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GEOPHYSICAL INSTITUTE

QUETTA

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

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Particulars of Stations and Instruments

(a) Stations

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

(b) Instruments

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

(Contd).



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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 "	—	—

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
1	Qt	ePKPZ	20	18	37		Lh	ePN	17	15		
		USCGS H 19 59 33						eSN	18	55		
		22 S 175 W					Qt	ePZ		21		
		Tonga Islands						eSNEN*	20	52		
1	Ch	ePZ	22	03	04		Kr	ePZ	19	24		
	Qt	ePZ		05	47			eSE	22	42		
		USCGS H 21 54 50					Ch	ePZ	20	00		
		Boeroe - Ceram						ePPZN*		25		
		Islands region						ePPPZN*		35		
2	Qt	ePKPZ	00	29	33			eSZN*	23	59		
		USCGS H 00 10 26						eSSN*	24	40		
		19 N 101 1/2 W										
		Michoacan, Mexico										
2	Qt	ePZ	12	21	29							
		e(S)N		24	16							
2	Qt	ePZ	22	07	39							
		USCGS H 21 56 25					3	Qt	ePZ	15	59	26
		52 N 30 W					4	Qt	ePZ	01	24	59
		North Atlantic Ocean					4	Ch	ePZN*	02	27	37 d
3	Ch	ePZ	01	13	23							
		ePcPZ			49							
	Qt	ePZ		15	37							
		USCGS H 01 02 20										
		7 S 156 E										
		Solomon Islands					Qt	ePZ	28	21	d	
								eSENE*	38	36		
3	Ch	ePZ	05	11	28							
		USCGS H 04 59 20										
		64 1/2 N 150 W										
		Central Alaska										
3	Qt	ePZ	11	46	42							
3	Wr	ePZ	14	17	13		4	Qt	ePZ	03	10	46
		iSZ		18	47				eSNE		13	39
							4	Ch	ePZN*	03	59	54 c

* 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
		epPZN*	04	00	18			USCGS H 16 25 25			
		esPZ			35			72 N 1½ W			
		ePPZ	01	23				Jan Mayen Islands			
		ePPPZ			45			region			
		ePcPZ	02	17		4	Ch	ePZ	21	09	22 d
		iXZ			23			ePPZ			31
		eSZN*	05	30				ePPPZN*			40
		eSSZN*	08	01				eSZN*			12 07
		eSSSZN*			32			eSSZN*			23
Qt		ePZ	02	22	c		Wr	iPN			32
		ePPE			48			eSN			17 54
		ePPZN*	04	21			Qt	ePZ			12 36
		eXZN*	05	50				eSNEN*			18 03
		ePcSZE	07	10				eLN*			20.3
		eSNEN*	09	46				Mu Sec			
		isSN*	10	41				PZ 0.2 1.2			
		epKPPKPZ	32	37				Δ = 34°3			
		Mu Sec						H 21 05 46			
		PZ 3.4 2.3						73¾ N 94½ E			
		Δ = 54.°8						Nicobar Islands			
Kr		ePZ	04	02	34 c			USCGS H 21 05 45			
		USCGS H 03 53 00						7½ N 94 E			
		31 N 129 E						Nicobar Islands			
		Near south coast of						Mag 5.9 (Qt)			
		Kyushu, Japan				5	Qt	ePZ	06	54	08
		depth about 100 km				5	Lh	ePN	11	26	42
		Mag 6½ (Pas), 6.9 (Qt)						eSN			27 48
4	Qt	ePZ	12	05	21		Wr	ePZ			23
		USCGS H 11 55 12						eS			29 07
		Hokkaido, Japan					Ch	ePN*	27	58	±
								eSN*			30 02
4	Qt	ePZ	16	35	00		Qt	ePZ	28	00	

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSNEN*	30	12		5	Ch	ePZ	15	57	50
	Kr	ePZ	28	15				ePPZ			59 28
		eSE	30	35				ePcPZ			47
		H 11 25 07						ePPPZ	16	00	00
		29 N 81 E						eSN*			04 08
		Nepal					Wr	ePZ			00 24
		USCGS H 11 25 00					Qt	ePZ			40
		29 N 81 E						USCGS H 14 40 53			
		Nepal						1 N 129 E			
								Halmahera aftershock			
5	Ch	ePN*	13	59	09	5	Lh	ePN	23	52	19
		iXN*			48			eSN			53 24
		ePPN*			58 50		Wr	iPZ			52 59
		ePPPZ*			59 20			eSN			54 41
		eSN*	14	03	29		Ch	ePZ			53 28
	Lh	ePN	13	59	30			ePPZ			37
		eSN	14	07	40			ePPPZ			46
	Wr	ePZ	13	59	48			eSN*			55 39
	Kr	ePZ			56 d		Qt	ePZ			53 37
		eSE	14	08	32			eSEN*			55 47
	Qt	ePZ			00 04 d		Kr	ePZ			53 49
		ePcPNE			34			eSE			56 11
		ePPN*	02	34				H 23 50 38			
		i!SNN*	08	48				29 N 80¾ E			
		eScSNE	09	58				Nepal			
		ePKPPKPZ	28	07				USCGS H 23 50 38			
		Mu Sec						29 N 81 E			
		PZ 3.7 1.6						Nepal			
		Δ = 65°7									
		USCGS H 13 49 16				6	Ch	ePZ	02	30	02 d
		1 N 129 E						ePPZN*			31 39
		Halmahera Island						ePcPZN*			56
		Mag 6¾ (Pas), 6.7 (Qt)						ePPPZN*			32 13

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSN*	36	22			Kr	ePZ	23	24	c
Wr		ePZ	32	35			Qt	ePZ		34	c
Kr		ePZ		46	d			ePcPZE	24	14	
Qt		ePZ		53	d			iXE		42	
		ePcPZ	33	26				eSNEN*	31	53	
		ePPZE	35	16				eScSNE	33	13	
		eSEN*	41	31				USCGS H 05 13 10			
		eScSN*	42	35				1½ N 125½ E			
		eSSN*	45	42				Celebes			
		eLN*	49	2		7	Qt	ePZ	05	52	40
	Mu	Sec				7	Ch	iPZ	06	21	04
	PZ	0.3 1.5						esPZ		04	
	Δ = 64° 4							eSZ		28	38
	USCGS H 02 22 06						Ch	ePZ		21	30
	1 N 129 E						Qt	ePZ		22	07
	Halmahera aftershock							epPZE		31	
	Mag 6.3 (Qt)							esPNE		44	
6	Qt	ePKPZ	04	30	56			ePPZE		24	33
		USCGS H 04 11 54						USCGS H 06 11 38			
		24 N 108 W						52 N 153 E			
		Gulf of California						Off southwest coast of			
		Mag 5-5½ (Pas)						Kamchatka			
7	Qt	ePZ	00	54	17			depth about 100 km			
		USCGS H 00 51 40				7	Qt	ePZ	11	43	18
		34½ N 55 E						USCGS H 11 34 23			
		Iran						23½ N 123½ E			
7	Qt	ePZ	02	16	52			Ryukyu Islands			
		USCGS H 02 08 04				7	Ch	ePZ	15	54	05
		5½ S 101 E					Wr	ePZ		56	24
		Off coast of Sumatra					Qt	ePZ		56	56
7	Ch	ePZ	05	20	39			USCGS H 15 47 50			
	Lh	ePZ		22	56 c			24½ N 125 E			
								Ryukyu Islands			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
7	Wr	ePZ	21	22	17			esPPZ		53	43
	Qt	ePZ		48				ePPPZN*		54	44
8	Qt	ePnZ	06	34	03 c			iSKSN*		57	53
		iP*ZE		08				i(S)N*		59	04
		iPgZN		17				i!XN*		40	
		iSnNN*		43				iSSN*	17	07	08
		i!S*NN*		50				Mu	Sec		
		i!SgN*	35	00				PZ	0.5 1.8		
	Kr	ePZ	34	15				Δ = 109°			
		iSE	35	07				USCGS H 16 33 38			
	Wr	ePZ		15				16½ S 168½ E			
		H 06 33 09						New Hebrides Islands			
		28 N 64 E						depth about 250 km			
		Kharan, Baluchistan						Mag 7-7½ (Pas),			
8	Ch	iPZN*	16	45	50 d			7 (Berk), 7.4 (Qt)			
		iPPZN*		46	53						
		isPZN*		47	20	8	Qt	ePZ	17	02	53 d
		ePPZN*		49	12		Kr	ePZ		57	
		ePPPZN*		51	06	8	Qt	iPZ	17	03	07 d
		iSZN*		55	53		Kr	ePZ		12	
		ePSN*		57	26		Ch	iPZ		59	d
		isSN*		45		9	Qt	ePZ	22	16	24
		iPKPPKPZ	17	12	01	10	Qt	epPKPZE	14	20	
	Lh	ePZ	16	47	09			eXZE		16	30
	Wr	iPZ		20				ePPZE		55	
	Kr	ePZ		34				ePKSZE		17	26
		iXZ		51	39			eSKSZN		20	41
	Qt	iPZ		47	36 d		Ch	ePKPZ		14	20
		epPZ		48	37			iXZ		15	13
		esPZE		49	06			USCGS H 23 54 20			
		iPZ		51	42			16 S 72 W			
		e(PP)ZE		52	00			Southern Peru			
								depth about 150 km			

Date	Station	Phase	h	m	s
10	Qt	ePZ	00	36	52
	USCGS H 00 24 20				
	64 N 169 W				
	Central Alaska				
10	Qt	ePKPZ	14	03	24
	ePPZ		05	16	
	USCGS H 13 44 25				
	15 S 174 W				
	Samoa Islands region				
10	Ch	iPZN*	14	41	58 d
	epPZ		42	30	
	esPZ			40	
	ePcPZ			59	
	ePPZN*		44	00	
	eSN*		49	26	
	esSN*		50	18	
	Lh	ePN	42	37	
	Wr	iPZ		34 d	
	Qt	iPZ	43	16 d	
	epPZNE			34	
	esPZ			47	
	eXNE			56	
	ePPZN*		45	36	
	ePPPZN		47	03	
	eSNN*		51	49	
	eScSNN*		52	36	
	eSSN*		56	02	
	Mu	Sec			
	PZ	0.7	1.8		
	$\Delta = 65^\circ.4$				
	USCGS H 14 32 39				
	47 N 152 E				

Date	Station	Phase	h	m	s
		Kurile Islands			
		depth about 100 km			
		Mag 6.3 (Qt)			
10	Qt	ePKPZ	19	14	57 2
		eXN*		17	28 2
	Ch	ePKPZ		15	34
		ePKSN*		19	20
		USCGS H 18 55 55			
		14½ N 91½ W			
		Guatemala			
		depth about 100 km			
11	Qt	ePZ	00	30	58
11	Ch	ePZ	00	43	43
11	Qt	ePZ		48	41
11	Qt	ePZ	13	22	15
		USCGS H 13 11 10			
		18½ N 145 E			
		Mariana Islands			
		depth about 200 km			
11	Lh	ePZ	16	33	04
	Wr	ePZ			25
	Qt	ePZ			41
12	Ch	ePZ	02	25	27 c
	Wr	iPZ		27	21 c
	Qt	ePZ			38 c
		epPZE		28	12
		esPZE			37
		eSKSNEN*		37	52
		eSEN*		38	15
		USCGS H 02 14 56			
		4 S 152½ E			

Date	Station	Phase	h	m	s
		Near coast of			
		New Britain			
		depth about 150 km			
	Qt	ePZ	02	53	40
	Qt	ePZ	12	01	25 d
		ePPZN*		02	59
		e(S)N*		07	39
		eLN*		10.5	
		Mu	Sec		
		PPZ 0.1	1.5		
	Wr	ePZ	12	01	38
	Lh	ePZ		02	08
	Ch	ePZ		04	19
		ePePZ		05	00
		ePPZ		06	36
		ePPPN*		08	03
		eSN*		12	38
		ePPSN*		13	02
		USCGS H 11 54 00			
		42 N 21 E			
		Southern Yugoslavia			
		Mag 5½ (Qt)			
	Qt	ePKPZ	14	07	12 c
		ePPZ		10	36
	Wr	ePKPZ		07	25
	Ch	ePKPZ			46
		USCGS H 13 47 52			
		36½ S 71 W			
		Chile - Argentina			
		border			
		depth about 150 km			
12	Wr	ePZ	15	54	33
	Qt	ePZ			55 39
12	Ch	iPZN*	20	41	31 d
		ePcPZ			42 02
		ePPZN*			43 58
		ePPPZN*			45 32
		eSN*			50 16
		ePSN*			37
		ePPSN*			46
		eScSN*			51 24
		eSSN*			54 28
		ePKPPKPZ	21	10	12
	Lh	iPZ	20	43	12 d
		eSKSN			53 28
	Wr	iPZ			43 24 d
		eSKSN			53 53
	Kr	ePZ			43 36 d
	Qt	iPZNE			40 d
		iXZ			52
		ePPZNN*			47 11
		ePPPN			49 10
		eSKSNEN*			54 10
		iSZNE			29
		iScSNEN*			38
		iPSN*			55 33
		iPPSN*			56 08
		iXN*			58 46
		eLN*	21	08.0	
		ePKPPKPZN	09	26	
		Mu	Sec		
	PZ	1.4	1.8		
	PN	0.4	1.5		

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	PE	0.7	1.7			14	Qt	ePZ	19	11	
	$\Delta = 89^\circ 6$							USCGS H 19 01 35			
	USCGS H 20 30 39							41½ N 142 E			
	6 S 152 E							Near coast of			
	New Britain							Honshu, Japan			
	Mag 6½ (Pas), 6.9 (Qt)					14	Qt	ePZ	20	18	
13	Qt	ePZ	02	33	44			ePPPZN			
	USCGS H 02 23 37							eSZNE	21		
	Near south coast of							eLN*	21		
	Hokkaido, Japan						Wr	iPZ	19		
	USCGS H 23 53 32							USCGS H 20 14 33			
14	Qt	ePKPZ	00	12	40			29 N 49½ E			
	USCGS H 23 53 32							Persian Gulf			
	7½ N 77 W										
	Panama - Columbia					15	Ch	ePZ	09	08	
	border							iPZ	11		
	depth about 60 km							ePZN			
	Mag 6 - 6½ (Pas)							USCGS H 09 00 55			
14	Lh	iPZ	01	02	28			2 N 127½ E			
	Wr	iPZ			33 c			Molucca passage			
	Qt	ePZ	03	10	c	15	Ch	ePZ	09	32	
	ePcPZN				52			ePcPZ			
	ePPZN				05 24			ePPZ	35		
	USCGS H 00 52 57							ePPPZ	37		
	42½ N 143 E							eSN*	42		
	Hokkaido, Japan							eScSN*			
14	Ch	ePZ	11	05	40		Wr	iPZ	32		
	Qt	ePZ	06	22				Lh	ePZ		
	USCGS H 10 54 05							eSN	42		
	51 N 180							Qt	ePZ	33	
	Andreasof Islands							iPcPZE			
	Aleutian Islands							ePPZNE	36		
								iSNEN*	43		

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eScSN*			56	18	Ch	ePZ	12	27	32
		eSSN*			49 00		Wr	ePZ			29 25
		Mu Sec					Qt	ePZ			40
	PZ	0.2	1.2					USCGS H 12 16 51			
	$\Delta = 83^\circ$							4½ S 152 E			
	USCGS H 09 20 56							New Britain			
	51 N 174½ W							depth about 150 km			
	Andreasof Islands					18	Wr	iPZ	14	47	16
	Aleutian Islands							iSN			53
	Mag 6.2 (Qt)						Lh	ePN			55
	USCGS H 10 08 58						Qt	ePZ	48	23	
	20 S 174 W							iSNE	49	55	
	Tonga Islands						Kr	ePZ			24
15	Qt	ePKPZ	10	28	04		Ch	ePZ	51	17	
	USCGS H 10 08 58							ePPZ			44
	20 S 174 W							ePPPZ			54
	USCGS H 00 33 05							eSN*	55	13	
	59½ S 26 W							H 14 46 23			
	Sandwich Islands							37¼ N 71 E			
16	Qt	ePKPZ	17	53	18			Northern Afghanistan			
	USCGS H 17 39 16										
	15½ S 173½ W					19	Ch	ePZ	09	28	24
	Samoa Islands region						Wr	ePZ			31 06
17	Wr	ePZ	20	25	41		Qt	ePZ			26
	Lh	ePZ			49			USCGS H 09 20 51			
	Qt	ePZ			26 14			2½ N 127 E			
	USCGS H 20 13 58							Molucca Passage			
	51 N 180										
	Andreasof Islands					19	Wr	iPZ	10	28	29
	Aleutian Islands							eSN			30 01
	USCGS H 10 35 31							Qt	ePZ		29 40
	10½ S 163 E							H 10 26 29			
	Solomon Islands							Kirghiz, S. S. R.,			
18	Ch	ePZ	10	46	49						
	USCGS H 10 35 31										
	10½ S 163 E										
	Solomon Islands					19	Qt	ePZ	14	58	53

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSN*	15	01	55			USCGS H 07 25 59			
		eLN*		03	6			$\frac{1}{2}$ N 99 $\frac{1}{2}$ E			
		H 14 55 05						Near coast of Sumatra			
19	Qt	ePZ	15	00	51	20	Qt	ePZ	10	46	13
19	Ch	ePZ	19	24	54	20	Ch	ePZ	13	45	22
		ePcPZ		26	09			esPZ			46
		ePPZ			54			ePPZ		47	15
		ePPPZ		27	51			eSN*		52	12
		eSN*		32	12			esSN*			52
		ePPSN*			28		Lh	ePZ		46	28
		eScSN*		34	43		Wr	iPZ			34
		eSSN*		35	45		Qt	ePZE		47	09 ^c
	Lh	ePN		26	55			epPNE			23
		eSN		36	12			ePPNE		49	27
	Wr	iPZ		27	11 d			e(S)NN*		55	41
	Qt	ePZ			27 d			Mu Sec			
		ePcPZNE			41			PZ 0.3 1.5			
		eXZ			54			$\Delta = 62^{\circ}0$			
		ePPZE		30	02			USCGS H 13 36 54			
		e!SNN*		37	03			40 N 143 $\frac{1}{2}$ E			
		eScSN*			37			Off northeast coast of			
		iPPSN*		38	02			Honshu, Japan			
		eLN*			46.6			depth about 60 km			
		USCGS H 19 15 37						Mag 6.2 (Qt)			
		3 S 138 E				20	Ch	ePZ		13	52 57
		New Guinea						USCGS H 13 44 25			
20	Qt	ePZ	06	30	43			Near east coast of			
20	Ch	ePZ	07	31	12			Honshu, Japan			
		eSZN*			35 29	20	Ch	ePZ		17	16 00 ^c
	Qt	ePZ			34 00			esPZ			25
								ePcPZ		17	26

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPZ			49			5 ft. Seismic Sea			
		ePPPZ		18	45			Waves at Miyako			
		eSZN*		22	50			Mag 7 (Pas) 7-7 $\frac{1}{4}$ (Berk)			
		eScSZN*		25	39			7 $\frac{1}{4}$ - 7 $\frac{1}{2}$ (Qt)			
		eSSZN*		26	17	20	Ch	ePZ		21	45 09
	Lh	ePZ		17	07		Qt	ePZ			46 56 ^c
		ePPZ		19	07			USCGS H 21 36 38			
		e(S)N		25	04			40 N 143 E			
	Wr	iPZ		17	11 ^c			Near east coast of			
		eSN		25	05			Honshu, Japan			
	Qt	ePZ		17	46 ^c	20	Qt	ePZ		22	29 36 ^c
		epPZNE		18	02	20	Qt	ePZ		22	36 52 ^c
		esPZ			12	20	Qt	ePZ		23	10 06
		iPcPZN			30	21	Qt	ePZ		00	12 01
		ePPZNE		20	10	21	Ch	ePZN*		00	43 21
		ePPPZ		21	38			ePcPZN*			44 56
		i!(S)ZNE		26	21			ePPPZ*			45 54
		i(s)NE			50			eSN*			50 09
		iScSNE		27	32			ePZ		44	43 \pm
		Mu Sec					Lh	iPZ			34 ^c
		PZ 4.4 2.0					Wr	eSN			52 24
		PPZ 3.7 2.5						ePZ		45	10 ^c
		SN 13.2 3.0					Qt	eXZE			28
		SE 27.7 5.0						ePPE			47 27
		$\Delta = 62^{\circ}$						eSNN*			53 33
	Kr	ePZ		17	18 05 ^c			ePSNEN*			44
		e(S)E			26 55			iXNN*			54 04
		USCGS H 17 07 30						eScSN*			59
		40 N 143 $\frac{1}{2}$ E						eSSN*			57 33
		Off northeast coast of						eLN*		01	00.5
		of Honshu, Japan						Mu Sec			
		depth about 60 km						PZ 0.7 2.1			
								$\Delta = 61^{\circ}9$			

				Major Shocks				
Date	Station	Phase	h m s	Date	Station	Phase	h m s	
21	Ch	USCGS H 00 34 50		21	Qt	ePZ	09 23 13	
		39½ N 143 E		21	Ch	ePZN*	09 26 52	
		Near east coast of				ePcPZ	28 24	
		Honshu, Japan				ePPZ	41	
		Mag 6½ (Pas), 6.5 (Qt)				ePPPZN*	29 27	
		ePnZN*	03 47 18			eSN*	33 44	
		ePgZ	38			ePSN*	50	
		eSnN*	48 16		Wr	ePN	28 05	
		eSgN*	41		Qt	ePZ	39	
		ePZ	51 39			ePcPZN	29 20	
21	Qt	ePPZ	52 19			ePPZN	30 55	
		ePPPZE	31			eSNE	37 01	
		H 03 46 01				Mu Sec		
		52¼ N 96½ E				PZ 0.8 1.9		
		Burma				Δ=61°·7		
		USCGS H 03 45 50				USCGS H 09 18 22		
		25 N 97½ E				40 N 143 E		
		Burma				Near east coast of		
		ePZ	04 51 52			Honshu, Japan		
		ePZ	53 42			Mag 6.6 (Qt)		
21	Ch	USCGS H 04 43 22		21	Qt	ePZ	09 46 04	
		40 N 142½ E		21	Ch	ePZ	09 51 57	
		Near east coast of			Qt	ePZ	53 43	
		Honshu, Japan				Honshu aftershock		
		ePZ	07 00 02		21	Qt	ePZ	10 17 25
		ePPZN*	01 50		21	Kr	ePnZ	12 26 21
		ePPZPN*	02 37				eSnE	38
		eSN*	06 51			Qt	ePnZ	27 12
		ePZ	01 49				iPgZNE	31
		ePPZ	04 07				eSnN	28 05
21	Qt	USCGS H 06 51 29				eSN*	21	
		40 N 143½ E				iSgNN*	35	
		Near east coast of				H 12 25 57		
		Honshu, Japan						

				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
21	Qt	Lasbela, West Pakistan		21	Qt	ePZ	16 50 45 c
		USCGS H 16 37 46				4½ S 154 E	
		New Ireland region					
		ePN	19 05 04				
		iSN	37				
		ePZ	06 03				
		eSNE	07 21				
		H 19 04 20					
		Hindukush					
		ePKPZ	20 08 29				
21	Ch	USCGS H 19 48 56		21	Ch	ePZ	23 05 28
		21 S 70½ W			Qt	ePZ	07 18
		Near coast of Chile					
		USCGS H 22 56 58					
		39½ N 143½ E					
		Near east coast of					
		Honshu, Japan					
		ePZ	23 30 14				
		ePZ	32 03				
		USCGS H 23 21 43					
21	Qt	39½ N 143 E		21	Qt	ePZ	01 02 12
		Near east coast of					
		Honshu, Japan					
		USCGS H 00 51 52					
		39½ N 143 E					
		Near east coast of					
		Honshu, Japan					
		ePZ	01 02 12				
		USCGS H 00 51 52					
		39½ N 143 E					
Near east coast of							
Honshu, Japan							
22	Qt	USCGS H 01 48 24		22	Qt	ePKPZ	02 07 43 ±
		61½ S 154 E					
		About 400 miles					
		northwest of					
		Balleny Islands					
		ePZ	09 15 55				
		ePZ	16 04				
		ePZ	10 31 09				
		ePZ	33 19				
		Honshu aftershock					
ePKPZ	13 38 49						
22	Qt	USCGS H 13 19 52		22	Qt	ePKPZ	13 38 49
		Jalisco, Mexico					
		Mag 5½ - 5¾ (Berk)					
		iPZ	21 21 47				
		ePZ	51				
		USCGS H 21 12 42					
		Near-coast of					
		western Java					
		depth about 150 km					
		ePZ	00 31 57 c				
22	Ch	iXZN*		22	Ch	iXZN*	32 06
		ePcPZN*					
		ePPN*	47				
		ePPPN*	34 31				
		eSN*	38 49				
		ePPSN*	39 01				
		iPZ	32 57				
		ePPZ	35 07				
		iPZ	33 05				
		e(S)N	41 06				
ePZ	33 42 c						

			Major Shocks		
Date	Station	Phase	b	m	s
					52
		eXZNE			36 02
		ePPZN*			37 26
		ePPPE			42 17
		i(S)NEN*			53
		iXN			01 03 02
		ePKPPKPZE			
			Mu	Sec	
		PZ	1.6	1.9	
		PPZ	0.9	2.0	
		SN	2.7	3.0	
		SE	2.2	3.0	
		$\Delta = 61.4$			
Kr		ePZ	00	34	03 c
		USCGS H	00	23	22
		39½ N	143	E	
		Near east coast of			
		Honshu, Japan			
		Mag 6½ - 6¾ (Pas),			
		6¾ - 7 (Berk), 6.9 (Qt)			
23	Ch	iPZ	01	15	47 c
		ePcPZ			17 20
		ePPZ			39
		ePPPZ			18 20
		eSZ			22 40
Lh		ePZ			16 51
		ePPZ			18 55
Wr		ePZ			16 57
		eSN			24 51
Qt		ePZ			17 35 c
		ePcPZNE			18 13
		eSN			26 00

			Major Shocks		
Date	Station	Phase	h	m	s
23	Qt	ePZ	08	01	02
23	Ch	ePZ	08	55	14
		ePcPZ			56 48
		ePPZ			57 04
		ePPPZN*			48
		eSN*	09	02	04
Lh		ePZ	08	56	18
Wr		iPZ			24 c
Qt		ePZ			57 01 c
		ePPE			59 21
		eSNEN*	09	05	28
Kr		ePZ	08	57	22
		USCGS H	08	46	44
		40 N	142½	E	
		Near coast of			
		Honshu, Japan			
23	Ch	ePZ	10	37	23
		eSN*			44 00
Lh		ePZ			38 30
Wr		ePZ			36
Qt		ePZ			39 12 c
		epPZ			36
		ePPZ			41 29
		eSEN*	47	34	
Kr		ePZ	39	31	c
		USCGS H	10	29	01
		39½ N	143	E	
		Near east coast of			
		Honshu, Japan			
		depth about 100 km			
23	Ch	ePZ	11	59	27 c
		ePcPZ			12 00 57

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
23	Ch	ePZ	21	42	53			Near east coast of Honshu, Japan			
	Lh	ePZ		44	00			Mag 6 (Pas), 6.5 (Qt)			
	Wr	ePZ			03	23	Ch	ePZ	23	00	00
	Qt	ePZ		40	c		Lh	ePZ		01	20
		USCGS H 21 34 19					Wr	ePZ			22
		39½ N 143½ E					Qt	ePZ			59
		Near east coast of Honshu, Japan						USCGS H 22 51 41			
23	Ch	iPZN*	22	31	09 c			40 N 143 E			
		iXZN*			19			Near east coast of Houshu, Japan			
		ePcPZ		32	43	23	Qt	ePZ	23	17	28
		ePPZ			58			USCGS H 23 08 49			
		ePPPZ		33	40			46½ N 8 E			
		eSZN*		37	57			Switzerland			
	Lh	ePZ		32	18±	23	Lh	ePZ	23	29	32
		ePPZ		34	22		Qt	ePZ		30	10
		eSN		40	06	23	Lh	ePZ	23	35	59
	Wr	ePZ		32	19		Wr	ePZ		36	01
	Qt	ePZ			56 c		Qt	ePZ			37
		ePcPZE		33	35			USCGS H 23 26 15			
		ePPZNE		35	14			39 N 143 E			
		ePPPZE		36	45			Near east coast of Honshu, Japan			
		eSZNEN*		41	21	24	Ch	ePZ	03	08	49
		iXN*		42	55		Qt	ePZ		09	28
		eLN*		48	4			USCGS H 02 57 01			
		Mu Sec						50 N 175½ W			
		PZ 0.8 2.5						Andreasof Islands			
		Δ = 61° 4						Aleutian Islands			
	Kr	ePZ	22	33	16 c	24	Ch	ePZ	06	03	55
		USCGS H 22 22 36						ePcPZ		05	00
		39½ N 143 E						ePPPZN*			56

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePPPZN*	07	03				USCGS H 02 28 56			
		eSZN*	11	27				19 S 177½ W			
		ePSN*		37				Fiji Islands			
	Lh	ePZ	04	36				depth about 400 km			
	Wr	ePZ		38		25	Kr	ePZ	09	50	53 c
	Qt	ePZ	05	15	d			eSE		55	12
		iXE		35			Qt	ePZ		51	19 c
		eSEN*	13	56				iSN*		55	59
		Mu Sec						iSSN*		56	16
		PZ 0.3 1.5						eLN*		57	0
		Δ = 64° 9					Wr	iPZ		52	33
		USCGS H 05 54 28						H 09 45 29			
		47 N 152½ E						Indian Ocean			
		Kurile Islands				26	Wr	ePZ	11	13	34
		Mag 6.3 (Qt)					Qt	ePZ		14	12
24	Wr	iPZ	10	08	05	27	Ch	ePZ	04	00	47
	Qt	ePZ			35 d			ePcPZN*			55
		USCGS H 09 56 00						ePPZN*		03	50
		50½ N 173 W						ePPPZN*		05	41
		Andreasof Islands						eSN*		10	54
		Aleutian Islands						eSKSN*		11	02
24	Qt	ePZ	12	31	49			eScSN*			11
24	Ch	ePZ	20	11	13			ePSN*			40
	Lh	ePZ		12	23			ePPSN*			12 00
	Wr	ePZ			25		Qt	ePZ			02 35
	Qt	ePZ	13	01	c			eSKSN*			13 18
		USCGS H 20 20 44						USCGS H 03 48 27			
		40 N 142½ E						13½ S 166 E			
		Near east coast of Honshu, Japan						New Hebrides Islands			
		Mag 6¼ (Pas)									
24	Qt	ePZ	23	24	47	27	Qt	ePZ	04	18	24
25	Qt	ePKPZ	02	47	07 d	27	Ch	ePZ	09	10	12

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		ePcPZN*			19			Jalisco, Mexico			
		ePPZN*			13 19			Mag 5 $\frac{3}{4}$ - 6 (Berk),			
		ePPPZ*			15 12			6 - 6 $\frac{1}{4}$ (Pas)			
		eSN*			20 21	27	Qt	ePKPZ	23	46	54
		cPSN*			21 05			USCGS H 23 28 04			
		ePPSN*			28			37 $\frac{1}{2}$ S 177 E			
	Wr	ePZ			11 46			Off coast of North			
	Qt	ePZ			12 02			Islands, Newzealand			
		e!SKSNEN*			22 42	27	Qt	ePZ	23	56	55
		USCGS H 08 57 53				28	Qt	ePKPZ	00	32	55
		13 $\frac{1}{2}$ S 116 $\frac{1}{2}$ E						ePPNEN*	35	19	28
		New Hebrides Islands						e!XN*	36	19	
		Mag 6 $\frac{1}{2}$ (Berk)						ePKSNE	24		
27	Qt	ePKPZ			17 43 44			ePPPEN*	38	08	
		USCGS H 17 24 41						eSKSN*	40	00	
		30 $\frac{1}{2}$ S 178 W						ePSN*	45	28	
		Kermadec Islands						eSSN*	53	30	28
27	Ch	ePZ			19 47 36		Lh	ePKPZ	32	59	
		ePcPZ			45		Ch	ePKPZ	33	32	
		ePPZ			50 37			ePPZN*	37	36	
		eSN*			57 36			eSKSZN*	40	40	
		USCGS H 19 36 25						USCGS H 00 13 38			
		13 S 166 E						7 $\frac{1}{2}$ N 82 W			
		New Hebrides Islands						Off south coast of			
27	Qt	ePKPZ			20 34 49			Panama			
		ePPZ			36 46			Mag 6 $\frac{1}{4}$ - 6 $\frac{1}{2}$ (Berk),			
		ePKSZNN*			38 18			6 $\frac{1}{2}$ - 6 $\frac{3}{4}$ (Pas)			
		eSKSN*			41 47	28	Ch	ePZ	06	48	18
	Ch	ePKPZ			35 29			esPN*	50	03	
		USCGS H 20 15 46						ePPZN*	51	31	
		20 N 104 $\frac{1}{2}$ W						ePPPZN*	53	24	

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		eSN*			58 00						
		ePSN*			59 37						
		ePPZ			54 21						
		USCGS H 06 36 27									
		13 $\frac{1}{2}$ S 166 E									
		New Hebrides Islands									
		depth about 300 kms									
		ePN			06 53 40	28	Qt				
		USCGS H 06 32 32									
		13 $\frac{1}{2}$ S 166 E									
		New Hebrides Islands									
		ePZ			06 55 00	28	Ch				
		ePcPZ			07						
		ePPZ			58 03						
		USCGS H 06 42 44									
		13 $\frac{1}{2}$ S 166 E									
		New Hebrides Islands									
		ePZ			08 08 17		Ch				
		ePcPZ			23						
		USCGS H 07 55 59									
		13 $\frac{1}{2}$ S 166 E									
		New Hebrides Islands									
		ePZ			09 55 55	28	Qt				
		ePKPZ			12 56 51	28	Qt				
		USCGS H 12 37 50									
		23 S 176 W									
		Tonga Islands region									
		ePKPZ			00 29 49	29	Qt				
		USCGS H 00 10 45									
		33 $\frac{1}{2}$ S 177 $\frac{1}{2}$ W									
		Kermadec Islands									
		region									
29	Kr	iPZ			02 19 35 c						
		iSE			20 00						
		ePZ			38						
	Qt	ePZ			06 38 34						
	Wr	iPZ			37						
	Ch	ePZ			06 43 30						
		ePcPZ			34						
		ePPZN*			46 47						
		ePPPZN*			48 43						
		eSKSN*			53 51						
		eSZN*			56						
		iScSN*			54 07						
		ePSN*			56						
		ePPSN*			55 13						
		ePZ			45 20		Qt				
		e!SKSN*			56 03						
		iSSN*			07 05 09						
		USCGS H 06 30 54									
		17 S 167 E									
		New Hebrides Islands									
		Mag 6 $\frac{3}{4}$ (Pas),									
		6 $\frac{1}{4}$ - 6 $\frac{1}{2}$ (Berk)									
		ePZ			06 49 33	29	Qt				
		ePZ			07 00 46	29	Qt				
		ePZ			07 35 40	29	Ch				
		ePPZ			36 08						
		ePPPZ			18						
		eSZN*			39 47						
	Wr	ePZ			38 29						
	Qt	ePZ			29						
		ePPZ			04 08						

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 07 30 33 0 98 E Off coast of Sumatra				30	Qt	ePZ USCGS H 12 58 57 69 N 167 W Off east coast of Greenland	13	09	07
29	Qt	ePZ	08	32	52						
22	Wr	iPZ	13	07	06 d	30	Wr	iPZ	14	20	19
		iSN		41			Qt	ePZ			25
	Qt	ePZ	08	11				USCGS H 14 11 40 3½ S 102 E Near coast of Sumatra			
		eSZNE	09	36							
		H 13 06 20 37 N 70 E Northern Afghanistan				30	Qt	ePKPZ	13	38	26
29	Qt	ePZ	16	09	18			USCGS 15 19 30 22½ S 174 E Loyalty Islands region			
29	Wr	ePZ	22	22	47	31	Wr	iPZ	00	50	29
	Qt	ePZ		59			Qt	ePZ			57
		ePPZE	26	20				USCGS H 00 39 59 18½ N 146 E Mariana Islands depth about 250 km			
		eSN*	33	25		31	Qt	ePZ	03	12	25
		eScSE		40				USCGS H 03 02 03 39½ N 143 E Off northeast coast of Honshu, Japan			
		USCGS H 22 10 20 6 S 147 E East coast of New Guinea				31	Qt	ePZ	03	42	03
30	Qt	ePZ	07	10	53			USCGS H 03 29 45 6 S 143 E New Guinea			
		USCGS H 06 58 36 51 N 178½ W Andreanof Islands Aleutian Islands				31	Qt	ePZ	04	39	00
30	Ch	ePZ	11	02	08	31	Qt	ePKPZ	15	24	37
	Qt	eSKSN*		14	37						
		USCGS H 10 49 47 13½ S 166 E New Hebrides Islands Mag 6 (Berk)									

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H 15 04 36 Pacific Ocean, about 900 miles southwest of Galapogas Islands				31	Wr	ePZ	15	57	59
							Qt	ePZ		58	36
								eSN*	16	06	57
		USCGS H 15 48 13 39½ N 143 E Off northeast coast of Honshu, Japan				31	Wr	ePZ	17	39	24
							Qt	ePZ		40	01
		USCGS H 17 29 40 40 N 143 E Off northeast coast of Honshu, Japan				31	Qt	ePKPZ	20	15	16
								ePPNE		17	09
		USCGS H 19 56 14 26 N 110 W Gulf of California Mag 5½ - 5¾ (Berk)				31	Wr	ePZ	21	42	14
							Qt	ePZ		52	c
		USCGS H 21 32 44 41½ N 142 E Near north coast of Honshu, Japan									

Minor Shocks				Minor Shocks				Minor Shocks							
Date	Phase	h	m	s	Date	Phase	h	m	s	Date	Phase	h	m	s	
11	iSZ			43	19	ePZ	06	14	41		iSZ			19 01	
	iPZ	13	35	24	19	ePZ	08	07	31	26	ePZ	15	11	21	31
	iSZ			59		eSZ	08	12	26		ePZ	20	27	22	
11	iPZ	15	56	32	19	ePZ	19	52	24		iSZ			28 09	
	iSZ			57 10		iSZ		53	05		ePZ	22	49	46	
13	ePZ	04	32	50	22	iPN	01	14	18	26	ePZ	06	57	02	7
13	ePZ	09	57	05	22	iSN		15	02	27	iPZ	07	26	39	10
	iSZ			52	22	iPZ	22	14	34	27	iSZ			27 14	10
13	iPZ	11	14	19	22	iSZ		15	05		ePZ	18	11	11	11
	iSZ			49	22	ePZ	23	18	06	27	iSZ			52.3	14
13	iPZ	14	15	05	23	iSZ		44			ePZ	15	39	04	15
	iSZ			36	23	ePZ	04	10	28	28	iSZ			40 18	16
13	iPgZ	20	35	41	23	iPZ	08	00	19	29	ePZ	02	17	18	16
	iSgZ			56	23	iSZ		51	29		eXZ	06	47	30	17
14	iPZ	09	16	40	23	iPZ	13	06	31	29	iPZ	17	49	16	
15	iPZ	18	28	52		iSZ		07	08		iSZ			54	20
	iSZ			29 29	23	iPZ	18	31	03	29	ePZ	23	41	22	26
15	ePZ	22	02	03		iSZ		37	30		ePZ	04	04	07	27
	iSZ			26	23	ePZ	19	17	17	30	ePZ	11	05	58	31
16	ePZ	02	57	20		iSZ		48			eSZ			06 30	
	iSZ			52	24	ePZ	12	13	31	30	ePZ	17	46	37	
16	iPZ	05	39	32		iSZ		14	03		iSZ			47 06	3
	iSN			40 04	24	iPZ	21	06	40	30	ePZ	17	59	57	21
16	ePZ	23	21	22	25	iPZ	09	52	08		iSZ	18	00	24	
17	ePZ	04	28	43	25	ePZ	17	27	05	31	iPZ	03	11	48	21
17	iPZ	23	46	30	25	ePZ	23	45	18	31	ePZ	03	44	30	23
	iSZ			59.3		iSZ		45	31		ePZ	04	48	51	
18	iPZ	05	48	13	26	ePZ	02	02	40	31	ePZ	10	44	12	
	iSZ			53	26	iSZ		03	13	31	iPZ	17	33	35	23
18	ePZ	08	59	28	26	ePZ	03	20	33		iSZ			34 08	
	iSZ			09 00 06	26	iSZ		21	11	31	ePZ	20	18	32	25
						ePZ	09	22	38						

Lahore

Karachi



Date	Phase	h	m	s	Date	Phase	h	m	s
28	ePZ	17	32	32					
28	eXZ	21	02	18					
29	e(P)Z	14	37	43					
29	e(P)Z	22	21	02					
	e(S)N	29	30						
Chittagong									
2	eXZ	04	55	40					
3	eXZ	16	02	35					
6	eXZ	08	38	25					
7	eXZ	11	40	13					
9	ePZ	01	16	26					
9	ePZ	17	57	18					
10	ePZ	09	56	26					
10	eXZ	14	20	02					
11	eXZ	13	20	20					
11	eXN	22	19	55					
13	eXZ	01	06	01					
14	e(P)N	19	09	40					
14	ePZ	20	21	18 \pm					
16	eXN	17	58	32					
17	ePZ	20	25	45 \pm					
19	ePZ	21	09	40					
22	eZP	01	56	55					
22	eXN	02	50	31					
22	e(P)Z	21	19	35					
23	eXN	06	11	16					
23	e(P)Z	16	09	20 \pm					
	eSN	16	25						
24	ePZ	10	07	14					
25	eXZ	02	43	23					
27	ePZ	12	35	16					
27	eXZ	23	45	42					