITUTE

QUETTA

Pakistan Meteorological Service

Director,
Meteorological Service

Sibte Nabi Naqvi

Deputy Director,
Geophysical Institute

Officer Incharge,
Seismological Section

Abdul Qadir Khan

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

All correspondence regarding the supply of this bulletin on exchange basis should be addressed to the Director, Meteorological Service, Secretariat Block No. 3, Frere Road, Karachi-1, 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
Quetta (Central Station)				
Sprengnether	Z	1.9 sec.	Critical	5,500
"	N	1.95 "	"	4,500
"	E	1.95 "	"	5,800
"	N	15.8 "	"	15,000
"	E	16.5 "	"	16,000

(Contd.)

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 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	02	16	03						
	Qt	ePZ			35						
		ePcPZE			17 30						
		ePPZE			18 48						
		eSEN*			24 31						
	Ch	ePN*			17 27						
		USCGS H 02 06 42									
		83 1/2 N 8 W									
		Off northeast coast of Greenland									
		Mag 5.9 (Up, Ki)									
2	Ch	ePZ	03	27	20						
	Qt	ePZ			54						
		USCGS H 03 15 40									
		Andreasof Islands									
		Aleutian Islands									
2	Qt	ePZ	05	29	18						
		USCGS H 05 19 36									
		Near coast of Brittany, France									
3	Qt	ePKPZ	11	37	12						
	Wr	ePKPZ			17						
	Lh	ePKPZ			26						
		USCGS H 11 17 38									
		14 1/2 S 75 1/2 W									
		Near coast of Peru									
4	Ch	ePZ	03	24	00 c						
		ePPZ			25 31						
		ePPPZ			51						
		ePcPZ			26 15						
		eSZ			29 55						
	Lh	ePZ			26 14						
	Qt	ePZ			39 c						
		ePcPZE			27 29						
		eSEN*			34 44						
		USCGS H 03 16 36									
		10 S 111 1/2 E									
		South of Java									
4	Qt	ePKPZ	03	51	20						
		USCGS H 03 32 15									
		21 S 174 1/2 E									
		Tonga Islands									
4	Qt	ePZ	04	02	40						
		ePPZNE			54						
		ePPPZ			03 02						
		eSE			04 56						
		eSSN*			05 13						
	Ch	ePZ			30						
		eSZ			10 07						
		USCGS H 03 59 44									
		Western Afghanistan									
4	Ch	ePZ	08	05	36						
	Qt	ePZ			06 58						
		ePcPZ			07 28						
		USCGS H 07 56 27									
		46 1/2 N 151 E									
		Kurile Islands									
		depth about 100 km									
4	Wr	iPZ	09	18	46 d						
		iSZ			19 23						
	Qt	ePZ			52						
		eSNE			21 19						
		H 09 17 56									
		Northern Afghanistan									
4	Qt	ePZ	21	19	56						
		eXZ			21 17						
		USCGS H 21 08 52									
		8 S 126 1/2 E									
		Timor Islands region									

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
4	Lh	ePZ	22	34	18±	5	Ch	iPZ	09	59	45d
		eSN		35	02			ePPZN*	10	03	15
	Wr	ePZ		34	32 c			ePPPN*		05	18
	Qt	ePZ		35	30			eSN*		10	31
		eSNE		37	29		Qt	ePKPZ		05	24
		H 22 32 56						eSKSNE		12	02
		Kashmir - Tibet						USCGS H 09 46 42			
		border region						22 S 171½ E			
5	Qt	ePZ	02	48	25			Loyalty Islands region			
		USCGS H 02 37 28				6	Qt	ePZ	01	38	38
		11½ N 141 E				6	Wr	iPZ	04	14	24 d
		Mariana Islands region						iSZ			51
		depth about 200 km						ePZ		15	17 d
5	Qt	ePZ	08	22	10 d			eSNE		16	26
		eXZNE			19			H 04 13 47			
		iSNN*		26	07			Hindukush			
	Wr	iPZ		23	03 d	6	Ch	iPZN	01	46	38 c
	Ch	ePZ		24	45			epPZ		48	09
		H 08 17 15						ePcPZ			14
		Coast of Aden						ePPZ			23
5	Ch	ePZ	09	46	18			eSZ		52	31
		ePcPZ			36			esSN*		55	10
		epPZ			48		Wr	iPZ		48	17 d
		esPZ		47	02		Qt	ePZ			49 d
		ePPZ		48	59			USCGS H 10 39 08			
		eSZN*		55	22			29 N 139½ E			
		eScSN*		56	18			Bonin Islands region			
	Wr	ePZ		48	06			depth about 450 km			
	Qt	ePZ			25	6	Ch	ePZ	12	04	32
		epPE			53			ePZ		06	36
		esPZ		49	07			USCGS H 11 53 39			
		eSN*		59	26			6½ S 155 E			
		USCGS H 09 35 13						Solomon Islands region			
		7 S 156½ E						depth about 100 km			
		Solomon Islands									
		depth about 100 km									

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
6	Qt	ePZ	12	18	20	7	Qt	ePZ	05	15	55 c
		eSN*		28	51			ePPPZ			16 08
		USCGS H 12 05 40						eSNE			18 01
		52 N 168 W					Kr	ePZ			15 56
		Fox Islands						eSE			18 01
		Aleutian Islands					Wr	ePZ			16 59
6	Ch	ePZ	12	39	21		Ch	ePZ			20 00
	Wr	ePZ		40	01			ePPZ			21 10
	Qt	ePZ			37			eSZ			25 21
		USCGS H 12 29 45						H 05 13 12			
		47½ N 153½ E						27 N 54½ E			
		Kurile Islands						Southern Iran			
6	Ch	ePZ	14	54	51			USCGS H 05 13 18			
		ePPZ		56	05			29 N 55 E			
		ePPPZ			23			Southern Iran			
		eSN*		15	00 17						
	Lh	ePZ		14	56 53	7	Ch	ePZ		06	40 04
		eSN		15	03 54			ePZ			40
	Kr	ePZ		14	57 00			ePZ			20 31 53
	Wr	ePZ			20 c			eXZE			32 27
	Qt	ePZ			22 c			eSNN*			33 33
		eXZ			34			eXN*			53
		ePcPNE		58	32		Kr	ePZ			32 25
		ePPNE		59	22		Wr	ePZ			46
		eSEN*		15	04 45		Lh	ePN			33 22
		eScSN*		07	10			H 20 29 43			
		eLN*		09	7			31 N 56½ E			
		USCGS H 14 48 03						Central Iran			
		7½ S 105½ E						ePZ		22	28 27
		South of Java						ePZ			46
7	Wr	iPZ	00	20	53 c	7	Qt	ePZ			31 36
		iSZ		21	28			ePZ			22 21 55
		ePZ			54			USCGS H 22 21 55			
		eSNE		23	15			37 N 29½ E			
		H 00 20 06						Southwestern Turkey			
		Hindukush									

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
8	Wr	ePKPZ	16	14	14	9	Qt	ePKPZ	21	11	10
	Lh	ePKPN		21				USCGS H 20 52 07			
	Qt	ePKPZ		23				14 N 90½ W			
	Kr	ePKPZ		35				Guatemala -			
	Ch	ePKPZ		38				El-Salvador border			
		USCGS H 15 54 41						depth about 150 km			
		Pacific Ocean				11	Qt	ePZE	04	33	56
		about 650 miles						USCGS H 04 27 23			
		northwest of						36½ N 29 E			
		Golapagos Islands						Near south coast			
8	Ch	ePZ	22	45	23	11	Lh	ePN	07	02	06
		eSN*		52	53			eSN		03	05
	Wr	ePZ		47	45		Wr	ePZ		02	08
	Kr	ePZ		48	00		Qt	ePZ		03	12
	Qt	ePZ		01				eSE		05	09
		eSN*		57	45			H 07 00 41			
		USCGS H 22 36 08						Kashmir			
		4½ S 138½ E				11	Qt	ePKPZE	07	41	31
		New Guinea						USCGS H 07 22 40			
9	Qt	ePZ	02	02	24			15 N 90 W			
		ePPZN		03	51			Guatemala			
		eSNE		08	16			depth about 200 km			
		eLN*		11.0		11	Wr	ePnZ	16	45	29
	Wr	ePE		02	44			ePgZ		58	
	Kr	ePZ		55				eSnN		46	44
	Ch	ePZ		04	46			ePnZ		45	30 c
		USCGS H 01 55 05						eSnN		46	45
		Near south coast of						eS*N		47	06
		Greece						ePNE		46	41
9	Wr	iPZ	03	19	08 c		Qt	ePNE		46	41
		iSZ		40				ePPE		50	
	Qt	ePZ		20	05			ePPPE		47	00
		eSZN		21	23			eSNEN*		48	53
		H 03 18 25									
		Hindukush									

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSSE		49	08	12	Wr	ePZ	19	08	52 d
		eLEN*		49.7				iSN		09	23
	Kr	ePZ		47	31		Lh	ePZ		32	d
	Ch	ePZN*		48	10 c			iSZ		10	33
		eSN*		51	34		Qt	ePZE		09	51 d
		H 16 43 49						esPE		10	34
		37 N 78¼ E						eSZE		11	09
		South western						H 19 08 11			
		Sinkiang						36 N 71 E			
		Province, China						Hindukush			
		USCGS H 16 43 46						depth about 200 km			
		37 N 79 E				13	Ch	ePZ	01	24	37
		Sinkiang						ePPZ		26	34
		Province, China					Lh	ePZ		24	
12	Ch	iPZN*	14	25	12 c		Wr	ePZ		40	
		ipPZ		43			Qt	ePZ		27	06
		ePcPZN*		26	28			ePcPZE		22	
		ePPZ		27	08			ePPZ		29	47
	Lh	ePZ		26	03 d			eSNE		36	38
		eSN		33	41			eScSN		37	13
		eScSN		35	32		Kr	ePZ		27	09
	Wr	iPZ		26	07 d			USCGS H 01 15 25			
	Qt	ePZ		44	d			13½ N 146 E			
		epPNE		27	09			Mariana Islands			
		eSN*		34	59			Mag 6¼ (Pas)			
		esSN*		35	40	13	Ch	ePZ	07	33	00
	Kr	ePZ		27	05			ePcPZ		11	
		USCGS H 14 16 28						eSZN*		42	54
		44 N 146 E					Wr	ePZ		33	03
		Near north coast					Qt	ePZ		32	c
		of Hokkaido, Japan						ePcPZ		36	
		depth about 100 km						eSNN*		43	56
								ePPSZ		45	10

Date	Station	Phase	h	m	s
		USCGS H 07 20 58 53 N 167½ W Fox Islands Aleutian Islands			
13	Ch	ePZ	07	39	17
	Lh	ePZ	41	30	
		eSN	47	49	
	Kr	ePZ	41	41	
	Wr	ePZ		56	
	Qt	ePZ	42	00	
		epPZ		39	
		ePPZ	43	51	
		eSN*	48	45	
		USCGS H 07 33 43 3 S 102 E Near south coast of Sumatra depth about 150 km			
13	Qt	ePKPZ	08	53	16
		ePKSN*	56	51	
	Ch	ePKPZ	53	48	
		USCGS H 08 34 08 9 N 83½ W Costa Rica depth about 100 km			
13	Qt	ePZ	09	44	46 d
		ePPZ	46	18	
		ePcPZ		58	
		eSN*	50	45	
		eLN*	53	4	
	Ch	ePZ	44	50	
		ePPZ	46	27	
		eSN*	50	53	
	Lh	ePZ	45	02	

Date	Station	Phase	h	m	s
	Wr	ePZ			19 c
		USCGS H 09 37 18 9 S 67½ E Chagos Archipelago region			
13	Ch	ePZ	14	41	04
	Qt	ePZ		42	36
		USCGS H 14 31 53 Kurile Islands			
13	Lh	ePKPZ	19	26	06
		USCGS H 19 06 40 16½ S 71½ W Southern Peru depth about 150 km			
13	Qt	ePKPZ	20	55	20
		epPKPZ		49	
		ePPZ	58	51	
		ePKSZ	59	05	
	Wr	ePKPZ	55	33	
	Lh	ePKPZ		33	
		epPKPZ	56	01	
		USCGS H 20 35 54 34½ S 71 W Central Chile depth about 100 km			
15	Ch	ePZ	15	46	17
	Qt	ePZ		48	36
		USCGS H 15 39 12 27 N 128 E Ryukyu Islands			
15	Ch	e (P)Z	21	33	26
		iSKSN*		43	04
	Wr	ePKPZ		38	21

Date	Station	Phase	h	m	s
	Kr	ePKPZ			26
		ePPZ	39	52	
	Qt	ePKPZ	38	28	
		ePPZ	40	01	
		eSKSN*	44	43	
		USCGS H 21 20 26 25½ S 180 South of Fiji Islands depth about 500 km Mag 6½ (Pas)			
16	Ch	iPZ	01	43	15 d
		ePcPZ		28	
		ePPZ	46	07	
		ePPPZ	47	56	
		iSZN*	53	00	
		eScSZN*		29	
		ePSZ	38		
		ePPSN*	53		
		eSSN*	57	57	
	Wr	ePZ	43	22	
	Lh	ePZ		25	
	Qt	iPZ		52 c	
		iPcPZ		57	
		ePPZ	47	01	
		eSKSN*	54	09	
		iSZNEN*		12	
		eScSZ		25	
		ePSZN*	55	06	
		ePPSZN*		28	
		eSSN*	59	40	
		eLN*	02	05	7
		Mu Sec			
	PZ	0.5	1.8		
		Δ = 83°			

Date	Station	Phase	h	m	s
	Kr	iPZ	01	44	14 c
		Mu Sec			
		PZ 0.5	1.5		
		PE 0.3	1.5		
		Δ = 87° 8			
		USCGS H 01 31 22 52½ N 171 W Fox Islands Aleutian Islands Mag 6.2 (Up, Ki), 6.4 (Qt), 6.5 (Kr)			
16	Qt	ePZ	17	04	14
		eSKSN*		14	52
		eSN*		15	30
		ePSN*		17	01
		USCGS H 16 50 40 52 N 131½ W Queen Charlotte Islands			
17	Ch	ePZ	09	31	29
	Wr	iPZ		34	10 c
	Qt	ePZ		32 c	
		ePcPZ		35	24
		ePPZ		36	43
		USCGS H 09 24 35 10½ N 126 E Near north coast of Mindanao Philippine Islands			
17	Ch	ePZ	10	26	55
	Wr	ePZ		27	40
	Qt	ePZ		28	18
		eSN*		37	02

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H	10	17	19			USCGS H	19	25	45
		45½ N 153 E						5 S 152½ E			
		Kurile Islands						New Britain region			
17	Wr	iFZ	13	40	58 c	18	Ch	ePKPZ	22	39	58
		iSZ		42	21		Wr	ePKPZ		40	43
	Qt	ePZ			10		Qt	ePKPZ		41	20 d
		eSNE		44	27			e!PPZ		42	51
		H 13 39 10						epPKPZ		43	20
18	Ch	Kirghiz S.S.R.						eSPPN*		53	24
		ePZ	14	51	53			e!SSN*		58	46
		ePPPN*		55	49			Mu Sec			
	Lh	ePZ		53	35			PPZ 0.4 2.0			
	Wr	ePZ			49 c			Δ = 120°			
	Qt	ePZ		54	05 c			USCGS H 22 23 15			
		eSN*		15	04 51			19 S 178 W			
		ePSN*			05 53			Fiji Islands			
		eLN*			19.1			depth about 450 km			
		USCGS H 14 41 06						Mag 6¼ (Pas),			
		5 S 152½ E						6.4 (Qt)			
		New Britain region				18	Ch	ePZ	22	50	53
18	Ch	ePZ	16	00	10		Qt	ePZ		51	24
	Qt	ePZ			46	19	Ch	ePZ	08	20	00
		eSN*		11	04		Qt	ePZ		22	26
		eScSN*			20			USCGS H 08 12 46			
		USCGS H 15 48 18						30 N 132 E			
		52 N 166½ W						South of Kyushu			
		Fox Islands						Japan			
		Aleutian Islands				20	Ch	ePZ	16	54	36
18	Ch	ePZ	19	17	13			ePcPZ		56	12
	Qt	ePZ		20	00			ePPZ			25
18	Ch	ePZ	19	36	33			eSN*		17	01 18
	Wr	ePZ		38	28 c		Lh	ePN		16	56 47
	Qt	ePZ			44 c			eSN		17	05 16
		ePSN*		50	34		Wr	ePZ		16	57 07

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Qt			18			H	13	57	28
		ePZ			43			Gulf of Aden			
		ePcPZN			59 51	21	Wr	ePZ	16	27	45
		ePPZN			17 06 20			eSZ		28	51
		eSNEN*			07 11		Qt	ePZ			41
		eScSE			10 53			eSE			30 26
		eSSN*			13.8			H 16 26 18			
		eLN*						Tadzhikistan			
		USCGS H 16 46 11				21	Qt	ePZ	16	48	26
		9 S 126 E					Ch	ePZ			49 16
		Timor Islands				22	Ch	iPZ	05	18	51 d
21	Ch	ePZ	11	13	48			ePcPZ			20 28
		ePPPZ			14 40			ePPZ			38
	Wr	ePZ			16 32			ePPPZN*			21 20
	Qt	ePZ			59			eSN*			25 33
		ePcPZ			18 23			eSSN*			28 53
		ePPZ			53			Lh	ePZ		20 00 c
		eSNEN*			24 04			ePPN			22 06
		USCGS H 11 08 10						eSN			27 48
		19 N 120 E						Wr	iPZ		20 09 c
		Near north coast						iSZ			28 08
		of Luzon					Qt	iPZ			20 44 c
		Philippine Islands				21	Kr	ePZ	14	01	48
								eSE			05 15
							Qt	ePZ			02 25
								eXZ			32
								ePPZ			50
								i!SNEN*			06 23
							Wr	ePZ			03 19
							Lh	ePZ			21
								eSN			08 07
							Ch	ePZ			05 04
								eSZN*			11 11

Major Shocks

Date	Station	Phase	h	m	s
		Mu Sec			
		PZ 1.2	2.0		
		PPZ 0.8	2.5		
Kr		ePZ	05	21	01 c
		ePcPZ			40
		eSE		29	45
		USCGS H	05	10	25
		34 N 142 E			
		Near east coast			
		of Honshu, Japan			
		Mag 6 $\frac{3}{4}$ - 7 (Pas),			
		6 $\frac{3}{4}$ (Berk), 7.2 (Up, Ki),			
		6.7 (Qt)			
22	Ch	ePZ	05	44	17
	Kr	ePZ		47	00
	Qt	ePZ			06
		USCGS H	05	36	06
		4 N 132 $\frac{1}{2}$ E			
		about 300 miles			
		northeast of			
		Halmahera			
22	Wr	ePZ	07	42	54
	Qt	ePZ		43	32
		eSNE		51	53
		USCGS H	07	33	14
		43 $\frac{1}{2}$ N 144 $\frac{1}{2}$ E			
		Hokkaido, Japan			
22	Lh	ePZ	09	56	09
	Wr	ePZ			19
	Qt	ePZ			55 c
		eXZ		57	04
		ePPZ		59	06
	Kr	ePZ		57	10 c
		USCGS H	09	46	40
		38 $\frac{1}{2}$ N 142 E			
		Near east coast			
		of Honshu, Japan			

Major Shocks

Date	Station	Phase	h	m	s
23	Wr	ePZ	07	09	33
	Qt	ePZ		10	09
	Kr	ePZ			27
23	Qt	ePZ	19	04	52 d
24	Ch	ePZ	05	16	47
		epPZ		17	06
		esPZ			34
		ePcPZ		18	26
		ePPZN*			34
		iSN*		23	13
		esSN*		24	04
	Lh	ePZN		17	57
		epPZN		18	17
		eSZ		25	29
	Wr	iPZ		18	04 c
		iSZ		25	44
	Qt	ePZ		18	40 c
		epPZEN*		19	02
		ePcPZ			24
		ePPZ		20	52
		epPPZ		21	21
		iSN*		26	49
		esSN*		27	29
		eScSN*		28	09
		Mu Sec			
		PZ 0.4	1.5		
	Kr	ePZ	05	18	59
		epPZ		19	20
		eSE		27	24
		USCGS H	05	08	35
		37 $\frac{1}{2}$ N 141 E			
		Near coast of			
		Honshu, Japan			
		depth about 100 km			
		Mag 6.4 (Up, Ki),			
		6.2 (Qt)			
24	Wr	ePZ	08	00	25
	Qt	ePZ			35 c
		ePcPZ		01	31
		ePPZ		02	50
		eSN*		08	25
		USCGS H	07	50	52
		1 $\frac{1}{2}$ S 116 $\frac{1}{2}$ E			
		Near east coast			
		of Borneo			
24	Wr	ePZ	15	46	35
	Qt	ePZ			48
		USCGS H	15	33	56
		New Britain region			
		depth about 100 km			
24	Qt	ePKPZ	16	10	38
		USCGS H	15	51	47
		17 $\frac{1}{2}$ S 175 W			
		Tonga Islands region			
		depth about 100 km			
24	Qt	ePZ	17	49	22
24	Wr	ePKPZ	20	01	31
	Qt	ePKPZ			35
		eXZ			50
		ePKSZNEN*		04	58
	Lh	ePKPZ		01	38
		USCGS H	19	42	20
		15 N 92 $\frac{1}{2}$ W			
		Mexico - Guatemala			
		Mag 6 $\frac{1}{4}$ (Pas)			
24	Qt	ePZ	20	06	47
		ePcPZ		07	07
		ePPZ		09	32
		eSN*		16	19
		eScSN*			55
		eSSN*		20	48
	Wr	ePZ			06 53
	Lh	ePZ			07 17
		USCGS H	19	55	14
		37 $\frac{1}{2}$ N 24 $\frac{1}{2}$ W			
		Azores Islands			
		Mag 6 $\frac{1}{4}$ -6 $\frac{1}{2}$ (Pas),			
		6.4 (Up, Ki)			
25	Qt	ePnZ	10	01	47 d
		ePgZ			52
		iSnZNE			02 13
	Wr	ePnZ			27
		H	10	01	12
		Eastern Baluchistan			
26	Qt	ePKPZ	03	38	15
	Wr	ePKPZ			20
		USCGS H	03	18	35
		25 S 71 $\frac{1}{2}$ W			
		Near coast of Chile			
26	Qt	ePZ	11	45	09
	Wr	ePZ			25
		USCGS H	11	38	25
		37 N 29 $\frac{1}{2}$ E			
		Southwestern Turkey			
26	Wr	ePZ	20	13	00
	Qt	ePZ			35
26	Wr	iPZ	21	52	02 c
	Qt	ePZ			36 c
		ePcPZ			53 43
		USCGS H	21	43	12
		27 N 128 $\frac{1}{2}$ E			
		Ryukyu Islands			
27	Wr	iPZ	03	44	45 c
	Qt	ePZ			45 04 c
		ePcPZ			46 05
		ePPZ			47 05

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Lh	ePN	45	10				ePKP2Z	25	22	
	Kr	ePZ		19	±			ePPZ	29	14	
		USCGS H 03 25 29						USCGS H 10 04 10			
		71½ N 2 W						30½ S 79 W			
		Jan Mayen Islands region						Juan Fernandez Islands region			
27	Qt	ePZ	06	27	42			Mag 6¼ (Pas)			
		e(S)ZE		29	27	28	Wr	iPZ	14	08	47 c
27	Wr	iPZ	21	15	09 c		Qt	iPZ		09	19 c
	Qt	ePZ			28 c			epPZ		11	15
		ePcPZ		16	01			USCGS H 13 59 53			
		epPZ			16			28½ N 138 E			
		eXN*		24	30			South of Honshu, Japan			
		USCGS H 21 05 29						depth about 550 km			
		4 N 126 E				29	Qt	ePZ	02	52	25
		Celebes Sea				29	Qt	ePZ	06	57	50
		depth about 200 km				29	Ch	ePZE	20	33	15
27	Qt	ePZ	23	43	56			ePcPZE			28
		USCCS H 23 32 52						ePPZN*			36 06
		52 N 159½ E						ePPPZ			37 51
		Near southeast coast of Kamchatka						eSEN*			42 53
28	Wr	ePZ	01	30	57			eScSN*			43 26
	Qt	ePZE		31	34			eSSN*			47 46
28	Kr	ePKP1Z	10	23	58		Wr	ePZ			33 22
	Qt	ePKP1Z		24	00		Qt	ePZ			53
		iXZ			06			ePcPZ			34 00
		ePKP2			23			ePPNE			37 02
		e(PKS)Z		27	40			eSN*			44 08
		ePPZN*			49			eScSN*			22
		eSKSZN*		31	06			eSSN*			49 32
		eSKKSN*		34	48			USCGS H 20 21 27			
		ePPSN*		40	42			52 N 174W			
		eSSN*		47	08			Andreanof Islands			
	Ch	ePKP1Z	24	21				Aleutian Islands			
								Mag 5¾ - 6 (Pas)			

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
29	Ch	iPZ	21	10	06 c			USCGS H 00 19 25			
		eSN*		19	47			10 S 161 E			
	Wr	ePZ		10	13			Solomon Islands			
	Lh	ePN			18			Mag 6¾ (Pas)			
	Qt	ePZ			44 c	30	Wr	iPZ	13	45	50 d
		ePcPZ			50		Lh	iSN			46 36
		eSNE		21	01			ePZN			18 d
		USCGS H 20 58 18						eSN			42 29
		52 N 174 W					Qt	ePZ			46 57 d
		Fox Islands						esPZN			47 47
		Aleutian Islands						eSZNE			48 37
29	Wr	ePZ	23	33	25		Kr	ePZ			47 59
	Qt	ePZ			43 c			H 13 44 49			
		ePcPZ			34 58			37½ N 73¼ E			
		ePPZN*			35 42			Pamirs, Tadzhikistan			
		ePPPZN*			36 45			depth about 150 km			
		ePcSN			38 57	30	Qt	ePKPZ	16	35	17
		iSN*			41 06			epPKPZ			38
		eSSN*			44 38			esPKPZ			58
	Lh	ePN			33 53			ePPZ			38 46
	Ch	ePZ			35 32		Wr	ePKPZ			35 28
		ePcPZN*			59		Lh	ePKPZ			32
		ePPZ			38 05			USCGS H 16 15 58			
		ePPPZ			39 39			26½ S 71 W			
		eSEN*			44 27			Near coast of Chile			
		eScSN*			45 26			depth about 100 km			
		USCGS H 23 24 30				30	Wr	ePKPZ	18	27	49
		71 N 8 E					Qt	ePKPZ			56
		Off coast of Norway						ePPZ			29 30
30	Ch	ePZE	00	31	11			USCGS H 18 09 02			
		ePcPZE			32			31 S 179 W			
		e(S)EN*			40 39			Kermadec Islands			
	Qt	ePZ			33 06	30	Ch	ePZ	20	47	41
								eSN*			54 43

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Lh	ePZ	48	32			Wr	ePZ	22	26	29
		eSN	56	16			Qt	ePZ	27	06	
		Mu	Sec					ePcPZ	48		
	PZ	1.0	1.6					ePPZ	29	27	
	Wr	ePZ	20	48	37			eXZ	53		
	Qt	ePZ	49	14	c			eSN*	35	20	
		ePcPZ	59					eScSN	36	55	
		ePPZN	51	29				eSSNN*	39	40	
		ePcSN	53	59				Mu	Sec		
		eSNN*	57	30			PZ	0.4	1.5		
		eScSN	59	04			Kr	ePZ	22	27	28
		eSSN*	21	01	29			eSE	36	07	
		eLN*	03	7				USCGS H	22	16	47
		Mu	Sec					44 N	144	E	
	PZ	0.6	1.9					Hokkaido, Japan			
	Kr	ePZ	20	49	37			Mag 6 - 6 $\frac{1}{4}$ (Pas),			
		eSE	58	14		31	Wr	6.5 (Up, Ki),			
		Mu	Sec					6.4 (Qt, Lh)			
	PZ	0.9	1.8				Lh	iPZ	06	00	39 c
		USCGS H	20	38	58			iSZ	01	13	
		44 N	144	E			Lh	ePZN	20		
		Hokkaido, Japan					Qt	eSN	02	26	
		Mag 5 $\frac{3}{4}$ - 6 (Pas),						ePZ	01	33	
		6.4 (Up, Ki), (Qt),						esPZ	02	25	
		6.6 (Lh, Kr)						eSNE	51		
30	Ch	ePZN*	22	25	32	31	Wr	H 05 59 53			
		ePPN*	27	14				36 $\frac{1}{2}$ N	70 $\frac{1}{2}$ E		
		ePPPN*	28	10				Hindukush			
		ePcSN*	30	55				depth about 200 km			
		eSN*	32	26							
		iScSN*	35	24							
		eSSN*	36	00							
	Lh	ePZ	26	24							
		eSN	34	08							
		Mu	Sec								
	PZ	0.6	1.4								

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
	Quetta				5	ePgZN	14	50	38.0
						eSgNE			43.3
1	ePgZE	04	46	17	6	eXN	01	38.0	
	eSgNE		29		6	eXZ	07	34.1	
1	eXE	07	12.9		6	ePZ	10	22	11
1	eXE	11	28	6	6	eXZ	12	31.1	
1	ePgZNE	18	58	29	6	eXNE	13	24.7	
	eSgZNE		37		6	eXZ	00	01	16
1	ePE	19	30	15	7	eXZE	00	18	46
1	ePZE	21	14	47	7	ePZ	06	40	40
1	ePZE	23	03	53	7	ePZ	07	20	53
	eSE		04	10	7	eSZ			21 10
2	eXZ	07	35	0	7	eXZ	10	30.0	
2	ePZN	07	47	30	7	ePZ	22	01	34
	eSZNE		54		7	eXZE	04	06	4
2	ePZ	08	12	14	8	eXZE	04	23.8	
2	ePgZ	21	11	52.8	8	eXE	04	27.0	
	eSgZ		54.7		8	eXE	04	29.0	
2	ePZ	22	37	58	8	ePgZ	07	07	21.1
	eSN		38	32	8	eSgZE			24
3	eXZ	04	31.4		8	ePZ	15	11	20
3	ePZNE	16	33	57	9	ePZ	08	47	11
	eSZNE		34	21		eSNE			48 05
3	ePE	16	36	12	9	ePgZE	12	06	08.0
	eSNE		42			eSgZE			09.9
3	ePE	16	53	10	9	ePZ	21	49	59
	eSE		34			eSNE			50 53
3	ePZNE	23	51	48 c	9	ePZ	02	29	35
	eSNE		52	13		ePZ	02	56	59
5	eXZ	01	29.1		10	ePE	12	50	24
5	ePgZ	07	47	27	11				
	eSgZ		37		11				

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			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
11	ePE	13 12 36	18	ePZN	14 20 36
	eSE	13 09		eSNE	59
11	ePgE	14 22 43.7	19	ePZ	05 41 52
	eSgZE	45.2	19	ePZ	07 25 45
11	ePZE	22 41 20		eSE	27 54
	eSZNE	44	19	ePZE	11 27 33
12	ePgE	19 41 49		eSZE	28 03
	eSgE	42 03	19	ePgZE	22 50 16
13	ePZE	00 57 44		eSgNE	20
	eSE	58 42	20	ePZ	01 32 32
13	ePgZE	17 07 48.6	20	ePE	14 14 32
	eSgE	49.7	20	ePZE	15 05 28
13	ePgE	17 12 41.5	20	ePgZE	21 31 58
	eSgE	43.1		eSgNE	32 03
14	ePgE	01 47 45	21	ePgE	17 23 19
	eSgE	50		eSgE	29
14	ePE	01 57 06	21	ePgEZ	19 07 05
	eSE	58 25		eSgZE	15
14	ePZE	01 59 39	22	eXN	10 05.3
	eSNE	02 00 12	22	eXE	15 14.2
14	ePZE	06 52 36	22	ePZ	18 55 56
	eSgZE	47	22	ePZ	20 14 22
14	eXE	20 58.0	22	ePZE	21 57 14
14	ePZ	23 53 20	23	ePZ	00 02 22
	eSE	42	23	eXE	07 23.0
16	ePZ	02 17 35	23	ePZN	07 31 04
	eSNE	18 49	23	ePZ	08 02 22
16	ePZ	23 49 56	23	ePZE	09 55 49
17	e(P)N	11 30 12	23	ePZE	23 59 28 d
17	ePgNZ	20 43 34	24	eSNE	00 00 47
	eSgZNE	42		ePZN	16 25 26
				eSNE	43

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			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
25	ePZ	11 00 50	1	ePZ	11 14 33
27	ePE	01 40 37		iPZ	15 25
	eSE	41 02	1	iPZ	23 01 59 c
28	ePgE	03 56 52.2		iSZ	02 33
	eSgE	54.7	2	eSZ	02 56 01
28	eXE	04 33.6		iSZ	46
28	eXE	06 49.7	2	iPZ	07 14 21 d
28	eXE	10 23.6		iSZ	15 01
28	eXE	18 35.4	2	iPZ	07 59 57 c
28	ePE	20 27 59		iSZ	08 00 32
	eSE	28 19	2	iPZ	11 26 11 d
29	ePE	01 34 35		iSZ	40
29	eXE	01 55.1	2	ePZ	12 24 31
29	eXE	01 56.7	2	ePZ	17 08 48
29	ePZE	10 02 45	2	ePZ	22 38 31
	eSNE	03 52	3	ePZ	11 00 55
29	ePZE	10 49 45	3	ePZ	19 15 23
	eSNE	50 51	3	ePZ	21 43 28
29	eXE	11 20.4	3	ePZ	23 52 22
30	eXZ	02 50.2	4	iPZ	07 50 05 c
30	ePgZE	04 34 06		iSZ	50
	eSgE	19	4	eXZ	21 18 36
30	ePZ	18 31 51	4	iPZ	21 26 19 d
30	ePZ	18 38 46		iSZ	59
	eSNE	39 09	5	ePZ	10 01 23
30	ePgZ	21 04 46	5	iPgZ	12 58 35 c
	eSgE	53		iSgZ	45
30	ePgZE	23 33 23	5	ePZ	13 59 45
	eSgNE	30	6	iPZ	04 57 19 c
	Warsak			iSZ	53
1	ePZ	08 06 09	6	iPZ	05 26 22 c
1	ePZ	09 18 04		iSZ	27 05
1	ePZ	10 34 08	6	iPZ	18 43 00 c
	iSZ	46		iSZ	31

Minor Shocks

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

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
15	ePgZ	13 09 50	20	iPZ	11 43 12 d
	iSgZ	10 03		iSZ	58
15	ePZ	15 42 26	20	iPZ	15 04 28 d
	iSZ	52		iSZ	53
15	iPZ	17 12 01	21	iPZ	11 20 52 c
	iSZ	37		iSZ	21 27
16	iPZ	02 16 45 d	22	iPZ	15 11 48 d
	iSZ	17 17		iSZ	12 21
16	ePZ	04 50 52	22	ePZ	20 13 34 d
16	iPZ	08 21 29 c		iSZ	14 07
	iSZ	48	22	ePZ	21 25 51 c
16	ePZ	22 49 43		iSZ	26 23
17	iPZ	01 13 39 c	23	iPZ	00 19 17 d
	iSZ	14 02		iSZ	44
17	iPZ	04 24 14 d	23	iPZ	03 37 45 d
	iSZ	43		iSZ	38 20
17	ePZ	06 08 26	23	iPZ	03 42 18 d
17	ePZ	06 32 32		iSZ	49
	iSZ	33 04	23	iPZ	05 10 13 c
17	ePZ	09 46 50		iSZ	41
	iSZ	47 30	23	iPZ	15 09 04 d
17	ePZ	11 29 29		iSZ	27
17	ePgZ	15 24 39	23	iPZ	17 38 18 d
	iSgZ	52	23	ePZ	23 43 41
17	ePZ	19 04 10		iSZ	44 53
	iSZ	42	23	iPZ	23 58 30 d
18	iPZ	07 28 33 d		iSZ	59 02
	iSZ	29 03	24	iPgZ	05 45 32 c
18	eXZ	22 51 36		iSgZ	48
19	iPZ	07 24 53 d	24	ePZ	11 53 08
	iSZ	25 21		iSZ	41
19	ePZ	20 28 45	24	ePgZ	13 17 29
	iSZ	29 22		eSgZ	40
20	ePZ	00 15 19	24	ePgZ	16 31 45
	iSZ	38			
20	ePZ	01 32 27			

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Date	Phase	h m s	Date	Phase	h m s
	iSgZ	56	29	ePZ	23 17 04
24	ePZ	20 56 26		iSZ	33
24	iPZ	21 17 40 d	30	ePZ	03 16 35
	iSZ	18 23		iSZ	17 08
25	ePZ	03 21 19	30	ePZ	09 10 37
25	iPZ	16 10 52 c	30	iPZ	13 45 50 d
	iSZ	11 33		iSN	46 36
25	ePZ	17 51 59	31	ePZ	00 23 17
25	iPZ	21 59 43 d		iSZ	58
	iSZ	22 00 12	31	ePZ	01 57 53
25	ePZ	22 26 36	31	ePZ	05 48 30
	eSZ	27 03	31	ePZ	15 39 53
26	iPZ	23 40 27		iSZ	40 23
	iSZ	41 02	31	ePZ	19 54 09
27	ePZ	20 17 22		iSZ	43
	iSZ	18 08	31	ePZ	23 08 40
28	ePZ	04 58 37			
	iSZ	59 11			
28	ePZ	10 38 33		Lahore	
	iSZ	39 11	1	iXN	23 07 3
28	ePZ	17 17 32	3	eXN	00 39 33
28	ePZ	17 45 51	3	ePZ	11 00 48
28	ePZ	22 39 59		eSN	01 34
	iSZ	40 41	4	eXN	04 03 51
29	ePZ	01 33 53	4	eXN	09 20 18
	iSZ	34 40	5	eXN	09 58 29
29	iPZ	01 54 00 c	5	eXN	04 07 10
	iSZ	46	6	eXZ	04 15 58
29	ePZ	02 01 57	7	eXN	05 17 28
	iSZ	02 37	7	eXN	23 22 4
29	ePZ	10 03 25	8	eXN	13 20 7
29	ePZ	10 39 35	8	eXN	20 55 41
29	ePZ	10 50 30	9	eXN	06 47 46
29	ePZ	16 19 39	9	ePN	22 49 53
	iSZ	30 22	10	eXN	02 30 6

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Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
10	eXN	02 56 0	21	eXZ	11 17 11
11	eXN	11 33 1	22	eXZ	07 44 08
11	eXN	12 32 7	22	eXZ	21 58 15
11	eXN	12 49 9	23	eXZ	08 02 16
13	iPZ	00 57 27	27	eXZ	21 16 05
	iSN	58 11	29	eXZ	20 34 44
14	eXZ	01 57 7	29	eXZ	23 34 24
15	eXN	19 27 4			
15	eXN	21 44 20		Chittagong	
16	eXN	02 18 5	3	eXN*	12 11 54
17	eXN	06 0 3	4	eXZ	11 09 29
17	eXN	11 29 8	4	e(P)Z	21 15 37
17	eXN	13 42 50	4	eXZ	23 18 30
19	eXN	07 25 8	6	ePnZ	04 34 22
20	eXN	15 06 47		ePgZ	29
20	eXN	22 09 1		iSnZ	52
21	eXN	16 29 02	7	ePZ	05 18 52
22	ePN	20 15 19	7	ePZ	18 40 20
29	eXN	01 34 5		iSZ	50
29	eXN	01 55 5	7	eXZ	20 10 35
29	eXN	10 04 2	7	ePZ	20 32 15
29	eXN	20 34 07	8	ePZ	01 53 03
			8	eXZ	04 16 27
			8	eXZ	18 14 34
	Karachi		10	eXZ	07 23 25
1	eXZ	02 17 11	11	eXZ	07 03 58
2	ePZ	20 23 01	11	ePZ	16 35 22
4	eXZ	03 26 36	11	ePZ	23 04 56
8	eXZ	15 11 33	13	eXZ	20 56 24
9	eXZ	03 23 11	14	ePZ	06 33 39
11	eXE	07 07 05	16	eXZ	02 06 42
12	eXE	19 11 58	16	eXN*	11 01 32
21	ePZ	04 57 05	16	eXZ	17 05 02
	eSE	36	16	eXZ	18 20 35

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
17	eXZ	13	46	54	25	eXN*	10	06	58
21	eXZ	04	13	11	27	eXN*	21	18	03
22	ePZ	03	03	51	28	ePE	17	26	58
22	eXZ	07	42	53		iSE		27	17
22	eXN*	10	01	43	28	ePE	21	54	04
23	eXN*	17	10	13	29	ePE	12	05	20
24	eXN*	08	05	15		eSE			50
24	eXZ	07	59	34	30	eXZ	13	50	24
24	iXN*	17	52	10	30	eXZ	16	36	38
24	eXN*	20	03	27	30	e(P)Z	16	40	26
24	eXN*	20	09	58					

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Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Quetta (Central Station)				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Contd.)

Pakistan Meteorological Service

Director,
Meteorological Service

Deputy Director,
Geophysical Institute

Officer Incharge,
Seismological Section

Sibte Nabi Naqvi

Abdul Qadir Khan

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

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki) 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.

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
I	Wr	iPZ	03	14	21						
		iSZ			56						
	Lh	ePZ			59						
		eSN			16 01						
	Qt	iPZ			15 19 d	2	Qt	ePZ	19	27	46
		esPZNN*			16 08		Wr	ePZ			28 07
		iSNEN*			38		Ch	ePZ			30 07
		Mu Sec									
		PZ 07 1.3									
		Δ=7°0									
	Kr	ePZ	03	16	20 d	2	Qt	ePZ	20	00	45
		esPZ			17 15	3	Qt	ePZ	08	39	03
		eSE			18 24			eXZ			33
	Ch	ePZ			23			e(S)N*N			40 47
		esPE			19 29		Kr	ePZ			39 20
		eSEN*			22 16		Wr	ePZ			40 07
		H 03 13 58									
		36 N 71 1/2 E									
		Hindukush									
		depth about 250 km									
		USCGS H 03 13 26									
		36 1/2 N 71 E									
		Hindukush									
		depth about 200 km									
		Mag 5.5 (Qt)									
1	Kr	ePZ	04	28	47						
	Qt	ePZ			51						
		eSN*			39 27						
		USCGS H 04 16 12									
		Ascension Island region									
2	Qt	ePZ	04	07	05						
		eXZ			08 41						

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
5	Wr	ePZ	01	16	53 c	6	Qt	ePKPZ	08	27	26	
	Lh	ePZ		17	03			USCGS H 08 08 00				
	Ch	ePE			07			Of coast of Oaxaca				
		ePcPE			16			Mexico				
		ePPE		20	14							
		ePPPE		21	57							
	Qt	eSE		27	11		6	Ch	iPZEN*	14	44	40 c
		ePZ		17	21 c				iPcPZN*			57
		ePPZN		20	34				ePPZ		47	26
	Kr	eSEN*		27	37			ePPPZE		49	10	
ePZ			17	44 c		eSN*		54	10			
						ePSN*		40				
						eScSN*		45				
					Wr	ePZ		44	48 c			
					Lh	ePZ			54			
					Qt	ePZ		45	20 c			
						ePPZN		48	24			
						eSNEN*		55	28			
						eScSNN*		45				
						eSSN*		15	00 56			
						eLN*		07	1			
							Mu		Sec			
							PZ	0.4	1.5			
							$\Delta = 81^\circ$					
						Kr	ePZ	14	45 41 e			
							USCGS H 14 32 58					
							51½ N 175½ W					
							Andeanof Islands					
							Aleutian Islands					
							Mag 6 (Pas),					
							5½-5¾ (Berk),					
							5.8 (Up, Ki), 6.2 (Qt)					
						6	Wr	ePZ	20	50 08		
							Qt	ePZ		40		
						7	Wr	ePZ	03	25 21 c		

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
								eSN*	17	01	35
								esSN*	04	54	
								USCGS H 16 45 35			
								6½ S 113 E			
								Near north coast of			
								Java			
								depth about 600 km			
						7	Qt	ePZ	20	15	42
							Wr	ePZ		16	00
								USCGS H 20 08 18			
								38 N 21 E			
								Near west coast of			
								Greece			
						8	Wr	ePZ	01	13	45
							Qt	ePZN			47
								ePPZN		16	28
								ePPPZ		18	06
								eSN*		23	14
								eSSN*		27	34
							Lh	ePN		14	06
								USCGS H 01 02 26			
								49 N 28½ W			
								North Atlantic Ocean			
								Mag 6¼-6½ (Pas)			
						8	Qt	ePKPZ	06	04	07
								USCGS H 05 46 15			
								23 S 180			
								South of Fiji Islands			
								depth about 600 km			
						8	Qt	ePKPZ	16	12	56
								USCGS H 15 54 06			
								32 S 176½ W			
								Kermadec Islands			
								depth about 100 km			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
9	Ch	iPZE	06	54	09d	10	Ch	ePE	23	01	26
		ePcPZE		24			Wr	ePZ		03	47
		ePPZE		56	52		Qt	ePZ		04	26
		ePPPZE		58	32	11	Wr	ePZ	00	49	36
		eSEN*	05	03	35			iSZ		57	
		eScSEN*	04	13			Qt	ePZE		50	22
	Wr	ePZ	04	54	24			eSNE		51	22
	Qt	ePZ		54				H 00 49 03			
		ePcPZN		55	02			Afghanistan			
		ePPZ		58	04			Near Kabul			
		eSNEN*	05	05	10			Felt Kabul			
		ePSN*	06	04		11	Ch	ePZF	03	50	38
		eLN*	16	5				ePPE		52	01
		Mu						ePPPE		21	
		Sec						eSE		56	18
		PZ 1.1		1.7			Wr	ePZ		53	19
		PPZ 0.4		2.0			Qt	ePZ		41	
		$\Delta = 82^\circ 4$						eSN	04	01	46
		USCGS H 04 42 33						USCGS H 03 43 38			
		50½ N 177½ W						9 N 127 E			
		Andreanof Islands						Near east coast of			
		Aleutian Islands						Mindanao Islands			
		Mag 6.3 (Up, Ki),						Philippine Islands			
		6½-6¾ (Qt)				11	Qt	ePKPZ	14	11	32
9	Ch	ePZ	21	24	28			ePKSN*	15	07	
	Wr	ePZ		25	57 c			USCGS H 13 52 13			
	Qt	ePZ		26	14 c			16 N 97 W			
		epPZ		41				Near coast of Oaxaca			
		eSKSN		36	35			Mexico			
		eSNN*		58				Mag 6 (Pas)			
		ePSN*		38	13	12	Qt	ePKPZ	20	16	37
		USCGS H 21 13 18						USCGS H 19 57 05			
		5 S 154 E						4 S 82½ W			
		Solomon Islands						Off coast of Peru			
		depth about 100 km				12	Qt	ePZ	09	28	16

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 09 15 58						USCGS H 04 36 10			
		Andreanof Islands						7½ S 122 E			
		Aleutian Islands						Flores Sea			
12	Wr	ePS	10	10	55	14	Wr	ePZ	19	36	51
		eSN		11	27			eSZ		37	24
	Qt	ePZ		04			Qt	ePZ		47	
		eSN		44				eSNE		39	07
	Lh	ePZ		19				H 19 36 02			
		H 10 10 13						Hindukush			
		Pakistan-Afghanistan				14	Ch	ePZE	22	12	24
		border						ePgZE		56	
12	Ch	iPZ	17	16	14 c			eSZE		13	38
		eSE		26	59		Lh	ePZ		15	15
	Qt	ePKPZ		21	52		Wr	ePZ		44	
		USCGS H 17 03 10						eSZ		19	45
		22 S 173 E					Qt	ePZ		16	15
		Loyalty Islands region						eSNN*		20	41
12	Ch	ePZ	18	03	30			H 22 10 41			
	Qt	ePZ		06	51			27¼ N 97 E			
13	Qt	ePKPZ*	02	03	35			Assam-Burma border			
		USCGS H 01 44 47						USCGS H 22 10 43			
		Tonga-Kermadec						28 N 96 E			
		Islands region						Pakistan foreshock			
13	Qt	ePKPZ	15	27	16						
		USCGS H 15 08 25				14	Ch	ePZ	22	27	30
		20 S 177 W					Lh	ePZ		30	18
		Tonga Islands					Wr	ePZ		50 c	
13	Qt	ePZ	19	49	46			eSZ		34	46
14	Ch	ePZE	04	44	07		Qt	ePZ		31	24 c
		ePPZ		45	48			eSN		35	49
		iSEN*		50	26			Mu	Sec		
	Wr	ePZ		46	41			PZ 0.5	1.5		
	Qt	ePZ		51				$\Delta = 25^\circ 4$			
		eSNN*		55	27		Kr	ePZ		22	31 28

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		H 22 25 50				15	Qt	ePKPZ	05	01	21
		27 N 97 E						USCGS 04 42 35			
		Assam-Burma border						59½ S 26 W			
		USCGS H 22 25 50						Sandwich Islands			
		28 N 97 E						Mag 6¼ (Pas)			
		East Pakistan				15	Wr	ePZ	13	15	35
		Mag 6.0 (Qt)					Qt	ePZ			40
14	Wr	ePZ	22	53	27	15	Wr	ePZ	20	01	10
	Qt	ePZ		54	01		Qt	ePZ			15
		Assam-Burma border				15	Qt	ePKPZ	23	45	46
15	Lh	ePZ	04	05	56		Ch	ePKPN*	46	07	
		ePPZ		06	08			USCGS H 23 26 17			
	Qt	ePZ			51			1½ S 81½ W			
		eSNN*		10	24			Near coast of Ecuador			
	Ch	ePZN*		07	31	16	Wr	ePKPZ	00	58	58
		eSN*		11	41		Qt	ePKPZ			59 02
	Kr	ePZ		07	43			ePKSZNN*	01	02	38
		H 04 02 20						eSKSN*			06 12
		44½ N 83¼ E					Ch	ePKPZ	00	59	28
		Sinkiang Province						USCGS H 00 39 32			
		China						1 S 81½ W			
		USCGS H 04 02 22						Near coast of			
		44½ N 83½ E						Ecuador			
		Sinkiang Province				16	Qt	ePKPZ	08	12	28
		China						USCGS H 07 54 28			
15	Qt	ePKPZ	04	18	11			25 S 180			
		ePPZN		19	26			South of Fiji Islands			
		eSKSN*		25	01			depth about 500 km			
		eSKKSN*		26	16	16	Wr	iPZ	11	48	29
		eSKSPN*		29	08			iSZ			49 09
		eSSN*		35	36		Qt	ePZ			36
		USCGS H 03 59 25						eSNE			51 06
		59½ S 25 W						H 11 47 39			
		Sandwich Islands						Northern Afghanistan			
		Mag 6½-6¾ (Pas)									

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
17	Qt	ePZE	06	45	37	17	Qt	ePZE	16	03	11
	Wr	ePZ		46	35			USCGS H 15 50 59			
17	Ch	ePZE	12	15	04			56 N 158½ W			
		ePcPZE			16			Alaska Peninsula			
		eSE		24	52	18	Qt	ePKPZE	02	15	24
	Wr	ePZ		15	09 d			USCGS H 01 57 21			
	Lh	ePZ			13 d			24 S 179½ W			
		iPcPZ			22			South of Fiji Islands			
		eSN		25	14			depth about 500 km			
	Qt	ePZ		15	39 d	18	Wr	iPZ	02	43	00
		ePPZ		18	54			iSZ			31
		ePPPZ		20	54		Qt	ePZE			57
		iSZNEN*		26	04			eSZNE			45 15
		eScSN			14			H 02 42 15			
		ePSN*			55			Hindukush			
		ePPSNN*		27	14	18	Wr	ePZ	04	29	27
		eSSN*		31	25			iSN			50
		eLN*		37.9			Qt	ePnZ			30 09
		Mu						eP*Z			17
		PZ 1.3		1.8				ePgZN			26
		PPZ 0.6		2.0				eSnEN*			59
		Δ=84°						eS*ZN*			31 09
	Kr	ePZ		12	16 02		Lh	ePnZ			30 11
		ePPZ			19 36			ePgZ			32
		eSE			26 51			iSnN			31 08
		USCGS H 12 03 05						eSgN			34
		51½ N 171 W						H 02 29 00			
		Fox Islands						33¼ N 69¾ E			
		Aleutian Islands						Eastern Afghanistan			
		Mag 6-6¼ (Pas),									
		6.4 (Up, Ki), 6.8 (Qt)				17	Wr	ePZ	12	59	04
							Qt	ePZ			38
17	Wr	ePZ						USCGS H 12 49 20			
		eSN*		13	07 57			32½ N 140½ E			
								South of Honshu,			
								Japan			

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 17 29 07 14 N 144 E Mariana Islands depth about 250 km					Qt	ePKPZ ePKSEN*			25 d 38 48
19	Wr	iPZ	19	59	09		Kr	ePKPZ			35 35
		iSN			42			USCGS H 18 16 22 15½ N 91 W Guatemala depth about 150 km Mag 6½ (Pas)			
	Lh	ePZ			50						
		eSZN	20	00	54						
	Qt	ePZ			03	21	Wr	iPZ	02	01	55
		eSNEN*			01 21		Qt	ePnZ			02 06
		H 19 58 22 36½ N 70½ E Hindukush depth about 200 km						ePgZNE			24
20	Qt	ePKPZ	04	32	23			eSnZE			58
	Wr	ePKPZ			32		Lh	ePZ	02	19	
	Lh	ePKPZ			49		Kr	ePZ	03	02	
		USCGS H 04 12 54 30½ S 71 W Central Chile depth about 100 km Mag 6¼-6½ (Pas)						eS*ZNE	03	12	
20	Qt	ePZ	10	47	10			eSE	04	40	
		e(S)NEN*			49 38			H 02 00 57 Afghanistan			
20	Wr	ePZ	14	25	00	21	Ch	ePE	08	33	18
		eSZ			30			ePPE			34 04
	Lh	ePZN			11			eSEN*			37 59
		eSN			51			ePZ	36	03	c
	Qt	ePZE	26	11			Wr	ePZ			26
		eSNE	27	35			Kr	ePZ			27
		H 14 24 24 34¼ N 74 E Pak,-Kashmir border					Qt	eSNN*	43	42	
20	Wr	ePKPZ	18	35	20 d			USCGS H 08 27 15 14 N 120½ E Luzon Island Philippine Islands			
								ePnZE	03	32	18
								ePgZE			50
								eSnE			33 35
								eSgE			34 13

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Lh	ePZ			17			USCGS H 10 26 06 5½ S 131 E Banda Sea Mag 6.5 (Qt)			
	Wr	ePZ			53						
	Qt	ePZ			35 36						
		eSNEN*			39 36	22	Ch	ePZ	20	46	14
		Mu Sec						e(S)Z			47 26
		PZ 0.7			2 0		Wr	ePZ			48 50
		Δ=22°2					Qt	ePZ			49 32
	Kr	ePZ	03	35	45			Southern Tibet			
		H 03 30 37 28¾ N 92¾ E Southern Tibet USCGS H 03 30 38 28½ N 91½ E Southern Tibet Mag 5.7 (Qt)				23	Qt	ePZ	00	06	38
22	Wr	ePZ	08	12	14			USCGS H 23 56 01 44½ N 149 E Kurile Islands			
	Qt	ePZ			48	23	Wr	ePZ	02	11	08
22	Qt	ePZ	08	54	21 c		Qt	ePZ			28
		eSZNEN*			55 12			USCGS H 01 58 38 5½ S 150 E New Britain			
	Wr	ePZ			54 22 c	23	Ch	ePE	10	41	10
	Kr	ePZ			55 15 d		Wr	ePE			26
	Ch	ePZ			58 24		Qt	ePZ			42 03
		H 08 53 14 West Pakistan						eLN*			59.6
22	Ch	ePZ	10	34	45			USCGS H 10 31 07 53½ N 158½ E Kamchatka			
		e(S)Z			41 28	23	Ch	ePEN*	16	14	43
	Wr	ePZ			37 13			eSN*			22 41
	Kr	ePZ			18		Wr	ePZ			15 12 c
	Qt	ePZ			27 c		Qt	ePZ			47 c
		eSNEN*			46 31			eSNN*			24 43
		Mu Sec						eScSN*			25 46
		PZ 0.5			1.5		Kr	ePZ			16 12 c
		Δ=69°						USCGS H 16 04 48 50 N 157 E Kurile Islands			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
23	Qt	ePZ	20	39	26			USCGS H 11 19 07			
		eSN*		46	14			28½ N 139 E			
		eLN*		50	0			South of Honshu,			
23	Qt	ePKPZ	22	40	03			Japan			
		USCGS H 22 20 58						depth about 550 km			
		28½ S 177 W				25	Qt	ePZ	18	15	39
		Kermadec Islands					Wr	ePZ		16	31
		region				25	Ch	iPZE	20	15	57 c
24	Wr	ePZ	12	28	35			epPZE		16	45
	Qt	ePZ			57		Lh	ePPZ		17	55
24	Wr	ePZ	12	54	45 c		Wr	ePZ		18	10
	Kr	ePZ		55	04		Kr	ePZ		30	c
	Qt	ePZ			08 c		Kr	ePZ		36	
		eSNEN*	13	02	49		Qt	ePZ		45	c
		USCGS H 12 45 41						epPZN		19	31
		11 N 122½ E						e(S)NEN*		27	33
		Panay Island						esSN*		28	37
		Philippine Islands						USCGS H 20 08 09			
		depth about 100 km						2 S 129 E			
25	Wr	iPZ	00	37	01			Ceram Sea			
		iSZ			32			depth about 200 km			
	Qt	ePZ			54	26	Wr	ePZ	01	51	02 d
		eSNEN*		39	12		Qt	ePZ			35 d
		H 00 36 12						USCGS H 01 42 31			
		Hindukush						25½ N 125 E			
25	Qt	ePKPZ	10	20	46			Ryukyu Islands			
		USCGS H 10 02 43				26	Ch	ePZ	04	51	34
		19 S 177 W					Qt	ePZ		54	00
		Fiji Islands region						USCGS H 04 41 00			
		depth about 500 km						5½ S 147 E			
25	Wr	ePZ	11	28	05 c			Near north east coast			
		eSZ		35	17			of New Guinea			
	Qt	ePZ		28	36 c	26	Qt	ePnZ	21	44	02
		eSNEN*		36	18			ePgZE			14
								eS*EN*			44

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Lh	ePnZ			08			USCGS H 20 56 30			
		ePgZ			18			27½ N 129 E			
		eSnN			51			Ryukyu Islands			
		eSgN		45	03	27	Qt	ePZ	22	22	43
	Wr	ePZ		44	11	28	Ch	ePZE	01	44	27
		H 21 43 13						ePcPE			35
		30½ N 70½ E						ePPE			47 28
		Near Fort Munro						eSN*			54 29
		West Pakistan						eScSN*			48
27	Qt	ePKPZ	15	39	33		Wr	ePZ			44 30
		USCGS H 15 20 27					Lh	ePZ			35
		22½ S 175 W					Qt	ePZ			59 c
		Tonga Islands region						eSNN*			55 25
27	Ch	ePZ	18	54	27			USCGS H 01 32 22			
		eSEN*		19	00 18			53 N 168½ W			
	Lh	ePZ		18	56 33			Fox Islands			
		eSN		19	04 13			Aleutian Islands			
	Wr	ePZ		18	56 56	28	Qt	ePZ	04	04	54
		eSZ		19	04 55			USCGS H 03 53 51			
	Qt	ePZ*		18	57 07			3 S 129½ E			
		eSNEN		19	05 16			Ceram Islands region			
		USCGS H 18 47 05				28	Qt	ePZE	10	46	02
		7 S 126 E				28	Qt	ePZ	11	27	25
		Banda Sea					Wr	ePZ			43
		depth about 600 km									
27	Ch	ePZE	21	03	15						
		eSN*		08	38						
	Lh	ePZ		05	03						
	Wr	ePZ			22						
	Qt	ePZ			54						
		ePcPZ		07	00						
		eSNEN*		13	22						
		eSSN*		16	58						
		eLN*		18	6						
	Kr	ePE		06	07						
		ePcPE		07	10						

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Date	Phase	h m s	Date	Phase	h m s
	Quetta		10	ePZE	23 20 50
				eSZNE	21 16
2	eXE	17 15.0	11	ePZ	09 21 23
3	ePZ	13 28 04	12	ePZ	06 19 50
	eSNE	29 04	12	ePZE	18 13 34
4	ePZ	02 30 39		eSZE	14 56
	eSNE	31 07	12	ePZ	23 12 33
4	ePN	21 18 09	13	ePZ	00 16 42
	eSE	19 01	13	ePZ	02 25 35
5	eXN	16 15 57	13	eXZ	23 30 20
5	ePZ	21 28 56	14	ePZ	23 12 12
6	ePZ	21 12 53		eSNN*	35
6	ePZ	22 00 31	15	ePgZ	17 09 59
	eSNE	01 00		eSgZ	10 13
8	eXE	03 06 40	17	ePE	10 09 43
8	eXE	03 30.0		eSE	11 07
8	ePZ	05 55 08	17	ePZ	10 35 50
8	ePE	11 13 21		eSNE	36 10
	eSE	14 32	17	ePZ	12 48 10
8	ePZE	20 24 05		e(S)NE	49 29
	eSNE	25 19	17	eXE	21 36.0
8	eXE	21 15.0	18	ePE	12 21 51
9	eXZE	11 43.6		eSE	22 09
9	eXE	12 19 35	18	eXZ	21 57.0
9	ePZ	21 47 49	19	ePgZE	05 32 42
10	ePgZE	04 08 17		eSgZE	51
	eSgNE	31	19	ePZ	06 10 02
10	ePE	04 14 10	19	eXZ	21 35.3
10	ePE	04 29 49	20	ePgE	13 22 21
	eSE	30 17		eSgE	37
10	ePgZE	07 20 57	21	ePZ	13 04 56
	eSgN	21 00	21	ePgE	15 28 06
10	eXE	14 03.5		eSgE	08
10	eXE	14 31 52	21	eXE	18 54 07
			21	eXE	19 07.3
			21	eXE	19 55.0
			21	eXE	20 51.5

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Date	Phase	h m s	Date	Phase	h m s
22	eXE	07 49.8	27	ePE	18 47 10
22	ePE	10 06 16		eSE	39
	eSE	07 34	27	eXE	21 04 26
22	ePZ	20 48 07		Warsak	
22	eXE	23 58.0			
23	ePZ	05 28 01	1	ePZ	09 36 41
	eSNE	54	2	ePZ	01 51 52
23	ePZ	15 10 42	2	ePZ	04 06 31
	eSN	11 00	2	ePZ	07 57 17
23	ePZ	23 00 49	2	ePZ	09 58 02
23	ePZ	23 07 55		iSZ	48
24	ePZ	00 25 44	2	ePZ	11 15 41
	eSNE	26 08		iSZ	59
24	ePZ	04 06 07	2	iPZ	11 22 11 d
24	eXZ	15 19.1		iSZ	44
25	eXZ	11 20.0	2	iPZ	22 00 40
25	ePgE	14 07 20		iSZ	01 00
	eSgE	25	3	ePZ	03 06 53
26	ePgZE	00 18 28	3	ePZ	03 44 44
	eSgE	30		iSZ	45 24
26	ePgE	01 18 32	3	iPZ	05 01 24 d
	eSgE	34		iSZ	02 01
26	ePZ	19 03 38	3	ePZ	10 02 06
	eSNE	04 43	3	ePZ	10 41 00
26	ePZ	19 48 01	3	ePZ	11 45 43
	eSNE	32	3	ePZ	11 58 02
26	e(P)Z	21 47 49	3	iPZ	13 27 11 c
26	eXZ	21 54 09		iSZ	29
27	ePZ	07 20 10	3	iPgZ	19 17 26 d
	eSE	41		iSgZ	39
27	ePZ	08 08 33	3	iPZ	20 04 34 d
	eSNE	09 03		iSZ	05 12
27	ePZE	12 53 34	3	ePZ	21 04 57
	eSE	54 08		iSZ	05 17
27	ePZE	17 20 45	4	ePZ	02 31 09
	eSNE	21 16	4	ePZ	05 06 53
27	eXZ	18 39.8	4	ePZ	07 48 02
				iSZ	36

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			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
4	ePZ	15 56 00	6	ePZ	22 49 45
	iSZ	35		iSZ	50 15
4	ePZ	18 04 00	7	ePZ	21 26 19
	iSZ	23		iSZ	45
4	ePZ	20 08 45	8	ePgZ	03 28 37
	iSZ	09 34		eSgZ	48
4	ePZ	21 17 07	8	iPZ	11 12 25d
	iSZ	24		iSZ	50
4	ePZ	21 47 00	8	ePZ	20 23 06
4	ePZ	00 00 34	8	iPgZ	22 41 15d
	iSZ	01 09		iSgZ	26
5	ePZ	06 00 53	9	iPZ	02 15 02
5	ePZ	06 23 55		iSZ	26
	iSZ	24 38	9	ePZ	12 11 50
5	ePZ	06 36 07	9	iPZ	18 12 15c
	iSZ	36		iSZ	58
5	ePZ	08 43 46	9	ePZ	21 26 19
5	ePZ	10 49 09		iSZ	53
	iSZ	40	10	ePZ	12 52 00
5	ePZ	14 32 16	10	iPZ	17 48 23
	iSZ	43		iSZ	49 04
5	ePZ	16 27 39	11	ePZ	03 57 24
	iSZ	28 08	11	iPZ	04 49 47
6	ePZ	00 05 34		iSZ	50 20
	iSZ	59	11	ePZ	08 38 47
6	ePZ	01 21 55	11	iPE	19 39 13d
6	ePZ	05 26 08		iSZ	37
6	ePZ	07 02 18	12	iPZ	07 33 34d
	eSZ	58		iSZ	34 06
6	ePZ	16 08 16	12	iPZ	08 33 11d
	ePZ	20 50 08		iSZ	29
6	ePZ	21 41 16	12	iPZ	13 14 07d
	ePZ	22 16 13		iSZ	41
	iSZ	31	12	iPZ	18 12 33d

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				Minor Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
		iSZ	13 10			iSZ	34
12		iPZ	21 06 24 c	17		iPZ	10 08 39
		iSZ	55	17		ePgZ	10 49 35
13		iPZ	01 35 58d			iSgZ	48
		iSZ	36 25	17		ePZ	12 23 15
13		ePZ	04 19 27	18		ePZ	21 55 56
13		iPZ	06 30 18d	19		ePZ	07 43 35
		iSZ	51	19		ePZ	11 31 35
13		ePZ	13 06 31	20		iPZ	14 32 07d
		iSZ	07 00			iSZ	34
13		iPZ	14 31 52d	20		iPZ	16 07 45d
		iSZ	32 27			iSZ	08 19
13		ePZ	15 20 34	21		iPZ	00 59 49d
13		iPZ	21 35 23d				01 00 :9
		iSZ	56	21		ePZ	21 30 45
13		ePZ	23 16 20	21		iPZ	21 42 48d
14		ePZ	06 46 53			iSZ	43 21
		iSZ	47 21	21		ePZ	22 24 58
14		iPZ	13 29 49d	22		ePZ	09 21 24
		iSZ	30 26	22		ePZ	09 45 32
15		ePZ	09 54 16	22		iPZ	10 05 16 c
15		iPZ	11 03 39 c			iSZ	48
		iSZ	04 19	22		iPZ	14 15 38
15		ePZ	16 01 11			iSZ	16 17
		iSZ	42	23		iPZ	05 27 20d
15		iPZ	17 09 04d			iSZ	48
		iSZ	36	23		iPZ	15 09 35
15		iPZ	17 15 12 c			iSZ	10 03
		iSZ	34	23		iPZ	18 31 32d
15		ePZ	20 10 10			iSZ	32 06
16		iPZ	08 23 13 c	24		iPZ	19 52 30d
		iSZ	42			iSZ	52
16		ePZ	11 57 49	24		iPZ	21 43 35d
		iSZ	58 23			iSZ	57
16		iPZ	15 52 01 c	26		iPZ	01 08 54d

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	iSZ	09 23	15	eXN	20 00 38
26	ePZ	04 53 20	16	eXZ	00 59 01
	eSZ	51	16	eXZ	11 50 09
26	iPZ	08 34 38 d	17	eXZ	10 10 22
	iSZ	35 06	18	eXZ	02 44 43
26	iPZ	11 10 23 d	18	ePZ	21 55 28
	iSZ	54		eSN	55
26	ePZ	18 33 00	20	ePZN	07 18 56
26	ePZ	19 03 48	20	eXZ	10 48 13
26	ePZ	19 48 30	25	iXZ	00 38 46
26	e(P)Z	21 47 36	26	ePZ	19 03 49
26	ePZ	21 48 03		e(S)N	04 40
26	e(P)Z	21 54 32	26	ePZ	21 47 53
26	iPZ	22 34 43 c		eSN	48 38
	iSZ	35 20			
27	iPZ	12 09 58 c		Karach	
	eSZ	10 50	18	iXZ	04 33 00
27	ePZ	15 23 52	26	ePnE	06 47 10
27	ePZ	18 09 39		ePgE	18
	iSZ	10 14		eSnE	43
27	ePZ	21 05 22	26	eXE	21 46 00
28	iPgZ	10 08 42 d	26	eXE	21 49 38
	iSgZ	54			
28	iPZ	18 03 26 d		Chittagong	
	iSZ	04 03		eXZ	04 31 05
			1		
	Lahore		2	eXE	04 12 25
1	ePN	07 45 42	2	eXN*	17 08 07
3	eXZ	13 28 21	3	ePZ	05 57 48
3	ePZ	13 53 39	4	eXZ	08 53 53
8	eXN	03 30 20	5	eXZ	10 54 09
11	eXZ	00 50 41	5	ePE	12 47 18
14	eXZ	19 38 31	6	ePE	05 54 36
15	eXN	17 10 53	6	eXE	07 30 44
			6	eXN	08 29 10

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
7	e(P)E	03 25 48	17	eXN*	03 13 56
7	ePE	16 50 29	17	eXZE	12 57 34
7	eXN*	20 19 58	19	eXE	20 11 13
8	eXN*	06 03 42	19	eXN*	20 32 55
9	ePE	21 24 08	20	eXEN*	12 17 43
10	ePE	06 25 46	21	ePZ	01 00 46
11	ePZ	03 54 43		eSE	01 14
11	eXE	14 12 24	21	eXE	02 12 10
12	eXZ	09 30 25	21	ePE	16 08 33
12	eXZ	10 23 00	23	e(P)Z	02 09 29
13	eXN*	15 32 14	23	eXN*	20 45 36
13	ePZ	23 13 29	24	eXE	00 57 34
14	eXE	22 52 43	25	ePE	11 26 25±
15	eXN*	04 07 36±	26	ePZ	01 49 05±
15	eXN*	05 00 45	26	ePZ	14 18 06
15	eXN*	13 16 07		eSZ	19 14
15	eXN*	19 58 11	26	eXZ	21 49 15
16	eXN*	08 12 42	27	eXE	15 44 43
16	e(P)Z	18 01 55	28	eXZ	11 24 11
17	eXN*	01 56 37	28	eXZ	19 34 09

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Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Quetta (Central Station)				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Contd).

Pakistan Meteorological Service

 Director,
Meteorological Service

Sibte Nabi Naqvi

 Deputy Director,
Geophysical Institute

 Officer Incharge,
Seismological Section

Abdul Qadir Khan

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All correspondence regarding the supply of this bulletin on exchange basis should be addressed to the Director, Meteorological Service, Secretariat Block No. 3, Frere Road, Karachi-1, Pakistan.

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 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	00 40 18			esPE	01 05
	Qt	ePZ	39			ePPZ	03 09
		ePPZNE	42 39			ePPPZ	04 49
		ePPPZN	43 40			eSNN*	09 25
		ePcSN	45 46			e(PKPPKP)Z	28 02
		eSNN*	48 13			Mu Sec	
		eSSN*	51 49			PZ 1.7 1.8	
	Lh	ePZ	40 43			USCGS H 16 49 13	
	Kr	ePZ	41 18			1 1/2 S 134 1/2 E	
		ePPE	43 32			Near north coast of New Guinea depth about 100 km Mag 7 (Pas), 7.1 (Up, Ki)	
1	Wr	iPZ	16 01 01 d				
		iSZ	29				
	Qt	ePZE	02 05				
		eSE	03 24				
		H 16 00 22					
		Hindukush					
	Ch	ePEN*	16 57 44				
		epPE	58 13				
		esPEN*	28				
		ePPN*	59 39				
1		ePPPEN*	17 00 34				
		eSEN*	04 34				
	Lh	ePZ	16 59 54 ±				
	Wr	ePZ	17 00 10				
	Kr	ePZ	21				
		ePPZ	03 02				
		eSE	09 25				
	Qt	ePZE	00 27				
		ePcPZE	44				
		epPE	55				
2							

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSNEN*	34	00				H 15 51 44			
		e(PKPPKP)ZNE53	00					36 N 70 $\frac{3}{4}$ E			
		USCGS H 09 13 42						Hindukush			
		8 S 128 E						depth about 250 km			
		Timor Islands						USCGS H 15 51 38			
2	Qt	ePZ	11	26	12			37 N 70 $\frac{1}{2}$ E			
		eSNN*	29	08				Hindukush			
		USCGS H 11 22 40						depth about 200 km			
		Western Iran						Mag 6.3 (Up, Ki),			
2	Wr	iPZN	15	52	26			6.6 (Qt, Kr)			
		Mu Sec						Felt Warsak, Mardan,			
		PN 57.9 0.5						Peshawar, Kohat,			
	Lh	ePZ	15	53	05			Abbotabad, Lahore,			
		esPZ		40				Rawalpindi			
	Qt	iPZ	53	21	d	2	Qt	ePnZ	19	42	18 d
		isPZN*	54	03				ePgZ		23	
		eXZ		26				iSnNN*		46	
		isZEN*		37				iS*ZN*		49	
		Mu Sec						ePZ		53	
		PZ 10.0 1.4						Lh ePZ		43	17
	Kr	iPZ	15	54	24 d			eSN		44	29
		iSE		56	27			H 19 41 40			
		Mu Sec						32 N 66 $\frac{1}{2}$ E			
		PZ 5.0 1.4						Afghanistan			
	Ch	iPZ	15	56	31 c	3	Wr	iPZ	13	44	19 c
		epPZ		57	11			iSZ		51	
		esPZEN*		38				Lh ePZ		45	00
		iSEN*	16	00	25			eSN		46	00
		esSZE		01	33			Qt ePZ		45	14
								eSE		46	31

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		H 13 43 36						Near west coast of			
		36 $\frac{1}{2}$ N 70 $\frac{1}{2}$ E						Honshu, Japan			
		Hindukush						5 Wr ePZ	00	25	33
		depth about 200 km						Qt ePZ		26	08
3	Qt	ePZ	21	35	30			USCGS H 00 15 08			
	Wr	ePZ		41	d			54 N 160 E			
4	Ch	ePZ	01	02	48			Near east coast of			
	Qt	ePZ		03	52			Kamchatka			
		USCGS H 00 52 49						5 Lh ePZ	14	19	26
		51 $\frac{1}{2}$ N 159 $\frac{1}{2}$ E						eSN		27	12
		Off south coast of						Wr ePZ		19	30
		Kamchatka						Qt ePZ		20	07
4	Qt	ePKPZ	19	13	57			epPZ		39	
		USCGS H 18 55 03						ePPZ		22	26
		20 $\frac{1}{2}$ S 175 $\frac{1}{2}$ W						eSN*		28	27
		Tonga Islands						USCGS H 14 09 47			
		depth about 100 km						44 $\frac{1}{2}$ N 147 E			
4	Ch	ePZ	20	00	36 d			Kurile Islands			
	Lh	ePZ		03	33			depth about 100 km			
	Wr	iPZ		04	05 d			5 Ch ePZ	23	00	18
	Qt	iPZ		12	d			ePPZ		42	
		USCGS H 19 57 55						ePPPZ		53	
		11 $\frac{1}{2}$ N 91 $\frac{1}{2}$ E						eSN*		04	14
		Andaman Islands						eSSEN*		51	
		Slightly deeper						Lh ePZN		02	40
		than normal						Wr ePZ		03	09
4	Lh	ePZ	23	09	43			Qt ePZ		12	
	Wr	ePZ		52				ePPZ		04	52
	Qt	ePZ		10	29			ePcPZNEN*		05	13
		ePcPZ		11	17			eSZNEN*		09	18
		USCGS H 23 00 30						eSSN*		12	23
		38 N 133 E									

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
14	Qt	ePZ	17	27	53		Wr	ePZ	34	17	
16	Ch	ePE	01	48	54		Qt	ePZ		51	c
	Qt	ePZ		49	42			eSZNEN*	42	29	
		USCGS H 01 36 45						eLN*	47	3	
		53½ N 164½ W					Kr	ePZ	35	01	
		South of Unimak						eSE	42	47	
		Islands						USCGS H 08 25 22			
16	Ch	ePZ	08	11	32			27½ N 130 E			
		ePcPE		12	39			Ryukyu Islands			
		eSE		19	02			Mag 5¾-6 (Pas)			
	Wr	iPZ		12	21 c	17	Qt	ePZ	22	09	49
	Qt	cPZ			58 c			USCGS H 22 00 06			
		USCGS H 08 02 10						Jan Mayen Islands			
		45½ N 151 E						region			
		Kurile Islands				18	Lh	ePZ	00	50	04
16	Wr	ePZ	15	28	43		Wr	ePZ		18	
	Qt	ePZ		29	36		Qt	ePZ		52	
16	Ch	ePE	23	46	43			eSNN*		58	30
		ePcPE			56			eScSN*	01	00	32
		eScSE		56	47		Kr	ePZ	00	51	05
	Qt	ePZ		47	18			USCGS H 00 41 17			
		USCGS H 23 34 48						27 N 129 E			
		53 N 168½ W						Ryukyu Islands			
		Fox Islands				18	Ch	ePZ	07	34	55
		Aleutian Islands						epPZ		35	23
		depth about 60 km						ePPZ		36	43
17	Ch	iPZN*	08	32	13 c		Wr	ePZ		14	
		ePPZ		33	28		Qt	ePZ		51	
		ePPPN*			43			epPZ		37	17
		iSZN*		37	41			esPZ		27	
		eSSZN*		39	49			ePPZ		39	10
	Lh	ePZ		34	03 c			eSN*		44	56
		eSN		40	53			esSN*		45	41

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 07 26 47						USCGS H 14 14 53			
		32 N 141 E						35 N 142 E			
		Near east coast of						Off east coast of			
		Honshu, Japan						Honshu, Japan			
		depth about 100 km				20	Ch	ePZ	01	12	43 c
18	Qt	ePZ	11	41	37		Lh	ePZ		13	09 c
		eSNE		43	33		Qt	ePZ			44 c
18	Qt	ePZ	12	35	22			USCGS H 01 02 42			
19	Ch	ePZ	07	31	07			52 N 159 E			
	Wr	ePZ		33	09			Near east coast of			
	Qt	ePZ			42			Kamchatka			
		USCGS H 07 24 11				20	Qt	ePZ	15	13	50
		27 N 130 E					Wr	ePZ		14	47
		Ryukyu Islands				20	Ch	ePZ	15	52	58
19	Wr	ePZ	08	37	50		Wr	ePZ		54	37 d
	Qt	ePZ			54		Qt	ePZ			51
		ePcPZNE		38	01	21	Kr	ePZ	00	03	34 c
		ePPZE		41	00			ePcPZ		04	20
		eSNEN*		48	09			Mu Sec			
		iScSN*			25			PZ 0.4 1.2			
		ePPSN*		49	13			PE 0.2 1.2			
		USCGS H 08 25 32					Wr	iPZ	00	03	43 c
		35 N 36 W					Qt	ePZ			51 c
		North Atlantic Ocean						ePcPZ		04	31
		Mag 6¼ (Pas)						ePPE		06	12
		6½ (Berk)						eSZNE		12	16
19	Ch	ePZ	09	49	56			Mu Sec			
	Qt	ePZ		50	02			PZ 0.2 1.3			
		USCGS H 09 37 53						USCGS H 23 53 24			
		61½ N 148 W						10 S 117 E			
		Southern Alaska						Sumbawa Islands			
		depth about 100 km						region			
19	Qt	ePZ	14	25	14			Mag 6-6½ (Qt, Kr)			

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
21	Qt	ePKPZ	04	45	14 c			H 23 13 27			
		ePPZE	46	45				Eastern Afghanistan			
		epPKPZE	47	26		24	Qt	ePZ	17	28	47 c
		eSKSN*	51	24				ePcPZ	29	30	
		USCGS H 04 27 21						eSN*	37	09	
		19 S 178 W						USCGS H 17 18 24			
		Fiji Islands						34 N 142 E			
		depth about 550 km						Off coast of			
21	Wr	iPZ	07	06	12 d			Honshu, Japan			
	Lh	ePN			36	25	Qt	ePZ	06	04	26 d
	Qt	ePZ			55			eXZNE			35
21	Wr	ePZ	19	49	22			iSZEN*			59
	Qt	ePZ			49			eXNE	05	08	
		eSN*	20	00	24			Wr	iPZ	04	46 d
		USCGS H 19 37 08						Lh	ePZ		49
		53½ N 165 W							eXZ	05	02
		Unimak Islands							eSN		34
		region						Kr	ePZ	05	12
23	Qt	ePZ	11	59	43			iSE	06	22	
23	Qt	ePnZN	21	27	26 d			USCGS H 06 03 48			
		iP*ZN			27			30 N 70 E			
		iPgEN*			30			West Pakistan			
		iXZE			34			depth about 100 km			
		iSnNEN*			49	25	Qt	ePZ	06	44	43
		iSgNEN*			53	25	Wr	ePZ	11	23	54
	Wr	ePnN	28	07			Qt	ePZ			57
		H 21 26 54				25	Wr	ePZ	16	26	55
		Eastern Afghanistan					Lh	ePZ			27 37
23	Qt	ePnZN	23	13	59		Qt	ePZ			53
		iP*ZN			14 00			eSZN	29	36	
		iPgNEN*			04			H 16 25 39			
		iSnNEN*			22			Tadzhikistan S.S.R.			
		iSgNEN*			25	26	Lh	ePZ	02	36	51 c
	Wr	ePnN	39				Wr	iPZ	37	06	c

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	ePZ			21 c			eSZNE			54 20
		ePPZ			41 03			H 21 50 20			
		USCGS H 02 24 12						Afghanistan-Tadzhik			
		7 S 155½ E						border			
		Solomon Islands				27	Qt	ePZ			06 51 28
		depth about 60 km				27	Qt	ePZ			07 02 15
26	Ch	ePZ	05	32	06	28	Ch	ePZ			15 10 35
	Lh	ePZ			34 35			USCGS H 14 59 44			
	Wr	ePZ			56			4½ S 152 E			
	Qt	ePZ			35 12			New Britain			
		ePcPZ			51	28	Ch	ePZ			17 17 00
		ePPZ			37 31			eSN*			21 37
		eSE			43 41		Qt	ePZ			20 00
		iScSNN*			45 00			USCGS H 17 11 09			
		eISSN*			47 46			20 N 120½ E			
		USCGS H 05 24 42						Off north coast of			
		0 125 E						Luzon Islands			
		Molucca Passage						Philippine Islands			
26	Wr	ePZ	11	05	58	28	Wr	iPZ	18	43	23 d
	Lh	ePZ			06 37			iSN			54
		eSN			08 09		Lh	iPZ			44 01 d
	Qt	ePZ			06 56			eSN			45 02
		eSNE			08 44		Qt	ePZ			44 27
	Ch	ePZE			10 10			eSPZN			45 10
		eSEN*			14 39			iSNE			49
		USCGS H 11 04 35					Ch	ePZ			47 52
		39 N 71½ E						H 18 42 42			
		Tadzhikistan S.S.R.						36¼ N 71¾ E			
26	Wr	iPZ	21	51	24 d			Hindukush			
		iSZ			52 13			depth about 200 km			
	Lh	ePZN			51 51			USCGS H 18 42 45			
		eSN			52 59			35½ N 71 E			
	Qt	ePZ			33			Hindukush			
								depth about 200 km			

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
28	Lh	ePKPZ	20	04	46			eSN*	45	25	
	Wr	ePKPZ			50			eLN*	46	2	
	Qt	iPKPZ			59 d	Lh		ePZ	46	18	
		ePPZ			06 36	Wr		iPZ		35 d	
		epPKPZ			07 20	Qt		ePZ	47	13	
		eSKSNEN*			11 07			USCGS H 12 41 03			
		eXN*			22 07			25½ N 100½ E			
		eSSN*			26			Yunnan Province			
		USCGS H 19 47 07						China			
		20 S 178½ W				31	Qt	ePZ	01	18	04
		Fiji Islands						eSN*	28	30	
		depth about 600 km						USCGS H 01 05 24			
		Mag 5¼-6 (Pas)						53 N 167 W			
29	Qt	ePZ	11	10	23			Fox Islands			
29	Lh	ePZ	19	17	58			Aleutian Islands			
	Wr	iPZ			18 04 d	31	Qt	ePKPZ	07	39	47
	Qt	ePZ			42 d			eSKSN*	46	52	
		eSE			26 00			USCGS H 07 20 45			
		esSEN*			27 55			15 S 173 W			
		USCGS H 19 09 33						Samoa Islands region			
		45½ N 137½ E						Mag 6 (Pas)			
		Sikhota Alin				31	Wr	iPZ	16	44	38 c
		depth about 300 km					Qt	ePZ	45	18	
30	Ch	ePZ	12	43	31						

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Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
	Quetta				8	ePZE	22	44	44
					9	ePE	21	08	38
1	ePE	09	12	56		eSE		10	06
1	ePE	09	17	47	9	eXZ	22	25	00
1	eXE	11	23	6	10	eXE	02	01	0
3	ePE	16	14	27	10	ePE	08	00	22
3	ePgE	18	31	32		eSE			42
	eSgE			34	10	ePZE	08	04	42
3	ePZE	21	28	09		eSNE			05 15
	eSE			36	10	ePZE	11	20	55
4	ePgZE	00	11	10	11	ePZE	00	53	04
	eSgE			20		eSNE			32
4	ePZE	05	05	50	11	ePE	12	53	32
	eSZ			06 43	11	ePE	13	17	23
4	ePgZE	13	49	43		eSE			18 35
	eSgZNE			52	11	ePgE	16	37	48
4	ePE	23	09	00		eSgE			38 00
	eSNE			28	11	eXE	19	45	5
5	eXE	00	08	0	12	ePZ	01	40	10
5	ePgE	14	27	02		eSNE			35
	eSgE			11	12	ePgE	04	57	13.3
5	eXE	19	41	7		eSgE			16.0
6	eXE	01	30	2	12	eXE	17	53	0
6	eXE	01	33	2	13	ePZE	01	27	14
6	ePE	02	44	25		eSNE			44
	eSE			46	13	ePgE	03	55	07
7	ePZE	15	55	13		eSgE			18
	eSE			31	13	eXE			10 06.2
7	eXE	21	20	5	13	ePgE	15	53	24
8	ePE	00	22	45		eSgE			35
8	ePE	11	24	24	13	eXE	16	32	5
	eSE			25 38	13	ePZ	19	15	21
8	eXE	16	31	3	13	ePZE	19	33	48
8	ePE	21	27	23		eSNE			34 10

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
13	eXE	19 57 27	24	eXZ	05 23 45
13	ePE	21 34 29	25	ePZ	01 37 26
	eSE	35 40		eSZ	49
14	ePgZE	08 17 53.8	26	eXZ	05 34 34
	eSgZN	55.7	26	ePZ	08 02 57
14	ePZ	13 12 57	26	ePgZNE	08 52 05.8
14	ePZ	14 30 21		eSgNE	07.4
14	ePZ	16 19 57	26	ePgZ	18 32 50
14	ePZ	22 41 44		eSgZE	33 00
15	ePgE	17 06 48	27	eXZ	02 01 06
	eSgE	57	27	ePZ	17 11 51
16	ePZ	01 49 42		eSZ	12 17
16	eXE	15 51.2	27	ePZ	18 15 03
16	ePZ	20 12 07	28	ePZ	00 01 14
17	eXE	14 44.0		eSNE	34
17	ePE	19 08 30	29	ePZ	01 02 00
	eSE	09 02	29	eXZ	02 34.4
17	eXZE	19 09 06	29	ePgZ	10 18 22.7
19	ePE	11 42 43		eSgNE	28.5
	eSE	43 58	29	ePZ	20 03 41
19	ePE	12 54 27	30	iPgZE	14 18 40
	eSE	55 42		iSgE	51
19	ePZE	17 32 47	30	ePZ	16 03.4
	eSZNE	33 27	30	ePZ	23 46 16
19	eXZE	22 28 04		eSN	55
20	ePZE	00 43 47	31	ePgZ	07 58 12
	eSNE	44 58		eSgE	14
20	ePZE	18 24 32	31	eXZ	08 41.8
	eSZE	58	31	ePgZE	22 37 42.9
22	ePZ	00 53 47		eSgNE	45.4
23	eXZ	06 09 18		Warsak	
23	eXZ	14 08 52	1	ePZ	09 13 04
23	ePZE	21 33 39	1	ePZ	10 17 44
	eSZN	34 03		iSZ	18 21

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
1	ePZ	17 28 33	7	iPZ	12 17 10 c
1	iPZ	18 57 34		iSZ	32
	eSZ	58 07	7	iPZ	16 04 23 d
2	iPZ	11 25 47 d	8	ePZ	09 26 16
	iSZ	26 22	8	iPZ	11 23 21 d
2	iPZ	14 11 22 d		iSZ	50
	iSZ	51	8	ePZ	13 51 09
3	iPgZ	09 54 08 c		iSZ	50
	iSgZ	15	9	iPZ	04 56 59 d
3	iPZ	16 13 41 c		iSZ	57 31
	iSZ	14 06	9	ePZ	05 10 05
3	iPgZ	20 29 20 c		iSZ	34
	iSgZ	22	9	ePgZ	16 43 07
4	iPZ	03 52 54 c		iSgE	20
	iSZ	53 26	9	iPZ	21 07 33 d
4	iPZ	10 59 15 c		iSZ	08 11
	iSZ	55	10	ePZ	02 01 44
5	ePZ	05 28 26	10	ePZ	14 34 30
	iSZ	51		iSZ	55
5	ePZ	10 09 29	11	ePZ	00 57 56
	iSZ	10 02		iSZ	58 29
5	iPZ	14 55 16 c	11	iPZ	12 52 41 d
	iSZ	46		iSZ	53 14
5	ePZ	18 01 16	11	iPZ	14 46 41 d
6	iPgZ	10 17 58 d		iSZ	47 14
	iSgZ	18 12	11	ePZ	21 58 01
7	ePZ	00 18 11	11	iPgZ	05 26 53.7d
	iSZ	19 14		iSgZ	55.4
7	iPZ	00 55 29 d	12	ePZ	09 03 02
	iSZ	56 00		iSZ	45
7	ePZ	05 05 52	12	iPZ	17 50 58 d
	iSZ	06 12		iSZ	51 28

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
12	iPZ	22 52 58 c	16	iPZ	07 43 44 d
	iSZ	53 25		iSZ	44 20
13	ePZ	01 28 46	16	iPZ	09 03 11 d
13	iPZ	03 20 39		iSZ	40
	iSZ	21 07	17	iPZ	02 49 56 c
13	iPZ	11 18 05 d		iSZ	50 27
13	ePZ	14 21 32	17	iPZ	03 52 31 d
13	iPZ	19 24 28 d		iSZ	53 06
	iSZ	25 01	17	iPZ	05 11 17 c
13	ePZ	19 56 38		iSZ	52
13	iPZ	21 33 30 d	17	iPZ	08 42 40 d
	iSZ	58		iSZ	43 10
14	ePZ	06 20 01	17	iPZ	17 40 13 d
	iSZ	34		iSZ	51
14	iPZ	07 44 17 d	17	ePZ	19 08 38
	iSZ	51	18	iPZ	03 13 19 c
14	iPZ	18 34 45 d		iSZ	44
	iSZ	35 19	18	iPZ	04 48 55 d
14	iPZ	19 17 38 c		iSZ	49 36
	iSZ	18 06	19	iPZ	02 09 49 d
15	ePZ	13 38 32		iSZ	42 45
	eSZ	59	19	iPZ	12 54 25 d
15	ePZ	14 24 08		iSZ	55
	iSZ	36	19	ePZ	17 33 21
15	ePZ	19 38 55	19	ePZ	21 20 35
	eSZ	39 36	19	ePZ	23 59 51
15	ePZ	21 57 12		iSZ	00 00 35
	iSZ	37	20	iPZ	00 42 45 d
16	ePZ	02 14 58		iSZ	43 10
	iSZ	15 38	21	ePZ	12 12 41 d
16	iPZ	07 30 12 d		iSZ	13 15
	iSZ	41	21	iPZ	12 17 46 d
				iSZ	18 22

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
22	iPZ	00 43 25 d	30	iPZ	02 19 30
	iSZ	58		iSZ	56
22	ePZ	07 54 05	30	iPZ	02 35 19 d
22	iPZ	15 15 12 d		iSZ	46
	iSZ	52	30	iPZ	18 38 12 c
23	iPZ	06 07 42 d	31	iPZ	09 22 21 d
	iSZ	08 17	31	iPZ	18 14 06 d
23	ePZ	08 48 11		iSZ	32
23	ePN	14 07 35	31	iPZ	19 55 36 c
	eSN	08 04		iSZ	56 01
24	iPZ	05 23 00 c			
24	iPZ	16 25 40 c			
24	e(P)Z	17 28 46			
24	iPZ	21 32 58 c	1	ePN	09 13 53
	iSZ	33 29	1	eXN	16 02 22
25	ePZ	09 11 18	2	eXZ	11 27 19
	iSZ	48	3	eXZN	16 15 09
26	ePZ	08 01 57	3	eXZ	21 36 18
	iSZ	02 58	4	eXZ	01 03 45
26	iPZ	21 51 24	8	e(P)Z	04 25 45
	iSZ	52 13	8	eXN	11 26 02
26	ePZ	22 59 44	10	eXZ	00 48 40
	iSZ	23 00 15	10	eXZ	02 12 12
27	ePZ	01 59 51	16	ePZ	09 03 53
27	iPZ	03 04 44 c		iSN	04 53
	iSZ	05 12	17	ePZ	19 08 41
28	iPZ	07 22 35 c	19	ePZ	17 33 24
	iSZ	23 16	23	ePZ	08 59 11
28	iPZ	14 05 08 d	24	eXN	05 22 35
	iSZ	49	24	iXN	21 34 39
28	iPZ	19 44 56 d	26	ePZ	08 04 00
	iSZ	45 29	28	ePZ	14 05 10
29	iPZ	12 58 22 d	30	eXZ	23 47 05

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
	Karachi				8	ePN*	17	16	08
					9	ePZE	09	52	51
2	eXE	11	26	47	11	ePE	09	39	58
4	e(P)Z	01	04	18	11	eXE	14	42	24
6	ePZ	12	56	03	11	ePE	16	01	50
	eSE			22	12	ePZ	10	14	30
11	eXE	23	39	45	12	ePZ	15	41	00
11	ePnZ	13	13	00	12	eXN*	08	15	35
	eSnE			32	13	ePZ	12	45	51
14	ePZ	16	19	45 c	13	eXN*	19	21	06
	iSZ		20	24	14	ePZ	07	09	04
16	ePZE	05	58	27	14	ePZ	14	47	52
	eSE			54	15	ePZ	22	29	09
18	eXZ	11	41	28	15	eXZ	19	08	22
19	eXZ	08	38	27	17	eXZ	08	44	01
19	eXE	17	34	42	19	ePZ	21	17	58
20	eXE	15	13	18	21	eXN*	04	43	31
23	eXE	21	30	01	21	eXN*	13	13	49
28	eXE	18	47	39	21	eXN*	19	49	23
31	ePZ	12	10	57	21	eXE	12	00	45
	eSE		11	19	23	eXZ	23	14	51
					23	eXZ	23	14	51
					24	eXE	17	25	06
					25	eXN*	06	14	40
					26	ePE	04	33	02
	Chittagong				26	iXN*	15	30	53
2	eXN*	01	51	53	26	eXN*	20	04	51
3	ePZ	08	29	56	28	ePZ	20	30	11
3	eXN*	21	36	41	28	iPZ	20	45	42
4	ePZ	06	55	16	28	eXN*	21	25	45
4	eNN*	23	13	24	28	eXN*	06	36	18
5	e(P)Z	00	25	42	29	eXN*	19	14	49
5	eXN*	14	26	13	29	e(P)Z	09	40	17
6	eXN*	08	52	51	31	ePN*	01	17	08
8	e(P)Z	00	33	32	31	e(P)Z	07	39	58
					31	eXZ	16	42	53
					31	e(P)Z	16	42	53

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QUETTA

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Particulars of Stations and Instruments
(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Quetta (Central Station)				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Contd).

Pakistan Meteorological Service

 Director,
Meteorological Service

Sibte Nabi Naqvi

 Deputy Director,
Geophysical Institute

 Officer Incharge,
Seismological Section

Abdul Qadir Khan

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

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki) 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.

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
1	Qt	ePZ	00	46	02 d			eSN*			15
		ePcPZ			17			esSN*			12 41
		eSNEN*			55 40			USCGS H 14 48 28			
		ePPSN*			56 32			18 S 169 E			
		eLN*			01 05.6			New Hebrides Islands			
	Wr	iPZ	00	46	13 d			depth about 150 km			
		USCGS H 00 34 18									
		27 1/2 N 21 W				1	Qt	ePZ	22	40	53
		Canary Islands					Wr	ePZ			41 07
		Mag 6 1/4 (Pas),					Lh	ePZ			43
		6.2 (Up, Ki)					Kr	ePZ			45
						1	Ch	ePZE	23	44	37
1	Ch	ePZ	14	22	48			ePcPZ			45 05
		ePcPZ			23 10			ePPE			47 07
		ePPZE			25 29			ePPPE			48 43
		ePPPE			27 13			iSEN*			53 32
		eSN*			32 07			ePSE			55
		ePSE			33			ePPSN*			54 05
		eSKSE			47			eScSN*			32
		eScSN*			54		Lh	ePZ			46 15
	Qt	ePZ	24	00			Wr	ePZ			27
		ePPZ			27 14		Qt	ePZ			45
		eSNN*			34 21			USCGS H 23 33 36			
		ePSN*			35 13			6 S 154 1/2 E			
		eSSN*			39 52			Solomon Islands			
	Wr	ePZ	24	10		2	Ch	ePZE	04	08	47
		USCGS H 14 11 30					Qt	ePZ			11 36
		48 S 98 1/2 E						USCGS H 04 02 31			
		Indian Ocean						26 N 125 E			
1	Ch	ePZE	15	00	56			Ryukyu Islands region			
		epPZ			01 42	2	Qt	ePZ	04	40	55
		esPZE			02 05		Ch	ePZE			44 00
		ePPE			04 22			USCGS H 04 34 20			
		eSKSN*			11 02			Northwestern Turkey			

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
2	Ch	ePZN*	19	27	19	3	Wr	iPZ	14	05	35	
		ePPZ		28	04			iSZ		06	18	
		ePPPZN*		13			Qt	ePZ		41		
		ePcPZN*	30	43				eSZN	08	16		
		eSN*	31	54				H 14 04 37				
		eSSN*	33	00				Northern Afghanistan				
	Qt	ePZ	30	25		3	Lh	ePZ	16	10	25	
		ePcPZNE	31	54			Wr	ePZ		57		
		ePPZNE	32	21			Qt	ePZ	11	02		
		ePPPZE	33	12				eSNN*	16	29		
		e(S)EN*	37	41				eLN*	18	8		
		eSSN*	40	55		3	Qt	ePZ	17	28	02	
		eLN*	41	9				eSN*	32	21		
		USCGS H 19 21 34				3	Qt	ePKPZ	19	53	22	
		20½ N 121 E						USCGS H 19 33 50				
		Batan Islands region						4 S 81 W				
2	Qt	ePKPZ	22	07	24			Near coast of				
		USCGS H 21 48 20						northern Peru				
		Tonga Islands										
3	Wr	ePZ	01	38	45	4	Qt	ePZ	00	49	29	
	Qt	ePZ		39	16	4	Wr	iPZ	17	00	02 d	
		USCGS H 01 27 06						iSZ		36		
		51½ N 179 E						ePZ		57		
		Rat Islands						eSNE	02	14		
		Aleutian Islands						H 16 59 16				
3	Ch	ePN*	05	54	16			Hindukush				
		ePPN*		55	16							
		eSN*		58	42							
	Wr	ePZ		56	45	4	Ch	ePE	19	15	12	
	Qt	ePZ		57	17			ePcPE		58		
		epPZ		58	01			ePPE		17	27	
		USCGS H 05 48 45						eSEN*		23	26	
		24 N 122 E						Lh	ePZ	15	31	
		Near east coast of						Wr	ePZ		34	
		Formosa						Qt	ePZ		16	04
		depth about 200 km										

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
		USCGS H 19 04 59						eScSEN*			33	
		54 N 161 E						esSE		29	47	
		Near east coast of						USCGS H 21 05 54				
		Kamchatka						15½ S 167½ E				
5	Ch	ePE	05	49	16			New Hebrides Islands				
		eSN*		59	08			depth about 150 km				
	Qt	ePZ		49	53	5	Ch	ePZE	23	39	38	
		ePPZ		53	10			ePPZE		41	52	
		USCGS H 05 37 18						eSEN*		47	52	
		52½ N 169½ W						ePSEN*		48	06	
		Fox Islands						ePPSE		14		
		Aleutian Islands						eScSE		49	26	
5	Qt	ePZ	10	56	40			ePKPPKPZE00	09	12		
		eSNEN*		11	03	46	Lh	ePZ		41	24	
	Wr	ePZ		10	56	48	Wr	ePZ		40		
	Kr	ePZ		57	06		Qt	ePZ		56		
		USCGS H 10 47 52						eXN*		52	10	
		44 N 7 E						eSNEN*		18		
		Southeastern France						USCGS H 23 29 25				
		Mag 5.5 (Up, Ki)						5½ S 146 E				
5	Wr	iPZ	15	21	41 d			Near north coast of				
	Kr	ePZ		51	d			New Guinea				
	Qt	ePZ		58	d	6	Ch	ePZE	05	36	02	
5	Ch	ePZ	20	09	07			ePcPZE		14		
	Lh	ePZ		10	02			ePPZ		38	54	
	Qt	ePZ		41				eSE		45	46	
		USCGS H 19 59 58						eScSE		46	15	
		46 N 151 E						Qt	ePZ	36	34	
		Kurile Islands						USCGS H 05 24 11				
5	Ch	ePZE	21	18	12			50½ N 177 W				
		ePcPZE		17				Andreanof Islands				
		epPZE		19	00			Aleutian Islands				
		ePPZ		21	29							
		eSEN*		28	25		6	Ch	iPZE	14	20	38
								ePPZE		22	18	

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePcPZE			31	7	Lh	ePZ	00	10	06
		ePPPZE			52		Wr	ePZ			13
		iSZEN*	26	59			Qt	ePZ			46
		eSSN*	30	01			Kr	ePZ			50
		eScSEN*			40			USCGS H 23 58 52			
Lh		ePZN	22	48				13 N 146½ E			
		ePPN			25 00			Mariana Islands			
		eSN	30	54				region			
Kr		ePZ	23	03	c	7	Qt	ePZ	05	55	08
		eSE	31	28				USCGS H 05 43 54			
		Mu			Sec			Northern Mariana			
	PZ	0.7	1.3					Islands region			
	PE	1.0	1.5			8	Wr	ePKPZ	01	41	33
		$\Delta = 62^\circ 2$					Qt	ePKPZ			41 c
Wr		ePN	14	23	14			epPKPZE	43	17	
		eSN			31 44			epPPNN*	44	50	
Qt		iPZ	23	21	c			eSSN*	59	31	
		eXZE	24	01				USCGS H 01 23 26			
		ePPZNE	25	44				32½ S 179½ E			
		ePPPNE	27	16				Kermadec Islands			
		iSZNEN*	31	57				region			
		iXN*	32	41				depth about 400 km			
		iScSN*	33	14				Mag 6-6½ (Pas)			
		eLN*	39.9			8	Qt	ePKPZ	08	20	28 c
		ePKPPKPZE	52	06				USCGS H 08 01 36			
		Mu			Sec			17 S 174½ W			
	PZ	1.6	2.0					Tonga Islands region			
	PPZ	0.4	1.8					depth about 100 km			
		$\Delta = 64^\circ 0$				8	Qt	ePKPZ	12	04	01
		USCGS H 14 12 36						eXZNE			53
		10 S 120½ E						ePPZNE	07	16	
		Sumba Islands						ePKSZNE			42
		Mag 6½ (Pas),						eSKSPN*	17	18	
		6.6 (Up, Ki),									
		6.7 (Qt, Kr)									

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Wr	ePKPZ	04	13							
	Ch	ePKPZ			14			about 1000 miles north			
	Lh	ePKPZ			16			of Kerguelen Islands			
		USCGS H 11 44 25						Mag 5½-6 (Pas),			
		50½ S 73 W						6.0 (Up, Ki), 6.7 (Qt)			
		Southern Chile				9	Ch	ePZ	12	57	10
		Argentina border					Qt	ePZ			50
9	Ch	ePZ	06	28	45			USCGS H 12 45 32			
		ePcPZE			29 30			50½ N 180			
		ePPZ			31 00			Andreanof I-lands			
		ePPPZE			32 27			Aleutian Islands			
		iSN*			36 58	9	Ch	ePrZE	17	09	40
		ePSEN*			37 12			eP*Z			48
		eScSEN*			38 30			iPgZ			57
	Kr	ePZ			28 55			eSnZN*			10 30
	Qt	ePZ			29 28			eS*ZN*			42
		ePcPZN			57			eSgZN*			52
		ePPZEN*			31 58			Lh	ePZ		12 52
		iSNN*			38 19			Wr	ePZ		13 27
		ePSN*			44			Qt	ePZ		57
		ePPSN*			58			eXZNE			14 12
		eScSN*			39 27			ePPPZE			42
		eSSN*			42 43			eSNE			18 16
		eLN*			45.9			eLN*			19.9
		Mu			Sec			H 17 08 34			
	PZ	1.1	2.0					25½ N 94½ E			
		$\Delta = 66^\circ 7$						Assam-Burma border			
Lh		ePZ	06	29	33			USCGS H 17 08 30			
Wr		ePZ			47			25 N 95 E			
		USCGS H 06 18 30						India-Burma border			
		36 S 76 E									
		Indian Ocean									

Date	Station	Phase	h	m	s
9	Qt	ePKPZ	17	55	26
		ePKSN*		59	01
		eSSN*	18	15	39
	USCGS H 17 36 10				
	7 N 82 W				
	South of Panama				
	Mag 6 $\frac{1}{4}$ -6 $\frac{1}{2}$ (Pas),				
	6.0 (Up, Ki)				
10	Qt	ePKPZ	06	05	24
		epPKPZE		07	40
		epPPZNE		08	58
		eSKSNEN*		17	30
		e!XNE		25	15
	USCGS H 05 47 34				
	25 S 178 $\frac{1}{2}$ E				
	South of Fiji Island				
	depth about 600 km				
10	Qt	iPgZNE	17	48	06 6d
		iSgZ \ E			170
	H 17 47 51				
	Afghanistan-Baluchistan				
	border				
10	Qt	iPgZNE	22	05	31.0 d
		iSgZNE			41.4
	H 22 05 15				
	Afghanistan-Baluchistan				
	border				
11	Ch	ePZ	11	36	52
		ePPZN*		38	29
		ePcPZN*			43
		ePPPZEN*		39	04
		iSN*		43	14

Major Shocks

Date	Station	Phase	h	m	s
		eSSN*		46	13
		eScSN*			52
	Wr	ePZ		39	24
	Kr	ePE			32
		ePPE		41	53
	Qt	ePZ		32	41
		ePPZNE		42	06
		eSNN*		48	25
		ePPSN*			57
		eScSN*		49	42
		eSSN*		52	42
		eLN*			56.0
		ePKPPKPZ	12	08	22
	USCGS H 11 28 50				
	1 S 128 E				
	Spice Islands				
11	Qt	ePZ	14	33	51
12	Wr	ePKPZ	10	13	48
	Qt	ePKPZ			54 d
		epPKPZN		14	22
		ePPZN		16	07
		epPPZNN*			32
		ePKSZNEN*		17	06
		ePPPN*		18	58
		epPPP*		19	16
		eSKSN*		20	51
		eSPN*		26	03
		ePPSN*		27	47
	Lh	ePKPZ		13	55
	USCGS H 09 54 51				
	17 $\frac{1}{2}$ N 95 W				
	Mexico				
	depth about 10 km				
	Mag 6 $\frac{1}{4}$ (Pas)				
	6 (Berk), 6.4 (Up, Ki)				

Date	Station	Phase	h	m	s
12	Ch	ePZE	11	05	00
		eSN*		09	32
	Lh	ePZ		07	23
	Wr	ePZ			42
	Qt	ePZ		08	14 c
		ePcPZ		09	38
	USCGS H 10 59 21				
	24 $\frac{1}{2}$ N 122 E				
	Near east coast of				
	Formosa				
12	Qt	ePZ	11	14	53
12	Ch	ePE	15	31	15
		epPZE			44
		esPZE			59
		ePPZ		33	15
		eSN*		38	22
		esSN*		39	14
	Wr	ePZ		33	41
	Qt	ePZ			56
		epPZ		34	20
		esPZ			31
		ePPZNE		36	41
		epPPZN		37	04
		eSNN*		42	56
		eScSN*		43	30
	USCGS H 15 22 33				
	4 $\frac{1}{2}$ S 134 E				
	Near coast of				
	New Guinea				
	depth about 100 km				
	Wr	iPZ	15	37	53 c
		iSZ			38 22
	Qt	ePZ			43 c

Major Shocks

Date	Station	Phase	h	m	s
		eSZN		39	53
	H 15 37 11				
	Hindukush region				
12	Wr	ePKPZ	21	12	52
	Qt	ePKPZ			13 01
		ePSN*			24 52
		eSSN*			31 26
	USCGS H 20 54 00				
	15 $\frac{1}{2}$ S 173 W				
	Samoa Islands region				
	Mag 6-6 $\frac{1}{2}$ (Pas)				
13	Ch	iPnZ	18	32	30
		iPgZ			33
	Lh	ePZ		36	28
	Wr	ePZ			56
	Qt	ePZ		18	38 24
		ePPZN			38 01
		ePPPZ			12
		eSN			41 46
		eSSNE			42 42
		eLN*			44
	USCGS H 18 31 57				
	23 N 93 $\frac{1}{2}$ E				
	India-Burma border				
	ePZ			22	44 50
13	Qt				
	USCGS H 22 32 34				
	50 $\frac{1}{2}$ N 180				
	Andreanof Islands				
	Aleutian Islands				
14	Qt	ePZ	00	43	45
14	Qt	ePZ	01	27	22
	Wr	ePZ			28 21

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
14	Qt	ePZ	01	44	02	15	Qt	ePKPZ	05	19	11
	Wr	ePZ		45	04			USCGS H 04 59 14			
14	Wr	iPZ	07	32	36 c			53½ S 135 W			
	Lh	ePZ			44			Pacific Ocean			
	Qt	ePZ		33	03 c	15	Lh	ePZ	17	14	39
		esPZE			26		Qt	ePZ		15	06 c
		ePPZN		36	16			USCGS H 17 02 45			
		USCGS H 07 20 28						51 N 177 W			
		57½ N 155 W						Andreanof Islands			
		Alaska Peninsula						Aleutian Islands			
		depth about 60 km				15	Ch	ePZ	19	21	26
15	Ch	ePZ	00	23	52			eSN*		29	34
		ePPZE		25	43		Wr	ePZ		21	45
		eSZE		30	43		Qt	ePZ		22	20
	Lh	ePZ		24	55 c			ePcPZ			48
	Wr	ePZ			59		Kr	ePZ		22	48
		eSN		32	43			USCGS H 19 11 20			
	Qt	ePZ		25	36 c			54 N 160½ E			
		ePcPE		26	18			Near east coast of			
		ePPZNE		27	49			Kamchatka			
		ePPPZE		29	16	16	Wr	ePZ	00	45	40
		eSNEN*		33	52		Qt	ePZ			57
		ePSN*		34	07	16	Qt	ePKPZ	07	45	21
		e!PPSN*			17			USCGS H 07 27 27			
		eScSN*		35	12			23½ S 179 E			
		ePN*		40	2			South of Fiji Islands			
	Kr	ePZ		25	56 c			depth about 550 km			
		USCGS H 00 15 21				16	Ch	ePZ	16	22	46
		41½ N 143 E						epPE		23	15
		Near south coast of						esPZE			30
		Hokkaido, Japan						ePcPE		24	12
		Mag 6.0 (Up, Ki)						ePPZE			44

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPPZ		25	41	18	Qt	ePZ	23	24	07
		eSEN*		29	49	18	Qt	ePZ	23	53	08
		esSE		30	43	19	Qt	ePKPZ	07	46	03
	Lh	ePZ		24	36			USCGS H 07 26 15			
		epPZ			57			45 S 82 W			
		eSZ		33	07			Pacific Ocean			
	Wr	ePN		24	54			Mag 6 (Pas)			
	Qt	ePZ		25	16	19	Qt	ePZ	09	04	15
		epPZ			38			ePPZN			41
		esPZ			54			eLN*			08.9
		epPPE		28	15		Wr	ePZ		04	32
		eSZNN*		34	20		Kr	ePZ			50
		esSN*		35	02		Lh	ePZ		05	04
		eSSN*		39	13		Ch	ePZ		07	29
	Kr	ePZ		25	18			USCGS H 08 59 17			
		epPZ			40			40 N 43 E			
		USCGS H 16 13 56						Eastern Turkey			
		12½ N 143 E				19	Ch	ePZE	15	15	39
		Mariana Islands						eSN*			25 43
		region					Wr	ePZ			15 43
		depth about 100 km					Lh	ePZ			55
		Mag 6½ (Pas)					Qt	ePZ			16 09
18	Ch	ePZE	06	28	41			eXZN			17
		ePcPZ			29 11			eSKSN			26 32
		ePPE			31 06			eSNN*			40
		eSEN*			37 26			USCGS H 15 03 26			
	Wr	ePZ		30	34 c			58 N 152½ W			
	Kr	ePZ			47			Near Kodiak Islands			
	Qt	ePZ			51 c			Alaska			
		eSKSNE		41	20			Mag 6¼ (Pas),			
		eSNE			43			5.8 (Up, Ki)			
		USCCS H 06 17 51				19	Qt	ePZ	20	25	36
		4½ S 154 E					Lh	ePZ			26 51
		New Ireland Islands									
		region									

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
19	Qt	ePZ	20	35	50		Qt	ePZ	13	24	
20	Ch	ePZ	03	38	13			USCGS H 10 02 30			
	Lh	ePZ		39	56			45 N 152½ E			
	Wr	ePZ		40	11 c			Kurile Islands			
	Qt	ePZ			28 c						
		esPZ		41	09	21	Qt	ePZ	11	07	58
		ePPZ		43	53	21	Qt	ePZ	11	30	59
		epPPZN		44	12	21	Qt	ePZ	12	56	07
		eSNN*		50	54			USCGS H 12 42 50			
		esSN*		51	32			56 N 162½ W			
		USCGS H 03 27 52						Bristol Bay			
		6 S 149½ E				22	Wr	iPN	03	37	19
		New Britain					Qt	iPZ		38	09 c
		depth about 100 km						esPZNE			44
		Mag 6 (Pas)						isZNE			39 16
20	Qt	ePKPZ	04	40	27			H 03 36 41			
		ePPZN*		42	48			Hindukush region			
		ePKSN*		43	56			depth about 200 km			
		USCGS H 04 21 10						USCGS H 03 36 49			
		8½ N 83 W						Hindukush region			
		Costa Rica				22	Lh	ePZ	07	06	41 c
								eSZ			07 11
20	Ch	ePZ	13	38	54		Wr	iPZ	06	57	c
	Wr	ePZ		42	29		Qt	ePZ	07	58	
	Qt	ePZ			57			eSNE			09 27
20	Qt	ePZ		37	10			H 07 06 02			
		USCGS H 19 26 01						Northern India			
		54 N 157½ E				22	Ch	ePZ	07	35	54
		Near east coast of					Qt	ePZ			38 59
		Kamchatka				22	Qt	ePZ	11	07	09 c
21	Wr	ePZ	07	42	04			ePcPZE			21
	Qt	ePZ			47			ePPZE			10 08
21	Lh	ePZ	10	12	44			ePPPN*			11 57

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSN*		17	03			e(S)N			30 30
		eSKSN*			20	24	Qt	ePKPZ			09 50 48
		eScSN*			28			ePKSZNEN*			54 13
		ePSN*			44			USCGS H 09 31 33			
	Wr	ePZ		07	10			11½ N 86½ W			
	Qt	ePZ			39 c			Near coast of			
		ePPZNE		10	54			Nicaragua			
		Mu Sec						Mag 6¼-5½ (Pas)			
	PZ	0.8 1.5				24	Lh	ePKPZ	18	16	52
	Kr	ePZ		11	08 02		Wr	ePKPZ			57
		USCGS H 10 55 05					Qt	iPKPZ			17 03 c
		54 N 167 W						ePPN*			19 03
		Fox Islands						ePKSN*			20 24
		Aleutian Islands						ePPPN*			21 39
		Mag 6 (Pas), 6.5 (Qt)						e!SKSPN*			28 58
22	Lh	ePZ		19	04 06			ePPSN*			30 39
	Wr	ePZ			46			USCGS H 17 57 58			
	Qt	ePZ			05 02			31 S 178 W			
22	Qt	ePKPZ		19	20 54			Kermadec Islands			
		USCGS H 19 01 41						Mag 6½-6¾ (Berk),			
		11½ N 86½ W						6¾-7 (Pas),			
		Near coast of						6.6 (Up, Ki)			
		Nicaragua				25	Qt	ePZ			00 33 12
22	Qt	ePKPZ		20	46 56			ePPZ			34 22
	Lh	ePKPZ			58			e(S)NEN*			38 13
	Wr	ePKPN			47 06			eLN*			40.3
		USCGS H 20 26 46						Wr	ePZ		33 32 c
		36½ S 97½ W						Kr	ePZ		39
		Pacific Ocean						Lh	ePZ		59
		Mag 5¾-6 (Pas)				23	Ch	ePZ	22	44	10
							Qt	ePZ			46 20
24	Wr	ePZ		00	29 48			USCGS H 00 26 40			
	Qt	ePZ			48			37 N 28½ E			
								Turkey			
								Mag 6.3 (Up, Ki)			

Major Shocks

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
25	Qt	ePZ	01	12	13			iPcPZ	49	22	
	Wr	ePZ			32			iSZE	51	03	
		USCGS H 01 05 37						isSZE	52	12	
		Dodecanese Islands				Lh		iPZ	48	24	c
		Mag 5.6 (Up, Ki)				Wr		ePZ	48	43	
25	Wr	ePZ	05	33	34			eSN	55	17	
	Qt	ePZ			51	Qt		iPZ	49	16	c
25	Lh	ePZ	22	59	12			epPZN		42	
	Wr	ePZ			23			esPZN	50	08	
	Qt	ePZ			55			ePcPZ		32	
26	Ch	ePEN*	05	59	59			ePPZNE	51	14	
		USCGS H 05 47 28						epPPZE		39	
		19½ S 169½ E						ePPPZN	52	13	
		New Hebrides Islands						eIPcSZ	54	25	
26	Qt	ePKPZ	06	41	37			iISZNEN*	56	15	
	Wr	ePKPZ			48			iScSN	58	59	
		USCGS H 06 21 56						eSSZNE	59	50	
		Off coast of Chile						esSSZNE	21	00	38
26	Ch	ePEN*	08	58	39						
		e(S)N*	09	07	35			Mu Sec			
		USCGS H 08 47 28						PZ 4.7 2.5			
		7½ S 157 E						PPZ 3.2 2.5			
		Solomon Islands						Δ=50°			
26	Lh	ePZ	12	40	12			USCGS H 20 40 38			
	Wr	ePZ			16			25 N 122½ E			
	Qt	ePZ			50			Near northeast coast of			
		eSSN*			46 58			Formosa			
		USCGS H 12 34 49						depth about 150 km			
		China-Burma						Mag 7¼-7½ (Berk),			
		border region						7.5 (Up, Ki),			
26	Ch	iPZ	20	46	23 d			7-7½ (Qt)			
		ePPZE			47 28	27	Wr	ePZ	03	01	10
		ePPPZE			44		Qt	ePZ			02 01

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
27	Ch	eFN*	09	56	37	27	Ch	iPZ	13	12	00
		ePPN*			58 22			ePFZN*			03
		ePPPN*			59 05			ePPPN*			15
		iISN*	10	00	04			eSN*	13	59	
	Lh	iPZ	09	58	54 c		Lh	ePZ			00
		eSN	10	07	19			eSN	15	55	
	Wr	iPZ	09	59	15 c			eSSN	16	04	
		iSN	10	08	01		Wr	ePZ	13	28	
	Kr	ePZ	09	59	16		Qt	ePZ	14	18	
		ePcPE			45			iISNEN*	18	22	
	Qt	ePZ			27 c			eSSEN*			55
		eXZNE	10	00	34			eLN*			19.9
		ePPZ			01 52			eMN*			21.7
		ePPPZ			03 41			Mu Sec			
		iSNEN*			08 24			PZ 0.6 1.8			
		ePSN			09 04			Δ=22°.6			
		iPPSNN*			15						
		iScSNN*			27		Kr	ePE	13	14	40
		USCGS H 09 48 09						H 13 09 16			
		7 S 129 E						33¼ N 93 E			
		Banda Sea						Tsinghai Province			
								China			
27	Wr	iPZ	11	42	45 d			USCGS H 13 09 20			
		iSN			43 17			33½ N 93 E			
	Qt	ePZ			46			Tsinghai Province			
		eSZNE			45 06			China			
		H 11 42 01						Mag 5.8 (Qt)			
		Hindukush									
27	Qt	ePZ	12	57	27	28	Lh	ePZ	01	55	16
		epPZ			58 07		Wr	ePZ			38
		USCGS H 12 47 27					Qt	ePZ			53
		½ S 124 E						USCGS H 01 44 21			
		Celebes region						4 S 135 E			
		depth about 200 km						Western New Guinea			

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
28	Wr	ePKPZ	11	28	39 c			eSN*	38	54	
	Lh	ePKPZ			45 c		Qt	ePZ	30	23	
		ePKSN	32	11				USCGS H 14 18 10			
	Qt	ePKPZNE	28	45	c			Rat Islands			
		ePPZN*	31	04				Aleutian Islands			
		i!PKSZNEN*	32	12		28	Wr	ePZ	16	10	27
		eSKSPN*	41	08			Qt	ePZ			44
	Kr	ePKPZ	28	54				USCGS H 15 58 13			
		ePKSE	32	30				6½ S 150 E			
	Ch	ePKPN*	29	04				Near south coast of			
		ePKSEN*	32	32				New Britain			
		ePPPEN*	35	22		28	Wr	ePZ	17	23	08
		eSKSN*	39	04			Lh	ePZ			11
		eSKSPN*	42	26			Qt	ePZ			39 c
		ePSN*		50				USCGS H 17 11 15			
		ePPSN*	44	36				52 N 173 W			
		eSSN*	50	52				Andreanof Islands			
		USCGS H 11 09 30						Aleutian Islands			
		15 N 93 W				28	Lh	ePZ	22	10	21
		Mexico-Guatemala					Wr	ePZ			34
		border					Qt	ePZ			11 09
		Mag 6½ (Berk),						USCGS H 22 01 04			
		6½-6¾ (pas),						36 N 141 E			
		6.5 (Up, Ki)						Near east coast of			
28	Lh	ePZ	13	13	11			Honshu, Japan			
	Qt	ePZ			43	29	Qt	ePZ	00	26	29
		USCGS H 13 00 57						eSNE			28 33
		5 S 152½ E						eLN*			29.2
		New Britain					Ch	ePN*			30 06
		depth about 100 km						USCGS H 00 23 50			
28	Ch	ePN*	14	29	35			28 N 55 E			
								Southern Iran			

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
30	Qt	ePKPZ	13	44	23						
		eSKSN*			51 06						
		eSSN*	14	10	44						
	Wr	ePKPZ	13	44	31						
		USCGS H 13 25 35									
		55½ S 26 W									
		Sandwich Islands									
30	Qt	ePZ	22	49	58						
		USCGS H 22 40 20									
		Arctic Ocean									
		west of Spitsbergen									

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	Quetta		10	ePgZ	04 59 33
1	ePgZ	19 20 54		eSgZE	44
	eSgZ	56	10	ePZ	10 00 32
2	ePgZ	02 31 30		eSNE	57
	eSgNE	39	10	ePZ	13 56 24
2	e(P)Z	12 29 16	10	ePZ	14 45 34
3	ePZ	05 31 16	11	ePZ	07 03 17
3	eXZ	16 30 34	11	ePZ	09 08 22
3	ePZ	16 38 48	11	ePZ	10 34 13
3	ePZ	17 54 39	11	ePZ	21 03 50
3	ePZ	18 39 27	12	ePZ	05 29 20
4	ePgZ	13 41 25	12	ePZ	11 58 33
	iSgN	27	13	ePgZ	04 54 21
4	ePZ	22 39 19		eSgZNE	30
5	ePZ	03 04 33	13	ePgZ	05 24 26
5	ePgZ	08 05 25		eSgZ	37
	eSgN	32	13	ePZ	10 33 19
5	ePZ	15 08 39	13	ePZ	13 16 43
5	e(P)Z	23 22 28	13	ePZ	14 58 19
6	ePZ	02 11 05	13	ePgZ	16 34 16
6	ePgZ	07 37 18		eSgZN	26
	ePgZ	29	13	ePZ	17 05 43
6	ePZ	21 38 23	13	ePZ	22 11 15
7	ePZ	06 25 43		eSNE	47
	eSN	26 09	14	ePgZ	08 42 26
8	ePgZ	03 16 27		eSgZ	38
	eSgZN	29	14	cPgZ	15 06 34
8	ePgZ	07 13 23		eSgN	50
	eSgZN	32	15	ePgZ	08 16 36
8	eXZ	18 03 00		eSgZ	42
8	ePZ	19 47 43	15	ePZ	11 38 32
8	eXZ	19 55 00		eSZ	54
8	ePZ	20 38 11	15		
9	ePZ	08 59 39			
	eSZNE	09 00 02			

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
15	ePgZ	18 37 54	20	ePZ	12 53 59
	eSgN	38 04	20	ePZ	12 58 00
15	ePZN	19 33 54	20	ePZ	19 16 25
	eSZN	34 18	21	ePZ	16 15 45
15	ePgZ	22 42 14	22	ePZ	01 47 09
	eSgZN	25		eSE	48 10
16	ePgZ	16 25 05	22	ePZ	09 58 15
	eSgZ	07	23	ePgZ	03 16 25
16	ePZ	17 04 19		eSgZNE	28
16	ePZ	19 49 25	23	ePZ	05 44 46
	eSZNE	42	23	ePZ	12 26 09
17	ePZ	04 19 42		eSZN	52
	eSNE	20 03	23	ePZ	16 27 28
17	ePgZ	06 55 23	23	ePZ	16 32 06
	eSgZN	34	24	ePZ	00 45 14
17	ePgZ	15 08 28	24	ePZ	10 58 47
	iSgZNE	39	25	ePgZ	09 40 55
18	ePZ	10 01 08		iSgZN	58
	e(S)N	02 23	25	ePgZ	14 03 03
18	ePZ	18 23 46		iSgN	06
	eSN	25 03	25	ePZ	15 21 49
18	ePZ	19 42 19	25	ePgZ	20 39 10
18	ePZ	19 50 43		iSgZN	13
18	eXZ	22 45 47	26	ePZ	16 51 48
19	ePZ	14 38 29		eSN	52 23
19	ePgZ	14 50 46	29	ePgZ	13 39 52
	eSgNE	56		eSgN	55
19	ePZ	18 34 53	29	ePZ	16 01 28
19	ePZ	20 02 07		eSNE	02 03
20	ePZ	02 16 11	29	ePZ	20 18 55
	eSgZNE	18	29	ePZ	23 33 53
20	ePZ	07 08 14		eSN	34 26
20	ePZ	07 36 26	30	ePZ	09 02 38
20	ePZ	07 57 30	30	ePZ	16 46 36

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	Warsak			iSZ	30
1	iPZ	05 38 06 c	8	iPZ	13 35 19 d
	iSZ	37		iSZ	52
1	iPZ	10 38 36 c	8	iPZ	18 01 29 d
	iSZ	29 06		iSZ	02 09
1	ePZ	13 47 30	9	ePZ	08 36 48
	iSZ	48 01	9	iPZ	14 37 54 d
1	ePZ	16 44 40		iSZ	38 22
2	iPZ	07 30 46 d	10	iPZ	07 34 40 d
	iSZ	31 29		iSZ	35 04
2	ePZ	17 42 32	10	iPZ	13 54 42 d
	iSZ	43 30		iSZ	55 21
2	ePZ	19 29 56	11	iPZ	00 01 49 d
3	iPZ	07 30 36 d	11	iPZ	12 11 21 d
3	iPZ	10 34 05 d		iSZ	47
3	ePZ	15 16 01	12	iPZ	05 31 20 c
	iSZ	27		iSZ	52
4	iPZ	11 47 02 c	12	ePZ	22 24 24
	iSZ	33		iSZ	51
4	iPZ	19 55 43 d	13	iPZ	01 49 54 c
	iSZ	56 17		iSZ	50 36
4	ePZ	23 46 10	13	iPZ	10 32 33 c
	iSZ	36	13	iPZ	13 15 35 c
5	ePZ	13 10 01		iSZ	16 04
	eSZ	35	13	ePZ	18 06 15
5	eXZ	20 09 20		iSZ	38
6	ePN	06 42 31	13	ePZ	21 41 57
7	ePZ	05 52 32	13	ePZ	22 11 37
	iSZ	58	14	iPgZ	11 38 17
7	iPZ	11 42 05 c		iSgZ	24
	iSZ	42	14	ePZ	16 15 32
7	iPZ	13 40 10 d		iSZ	57

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
15	iPZ	12 33 53 c	22	eXZ	07 36 56
	iSZ	34 43	22	ePN	09 55 47
15	iPgZ	14 04 45 c	23	iPZ	12 25 19 d
	iSgZ	54		iSZ	52
15	ePZ	16 09 56	25	ePZ	04 49 22
15	ePZ	21 24 59		iSZ	53
	iSZ	25 31	25	iPZ	08 31 51 c
17	ePZ	08 27 47		iSZ	32 12
	iSZ	28 17	25	ePZ	09 06 52
17	iPZ	16 30 07		iSZ	07 33
	iSZ	40	25	iPZ	09 09 37 c
18	ePZ	09 46 43		iSZ	10 17
18	ePZ	11 49 36	25	iPZ	10 15 54 d
	iSZ	50 37	25	iSZ	16 35
18	iPZ	18 22 43 d	25	iPZ	11 58 49 d
	iSZ	23 12	25	iSZ	59 29
18	iPZ	19 13 20 c		ePZ	12 12 25
	iSZ	56	25	iSZ	13 05
18	iPZ	22 45 20 d		iPZ	12 14 12 d
	iSZ	46 07	25	iSZ	52
19	iPZ	02 27 19 c		iPZ	15 20 58 d
	iSZ	52	25	iSZ	21 34
19	ePZ	07 46 35	25	iPZ	20 36 57 d
19	ePZ	17 46 38	26	iPZ	11 39 01 c
19	ePZ	19 14 54		iSZ	35
20	ePZ	04 35 24	27	iPgZ	02 43 49 d
	iSZ	36 19		iSgZ	44 03
20	iPZ	04 43 24 c	27	iPZ	16 14 49 d
	iSZ	53		iSZ	15 27
20	iPZ	19 14 02 d	27	iPZ	16 24 13 c
	iSZ	30		iSZ	43
21	iPZ	08 39 51 d	28	iPZ	15 03 17 d
	iSZ	40 19		iSZ	59
			29	iPgZ	07 13 43 d
				iSgZ	52

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
29	ePZ	16 01 32	29	ePZ	14 58 54
29	iPZ	20 17 57 d	29	eXZ	15 46 44
	iSZ	18 25	29	eXZ	16 03 43
30	iPZ	04 25 12 d	29	eXZ	20 18 29
	iSZ	41			
30	iPgZ	09 17 02 d		Karachi	
	iSgZ	09	1	ePZ	00 46 21 ±
			3	eXE	17 27 31
	Lahore		5	eXE	21 35 02
3	eNZX	14 07 15	5	eXZ	23 42 03
4	eXN	03 08 17	9	eXE	17 14 11
4	ePZ	04 28 11	10	eXE	17 50 36
4	ePZ	11 48 47	10	eXE	22 07 53
5	eXZ	10 56 13	12	eXZ	15 34 00
8	eXZ	18 03 22	13	e(P)Z	18 37 22
11	eXZ	11 39 40	14	ePZ	17 33 27 c
12	eXZ	21 13 03	16	iXE	19 44 34
13	eXN	13 17 13	17	ePZ	02 45 22
13	eXN	21 41 24		eSE	39
13	ePZ	22 11 31	18	eXZ	10 00 18
14	ePZ	11 39 55	22	eXE	03 41 06
15	ePZ	16 08 56	24	eXZ	00 32 29
	e(S)N	09 45	25	eXZ	00 33 39
18	eXZ	06 24 24	26	eXZ	20 49 20
18	eXZ	18 24 24			
18	ePZ	22 45 16		Chittagong	
	eSN	45	1	eXZ	00 49 53
20	ePZ	00 17 24	1	eXZ	19 35 05
21	e(P)N	07 41 33	1	ePZE	23 00 15
22	eXZ	03 38 15	3	eXZ	01 39 05
22	iPZ	09 55 20 d	3	e(P)N*	16 06 33
24	eXN	10 59 40	3	eXN*	17 30 53
25	ePZ	15 23 05			

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
4	eXN	00 54 05	25	eXZ	00 36 20
5	eXN	11 05 43	25	ePN*	01 09 53
5	eXN*	11 54 00	25	eXN*	05 37 50
7	eXZ	00 10 50	26	eXN*	12 37 27
7	ePZE	12 25 39	28	eXN*	01 56 02
8	eXZ	20 41 58	28	ePN*	13 11 34 ±
9	ePZE	04 56 20 ±	28	eXN*	17 24 01
9	ePZ	12 33 24	28	eXN*	22 09 40
10	eXZ	00 33 00	30	eXN*	16 45 55
10	eXZ	06 03 55			
11	eXN*	01 52 00			
12	eXN*	10 17 54			
12	eXN*	21 14 55			
13	iPgZ	16 32 30 c			
	iSgZE	38			
13	eXZ	22 43 0			
14	ePgZ	21 12 39			
	eSgZ	53			
15	eXN*	17 14 30			
16	ePZ	16 27 53			
17	eXN*	01 00 51			
18	ePZE	11 38 34			
	eSEN*	39 16			
19	eXN*	15 00 14			
20	eXZ	04 41 08			
20	ePZ	09 01 38			
21	eXZ	07 41 12			
21	eXZE	10 11 38			
22	eXN*	03 42 04			
22	eXN*	19 05 33			
22	eXN*	20 50 27			
24	eXN*	18 17 40			

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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
<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).

Pakistan Meteorological Service

 Director,
Meteorological Service

 Deputy Director,
Geophysical Institute

 Officer Incharge,
Seismological Section

Sibte Nabi Naqvi

Abdul Qadir Khan

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

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds
 (Pas), (Berk), (Up), (Ki) 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
Volume 5 No. 5, May 1959

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
1	Qt	ePZ	02	17	48			USCGS H 14 56 57			
1	Wr	ePZ	05	59	09			5 S 154 E			
	Qt	ePZ			57 d			Solomon Islands region			
		USCGS 05 53 26						depth about 60 km			
		45 1/2 N 104 E				3	Qt	ePKPZ	05	00	30
		Outer Mongolia						ePKSZNE	03	52	
1	Wr	ePZ	07	30	40			USCGS H 04 41 24			
	Qt	ePZ			57			12 1/2 N 87 1/2 W			
		eSN*			40 32			Near coast of			
		eScSN*			41 05			Nicaragua			
		USCGS H 07 19 16						depth about 100 km			
		3 1/2 S 135 1/2 E				3	Ch	ePZ	07	34	25
		Western New Guinea						eSN*	41	03	
1	Qt	ePZ	07	37	47		Wr	ePZ	35	51	
1	Qt	ePZ	08	27	32 c		Qt	ePZ	36	27	
		iPPZN			42			USCGS H 07 26 08			
		iPPPZ			48			About 100 miles off			
		iSN*			30 17			east coast of Honshu,			
		eSSN			32			Japan			
		eLN*			31.5	3	Qt	ePZ	13	31	59
	Wr	ePZ	27	51			Wr	ePZ	32	49	
	Kr	ePZ	28	06		3	Wr	ePZ	18	42	01
	Ch	ePZ	31	17			Qt	ePZ			06
		ePPZE	32	44				USCGS 18 32 58			
		ePPPZE	33	06				Sunda Strait			
		eSN*	37	08		4	Ch	iPZEN*	07	25	43 c
		USCGS H 08 23 57						isPZE	26	07	
		36 1/2 N 52 E						iPcPZEN*			27
		Near north coast of						ePPZEN*	27	58	
		Iran (Caspian Sea)						ePPPZE	29	26	
		Mag 5.5 (Up, Ki)						eSZEN*	33	49	
1	Wr	ePZ	15	09	35			iSZEN*	34	20	
	Qt	ePZ			51			eScSE	35	21	
							Wr	ePZ	26	04	
								eSZ	34	31	

Date	Station	Phase	h	m	s
		Mu Sec			
	PN	22-0	1-0		
Lh	ePZ		07	26	07
	eSZN			34	26
Qt	iPZNE		26	41	c
	iPcPZE			27	03
	iPPZ			29	25
	ePPPZ			30	52
	iXZ			31	38
	iSZNE			35	36
	isSZN				57
	iScSZN			36	32
	ePKPPKPZ			54	50
		Mu Sec			
	PZ	27-9	2-2		
	PPZ	14-5	2-2		
Kr	ePZ		07	27	05 c
	iSE			36	23
	USCGS H	07 15 42			
		52½ N 159½ E			
		Near east coast of Kamchatka			
		depth about 60 km			
		Mag 8 (Pas), 8¼ (Berk),			
		8 (Qt), 7-8 (Up, Ki)			
4	Qt	ePZ	08	03	37
4	Qt	ePZ	08	27	24
4	Ch	ePnEN*	17	20	14
		eP*EN*			27
		ePgEN*			40
		eSnEN*			21 24
Lh	ePZ		22	11	
	eSZ			24	56

Date	Station	Phase	h	m	s
	Ch	ePZ		46	04
		H 11 40 29			
		35½ N 72½ E			
		Swat State			
		West Pakistan			
		depth about 100 km			
		USCGS H 11 40 08			
		34½ N 71½ E			
		Afghanistan			
5	Wr	iPZ	13	03	34 d
	Lh	ePZ			44
	Qt	ePZ			04 46
5	Qt	ePnZ	18	34	45 c
		ePZNE			49
		eXZN			53
		ePgZE			56
		iSZNEN*			35 23
	Wr	iPnZ			35 c
	Lh	ePnZ			56
		eSnZ			37 27
		H 18 33 55			
		30¼ N 63½ E			
		Southern Afghanistan			
5	Lh	ePZ	19	14	38
	Qt	ePZ			15 11
		eXZ			17
		ePcPZE			34
		ePPZ			17 41
		eSNN*			24 04
		e(SS)N*			28 42
		eLN*			32-0
		Mu Sec			
	PZ	0-4	1-9		

USCGS H 19 04 16

53 N 159 E

Kamchatka aftershock

Mag 6 (Pas), 6-0 (Up, Ki),

6-3 (Qt)

6 Qt ePZ 03 42 24

6 Ch ePN* 07 56 01

ePPN* 58 45

eSN* 08 05 32

ePSN* 06 04

USCGS H 07 44 25

51½ N 176 W

Andreanof Islands

Aleutian Islands

6 Qt ePZ 14 15 17

Wr ePZ 35

6 Ch ePN* 19 00 40

eSN* 07 15

Lh ePZ 02 42 c

eSZ 11 01

Wr ePZ 03 00

Qt ePZ 18 c

ePPZ 05 46

eSNEN* 12 10

eScSN* 13 13

eSSN* 16 31

eLN* 19-8

USCGS H 18 52 22

3 S 128 E

Ceram Island

7 Ch ePZN* 00 13 44 c

ePcPZ 14 26

ePPZN* 16 01

ePPPZN* 17 33

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSN*	22	05				eSN*	42	28	
		ePSN*		20				eScSN*	43	33	
		ePPSN*		33				eSSN*	46	51	
	Lh	ePZ	15	28				eLN*	50	6	
	Wr	ePZ		41				ePKPPKPZ	21	02	03
	Qt	ePZ		59				USCGS H 20 22 41			
		ePcPZ	16	02				8½ S 123½ E			
		eSKSN*	26	20				Flores Sea			
		eSNN*		26		7	Qt	ePZ	23	47	57
		ePSE*	27	16		8	Ch	ePZN*	05	22	00
		eLN*	39	8				ePPZN*	23	16	
		USCGS H 00 03 24						eSN*	27	29	
		3 S 148½ E					Wr	iPZ	24	02	c
		Bismarck Sea					Qt	ePZ		35	c
		Mag 6-6¼ (Pas),						USCGS H 05 15 17			
		6.2 (Up, Ki)						26½ N 127½ E			
7	Ch	ePEN*	11	27	36			Ryukyu Islands			
		ePPEN*		29	53	8	Qt	ePZ	06	52	16
		ePPPEN*		31	23			USCGS H 06 46 18			
		eSEN*		35	55			53½ N 159½ E			
		ePSEN*		36	08			Near east coast of			
		ePPSN*		25				Kamchatka			
	Lh	ePZ	29	30		8	Ch	ePEN*	11	44	53
	Wr	ePZ		42				epPN*	45	17	
	Qt	ePZ	30	02				ePcPN*	37		
		USCGS H 11 17 16						ePPPEN*	48	43	
		3½ S 150 E						eSEN*	53	02	
		Bismarck Sea						ePSN*	33		
7	Ch	ePZN*	20	30	37			esSN*	41		
		eSN*		37	01			eSSN*	57	05	
	Wr	iPZ	33	29	c		Wr	iPZ	45	09	c
	Qt	ePZ		38	c		Lh	ePZ		12	

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePZ			47 c			USCGS H 12 46 22			
		epPE		46	02			52½ N 168½ W			
		ePcPZE		12				Aleutian Islands			
		ePPZ		48	19	9	Qt	ePZ	18	45	54
		eSNEN*		54	44	10	Ch	ePZN*	00	06	11
		esSN*		55	06			ePPZN*	08	09	
		eScSN*		35				eSN*	13	32	
		e(SS)N*		58	50		Lh	ePZ	07	01	
		Mu Sec					Wr	ePN	04		
	PZ	0.3 1.4					Qt	ePZ	42		
		ePZ		11	46	08		ePcPZ	08	14	
	Kr	Mu Sec						ePPNE	10	03	
		PZ 0.5 1.3						eSNN*	16	19	
		USCGS H 11 34 50						eLN*	23	0	
		53½ N 160½ E						USCGS H 23 57 03			
		Near east coast of						45 N 149 E			
		Kamchatka						Kurile Islands			
		depth about 60 km						ePEN*	09	52	33
		Mag 6 (Pas), 6.1 (Qt)				10	Ch	ePcPN*	53	35	
8	Ch	ePEN*	15	38	08			epPN*	57		
		eSEN*		45	30			ePPN*	54	38	
	Wr	iPZ		39	05 c			epPEN*	43		
	Qt	ePZ		42				ePPPEN*	55	59	
		USCGS 15 28 58						eSN*	59	27	
		45½ N 150½ E						esSN*	10	01	58
		Kurile Islands					Wr	ePN	09	53	12
8	Qt	ePZ	22	26	07		Qt	ePZ	49	d	
9	Wr	ePN	08	54	23			USCGS H 09 44 02			
	Qt	ePZ			38 d			48½ N 148 E			
9	Ch	ePN*	12	58	12			Sea of Okhotsk			
	Qt	ePZ			57 c			depth about 400 km			
		eSNN*	13	09	28	10	Ch	ePEN*	10	58	17
		eScSN*		39				eSN*	11	05	33

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 10 49 08						eSE	42	29	
		44½ N 150 E						H 00 35 49			
		Kurile Islands						31¼ N 78¾ E			
10	Qt	ePZ	19	09	57			India-Tibet border			
11	Ch	ePZE	16	38	47			USCGS H 00 35 46			
		ePcPZE	39	36				32½ N 79 E			
		ePPE	40	58				India-Tibet border			
		eSN*	46	52		12	Ch	ePZEN*	05	08	11
		ePSEN*	47	03				ePcPZN*		49	
	Wr	ePZ	39	12				ePPZEN*	10	32	
	Lh	ePZ	14					ePPPEN*	12	06	
	Qt	ePZ	49					eSE	16	45	
		epPZ	40	05				ePPSEN*		09	
		ePcPZ	16					eScSE	18	01	
		eSN*	48	46				eSSEN*	20	49	
		esSN*	49	12			Wr	iPZ	08	26	d
		eScSN*	40					eSN	17	10	
		USCGS H 16 28 49					Qt	ePZ	09	00	d
		53½ N 160 E						eXZ		11	
		Kamchatka						ePPZ	11	38	
		slightly deeper than normal						iSNEN*	18	17	
11	Qt	ePZ	20	40	36			iScSN*	19	02	
		eSNEN*	42	32				eSSN*	22	52	
12	Lh	ePZ	00	36	48			eLN*	27	3	
	Wr	iPZ	37	26	d			Mu Sec			
	Qt	ePZ	38	15	d			PZ 0.5 2.0			
		eXN*	39	48				USCGS H 04 57 35			
		eSZNN*	40	07				54½ N 168 E			
		iXE	11					Komandorskje Islands			
	Kr	ePZ	38	48				Mag 6½ (Pas),			
		iSE	41	06				6.3 (Up, Ki), (Qt)			
	Ch	ePZEN*	39	29		12	Qt	ePKPZNE	10	06	10
								eXZ		22	

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eZE	09	06				ePSN*	02	01	
		ePKSNE	48					eScSN*	04		
		eXZNE	10	00				ePPSN*	14		
		eSKSPN	18	42			Wr	ePZ	21	52	10
		e(SS)N*	26	52			Lh	ePZ	16		
	Wr	ePKPZ	06	17			Qt	ePZ	42	0	
		eXZ	09	32				iXZ	43		
	Kr	ePKPZ	06	27				ePcPZNE	48		
		ePKSE	09	59				eXZ	55	39	
	Lh	ePKPN	06	27				eSNEN*	22	02	54
	Ch	ePKP1EN*	53					eScSEN*	03	09	
		ePKP2E	07	31				eXNN*	06	29	
		ePKSN*	10	22				e(SS)N*	08	35	
		ePPEN*	11	11				Mu Sec			
		eSKSE	14	00				PZ 0.8 1.5			
		ePPPN*	51				Kr	ePZ	21	53	05
		eSKKSEN*	17	57				USCGS H 21 40 22			
		eSKKKSN*	18	51				51½ N 177 W			
		eSKSPN*	21	31				Andreanof Islands			
		ePPSN*	24	35				Aleutian Islands			
		eSSPN9	31	13				Mag 6.5 (Qt),			
		eSSPN*	32	10				5.8 (Up, Ki)			
		USCGS 09 46 51						ePZN*	22	11	34
		23½ S 64½ W						ePcPZN*	49		
		Satta Province,						ePPZN*	14	19	
		Argentina						ePPPN*	16	03	
		Mag 6¾ (Pas),						eSN*	21	03	
		6¼-6½ (Berk),						e(SKS)N*	36		
		6.8 (Up, Ki)						eScSN*	40		
12	Ch	ePZN*	21	51	58			ePPSN*	50		
		iPcPZN*	52	14				iPZ	11	46	c
		ePPZN	54	43			Wr	ePN	53		
		ePPPZ	56	27			Lh	eSN	21	34	
		eSN*	22	01	27						

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	iPZ	12	17	e			USCGS H 06 27 02			
		ePcPN		22				Crete foreshock			
		eSEN*	22	29		14	Qt	ePZ	06	43	56 o
		eScSE		47				eXZ		44	01
		Mu Sec						iPPE		45	12
	PZ	0.8	1.5					ePPZ			15
	USCGS H	21 59 56						ePcPZNE		46	28
	51½ N	177 W						eSNEN*		49	29
	Andreanof Islands							eSSNEN*		51	45
	Aleutian Islands							eLN*		52	2
		Mag 6 (Pas), 6.5 (Qt)						Mu Sec			
13	Wr	iPZ	01	36	07 d		PZ	0.7	1.7		
		iSZ		40			Kr	ePZ	06	44	14 o
	Qt	iPZ	37	10	d			iXZ			21
		iSNE	38	31				ePPZ		45	39
		H 01 35 23						eSE		50	07
		Hindukush						eLE		53	0
13	Ch	ePN*	13	36	42		Wr	ePZ		44	17
	Lh	ePZ		39	57			eSZ		50	09
	Qt	ePZ		40	56		Lh	ePZ		44	43 c
		eSNE		45	00			ePPN		46	23
		H 13 35 53						ePPPn			54
		Assam						eSN		50	59
14	Ch	ePN*	00	53	58		Ch	ePEN*		47	05
		eSN*		58	09			ePcPE			48
	Wr	ePZ		56	36			ePPE		49	18
	Qt	ePZ			42			ePPPEN*		50	46
		eSN*	01	02	58			eSN*		55	15
		H 00 48 52						ePSN*			28
		Northern Sumatra						ePPSEN*			41
14	Ch	ePN*	06	37	11			iScSEN*		56	52

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 06 36 57						ePSN*		41	11
		35½ N 24½ E						eXN*		44	16
		Crete						e(SS)N*		45	51
		Mag 6½ (Pas), 6.3 (Qt),						eLN*		52	8
		6.2 (Up, Ki)						Mu Sec			
14	Qt	ePZ	17	40	33 c		PZ	0.8	2.0		
14	Qt	ePZ		19	29 34		USCGS H 06 16 23				
14	Qt	ePZ		21	09 46		4½ S 153½ E				
	Wr	ePZ			10 16		New Britain				
16	Ch	iPZE	06	27	09 c		depth about 60 km				
		epPZE			28		Mag 6¾ (Pas), 6.6 (Qt)				
		ePcPZE			35	16	Qt	ePZ		12	04 28
		esPZE			45	16	Qt	eFZ		14	35 25
		ePPZE		24	40	16	Wr	ePN		19	25 21
		iSEN*			35 55			eSN			53
		iPSN*			36 33		Qt	ePZ			26 19
		esSEN*			39			eSZNE			27 36
		ePPSEN*			46			H 19 24 38			
		eScSEN*			52			Hindukush			
		eSSN*		40	22	17	Wr	ePN		18	31 36
	Lh	ePZ		28	49			eSN			32 04
		eSN			39 03		Qt	eFZ			38
	Wr	ePN		29	02			eSNE			34 00
		eSN			39 31			Hindukush region			
	Kr	ePE		29	15	17	Qt	ePZ		19	26 41
		eSE			39 56			USCGS H 19 15 42			
	Qt	iPZ		29	19 c			54 N 159½ E			
		epPZN*			36			Near east coast of			
		ePPZN*			32 33			Kamchatka			
		ePPPZ			34 34	18	Qt	ePZ		07	35 59 o
		eSKSZNEN*			39 49			USCGS H 07 24 11			
		iSNN*			40 02			52½ N 173½ E			
		eScSN			09			Near Islands			
		isSN*			35			Aleutian Islands			

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
19	Qt	iPNZNE iPgZEN* iSnN*	15	18	33 c			Eastern Afghanistan aftershock			
	Wr	iPnZN	18	35	d	20	Qt	ePZ	00	56	28
	Lh	ePnZ eSnN	19	06		20	Qt	ePKPZ	01	10	17
	Kr	ePZ	19	45				USCGS H 00 50 03 23 S 114 W			
	Ch	iSZ ePZE ePPEN* ePPPZN* eSEN* eSSN*	21	22		20	Ch	ePE ePPE ePPPE eSEN*	10	43	30
		H 15 17 45 32 $\frac{3}{4}$ N 68 $\frac{1}{4}$ E Eastern Afghanistan USCGS H 15 17 44 Eastern Afghanistan Mag 5.8 (Up, Ki)	22	53			Qt	ePZ	46	52	
			23	23				USCGS H 01 36 42 About 250 miles off south coast of Java			
			27	03		20	Qt	ePZ	10	23	23
			50			20	Ch	ePEN*	11	33	26
19	Qt	ePnZ iP*Z iPgZ eSnNE	15	41	48 c		Lh	ePZ	35	00	
	Wr	ePN	03			Wr	iPZ	10	d		
		Eastern Afghanistan aftershock				Qt	iPZ	45	d		
						Kr	ePPZ eSN*	38	02	43	15
								Mu Sec PZ 0.2 1.3			
								USCGS H 11 26 28 32 $\frac{1}{2}$ N 136 $\frac{1}{2}$ E South of Honshu, Japan depth about 450 km			
19	Qt	ePnZ eP*Z ePgZ eSn*NEN* eS*ZE	20	50	47 c	20	Wr	ePZ	19	45	06
	Lh	ePnZ	22			Lh	ePZ	07		53	06
						Qt	eSN ePZ	45	43	e	

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eXZ			59			USCGS H 06 51 40 52 $\frac{1}{2}$ N 170 $\frac{1}{2}$ W Fox Islands Aleutian Islands			
		ePcPZE iSN*	46	17		21	Kr	ePKPZ	11	53	52
	Kr	ePZ	46	06		Qt	ePKPZ	53		57	07
		USCGS H 19 35 03 44 $\frac{1}{2}$ N 149 E Kurile Islands Mag 5.7 (Up, Ki)						eXZE ePKSZ ePSN*			27
20	Qt	ePZ ePPPN eSNN* eSSN*	19	54	24 c	Wr	ePKPZ	12	07	23	
			55	05		Lh	ePKPZ	11	54	04	09
			58	34				USCGS H 11 34 23 Chile-Argentina border depth about 60 km Mag 6 (Pas) 5 $\frac{3}{4}$ -6 (Berk)			
	Wr	ePZ	54	36		21	Ch	ePZ	22	43	32
	Kr	ePZ	58	c		Qt	ePZ	44	22		
		USCGS H 19 49 12 41 $\frac{1}{2}$ N 42 E Georgia, S.S.R. Mag 5.7 (Up, Ki)						USCGS H 22 31 50 Fox Islands region Aleutian Islands			
21	Wr	iPZ	02	31	26	Wr	iPZ	04	21	05 c	
	Qt	ePZ	53			Lh	ePZ	26		22	01
		USCGS 02 22 56 18 $\frac{1}{2}$ N 121 E Near north coast of Luzon, Philippine Islands				Qt	ePZ	14		23	27
								eSNE			
21	Ch	ePZN* ePcPZ ePPZ eSN* ePSN*	07	03	20			H 04 20 39 34 N 73 E Near Haripur Hazara West Pakistan			
			36			22	Ch	ePZ	04	52	09
			06	09		Qt	ePZ	53	01		
			12	56							
			13	33							
	Qt	ePZ	04	09	c						
		ePcPZ eSN	14								
			14	31							

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
22	Qt	USCGS H 04 41 57 51½ N 159 E Off southeastern coast of Kamchatka	07	15	58	24	Ch	ePEN* eSEN*	11	29	26
							Lh	ePZ	31	48	
							Wr	iPZ	32	29 d	
							Qt	ePZ	33	05 d	
								iXZ	12		
								iPPZ	28		
								eXEN*	36	40	
								eSEN*	55		
								eSSN*	37	27	
22	Ch	USCGS H 06 57 00 40 S 176 E North Island New Zealand	08	32	22			eLN*	38.7		
							Kr	ePZ	33	07 ±	
								eSE	36	54	
								eLE	38.7		
								USCGS H 11 28 18 26½ N 90½ E Bhutan-India border			
	Lh		35	45				Felt Dinajpur, Rajshahi, Bogra, Mymen Singh, East Pakistan Kathiag, Monghyr India			
	Wr		36	16 c							
	Qt		45	c							
			37	28							
			41	16							
			42	27							
			44.7								
						24	Wr	ePZ	12	45	18
							Qt	ePZ	46	14	
								eSNE	47	44	
								H 12 44 17 Northern Afghanistan			
23	Wr	USCGS H 08 31 06 25½ N 95½ E Northern Burma	20	24	46 d	24	Wr	ePKPZ	19	36	38
			25	19				ePKPZ	44		
	Qt		49	d			Qt	iXZ	46		
			27	10				epPKPZ	37	06	
								esPKPZ	19		
24	Qt	Hindukush	02	28	02						
			29	24							

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		e!PPZN*	38	57			Qt	ePZ	02	14	
		epPPZN	39	21				eSN	03	30	
		ePKSZN	59					H 09 00 32 33.3 N 74.2 E Pakistan-Kashmir border			
		iXN*	40	09							
		eSKSEN*	43	40		25	Ch	ePE	19	21	23
		eSKSPEN*	48	38				eSEN*	53		
		ePSE	49	07			Lh	ePN	25	03	
		ePPSN*	50	56				eSN	28	25	
		iXN*	22	23			Wr	iPZ	25	33 d	
		Mu Sec					Qt	ePZ	26	01 d	
		PPZ 4.0 3.5						ePPZ	34		
		(Activities started 10 secs ahead of PKP)						eSE	30	16	
	Lh	ePKPZ	19	36	47			H 19 20 41 24 N 94½ E Assam-Burma border			
		epPKPZ	37	10							
		ePPN	38	59		26	Ch	ePEN*	04	19	28
		epPPZ	39	25				epPEN*	55		
	Ch	ePKSN	40	12				esPE	20	08	
		ePKPN*	37	04				ePPEN*	45		
		iXN*	40	01				ePPPEN*	21	01	
		ePPEN*	30					ePcPE	22	08	
		iSKPEN*	42					eSEN*	24	37	
		eSSN*	58	47				esSEN*	25	26	
		USCGS H 19 17 40 17½ N 97 W Oxaca, Mexico depth about 100 km Mag 6¾-7 (Pas), 6¾ (Berk) 7.2 (Up, Ki), 6.8 (Qt)						eSSN*	26	49	
							Qt	eScS v*	29	37	
								iPZNE	22	09 d	
								epPZNE	35		
								esPZEN*	48		
25	Lh	iPZ	09	01	04			ePcPZN*	23	17	
		iSZN	28					ePPZE	24	15	
	Wr	iPZ	01	12				epPPZNE	31		
		iSZ	42					esPPZE	46		

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPPZE	25	15				Afghanistan-Tadzhik border			
		ePcSZ	27	08							
		eSNE	29	28		27	Wr	ePZ	05	01	36
		esSEN*	50				Qt	ePZ	02	10	
		eXN*	31	16		28	Wr	iPZ	09	29	40 d
		e!XNEN*	50					iSN	30	06	
		eSSN*	33	17			Qt	ePZE	30	38 d	
		Mu Sec						eSE	31	49	
	Kr	PZ 1.3	1.6					H 09 29 05			
		ePZ	04	22	18 d			Hindukush			
		Mu Sec									
		PZ 1.2	1.3			28	Wr	iPZ	11	59	14 d
		USCGS H 04 13 01						iSN		43	
		27½ N 126½ E					Qt	ePZE	12	00	18
		Ryukya Islands region						eSNE	01	35	
		depth about 100 km						H 11 58 35			
		Mag 6½-6¾ (Pas),						Hindukush			
		6.7 (Qt, Kr)				28	Wr	ePZ	15	23	45
26	Wr	iPZ	06	36	55		Qt	ePZ	24	10	
	Lh	ePZ	37	40							
	Qt	ePZ	52	c		28	Wr	iPZ	22	39	00 c
		eXZNN*	38	38			Qt	ePZ	18	c	
		eXZN	39	08				eXZ	46		
		eSNEN*	14			29	Qt	ePZ	01	03	02
	Ch	ePZEN*	41	24		29	Ch	ePZE	10	55	45
		iSEN*	45	43				iSKSN*	11	05	52
		USCGS H 06 36 00					Wr	ePZ	10	56	57
		37½ N 70 E					Qt	eXZ	57	31	
		Northern Afghanistan-Tadzhik border						ePPNEN*	11	01	44
								epPPZN*	02	08	
26	Wr	iPZ	06	51	50 c			eSKSN*	07	37	
	Qt	ePZ	52	47				ePPSN*	12	13	
		eSN	54	10				eSSN*	17	05	

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 10 42 48						depth about 150 km			
		19 S 169 E				31	Qt	ePZ	13	05	40
		New Hebrides Islands						eSNEN*	08	50	
		depth about 100 km					Wr	ePN	06	06	
		Mag 6½ (Pas)						H 13 01 38			
29	Qt	ePZ	11	12	19			Northwestern Iran			
29	Qt	ePZ	12	39	29	31	Qt	ePZ	13	11	41
29	Wr	ePZ	18	39	50						
	Qt	ePZ	40	27							
		USCGS H 18 29 27									
		50½ N 157 E									
		Near south coast of Kamchatka									
29	Qt	ePZ	23	50	19						
		ePPZ	30								
		eSN*	52	59							
	Wr	ePZ	50	58							
	Lh	ePZ	51	25							
		H 23 46 54									
		Western Iran									
30	Qt	ePZ	05	46	03						
		eSZE	49	03							
30	Wr	iPZ	12	23	48 c						
		iSZ	24	27							
	Lh	ePZ	26								
		iSN	25	33							
	Qt	ePZ	24	54 c							
		isPZNE	25	34							
		isZNE	26	22							
		H 12 23 00									
		37 N 72 E									
		Northern Afghanistan-Tadzhik border									

			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
	Quetta			eSN	02 02
1	ePgZ	03 22 53.8	8	ePZ	18 20 05
	eSgN	55.6	9	eSN	21 24
2	eXZ	05 35 26	9	ePZ	13 36 55
2	ePZ	12 39 02	9	ePZ	15 24 10
	eSZNE	46	9	ePZ	16 46 57
3	ePgZN	00 56 36.8	10	eXZ	05 32.4
	eSgZN	38.5	10	eXZ	11 10.0
3	ePZ	02 00 58	10	eXZ	12 00.3
	iSNE	02 10	11	ePgZ	05 59 09.7
3	eXZ	04 30.8		eSgZN	12.2
4	ePZN	11 21 00	11	eXZ	18 36.0
	eSZN	27	19	eXZ	17 20.4
4	ePZ	16 46 54	12	ePE	22 54 24
6	ePZ	04 17 08	13	ePZ	04 18 46
	eSN	18 12		eSZE	20 16
6	ePgZ	22 57 53	13	ePgZE	10 09 21.5
	eSgN	58 02		eSgZE	26.8
7	ePZ	05 30 07	14	ePZ	07 59 49
	eSNE	31 27	14	ePZ	08 25 46
7	ePZ	08 08 09	14	eSNE	26 41
	e(S)N	50	14	ePZ	17 32 34
7	ePZ	20 35 35	14	ePZ	20 21 03
7	ePZ	21 02 03	15	eXZ	06 53.0
8	eXZ	07 02.0	15	ePgZE	08 17 41
8	ePZN	08 45 37		eSgZE	53
	eSZN	47 05		ePZE	09 46 19
8	ePZN	12 55 20	15	eSNE	38
	eSZN	43		ePZE	20 52 14
8	ePnZ	15 23 00	16	eSNE	37
	ePgZ	08	17	eXZ	09 54.9
8	ePZ	16 01 37	17	ePZ	07 25 41
				eSNE	26 50

			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
19	ePZ	16 54 04		eSE	40 20
19	eXZ	17 39.2	26	ePZ	17 02 54
19	ePZ	18 40 22		eSNE	03 32
19	ePZ	19 10 40	27	eXZ	05 55 05
19	ePZNE	23 20 50	27	ePgZ	07 59 15
	eSZNE	22 06		eSgZN	25
20	eXZ	05 59.5	27	ePgZ	20 56 15
20	ePZ	08 05 19		eSgN	30
	eSNE	06 18	28	ePZE	07 42 56
20	ePZ	10 49 38		eSNE	44 20
21	eXZ	13 47 37	28	ePZ	22 47 02
21	ePZ	19 04 44		eSE	25
22	ePZ	06 12 42	29	ePE	00 36 17
	eSNE	13 16		eSE	37 32
22	ePZ	06 49 46	29	ePE	00 44 31
22	iPgZE	13 13 13 d	29	ePZE	17 46 50
	iSgZE	24		eSE	47 49
23	eXZ	05 51.1	31	e(P)N	04 29 09
23	eXZ	06 51.8	31	eXZE	09 41 17
23	ePZ	07 59 36	31	ePN	12 22 33
23	ePZE	17 29 52			
	eSE	30 32			
23	ePZN	19 16 34	1	iPZ	01 39 02 c
	eSE	59		iSZ	32
23	ePZE	22 38 52	1	iPZ	09 55 06 c
	eSE	39 32		iSZ	42
24	ePZ	00 16 38	1	ePZ	20 36 10
	eSE	17 12		eSZ	45
24	ePZ	22 21 37	2	ePZ	01 36 53
25	eXZ	11 09 34		iSZ	37 33
25	eXZ	12 56.9	2	iPZ	01 53 51 c
25	ePZE	13 39 41		iSZ	54 22

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
2	iPZ	06 14 15 d		iSZ	24 00
	iSZ	40	8	iPZ	08 44 31 d
2	iPZ	11 02 57 c		iSZ	45 09
	iSZ	03 25	8	ePZ	10 20 53
3	iPZ	00 14 55 c		iSZ	21 31
	iSZ	15 26	8	iPZ	18 19 06 d
3	iPZ	01 59 56		iSZ	36
	iSZ	02 00 33	9	ePN	09 16 48
3	iPZ	04 28 38 d		eSN	17 18
	iSZ	29 14	10	ePZ	04 37 07
3	ePZ	11 47 45		iSZ	30
3	iPZ	18 00 33 d	10	ePN	10 09 36
	iSZ	54		eSN	10 06
3	iPZ	20 51 40 d	10	iPZ	13 45 05 c
3	iSZ	52 01	10	ePZ	18 05 42
3	iPZ	21 07 02 d		iSZ	06 15
	iSZ	29	11	ePZ	02 16 32
4	ePZ	10 50 27	11	ePZ	20 18 06
	iSZ	51 11		iSZ	35
4	ePZ	12 37 13	11	ePZ	22 08 11
	iSZ	54		iSZ	35
	iPZ	13 51 02 c	12	iPgZ	00 02 21 d
	iSZ	36		iSgZ	28
5	ePZ	14 32 01	12	iPZ	15 49 29 d
7	iPZ	02 17 47 d	12	iPZ	16 09 30 d
	iSZ	18 12		iSZ	17 00 08
7	iPZ	05 29 18 d	13	iPZ	05 31 26 d
	iSZ	48		iSZ	59
7	iPZ	07 13 26 c	13	iPgZ	10 22 38 d
7	ePZ	09 16 04		iSgZ	42
7	iPZ	09 59 02 d	13	ePZ	17 41 07
	iSZ	32	13	ePZ	19 40 09
8	iPZ	06 23 29 c	13	ePZ	08 25 01

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	iSZ	30	22	ePZ	05 39 05
14	iPZ	18 21 03 d	22	iPZ	06 12 47 c
	iSZ	39	23	iPZ	17 18 55 c
15	iPZ	08 52 51 c		iSZ	19 27
15	ePZ	14 30 16	23	iPZ	17 29 53 c
15	ePZ	16 35 59 c		iSZ	30 37
	eSZ	36 54	23	iPZ	18 56 11 d
17	ePN	07 24 56		iSZ	42
	eSN	25 33	23	iPZ	22 38 54 c
18	ePN	01 53 37	24	ePZ	00 16 32
	iSN	54 14		iSZ	17 25
18	ePN	03 41 59	24	iPZ	10 29 34 d
	eSZ	42 31		iSZ	30 07
18	ePZ	20 52 04	24	ePZ	10 42 46
	eSN	35		eSZ	43 15
19	ePN	20 50 56	25	ePZ	05 00 39
19	ePN	23 19 55	25	ePZ	06 59 03
	eSN	20 28		iSZ	27
20	iPgZ	08 04 11 c	25	iPZ	10 42 57 d
20	ePZ	22 50 44		iSZ	43 26
	iSZ	51 12	25	iPZ	12 32 05 d
21	iPZ	04 50 28 d	26	iPZ	07 23 20 c
	iSZ	51 00		iSZ	57
21	ePZ	10 49 35	26	iPZ	13 32 51 c
21	ePZ	13 47 47	27	ePZ	13 06 49
21	iPZ	15 17 44 d		eSZ	07 32
	iSZ	18 13	28	iPZ	07 41 51 d
21	ePZ	16 16 09		iSE	24 23
	iSZ	57	28	iPZ	16 45 54 d
21	ePZ	19 04 59		iSZ	46 24
21	iPZ	19 51 51 c	28	iPZ	16 56 18 c
	iSZ	52 17		iSZ	52
22	ePZ	01 26 01	28	iPZ	22 46 50 c

Date	Phase	h m s	Date	Phase	h m s
	iSZ	47 12	20	ePZ	08 04 49
29	ePZ	05 55 50	23	ePZ	04 47 36
29	iPZ	19 12 32 c	23	eXN	20 26 21
30	ePZ	00 07 45	24	eXZ	12 46 32
	iSZ	08 54	25	eXZ	05 00 46
30	ePZ	06 44 43	28	eXN	09 31 24
	iSZ	45 07	28	eXN	12 00 58
31	ePN	12 22 43	29	eXZ	10 59 54
	Lahore		30	eXZ	00 10 14
	ePZ	11 47 15	31	ePZ	09 40 54
3	eSN	48 01	31	ePZ	12 23 13
	ePgZ	22 42 58		Karachi	
5	eSgZ	43 06	2	eXE	17 21.5
	ePZ	05 29 59	4	ePgZ	22 34 24
7	iSN	31 03		iSgE	34
	ePZ	07 13 23	5	eXZ	05 34.3
7	iSN	46	5	eXZ	18 35 23
	eXN	02 53.4	12	eXE	05 09 28
8	ePZ	18 19 43	13	ePZ	21 53 05
	eSN	20 38	14	ePgE	08 58 16
12	ePZ	15 49 06		eSgE	30
	eSN	47	16	ePE	05 40 20
13	eXZ	01 37 38		iSE	48
13	ePZ	17 40 32	19	ePZ	07 56 44
	eSN	41 26	19	eXZ	15 44 46
13	eXN	19 41 40	24	eXZ	19 36 59
14	eXZ	00 53 11	26	eXZ	06 41 33
17	eXN	07 26 56	29	eXE	00 35.7
19	eXZ	15 43 42		Chittagong	
19	ePZ	21 58 20		eXEN	06 00 39
19	ePZ	23 20 38	1	eXEN*	07 29 35
	eSN	21 38	1		

Date	Phase	h m s	Date	Phase	h m s
1	e(P)ZN*	15 08 33	14	eXN*	16 29 11
2	iXZ	18 26 46	15	eXN*	01 43 01
3	eXN*	22 21 28	16	ePZ	00 56 14
4	eXN*	03 24 05	16	ePZ	07 42 20
4	eXN*	23 03 53	17	e(P)Z	18 39 47
4	eXN*	19 14 38	19	ePEN	07 56 41
5	ePZE	09 14 15	19	eXN*	19 01 12
7	eXN*	06 57 00	20	eXN*	01 10 02
8	eXN*	14 08 15	20	eXN*	16 46 36
8	ePE	16 24 31	20	iXN*	19 51 32
8	eXZ	20 44 38	21	eXN*	11 55 12
11	ePZE	23 16 44	21	eXN*	20 29 31
11	iSEN*	17 28	23	eXN*	04 57 35
	eXN*	10 34 59	24	eXN	22 53 42
12	eXN*	01 04 39	25	eXN*	07 15 33
13	eXN*	10 12 06	26	e(P)Z	12 03 39
13	eXEN*	09 45 04	28	e(P)Z	05 47 58
14	eXN*	10 54 37	25	eXN*	08 44 27
14	(P)EN*	11 51 11	30	ePZN*	09 40 56
			31		

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Director,
Meteorological Service

Deputy Director,
Geophysical Institute

Officer Incharge,
Geomagnetic Section

Sibte Nabi Naqvi

Abdul Qadir Khan

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All correspondence regarding the supply of this bulletin on exchange basis should be addressed to the Director, Meteorological Service, Secretariat Block No. 3, Frere Road, Karachi-1, 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
Quetta (Central Station)				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Contd).

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 ..	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi Sprengnether	Z	1.8 sec.	Critical	5,800
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 ..	—	—
Warsak Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki) 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	Date	Station	Phase	h	m	s
1	Lh	ePZ	12	44	23		Qt	ePZ			31 d
	Wr	ePZ			36	2	Ch	ePZE	02	43	39
	Qt	ePZ			52			eSN*			48 22
1	Ch	ePZE	15	53	20		Wr	ePN			46 09
	Wr	ePZ			54 37		Qt	ePZ			36
	Qt	ePZ			55 07			ePPNE			48 27
1	Ch	ePZEN*	17	18	42			ePPPNE			49 23
		ePcPZE			19 01			iSN*			53 43
		epPEN*			14			eScSN*			56 31
		ePPZE			21 30			USCGS H 02 37 46			
		ePPPZN*			23 13			21 N 127 E			
		eSN*			27 57			Batan Islands region			
	Lh	ePZ			20 00			Mag 5.9 (Up, Ki)			
	Qt	ePZ			28	2	Qt	ePKPZ	03	50	59
		esSN*			32 06			Tonga Islands region			
		ePSN*			45	2	Ch	ePZE	05	03	09
		eSSN*			37 26			ePPPN*			04 09
		USCGS H 17 07 23						eSEN*			07 50
		6 1/2 S 155 1/2 E					Lh	ePZ			05 13
		Solomon Islands						ePPN			06 53
		depth about 100 km						eSN			11 35
1	Qt	ePZ	18	04	57		Wr	ePN			05 47
	Lh	ePZ			05 07		Qt	ePZ			06 10
2	Ch	ePEN*	00	54	35			ePcPE			07 32
		e(S)N*			01 00 08			ePPE			08 03
	Lh	ePZ			00 56 00			ePPNE			57
	Qt	ePZE			49			eSN*			13 17
		USCGS H 00 47 20						eScSN*			15 59
		32 N 131 E						eLN*			17.8
		Kyushu, Japan						USCGS H 04 57 18			
2	Lh	ePZ	02	05	54			21 N 121 1/2 E			
	Wr	ePN			06 13			Batan Islands region			

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
2	Qt	Mag 6.4 (Up, Ki) ePKPZ	06	01	58 c		Qt	ePZ	27	10	
	Lh	ePKPZ	02	08	c	4	Lh	e(S)NE	29	19	
	Wr	ePKPN	10				Wr	ePN	17	02	
		USCGS H 05 42 26 43 S 72 W Chile-Argentina border depth about 150 km					Qt	ePZ	31		
3	Qt	ePKPZ	04	02	59	5	Qt	ePKPZ	20	56	22
		ePKSZNE	06	21				ePKSN*	59	45	
		USCGS H 03 43 42 4 N 77 W Near west coast of Colombia						USCGS H 20 37 15 12 N 86½ W Near coast of Nicaragua depth about 100 km			
3	Ch	ePZ	05	55	14	7	Qt	ePZ	08	44	28
	Lh	ePZ			37 c			USCGS H 08 34 32 Samar, Philippine Islands			
	Qt	ePZ			56 01 c	7	Lh	ePZ	09	08	16
		eSNN*	06	06	26		Qt	ePZ	17		
		Mu Sec PZ 0.3 1.3 Δ = 84° 2						eSNN*	11	47	
		USCGS H 05 43 28 52½ N 170 W Fox Islands Aleutian Islands						eSSN*	12	12	
3	Qt	Mag 6.4 (Qt) ePZ	08	47	10		Wr	eLN*	13.0		
		USCGS H 08 36 04 55½ N 163 E Near east coast of Kamchatka				7	Qt	ePN	09	15	
							Qt	ePZ	10	21	24
4	Wr	ePN	08	26	25			eSN*	25	20	
								eLN*	27.4		
						7	Qt	ePZ	13	52	20
								eSN*	14	02	55
								eSSN*	08	29	
							Wr	eLN*	14.5		
							Lh	ePN	13	52	31
								ePZ	50		

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
		USCGS H 13 39 38 ½ N 18 W Atlantic Ocean					Lh	ePZ			59	
		Mag 6.1 (Up, Ki)				10	Ch	ePZE	04	26	13	
7	Qt	ePZ	16	11	24		Qt	ePZ			30 08	
		eSNE	12	02		10	Lh	ePZ	05	17	58	
	Wr	ePN	11	30			Wr	ePN			18 19	
		iSN	12	11			Qt	ePZ			37	
		H 16 10 33 West Pakistan				10	Qt	ePZ	09	58	59	
7	Qt	ePnZ	16	12	47			USCGS H 09 49 53 13½ N 120 E Mindoro, Philippine Islands depth about 100 km				
		eSnZNE*	13	21				ePN	07	58	26	
	Wr	eSgN*	30			11	Wr	iSN			57	
	Lh	ePZ	12	57			Qt	ePZ			59 20	
		H 16 12 02 31 N 70 E West Pakistan						eSNE	08	00	34	
8	Ch	ePZ	09	51	28			H 07 57 44 Hindukush				
		ePPZ	52	47		11	Wr	ePN	08	25	09	
		ePPPZ	53	11			Lh	ePZ			51	
		eSN*	57	09				esPZN			26 18	
	Qt	ePZ	54	33				eSN			27 20	
		USCGS H 09 44 25 About 150 miles south of Java					Qt	ePZ			26 10	
9	Ch	ePZ	06	30	27			esPN			39	
		USCGS H 06 19 54 6 S 146½ E Near coast of New Guinea						eSNE			27 59	
								H 08 23 51 39¼ N 70¾ E Tadzhikistan S.S.R. depth about 100 km				
10	Wr	ePN	04	23	31		11	Ch	ePZN*	21	19	39
								USCGS H 21 09 30 Southern Greece				

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
12	Qt	ePZ	00	58	28		Qt	ePZ	21	19	
12	Lh	ePZ	13	23	01			USCGS H 08 10 16			
	Qt	ePZ			35			Ceram Sea			
12	Qt	ePZ	14	15	34	14	Qt	ePKPZ	15	16	01
13	Qt	ePnZ	11	42	35			USCGS H 14 56 57			
		ePgNE			42			20 S 173½ W			
		eSnNEN*			43 04			Tonga Islands			
		eSgNEN*			12	14	Qt	ePZ	16	26	06
	Lh	ePnZ			34	14	Ch	ePZ	16	55	00
		eSnZ			44 49			USCGS H 16 47 04			
		H 11 41 55						27 N 143½ E			
		Southern Afghanistan						Bonin Islands			
13	Qt	ePZ	13	33	31	14	Ch	ePZ	21	00	36
		eSNN*			34 00			USCGS H 20 48 42			
		H 13 32 51						64 N 152 W			
		Southern Afghanistan						Alaska			
13	Qt	ePZ	16	10	35	14	Qt	ePKPZ	21	20	51
13	Qt	ePZ	22	04	52			USCGS H 21 02 32			
		USCGS H 21 56 40						23½ S 179½ W			
		46½ N 13 E						Tonga Islands region			
		Austria-Italy border						depth about 300 km			
14	Qt	ePKPZ	00	31	12	14	Qt	ePZ	23	47	48
	Wr	ePKPN			27	15	Qt	ePZ	02	47	41 d
	Lh	ePKPZ			31			eSN*			55 14
	Ch	iPKPZ			32 00 d			eSSN*			58 52
		20½ S 168 W						H 02 38 15			
		Southwestern Bolivia						Near northeast coast of			
		depth about 100 km						Formosa			
		Mag 7¼-7½ (Pas),				16	Qt	ePKPZ	08	21	14
		7.5 (Up, Ki)						epPKPZ			32
14	Ch	ePZ	08	18	30			ePKSZE			24 37

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 08 02 05						ePSN			47
		15 N 93½ W						eScSN			51 47
		Off coast of Chiapas.						eSSN			54 33
		Mexico						eLN			57.4
		depth about 60 km					Qt	ePZ			42 24
16	Ch	ePE	15	55	27			ePePZ			50
		ePcPE			41			ePPZNN*			44 58
	Qt	ePZ			56 05			ePPP*			46 30
		USCGS H 14 43 45						iSNN*			51 26
		51 N 177 W						ePPSN*			58
		Andeanof Islands						eSSN*			55 41
		Aleutian Islands						Mu Sec			
17	Qt	ePZ	10	55	23			PPZ 0.6			2.0
		USCGS H 10 43 44						Δ=68.°5			
		3 S 135½ E					Kr	ePZ			15 42 54
		Western New Guinea						USCGS H 15 31 25			
17	Qt	ePZ	20	58	19			54 N 160 E			
18	Qt	ePKPZ	07	10	49			Near east coast of			
		USCGS H 06 50 45						Kamchatka			
		55 S 129 W						Mag 6¼-6½ (Berk),			
		Pacific Ocean						6½ (Qt), 6.7 (Up, Ki)			
18	Ch	ePZ	15	41	31	18	Ch	ePZ	16	08	45
		ePcPZ			42 19		Wr	ePN			09 01
		ePPZ			43 40		Qt	ePZ			34
		ePPPZ			45 10			USCGS H 15 58 38			
		eSN*			49 39			54 N 161 E			
		ePPSN*			50 00			Near east coast of			
	Wr	ePN			41 47			Kamchatka			
	Lh	ePN			58±			Mag 6½-6¾ (Pas)			
		ePPZ			44 16	18	Qt	ePZ			16 37 55
		ePPPZ			45 43	18	Wr	ePN			23 20 45
		eSN			50 28			iSN			21 40

Date	Station	Phase	h	m	s
	Qt	ePZ			54
		eSZN		23	48
		H 23 19 26			
		Tadzhikistan S.S.R.			
19	Qt	ePKPZ	01	57	17
		USCGS H 01 37 51			
		6 N 82½ W			
		South of Panama			
20	Qt	ePZ	08	24	06
20	Lh	ePZ	14	18	37
	Qt	ePZ			58
		eSZNE		20	38
		H 14 16 48			
		Northern Afghanistan			
		Tadzhikistan border			
20	Qt	ePZ	16	55	16
		USCGS H 16 42 25			
		32 N 40 W			
		Atlantic Ocean			
21	Ch	ePZ	03	38	30
	Qt	ePZ			40 49
		USCGS H 03 28 10			
		3 S 146 E			
		Bismarck Sea			
21	Ch	ePZE	05	58	17
		ePcPE			48
		ePPZ		06	00 43
		eSE			07 05
		ePSE			24
	Qt	ePZ			00 19

Date	Station	Phase	h	m	s
		Sinkiang Province			
		China			
23	Qt	ePKPZ	14	53	10
		USCGS H 14 35 02			
		39 N 119 W			
		Western Nevada			
		Mag 6¼ (Pas),			
		6-6¼ (Berk),			
		6.0 (Up, Ki),			
24	Qt	ePZE	16	05	58
		ePPZE			06 11
		ePPPE			17
		eSEN*			08 36
		eSSE			53
		eLN*			09.6
	Wr	ePZ			06 43
	Lh	ePZ			07 12
		eLN			12.0
	Ch	ePZ			09 07
		H 16 02 36			
		31¼ N 50¼ E			
		Western Iran			
25	Wr	iPN	03	13	24
		iSN			53
	Lh	iPZ			14 03 d
		esPZ			44
		iSN			15 02
	Qt	ePZ			14 29 d
		esPZE			15 10
		iSZNE			48
	Kr	ePZ			32
		H 03 12 48			

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m
	Lh	ePZ	14	08			Lh	ePFSE		20
		eSZ	16	06			Wr	ePZ	53	40
	Qt	ePZ	15	07	c		Wr	iPZ	54	05
		ePPZE		17			Qt	e(S)N	20	02
		eSZEN*	17	46			Qt	ePZ	19	54
		eSSZN*		59				ePcPZ		43
		eLN*	18	4				ePPZE	56	46
	Kr	ePZ	15	58				ePPPZ	58	17
	Ch	iPZEN*	16	23	c			e(S)EN*	20	02
		ePPZE		49				ePSN*	03	23
		iPPPZ		57				eSSN*	07	20
		iSEN*	20	20				eLN*	09	8
		H 19 11 38						Mu	Sec	
		40 $\frac{1}{4}$ N 80 $\frac{1}{4}$ E						PZ	0.6	1.3
		Sinkiang Province						$\Delta = 64^\circ$		
		China						USCGS H 19 43 22		
		USCGS H 19 11 23						9 $\frac{1}{2}$ S 122 $\frac{1}{2}$ E		
		42 N 80 E						Sawoe Sea		
		China-U.S.S.R.						Mag 6.6 (Qt),		
		border						6.4 (Up, Ki)		
27	Qt	ePKPZ	19	23	21	29	Qt	ePZ	07	29
		USCGS H 19 04 27						ePPZ	32	58
		33 S 179 W						iSN*	40	18
		South of Kermadec						USCGS H 07 16 07		
		Islands						7 S 155 $\frac{1}{2}$ E		
		depth about 100 km						Solomon Islands		
		Mag 6 $\frac{3}{4}$ (Pas), 6 $\frac{1}{2}$ (Berk)						Mag 6-6 $\frac{1}{4}$ (Pas)		
28	Ch	iPZE	19	51	34	29	Ch	ePZ	13	26
		ePcPZE		53	17		Wr	ePZ	29	27
		ePPZE		20			Qt	ePZ		47
		eSZE	58	12				USCGS H 13 19 47		
		ePSE		19				6 N 126 $\frac{1}{2}$ E		

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
								Near south coast of			
								Mindanao			
								Philippine Islands			
								depth about 150 km			
30	Qt	ePZ	04	41	10						
30	Qt	ePKPZ	10	42	22						
		USCGS H 10 23 17									
		34 S 179 W									
		South of Kermadec									
		Islands									
30	Qt	ePZ	13	32	18						
		USCGS H 13 22 45									
		30 N 131 E									
		Ryukyu Islands									
30	Wr	ePN	23	42	58						
	Lh	ePZ		43	47						
	Qt	ePZ		44	11						
		eSZNE		46	18						
		H 23 41 27									
		Tadzhik-Sinkiang									
		border									

			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
	Quetta		10	ePZ	09 58 59
1	ePZ	05 45 24	10	ePgZ	10 28 30
1	ePZ	10 32 23		eSgN	43
	eSZN	38	10	ePgZ	10 57 36
1	ePZ	20 10 43		eSgE	51
1	ePZ	23 58 19	13	iPgZ	13 45 47
	eSNE	59 38		iSgN	51
2	ePZE	00 56 49	13	ePZ	15 56 22
2	ePE	16 18 57		eSNE	43
	eSE	19 17	14	ePZ	01 07 30
2	ePE	16 59 48	14	eXZ	01 10.6
2	ePE	19 22 25	14	ePZ	01 15 59
2	ePgE	22 01 46	14	eXZ	03 10.6
	eSgE	56	14	ePZ	05 18 29
4	ePZ	10 44 59		eSZNE	52
4	eXZ	12 44 19	14	ePZ	16 56 27
4	ePZ	12 47 26	14	ePZ	19 59 30
4	ePgE	14 35 26	14	ePZ	21 09 35
	eSgE	36	14	ePZ	21 29 39
5	iPgE	05 33 01.5d	15	ePZ	08 33 17
	eSgN	03.8		iPgZ	22
6	ePgZ	02 47 16		eSnZE	45
	eSgN	29	16	ePZ	16 07 22
6	ePgZ	09 15 52	17	ePZ	01 28 41
	eSgN	16 06	17	ePgZ	14 41 53
7	ePZ	18 40 29		eSgZ	42 08
	eSN	41 03	17	ePZ	18 27 20
8	ePZ	13 52 52		e(S)Z	28 16
	eSE	53 12	17	ePZ	19 51 50
9	ePgZ	08 52 30		eSE	52 15
	eSgN	38	18	ePZ	00 12 57
10	ePZ	09 02 36		eSN	13 32
	eSNE	03 01			

			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
19	ePZ	16 12 12	1	iPN	11 54 15
	eSE	13 30		iSZ	44
20	eXZ	16 38.0	3	ePN	13 42 35
20	ePZ	16 55 16		eSN	50
20	ePE	18 37 03	5	ePN	06 23 39
	eSE	44		eSN	24 11
21	ePZ	07 44 57	5	ePZ	12 35 49
	eSN	46 13		eSN	36 22
21	ePZ	08 46 13	7	ePgN	01 22 12
	eSN	49		eSgN	22
21	ePZ	08 57 25	10	ePN	02 19 58
	eSN	44	11	ePN	20 35 53
21	ePZ	23 52 29		iSN	36 30
22	ePZ	13 15 50	11	ePN	20 42 22
23	ePZ	16 50 01		eSN	51
25	ePZ	01 21 13	12	ePN	02 35 39
26	ePgZ	04 46 22		eSN	36 11
	eSgE	31	12	ePN	16 33 22
26	ePZ	05 43 14		eSN	34 06
26	ePZ	08 45 24	13	ePN	00 54 20
27	ePZ	06 20 01		eSN	48
	eSgNE	16	13	eXN	12 45 39
27	ePZ	07 29 12	13	ePN	13 33 37
28	ePZ	02 21 36	13	ePN	22 44 11
29	eXZ	08 20.0	14	ePN	01 08 15
29	eXZ	13 06.0	15	ePN	14 21 01
				iSN	34
	Warsak		16	ePN	13 29 18
1	iPZ	10 09 16 d		eSN	53
	iSN	10 02	17	ePN	16 57 34
1	iPZ	12 14 09 d		iSN	58 05
	iSZ	41	17	ePN	18 27 34
			17	ePN	23 15 11

Date	Phase	h m s
18	ePN	00 13 08
18	ePN	07 16 24
	iSN	17 08
18	ePgN	22 24 12
	iSgN	18
19	ePN	07 46 01
19	iPZ	14 38 30 d
	iSZ	59
19	iPN	16 11 13
	iSZ	47
20	eXN	14 17 33
21	ePN	07 44 06
	eSN	41
21	ePN	13 12 48
	eSN	13 22
23	iPgZ	14 40 24 c
	iSgN	36
23	ePZ	22 31 22
24	ePZ	11 16 19
27	iPZ	07 27 54 c
	iSZ	28 37
27	iPZ	07 49 15 c
	iSZ	43
27	iPZ	11 55 06
	iSZ	38
28	ePZ	06 34 48
	iSZ	35 29
29	ePZ	04 42 29
	iSZ	43 01
29	iPZ	21 10 27 d
	iSZ	58

Minor Shocks

Date	Phase	h m s
30	ePN	19 14 17
30	ePN	22 33 24
	iSN	55
	Lahore	
1	ePZ	10 08 53
	eSE	09 23
1	eXN	15 56 36
2	eXN	02 53 43
2	ePZ	05 50 39
3	eXZ	17 00 26
4	eXZ	08 28 04
12	ePZ	23 50 17
	eSZ	43
13	ePZ	12 08 47
13	eXZ	13 35 17
15	ePZ	02 46 46
15	ePZ	14 21 43
	eSN	22 46
15	eXN	15 28 46
16	ePZN	13 30 54
18	ePZ	23 21 04
	eSN	22 18
19	ePZ	16 11 51
	eSN	12 51
20	ePZN	18 44 21
21	eXN	07 45 53
21	eXZ	23 49 48
23	e(P)Z	22 00 05
25	eXZ	06 46 44
26	ePZ	20 17 44
	eSN	18 58

Date	Phase	h m s
27	ePZ	07 27 28
	eSZ	57
29	iXZ	13 59 05 c
30	eXZ	12 49 20
30	eXZ	22 35 09
30	ePZ	23 43 74
	Karachi	
	iXZ	03 14 34
3	eSZ	00 34 18
14	eXZ	06 58 12
25	Chittagong	
	eXZ	12 45 18
1	ePZ	05 40 25
2	eXE	06 03 21
2	eXN*	04 04 23
3	eXZ	08 52 50
3	eXZ	20 50 40
5	eXE	02 47 26
6	ePZE	08 34 09
7	eSZE	48
7	ePZE	08 40 08 ±
7	eXZ	13 58 15
7	eXN*	15 14 11
9	iXZ	05 14 25
10	eXZ	09 57 16
10	eXN*	11 09 23
10	eXZ	22 44 58
12	eXZ	12 12 58
13	eXZ	16 14 48
14	eXZ	18 03 01
16	eXE	

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Pakistan Meteorological Service

Director,
Meteorological Service

Sibte Nabi Naqvi

Deputy Director,
Geophysical Institute

Officer Incharge,
Geomagnetic Section

Abdul Qadir Khan

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All correspondence regarding the supply of this bulletin on exchange basis should be addressed to the Director, Meteorological Service, Secretariat Block No. 3, Frere Road, Karachi-I, 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 "	—	—
Lahore Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki) 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	Ch	iPZE	02 35 05 d	3	Qt	ePZE	05 33 56
		iXZ	13			USCGS H	05 21 13
		epPZ	36 52			Kodiak Islands region	
		ePPZE	57	3	Wr	ePN	08 05 07
		iSE	40 56		Lh	ePZ	49
		esSE	44 00		Qt	ePZ	06 28
		eSSE	21			eSZE	07 38
	Wr	ePN	36 48			H 08 04 56	
		iSN	44 06			34 1/2 N 72 E	
	Qt	ePZ	37 19 d			Mardan, West Pakistan	
		ePcPN	52	3	Lh	ePKPZ	18 13 33
		epPZ	39 14			ePPN	14 22
		ePPE	49		Qt	ePKPZ	13 38
		esPN	40 02			epPKPZ	14 28
		ePPPZ	41 25			ePPZ	33
		iSNEN*	45 05			cpPPEN*	15 16
		iSSN*	49 22			eSKSN*	20 05
		USCGS H 02 27 46				eSSSN*N	34 10
		28 N 139 1/2 E				USCGS H 17 55 29	
		Bonin Islands region				16 S 172 1/2 E	
		depth about 550 km				New Hebrides Islands	
		Mag 6 (Pas), 6.5 (Up, Ki)				region	
2	Qt	ePZ	05 16 00			depth about 200 km	
2	Qt	ePKPZ	11 45 31			Mag 6 1/4-6 1/2 (Pas),	
		USCGS H 11 27 45				6 1/4 (Berk)	
		20 S 178 1/2 W		3	Wr	ePZ	19 43 05
		Fiji Islands				eSN	39
		depth about 650 km			Lh	ePZ	46
						eSZN	44 56
2	Qt	ePKPZ	11 52 07			ePZ	43 57
		USCGS H 11 34 20			Qt	eSZ	45 15
		20 S 178 W				H 19 42 16	
		Fiji Islands				36 1/2 N 70 E	
		depth about 650 km					

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Date	Station	Phase	h m s	Date	Station	Phase	h m s
		Hindukush depth about 200 km				e!PPZ Mu Sec PPZ 5.0 2.4 $\Delta = 133^{\circ}9$	44 19
5	Ch	ePEN* USCGS H 05 33 07 52½ N 159 E Kamchatka	05 43 26		Qt	ePKPZ i!XZ epPKPZ i!PPZEN* ePKSN* Mu Sec PPZ 5.9 2.5 $\Delta = 134^{\circ}6$	09 41 33 46 44 11 22 47 41
5	Ch	ePE USCGS H 14 05 42 6 S 147 E Near northeast coast of New Guinea	14 16 08		Ch	ePKPZE USCGS H 09 23 27 26½ S 61½ W Chaco Province, Argentina depth about 600 km Mag 6¾-7 (Pas), 6¼-6½ (Berk), 7-7¼ (Qt, Kr), 6.6 (Up, Ki)	09 42 22
6	Kr	eXZ ePPZ	09 28 35 31 08	6	Ch	ePZ USCGS H 15 00 15 Samoa Islands region	15 12 26
	Qt	ePKPZ i!XZE epPKPZ i!PPZE ePKSN* eSKSZEN* Mu Sec PPZ 3.2 2.0 $\Delta = 134^{\circ}6$	28 23 36 31 01 11 32 00 34 33	7	Ch	ePZ USCGS H 05 49 46 4½ S 145 E Eastern New Guinea	06 00 09
	Ch	ePKPZE epPKPZN* USCGS H 09 10 17 26½ S 61½ W Chaco Province, Argentina depth about 600 km Mag 6¾ (Pas), 6¼ (Berk), 7.0 (Qt), 6.6 (UP, Ki)	09 29 11 32 00	7	Ch	ePZ USCGS H 14 40 55 40 N 143½ E	14 49 12 51 12
6	Kr	eXZ	09 41 46				

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				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
		Off east coast of Honshu, Japan				esPKPZ	25 12
7	Wr	iPZ	15 53 43 d			ePPZ	27 33
	Lh	ePZ	54 23			epPPZ	54
		eSZ	55 23			ePKSZ	28 07
	Qt	ePZ	54 47			epPKSZ	32
		eSEN	56 06			esPKSZ	43
		36N 71¼E Hindukush depth about 200 km				eXZN*	55
8	Wr	ePZ	04 10 21			ePPPZN*	30 28
	Qt	ePZ	59			eSKSPN*	37 14
		USCGS H 04 00 37 44 N 147½ E Kurile Islands depth about 100 km			Lh	ePKPZ	24 50
8	Ch	ePZ	13 13 13			esPKPZ	25 26
		USCGS H 13 04 03 5 S 134 E Aroe Islands region				USCGS H 16 05 18 20½ S 68 W Chile-Bolivia border depth about 100 km Mag 6¾ (Pas), 6.5 (Up, Ki)	
9	Wr	ePZ	06 33 02	9	Wr	iPZ	20 01 44 d
		iSZ	35			iSZ	02 13
	Lh	eSN	34 43		Qt	ePZ	49
	Qt	ePZ	33 58			iSZNE	04 09
		eSE	35 14			H 20 01 04 Hindukush	
		H 06 32 22 36 N 70¾ E Hindukush depth about 200 km		10	Wr	ePZ	17 42 36
9	Qt	ePKPZ	16 24 30		Qt	ePZ	43 43
		eXZ	41			ePPZ	48
		epPKPZ	59			eSZE	45 53
						eSSN	46 08
						USCGS H 17 40 47 41 N 63 E Kirghiz, S.S.R.	

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
11	Ch	ePZN*	12	11	51						
		ePPN*	14	07							
		ePPPN*	15	31							
		eSN*	20	08							
		iPSN*	17								
		ePPSN*	32								
		eScSN*	39								
	Lh	ePZ	12	29							
		eSZ	21	10							
	Qt	ePZ	12	41							
		ePcPZ	13	05							
		ePPZ	15	12							
		ePPPZN*	16	41							
		ePcSZ	17	12							
		iSN*	21	37							
		iPSN*	22	04							
		eSSN*	26	01							
		eSSSN*	28	55							
		eLN*	29	5							
	Wr	ePZ	12	59							
		USCGS H	12	01	36						
		36 S 78 E									
		Indian Ocean									
		Mag 6 $\frac{1}{4}$ -6 $\frac{1}{2}$ (Pas),									
		6.3 (Up, Ki)									
11	Ch	ePZ	18	32	08						
	Lh	iPZ	57	c							
	Wr	iPZ	33	00							
	Qt	iPZ	37	c							
		ePcPZN	34	12							
		USCGS H	18	23	00						
		44 $\frac{1}{2}$ N 148 $\frac{1}{2}$ E									

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		iSKSEN*	48								
		eScSEN*	54								
		ePSE	51	02							
		ePPSE	21								
		Mu Sec									
		PE 1.4	0.7								
		$\Delta = 76^\circ.8$									
	Wr	iPZ	12	40	45 d						
	Lh	iPZ	49	d							
	Qt	iPZ	41	15	d						
		ePPZE	44	23							
		ePPPZE	46	14							
		iSENN*	51	38							
		iScSEN	45								
		ePSN*	52	24							
		iPPSN	44								
		eSSN*	57	11							
		eLN*	13	03.5							
		Mu Sec									
		PE 0.5	1.0								
		$\Delta = 83^\circ.8$									
	Kr	ePE	12	41	38						
		ePcPZ	40								
		USCGS H	12	28	45						
		52 N 172 $\frac{1}{2}$ W									
		Andreanof Islands									
		Aleutian Islands									
		Mag 6 $\frac{1}{2}$ (Pas),									
		5 $\frac{3}{4}$ -6 (Berk),									
		6.2 (Up, Ki)									
14	Ch	ePEN*	08	52	43						
		ePcPE	55								

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	ePZE	36	41				Mu Sec			
		iSNE	37	57				PZ 5.5 1.2			
		H 21 35 02						$\Delta = 45^\circ 0$			
		Hindukush					Wr	iPZ	20	03	23 d
16	Ch	ePZ	15	29	03		Kr	iPZ			49 d
	Lh	ePZ		21	d			iXZ			04 09
	Qt	ePZ		47	d			Mu Sec			
		USCGS H 15 17 27						PZ 4.0 1.2			
		50 $\frac{1}{2}$ N 177 W						$\Delta = 50^\circ 8$			
		Andreanof Islands region					tQ	iPZ	20	03	50 d
17	Qt	ePZ	19	14	55			eXZE			04 12
18	Qt	ePZE	03	55	12			iPcPZ			05 06
		ePPE		35				ePPZ			40
		ePPPE		47				ePPPZ			06 48
		eSNE	59	08				ePcSZNE			09 04
		iSSZE		45				i!SZN			10 58
18	Ch	iPZE	20	00	40 d			ePSZN			11 12
		ePPZN*		01	31			ePPSE			21
		ePPPZN*		43				iScSZN			13 40
		ePcPZE		03	54			eSSZE			14 23
		iSEN*		05	24			Mu Sec			
		eSSEN*		06	48			PZ 7.4 2.0			
		i!XZE		07	22			$\Delta = 51^\circ 0$			
		ePcSEN*		34				USCGS H 19 54 45			
		i!XZE		11	18			151 $\frac{1}{2}$ N 120 $\frac{1}{2}$ E			
		eScSZEN*		29				Luzon			
		Mu Sec						Mag 6 $\frac{1}{2}$ - 6 $\frac{3}{4}$ (Pas),			
		PZ 2.9 0.6						7 $\frac{1}{4}$ (Ch, Lh, Kr, Qt),			
		$\Delta = 28^\circ$						7.1 (Up, Ki)			
Lh	iPZ		20	03	04 d	19	Ch	ePZN*	03	49	30
								eSEN*		55	32
							Kr	ePZ		50	53 c
							Wr	iPZ		51	14 c
							Qt	iPZ			16 c

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		ePcPZ	52	29			Ch	ePKPZEN*	25	55	
		ePPZE	53	12				ipPKPZE	26	42	
		ePPPZ	54	15				i!XZE	27	35	
		eSNEN*	58	36				USCGS H 15 06 10			
		ePSZE		48				15 S 70 $\frac{1}{2}$ W			
		ePPSE		55				Peru			
		eScSNN*	04	01	03			depth about 200 km			
		eSSN*		02	08			Mag 7 (Pas), (Up, Ki)			
		USCGS H 03 42 02				20	Ch	iPZE	02	47	10
		6 $\frac{1}{2}$ S 105 E						ePPZE		48	31
		Sunda Strait						ePcPZE		49	40
		Mag 5.9 (Up, Ki)						eSEN*		52	44
19	Qt	ePKPZ	15	25	10		Kr	iPZ		49	37
		epPKPNE		26	05		Wr	iPZ		49	49 d
		esPKPZ		25			Qt	iPZ			55 d
		ePPZ		28	05			iXZ		51	36
		i!SKPZNNEN*		31				i(S)ZENN*		57	00
		ePKSZN		50				USCGS H 02 40 13			
		ipPKSN		29	33			6 S 110 E			
		esPKSZN		30	00			Java Sea			
		eSKSZ		32	08			Mag 6.0 (Up, Ki)			
		iSKSPE		37	44	21	Qt	ePZ	01	01	54
		iPSKSEN		38	00	21	Qt	ePZ	02	59	11
		ePSNE		45		22	Ch	ePZE	11	23	07
		epPSNE		39	26			eSN		29	13
		iSSN*		45	49		Lh	iPZ		25	19 d
		esSSN*		47	15		Wr	iPZ			40 d
	Wr	ePKPZ		25	15		Qt	ePZ			57 d
	Kr	eSKPZ		28	37			iXZ		26	39
		ePKSZ		49				USCGS H 11 15 33			
	Lh	ePKPZ		25	24			2 N 126 $\frac{1}{2}$ E			
		eSKPZ		28	45			Molucca Passage			
22	Ch	iPZE	19	32	55 d						

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePcPZE	33	45			Wr	iPZ	15	04	c
		epPZE	34	55				eSKSN	25	30	
		ePPZE	35	17			Kr	ePE	15	18	
		esPZE	36	07				eSKSE	25	44	
		iSZEN*	39	54			Qt	iPZ	15	20	c
		iXE	40	07				eSKSZNE	25	50	
		eScSZE	41	37				cSNE	26	03	
		isSEN*	43	31				eScSN*	18		
	Wr	iPZ	33	17	d			ePSN*	27	16	
		epPN	35	20				ePPSN*	28	04	
		eSN	40	33				eSSN*	31	48	
	Lh	iPZ	33	19	d			H 23 02 32			
		epPZ	35	23				USCGS			
		eSN	40	33				5 S 152½ E			
	Qt	iPZ	33	52	d			New Britain			
		ePcPZE	34	22				depth about 60 km			
		epPZN	35	55				Mag 6.6 (Up, Ki)			
		ePPZEN	36	29		23	Qt	ePKPZ	15	15	41
		iSZENN*	41	42				USCGS H 14 56 38			
		eScSEN*	42	27				Tonga Island			
		esSN*	45	21		23	Lh	ePZ	21	33	59
		Mu Sec					Wr	ePZ	34	16	c
		PZ 1.1 1.8					Qt	ePZ	48		c
	Kr	iPZ	19	34	17 d	24	Qt	ePZ	07	23	04
		USCGS H 19 34 17					Ch	ePZ	26	06	
		53 N 153 E				24	Ch	iPnZE	16	18	39 c
		Sea of Okhotsk						eP*ZE	44		
		depth about 650 km						ePgZE	49		
		Mag 6.0 (Qt),						iSnZEN*	19	18	
		6.1 (Up, Ki)						eS*EN*	25		
22	Ch	ePZ	23	13	12			eSgN*	31		
	Lh	iPZ	14	59	c		Lh	ePZ	22	07	

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSN	25	30			Qt	ePZE	30	35	
	Wr	ePZ	22	39	c			USCGS H 21 20 35			
		eSN	26	35				37 N 140½ E			
	Qt	ePZE	23	05	c			Honshu, Japan			
		ePPZN	36					depth about 100 km			
		ePPPZN	49			26	Wr	iPZ	00	21	10 d
		eSZEN	27	21				iSN	40		
		eSSN	28	07			Lh	ePZ	52		
		H 16 17 47						iSN	22	51	
		24 N 95 E					Qt	ePZ	15		
		Assam-Burma border						eSNE	23	32	
		Mag 6.1 (Up, Ki)						H 00 20 35			
24	Ch	ePZE	19	30	58			36 N 71 E			
	Lh	ePZ	32	31				Hindukush			
	Qt	ePZ	33	00				depth about 150 km			
		USCGS H 19 20 03				26	Qt	ePZ	17	13	51
		5½ S 153 E					Wr	ePZ	14	07	
		New Britain Islands					Ch	ePZ	17	16	
		region						USCGS H 17 07 03			
24	Qt	ePZ	23	21	52			41N 27½ E			
		USCGS H						Northwestern Turkey			
		56½ S 28½ W						Mag 5.1 (Up, Ki)			
		Sandwich Islands				26	Ch	ePZE	19	48	00
25	Qt	ePZE	01	46	49		Qt	ePZE	49	00	
	Wr	ePZ	51					USCGS H 19 37 40			
25	Qt	ePZ	02	26	10			53 N 160 E			
	Wr	ePZ	23					Kamchatka			
	Ch	ePZ	46			26	Qt	ePnZ	21	38	11
25	Wr	ePZ	19	33	14			ePgZNE	19		
	Lh	ePZ	15					eSnZNE	45		
	Qt	ePZ	55					eSgNE	55		
25	Ch	ePZ	21	28	33		Wr	ePZ	39	29	
	Wr	ePZ	29	59				H 21 37 26			

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Kharan, Baluchistan						eSNEN*			59
		West Pakistan						H 16 46 01			
26	Qt	ePZ	22	53	05			36 N 71 E			
29	Qt	iPnZ	09	54	51 c			Hindukush			
		eP*Z			55			depth about 200 km			
		ePgZE	55	04				USCGS H 16 45 55			
		iSnNEN*			32			36 N 70½ E			
		eS*ZE			40			Hindukush			
		eSgE			46			depth about 200 km			
	Wr	iPnZ	54	52		31	Qt	ePZ	05	12	21
		iSnN	55	33				USCGS H 04 59 23			
	Lh	ePnZ			24 ±			5 S 152½ E			
		eSnN	56	37				New Britain			
		H 09 53 56				31	Qt	ePZ	10	30	53
		33¼ N 67½ E				31	Wr	iPZ	19	54	21 c
		Afghanistan					Lh	ePN		55	01 c
29	Qt	ePnZ	23	04	57 c		Qt	iPZ		18	c
		eSnNEN*			05 37			ePPPZN		31	
	Wr	iPnZ			04 58			eSZNEN*		57	00
		iSnN			05 40			eSSZE		13	
		H 23 04 02						eSSSZEN*		25	
		Afghanistan					Kr	ePZ		56	25 c
30	Qt	ePKPZ	13	13	03		Ch	ePZE		58	38 c
		USCGS H 12 53 56						eXZE		49	
		31½ S 177½ W						ePPZE		59	19
		Kermadec Islands						ePPPZE		29	
30	Wr	iPZ	16	46	42 d			eSEN*	20	03	07
		iSN			47 13			eSSE		04	13
	Lh	ePN			23			USCGS H 19 53 02			
		eSN			48 24			38½ N 70 E			
	Qt	ePZ			47 41 d			Tadzhik, S.S.R.			
		esPZN			48 21			Mag 5.3 (Up)			

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Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
	Quetta					eSgZ			51
1	ePZ	05	18	34	14	ePgZ	08	46	19
	eSN		19	00		eSgNE			29
1	ePnZ	17	51	49	15	ePZE	07	25	51
	ePgZE		52	04		eSE			26 47
	eSnZE			38	15	ePgZE	22	37	59
3	ePE	05	12	48		eSgNE			38 06
3	ePE	07	05	40	16	ePZ	06	42	59
3	eXZ	07	21	32		eSN			43 40
3	ePZE	12	18	09	16	ePgZ	08	20	41
	eSNE		19	04		eSgNE			53
5	ePE	00	21	42	16	ePZ	08	44	43
5	ePE	12	15	16		eSE			45 00
	eSE		16	08	16	ePZ	17	30	09
5	ePE	16	37	39	16	ePgE	20	04	51
	eSE		39	03		eSgE			56
5	ePE	23	21	50	17	ePZ	16	45	11
7	ePZ	02	25	22		eSN			43
7	ePZ	05	25	03	18	ePZ	22	37	39
7	ePZE	09	20	21		eSN			38 05
8	ePZ	08	06	50	19	ePgZ	05	20	56
8	ePZ	18	21	33		eSgE			21 08
	eSN			49	19	ePZ	14	29	44
9	ePZE	06	57	20	20	ePZ	06	05	12
10	ePgE	13	57	20	20	ePZ	11	21	18
	eSge			32		ePgZ	07	46	04
10	ePZ	18	21	34	21	eSgZ			19
	eSN			55		eXZ	12	48	28
11	ePgZ	21	30	48	21	ePZ	11	11	41
	eSgNE		31	00	22	eSZ			13 02
11	ePnZ	16	42	16		ePZ	12	42	09
	ePgZ			22	22	ePZ	00	39	07
	eSnN			45	23				

			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
23	ePZ	08 58 01	30	ePZ	09 51 48
	eSNE	52		eSE	52 24
23	ePZ	16 07 00	30	ePZ	21 39 00
	eSZNE	55		eSZ	40 15
23	ePgZ	17 21 56.4	31	ePZ	03 27 27
	eSgE	59.8	31	ePZ	05 12 21
23	ePZ	13 34 03		Warsak	
23	eXE	18 51.0	1	ePN	05 35 21
23	eXE	21 04.0	1	ePN	17 51 57
23	eXE	23 54.0		eSN	52 37
24	ePZE	04 02 51	2	ePN	15 03 55
	eSZE	04 45		eSN	04 27
24	ePE	07 18 26	3	ePN	00 52 37
	eSNE	19 59	3	ePN	10 54 22
24	ePZE	13 05 24	3	ePN	12 18 17
	eSE	06 51	3	ePN	18 13 48
24	ePE	20 53 19	4	iPZ	03 42 51 d
	eSE	54 51		iSZ	43 21
26	ePgZ	05 30 29	4	iPZ	13 59 12 d
	eSgZE	40		iSZ	46
27	eXZ	05 48.5	5	ePZ	00 01 11
27	ePgZ	21 58 25	5	ePZ	01 16 42
	iSgNE	36	5	ePZ	02 35 42
28	eXZ	09 42.3		iSZ	36 05
28	eXZ	21 26.3	5	ePZ	07 58 47
29	ePE	08 31 37		iSZ	59 10
	eSE	33 04	5	ePZ	16 36 32
29	ePZ	10 56 27		iSZ	37 09
29	ePZ	11 28 12	5	iPZ	19 58 04 d
29	ePZ	13 11 37		iSZ	27
29	eXZ	16 22 34	5	iPZ	23 21 05 d
30	ePZ	06 47 37		iSN	54
	eSZE	48 16			

			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
6	ePZ	01 33 04	12	iPZ	04 09 59 d
	eSZ	27		iSZ	01 36
6	ePZ	01 57 37	12	iPZ	09 12 44 c
	iSZ	59	12	iPZ	10 42 45 c
6	ePN	09 28 36		iSZ	43 18
6	ePN	09 41 49	12	ePZ	12 58 27
7	ePN	02 24 34	13	iPZ	03 48 32 d
	iSZ	56		iSZ	56
7	ePZ	05 23 46	13	ePZ	04 46 21 d
7	ePZ	09 20 22	13	iPgZ	07 07 47 d
7	iPZ	17 53 19 d		iSgZ	08 01
	iSZ	43	13	iPZ	10 13 01 d
8	iPZ	06 42 47 d		iSZ	18
	iSZ	43 18	13	ePZ	17 34 18
8	iPZ	09 45 58 c	13	iPZ	19 01 01 d
	iSZ	46 29		iSZ	17
8	iPN	08 06 07 c	13	ePZ	22 30 23
	iSN	47		iSZ	31 29
8	iPZ	15 18 50 d	13	ePZ	22 37 47
	iSZ	19 12	13	ePZ	23 46 25
9	ePN	00 07 37		iSZ	47 06
	iSZ	08 02	14	ePZ	02 48 08
9	ePZ	03 34 25		iSZ	31
9	ePZ	06 56 36	14	iPZ	04 55 57 d
9	eXZ	16 24 48		iSZ	56 15
10	iPZ	06 28 40 c	14	iPZ	21 12 28 d
	iSZ	29 22		iSZ	55
10	ePZ	17 23 09	15	iPZ	08 30 13 d
	iSE	35	15	ePZ	12 23 37
10	iPZ	20 33 43 d	15	iPZ	15 57 00 c
11	ePZ	10 45 30		iSZ	33
11	ePZ	16 42 43	16	iPZ	16 17 03 d

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
17	iPZ	12	44	51 d	22	iPZ	09	51	09 d
	iSZ		45	27		iSZ			46 d
17	ePZ	16	45	28	22	iPZ	12	42	11
17	iPZ	23	04	53 c		iSZ			51
18	iPZ	04	56	02 d	23	ePZ	00	39	13
18	ePZ	05	59	37		eSZ			56
18	ePZ	13	34	22	23	ePZ	15	22	16
	iSZ			56		eSZ			23 34
18	iPZ	17	37	51 c	23	iPZ	16	07	02 c
	iSN		38	26	23	iPZ	17	34	12 c
18	iPZ	22	14	49	23	ePZ	22	54	43
	iSZ		15	24	24	ePZ	04	01	47
19	iPZ	14	35	21 c	24	iPZ	06	54	53
20	iPZ	05	54	45 c	24	iPZ	07	17	24 d
	iSZ		55	11		iSZ		18	04
20	iPZ	08	31	11 d	24	iPZ	13	04	20 d
	iSZ			49	24	iPZ	20	52	17 d
20	iPZ	08	42	18 c		iSZ			57
	iSZ			49	24	iPZ	22	50	33 d
20	iPZ	15	18	50	25	ePZ	08	36	26
	iSZ		19	22		eSN			37 33
20	ePZ	16	43	00	25	iPZ	11	15	08 c
	iSZ			22	26	iPZ			36
20	ePZ	20	16	41	26	iPZ	05	00	40 d
20	ePZ	23	19	08		iSZ		01	33
21	iPZ	01	31	57 c	26	ePZ	14	00	50
21	iPZ	06	27	39 c	26	iPZ	14	22	12
21	ePZ	07	57	54		iSZ			46
21	ePZ	13	21	37	26	ePZ	14	59	58
21	iPZ	16	08	54 c	26	ePZ	15	23	32
21	iPZ	19	31	55 c	26	iPZ	16	55	04 d
22	iPZ	01	10	32 d	26	iSZ			38
	iSZ		11	08					

Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
26	iPZ	19	37	46	31	ePZ	07	18	03
27	iPZ	00	32	18 d		iSZ			31
	iSZ		33	01	31	iPZ	10	32	18 c
27	iPZ	09	33	55 d	31	ePZ	14	41	22
27	ePZ	15	32	21	31	ePZ	18	28	33
27	ePZ	18	04	20					
27	iPZ	18	25	57 d		Lahore			
	iSZ		26	31	3	eXZ	18	10	06
27	iPZ	21	37	14 d	5	ePZ	23	22	24
28	ePZ	00	36	29	9	ePZ	06	56	39
	iSZ			51		eSN			57 39
28	iPZ	02	21	49 d	10	ePZ	22	43	07
	iSZ		22	19	12	ePZ	09	12	11
28	iPZ	10	10	50 c		eSZ			40
	iSZ		11	22	13	ePZ	19	01	35
28	ePZ	13	29	21	15	eXZ	07	48	12
	iSZ			50	17	ePZ	12	44	30
28	ePZ	18	52	03		eSZ			58
	iSZ			45	17	eXZ	16	47	37
29	iPZ	08	30	39 d	23	ePZ	15	23	33
	iSZ		31	12	25	eXZ	21	29	25
29	iPZ	18	32	31 c	26	ePZ	15	24	07
	iSZ		33	03		iSN			32
30	ePZ	04	22	21	27	eXZ	15	25	14
30	ePZ	06	47	41					
30	ePZ	07	19	02	5	Karachi			
	iSZ			44	7	eXZ	09	30.5	
30	ePZ	14	22	33		ePgE	03	55	37
	iSZ		23	03	21	eSgE			47
30	iPZ	21	38	01 d		ePgZ	16	30	34
	iSZ			32	26	iSgE			45
31	iPZ	01	27	24 d	29	ePE	21	38	08 ±
						eXZ	09	56	23

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			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
	Chittagong			e(S)EN*	56 35
2	eXZ	11 46 51	20	eXE	17 10 02
2	eXZ	11 53 07	21	ePZ	07 55 38
3	eXN*	05 35 53	21	ePZE	12 48 50±
3	ePZ	18 08 06	23	eXZ	21 37 11
3	eXN*	18 10 29	24	ePE	01 42 41
4	ePZN*	05 12 53	29	eXE	10 00 28
5	ePE	21 31 56	29	ePZ	23 07 58
5	eXE	23 23 07	30	eXZ	16 51 34
6	ePZE	06 37 36			
8	eXZ	04 09 42			
9	eXN*	10 28 17			
9	eXE*	16 24 56			
10	ePZ	17 17 06			
	iXZE	18			
	e(S)Z	19 13			
10	eXZ	17 47 11			
11	ePZN*	05 04 06±			
12	eXZ	04 22 21			
12	eXN*	19 29 58			
14	ePZE	11 45 32			
14	eXE	22 43 54			
15	eXZ	16 46 51			
18	eXZ	03 58 10			
19	ePN*	14 02 41			
20	ePZEN*	02 51 59			

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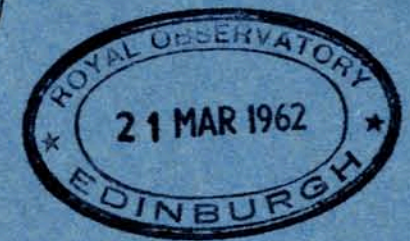
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Pakistan Meteorological Service

Director,
Meteorological Service

Sibte Nabi Naqvi

Deputy Director,
Geophysical Institute

Officer Incharge,
Seismological Section

Abdul Qadir Khan

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All correspondence regarding the supply of this bulletin on exchange basis should be addressed to the Director, Meteorological Service, Secretariat Block No. 3, Frere Road, Karachi-I, 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 (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 "	—	—
Lahore				
Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi				
Sprengnether	Z	1.8 sec.	Critical	5,800
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong				
Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak				
Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki) 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	17	37	45			eSN*		32	50
		iSZ		38	17			USCGS H 10 09 54			
	Qt	ePZ			47			Indian Ocean			
		eSZE		40	08			near 46 1/2 S 98 E			
		H 17 37 02				4	Qt	ePKPZ	03	20	12
		Hindukush						USCGS H 03 00 33			
2	Qt	ePZ	20	31	01			27 S 68 1/2 W			
3	Wr	ePZ	11	26	01			Chile-Argentina border			
		iSZ			32	4	Wr	ePKPZ	08	19	59
	Lh	ePZ			34		Qt	ePKPZ		20	07
		eSN		27	28			USCGS H 08 02 17			
	Qt	ePZE			16			20 1/2 S 178 W			
		eSE		28	43			Fiji Islands region			
	Ch	ePZ		30	44 ±			depth about 600 km			
		H 11 25 25				5	Ch	ePZE	05	22	49
		36 N 73 E						ePPZE		23	45
		Hindukush region						ePPPZE			59
		depth about 100 km						eSEN*		27	44
3	Ch	ePZE	15	46	53		Wr	iPZ		26	01
		ePcPZE		47	34		Qt	ePZE			25
		ePPZE		49	10			eSN*		34	15
		ePPPZE		50	39			USCGS H 05 16 39			
		eSZE		55	12			12 1/2 N 125 E			
		ePSE			28			Samar, Philippine Islands			
	Qt	ePZE		49	12			Mag 6.0 (Up, Ki)			
		eSN*		59	34	5	Ch	ePZE	13	55	55
	Wr	ePZ		49	25			ePPZE		57	23
		USCGS H 15 36 37						ePPPE			42
		Indian Ocean						eSE		14	01
		near 46 1/2 S 98 E					Lh	ePZ	13	58	14
3	Ch	ePZ	16	20	14		Wr	ePN			41
	Qt	ePZE		22	28		Qt	ePZE			58

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 13 48 42						eSgZN			50
		5½ N 125½ E					Wr	ePZ			58
		Near south coast of Mindanao						H 04 53 34			
		Philippine Islands						Afghanistan-Baluchistan border			
5	Ch	ePZE	20	01	46	7	Ch	ePE	10	55	39
		ePPZ		03	41			eSN*	11	05	28
		ePPPE		04	34		Wr	ePZ	10	55	53
		eSN*		08	54		Lh	ePZ		56	01 c
		ePSE			59			eSN	11	06	20
		USCGS H 19 52 54					Qt	ePZ	10	56	20 c
		14 N 142 E						ePPZN		59	41
		Mariana Islands						eSNN*	11	06	48
6	Wr	iPZ	02	35	43			ePSN*	08	02	
	Qt	ePZ			58			eSSN*	12	49	
6	Wr	e(PKP)Z	04	01	21			USCGS H 10 43 32			
	Qt	e(PKP)Z			37			56 N 154 W			
		USCGS H 03 44 37						Kodiak Islands region			
		48 N 120 W						Mag 5 (Berk), 5¼ (Pas),			
		Washington State						5.9 (Up, Ki)			
6	Qt	ePZE	09	39	40	7	Qt	ePZ	17	25	45
		e(S)E		31	02			iXN*		28	20
	Wr	ePZ			26		7	Ch	ePZE	21	57 23
	Lh	ePZ			46			Wr	ePZ		48
		eSN		32	56			Lh	ePZ		57 c
		H 09 30 14						eSN	22	08	15
		31.4 N 67.1 E						ePZ	21	58	14 c
		Afghanistan-Baluchistan border					Qt	ePPZN	22	01	38
								eSN*		08	43
7	Qt	ePnZ	04	54	14			eScSN*			57
		ePgZN			20			ePSN*		09	50
		eSn.NN*			43			eSSN*		14	42

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 21 45 26						epPZE			35
		56½ N 154 W						esPE			49
		Kodiak Islands						ePPZ		09	42
		Mag 6.0 (Up, Ki)						eSE		16	02
8	Ch	ePZE	00	57	43			esSZE			56
		ePcPZE		58	31			USCGS H 23 53 05			
		ePPZE		59	51			6 S 155 E			
		ePPPZE	01	01	20			Solomon Islands			
		eSEN*		05	50			depth about 100 km			
		ePSEN*		06	03	9	Wr	ePZ	02	44	58
		ePPSN*			12		Qt	ePZ			45 16
		eScSN*		07	31	9	Qt	ePZ	04	54	43
	Qt	ePZE	00	58	45 e			ePPZN*			55 45
		eSNN*	01	07	45			eSN*			59 53
	Kr	iPZ	00	59	10 c		Wr	ePZ			55 55
		ePcPZ			24	9	Ch	ePZE	09	19	08
		Ma Sec						USCGS H 09 09 53			
		PZ 0.4 1.2						17 N 146 E			
		USCGS H 00 47 38						Mariana Islands			
		55 N 162½ E				9	Ch	ePZ	23	51	12
		Near east coast of Kamchatka						ePcPZ			32
		Mag 6½ (Pas), 6.4 (Kr),						epPZ			45
		6.0 (Up, Ki)						eSN*	00	00	20
8	Wr	iPZ	13	45	50			USCGS H 23 40 03			
		iSZ		47	01			8½ S 159 E			
	Lh	ePZ		46	17			Solomon Islands			
	Qt	ePZ			59			depth about 100 km			
		eSNE		49	06			ePKPZ	00	55	42
		H 13 44 15				10	Qt				
		Tadzhikistan, S.S.R.						USCGS H 00 36 35			
9	Ch	ePZE	00	07	04			55½ S 146 E			
								Indian Ocean			
								South of Australia			

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
10	Qt	ePZ	21	53	59		Wr	ePZ	16	00	
10	Ch	ePZ	23	12	21			USCGS H 04 05 20			
		eSN*	16	17				15 S 18 E			
	Lh	ePZ	13	50				Northern Rhodesia			
	Wr	ePZ	14	00		12	Wr	ePZ	09	03	01
	Qt	ePZ	41				Qt	ePZ		35	
		H 23 07 27				12	Lh	ePKPZ	10	16	51
		35½ N 111 E					Wr	ePKPZ	17	12	
		Shansi Province, China					Qt	ePKPZ		16	
		USCGS H 23 07 27						ePPZNE	18	33	
		35 N 111 E						ePPN		48	
		Shansi Province, China						ePKSZN	20	48	
11	Wr	ePZ	00	47	40			eXZN*	21	45	
	Qt	ePZ	48	12				ePSN*	28	31	
	Ch	ePZ	52	27				ePPSN*	29	48	
11	Lh	ePZ	15	34	25			eSSN*	35	10	
	Wr	ePZ		27				16½ S 177½ W			
	Qt	ePZ	35	06				Fiji Islands region			
		USCGS H 15 24 30						USCGS H			
		44½ N 14½ E						Mag 6½ (Pas), 6.5 (Up, Ki)			
		Kurile Islands				13	Qt	ePZ	00	37	21
11	Lh	ePZ	16	43	22			ePPZE		36	
	Wr	ePZ		33				ePPPZE		44	
	Qt	ePZ		51				eSEN*	40	46	
11	Ch	ePZ	22	01	10			eSSN*	41	10	
	Lh	ePZ	03	07				eLN*	42	4	
	Qt	ePZ		36			Wr	ePZ	37	35	
		USCGS H 21 49 42						eSN	41	12	
		11 S 163 E					Lh	ePZ	37	55	
		Solomon Islands region						eSN	41	49	
12	Qt	ePZ	04	15	24		Kr	ePZ	38	03	
		eSN		23	37		Ch	ePZE	41	30	

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPZE	43	20				36 N 70½ E			
		ePPPE	44	07				Hindukush			
		eSE	48	23				depth about 150 km			
		ePSE		29		15	Ch	ePZ	09	02	48
		USCGS H 00 32 55						ePPZE		03	37
		Caspian Sea						ePPPZE			54
		Mag 5.8 (Up, Ki)						ePcPZE		06	00
13	Wr	ePZ	15	42	32			eSEN*		07	35
	Qt	ePZ	43	02				eSSN*		09	02
		USCGS H 15 30 42					Lh	ePZ		04	58 c
		51½ N 176 E						eSN		11	20
		Aleutian Islands						eScSN		14	57
14	Ch	ePZE	04	46	47		Wr	ePZ		05	17
	Lh	ePZ	49	01			Qt	ePZ			49 c
		eSN	56	49				ePPZN		07	47
	Qt	ePZ	49	35				ePPPZ		08	42
		eFcPZ	50	17				eSNN*		12	55
		ePPZ	51	52				eScSN		15	33
		eLN*	05	05.2				Mu Sec			
		USCGS H 04 39 07						PZ 6.7		1.5	
		O 125½ E						Δ=49°			
		Molucca Passage					Kr	ePZ		09	05 53 c
14	Ch	ePZE	09	53	25			eSE		13	04
		USCGS H 09 41 07						Mu Sec			
		Santa Cruz Islands						PZ 0.8		1.4	
15	Wr	iPZ	00	50	47 d			Δ=50°			
		eSN	51	15				23 N 121 E			
	Lh	ePN		32				Formosa			
		eSN	52	32				USCGS H			
	Qt	ePZ	51	50				Mag 6¼-7 (Pas), 6½ (Qt),			
		eSN	53	06				6.6 (Kr), 7.2 (Up, Ki)			
		H 00 50 12									

Major Shocks

Date	Station	Phase	h m s	Date	Station	Phase	h m s
15	Wr	ePKPZ	13 31 06			West coast of Turkey	
	Qt	ePKPZ	38			Mag 5.5 (Up, Ki)	
		USCGS H 13 14 26		17	Ch	ePE	01 08 40
		21 S 174 W				ePPE	09 32
		Tonga Islands				eSE	13 28
16	Ch	ePZE	01 27 07		Lh	ePZ	10 33
		ePPZ	59		Wr	ePZ	53
		ePPPZE	28 14		Qt	ePZ	13 15
		eSE	31 56			eSEN*	18 26
	Lh	ePZ	29 05			USCGS H 01 02 37	
	Wr	ePZ	23			22½ N 121 E	
	Qt	ePZ	54			Formosa	
		USCGS H 01 21 05		17	Qt	ePZ	01 40 46
		22 N 121 E				ePPPZE	42 21
		Formosa				ePcPZ	54
16	Qt	ePZ	07 15 19			eSN*	46 54
		eSNEN*	18 29		Wr	ePZ	41 01
		iSSN*	44		Lh	ePZ	27
		eLN*	19.2		Ch	ePE	43 46
	Wr	ePZ	15 33			ePcPE	44 22
		H 07 11 17				ePPE	46 09
		Caspian Sea				eSE	52 18
16	Qt	ePKPZ	10 11 51			USCGS H 01 33 15	
		USCGS H 09 53 52				41½ N 20½ E	
		18 S 178 W				Albania-Yugoslavia	
		Fiji Islands				border	
		depth about 350 km				Mag 5.8 (Up, Ki)	
16	Qt	ePZ	13 36 55	17	Qt	eXZ	04 36 07
16	Wr	ePZ	18 01 01		Ch	ePZE	39 33
	Qt	ePZ	35			eSEN*	48 04
16	Wr	ePZ	18 49 18			USCGS H 04 29 00	
	Qt	ePZ	18			41 N 20 E	

Major Shocks

Date	Station	Phase	h m s	Date	Station	Phase	h m s
		Albania				ePPZE	38 37
17	Wr	ePZ	08 06 22			eSZE	42 35
	Qt	ePZ	50			eSSZ	45 27
17	Wr	ePZ	08 33 33		Lh	ePZ	39 23 c
	Qt	ePZ	34 03		Wr	iPZ	44 c
17	Ch	ePZ	21 15 57		Qt	ePZ	57 c
		ePcPZE	16 19			Mu Sec	
		ePPZE	18 35			PZ 0.5 1.5	
		ePPPZE	20 15			USCGS H 00 30 00	
		eSEN*	25 09			O 123 E	
		ePSE	34			Northern Celebes	
		ePPSE	49			depth about 200 km	
		eSesE	58	18	Ch	ePZE	00 39 31
	Lh	ePZ	17 31 c			ePPZ	40 17
		eSN	28 11			ePPPZE	29
		Mu Sec				eSZE	44 08
		PZ 2.8 1.8			Qt	eSSZE	45 22
		$\Delta = 87^\circ 4$				ePZ	42 37 d
	Wr	ePZ	21 17 40			ePcPE	43 53
	Qt	ePZ	18 00 c			ePPNE	44 26
		ePPZ	21 40			ePPPN	45 25
		ePPPZ	23 45			eSNEN*	49 36
		eSKSNE	28 31			eScSN*	52 21
		eSKKSE	48			eLN*	54.0
		eSN	29 04			USCGS H 00 33 43	
		ePSE	30 32			22 N 121½ E	
		USCGS H 21 04 0				Near south coast of	
		7½ S 156 E				Formosa	
		Solomon Islands				Mag 6.8 (Up, Ki)	
		Mag 7¼ (Pas), (Lh),		18	Wr	ePZ	06 51 12
		7.0 (Up, Ki)			Qt	ePZ	31
18	Ch	ePZ	00 37 01 c			ePPZN	55 52
		epPZ	44			ePPPZN	58 01

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		e(SKS)NE	07	02	28	19	Ch	ePZ	07	14	23
		ePSNE	05	04				ePPZ	15	13	
		ePPSE	06	06				eSZE	19	11	
		eLE	20	7			Qt	ePZ	17	13	
	Ch	ePKPEN*	06	56	32			USCGS H 07 08 23			
		USCGS H 06 37 13						21½ N 121 E			
		44½ N 111 W						South of Formosa			
		Yellow Stone Park									
		Wyoming				20	Ch	ePZ	02	10	21
		Mag 7.1 (Pas),						USCGS H 01 59 06			
		7.5 (Up, Ki)						10½ S 161 E			
18	Ch	ePKPEN*	08	15	34			Solomon Islands			
		USCGS H 07 56 18				20	Qt	ePKPZ	07	38	14
		35 N 110½ W						USCGS H 07 18 34			
		Yellow Stone aftershock						7 S 85 W			
		Mag 6½ (Berk)						Off coast of Peru			
18	Ch	ePKPE	09	01	09	20	Ch	ePZ	09	05	49
		USCGS H 08 41 50						eZcPZ	06	17	
		45 N 110½ W						ePPZ	08	14	
		Yellow Stone aftershock						eSE	14	40	
		Mag 6 (Berk)						ePSE	58		
18	Qt	eXZ	15	43	55			ePPSEN*	15	11	
	Ch	ePKPEN*	45	25				USCGS H 08 54 59			
		USCGS H 15 26 06						New Britain			
		44½ N 111 W				20	Qt	ePZ	12	31	22
		Yellow Stone aftershock						eSN*	40	25	
		Mag 6½ (Pas), 6¾-7						ePSN*	59		
		(Berk), 6.5 (Up, Ki)						eLN*	48.9		
18	Ch	ePE	21	24	21		Wr	ePZ	31	42	
		USCGS H 21 13 09						USCGS H 12 20 08			
		11 S 162½ E						29 S 78 E			
		Solomon Islands						Indian Ocean			
		depth about 200 km									
18	Qt	ePZ	22	11	33						
		USCGS H 22 04 01				20	Wr	ePN	13	43	08
		Albania						ePZ	44	07	
19	Qt	ePZ	04	11	07						

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
20	Qt	ePZ	17	45	39			6.0 (Up, Ki)			
20	Wr	iPZ	21	12	09 d	21	Ch	ePZE	09	50	19±
		iSN	42				Qt	eXZ	51	43	
	Qt	ePZ	13	14	d			eSKSN*	10	02	35
		eSNE	14	35				ePPSN*	06	02	
		H 21 11 28						eSSN*	10	59	
		Hindukush						USCGS H 09 37 49			
21	Ch	ePZ	07	19	17			50½ S 140 E			
		ePPZ	20	10				Indian Ocean			
		ePPPZE	21					South of Australia			
		eSZN*	24	05		21	Qt	ePZ	10	06	15
		eSSN*	25	25		22	Ch	ePKPZ	21	47	02
	Qt	ePZ	19	51				USCGS H 21 28 02			
		USCGS H 07 13 19						17½ S 69½ W			
		38½ N 104 E						Peru-Chile border			
		Kansu, Province China						depth about 150 km			
21	Ch	ePZ	08	15	32	22	Qt	ePZ	23	49	26
		ePePZE	38					iXZNE	48		
		ePPZ	18	38			Kr	iPZ	28		
		eSN*	25	40			Wr	iPZ	50	38	
	Qt	eXZ	19	35				Baluchistan			
		e(SKS)N*	27	44		23	Qt	iPnZ	03	19	41 c
		eSKKSN*	28	28				eP*Z	45		
		ePPSN*	31	25				iPgZE	50		
		eSSN*	36	29				iSnZNE	20	16	
		iXN*	38	53				iSgNE	25		
		eSSSN*	40	04			Kr	ePZ	13		
		eLN*	48.3				Wr	iPZ	21	c	
		USCGS H 08 03 15					Ch	ePZE	23	40	
		50½ S 139½ E						ePPE	24	03	
		Indian Ocean						ePPPZE	12		
		South of Australia						eSE	27	29	
		Mag 5¼-6 (Pas),						eSSE	58		

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		H 03 18 54						eSKSEN*			45
		Suleman Range						ePSN*			53
		West Pakistan						ePPSEN*		53	08
23	Qt	ePnZ	05	40	24 c			eSSN*		57	09
		ePgZN			34	Lh		ePZ		44	05
		eSnNE			41 00			eSKKSN		55	00
		eS*Z			07			eSN			08
	Kr	ePZ			40 53	Wr		ePZ		44	12
		eSE			41 51	Qt		ePZ			28
	Wr	iPZ			04 c			ePPPEN*		50	37
		H 05 39 36						eSKSNEN*		55	08
		28½ N 70 E						eSKKSN*			24
		Suleman Range						e(S)N			43
		West Pakistan						iXN		56	03
24	Lh	ePZ	08	18	03			USCGS H 21 30 46			
	Wr	ePZ			34			10½ S 161 E			
	Qt	ePZ			19 23			Solomon Islands			
24	Ch	ePZN*	12	39	29			Mag 7 (Pas),			
	Qt	ePZ			40 22			6.8 (Up, Ki)			
		USCGS H 12 29 20				24	Ch	ePZ		23	44 07
		53 N 159½ E						USCGS H 23 32 23			
		Kamchatka						10½ S 161½ E			
24	Qt	ePZ	15	55	34			Solomon Islands			
		USCGS H 15 41 40						aftershock			
		10½ S 161½ E				25	Qt	ePKPZ		12	43 55
		Solomon Islands					Wr	ePKPZ		44	06
		foreshock					Lh	ePKPZ			14
24	Ch	iPZE	21	42	39			USCGS H 12 24 18			
		ePcPZEN*			52			Northern Chile			
		ePPZE			45 30	25	Ch	ePZN*		13	51 16
		ePPPE			47 16			ePcPZN*			40
		eSEN*			52 17			ePPN*		53	51

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSEN*	14	00	21			Vera Cruz, Mexico			
		ePPSEN*			56			Mag 6¼ (Pas),			
		eScSEN			01 15			6.9 (Up, Ki)			
	Wr	ePZ	13	52	59	26	Wr	ePZ	10	40	28
	Qt	ePZ			53 28		Lh	ePZ			41 08
		USCGS H 13 40 06						eSKSN			51 40
		6½ S 155 E					Qt	ePZ			41 22 d
		Solomon Islands						eSKSNN*			51 56
25	Qt	ePKPZ	18	11	23			eSKKSN			52 24
	Wr	ePKPZ			32			eSNN*			48
		USCGS H 17 51 49						USCGS H 10 27 41			
		27½ S 71 W						57 N 132 W			
		Northern Chile						South of Queen			
26	Wr	iPKPZ	08	44	37 c			Charlotte Islands			
	Lh	ePKPZ			38			Mag 6.5 (Up, Ki)			
		ePPZ			46 52	27	Wr	ePZ	05	17	42
		eSKSN			51 54		Qt	ePZ			59 c
	Qt	iPKPZ			44 42 c			USCGS H 05 05 44			
		ePPZNN*			46 47			5 S 150½ E			
		ePKSZN			48 17			New Britain region			
		ePPPEN*			49 42			depth about 300 km			
		eSKSN			51 52	27	Wr	ePZ	08	00	13
		eSKKSN*			53 52		Qt	ePZ			28
		eSKSPN*			56 54			ePPZ			01 36
		eSSN*			09 04 36			USCGS H 07 50 28			
	Kr	ePKPZ	08	44	52			0 122 E			
	Ch	ePKPZE			45 02			Northern Celebes Islands			
		ePPZN*			48 07			depth about 200 km			
		iPKSN*			37	27	Qt	ePZ	13	56	46
		ePPPN*			51 12	27	Ch	ePnZE	23	54	27
		eSKSEN*			52 11			eP*ZE			36
		USCGS H 08 25 30						ePgZE			46
		18 N 94½ W						iSnZE			55 22

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eS*ZE			33		Ch	ePZE			39
		eSgZE			47			H 05 31 40			
Lh		ePZ		57	51 c			39 N 74 $\frac{3}{4}$ E			
		eSN	00	01	30			Tadzhikistan Sinking			
Wr		ePZ	23	58	23 c			border			
Qt		ePZ			51 c	29	Qt	ePZ	10	45	19
		ePPZNE		59	32		Wr	ePZ			30
		ePPPZ			39	29	Qt	ePZ	13	07	52
		eSN*	00	03	20	29	Wr	ePZ	17	09	35
		H 23 53 15					Lh	ePZ			38 d
		24 $\frac{1}{2}$ N 96 E					Ch	iPZE			46 d
		Burma						iPPEN*			10 55
		USCGS H 23 53 10						ePPPZN*			11 11
		25 N 96 E						ePcPZ			12 31
		Northern Burma						eSEN*			15 02
28	Ch	ePZ		12	20 01			eSSEN*			16 58
	Qt	ePZ			06			eScSE			20 16
		USCGS H 12 07 44					Qt	ePZ			10 22 d
		63 $\frac{1}{2}$ N 149 W						ePPPZ			12 07
		Central Alaska						ePcPZNE			43
28	Ch	ePZE		16	04 45 c			iSZN*			16 07
		ePcPZE			50			eSSN*			18 33
		ePPZE		08	02			eLN*			18-8
		eSKSE		15	07			USCGS H 17 03 10			
		eSEN*			11			52 N 106 $\frac{1}{2}$ E			
	Qt	ePKPZ		10	48			Lake Baikal, U. S. S. R.			
		USCGS H 15 52 10						Mag 6 $\frac{1}{2}$ -6 $\frac{3}{4}$ (Pas),			
		17 S 167 E						6 $\frac{3}{4}$ (Berk), 6-7 (Up, Ki)			
		New Hebrides Islands				30	Qt	ePZ		03	34 49
29	Wr	ePZ		05	33 11 \pm			USCGS H 03 24 54			
	Lh	ePN			35			35 $\frac{1}{2}$ N 3 W			
	Qt	ePZ		34	20			Mediterranean Sea			
		eSNEN*		36	24			north of Spanish			
								Morocco			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
30	Qt	ePZ	21	56	06	31	Qt	ePZ	09	18	29
		ePcPZ			33			USCGS H 09 05 56			
		eSN*	22	05	04			52 $\frac{1}{2}$ N 171 W			
		eScSN*			06 04			Fox Islands			
		eSSN*			09 26			Aleutian Islands			
		eLN*			13 5						
	Lh	ePZ	21	56	17						
		eScSN	22	06	14						
	Wr	ePZ	21	56	27						
		USCGS H 21 45 07									
		36 $\frac{1}{2}$ S 78 $\frac{1}{2}$ E									
		Indian Ocean									
30	Wr	iPZ	22	57	59 d						
		iSN			58 47						
	Qt	ePZ			38						
		eXZ			53						
		eSNE			59 52						
	Lh	ePZ			58 44						
		H 22 57 02									
		36 $\frac{1}{4}$ N 68 E									
		Northern Afghanistan									
		USCGS H 22 57 00									
		37 N 68 $\frac{1}{2}$ E									
		Afghanistan-Tadzhik									
		border									
30	Qt	ePZ	23	43	53						
		USCGS H 23 36 42									
		53 N 106 E									
		Lake Baikal aftershock									

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	Quetta		17	eXZ	04 36 07
1	ePgE	07 40 04	17	eXZ	07 30 22
	eSgZ	16		eSZ	45
1	ePZE	12 26 16	17	ePZ	09 19 08
2	eXZ	12 11 17	17	ePZ	16 41 31
3	ePgE	15 31 13		eSN	42 03
	eSgE	23	18	ePZ	08 14 39
4	eXZ	12 41 26	18	ePgZ	08 50 47
4	eXZ	13 53 09		eSgN	51 02
4	ePZ	19 29 16	18	eXZ	15 43 55
5	ePZ	22 53 33	19	ePZ	05 59 00
	eSN	54 01	19	ePgZ	10 26 58.4
6	ePZE	10 27 20		eSgN	27 02.0
6	ePZ	16 20 44	20	ePZ	10 38 21
8	ePZ	14 03 39		eSN	39 00
9	ePZ	05 53 33	20	ePZ	17 06 36
	eSN	54 15		eSNE	56
10	ePZ	06 20 22	20	ePgZ	17 40 13.9
10	eXZ	06 29 06		eSgN	15 6
10	ePE	09 47 43	20	ePZ	20 13 14 d
10	ePgE	15 50 53		eSNE	14 35
	eSgZE	51 03	20	ePgZ	22 23 18.6
10	ePZE	16 17 33		eSgN	20.4
	eSNE	53	22	ePZ	00 12 48
10	ePZE	20 08 40	22	ePZ	20 38 19
11	ePZ	02 00 38		eSNE	36
11	ePZ	04 12 16	23	ePZ	05 38 18
12	eXZ	00 54 40		eSgZN	34
12	e(P)Z	19 04 22	23	ePZ	06 31 31
14	ePgZ	02 12 04	24	ePgZ	08 18 16.0
	eSgN	19		eSgZE	18.1
14	ePZ	08 14 10	24	ePZ	17 35 10
			26	ePZ	12 42 54
				eSN	43 11

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
26	ePZ	15 44 53	3	iPZ	13 47 11 o
	eSN	45 51		iSZ	48
27	ePZ	10 45 19	3	e(P)Z	16 22 31
27	e(P)Z	14 50 08	3	iPZ	17 30 11
27	e(P)Z	15 45 04		iSZ	58
	eSNE	48 23	3	ePZ	19 15 43
28	ePZ	02 42 29		iSZ	16 16
	eSNE	43 05	4	ePZ	02 03 16
28	ePZ	07 25 36		eSZ	04 04
	e(S)E	27 18	4	ePZ	06 29 48
28	ePZ	17 44 54	4	ePZ	09 57 42
	eSNE	45 59	4	ePgZ	11 02 49
31	ePZ	08 40 29		eSgZ	03 03
31	ePZ	13 14 22	4	ePZ	13 06 37
31	ePZ	15 12 21	4	ePZ	23 51 57
31	ePZ	16 00 02	5	ePN	19 40 41
	Warsak			eSN	41 18
1	ePZ	05 37 45	5	iPZ	23 54 26
1	iPZ	10 20 48		iSZ	55 05
1	ePZ	11 20 04	6	ePZ	01 43 30
	iSZ	33		iSZ	44 07
2	ePZ	05 35 30	6	ePZ	06 07 25
	iSZ	54	6	ePZ	16 15 37
2	iPZ	13 16 17 d	6	ePZ	18 15 09
	iSZ	46	6	ePZ	23 34 54
2	iPZ	21 26 59 c		iSZ	35 23
	iSZ	27 31	6	iPZ	23 52 28
2	ePZ	22 49 53		iSZ	49
	iSZ	50 24	7	iPgZ	05 41 47
3	ePZ	08 41 57		iSgZ	42 01
3	ePZ	12 56 12	7	iPZ	16 28 54
				iSZ	29 25

Minor Shocks

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

Minor Shocks

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

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
29	ePZ	05 13 33	9	eXN	02 52 20
29	iPZ	08 23 51	11	e(P)N	14 16 04
	iSZ	24 24	12	eXZ	10 58 54
29	ePZ	15 12 30	12	ePN	19 07 58
29	iPZ	19 14 27	18	ePZ	06 54 55
	iSZ	15 06	23	ePZ	05 41 19 c
29	iPZ	21 18 39 c		eSN	42 26
29	ePZ	21 48 13	28	eXN	07 25 18
30	iPZ	04 10 41	28	ePN	15 55 46
30	ePZ	10 41 10	28	ePN	22 27 37
	iSZ	50	29	ePN	05 13 02
31	iPZ	08 40 25		eSN	27
31	ePZ	11 22 49		Karachi	
	iSZ	23 19	6	eXZ	09 33 01
31	iPZ	11 50 09 c	7	eXZ	04 55 49.4
	iSZ	36	20	eXZ	21 15 58
31	iPZ	12 31 48	27	eXZ	12 50 17.2
	iSZ	32 22	27	eXE	23 59 17
31	iPZ	15 12 22	29	iXZ	17 11 05
	iSZ	15 03	30	eXE	23 03 53
31	iPZ	20 06 41		Chittagong	
	iSZ	07 14	1	eXZ	17 42 50
31	ePZ	21 10 42	3	ePZ	11 30 44
	iSZ	11 35	7	ePZE	19 22 09
	Lahore		8	ePZE	00 06 54
6	ePZ	16 15 06	8	eXE	14 00 54
	eSN	32	9	ePZ	02 44 43±
8	eXN	16 08 42	9	e(P)Z	04 58 51
8	ePZ	19 53 17	10	eXZ	00 59 13
	eSN	54 44	11	ePZ	15 33 51±
9	eXN	00 05 15	12	eXE	04 17 55

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
13	eXZE	15 42 28			
15	ePZE	18 52 06			
16	eXZ	01 10 31			
16	eXE	11 20 42			
18	eXE	22 16 36			
19	eXE	22 06 12			
20	ePZE*	07 38 24±			
20	ePZ	12 32 21			
20	eXZ	19 31 30			
23	eXZ	05 46 17			
24	eXN*	15 46 19			
24	ePZ	16 41 04			
25	eXN*	06 49 21			
26	eXZ	10 43 12			
27	eXZ	05 20 35			
28	ePZE	02 06 05			
28	e(P)Z	17 42 27			
30	eXZE	22 57 32±			
30	eXE	23 03 38			

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Pakistan Meteorological Service, Geophysical Institute, Quetta.

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Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaceous Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Quetta (Central Station)				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Contd).

Pakistan Meteorological Service

Director,
Meteorological Service

Deputy Director,
Geophysical Institute

Officer Incharge,
Seismological Section

Sibte Nabi Naqvi

Abdul Qadir Khan

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

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki) 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	Ch	ePgZ	01	01	15 c		Lh	iPZ			52 c
		eSgN			29			eSN			52 21
	Lh	ePZ		05	12		Ch	ePZ			48 04
	Wr	iPZ			44			USCGS H 11 37 42			
	Qt	ePZ		06	09			41 1/2 N 20 E			
		ePPPZ			55			Albania			
		eSNEN*		10	24	1	Qt	ePZ		15	55 54
		H 01 00 53						eSZE			57 40
		23 N 92 3/4 E						eLNE			57.9
		Assam-East Pakistan border					Wr	ePZ			56 06
								H 15 53 36			
1	Ch	ePKPN*	01	11	38			Iran-Turkmen border			
		USCGS H 00 52 04				1	Wr	iPZ		21	51 10
		11 S 74 1/2 W					Qt	ePZNE			52
		Peru						eSZNN*			53 13
1	Qt	ePZ	05	05	09		Lh	ePZ			51 56
		eSZ			06 56			eSZN			53 24
1	Lh	ePZ			46 00			H 21 50 06			
		eSN			47 06			Afghanistan-Tadzhik border			
	Wr	ePZ			46 22						
	Qt	ePZ			47 11	2	Ch	ePZ		13	02 16
		eSNE			49 09		Qt	ePZE			03 28
		H 05 44 34						USCGS H 12 52 20			
		Kashmir-Tibet border						Near east coast of Kamchatka			
1	Qt	ePZ	11	45	12 c	3	Ch	ePZ		06	35 14
		ePPZE			46 44			ePPZE			36 50
		ePcPN			47 21			ePPPE			37 18
		eSNEN*			51 04			eSE			41 23
		eLN*			54.3		Lh	ePZ			37 29
		i!ScSNE			55 24			eSN			45 33
	Wr	ePZ			45 27		Wr	ePZ			37 50

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Date	Station	Phase	h	m	s
	Qt	ePZE	38	03	
		ePcPZ		40	
		ePPNE	40	19	
		ePPPZNE	41	53	
		eSEN*	46	32	
		ePSN*		52	
		iScSN*	47	52	
		eLN*		54.8	
		ePKPPKPZ	07	07	01
		USCGS H 06 27 30			
		4½ S 123 E			
		Celebes Islands			
		Mag 6.2 (Up, Ki)			
4	Ch	ePZ	00	11	35
		eSN		12	48
	Lh	ePZ		13	33
	Wr	ePZ		14	08
	Qt	ePZ			51
		ePPZ		15	12
		iSN*		18	53
		eLN*			21.1
		H 00 09 50			
		Northern Assam			
4	Qt	ePZ	18	39	50 d
		eSN*		50	48
		USCGS H 18 26 41			
		1 S 24 W			
		Atlantic Ocean			
4	Qt	ePZNE	19	17	33
	Wr	ePZ		18	02
	Ch	e(P)ZE		19	08
4	Ch	ePZ	19	34	18
	Qt	ePZ		35	07

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Date	Station	Phase	h	m	s
	Kr	ePZ	45	24	
	Qt	ePZ			34
		ePPZN*	47	56	
		iSNN*		54	15
		iPPSN*			55
		iScSN*		55	20
		eLN*		16	02.9
		USCGS H 15 34 44			
		1 N 129 E			
		Halmahera after shock			
		Mag 6.1 (Up, Ki)			
5	Lh	ePZ	21	23	45 c
	Qt	ePZ		24	12 c
		USCGS H 21 12 02			
		5½ N 179½ E			
		Rat Islands			
		Aleutian Islands			
5	Lh	ePZ	21	40	24 c
	Qt	ePZ			52 c
		ePPZ		43	53
		iSN*		50	54
		eSSN*		56	02
		H 21 28 40			
		Aleutian Islands			
5	Lh	ePZ	22	05	04
	Qt	ePZ			31 c
		USCGS H 21 53 22			
		Rat Islands			
		Aleutian Islands			
5	Qt	ePKPZ	23	24	10
		USCGS H 23 05 00			
		18 S 178½ W			

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Date	Station	Phase	h	m	s	
8	Ch	Near north coast of New Guinea	10	11	32	
		ePZE				
		ePPZE				
		ePPPE				
	Wr Qt	eSEN*	12	59	c	
		iPZ				
		iPZ				
		USCGS H 10 03 27				
8	Qt	36½ N 140 E	13	25	21 d	
		Honshu, Japan depth about 100 km				
		ePZ				
	Wr	ePPZE	25	43		
		eSKSN*				
		iPZ				
8	Ch	USCGS H 13 12 04	19	27	55	
		South Atlantic Ocean about 700 miles east of Bonvet Island				
		ePZN*				
		ePZ				
	Wr Qt	iPZ	29	01		
		ePZ				
		epPZN				
		ePPZN*				
9	Wr	epPPNN*	05	45	09 d	
		USCGS H 19 19 39				
		42½ N 142½ E				
		Hokkaido, Japan depth about 100 km				
9	Wr	iSN	16	28	30	
		USCGS H 16 18 09				

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Date	Station	Phase	h	m	s	
10	Ch	9½ S 151½ E	23	06	01	
		Near east coast of New Guinea depth about 100 km				
		ePZ				
		ePPZ				
	Wr Qt	ePPPZ	07	18	d	
		eSN*				
		ePZ				
		ePZE				
11	Qt	USCGS H 22 56 34	14	29	51	
		47 N 152 E				
		Kurile Islands				
		ePZ				
12	Ch	USCGS H 05 44 38	00	28	51	
		Hindukush depth about 200 km				
	Wr Qt	USCGS H 05 44 38	31	03	c	
		Hindukush depth about 200 km				
12	Ch	USCGS H 00 22 01	11	36	01	
		6 S 106 E				
		Near west coast of Java depth about 100 km				
		ePZ				
	Qt	epPKPZ	02	00	17	
		epPKPZ				
		ePKPZ				
		USCGS H 01 41 03				
12	Ch	20 S 68 W	02	04	20	
		Southwestern Bolivia depth about 150 km				
		ePZ				
		ePZ				
12	Wr	iPZ	19	56	04 d	
		iSZ				
		ePZ				
		eSZNE				
12	Wr	Northern Afghanistan	20	46	33	
		iPZ				
		iSZ				
		ePZE				
12	Qt	eSNE	47	40		
		eSNE				

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		H 20 45 59					Lh	ePZ			57
		Hindukush region						eSN			19 28
12	Wr	iPN	21	20	46 d		Qt	ePZ			18 38
	Lh	iPZ	21	26	d			ePPZ			45
		iSN	22	24				eS EN*			20 45
	Qt	iPZNE	21	45	d			eLN*			21 6
		isPZNE		28			Kr	eSE			22 37
		isZNEN*	23	03			Ch	ePZ			21 03
		Mu Sec						eSE			25 10
		PZ 1 8 0 75						H 10 15 54			
		$\Delta = 6.02$						30° N 74 E			
								Tadzhikistan, S.S.R.			
	Kr	iPZ	21	22	46	13	Ch	ePZE	22	48	35
		eSZ		24	50			ePPZE			50 15
	Ch	ePZ			51			ePcPZE			31
		epPZN*		25	33			eSN*			54 55
		ePPZ			37		Lh	ePZ	50	48	d
		iPPPZE			53			eSN			58 58
		esPZN*		26	00		Wr	iPZ			51 08 d
		eSE		28	47		Kr	ePZ			21 d
		H 21 20 05					Qt	ePZ			25 d
		36 N 71 E						eSNEN*			23 00 11
		Hindukush						USCGS H 22 40 36			
		depth about 200 km						1 N 1.9 E			
		USCGS H 21 19 57						Halmahera Islands			
		36 N 71 E						region			
		Hindukush				14	Lh	ePZ	01	38	54
		depth about 200 km					Wr	iPZ			39 07
		Mag 6.4 (Qt)					Qt	ePZ			09
		Felt Rawalpindi,				14	Ch	ePKPZ	13	33	05
		Peshawar & Sargodha					Wr	ePKPZ			31 42
13	Wr	iPZ	19	17	29						

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
								28½ S 176½ W			
								Kermadec Islands			
	Qt	ePKPZ			50						
		eSKSEN*			42 03						
		USCGS H 13 15 49				14	Qt	ePZ	16	07	58
		24 S 176½ W				14	Qt	ePZ	16	15	09
		Tonga Islands region				14	Qt	ePZ	17	15	17
		Mag 5¾-6 (Berk)				14	Ch	ePZEN*	17	20	14
14	Ch	ePZEN*	14	23	36			ePPEN*			24 23
		ePPZ			27 48			ePPPN*			26 37
		ePPPE			30 01			iSKSEN*			30 51
		eSKSEN*			34 15			eSN*			31 51
		iSKKSEN*			45			eSSN*			38 58
		eSE			35 15		Lh	ePKPZ			25 07
		ePSEN*			36 48		Wr	ePKPZ			11
		ePPSN*			37 43		Qt	ePKPZ			18 c
		eSSN*			42 25			USCGS H 17 06 15			
	Lh	ePKPZ			28 27			29 S 176½ W			
	Wr	iPKPZ			36 c			Kermadec aftershock			
	Qt	iPKPZ			43 c			Mag 6.6 (Up, Ki)			
		ePPEN*			30 40	14	Lh	ePZ	17	32	33 c
		iPKSNEN*			32 17		Wr	iPZ			36 c
		ePPPN			33 23		Qt	iPZ			33 12 c
		iSKSE			35 49	14	Qt	ePZ	17	57	01
		eSKKSE			37 37	14	Qt	ePZ	20	46	15
		ePSZN			40 39	14	Lh	ePKPZ	22	42	45
	Kr	iPKPZ			28 45		Wr	ePKPZ			49
		USCGS H 14 09 39					Qt	ePKPZ			57 c
		28½ S 177 W						USCGS H 22 23 53			
		Kermadec Islands						29 S 177 W			
		Mag 7¾ (Pas), 7¾-8 (Berk),						Kermadec after shock			
		7.5 (Up, Ki)				14	Qt	iPKPZ	15	17	45 c
14	Qt	iPKPZ	15	17	45 c			Mag 6½ (Berk),			
		USCGS H 14 58 40						6.2 (Up, Ki)			

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15	Ch	ePZ	05	58	44		Qt	iPKPZ			23 d
	Wr	iPZ	06	02	45			ePPZEN*			24 51
	Qt	ePZ		03	12			epPKPZ			25 40
15	Ch	ePZE	06	13	41			esPPN*			27 55
		ePPZN*		17	53			iSKSNEN*			29 29
		ePPPZN*		20	06			iSKKSN*			30 24
		eSKSEN*		24	20			eSKSPN*			33 56
		eSKKSE			53			eSSN*			40 15
		eSE		25	24			USCGS H 11 05 33			
		ePSE		27	03			21½ S 179½ W			
		eSSN*		32	20			Fiji Islands region			
	Wr	ePKPZ		18	37			depth about 600 km			
	Qt	ePKPZ			45 c			Mag 6½ (Berk),			
		ePPZN*		20	37			7.1 (Up, Ki)			
		ePPPZ		23	19						
		USCGS H 05 59 42				15	Qt	ePZ			11 33 32
		28½ S 177 W				15	Qt	ePZ			13 50 22 d
		Kermadec after shock				15	Qt	ePZ			14 05 1 d
		Mag 6¾ (Pas), 7¼-7½ (Berk),				15	Qt	ePZ			22 53 47
		7.0 (Up, Ki)				16	Qt	ePZ			02 55 04
15	Qt	ePZ	06	36	33	16	Qt	ePZ			05 20 43
15	Wr	ePZ	08	19	20		Wr	iPZ			21 05
	Qt	ePZ			27	16	Wr	iPZ			09 43 10 d
15	Ch	ePZ	11	18	08		Lh	ePZ			52
		epPEN*		20	17			eSN			44 55
		ePPE		22	16		Qt	ePZ			13
		ePPPZ*		24	35			eSNE			45 36
		iSKSN*		27	48			H 09 42 38			
		iSE		28	42			35¾ N 71 E			
		ePSEN*		31	31			Hindukush			
		esSN*		32	33			depth about 160 km			
		eSSN*		35	52	16	Ch	ePN*			10 21 56
	Wr	iPKPZ		23	16 d			ePPN*			26 20

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPPZ*		28	33			ePZ			07 29 31
		e(PKS)N*		29	41	17	Qt	ePZ			12 20 03
		eSKSN*		32	33	17	Wr	ePZ			12 31 07
		eSE		33	46		Qt	ePZ			32 17
		ePSN*		35	24	17	Ch	ePE			14 50 10
		eSSN*		41	12			ePPE			54 24
	Qt	ePKPZ		26	51 c			eSKSE			15 00 54
		USCGS H 10 07 45						eSKKSEN*			01 24
		29 S 176½ W						eSEN*			49
		Kermadec Islands					Qt	ePKPZ			14 55 15
16	Ch	ePN*	16	10	56			iSKKSN*			15 04 06
	Qt	ePKPZ		16	09			ePSN*			07 20
		ePPN*		18	02			ePPSN*			08 55
		ePKSN*		19	44			eSSN*			14 21
		ePPPZ*		20	55			USCGS H 14 36 11			
		eSKSN*		23	13			28½ S 176 W			
		eSKKSN*		25	00			Kermadec Islands			
		eSSN*		35	12			Mag 5¾-6 (Berk),			
		USCGS H 15 57 03						5.8 (Up, Ki)			
		28½ S 176 W				17	Wr	ePKPZ			21 43 30
		Kermadec Islands					Qt	ePKPZ			35
		Mag 5¾-6 (Berk),					Lh	ePKPZ			37
		6.2 (Up, Ki)						USCGS H 21 24 27			
16	Qt	ePZ	16	30	25			13½ N 88½ W			
16	Qt	ePZ	17	08	45			El-Salvador			
16	Qt	ePZ	17	24	46			depth about 60 km			
	Wr	ePZ		25	36			ePKPZ			12 19 57
	Lh	ePZ			40	18	Qt	ePKPZ			20 07
16	Qt	ePZ	17	48	04		Wr	ePKPZ			
16	Qt	ePZ	18	01	05			Sandwich Islands			
16	Qt	ePZ	18	20	06			Mag 5.8 (Up, Ki)			
16	Qt	ePZ	19	23	37	18	Qt	ePZ			17 24 25 d
		e(S)N*		27	57			eSEN*			51

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Wr	ePN	25	00		Wr	ePZ		21	05	
		H 17 23 50				Qt	ePZ		21	d	
		Eastern Baluchistan					eSKSN*		31	49	
19	Wr	ePZ	04	20	39		iSN*		32	04	
	Qt	ePZ		21	17		ePSN*		33	08	
19	Qt	ePZ	16	05	38		eSSN*		37	50	
		ePPZ			48		USCGS H 02 08 28				
		eSEN*	08	05			9½ S 149 E				
		eLN*	09	6			Near coast of				
	Wr	iPZ	06	29			New Guinea				
	Lh	ePZ			49	21	Wr	iPZ	12	21	28
		H 16 02 29					Lh	ePZ			54
		Southwestern Iran					Qt	iPZ	22	34	c
19	Qt	ePZ	18	43	51			ePPZN			44
	Wr	ePZ			44			eSNN*			24
20	Wr	ePZ	04	09	28			H 12 20 37			
	Qt	ePZE			28			Kirghiz, S.S.R.			
		eXZ	11	55							
20	Qt	ePKPZ	06	28	06	21	Wr	ePZ	13	20	11
		USCGS H 06 07 59					Qt	ePZ			20
		13½ S 111½ W					Ch	ePZE	21	21	
		Pacific Ocean				21	Kr	ePnZ	17	52	31
		north of Easter Islands						ePgZ			34
21	Ch	ePZ	02	19	09			iXZ			44
		ePcPZE			42			iSgE			57
		ePPZN*	21	34			Qt	ePnZ	53	06	
		ePPPZN*	23	08				eP*Z			14
		eSN*	27	49				iPgZN			22
		ePSN*	28	11				eSnEN*			56
		ePPSEN*	18					eS*N*			54
		eScSEN*	29	00			Lh	ePZ			17
		eSSN*	32	01				eSN			56
	Lh	ePZ	02	20	51		Wr	iPZ			54

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		H 17 52 00						29½ S 176½ W			
		26¼ N 65¾ E						Kermadec Islands			
		Kalat, West Pakistan				25	Ch	ePZ	00	21	56
22	Ch	ePZ	06	04	29			ePPE			23
		eP*ZE			33			ePPPE			42
		ePgZE			37			iSN*			27
		eSnEN*	05	02				eSSEN*			30
		eSgEN*			10		Lh	ePZ			24
	Wr	ePZ			08			eSN			31
	Qt	ePZ			09		Kr	ePZ			24
		eSNN*			13		Wr	iPZ			36
		H 06 03 45					Qt	ePZ			42
		22½ N 93 E						eSN			32
		Assam-Burma border						USCGS H 00 14 30			
22	Qt	ePZ	07	58	37			9 S 113½ E			
22	Qt	ePZ	08	33	20			Off east coast of Java			
		eSNEN*			35						
	Wr	ePZ			33		25	Ch	ePN*	02	42
		H 08 30 04						ePPN*			43
		Caspian Sea						eSN*			47
23	Ch	ePE	22	31	03			eSSN*			48
	Wr	ePZ			32		Lh	ePZ			44
	Qt	ePZ			33			ePPZ			46
		eSN*			40			ePPPZ			47
24	Wr	ePZ	05	52	42			eSN			51
	Lh	ePZ			58			eSSN			54
	Qt	ePZ			53		Wr	ePZ			45
		eSN*	06	00	52		Qt	ePZ			40
		USCGS H 05 43 38						ePcPZ			47
		83½ N 112½ E						ePPZE			32
		Arctic Ocean						ePPPZEN			48
24	Qt	ePKPZ	20	03	34			iSNN*			52
		USCGS H 19 44 29						eScSNEN*			55

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSSZE	56	12				35 $\frac{3}{4}$ N 71 $\frac{1}{4}$ E			
		eLNN*	56	8				Hindukush			
	Kr	ePZ	45	45	c			depth about 150 km			
		USCGS H 02 36 48				26	Qt	ePZ	19	59	25
		22 N 122 E				27	Ch	ePE	10	28	18
		Near east coast					Lh	ePZ	31	05	
		of Formosa					Wr	ePZ		25	
		Mag 6.8 (Up, Ki)					Qt	ePZ		39	
26	Qt	ePZEN*	08	34	33			iPcPZNE		59	
		ePPZ	38	27				eSNE	40	53	
		eXN*	39	00				USCGS H 10 20 18			
		ePPPN*	40	41				5 $\frac{1}{2}$ S 129 $\frac{1}{2}$ E			
		eSKSN*	45	13				Banda Sea			
		eSNN*	52			27	Wr	iPZ	12	41	53
		USCGS H 08 20 51					Lh	ePZ	42	35	
		43 $\frac{1}{2}$ N 128 $\frac{1}{2}$ W					Qt	ePZ		45	
		Off coast of Oregon						esPNE	43	12	
26	Qt	ePKPZ	10	37	35			eSNE	44	03	
	Lh	ePKPZ		44				H 12 41 05			
		USCGS H 10 18 20						36 $\frac{1}{2}$ N 70 E			
		22 S 68 $\frac{1}{2}$ W						Hindukush			
		Chile						depth about 200 km			
		depth about 150 km				28	Ch	ePZE	04	27	14
26	Wr	iPZ	15	42	22 d			ePPZ		28	32
		iSN		52				eSE		32	40
	Lh	ePZ	43	02			Wr	iPZ	29	20	
		eSN	44	03			Qt	ePZ		53	
	Qt	ePZ	43	22				USCGS H 04 20 27			
		esPZN		58				26 $\frac{1}{2}$ N 128 E			
		eSNE	44	39				Okinawa Islands			
	Ch	ePZ	46	40		29	Ch	ePZE	15	46	01
		eSEN*	50	45				ePPZ		50	21
		H 15 41 47									

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPPE	52	32			Lh	ePZ			37
		eSKSE	56	41				H 10 24 27			
		eSE	57	46				32 $\frac{1}{2}$ N 43 $\frac{3}{4}$ E			
		ePKPZ	15	50	53			Western Iran			
	Wr	ePKPZ				30	Qt	ePKPZ	13	50	35
	Qt	ePPZN*	53	00				USCGS H 13 31 30			
		ePKSZN*	54	38				29 S 176 $\frac{1}{2}$ W			
		ePPPN*	55	43				Kermadec Islands			
		eSKSN*	58	09		30	Ch	ePZ	20	38	31
		eSKKSN*	59	56			Qt	ePKPZ		44	05
		eSKSPN*	16	02	56			USCGS H 20 25 58			
		USCGS H 15 31 57						18 S 168 E			
		29 S 176 $\frac{1}{2}$ W						New Hebrides Islands			
		Kermadec Islands						Mag 6 $\frac{1}{2}$ (Pas), 6.2 (Up, Ki)			
		Mag 6 $\frac{1}{2}$ -6 $\frac{3}{4}$ (Pas),									
		6 $\frac{1}{4}$ (Berk), 6.5 (Up, Ki)				29	Ch	ePZ	15	55	23
		USCGS H 15 41 21					Qt	ePKPZE	16	00	26
		29 S 176 W									
		Kermadec Islands									
						30	Ch	ePZ	03	36	41
								ePPZ		37	46
								ePPPZ		38	02
								eSZ		41	54
							Wr	ePZ		39	02
							Qt	ePZ			35
								USCGS H 03 30 05			
								27 N 125 E			
								Ryukyu Island			
						30	Qt	ePZ	10	28	30
								eSNE		31	41
							Wr	ePZ		29	09

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				Minor Shocks					
Date	Phase	h	m	s	Date	Phase	h	m	s
	Quetta				7	ePgZ	06	35	53
1	ePZ	18	53	51		eSgNE		36	01
2	ePgZ	03	15	42	7	ePgZ	06	58	19
	eSgZN			52		eSgNE			28
2	ePgZ	07	50	18	7	ePZ	10	59	04
	eSgE			29		eSZNE			28
2	ePE	19	29	58	7	ePgZ	12	00	41
	eSZE			30 17		iSgZNE			51
2	iPgZE	22	50	34 d	7	ePgZ	16	54	39
	iSgNE			45		eSgZNE			47
3	ePZE	02	16	47	7	ePZE	21	31	11
3	eXZ	04	01	0		eSZE			32 27
3	ePZ	07	51	46	7	ePgZ	23	36	28
3	ePE	22	34	53		eSgZNE			37
	eSE			36 14	8	ePZE	01	11	47
3	ePZ	22	44	38	8	iPZ	08	45	21
	iSZNE			45 02		eSZNE			52
4	ePZE	08	58	17	8	ePZ	08	58	21
4	ePZE	09	05	52		eSZNE			59 48
4	ePZE	14	03	0	10	eXZ	19	13	3
4	eXE	14	52	5		ePE	05	02	02
4	ePgNE	16	25	37	10	eSE			57
	eSgNE			42	10	ePZE	05	48	12
5	ePZ	21	48	29	10	ePgZE	09	49	44
6	eXZ	01	53	9	11	eSgNE			49
6	ePZ	04	03	16		ePgZE	00	46	32
6	ePgZE	11	32	36	11	eSgZNE			45
	eSgNE			47		ePZE	10	57	36
7	ePZ	02	31	21	11	eSNE			58 14
7	ePgZ	05	58	14	11	ePZE	11	39	18
	eSgZNE			23	11	ePE	20	25	24
						eSNE			47
					12	eXZ	07	08	13

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				Minor Shocks					
Date	Phase	h	m	s	Date	Phase	h	m	s
12	eXZ	08	30	10	19	ePZE	11	31	53
12	eXZ	09	00	07		eSE			32 42
12	eXZ	10	00	11	19	eXZ	12	23	59
13	ePgNE	01	34	39	19	eXE	12	26	04
	eSgNE			47	19	ePZE	14	25	35
13	ePZE	08	39	42		eSE			58
	eSNE			40 30	20	ePZ	03	45	09
13	ePZE	22	43	13	20	ePE	06	30	48
	eSNE			35		e(S)E			32 51
14	ePZ	01	39	09	20	ePZE	14	05	19
14	e(P)Z	02	13	18		eSNE			39
14	ePZE	03	20	46	21	ePZ	03	38	43
	eSNE			22 07	21	ePZ	08	13	43
14	e(P)Z	07	17	13		eSN			14 53
14	ePZ	17	15	17	23	ePZ	10	48	20
14	ePZE	20	37	39	23	ePZE	12	45	25
	eSNE			38 42		eSZNE			46 57
15	ePZ	11	43	12	23	ePgZ	13	22	33
15	ePgZ	21	53	26		eSgN			36
	eSgNE			28	23	ePZ	13	58	25
16	ePZ	06	42	29	24	eXZ	10	59	51
16	eXZ	18	15	0		eSZ			54
17	ePZ	02	48	42	24	ePZ	14	16	29
17	ePZ	12	41	32		eSN			54
18	ePZ	02	37	45	24	ePgZ	23	01	32
	eSN			38 14		eSgNE			46
18	ePZ	14	23	25	25	ePZE	08	55	54
	eSZNE			43		eSN			56 22
18	ePZ	22	55	27	25	ePZE	20	10	42
18	ePZ	23	52	10		e(S)NEN*			13 41
19	ePZ	00	36	00	26	ePZ	13	36	50
					28	ePZ	14	33	36

Date	Phase	h m s	Date	Phase	h m s
28	ePZE	21 51 35	5	iPZ	04 47 08
	eSNE	52 16		iSZ	35
29	ePZ	09 01 52	5	eXZ	15 45 03
29	ePE	18 21 00	5	iPZ	18 17 09
	eSE	22 11		iSZ	42
30	eXE	15 08.0	6	ePZ	00 02 44
30	eXZE	21 00.0		iSZ	03 11
30	ePZE	21 55 12	6	ePZ	01 16 31
	eSNE	37		iSZ	17 09
30	eXZ	22 08.8	6	ePZ	04 44 40
	Warsak			iSZ	46 18
1	ePZ	03 05 11	6	iPZ	06 48 03
	iSZ	54		iSZ	26
2	iPZ	13 48 12 c	6	ePZ	13 27 12
	iSE	42	7	ePZ	07 13 54
2	iPZ	17 24 16 d		iSZ	14 41
	iSN	25 52	7	ePZ	13 57 30
3	iPZ	03 39 35 c		iSZ	58 04
	iSZ	40 35	7	ePZ	21 30 08
3	iPZ	18 09 49 c		iSZ	37
	iSZ	10 24	8	iPZ	01 52 02
3	iPgZ	19 45 54 c		iSZ	37
	iSgZ	46 08	8	iPZ	08 57 16
3	ePZ	22 33 49		iSZ	52
	iSZ	34 22	8	iPgZ	13 53 20
4	iPZ	06 28 14 c		iSgZ	29
	iSZ	51	9	ePN	09 31 37
4	iPgZ	06 54 26 c		iSN	32 02
	iSgN	35	9	ePN	09 39 13
4	ePZ	14 19 02		eSN	42
	iSZ	38	9	eXN	11 18 05
5	ePZ	00 13 41	9	eXN	13 01 50

Date	Phase	h m s	Date	Phase	h m s
10	ePZ	05 47 56	15	iPZ	23 54 36 d
10	iPZ	07 04 20 d		iSZ	55 06
	iSZ	49	16	iPZ	04 29 53 c
10	ePgZ	10 32 52		iSZ	30 20
	iSgZ	33 02	16	iPZ	12 32 35 d
10	iPZ	11 58 49 d	16	iPZ	16 36 09 d
	iSZ	59 35		iSZ	48
10	iPZ	12 39 54 d	16	ePZ	17 25 36
10	ePZ	14 04 35	16	iPgZ	21 48 09 d
10	ePZ	22 26 11		iSgZ	22
	iSZ	41	17	ePZ	00 35 58
11	ePZ	10 57 39	17	ePZ	03 18 18
11	ePZ	14 14 46	17	iPZ	04 22 25 c
	iSZ	42 21		iSZ	58
12	ePZ	09 02 44	17	iPgZ	07 56 32 d
12	iPZ	12 57 22 c		iSgZ	45
	iSN	53	17	iPZ	09 22 10 d
12	iPgZ	15 58 01 d		iSZ	39
	iSgZ	10	17	ePZ	11 14 46
13	ePZ	06 46 26	17	ePN	15 34 14
14	ePZ	09 39 56	17	ePZ	17 49 18
	iSZ	40 21		iSZ	59
14	ePZ	14 07 04	18	ePZ	00 45 26
	iSZ	37		iSZ	46 20
14	ePZ	15 26 40	18	ePZ	02 38 11
14	iPgZ	20 36 35 d	18	ePZ	04 36 56
	iSgN	46	18	ePZ	08 28 30
15	ePZ	12 09 20		iSZ	29 02
15	iPZ	16 18 12 d	19	ePZ	11 03 01
15	iPZ	21 10 52 d		iSZ	30
	iSZ	11 25	19	ePZ	12 22 51

Minor Shocks

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

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
30	iPZ	22 05 56	20	ePN	09 29 36
	iSZ	06 48		e(S)N	30 46
	Lahore		20	eXZ	11 55 50
3	ePZ	00 12 10 c	20	ePZ	23 37 06
	eSN	35	22	eXZ	06 10 53
3	ePZ	19 46 57	22	ePZ	13 46 17
5	ePZ	00 13 06	22	ePZ	19 37 18
	eSN	32	23	ePZ	13 55 54
6	ePZ	20 14 41	26	eXZ	08 39 12
9	eXZ	11 16 52	26	eXN	09 39 10
9	eXZ	13 00 28	30	ePN	20 59 15
11	ePZ	22 18 37		Karachi	
	eSN	19 02	1	eXZ	11 45 37
12	ePZ	19 56 43	9	eXZ	05 47 18
	eSN	57 51		eSE	49 20
12	ePZ	20 47 13	15	eXZ	06 18 43
	eSN	48 12	15	eXZ	11 08 23
14	ePZ	20 37 28	18	eXZ	17 44 22
17	ePZ	03 19 06	19	eXZ	11 31 10
	eSN	40	27	eXZ	12 43 48
17	ePZ	11 14 05		Chittagong	
	eSZ	38	1	eXZ	21 54 05
17	eXN	12 33 00	3	eXE	02 58 08
17	ePZ	17 51 40	3	eXE	22 08 55
18	ePZ	12 27 01 c	4	eXZ	12 49 05
18	eXN	17 26 34	4	eXZ	18 40 14
20	ePZ	00 03 30	5	ePgZ	03 49 03
	eSN	51		eSgE	17
			5	eXN	05 35 55

Date	Phase	h	m	s	Date	Phase	h	m	s
5	eXZ	15	42	29					
5	eXZ	21	23	34					
5	ePZ	21	54	51					
5	eXZE	22	04	49					
9	eXN*	02	00	40					
9	eXN*	11	14	21					
9	eXN*	12	58	06					
11	eXZ	14	31	30					
12	eXZ	09	02	02					
12	ePZ	14	51	09					
12	eXZ	17	20	24					
14	eXZ	09	55	25					
14	eXZE	22	41	00					
15	eXN*	13	55	17					
16	eXN*	17	06	40					
16	eXN*	19	19	28					
18	eXN*	12	21	54					
19	eXN*	16	10	04					
20	eXN*	06	31	03					
21	eXN*	12	26	22					
21	eXZ	17	58	10					
22	eXN*	08	37	07					
22	eXZ	13	52	55					
23	ePE	22	31	03					
24	eXZ	05	57	32					
26	eXE	08	40	05					
28	ePZ	01	22	18					
29	ePZE	17	52	21					

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Pakistan Meteorological Service

Director,
Meteorological Service

Sibte Nabi Naqvi

Deputy Director,
Geophysical Institute

Officer Incharge,
Seismological Section

Abdul Qadir Khan

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All correspondence regarding the supply of this bulletin on exchange basis should be addressed to the Director, Meteorological Service, Secretariat Block No. 3, Frere Road, Karachi-1, 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	63° 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 "	—	—
Lahore Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Sec=Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki) 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	20 38 30 d	5	Qt	ePZ	11 46 32
		iSZ	39 03			USCGS H	11 33 14
	Lh	ePZ	04 d			45 N 111 1/2 W	
		eSN	40 04			Yellow Stone aftershock	
	Qt	ePZ	39 28 c	5	Wr	ePZ	18 05 28
		iSNE	40 46		Lh	ePZ	45
	Ch	ePZ	43 01		Qt	ePZ	06 01
		H 20 37 48				USCGS H	17 56 25
		36 1/4 N 70 1/2 E				84 N 113 E	
		Hindukush				North Polar region	
		depth about 200 km		5	Qt	ePZ	18 20 56
2	Qt	ePZ	20 59 42			USCGS H	18 11 18
3	Qt	ePZE	00 50 21			North Polar region,	
3	Ch	ePZ	09 17 30			northeast of Severnaya	
	Wr	ePZ	19 49			Zemlya	
		USCGS H	09 08 33	5	Wr	ePZ	18 36 51
		14 1/2 N 142 E			Lh	ePZ	37 09
		Mariana Islands region			Qt	ePZ	25
3	Ch	ePZ	20 11 04			ePcPN*	38 26
	Wr	iPZ	12 48 c			ePPN*	39 29
	Qt	ePZ	13 15 c			iSNN*	45 17
		USCGS H	20 02 40			eScSN*	47 18
		42 N 146 E				eSSN*	49 01
		Off coast of Hokkaido,				eLN*	50.7
		Japan			Ch	ePZN*	38 09
4	Qt	ePKPZ	11 12 50			ePcPZ	48
	Wr	ePKPZ	56			ePPN	40 27
	Ch	ePKPE	13 24			ePPP*	41 55
		USCGS H	10 53 27			eSN*	46 36
		31 S 70 W				ePSN*	48
		San Juan Province				ePPSN*	56
		Argentina				eScSEN*	47 59
		depth about 150 km					

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s		
5	Qt	USCGS H 18 27 47	20	41	37	83½ N 112½ E	Arctic Ocean	eSNN*	44	14			
		Mag 5½-6 (Berk),						eLN*	47	4			
		5.9 (Up, Ki)						Wr	ePZ	38	26		
								Kr	ePZ		36	c	
								Lh	ePZ		51		
								Ch	iPZ	41	06	c	
									ePcPZ		46		
									ePPZN*	43	25		
									ePPPZN*	44	54		
									eSEN*	49	31		
6	Ch	USCGS H 20 34 04	05	51	32	41 N 20 E	Albania	ePZE					
		Mag 5.5 (Up, Ki)						epPZE		52	10		
								esPZ		45			
								ePPZE		53	10		
								esPPEN*		52			
								eSEN*		57	09		
								Wr	iPZ	54	17	d	
								Qt	iPZ		20	d	
									eSNN*	06	02	33	
									USCGS H 05 44 37				
7	Qt	½ N 122½ E	08	38	12 c	Celebes Islands	depth about 200 km	ePZ					
								ePPZ		39	47		
								ePPPZE		40	10		
								ePcPZN		22			
									USCGS H 08 30 41				
									41 N 20 E				
									Albania				
									Mag 5.9 (Up, Ki)				
									8 Ch	ePZE	00	15	52
										ePcPZE		58	
			ePPEN*	19	01								
			eSKSN*	26	13								
			eScSN*		20								
			ePSN*		55								
		USCGS H 00 03 28											
		19 S 169 E											
		New Hebrides Islands											
		8 Ch	ePZE	02	47	14 c							
			ePcPZE		26								
			ePPZE		50	04							
			ePPPZEN*		51	56							
			eSN*		56	58							
			eSKSN*		57	21							
			ePPSN*		48								
		Wr	ePZ	47	23								

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	Qt	Lh	ePZ		28	9	Qt	H 19 59 45							
			ePZ		53			Nepal-Tibet border							
			eSN*	58	16										
			USCGS H 02 35 20												
			52½ N 171 W												
			Fox Islands												
			Aleutian Islands												
		8	Wr	ePZ	11				00	36					
			Qt	ePZ					01	48					
				eSNE					04	11					
8	Ch	H 10 58 46	14	20	51	Kirghiz, S.S.R.	ePE								
		ePPEN*						22	03						
		eSEN*						26	11						
		Qt					ePE		21	03					
							USCGS H 14 14 10								
							52½ N 107 E								
							Lake Baikal S.S.R.								
							8 Wr	iPZ	15	23	35				
								iSZ		24	04				
							Lh	ePZ			18				
8	Qt		eSZ		25	19									
			ePZ		24	31									
			eSNE		25	43									
			H 15 22 57												
			35½ N 70½ E												
			Hindukush												
			depth about 150 km												
			8 Wr	ePZ	20	02	23								
			Qt	ePZ		03	08								
				eSN*		05	47								
11	Qt					11	Qt	ePKPZE	18	09	27				
								USCGS H 17 50 22							
									28½ S 176½ W						
										Kermadec Islands					
											11 Ch				
												ePZ			
													20		
														13	
															32
				ePZ											
					15										
						48									
							USCGS H 20 03 10								
								Near north coast of							
									New Guinea						
										11 Qt					
											ePKPZ				
												20			
													22		
				31											
					USCGS H 20 03 25										

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		28½ S 176½ W Kermadec Islands						Near coast of Sumatra Mag 6.3 (Up, Ki)			
12	Qt	ePZ	01	13	13	12	Qt	ePKPZ	04	03	01
	Wr	ePZ			26			USCGS H 03 43 44			
12	Wr	iPN	01	39	51 d			19 S 68½ W Northern Chile- Bolivia border depth about 150 km			
	Lh	ePZ			40 34						
		eSN			41 37						
	Qt	ePZN			40 54 d						
		eSNE			42 17	12	Ch	ePZ	19	29	04
		H 01 39 08					Lh	ePZ			51
		36½ N 71 E Hindukush depth about 150 km						eSN			32 51
							Qt	ePZ			30 21
								eSNN*			33 50
12	Ch	iPZEN*	03	26	42 c		Wr	ePZ			30 34
		iIXZEN*			56			H 19 25 56 Bay of Bengal			
		ePPZE			27 07	13	Wr	iPZ	05	51	21 d
		ePPPZE			17		Qt	ePZ			52 20 d
		iXZ			39			eSNE			53 39
		iSEN*			30 39			H 05 50 46 Hindukush			
		iPcPZN*			44						
		iSSEN*			31 14	14	Qt	ePZ	07	30	26
	Lh	ePZ			29 04			iSZNE			32 39
	Kr	ePZ			12		Wr	iPZ			30 49
	Wr	iPZ			34 c			H 07 27 33 Northern Iran			
	Qt	ePZ			37 c						
		e(pP)Z			48						
		ePcPZ			31 36	14	Ch	ePE	08	20	05
		iSN*			35 42		Qt	ePZ			21 45
		e(sS)N*			36 07			eSZNEN*			23 59
		eLN*			38 52			H 08 18 52			
		USCGS H 03 21 52				14	Ch	ePZ	10	03	04
		2 N 98½ E					Wr	ePZ			05 13

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Qt ePZ			47 c			Mu Sec			
		USCGS H 09 56 13 Ryukyu Islands region						PPZ 2.0 2.5 Δ = 58.7			
15	Qt	ePZ	04	35	14 c			USCGS H 06 15 32 ½ N 120 E Celebes Mag 6½ (Pas), 6.9 (Qt), 6.8 (Up, Ki)			
		USCGS H 04 22 44 5½ S 146 E Near north coast of New Guinea									
15	Ch	ePZ	06	22	33 d	15	Ch	ePZ	07	49	36
		ePPZE			23 55		Lh	ePZ			50 23
		ePPPZE			24 10		Wr	ePZ			28
		ePcPZE			25 02		Qt	ePZ			51 03
		iSEN*			28 09			USCGS H 07 40 20 44 N 148 E Kurile Islands			
		ePcSEN*			47						
		eSSN*			30 27	15	Ch	ePZ	20	45	05
		eSSSN*			49		Qt	ePZ			46 24
		Mu Sec						USCGS H 20 33 45 Fox Islands Aleutian Islands			
	Lh	ePZ			24 55						
		ePPZ			26 58	16	Qt	ePKPZ	01	34	33
		eSN			32 32		Wr	ePKPZ			41
	Wr	ePZ			25 19		Lh	ePKPZ			46
	Kr	ePE			24			USCGS H 01 15 08 30½ S 69 W San Juan Province, Argentina depth about 100 km			
		ePPE			27 42						
	Qt	ePZ			25 33						
		iXZ			26 01						
		ePPZE			27 44	16	Ch	ePZE	16	22	38
		ePPPZN			29 04			ePPZE			24 18
		ePcSZE			30 21			ePcPZ			39
		eSZNEN*			33 37			ePPPZ			45
		ePKPPKPZNE			55 12						

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		eSN*	28	51			Qt	ePZE			55
		eSSN*	31	46				eSNE		40	38
Lh		ePZ	24	54				H 19 36 43			
		e(S)ZN	32	40				Tadzhik-Afghanistan			
Wr		ePZ	25	18				border			
Qt		ePZ		33		17	Wr	ePZ	20	40	00
		ePcPZ	26	08			Qt	ePZ			25
		ePPZ	27	58			Ch	ePZ			30
		eScSN*	35	20				USCGS H 20 27 35			
		eLN*	42	8				60 N 138½ W			
		USCGS H 16 14 53						Yukon-British			
		6 N 125 E						Columbia border			
		Near south coast of				18	Ch	ePZ	05	51	38
		Mindanao						eSN*			57 43
		Philippine Islands				18	Qt	ePZ	05	54	36
17	Qt	ePZ	02	45	30			USCGS H 05 44 04			
17	Qt	ePKPZE	08	54	26			South of Honshu, Japan			
		USCGS H 08 35 00				18	Ch	ePZ	17	16	19 c
		57½ S 161 W						ePPZ			13 30
		South Pacific Ocean						ePPPZ			19 54
17	Lh	ePZ	10	48	28			eSZN*			24 27
	Wr	ePZ			48		Wr	iPZ			16 43
	Qt	ePZ	49	52			Qt	ePZ			17 19
		eSNEN*	52	04				USCGS H 17 06 13			
		H 10 47 00						50½ N 156 E			
		34½ N 80½ E						Off south coast of			
		Western Tibet				18	Wr	iPZ	23	34	03 c
17	Qt	ePZ	13	30	00		Qt	ePZ			05 c
17	Wr	iPZ	19	37	48			USCGS H 23 25 13			
		iSZ			38 38			6 S 105 E			

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Sunda Strait					Ch	ePKPZ			33
		depth about 150 km						ePPZN*			16 27
19	Ch	ePZ	02	55	49			ePKSZN*			18 10
		eSE	03	03	01			ePPPZN*			19 11
	Lh	ePZ	02	56	41			eSKSN*			21 35
	Wr	ePZ			46 c			eSKKSN*			23 18
	Qt	ePZ			57 23 c			ePSN*			26 29
		ePPE			59 44			ePPSN*			27 57
		eSNE	03	05	51			eSSN*			33 20
		USCGS H 02 46 49						USCGS H 15 55 30			
		44½ N 148 E						54½ S 29 W			
		Kurile Islands						Sandwich Islands region			
19	Qt	ePZ	08	46	24			Mag 6.4 (Up, Ki)			
		USCGS H 08 27 21				19	Qt	ePZ	16	24	48
		27½ S 177 W				20	Qt	ePZ	17	49	30
		Kermadec Islands				20	Ch	ePZ	21	48	20
19	Qt	ePKPZ	09	34	25		Qt	ePZ			50 24
		USCGS H 09 15 20				22	Qt	ePnZ	09	36	06 d
		28 S 176½ W						ePgZE			10
		Kermadec Islands region						eSnNE			31
19	Qt	ePKPZ	16	14	16		Wr	ePZ			45
		ePPZN*			15 25			H 09 35 32			
		ePKSZN			17 52			Eastern Baluchistan			
		ePPPZ*			18 12	22	Qt	ePnZ	11	21	58 d
		eSKSN*			21 14			ePgZE			22 02
		eSKKSN*			22 36			eSnNE			23
		eSKSPN*			25 14			eSgNE			27
		eSSN*			31 36		Wr	ePZ			37
	Wr	ePKPZ	14	26				H 11 21 24			
	Lh	ePKPZ			27			Eastern Baluchistan			

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22	Qt	ePZ	19	39	43		H 23 40 29				
		USCGS H 19 27 08					41½ N 69½ E				
		52½ N 170½ W					Uzbekistan, S.S.R.				
		Fox Islands					USCGS H 23 40 34				
		Aleutian Islands					41½ N 70 E				
23	Qt	ePnZ	05	50	06 d		Kazakh, S.S.R.				
		eSnZE			32	25	Qt	ePZ	07	02	52
	Wr	ePZ			46		USCGS H 06 51 09				
		H 05 49 31					Atlantic Ocean				
		Eastern Baluchistan					North of Azore				
23	Qt	ePZ	16	56	17 d	25	Qt	ePZ	16	02	56
		ePPZ			24			eSNEN*			07 01
		eSNEN*			57 46		Wr	ePZ			03 13
		iSSZN			58 00		Ch	ePZ			06 14
		eLN*			58 2			ePPZN*			08 01
	Wr	ePZ			56 59			ePPPZN*			49
		USCGS H 16 54 23						USCGS H 15 57 51			
		33½ N 59 E						39 N 42 E			
		Eastern Iran						Eastern Turkey			
23	Qt	ePZE	17	16	46			Mag 8.2 (Up, Ki)			
		eSN			18 54	25	Ch	ePZ	17	17	19
		eSSN*			19 03		Wr	ePZ			49
	Wr	ePZ			17 25		Qt	ePZ			18 08
		H 17 13 59						USCGS H 17 07 41			
		Northern Iran						Talaud Islands region			
24	Wr	iPZ	23	42	29	26	Wr	iPZ	00	52	10
	Lh	ePZ			43 08			iSZ			44
	Qt	ePZ			24		Qt	ePZ			53 06
		iXZN			44 03			eSE			54 24
		eSZEN*			45 40			H 00 51 24			
		eSSN*			58			Hindukush			
	Kr	ePZ			44 32						

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26	Ch	ePZ	07	43	34 c			Mag 6 (Berk), 6½ (Pas),			
		epPZ			54			6.8 (Qt), (Up, Ki)			
		esPZ			44 04	26	Ch	ePZ	10	38	47 c
		ePPZ			45 27		Wr	ePZ			39 14
		ePPPZ			15		Qt	ePZ			50 c
		eSZ			50 16			USCGS H 10 29 09			
		ePSZ			42			51½ N 157½ E			
		esSZ			49			Near east coast of			
		Mu			Sec			Kamchatka			
		PZ	1.5		0.6			depth about 150 km			
		Δ = 46°-8				27	Ch	iPZ	07	02	05
	Wr	ePZ			44 53			epPN*			32
	Qt	ePZ			45 29 c			esPN*			50
		epPZ			49			ePcPZN*			03 06
		esPZ			56			ePPZN*			04 09
		ePcPZ			46 10			ePPPZN*			05 21
		ePPZE			47 56			iSZN*			09 33
		esPPZ			48 20			ePSZN*			10 06
		ePPPZE			49 41			esSN*			11 35
		iSNN*			53 50			ePKPPKPZ			32 16
		esSN			54 20			Mu			Sec
		ePKPPKPZ			08 14 38			PZ	1.9		1.0
		Mu			Sec			Δ = 53°-8			
		PZ	1.5		1.9		Lh	ePZ			02 50 c
		Δ = 62°-3					Wr	iPZ			52 c
	Kr	ePZ			07 45 44		Qt	iPZ			03 29 c
		USCGS H 07 35 12						epPZ			46
		37½ N 142½ E						ePPZN			05 53
		Near east coast of						epPPZ			06 16
		Honshu, Japan						ePPPZ			07 28
		depth about 60 km						epPPPNE			48
								iSNN*			12 06

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		esSE			42	29	Ch	ePZ	10	44	39
		eScSNE	13	03			Wr	ePZ		45	29
		eSSNE	16	28			Qt	ePZ		46	06 c
		ePKPPKPZ	32	12				USCGS H 10 35 20			
		Mu Sec						46 N 151 E			
		PZ 2.5 1.9						Kurile Islands			
		$\Delta = 65^\circ 7$				29	Ch	ePZ	14	36	46
Kr		ePZ	03	50			Lh	iPZ		37	59
		USCGS H 06 52 50						epPZ		39	36
		45½ N 151 E						iSN		44	01
		Kurile Islands						Mu Sec			
		depth about 100 km						PZ 1.2 1.8			
		Mag 6¼-6½ (Berk),						$\Delta = 45^\circ 6$			
		6.8 (Qt), 6.7 (Up, Ki)					Wr	iPZ		38	07 d
27	Ch	ePZ	13	28	14			eSN		44	15
		ePcPZ		29	20			iPZ		38	45 d
		ePPZ		30	15		Qt	iXZ		39	27
		eSN*		35	45			epPNE		40	31
		ePSZN*			57			ePPZNEN*			56
	Wr	ePZ	29	01				esPNE		41	24
	Qt	ePZ			37			iSZNEN*		45	28
		USCGS H 13 18 51						eScSEN*		47	35
		46 N 151 E						esSN*		48	39
		Kurile Islands						eSSN*		49	31
27	Wr	ePZ	22	26	35			Mu Sec			
	Qt	ePZ		27	09			PZ 1.5 1.6			
28	Wr	ePZ	00	03	21			$\Delta = 52^\circ 0$			
	Qt	ePZE			56		Kr	iPZ		39	06
		eSNE		06	25			epPZ		40	52
		H 00 00 44						eSZ		46	03
		Nepal									

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		Mu Sec						USCGS H 06 24 38				
		PZ 1.9 1.7						7 S 123½ E				
		$\Delta = 54^\circ 5$						Flores Sea				
		USCGS H 14 30 24				30	Qt	ePKPZ	07	22	55	
		43 N 131 E						USCGS H 07 04 48				
		China-Korea border						19 S 177½ W				
		depth about 550 km						Fiji Islands				
		Mag 6¼ (Pas), (Lh),						depth about 450 km				
		6½ (Qt, Kr), 6.2 (Up, Ki)				30	Qt	ePKPZE	14	17	29	
29	Qt	ePZ	20	00	10			USCGS H 13 58 25				
		USCGS H 19 49 45						23½ S 175½ W				
		Off coast of Honshu,						Tonga Islands region				
		Japan				30	Qt	ePKPZE	21	55	28	
30	Ch	ePZ	00	41	45			USCGS H 21 37 35				
	Wr	ePZ		43	17			19 S 177½ W				
	Kr	ePZ			39 c			Fiji Islands				
	Qt	ePZ			40 c			depth about 600 km				
		eSN*		52	42			ePKPZE	04	45	16 c	
		USCGS H 00 32 29				31	Qt	ePKPZE	04	45	16 c	
		8½ N 138 E						USCGS H 04 27 12				
		Caroline Islands						16½ S 178 W				
								Fiji Islands				
								depth about 450 km				
								Mag 6½-6¾ (Pas)				
30	Wr	ePZ	04	09	18							
	Qt	ePZ			58 c							
		USCGS H 04 00 26				31	Wr	iPZ	04	59	16 c	
		66 N 136½ E						iSZ			47	
		Yakutsk, S.S.R.						Qt	ePZE	05	00	13 d
								eSNE		01	31	
30	Qt	ePKPZ	05	40	07			H 04 58 32				
		USCGS H 05 20 36						Hindukush				
		4 S 80½ W										
		Peru-Ecuador border										
30	Ch	ePZ	06	33	01							
	Qt	ePZ			35 27							

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Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	Quetta		8	ePZE	11 18 47
1	ePZE	05 03 08		eSN	19 09
	eSZN	04 30	9	ePE	11 52.2
2	ePgZ	01 47 24.4	9	ePE	12 2 28
	eSgN	26.2		eSE	27 38
2	ePZ	02 14 35	9	ePZE	14 39 22
	eSE	15 10		eSZE	40 50
2	ePZ	04 50 39	9	ePE	18 39.0
	eSN	56	9	ePE	22 22 08
2	ePZE	15 40 08	10	eXE	02 44.5
2	ePZ	17 52 41	10	ePZ	07 53 40
3	ePZ	04 05 19		eSE	55 07
3	ePZ	06 15 44	10	ePgZ	17 34 32
3	ePZ	09 19 49		eSgE	36
3	ePZE	09 33 47	10	ePZ	18 02 38
3	ePZ	10 41 52		eSNE	57
4	ePZ	10 08 16	11	ePZ	07 21 50
4	eXZ	16 36 54		eSNE	22 13
5	ePZ	02 16 38	11	ePZ	08 19 28
5	ePZE	20 00 16		eSNE	49
6	eSgZE	01 16	11	eXE	09 16.0
6	ePgZE	03 48 35	12	ePZ	00 36 55
	eSgE	46	12	ePZ	12 14 17
6	ePZE	05 20 21		eSNE	42 07
7	ePZ	13 04 21	12	ePZ	13 14 31
7	ePE	15 11 43	12	ePZ	20 56 29
7	ePZE	21 03 21	12	ePZ	21 11 17
	eSNEN*	40	12	ePZ	03 58 12
8	ePZ	04 55.0	13	eSN	59 28
8	ePZ-	08 22 28	13	ePZ	16 59 05
	eSNE	23 21		eSE	17 00 28
8	ePZ	10 32 37			
	eSNE	33 55			

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Date	Phase	h m s	Date	Phase	h m s
14	eXZ	01 48.0	23	ePZ	02 58 33
14	ePZ	02 00 12	23	ePZ	09 46 04
15	eXZ	04 42 31		e(S)E	48 20
16	ePZ	02 16 51	23	ePZ	16 34 31
16	ePZ	03 32 53		e(S)N	36 50
17	ePgE	01 42 37	23	ePZ	19 48 43
	eSgE	48		eSN	49 09
17	ePZ	08 26 23	23	ePZ	20 02 25
19	eXZ	06 30.4		eSE	49
19	ePgZ	18 47 17	24	ePZ	19 26 33
	eSgZN	27		eSNE	59
20	eXZ	07 30.0	24	ePgZ	22 46 44
20	ePgZ	09 20 00		eSgZN	57
	eSgNE	10	25	ePZ	06 47 25
20	eXZ	10 27.4	27	ePZ	04 09 40
20	ePZ	17 57 16	28	ePZE	04 46 46
	eSE	44		eSNE	48 07
21	ePZ	04 09 32	29	ePZ	00 31 15
21	ePZ	13 18 44		eSN	48
	eSNE	43	29	ePZE	19 38 18
21	ePZ	14 04 23		eSN	47
	eSNE	48	30	ePZ	07 58 56
21	ePZE	22 51 55	30	ePZ	12 46 16
	e(S)E	53 37	30	ePZ	15 39 58
22	ePZE	06 37 01	30	e(P)NE	22 42 23
22	ePZ	11 17 15	31	ePZ	06 08 50
22	ePZ	12 29 12	31	ePgZ	16 23 09
	eSE	57		eSNE	24
22	ePZ	13 15 54	1	Warsak	
22	ePZ	17 07 16		iPZ	05 02 03 d
22	ePZ	19 17 37	1	iSZ	32
	eSE	18 21		iPZ	07 04 16 d
				iSZ	34

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Date	Phase	h m s	Date	Phase	h m s
1	iPZ	07 41 42 d	7	ePZ	13 03 16
1	ePZ	10 17 51		eSN	04 35
1	ePZ	11 58 12	7	iPZ	15 10 54 d
1	iPZ	22 07 45 c		iSZ	11 33
1	ePZ	23 18 05	7	iPZ	17 29 27
	iSZ	31		iSZ	30 05
2	iPZ	02 04 29 c	7	ePZ	22 14 05
	iSZ	05 03	8	iPZ	01 45 19 d
2	ePZ	02 14 14		iSZ	51
3	ePZ	12 19 43	8	ePZ	07 56 53
	iSZ	20 10	8	ePZ	09 45 23
3	ePZ	19 46 05		iSZ	53
4	ePZ	00 41 36		iPZ	10 31 41 d
	iSZ	42 55	8	iSZ	32 11
4	iPZ	07 48 23 c	8	ePZ	15 50 53
	iSZ	54		iSZ	51 26
4	ePZ	08 24 30	9	iPZ	11 52 34 d
4	ePgZ	18 53 40		iSZ	55
	iSgZ	50	9	ePZ	14 38 35
4	ePZ	21 23 00		iSZ	39 05
5	iPZ	06 08 25 d	9	iPZ	22 19 50 d
	iSZ	09 04		iSZ	20 19
5	iPZ	09 03 59 c	10	iPZ	00 41 09 d
	iSZ	04 35		iSZ	38
5	iPZ	13 21 29 c	10	ePZ	03 34 21
	iSZ	22 06		iSZ	35 08
6	ePZ	02 12 00	10	ePZ	07 54 47
6	ePZ	10 42 00	10	iPZ	19 18 49 c
6	iPZ	12 04 51 d		iSZ	19 25
	iSZ	05 25	10	ePZ	22 32 17
6	ePZ	13 06 50		iSZ	48
	iSZ	07 15	11	ePZ	07 22 39

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

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Date	Phase	h m s	Date	Phase	h m s
21	iPZ	19 03 44 d	25	ePZ	21 41 14
	iSZ	04 17		iSZ	34
21	ePZ	22 51 31	26	ePZ	12 14 33
	eSN	57	26	ePZ	21 26 26
22	iPZ	07 28 24 d		iSZ	59
	iSZ	29 05	26	ePZ	23 42 58
27	ePZ	11 33 55	27	ePZ	08 31 15
22	iPgZ	11 42 28	27	iPZ	14 02 08
	iSgZ	40		iSZ	51
22	ePZ	15 14 52	28	iPZ	04 29 42 c
22	iPZ	16 12 11 d		iSZ	30 12
	iSZ	57	28	iPZ	04 45 47 c
22	ePZ	17 06 24		iSZ	46 20
22	iPZ	23 34 27 d	28	iPZ	07 21 17 d
	iSZ	35 07	28	ePZ	16 22 28
23	ePZ	03 54 40		eSZ	23 06
23	iPZ	07 11 13	28	ePZ	17 05 29
	iSZ	45		iSZ	55
23	iPZ	10 07 49 d	28	ePZ	22 40 33
24	iPZ	14 53 09 d	29	ePZ	00 31 36
	iSZ	43	29	iXZ	03 09 05
24	ePZ	19 27 14	29	iPZ	10 32 46 c
24	ePZ	21 36 25		iSZ	33 22
	iSZ	37 04	29	ePZ	11 44 53
25	ePZ	01 28 33		iSZ	45 22
25	ePZ	01 34 36	29	ePZ	18 26 58
25	ePZ	04 37 39		iSZ	27 35
	iSZ	39 04	29	ePZ	19 38 44
25	ePZ	12 42 35	29	iPZ	22 59 55
	iSZ	44 01	29	iSZ	23 00 29
25	ePZ	16 03 13			

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Date	Phase	h m s	Date	Phase	h m s
30	ePZ	07 51 15	8	ePZ	10 33 30
	iSZ	47	8	eXZ	11 00 52
30	ePZ	08 15 13	9	ePZ	22 30 25
	iSZ	42	12	e(P)Z	19 33 34
30	ePZ	08 24 03	13	eXZ	05 52 52
	iSZ	31	14	eXN	07 35 48
30	ePgZ	15 26 12	17	ePZ	08 26 40
	iSgZ	26		eSZ	28 08
30	ePZ	21 36 55	21	eXZ	22 51 39
	iSZ	37 29	22	ePZ	14 57 23
31	ePZ	06 33 29		eSZ	48
	iSZ	34 09	22	iPZ	15 14 17 d
31	ePZ	10 50 54		iSN	42
	iSZ	51 28	22	ePZ	17 05 48
31	ePZ	19 59 11		eSN	06 13
	iSZ	40	23	eXZ	16 58 01
	Lahore		31	eXZ	05 00 51
1	eXN	05 03 42		Karachi	
1	ePZ	11 59 01	7	eXE	09 40 45.5
	eSZ	12 00 20	7	eXE	15 45 50
2	eXZ	20 58 49	9	ePZ	10 38 39
2	ePZ	22 30 02		iSZ	55
	eSN	26	12	eXZ	01 41 59
3	ePN	19 45 47	12	ePZ	12 41 13
	eSN	46 11		iSZ	30
4	ePN	15 23 46	12	eXZ	19 29 36
	eSN	24 09	12	ePZ	20 56 24
5	ePZ	20 00 14		eSE	57 06
	eSN	01 12	12	ePZ	21 11 09
6	ePZ	02 11 27		eSE	45
	eSN	12 23	14	eXZ	07 35 04
7	ePZ	15 12 08	22	eXZ	17 10 41

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Date	Phase	h	m	s	Date	Phase	h	m	s
23	eXZ	16	56	49	27	ePZ	07	23	36
28	eXZ	00	06	59		e(S)N*		31	05
31	ePZ	07	19	48	27	eXZ	10	20	34
	e(S)Z		20	07	27	eXZ	22	31	27
31	ePZ	08	04	46	28	ePZ	00	06	57
	eSZ		05	02	28	eXZ	07	18	12
	Chittagong				30	ePZ	07	19	14
5	eXE	18	07	33	30	eXZ	14	14	38
7	eXZ	00	03	52	30	eXZ	21	51	24
7	ePZE	23	42	41	31	ePZ	04	41	08
8	eXZ	00	45	59					
8	ePE	17	08	04					
8	eXE	20	03	59					
9	eXE	03	32	00					
9	e(P)ZE	19	51	44					
12	ePZE	19	33	02					
12	iPZE	21	06	45 d					
	iSZE		07	02					
12	e(P)ZE	22	22	53					
13	eXN*	08	34	03					
14	ePZ	07	32	28					
15	ePZ	07	44	01					
19	eXZ	01	44	33					
19	ePZ	02	25	41					
19	eXN*	04	48	46					
19	eXN*	08	44	50					
19	eXN*	14	09	18					
21	eXN*	06	13	31					
22	eXZ	17	15	37					
23	ePZ	03	54	22					
23	ePZ	06	58	15					
23	eXN*	17	02	17					
25	ePZ	07	03	21					

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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).

Pakistan Meteorological Service

Director,
Meteorological Service

Sibte Nabi Naqvi

Deputy Director,
Geophysical Institute

Officer Incharge,
Seismological Section

Abdul Qadir Khan

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All correspondence regarding the supply of this bulletin on exchange basis should be addressed to the Director, Meteorological Service, Secretariat Block No. 3, Frere Road, Karachi-1, Pakistan.

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore				
Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi				
Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong				
Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak				
Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 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
2	Qt	ePZ	01	15	14			H 12 02 43			
2	Ch	ePZ	08	52	40			40 1/2 N 74 1/4 E			
		ePPE		54	26			Kirghiz, S.S.R.			
		eSEN*		59	32	2	Ch	iPZEN*	13	15	57
		ePSE			37		Lh	ePN		19	51
		eScSN*	09	02	26		Wr	eSN		23	11
	Lh	ePZ	08	54	19		Wr	ePZ		20	34
		eSN	09	02	34			eSN		24	31
	Wr	iPZ	08	54	33		Kr	ePZ		20	48
		iPcPZ		55	04		Qt	ePZ			56
	Qt	ePZ			03			epPZ		21	15
		ePcPZ			27			esPZ			26
		eSZNEN*	09	04	01			ePPZ			41
		USCGS H-08 43 54						eSNN*		25	13
		22 1/2 N 144 1/2 E						eXZNEN*			25
		Mariana Islands region						esSN*			51
2	Ch	ePE	09	11	02			USCGS H 13 15 40			
	Qt	ePZ		13	20			21 1/2 N 92 1/2 E			
		USCGS H 09 02 20						East Pakistan Burma			
		22 N 144 1/2 E						border			
		Volcano-Mariana						depth about 100 km			
		Islands region						Felt Chittagong			
		depth about 100 km				2	Qt	ePZ	19	31	27
2	Wr	iPZ	12	04	22		Lh	ePZ			27
	Lh	ePN			51	2	Ch	ePZE	20	14	14
		eSN		06	31			e(S)N*		22	43
	Qt	ePZ		05	28		Lh	ePZ		15	49
		eSNEN*		07	38		Wr	ePZ		16	01
	Ch	ePZE			58		Qt	ePZ			16 c
		ePPZE		08	31			epPZN			33
		ePPPZE			40			eSKSN*		26	36
		eSZ		12	13			eSN*			45
								eScSN*		27	01

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePSN*	28	24				ePcSZN*	55	00	
	USCGS H 20 03 32							iSNEN*	58	07	
	5½ S 151½ E							ePSZE		23	
	New Britain							ePPSE		31	
	depth about 60 km							eScSZNEN*	59	54	
	Mag 6¾ (Berk), 6.3 (Up, Ki)							eSSN*	10	02	11
2	Qt	ePKPZ	22	12	08			eLN*		04.8	
	USCGS H 21 53 05							ePKPPKPZE	19	46	
	23½ S 175½ W										
	Tonga Islands region										
3	Lh	ePZ	00	42	08						
	Wr	ePZ			30 c						
	Qt	ePZ			48 c						
	USCGS H 00 32 19										
	3½ N 126½ E										
	Molucca Passage										
3	Ch	ePZ	09	47	27						
	ePPZE				48 55						
	ePPPZE				49 22						
	ePcPZE				47						
	iSZN*				53 16						
	Lh	ePZ			49 39						
	eSN				57 16						
	Wr	iPZ			49 44 d						
	ePcPZ				50 48						
	Wr	iPZ			02 d						
	eSN				57 58						
	Qt	iPZ			50 06 d						
	iXZE				36						
	ePPZNN*				52 21						
	ePPPZN*				53 49						

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
4	Qt	ePZ	09	55	47 c		Qt	ePZ		07	36
		eSN*			56 17			USCGS H 11 50 17			
	Wr	ePZ			15			13 S 166½ E			
		iSN			57 08			New Hebrides region			
	Lh	ePZ			56 16			depth about 100 km			
	Kr	ePZ			37		5	Ch	ePN*	15	05 57
		H 09 55 10							epPN*		06 52
		30½ N 69½ E							ePPN*		07 26
		Near Fort Munro							eSN*		11 00
		West Pakistan							esSE		12 39
4	Ch	ePZE	19	20	24		Qt	ePZ		08	39
		eSE			31 01			USCGS H 14 59 37			
		USCGS H 19 07 36						30 N 129 E			
		20 S 169½ E						Ryukyu Islands region			
		Loyalty Islands						depth about 250 km			
5	Ch	ePZ	05	56	03		5	Ch	ePE	17	49 23
		eSN*			06 04 45				ePcPE		37
	Wr	ePZ			05 57 55				ePPE		52 12
	Qt	ePZ			58 12				ePPPE		53 53
		USCGS H 05 45 23							iSEN*		58 58
		4½ S 153 E							eSKSN*		59 24
		New Britain region							USCGS H 17 37 40		
		depth about 100 km							9 S 158 E		
5	Qt	ePZ	11	06	41 c		5	Qt	ePZ	17	51 35
		eSNN*			12 17				eSKSN*	18	02 14
		USCGS H 10 59 40							eSKKSN*		26
		Chagos-Archipelago							eSN*		48
5	Ch	ePEN*	12	02	32				ePSN*		04 20
		epPE			03 04				eSSN*		09 22
		esPEN*			17				USCGS H 17 38 08		
		ePPN*			05 51				9 S 157½ E		
		eSN*			12 46				Solomon Islands		

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s		
6	Qt	ePZ	01	20	59	7	Qt	ePZ	02	41	27		
		ePPZN*	24	21	Ch			ePZ	44	02			
		ePPPN*	26	58				ePcPZ	14				
		eSKSN*	31	35				ePPZ	46	56			
		eSKKSN*	51					USCGS H 02 32 07					
		eSN*	32	11				36½ N 2½ E					
		ePSN*	33	38				Near coast of Algeria					
		ePPSN*	34	14	7			Qt	ePZ	15	24	52	
		eSSN*	38	45				Ch	ePZ			55	
		USCGS H 01 07 31						7	Ch	ePZ	22	30	12
9 S 157½ E						ePPE			34	27			
Solomon Islands						ePPPZE			36	35			
6	Qt	ePZ	11	45	18		eSKSE			40	51		
		USCGS H 11 32 50					eSE			41	51		
Bismarck Sea					Qt	ePKPZ			35	20			
6	Wr	ePKPZ	12	02	05	USCGS H 22 16 15							
	Qt	ePKPZ			13	23½ S 175½ W							
USCGS H 11 43 06					Tonga Islands region								
24 S 174½ W					Mag 6¼ (Pas)								
Tonga Islands region					8	Kr	ePZ			11	59	15	
6	Qt	ePgZE	21	44			32		eSE			47	
		eSgNN*			46	Qt	ePZ				32		
Wr	ePZ		45	36			eSNE			12	00	18	
		H 21 44 10					H 11 58 31						
Near Sibi, Baluchistan					Mekran Range								
7	Wr	ePZ	02	31	50	8	Ch	ePZE			14	03	19
		eSN			32			23	ePcPZE			04	58
		ePZ			43				ePPZE			05	06
		eSN			34			00	ePPPZE				48
		H 02 31 02							eSE			10	02
Hindukush					ePSE				08				

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s		
		ePPSE			15	9	Wr	ePZ	04	38	49		
		eScSE			13			15	Qt	ePZ			50
	Wr	iPZ			04	17	c	9	Ch	ePE	13	44	12
		Mu	Sec							eSE			51
		PZ	1.1		2.2	Wr	ePZ		46	55			
	Qt	iPZ			04			55	c	ePZ			47
		ePcPZN			05	46	USCGS H 13 35 40						
		ePPZN			07	04	6½ S 132 E						
		ePPPZE			08	27	Banda Sea						
		ePcSZE			09	46	10	Qt	ePZ	04	18	27	
		eSNEN*			12	58				eSNE			53
		eScSN*			14	43	Wr	ePZ			19	19	
		eSSN*			16	52			H 04 17 52				
		eLN*			20.5		Eastern Baluchistan						
		ePKPPKPZ			34	34	10	Ch	ePZ	16	51	50	
		Mu	Sec						USCGS H 16 40 45				
		PZ	0.9		2.0		7 S 156 E						
		Δ = 58°·6					Solomon Islands						
	Kr	ePZ			05	18	10	Lh	ePZ	20	59	17	
		eSE			13	43			Ch	ePZ			34
		Mu	Sec					ePPZE			45		
		PZ	0.5		1.5			ePPPZE			49		
		Δ = 61°·8						eSZE			21	02	11
		USCGS H 13 54 55					Wr	ePZ			20	59	36
		44 N 140½ E							Qt	ePZ			21
		Near west coast of						ePPZNE				56	
		Hokkaido, Japan						ePPPZNE				01	03
		Mag 6½ (Pas),						eSN*				04	00
		6.4 (Qt, Kr, Wr), (Up, Ki)						eLN*				04.3	
9	Qt	ePKPZ			00	24	50	Kr	ePZ			01	06
		USCGS H 00 05 36							eLE				05.1
		18½ N 103 W					H 20 56 19						
		Mexico					35¼ N 88½ E						

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Northern Tibet						USCGS H 10 06 14			
		USCGS H 20 50 12						23 S 179 E			
		36 N 89 E						South of Fiji Islands			
		Northern Tibet						depth about 600 km			
		Mag 6.1 (Up, Ki)				14	Qt	ePZ	01	55	37
12	Kr	iPnZ	06	04	56 d			iSNN*		56	15
		iSgE		05	44		Kr	ePZ			22
	Qt	ePZ			51		Lh	ePZ		57	00
		iXZ		06	04			H 01 54 46			
		eSNN*		07	11			30 1/4 N 63 1/2 E			
	Wr	ePZ			05			Southern Afghanistan			
		H 06 04 06				14	Ch	ePZ	10	44	15
		24 N 63 3/4 E						ePcPZ			57
		Arabian Sea						eSZ		52	34
12	Ch	ePZE	20	42	40		Qt	ePZ		46	34
		USCGS H 20 30 12						USCGS H 10 33 56			
		11 S 166 1/2 E						3 S 148 1/2 E			
		Santa Cruz Islands						Bismarck Sea			
13	Qt	ePZ	08	53	24	14	Qt	ePZ	21	04	07
		eSEN*		56	33	15	Ch	ePZ	08	16	55
	Wr	ePZ		53	46			USCGS H 08 04 45			
	Kr	ePZ			51			Fiji Islands region			
	Ch	ePZ		56	58			depth about 500 km			
		H 08 49 23				15	Wr	ePZ	10	26	42
		Northwestern Iran					Qt	ePZ		27	53
13	Qt	ePZ	09	24	51			iXZNE			57
		eSNEN*		27	56			iSZNEN*		29	57
	Wr	ePZ		25	21		Kr	ePZ		28	53
	Ch	ePZ		28	28			eSE		31	35
		H 09 20 55					Ch	iPZE		30	05 c
		Northwestern Iran						iXZE			12
13	Ch	ePZ	10	18	45			ePPZE			30

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPPZE			40			ePcSZE		23	48
		eSE		34	00			eSE		27	32
		ePcPE			10			ePSE			46
		eSSE			32			ePPSE			56
		eSSSE			50			ePKPPKPZ		48	29
		H 10 25 13						USCGS H 17 08 41			
		38 N 76 E						37 1/2 N 20 1/2 E			
		Western Sinkiang						Near west coast of Greece			
		Province, China						Mag 6 1/2-6 3/4 (Pas),			
		USCGS H 10 25 03						6.9 (Up, Ki)			
		38 N 74 1/2 E				15	Qt	ePnZ		20	02 36
		Tadzhik, S.S.R.						iPgZNE			47
		Mag 6.5 (Up, Ki)						iSnZNE		03	12
15	Qt	ePZ	17	16	10			iSgZNN*			23
		ePPZ		17	39		Kr	ePnZ			03
		ePPPZE		18	00			iPE			13
		iPcPZNE			20			iPgE			26
		eSNN*		22	10		Wr	iSE			55
		eLEN*		24.9			Lh	ePZ			04 03
	Wr	ePZ		16	28			eSN			05 39
	Kr	ePZ			31			H 20 01 48			
		iXZE			47			28 1/2 N 64 E			
		iPPPE		18	39			Northwestern Baluchistan			
		iSE		22	53			West Pakistan			
	Lh	ePZ		16	56						
		e(S)N		23	41	15	Qt	ePnZ		20	54 32
	Ch	iPZE		19	07			iP*Z			36
		iXZE			14			ePgZN			43
		ePcPZE			43			iSnZNE		55	08
		ePPZE		21	26			iSgZNN*			19
		ePPPZE		22	55		Kr	ePnZ			00

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSnE			56			eSZE	56	56	
		eSgE		56	13		Wr	iPZ	53	42	d
	Wr	ePZ		55	45		Kr	iPZ			52 d
		H 20 53 44					Qt	iPZ	54	01	d
		28½ N 64 E						USCGS H 23 43 40			
		Northwestern Baluchistan						4 N 126½ E			
		West Pakistan						Talaud Islands			
16	Wr	ePKPZ	01	18	51	16	Ch	ePZ	23	59	52
	Qt	ePKPZ			51			USCGS H 23 50 35			
		epPKPZ		19	24			18 N 147 E			
		ePPZE		22	13			Mariana Islands			
		USCGS H 00 59 22				17	Kr	ePZ	02	39	42 c
		35 S 70 W					Qt	ePZ	40	26	c
		Chile-Argentina border						ePPZN	42	07	
		depth about 100 km						ePcPZE		24	
16	Qt	ePZ	10	34	32 d			ePPPZN		36	
	Wr	ePZ			47			ePcSNE	46	17	
		USCGS H 10 21 17						eSNN*		42	
		1 N 26½ W						eSSN*	49	44	
		Mid-Atlantic Ocean						eLN*	49	9	
		Mag 6¼-6½ (Pas),					Lh	ePZ	40	48	c
		6.3 (Up, Ki)					Wr	ePZ			58
16	Qt	ePnZ	17	52	43			USCGS H 02 32 37			
		eSnZNE		53	20			11 S 66½ E			
	Kr	ePnZ			05			Indian Ocean			
	Wr	ePZ			55	17	Ch	ePZ	17	33	47
		H 17 51 53					Wr	ePZ		35	17
		Northwestern Baluchistan					Qt	ePZ			32
		West Pakistan						USCGS H 17 23 26			
16	Ch	ePZ	23	51	05			5 S 141 E			
		ePPZ			52 33			New Guinea			

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
17	Wr	ePZ	20	00	31			Northern Mariana			
		iSZ		02	04			Islands region			
	Lh	ePZ		00	52			depth about 200 km			
		eSN		02	35	19	Ch	ePZ	04	46	36
	Qt	ePZ		01	42			ePPZ			49 21
		esPZN		02	10			eSZ			56 03
		eSZNE		04	12			USCGS H 04 34 57			
		H 19 58 31						51½ N 175½ W			
		41 N 77¼ E						Andreanof Islands			
		Kirghiz-Sinkiang border						Aleutian Islands			
		depth about 100 km				17	Ch	ePZ	23	57	05
								ePPZE			10
								ePPPZE			23
								eSZE	58	40	
								eSSZE		53	
								eSSSE	59	04	
	Lh	ePN			10			ePSE			27 07
	Wr	ePZ			27		Wr	iPZ			20 49 d
18	Qt	ePZ	00	00	12			iSZ			30 47
		ePPZNE			42		Kr	iPZ			21 01 d
		eSNEN*		04	21			ePcPZ			10
	Kr	ePZ		00	24			iSE			31 09
		H 23 55 02					Qt	ePZ			21 06 d
		30¼ N 94½ E						iPcPZNE			13
		Sinkiang Province, China						iXZN			22 08
		USCGS H 23 55 01						ePPZNN*			24 07
		30½ N 94 E						ePPPNN*			26 05
		Sinkiang Province China						i!SNN*			31 17
18	Ch	ePZE	13	40	32			ePSEN*			32 04
	Qt	ePZ		42	55			iPPSEN*			25
		USCGS H 13 32 08						iSSN*			36 52

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
		eLN*	41	7		20	Ch	ePZE	16	39	20	
		ePKPPKPZ	47	24				ePPZE	41	10		
		Mu Sec						ePPPZ		55		
		PZ 0.4 1.0					Wr	iPZ		47		
		$\Delta = 81^\circ 4$					Qt	ePZ		59		
		USCGS H 11 08 32						USCGS H 16 30 45				
		5½ S 146 E						7 S 129 E				
		Near north coast of New Guinea						Banda Sea				
		Mag 7 (Pas), 6.5 (Qt), 6.9 (Up, Ki)				20	Kr	ePZ	19	42	48	
19	Qt	ePZ	14	07	18		Qt	ePZ		54		
		eSNEN*		12	48			USCGS H 19 29 38				
		eSSN*		14	58			1 N 26½ W				
		eLN*		16	3			Mid-Atlantic Ocean				
	Wr	ePZ		07	33	22	Ch	ePZ	12	57	19	
	Ch	ePZ		10	05			ePPZ		59	18	
		USCGS H 14 00 24						ePPPZ		13	00	27
		38½ N 26 E						eSZ		04	49	
		Off west coast of Turkey					Wr	ePZ		12	59	33
		Mag 5.4 (Up, Ki)					Kr	ePZ			48	
							Qt	ePZ			50	
19	Ch	ePKPZ	14	28	00			USCGS H 12 47 56				
		USCGS H 14 08 20						3 S 140 E				
		Near coast of Nicaragua						Near north coast of New Guinea				
		depth about 60 km										
20	Ch	ePZ	11	07	37	22	Lh	ePZ	13	56	03	
		ePcPZ		08	11		Wr	iPZ			42	
	Qt	ePZ		09	46		Qt	ePZ		57	27	
		USCGS H 10 56 59						eSEN*		59	23	
		4½ S 153 E						H 13 54 50				
		New Britain region						31 N 79¼ E				
		depth about 100 km						Himalaya Range				

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
22	Ch	ePKPZ	16	45	53			Fiji Islands region			
	Kr	ePKPZ		46	18			depth about 550 km			
	Qt	ePKPZ		21		24	Ch	ePZE	15	03	01
	Lh	ePKPZ		22				ePPZE			47
	Wr	ePKPZ		30				ePPPZ			04 00
		USCGS H 16 26 34						eSZE			07 36
		54 S 136 W					Wr	ePZ			05 45
		South Pacific Ocean					Qt	ePZ			06 12
22	Ch	ePZ	19	47	16			USCGS H 14 57 15			
	Wr	ePKPZ		52	24			17½ N 120 E			
	Qt	ePKPZ		31				Off west coast of Luzon Islands			
	Kr	ePKPZ		32				Philippine Islands			
		USCGS H 19 34 35									
		21½ S 178½ W				25	Qt	ePZ	01	02	21
		Fiji Islands				25	Ch	ePZE	19	11	40
		depth about 550 km						ePPZE			13 11
23	Ch	ePZ	14	49	59			ePPPZ			30
	Wr	ePZ		52	32			eSE			17 31
	Qt	ePZ		56			Wr	iPZ			14 19 c
		USCGS H 14 41 42					Qt	ePZ			39
		½ S 128½ E						USCGS H 19 04 20			
		Spice Islands						6 N 127 E			
23	Ch	ePZ	21	11	20			South of Mindanao			
	Wr	ePZ		13	41			Philippine Islands			
	Qt	ePZ		14	09						
		USCGS H 21 05 18				26	Ch	ePZ	00	49	23
		24½ N 122 E						ePPZ			51 01
		Near coast of Formosa						ePPPZ			29
								eSZE			55 36
24	Ch	ePZ	14	16	53		Lh	ePN			51 44
		USCGS H 14 04 17					Wr	iPZ			59 d
		19 S 178½ W					Qt	ePZ			52 25 d

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				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
		USCGS H 00 41 35 1½ N 127½ E Halmahera				eSSZE	21 53
26	Ch	ePZ	07 12 29 c	Lh	ePN	eSSSE	22 18
		ePPZE	13 25		iScSE	eSN	24 26
		ePPPZE	40	Kr	ePZ	eSN	24 26
		ePcPZE	15 34	Wr	iPZ	ePZ	17 52
		eSZE	17 24		eSN	iPZ	18 15
		eSS/E	18 58	Qt	iPZ	eSN	25 17
		eSSSE	19 18		ePcPZ	ePcPZ	19 39
Lh		ePZ	14 43 c		ePPPZE	ePPPZE	21 05
		eSN	21 20		ePcSZEN*	ePcSZEN*	23 37
Kr		ePZ	14 48 c		iSZNN*	iSZNN*	25 19
Wr		iPZ	15 10 c		eScSZN	eScSZN	28 07
		eSN	22 13		USCGS H 23 09 23 5½ S 103 E Near coast of Sumatra Mag 6.8 (Up, Ki)		
Qt		iPZ	15 12 c	27	Qt	ePZ	00 29 53
		ePcPZ	16 35			ePPPZ	31 50
		ePPZE	17 09			eSNE	35 52
		ePPPZN	18 01		Wr	iPZ	30 10
		ePcSZNE	20 32		Ch	ePZ	32 49
		iSZNEN*	22 15			eSE	41 08
		eScSNEN*	25 03		USCGS H 00 22 30 38½ N 20½ E Greece		
		eSSZNE	26 50	27	Ch	ePZ	18 57 39
		eLN*	27.4			ePPZE	58 35
		USCGS H 07 06 19 5½ S 102½ E Near coast of Sumatra Mag 6½ (Pas), 6.6 (Up, Ki)				ePPPZE	49
26	Ch	ePZ	23 15 33 c			eSE	19 02 34
		ePPZE	16 31				
		eSZE	20 26				
		iXE	50				

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				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
	Lh	ePN	18 59 52 c			Chile	
		iSN	19 06 31			Mag 6½ (Pas)	
	Kr	ePZ	18 59 55	28	Ch	ePZ	21 30 54
	Wr	iPZ	19 00 19 c			USCGS H 21 18 32 14½ S 168 E New Hebrides Islands	
	Qt	ePZ	20 c			ePZE	22 51 35 c
		eSN*	07 18			ePcPZE	42
		USCGS H 18 51 27 5½ S 103 E Off west coast of Sumatra		28	Ch	ePZ	03 27 10
						e(S)E	32 44
28	Ch	ePZ	03 27 10		Wr	iPZ	29 18 c
		e(S)E	32 44		Qt	ePZ	51 c
	Wr	iPZ	29 18 c		Kr	ePZ	58
	Qt	ePZ	51 c			USCGS H 03 20 24 26 N 128½ E Ryukyu Islands	
	Kr	ePZ	58	28	Kr	ePKPZ	12 54 28
		USCGS H 03 20 24 26 N 128½ E Ryukyu Islands			Qt	ePKPZ	30 c
28	Kr	ePKPZ	12 54 28			ePPZE	57 53
	Qt	ePKPZ	30 c			ePKSZNE	58 08
		ePPZE	57 53			ePPPZN*	13 01 08
		ePKSZNE	58 08			eSKSNN*	40
		ePPPZN*	13 01 08			eSKKSN*	04 38
		eSKSNN*	40			eSSN*	16 33
		eSKKSN*	04 38		Wr	iPKPZ	12 54 39 c
		eSSN*	16 33		Lh	ePKPN	51 ±
	Wr	iPKPZ	12 54 39 c		Ch	ePKPZE	50 00
	Lh	ePKPN	51 ±			ePKSZE	58 31
	Ch	ePKPZE	50 00			ePPZE	59 47
		ePKSZE	58 31			eSKSE	13 02 02
		ePPZE	59 47			eSKKSZE	06 35
		eSKSE	13 02 02			USCGS H 12 34 53 28½ S 71 W	
		eSKKSZE	06 35				
		USCGS H 12 34 53 28½ S 71 W				H 22 59 28 Suleman Range West Pakistan	

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					Major Shocks						
Date	Station	Phase	b	m	s	Date	Station	Phase	h	m	s
30	Wr	ePZ	11	15	56	30	Qt	ePnZ	20	33	23
	Lh	ePZ		16	13 c			eP*ZE			28
		ePPZ			22			iPgZE			35
		ePPPZ			30			eSnNN*	44	03	
		eSN		18	51			eS*Z			10
	Qt	ePZ		17	04 c			eSgZN*			15
		ePPZN			19		Wr	ePnZ	33	24	
		ePPPZNE			28			H 20 32 30			
		i!SNN*		20	24			Eastern Afghanistan			
		eSSZNN*			47						
		eLNEN*		21	0						
	Kr	ePZ		17	56						
		ePPPE		18	32						
		eSE		22	01						
		eSSE			43						
	Ch	ePZ		18	12 c						
		ePPZE			48						
		ePPPZE			19 00						
		eSZE		22	30						
		H 11 12 50									
		44½ N 80¼ E									
		Sinkiang Province, China									
		USCGS H 11 12 43									
		44½ N 80½ E									
		Sinkiang Province China									
		Mag 6.2 (Up, Ki)									
30	Wr	ePZ	15	30	46						
	Ch	ePZ		31	08						
		ePcPZ			14						
	Qt	ePZ			14						
		ePPZN		34	32						
		USCGS H 15 18 37									
		59½ N 152 W									
		Kenai Peninsula, Alaska									

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					Minor Shocks				
Date	Phase	h	m	s	Date	Phase	h	m	s
1	ePZ	09	05	10	9	eXZ	12	15	15
2	ePgZ	21	54	36	9	ePZ	12	20	44
	eSgNEN*			51	9	ePZ	17	57	33
3	ePZ	05	08	01		eSN			59 11
3	ePZ	22	48	08	11	ePZ	00	59	58
4	ePZ	18	46	50	11	ePgZ	03	09	54
4	ePZ	23	45	26		eSgZ			10 06
5	ePZ	00	12	23	11	ePgZ	12	53	18
	eSZE			47		eSgZNE			30
5	ePgE	10	22	36	11	ePZ	15	11	17
	eSgZE			48		eSNE			12 09
5	eXE	01	33	0	11	ePZ	18	22	06
5	eXE	03	16	0		eSN			23 29
5	ePgZE	07	37	14	13	ePZ	02	22	54
	eSgE			28	13	ePZ	05	40	7
6	ePE	02	07	25	13	ePZ	17	03	53
6	ePgE	03	01	54	13	ePZ	17	49	17
	eSgE			02 09	15	eXZ	03	14	3
6	ePE	08	08	16	16	ePZ	00	37	48
	e(S)N*			11 04		eSN			38 23
6	ePZE	22	54	41	16	ePZ	16	03	23
7	ePZ	04	11	05	17	iPgZ	05	56	11
	eSN			28		iSgNE			24
7	ePgZ	18	51	56.3	19	ePZ	12	21	30
	eSgZ			52 91.6	19	ePZ	14	40	12
8	ePZ	12	47	21	20	ePZ	06	35	46
	e(S)NE			49 07		eSN*			36 06
8	ePZ	16	01	41	20	ePZ	15	10	47
	eSN			03 07	20	ePZ	22	25	44
9	ePZ	02	58	22	21	ePgZ	23	06	08
	eSNE			47		eSgNE			20
					22	ePZ	05	14	52

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			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
23	ePZ	00 00 38	1	ePZ	14 46 55
23	eXZ	16 31 44		iSZ	43 07
23	ePZ	18 13 57	1	ePZ	15 57 00
	eSZN	14 18	1	ePZ	22 29 47
24	ePZ	01 30 32		iSZ	30 26
24	ePZ	02 27 13	2	iPZ	07 34 24 d
	eSE	28 06		iSZ	56
24	ePZ	06 28 32	3	iPZ	08 39 04 d
24	ePZ	15 06 12		iSZ	41
24	ePZ	15 25 42	3	ePZ	10 30 13
	eSE	26 00		e(S)Z	37 36
25	ePZ	14 31 09	3	ePZ	13 14 42
	eSE	32 26		iSZ	15 24
25	ePZ	16 29 58	3	ePZ	21 08 59
	eSNE	30 26		iSZ	09 35
25	ePZ	18 27 09	4	ePZ	03 52 03
	e(S)E	28 07		iSZ	39
26	ePZ	09 29 40	4	iPZ	05 04 15 d
26	ePZ	21 55 11		iSZ	50
28	ePZ	19 09 37	4	ePZ	07 41 37
	e(S)Z	10 21		iSZ	42 23
28	ePZ	19 11 55	4	ePZ	18 45 53
	eSZN	13 17		iSN	46 25
29	ePZ	08 59 27	4	iPZ	23 44 22 d
	e(S)N	09 00 10		iSZ	45 02
29	ePZ	19 30 20	5	ePZ	01 15 14
30	ePZ	10 47 32		iSZ	50
	Warsak		5	iPZ	03 14 54
1	iPZ	14 25 50 c		iSZ	15 40
	iSZ	26 24	5	ePZ	08 12 13
				iSZ	48

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			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
5	ePZ	23 31 38	9	ePZ	17 56 26
	i-Z	32 09		iSZ	57 14
6	ePN	02 06 34	9	ePZ	19 29 01
	eSN	07 09		iSZ	43
6	ePZ	08 02 09	9	ePZ	21 18 52
	iSZ	38	10	ePZ	13 48 33
6	ePZ	15 26 27	10	ePZ	14 02 15
	iSZ	27 01		iSZ	57
6	ePZ	23 30 01	10	ePZ	16 43 41
7	iPZ	02 51 17 d		iSZ	44 15
	iSZ	38	10	ePZ	16 52 41
7	ePZ	06 57 42	11	ePZ	00 59 10
7	ePZ	15 49 47		iSZ	56
	iSZ	50 18	11	ePZ	11 40 18
7	iPZ	16 01 43 c	11	iPZ	13 50 04
	iSZ	02 16		iSZ	37
7	ePZ	19 45 33	11	iPZ	18 21 30 d
	iSZ	46 08		iSZ	36
7	iPZ	23 40 21 d	11	iPZ	21 48 22 d
	iSZ	41 03		iSZ	50
8	ePZ	03 33 42	12	iPZ	01 03 55 d
	iSZ	34 14		iSZ	04 37
8	iPZ	15 23 58 d	12	ePZ	01 22 58
	iSZ	24 29	12	ePZ	01 53 59
8	iPZ	16 00 31 c		iSZ	54 33
	iSN	01 41	12	ePZ	15 03 15
9	iPZ	07 36 05 c		iSZ	04 15
9	ePZ	12 04 29	13	iPZ	05 39 17 c
	iSZ	53		eSN	40 11
9	ePZ	12 21 14 c	13	ePZ	15 14 03
9	iPZ	16 26 57 c		iSN	40
	iSZ	27 39	13	ePZ	15 21 44

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Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
14	iPZ	01	56	06	18	iPgZ	07	28	10 d
	iSZ			51		iSgZ			12
14	iPZ	03	59	17 d	18	ePZ	11	23	57
	eSN			51	18	ePZ	12	31	17
14	iPZ	17	23	40 d		iSZ			34
	iSZ		24	11	18	iPZ	19	46	57
14	ePZ	22	31	55		iSZ		47	27
15	ePZ	01	58	22	19	iPZ	06	02	14 d
	eSZ		59	09		iSZ			44
15	ePZ	18	44	32	19	ePZ	11	46	52
16	ePgZ	01	40	32	19	ePZ	19	15	42
	iSgZ			47	19	iPZ	23	10	22 d
16	iPZ	03	48	13 d		iSZ			49
	eSZ			52	20	iPZ	03	28	36 d
16	iPZ	06	31	55		iSZ		29	07
	iSZ		32	22	21	iPZ	11	36	05 d
16	ePZ	16	03	26		iSZ			37
16	iPgZ	17	14	10 d	21	ePZ	15	21	39
	iSgZ			26	21	ePZ	17	30	02
17	ePZ	08	29	51	22	ePZ	01	27	46
	iSZ		30	43		iSZ		28	39
17	iPZ	11	39	11 d	22	ePZ	05	11	58
	iSZ			42		iSZ		12	48
17	iPZ	15	27	19 c	22	ePZ	11	17	29
17	iPZ	16	37	27 d	22	ePZ	14	16	26
	iSZ			57		iSZ			57
17	ePZ	19	45	26	22	ePZ	14	35	16
17	ePZ	22	15	26		iSZ			47
	iSZ		16	00	22	ePZ	23	58	01
17	ePgZ	23	36	48		iSZ			38
	iSgZ		37	01	23	ePZ	06	00	09
18	ePZ	00	31	58		iSZ			31

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Minor Shocks

Date	Phase	h	m	s	Date	Phase	h	m	s
23	ePZ	11	43	55	27	ePZ	05	30	23
	iSZ		44	18	27	ePZ	06	57	54
24	iPZ	02	20	42 c		iSZ			58 25
	eSZ		21	16	27	iPZ	13	50	18 d
24	ePZ	02	27	14		iSZ			48
24	iPZ	08	40	16	28	ePZ	15	46	40
	iSZ			43		iSZ		47	12
24	ePZ	10	51	05	28	ePZ	19	08	25
	iSZ			34	28	ePZ	22	53	07
24	ePZ	16	50	30	29	iPZ	02	32	43 d
	iSZ		51	06		iSZ			33 09
24	iPZ	17	06	26 d	29	ePZ	05	49	50
	iSZ		07	06	29	ePZ	08	59	57
24	ePZ	19	00	19	29	ePZ	10	54	13
	iSZ			48	29	ePZ	11	16	00
24	ePZ	22	32	15	29	iPZ	14	32	58
25	ePZ	16	03	08		iSZ			33 30
	iSZ			32	29	ePZ	23	57	43
25	ePZ	18	27	11	30	iPZ	17	29	55 c
25	ePZ	19	07	29	30	iPZ	19	01	52 c
	iSZ			59		iSZ			02 37
26	iPZ	04	08	36 d		Lahore			
	iSZ		09	12	8	eXN	14	05	34
26	iPZ	05	57	27 d	11	ePZ	00	59	58
	iSZ		58	11		eSN	01	00	37
26	ePZ	10	49	55	11	iXN	19	21	44
26	iPZ	10	56	53 c	12	ePZ	02	38	01
26	ePZ	22	26	14	12	eXN	06	08	34
27	iPZ	00	01	10 c	13	ePZ	15	14	00
27	iPZ	00	15	21 d		eSN			30
27	ePZ	04	39	54	14	ePZ	03	59	58
	iSZ		40	39		eSZ	04	01	02

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
	Karachi				
8	ePZ	16 05 58	2	ePZE	15 12 49
	e(S)E	06 03		eSE	13 00
11	eXZ	11 40 38	2	ePZE	15 49 13
12	eXZ	10 32 03	2	ePZE	16 35 01
13	eXZ	09 25 19	2	ePZE	16 47 59
16	eXZ	10 34 33	2	eSZE	48 10
17	ePgZ	00 01 40	2	ePZE	21 03 37
	eSgZ	53	2	ePE	22 46 16
18	ePZ	00 00 24 d	2	ePE	23 30 12
21	ePZ	06 55 00	3	ePE	00 04 01
	eSZ	20	3	ePE	00 19 16
22	eXE	13 57 50	3	ePE	00 51 22
23	eXE	12 05 57	3	eXE	01 13 58
23	eXE	16 34 22	3	eXZ	02 42 43
23	eXE	18 14 09	3	ePZ	03 17 53
25	ePZ	14 31 08		eSE	18 05
	eSE	47	3	ePZ	04 28 34
26	ePZ	23 21 04	3	ePZ	09 05 41
29	eXZ	23 01 19	3	eSE	52
30	eXE	20 35 55	3	eXN*	09 21 37
	Chittagong		3	ePZ	12 09 18
1	eXE	09 58 40	3	ePZ	13 41 04
2	ePZE	04 17 10	3	ePE	15 49 59
2	ePZE	05 12 05	3	ePZE	17 42 27
2	ePE	09 42 21		eSZ	38
2	ePZE	13 36 33	3	ePZ	18 31 49
2	ePE	13 40 38 ±	3	ePZ	20 30 42
2	ePZE	13 44 32	3	ePZ	21 05 54
2	ePZE	14 41 53	4	ePZ	01 38 01
	eSE	42 04	4	ePE	02 17 52
2	ePE	14 47 32	4	ePE	02 28 39
			4	ePE	02 33 56

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
4	ePE	03 02 49	8	ePZE	01 52 04
4	ePE	03 49 58		eSE	15
4	ePE	04 01 00	8	ePE	14 39 54
4	ePE	04 30 27	8	ePZE	16 06 49 ±
4	eXE	04 33 19	8	eXZ	17 18 06
4	ePE	05 27 30	8	ePZ	22 28 46
4	ePE	08 32 42	9	ePZ	21 40 55
4	eXE	10 04 53		eSE	41 06
4	ePE	11 13 21	12	eXZE	14 42 41
	eSE	32	13	eXZE	10 03 17
4	ePZE	21 32 46	13	ePZ	23 05 07
	eSE	57		eSE	18
4	ePE	23 31 16	16	eXZ	10 41 05
5	ePZE	06 22 46	17	eXZ	02 44 28
	iSE	57	18	eXZ	05 19 14
5	eXN*	11 06 39	21	eXZ	06 25 56
5	ePE	15 15 47	22	eXZ	13 58 31
	eSE	58	23	ePZ	07 56 21
5	ePE	16 01 29	23	eXZ	16 28 00
	eSE	41	26	e(P)Z	00 32 01
5	ePZE	19 39 45	26	eXZ	07 51 47
	eSZE	40 00	26	ePZ	23 58 19
6	ePZE	10 34 27	28	ePZ	00 58 01
	eSE	38	29	eXZ	19 40 41
6	eXE	11 44 53	30	e(P)Z	00 00 07
6	ePE	20 21 30	30	eXZ	13 26 51
7	ePZE	02 09 47			
	eSE	58			
7	ePZ	08 30 16			
7	ePZ	09 30 02			
7	ePE	15 10 00			
	eSE	11			

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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 Sismo. & Galvo.	Damping	Max Magnification
Quetta (Central Station)				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

Pakistan Meteorological Service

Director,
Meteorological Service

Sibte Nabi Naqvi

Deputy Director,
Geophysical Institute

Officer Incharge,
Seismological Section

Abdul Qadir Khan

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All correspondence regarding the supply of this bulletin on exchange basis should be addressed to the Director, Meteorological Service, Secretariat Block No. 3, Frere Road, Karachi-1, Pakistan.

(Contd).

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 ..	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 ..	—	—
Lahore Sprengnether	Z	1.8 ..	Critical	4,900
"	N	1.7 ..	"	4,200
"	E	1.6 ..	"	4,100
Karachi Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 ..	"	4,700
"	E	1.4 ..	"	4,700
Chittagong Sprengnether	Z	1.7 ..	Critical	5,200
"	N	1.8 ..	"	5,700
"	E	1.5 ..	"	3,600
"	N	7.0 ..	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 ..	—	—
Warsak Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 ..	—	—

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 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	12 46 15 c	1	Ch	USCGS H 14 59 40				
		ePPZE	47 50			63 S 154 E				
		eSN*	52 16			Balleny Islands region				
		eSSN*	55 01			ePZE	18 18 23 d			
		eLN*	55.2			epPZE	19 43			
		Wr	ePZ			46 32	ePPZE	20 00		
			Kr			ePZ	37 c	eSE	23 39	
						ePPZ	48 14	Lh	ePN	20 39
		Lh	ePZ			47 02	eSN		27 45	
			Ch			ePPPZ	49 30	Wr	iPZ	21 01 d
		ePZ				12	Kr		iPZ	12 d
		ePcPZ				51		Qt	ePZ	20 d
ePPZE	51 28	USCGS H 18 11 49								
ePPPE	52 59	5 N 125 E								
eSZE	57 39	Near south coast of Mindanao								
			USCGS H 12 38 46							
			38 N 21 1/2 E							
			Near west coast of Greece							
1	Qt	ePnZ	13 27 17	2	Ch	ePZ	07 35 59			
		iPgZNE	26			Lh	ePN	38 15		
		iSnNE	48				ePPN	40 06		
		iSgNEN*	59			Wr	ePZ	38 40		
		Wr	iPZ				49	Qt	ePZ	42
			Kr				ePZ	55	eXZ	39 03
						H 13 26 35	epPZE	16		
						Near Fort Munro	ePcPZE	40 03		
						West Pakistan	ePPZE	40		
1	Lh	e(PKP)Z	15 18 02			eSN*	45 24			
		Qt	ePKPZ	38			eSeSN*	48 08		
				ePKSN*	22 13			eSSN*	49 24	
				eSKSN*	25 48			USCGS H 07 30 05		
						5 S 104 E				

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Near coast of Sumatra depth about 150 km				2	Wr	ePZ	20	09	35
							Qt	ePZ			52
2	Wr	ePZ	07	49	00			USCGS H	19	57	55
	Qt	ePZ			21			4½ S	140	E	
2	Ch	ePZE	09	41	29			New Guinea			
		eXZE			40	2	Qt	ePZ	23	04	40
		ePPZE			43 01			USCGS H	22	52	45
		ePPPZE			22			52 N	174	E	
		ePcPZE			40			Near Islands			
		eSZE			47 28			Alentian Islands			
		eScSZE			51 35	3	Ch	ePnZE	14	01	25
	Lh	ePN			43 45			ePgZE			32
		eSN			51 33			eSnZE			02 00
	Wr	ePZ			44 09			eSgE			11
		eSN			52 17		Wr	ePZ	05	17	
	Qt	ePZ			44 23		Qt	ePZ			44
		eXZ			36			H	14	00	38
		ePPZNE			46 36			25 N	93	E	
		ePPPZNE			48 04			Assam-East Pakistan			
		ePcSZE			49 00			border			
		eSN*			52 33	4	Qt	ePZ	09	08	11
		iSNN*			44		Wr	ePZ			31
		iScSEN*			54 13			ePZ			
		eSSEN*			56 31	7	Ch	ePZ	05	23	31
		eLNEN*			59.6			USCGS H	05	15	24
		ePKPPKPZ	10	13	37			32½ N	139½ E		
		Mu						South of Honshu, Japan			
		Sec									
		PZ	0.5		1.8	7	Qt	ePZ	13	24	39
		USCGS H	09	34	00			eSN			26 37
		1 S	123	E				iPgZ			19 03 42
		Celebes						iSgNE			57
		Mag 6½-6¾ (Pas),				7	Qt	iPZ			04 41
		6.5 (Qt)					Wr				

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Kr	ePZ			40±		Kr	ePZ			15
		eSE			05 52			eSE			26 45
	Lh	ePgN			15		Ch	ePZE			05
		eSnN			53			ePPZE			44
		H	19	03	19			eSZE			30 10
		29¾ N	68	E				H	12	21	01
		Near Sibi						38 N	73	E	
		Eastern Baluchistan						Tadzhikistan			
8	Ch	ePZ	03	08	19			depth about 100 km			
		eXZ			30			USCCS H	12	20	55
		ePPZE			10 06			37½ N	72½ E		
		ePPPZE			47			Afghanistan-Tadzhik			
		eSE			15 01			border			
	Qt	ePZ			10 14	8	Qt	ePZ	12	52	56
		USCGS H	02	59	56			eSN*			54 32
		36½ N	141½ E					iLN*			55 25
		Near east coast of					Kr	ePZ.			53 24
		Honshu, Japan					Wr	ePZ			50
8	Ch	ePZ	04	37	34		Ch	ePZ			57 18
	Wr	ePZ			40 13			ePPZE			58 24
	Qt	ePZ			27			ePPPE			39
		USCGS H	04	30	06			eSE			13 02 30
		1 S	124	E				H	12	50	51
		Celebes region						30¾ N	57	E	
8	Wr	ePZ	12	22	04			Central Iran			
	Lh	ePN			39			USCGS H	12	50	45
		esPN			57			Southern Iran			
		eSN			23 44						
	Qt	ePZ			14	8	Qt	ePZ	13	38	52
		esPZN			42			ePPZE			39 22
		eSZNN*			24 58			ePPPZ			33
								iSNN*			42 58

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSSN*	43	46			Wr	ePZ	16	59	29
		eLN*	44	1		9	Lh	ePN	18	26	07
	Wr	iPZ	39	04	c			eSN	27	32	
	Kr	ePZ	26				Wr	ePZ	26	47	
	Lh	ePN	44				Qt	ePZ	27	34	
		eSN	44	32				eSN	30	10	
	Ch	ePZE	42	13			Kr	ePZ	27	52	
		ePcPZ	46					eSE	30	42	
		ePPZ	43	58				H 18 24 14			
		ePPPZE	44	36				31½ N 83½ E			
		eSZE	48	46				Tibet			
		H 13 33 46				9	Wr	ePZ	21	41	33
		USCGS H 13 33 59					Qt	ePZ			49
		42 N 44½ E						USCGS H 21 28 57			
		Georgia, S.S.R.						5 S 153 E			
8	Wr	iPZ	23	16	03 d			New Britain region			
	Lh	ePN	43			11	Ch	ePZE	00	40	12
		eSN	17	43				eXZE			21
	Qt	ePZ	08					ePcPZE	41	47	
		eSZN	18	26				ePPZE	42	01	
		H 23 15 28						ePPPZE	47		
		36 N 71½ E						eSE	47	02	
		Hindukush						ePSZE	10		
9	Lh	ePN	03	56	28		Kr	ePZ	42	45	c
		e(S)N	04	00	26		Qt	ePZ			56 c
	Qt	ePZ	03	56	36			iXZ	43	05	
		eSN*	04	00	34			USCGS H 00 31 40			
	Wr	ePZ	03	56	48			5 S 130 E			
		H 03 51 40						Banda Sea			
		Bay of Bengal				13	Ch	ePZ	03	29	05
9	Qt	ePZ	16	59	10		Qt	ePZ	30	46	
		eSN*	17	03	40						

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 03 20 38						epPZE	09	00	
		42 N 142 E						ePcPZ	08		
		Hokkaido, Japan						esPZE	17		
13	Ch	ePZ	05	46	25			ePPZE	10	47	
		eSE	51	53				epPPZE	11	14	
	Wr	ePZ	48	55				esPPNE	33		
	Qt	ePZ	56					ePPPE	12	06	
		USCGS H 05 39 31						epPPPZN	32		
		9½ S 106½ E						ePcSZNE	47		
		Off south coast of Java						iISNN*	16	32	
13	Qt	ePZ	15	03	01			isSEN*	17	29	
13	Qt	ePKPZ	17	55	11			eScSN*	48		
		USCGS H 17 36 07						eSSNN*	20	32	
		18 S 173½ E						ePKPPKPZ	38	00	
		Tonga Islands						Mu Sec			
14	Qt	ePZ	00	33	12			PZ 0.5 1.2			
14	Ch	ePZE	18	05	30			Δ=62°			
		ipPZE	59					USCGS H 17 58 31			
		isPZE	06	13				5 N 126 E			
		ePPZE	07	02				Near south coast of			
		ePPPZE	24					Mindanao			
		iSZE	11	07				Philippine Islands			
		esSZE	56					depth about 150 km			
		eSSZE	13	48				Mag 6.3 (Qt)			
		eScSZE	15	28							
	Lh	iPZ	07	49	d	14	Ch	ePZ	21	56	40 d
		iSN	15	17			Lh	ePZ	58	59	
	Wr	iPZ	08	09	d		Wr	ePZ	21	59	17
		eSN	15	56			Kr	ePZ	24		
	Kr	ePZ	08	20	d		Qt	ePZ	35	d	
		epPZ	52					eXZ	46		
	Qt	ePZ	08	27	d			ePPZ	22	01	51

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 21 49 10 1 N 125 E Celebes						Aleutian Islands Mag 6 (Pas), 6½ (Berk), 6.4 (Qt)			
14	Ch	ePZE	22	12	56 c	14	Kr	ePKPZ	23	40	38 c
		ePcPZE		13	05			iXZ			43
		ePPZE		15	54		Qt	ePKPZ			45 c
		ePPPE		17	47			iPPZ			42 05
		eSZE		22	54			ePKSZ			44 24
		eSKSZE		23	07			ePPPE			31
		eScSZE			16			iSKSN*			47 38
		ePSZE			36			iSKKSZN*			48 52
		ePPSZE			55			Mu Sec			
	Wr	ePZ		12	58			PPZ 0.9 2.0			
	Lh	iPZ		13	05 c			Δ = 118°			
		eSN		23	13		Lh	ePKPZ	23	40	55 c
	Qt	iPZ		13	29 c			ePKSN			44 32
		iPcPZ			34		Ch	ePKPZE			40 57
		ePPZN*		16	42			ePPZE			42 45
		ePPPN*		18	43			ePKSE			44 34
		iSNEN*		23	58			ePPPZE			45 24
		iScSN*		24	08			eSKSZE			47 58
		eSSN*		29	40			eSKKSE			49 41
		eSSSN*		33	02			ePSZE			52 38
		eLN*			37.0			ePPSE			54 09
		Mu Sec						eSSE			59 36
		PZ 0.3 1.3						USCGS H 23 21 56			
		Δ = 85° 1						59½ S 31 W			
	Kr	ePZ		22	13 51			Sandwich Islands			
		ePcPZ			54			Mag 7 (Pas), 7.2 (Qt)			
		USCGS H 22 00 50						ePZE	01	44	25
		52½ N 168 W						ePcPZ			45 43
		Fox Islands					15	Ch			

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPZ		46	21			Near south coast of Mindanao			
		ePPPZ		47	20			Philippine Islands			
		eSZE		51	39						
	Wr	ePZ		46	20	15	Wr	iPZ	10	48	32 c
	Qt	ePZ			49			iSN			49 06
		USCGS H 01 35 23					Lh	ePN			18
		17½ N 145 E						eSN			50 26
		Mariana Islands					Qt	ePZ			49 25 c
15	Ch	ePZE	05	13	15			eSNEN*			50 42
		ePcPZ		14	34		Kr	ePZ			30
		ePPZ		15	11			eSE			52 36
		eSE		20	28		Ch	ePZE			56
	Wr	ePZ		15	13			epPZ			53 15
	Qt	ePZ			40 c			ePPZE			30
		USCGS H 05 04 14						ePPPZE			40
		17 N 145 E						eSZE			57 08
		Mariana Islands						H 10 47 45			
15	Ch	ePZE	07	11	10 c			36½ N 69½ E			
		iSE		12	18			Hindukush			
	Wr	ePZ		13	24			depth about 100 km			
	Qt	ePZ		14	08			USCGS H 10 47 42			
15	Ch	ePZE	09	05	17			37 N 70 E			
		ePPZ		07	15			Hindukush			
	Wr	ePZ		16		15	Ch	ePZE	11	34	07
	Qt	ePZ			43			ePPZ			36 03
		USCGS H 08 56 20						eSE			41 19
		17½ N 145 E						ePZ			36 31
		Mariana Islands						USCGS H 11 25 07			
15	Wr	ePZ	09	40	12			17 N 145 E			
	Qt	ePZ			31			Mariana Islands			
		USCGS H 09 30 22						ePKPZ	12	34	38
		5½ N 125½ E						ePKPZ			49

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 12 15 45 59 S 24 W Sandwich Islands						H 05 02 27 Tadzhikistan, S.S.R			
15	Qt	ePZ	14	29	09	16	Ch	ePZ	11	30	57
15	Wr	ePN	14	48	53			USCGS H 11 21 47 47½ N 152 E Kurile Islands			
	Lh	ePN		49	06						
		eSN		50	47	17	Ch	ePZ	02	36	49 c
	Qt	ePZ			04			ePPZE		37	35
		eSNN*		52	29		Qt	ePZ		39	53
		eLN*		53	5			USCGS H 02 31 02 21½ N 121 E Off south coast of Formosa			
	Ch	ePZ		51	13	17	Ch	ePZE	05	13	14 c
		H 14 46 57 39½ N 78 E Sinkiang Province, China						ePPZE		15	01
15	Wr	ePZ	22	06	36			eSE		20	00
	Qt	ePZ		07	47		Wr	iPZ		14	24 c
15	Qt	ePZ	22	23	27		Qt	ePZ		15	01 c
16	Qt	ePZ	00	00	38			USCGS H 05 04 46 40½ N 142½ E Near east coast of Honshu, Japan			
16	Wr	ePN	00	16	37						
	Lh	ePN			47	17	Ch	ePZE	05	59	59
		eSN		19	20			ePPZE	06	00	58
	Qt	ePZ		17	44			ePPPZE		01	12
		eSN		21	12			ePcPZE		03	01
		H 00 13 20 44 N 83½ E Northern Sinkiang Province, China						eSE		04	57
16	Wr	iPZ	05	03	34 d			eSSZE		06	35
		eSN		04	25			eScSZE		10	40
	Qt	ePZ			43		Lh	ePN		02	13
		eSN		06	28		Wr	iPZ			40 c

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		Qt			42 c			iSZE			46 47
		eXZ			53			eSKSE			47 02
		eSN*		09	45			eScSZE			10
		USCGS H 05 53 46 5½ S 102½ E Off south coast of Sumatra					Wr	iPZ			36 57 c
17	Wr	ePN	12	53	34		Lh	ePZ			37 05
		eSN		54	13			eSN			47 16
	Lh	ePN			03		Qt	iPZ			37 27 c
		eSN		55	11			iPcPZNE			32
	Qt	ePZ		54	38			iXZ			39
		esPN		55	04			ePPZE			40 40
		eSN		56	08			ePPPNE			42 33
		H 12 52 43 36½ N 72½ E Afghanistan-fadzhikistan border depth about 100 km						iSNEN*			47 52
17	Qt	ePKPZ	17	09	06			iScSN*			48 04
		USCGS H 16 48 55 36½ S 101½ W South Pacific Ocean						iPPSN*			49 13
17	Wr	ePZ	23	01	06			eSSN*			53 35
	Qt	ePZ			02			eSSSN*			56 55
		eSN		03	44			eLN*			17 00.2
		H 22 59 49 Uzbekistan, S.S.R.						Mu		Sec	
18	Ch	iPZE	16	36	53 c			PZ	1.0	1.6	
		iPcPZE		37	04			Δ = 84° 2			
		ePPZE		39	52			USCGS H 16 24 50 53 N 168½ W Fox Islands Aleutian Islands Mag 6½ (Pas), 6.8 (Qt)			
		ePPPZE		41	40		18	Wr	ePZ		17 02 23
								Qt	ePZ		51
							18	Wr	ePZ		18 11 58
								Ch	ePZ		59

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	ePZ	12	49				iXNE			09
		ePPZNE	13	09				iPPZ			30
		eSNN*	16	38				iSNN*	28	03	
		H 18 08 03						iXNE			08
		Eastern Sinkiang						iLNEN*	28	5	
		Province, China						Mu Sec			
18	Wr	ePZ	19	58	29		PZ	17.3	2.1		
	Qt	ePZ			57		$\Delta = 22^\circ 0$				
	Ch	ePZ			59 26	Wr	ePZ			11	24 58
19	Qt	ePZ	03	34	16	Lh	ePN				25 04
19	Qt	ePZ	10	44	57		eSN				29 51
19	Wr	ePZ	14	23	41	Ch	ePE				26 46
	Qt	ePZ			24 31		ePPE				28 23
20	Wr	ePKPZ	08	24	34		ePPPE				46
	Qt	ePKPZ			39		iSE				32 47
		USCGS H 08 05 34					eSSE				35 30
		South of Kermadec					H 11 19 06				
		Islands					14½ N 50½ E				
							Near coast of Aden				
20	Wr	ePZ	13	03	16		USCGS H 11 19 14				
	Qt	ePZ			38		14 N 52 E				
		USCGS H 12 53 37					Gulf of Aden				
		10½ N 126½ E					Mag 6½-6¾ (Pas),				
		North of Mindanao					7.1 (Qt)				
		Philippine Islands				21	Qt	ePZ			12 10 26
21	Wr	ePKPZ	10	39	33	21	Qt	ePZ			13 58 22
	Qt	ePKPZ			39	21	Qt	ePZ			17 41 38
		USCGS H 10 20 33				22	Qt	ePZ			00 14 33 c
		27½ S 176 W						iSNEN*			18 32
		Kermadec Islands region						Mu Sec			
		Mag 6 (Pas)					PZ	0.4	1.7		
21	Qt	ePZ	11	24	04		$\Delta = 22^\circ 0$				

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Wr	iPZ	00	15	26 c	23	Qt	ePZ	07	33	35
	Lh	ePZ			31	23	Qt	ePZ	09	37	04 d
	Ch	ePZ			17 08			eXZ			44
		H 00 09 35					Wr	ePZ			21
		Aden aftershock					Ch	ePZ			39 51
		Mag 5.6 (Qt)						ePcPZ			40 21
22	Qt	ePZ	03	53	16 d			ePPZ			42 20
22	Qt	ePZ	08	26	15			eSE			48 42
22	Ch	iPZE	17	28	38 c			USCGS H 09 28 56			
	Lh	ePZN			29 50 c			38 N 14½ E			
	Wr	iPZ			58 c			Near north coast of Sicily			
	Qt	ePZE			30 34 c	23	Ch	e(PKP)Z	14	15	05
		epPZE			44		Qt	ePKPZ			18 06
		esPZE			59			USCGS H 13 59 02			
		ePPZN			32 48			27½ S 176 W			
		USCGS H 17 20 19						Kermadec Islands region			
		37½ N 141½ E									
		Off east coast of									
		Honshu, Japan				23	Qt	ePnZ	20	21	26
		Slightly deeper than						eP*ZE			29
		normal						iPgZNE			34
23	Wr	iPZ	04	01	16			iS*nZNE			59
	Qt	ePZ			43 c			eSNN*			22 04
		eSKSN*			12 (8			eSgNEN*			08
		eSN*			16		Wr	ePnZ			21 27
		USCGS H 03 49 00						iS*N			22 08
		56½ N 158 W						H 20 20 42			
		Alaska Peninsula						Afghanistan			
23	Qt	ePKPZ	04	50	09						
		USCGS H 04 31 00									
		28 S 176 W				23	Qt	ePZ	21	46	34
		Kermadec Islands					Wr	ePZ			54

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				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
24	Wr	ePZ	07 07 47	25	Qt	Mindanao	
	Lh	ePN	08 34			Philippine Islands	
		esPN	55			ePZ	01 12 38
	Qt	ePZ	41 d			ePKPZ	04 08 03
		esPNE	09 13			USCGS H 03 48 58	
		eSNN*	10 01			27½ S 176 W	
		H 07 06 58				Kermadec Islands region	
		36¼ N 69½ E				ePZ	05 59 45
		Hindukush				ePKPZ	10 38 04
		depth about 100 km				eXZ	43
24	Qt	ePZ	07 27 40			ePPZN*	41 05
	Wr	ePZ	58			ePKSZN*	44
24	Qt	ePKPZ	04 33 29			ePPPN*	44 11
		USCGS H 09 14 24				eSKKSN*	47 58
		27½ S 176½ W				eSKSPN*	51 11
		Kermadec Islands region				ePSN*	25
24	Ch	ePZE	13 15 18			ePPSN*	53 14
		ePPZE	16 58			i(SS)N*	59 33
		ePPPZE	17 18	Wr		iPKPZ	38 16
		ePcPZ	18 09	Lh		ePKPN	28±
		eSE	21 15	Ch		ePKPZE	43
	Wr	ePZ	18 15			iXZ	39 30
		ePZ	38			ePKS	42 14
		ePPZNE	20 47			ePPZE	43 41
		eSN*	26 42			eSKSE	45 47
		ePSN*	57			USCGS H 10 18 35	
	ePPSN*	27 06			25½ S 67 W		
	eLN*	33·8			Chile-Argentina		
	USCGS H 13 08 34				border region		
	9 N 126½ E				Mag 6½-6¾ (Pas)		
	Near north coast of			25	Wr	ePZ	13 56 10
						eSN	43

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				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
	Lh	ePN	54			eSE	20 45
	Qt	ePZ	57 10		Wr	ePZ	13 01 c
		eSZNE	58 28		Qt	ePZ	37 o
		H 13 55 30				ePcPZE	14 02
		36¼ N 70½ E				ePPE	16 06
		Hindukush				eSN*	22 41
		depth about 150 km				ePSN*	59
25	Qt	ePZ	14 18 17			ePPSN*	23 16
25	Wr	ePZ	16 05 18			eSSN*	26 55
	Qt	ePZ	28			eLN*	30·6
26	Wr	ePZ	08 12 46			USCGS H 22 02 35	
		iSZ	13 19			53 N 160 E	
	Qt	ePZ	14 01			Kamchatka foreshock	
		eSZNE	15 28	27	Ch	ePZE	04 57 52
		H 08 12 07				ePcPZE	58 40
		Chitral, West Pakistan				ePPZE	05 00 05
26	Qt	ePZ	12 23 58			eSE	06 01
26	Wr	ePZ	18 31 18			ePSZE	15
	Ch	ePZ	40			ePPSE	22
		ePcPZ	45			eScSE	07 40
	Qt	ePZ	45		Wr	ePZ	04 58 15 c
		ePcPZ	48		Qt	ePZ	50 o
		ePPZ	35 03			eSN*	05 07 49
		eSN*	42 11			ePSN*	08 13
		eSSN*	47 50			ePPSN*	34
		eLN*	54·1			eScSN*	51
		USCGS H 18 19 10				eSSN*	12 13
		59½ N 151½ W				eLN*	16·0
		Kenai Peninsula, Alaska				USCGS H 04 47 45	
26	Ch	ePZE	22 12 39			52½ N 160½ E	
		ePcPZE	13 30			Kamchatka foreshock	
		ePPZE	14 51	27	Ch	ePZ	05 12 03
		ePPPZE	16 15			ePcPZ	49

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPE	14	16		27	Qt	ePZ	07	56	27
		eSE	20	07				USCGS H 07 45 25			
	Qt	ePZ	12	59				52½ N 159½ E			
		USCGS H 05 01 55						Near southeast coast of			
		52½ N 160 E						Kamchatka			
		Kamchatka foreshock				27	Ch	ePZ	08	15	36
27	Qt	ePZ	05	17	18	Qt	ePZ		16	35	
		USCGS H 05 06 14						eXZ	17	14	
		52½ N 160 E						USCGS H 08 05 30			
		Near southeast coast of						52½ N 160 E			
		Kamchatka						Near southeast coast of			
27	Qt	ePZ	05	18	42			Kamchatka			
27	Qt	ePZ	05	29	30	27	Ch	ePZ	09	32	45±
		ePPZ	30	42			Wr	ePZ	36	23	c
	Wr	ePZ	29	52			Qt	ePZ		48	
		USCGS H 05 22 39						eSN*	41	22	
		35 N 26 E						H 09 31 07			
		Near east coast of Crete						Northern Burma			
27	Ch	ePZ	06	28	10	27	Ch	ePZ	11	59	05
		USCGS H 06 18 08					Qt	ePZ	12	00	00
		Near southeast coast of						USCGS H 11 48 55			
		Kamchatka						52½ N 160 E			
								Near southeast coast of			
27	Ch	ePZ	07	01	44			Kamchatka			
		ePPZ	03	56		27	Ch	ePZE	12	04	55
		eSE	09	49				ePcPZE	05	44	
	Wr	iPZ	02	02	c			ePPZE	07	10	
	Qt	ePZ		38	c			ePPPZ	08	34	
		ePPZNE	05	10				eSE	13	04	
		eSN*	11	32				iPZ	05	17	c
		USCGS H 06 51 35					Wr	iPZ	05	17	c
		52½ N 159½ E					Qt	ePZ		51	c
		Kamchatka foreshock						ePPZ	07	57	
								eSN*	14	56	

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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 11 54 48						eSNN*	12	56	
		52½ N 160 E						iXN*	13	14	
		Kamchatka foreshock						iScSEN*		56	
27	Qt	ePKPZ	12	57	17			iLN*	21	9	
		iXZ		30				ePKPPKPZ	32	17	
	Wr	ePKPZ		31				Mu Sec			
	Ch	ePKP,ZE	58	02	d			PZ 1.2 2.0			
		iXZE		35				PPZ 0.9 2.5			
		ePKP,ZE	59	13				Δ = 67° 7			
		epPKPZ	13	00	22			USCGS H 15 52 55			
		ePPZE	02	15				56 N 162½ E			
		iSKSZ	04	21				Kamchatka			
		USCGS H 12 39 09						Mag 6.8 (Qt)			
		28 S 63 W				27	Ch	ePZ	19	38	54
		Santiago del Estro					Qt	ePZ		39	43 c
		Province, Argentina						USCGS H 19 28 39			
		depth about 650 km						56 N 162 E			
27	Qt	ePZ	13	00	06 c			Near east coast of			
27	Ch	ePZE	16	03	11			Kamchatka			
		ePcPZE		54		28	Wr	iPZ	02	13	08 o
		ePPZE	05	26				eSN		42	
		ePPPZE	06	52			Qt	ePZ		14	01
		eSE	11	27				esPZNE		43	
		ePSE		40			Ch	ePZE		17	02
		ePPS		49				H 02 12 24			
	Wr	ePZ	03	22	c			36½ N 70 E			
	Qt	ePZ		59	c			Hindukush			
		iXZ	04	16				depth about 200 km			
		ePcPZNE		24				USCGS H 02 12 18			
		ePPZ	06	30				37 N 70½ E			
		ePPPZNE	08	04				Hindukush			
		iPcSN*		32				depth about 200 km			

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
28	Ch	ePZE	07	30	40 c			ePPZ	27	15	
		ePcPZE	31	27				USCGS H 10 03 08			
		ePPZE	2	53				22½ S 67½ W			
		ePPPZE	34	19				Chile-Bolivia border			
		eSZE	58	50				depth about 100 km			
		ePSE	39	12		28	Ch	ePZE	13	14	38 c
	Wr	iPZ	31	01	c			eXE		47	
	Qt	ePZ		38	c			ePcPE	15	26	
		iXZ		53				ePPE	16	54	
		ePcPZ	32	03				eSE	22	48	
		ePPZNN*	34	08			Wr	iPZ	15	02	c
		ePPPN*	35	47			Qt	ePZ		37	c
		ePcSZEN*	36	07				eXZ		48	
		iSNEN*	40	42				ePcPZE	16	02	
		ePSNE		58				ePPZNN*	18	09	
		iPPSN*	41	20				ePPPN*	19	45	
		iScSEN*		33				ePcNN*	20	04	
		eSSN*	45	20				eSNN*	24	42	
		iLN*	48	9				ePSN*	25	03	
		ePKPPKPZ	59	55				ePPSN*		18	
		Mu Sec						eSSN*	29	03	
		PZ 0.9 2.2						eLN*	32	9	
		Δ = 63° 9						Mu Sec			
		USCGS H 07 20 32						PZ 0.4 1.8			
		52½ N 160 E						Δ = 69° 1			
		Near east coast of						USCGS H 13 04 30			
		Kamchatka						52½ N 160 E			
		Mag 6½ (Pas),						Near southeast coast of			
		6¼ (Berk), 6.6 (Qt)						Kamchatka			
28	Qt	ePKPZ	10	22	34 ±			Mag 6 (Pas), 6.4 (Qt)			
	Wr	ePKPZ			35						
	Ch	ePKPZ	23	06		29	Qt	ePZ	03	04	27

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
29	Ch	ePZ	07	12	05 c	29	Wr	ePZ	21	37	55
		ePPZ		13	45			Qt	ePZ		38 04
	Wr	iPZ		14	43 c			USCGS H 21 35 55			
	Qt	ePZ		57	c			8½ S 122 E			
		USCGS H 07 04 14						Flores Islands			
		2 S 126 E				30	Wr	iPZ	06	32	02 d
		Spice Island						iSZ		35	
29	Qt	ePKPZ	17	33	45		Qt	ePZ		33	04
		USCGS H 17 14 40						eSNE		34	24
		21½ S 174 W						H 06 31 19			
		Tonga Islands						Hindukush			
29	Ch	ePZE	20	43	32 d	30	Qt	ePZ	07	21	48
		epPZE		44	49	30	Qt	ePZ	14	04	51
		esPZE		45	24			USCGS H 13 55 45			
		ePPZE		33				6 S 105½ E			
		ePPPZE		46	47			Sunda Strait			
		eSE		50	15			depth about 150 km			
		esSE		52	23	31	Ch	ePZE	10	39	03
		eScSE		45			Wr	iPZ		41	06 c
	Wr	iPZ		45	31 d		Qt	ePZ			18 c
	Qt	ePZ		57	d			USCGS H 10 29 23			
		ePcPZNE		46	16			3 S 139½ E			
		epPZNE		47	14			Northern New Guinea			
		esPZNE		48		31	Qt	ePZ	21	04	33
		ePPZN		48	42			USCGS H 20 52 55			
		iSNN*		54	45			37½ N 25 W			
		iScSN*		55	14			Azores Islands			
		USCGS H 20 35 08									
		18 N 145 E									
		Mariana Islands									
		depth about 350 km									
		Mag 6-6¼ (Pas)									

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			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
	Quetta		9	ePZ	20 38 56
1	ePZ	23 38 38	10	ePgZ	01 23 11
3	ePZ	00 22 16		eSgN	18
3	ePgZ	19 19 43	11	ePgZ	05 24 36
	eSgZ	50		eSgNE	50
3	ePgZ	19 15 45	11	ePZ	15 24 18
	eSgN	52	12	eXZ	23 59 8
3	eXZ	20 13 4	13	ePZ	12 06 48
4	eXZ	04 05 3		eSN	07 52
4	eXZ	14 49 6	14	eXZ	08 52 0
4	eXZ	23 52 2	14	ePZ	23 37 06
5	ePZ	09 00 51	15	eXZ	13 47 1
5	ePZ	18 10 26	15	eXZ	14 19 6
	eSN	55	15	ePZ	19 14 35
7	ePgZ	19 08 29	15	ePgZ	20 36 36
	eSZN	44		eSgN	48
7	ePgZ	19 14 20	18	ePgZ	00 12 00
	eSgN	34		eSgN	12
7	ePgZ	23 27 12	18	ePZ	09 37 01
	eSgZN	26	18	ePZ	19 28 48
8	eXZ	03 55 5		eSNE	29 14
8	ePZ	13 16 19	19	ePZ	14 59 01
	eSZNE	44	19	ePZ	15 02 17
8	ePZ	17 28 58		eSN	03 07
9	ePZ	03 10 12	20	ePZ	12 45 08
	eSN	32		eSNE	39
9	ePgZ	03 30 11 3	24	e(P)Z	05 37 53
	eSgZN	13 1	24	ePgZ	13 04 16
9	ePZ	07 07 51		eSgZ	18
	eSN	08 29	24	ePZ	13 44 55
9	ePZ	19 06 29	25	ePZ	04 37 48
	eSN	07 10	25	ePZ	05 38 57

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			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
26	ePZ	20 17 05	6	iPZ	18 34 30 c
26	ePZ	22 47 20		iSZ	56
29	ePZ	19 36 36	7	ePZ	05 26 45
29	ePZ	23 16 39	7	ePZ	06 37 23
31	ePZ	15 51 15		iSZ	44
	Warsak		7	ePZ	20 28 35
1	iPZ	09 34 47 d		iSZ	57
1	ePZ	15 57 32	8	iPZ	00 34 25 d
1	iPZ	23 37 27 d		iSZ	58
2	ePZ	00 55 53	8	iPZ	05 39 50 c
2	ePZ	04 07 13		iSZ	40 20
3	ePZ	00 22 18	8	ePZ	08 50 52
3	iPZ	00 37 11 c	8	iPZ	20 01 36 c
	iSZ	46	9	ePZ	22 41 24
3	iPZ	19 15 56 d		iSZ	42 05
	iSZ	16 27	10	ePZ	12 25 17
3	iPZ	20 31 51 d		iSZ	52
	iSZ	32 23	10	ePZ	21 44
5	ePZ	09 08 12		iSZ	45 08
5	ePZ	12 14 43	11	iPZ	00 28 43 c
5	iPZ	15 44 25 d	11	iPZ	07 36 04 c
	iSN	45 06		iSZ	38
5	iPZ	16 24 53 d	11	ePZ	08 33 25
	iSZ	25 23	11	ePZ	11 37 56
5	iPZ	16 56 03 c		iSZ	38 29
	iSZ	32	11	iPZ	11 47 27
5	iPZ	17 32 01 c		iSZ	49 00
	iSZ	31	11	ePZ	13 29 30
6	iPZ	13 37 09 c	11	ePZ	14 31 34
	iSZ	37	11	ePZ	15 25 18
6	iPgZ	14 14 11 1 c	11	ePZ	18 51 29
	iSgZ	15 3		iSZ	58

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			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
11	ePZ	22 25 09		iSZ	42
12	ePZ	00 37 46	17	ePZ	07 57 34
	iSZ	39 03		iSZ	58 47
12	ePZ	07 26 00	17	iPZ	09 31 48 d
12	ePZ	08 45 19		iSZ	32 51
	iSZ	49	17	eXZ	17 08 53
12	iPZ	11 11 07 d	18	iPZ	09 36 31 c
	iSZ	41		iSZ	53
12	ePZ	11 47 18	18	ePZ	16 57 03 d
12	ePZ	12 13 23		iSZ	31
12	ePZ	13 08 23	18	ePZ	17 46 10
12	ePZ	21 17 14		eSZ	47 02
	iSZ	18 32	18	ePZ	18 11 05
13	iPZ	11 42 16	18	ePZ	19 53 47
	iSZ	58		iSZ	54 22
13	ePZ	12 05 56	19	iPZ	14 58 14
	iSZ	06 22		iSZ	37
13	ePZ	15 41 56	19	iPZ	15 01 25 d
14	iPZ	04 45 25 d	19	ePZ	21 00 38
	iSZ	46 55	20	ePZ	05 34 15
14	iPZ	09 13 31 c	20	ePZ	06 52 36 c
	iSZ	14 06		iSZ	53 08
14	ePgZ	12 38 19	21	ePZ	08 30 52
	iSgZ	31		iSZ	32 03
14	eXZ	23 37 37	21	iPZ	14 14 08 c
15	ePZ	02 29 52		iSZ	41
	eSZ	30 29	21	ePZ	14 43 42
15	ePN	15 40 59		iSZ	44 25
	iSN	41 24	21	iPZ	21 28 40
16	ePgZ	04 58 56		iSZ	29 16
	iSgZ	59 08	21	iPZ	23 28 25
16	ePZ	23 02 01	22	iSZ	54
				iPZ	05 10 55

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			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
22	iPZ	06 39 35	26	iPZ	23 35 13 c
	iSZ	40 10		iSZ	53
23	iPZ	02 52 12 c	27	ePZ	04 01 41
	iSZ	47		iSZ	02 13
23	iPZ	06 13 16	27	ePZ	05 11 58
	iSZ	50	27	ePZ	14 15 45
24	iPZ	05 30 31	27	ePZ	17 58 20
24	ePZ	13 09 44		iSZ	47
24	iPZ	13 42 20	27	ePZ	20 30 58
	iSZ	43 00	28	ePZ	03 40 14
24	ePZ	13 50 12		iSZ	45
24	ePZ	14 24 07	28	ePZ	16 08 13
	iSZ	41	28	iPZ	23 32 11 c
24	iPZ	18 48 10 c	29	iPZ	07 08 29
	iSZ	57		iSZ	09 24
24	ePgZ	20 12 35	29	ePZ	18 36 39
	eSgZ	42		iSZ	37 51
24	ePZ	20 59 25	30	ePZ	12 58 21
25	ePZ	00 28 17		iSZ	59 12
25	ePZ	04 34 06	30	iPZ	13 06 29 c
	iSZ	42		ePZ	20 44 56
25	ePZ	22 24 18	30	ePZ	21 38 49
	eSZ	25 15		iSZ	39 23
26	iPZ	01 34 00	30	ePZ	22 04 34
	iSZ	44		iSZ	05 00
26	iPZ	04 35 50	30	ePZ	23 37 45
	iSZ	36 22	31	ePZ	02 04 04
26	ePZ	05 53 50		eSZ	48
26	ePZ	12 58 12	31	ePZ	09 01 38
26	ePZ	13 54 59		ePZ	15 51 17
	iSZ	55 36	31	ePZ	16 15 55
26	ePZ	20 15 55			

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			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
31	ePZ	18 09 21	10	eXE	06 54 5
	iSZ	56	15	eXZ	01 46 53
31	ePZ	20 59 54	18	ePZ	00 11 44
	Lahore			iSE	12 17
1	eXZ	13 28.0		Chittagong	
2	ePN	00 36 46	1	ePgZ	09 14 54
2	ePN	04 06 39		eSgZ	15 05
2	eXN	07 52 05	1	eXZ	15 13 37
8	eXN	04 40 19	1	eXZ	15 59 36
8	eXN	12 54 32	1	ePZ	19 00 18
10	ePZ	00 43 23	2	ePgZE	07 44 35
11	eXN	11 49 19		iSgZ	49
11	ePN	13 30 22	2	e(P)Z	20 08 22
13	ePN	15 41 39	3	ePZE	19 24 13
15	eXN	01 47 12	3	ePZE	21 24 43
15	eXZ	07 14 07	4	e(P)Z	09 37 03
15	eXN	22 08 28	5	eXZ	08 58 48
16	eXZ	05 04 01	6	ePgZE	02 16 44
17	eXN	23 02 06		eSgZE	54
19	eXN	14 26 38	7	eXZE	19 16 43
19	ePN	15 00 04	7	ePZ	22 11 35
23	eXN	18 22 33	9	ePgZE	01 08 22
23	eXN	20 22 39		eSgZE	32
28	eXZ	02 13 38	9	eXZ	14 18 47
29	eXZ	20 46 27	9	eXE	18 27 41
	Karachi		10	ePZ	00 40 00
1	eXZ	00 32.5	11	eXZ	10 20 49
4	ePZ	19 25 14	15	ePZ	09 37 37±
	e(S)E	14	15	eXZ	23 17 13
9	ePZ	19 06 50	17	e(P)ZE	03 08 03
	eSE	31	17	eXZ	17 08 58
			18	eXE	17 00 59

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			Minor Shocks		
Date	Phase	h m s	Date	Phase	h m s
18	ePZ	18 11 59			
20	ePE	13 00 49			
21	eXE	10 35 48			
23	e(P)ZE	04 00 58			
23	eXZ	04 46 24			
23	ePZE	13 13 07			
24	eXE	18 38 18			
25	eXZ	14 20 06			
27	ePZE	05 33 00±			
27	ePZE	06 01 30			
29	ePZ	04 28 59			
29	ePZ	06 21 37			
29	eXZE	17 35 24			
29	ePZE	21 33 53±			
30	eXZ	06 36 25			
30	ePZ	11 02 24			
30	ePZ	13 16 97			
31	eXZ	21 07 11			