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MATSUSHIRO SEISMOLOGICAL OBSERVATORY, JAPAN.

Seismological Bulletin

for September 1 to October 31, 1961

Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
			h	m	s				h	m	s
1.	iPKP 1	NEZ	00	29	14.7	1.	iP	NEZ	18	51	35.2
	i	N			27		PcP	N			59
	PKP 2	Z		30	04.3		ePKPPKP	E	19	19	15
	PP	Z		33	19.3		e	E		25	10
	pPP	Z			46		P:N,W,C				
	i	Z			50		18.0 S., 178.3 W.				
	SKKS	NE		39	55		Fiji Is. region.				
	SKSP	Z		43	24		h: 619 km ca.				
	i	NZ		48	08		H=18 41 32.4 USCGS				
	SS	NE		52	50						
	L	E	01	15	00 ca.	1.	iP	NEZ	18	59	57.5
	L	N		23	00 ca.		iS	E	19	00	15
	P:C						P:N,W,C				
	Mag. 7 (Mat.)						35.4 N., 138.8 E.				
	59.3 S., 27.3 W.						Honshu, Japan.				
	Sandwich Is. region.						h: 87 km ca.				
	h: 131 km ca.						H=18 59 36.3 USCGS				
	H=00 09 34.6 USCGS										
1.	iP	Z	01	20	53.5	1.	P	Z	19	05	56
	iS	Z			55.4		L	E		42	30 ca.
	i	E			55.9		Mag. 5 3/4 - 6 (Mat.)				
	P:D						13.5 N., 92.5 W.				
							Off coast of Guatemala.				
							h: 37 km ca.				
							H=18 50 35.4 USCGS				
1.	iP	NEZ	05	24	42.7	2.	iP	NEZ	00	33	30.2
	i	Z			59.0		i	N			33.4
	P:S,E,C						PPP	Z		35	42
1.	iP	NEZ	06	21	38.0		S	EZ		39	28
	iS	E		22	07.4		SS	E		41	48
	P:S,E,D						eL	NE		42	25
							L	Z		44.5	
1.	iP	EZ	07	02	39.0		P:N,E,D				
	i	N			40.3		Mag. 5 1/2 (Mat.)				
	S	E		03	17		52.0 N., 170.9 W.				
	P:D						Fox Is., Aleutian Is.				
							h: 39 km ca.				
							H=00 26 06.2 USCGS				
1.	iP	EZ,P N	08	21	53.0	2.	iP	Z	01	59	21.2
	i	EZ		22	05.7						
	e	E			48						
	i	Z			55						
	P:E,C										
1.	P	Z	12	24	58	2.	iP	NEZ	02	01	18.4
	i	EZ		25	35		iS	NEZ			40.7
	i	Z		27	33		P:N,E,D				
1.	iP	Z,P NE	16	47	05.2	2.	iP	NZ	04	07	59.0
	P:C						iS	NE		08	16.4
	16.4 S., 176.6 W.						P:N,D				
	Fiji Is. region.										
	h: 437 km ca.										
	H=16 36 49.9 USCGS					2.	eS	E	04	10	55
							eL	E		24	00 ca.
											(cont.)

Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
			h	m	s				h	m	s
5.	iP iS	Z E	08	55	45.6 55.3	continued	L NE	08	29	15	
5.	iP i i eL	Z E E NE	09	14	04.6 06.1 16.1	P:N,C 2.8 N., 125.8 E. Molucca Passage. h:58 km ca. H=08 14 17.4	USCGS				
	P:D 44.2 N., 149.2 E. Kurile Is. h:49 km ca. H=09 11 22.2					6.	iP P:C	Z	13	44	40.8
5.	iP i PP PPP S SS L L L	NEZ Z Z N NEZ E E N Z	11	43	28.1 47	36.3 N., 70.6 E. Hindu Kush. h:238 km ca. H=13 35 42.2	USCGS				
	P:S,W,C Mag. 6 - 6 1/4 (Mat.) 59.8 N., 150.6 W. Kenai Peninsula. h:49 km ca. H=11 34 37.3					6.	P e	Z E	16	14	58 37.2 ca.
5.	iP iS P:W,C	EZ E	12	11	11.5 32.8	6.	iP S	NEZ NE	23	18	32.8 35.4
5.	iP P:D	Z	14	08	20.3	7.	iP iS	NEZ EZ	00	50	14.8 34.8
	P:N,E,C										
5.	iP P:C	Z	17	09	46.3	7.	iP iS	Z,P NE EZ	07	26	24.1 39.8
5.	iP iS	Z,P NE NE	17	58	44.6 50.6	7.	iP eS	EZ,P N N	09	12	59.1 13 30
	P:E,D										
5.	iP i i P:C	Z,P E N N	19	33	44.6 34 24.3 37.8	7.	iP S	NEZ NEZ	09	18	59 19 18.3
	P:N,W,D										
5.	P eS eL	Z E E	21	12	56 17 24 19 30	7.	P S	EZ N	12	54	44 55 12.0
	11.8 N., 141.9 E. Mariana Is. region. h:25 km ca. H=21 07 32.6					7.	iP iS	NE N	15	53	46.6 54 06.3
	USCGS										
6.	iP i PcP e eS	NZ NEZ Z N E	08	21	12.5 13.4 42.1 28 40	7.	iP P:N,E,D	NEZ	15	59	25.3
	(cont.)					7.	e	N	18	17	30 ca.
						8.	iP	Z	00	13	54.1
											(cont.)

Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
			h	m	s				h	m	s
continued						8.	iP iS P:S,W,D	NEZ E	23	06	15.2 17.3
63.1 N., 150.5 W. Alaska. h:135 km ca. H=00 05 13.8						8.	iP iS	Z,P NE NE	23	27	51.6 53.9
USCGS						8.	P i	Z NE	23	51	55 56.3
8.	iP i eS P:C	Z E NE	02	13	44.9 14 05.6 14	8.	P i	Z NE	23	51	55 56.3
8.	iP i	NEZ E	04	53	20.6 37.1	9.	P i i	Z Z N	00	27	37 38.6 28 18.1
	P:S,W,C					9.	iP i iS	EZ N NE	01	27	02.2 03.8 12.1
8.	P S L L L	Z E E E	05	02	30 11 06 18 08 20 20 21 25	9.	iP S	Z,P NE N	03	29	54.3 30 21.3
	Mag. 5(Berk.) 51.8 N., 131.2 W. Queen Charlotte Is. h:54 km ca. H=04 52 10.3										
	USCGS					9.	iP S	EZ,P N E	04	52	31.8 51
8.	iP P:S,W,C	NZ	08	56	34.7	9.	iP i S	NEZ E E	09	16	54.3 54.9 17 30.8
	P:S,E,D 33.8 N., 139.6 E. Off coast of Honshu, Japan. h:151 km ca. H=09 16 08.6										
	USCGS					9.	L L	E N	09	24	00 26 50
8.	iPKP 1 PKP 2 i PP PPP SKKS i SS SSS i	NEZ Z Z NE Z Z NE E N	11	46	14.8 49 51 50 20.2 53 32 56 55 58 56 12 10 02 16 04 18 53						
	P:N,E,C Mag. 7 1/4 - 7 1/2 (Mat.) 56.1 S., 27.3 W. Sandwich Is. region. h:125 km ca. H=11 26 32.8										
	USCGS					9.	iP eL eL	Z N N	11	54	13.1 12 02 44 06 00
8.	iP i i i	NZ,P E N E NE	14	15	36.4 39.5 47.5 54						
	P:S,C 51.7 N., 174.9 W. Andreanof Is., Aleutian Is. h:50 km ca. H=11 47 12.4										
	USCGS					9.	P i eS eL L	NZ Z E N E	15	33	09 34 37 40 45 47 32 49 40
8.	P PP SPP	NEZ Z E	17	37	45 39 23 40 33.2						
	0.4 S., 123.3 E. Celebes. h:169 km ca. H=17 30 37.4										
	USCGS										



I	Date			Time(GMT)			Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)				
	h	m	s	h	m	s				h	m	s				h	m	s		
	continued							continued												
	10.6 S., 164.4 E. Santa Cruz Is. region. h:79 km ca. H=15 23 57.8 USCGS							PcP	N	09	08	31								
								PP	N	09	11									
								L	E	28	00									
								Nuclear Explosion, U. S. S. R.												
9.	eSS	E	19	47	54		10.	iP	NEZ	09	46	16.7								
	L	E	20	06	30 ca.			i	E		20									
	1.5 N., 90.6 W. Galapagos Is. h:54 km ca. H=19 10 47.6 USCGS							i	E		34									
								P:D												
9.	iP	Z, P N	23	34	49.8		10.	iP	EZ	14	52	13.9								
	eS	N		35	35			S	NE		32									
								P:E												
10.	P	E	00	21	27		10.	P	Z	16	29	11								
	S	NEZ			43			e	Z		31	45								
								L	E		58	10								
								Nuclear Explosion, U. S. S. R.												
10.	P	NEZ	00	57	02		10.	iP	Z	18	20	38.2								
	eS	E			48			i	NE			38.9								
	i	N			53			i	Z			10.7								
								i	Z			23.0								
10.	iP	NEZ	01	47	38.6			P:D												
	e	E		53	20			27.6 S., 177.8 W. Kermadec Is. region. h:152 km ca. H=18 09 07.3 USCGS												
	P:S,W																			
	49.2 N., 158.2 E. Off south coast of Kamchatka. h:33 km ca. H=01 43 07.2 USCGS																			
10.	P 1	Z	02	11	21		10.	iP	Z	23	04	01.7								
	iP 2	NZ			25.9			i	NE			02.5								
	S	EZ			54			S	NE			22								
	35.4 N., 136.1 E. Northern part of Shiga Pref., Japan. h:5 km ca. J. M. A.																			
10.	iP	NEZ	03	30	57.9		11.	P	Z	02	03	47.4								
	S	NE		31	13.1			e	E		04	02								
	P:S,W,C							S	N			34								
								P:C												
10.	iP	Z	04	01	41.8		11.	iP	Z	02	53	22.2								
	S	N			44.2			S	E			58	40							
								L	N		03	00	56							
								L	E			01	03							
								P:C												
10.	iPKP 1	Z	05	04	24.8			51.3 N., 179.7 W. Andreanof Is., Aleutian Is. h:15 km ca. H=02 46 43.4 USCGS												
	i	Z			28															
	iPKP 2	Z			57.0															
	pPKP	Z		06	59															
	e	E		21	45															
	P:C																			
	22.7 S., 63.1 W. Salta Province, Argentina. h:519 km ca. H=04 45 27.1 USCGS																			
10.	P	Z	09	07	02		11.	P	Z	04	50	46.1								
	(cont.)							P:D												
								43.5 N., 127.2 W. Off coast of California. h:23 km ca. H=04 39 44.9 USCGS												

Date	Phase	Comt.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
			h	m	s				h	m	s
12.	iP	NZ	11	36	58.4	continued					
	i	Z		37	03		h:100 km ca.				
	SKP	Z		39	59		H=03 05 35.9	USCGS			
	P:N,D 10.8 S., 69.8 W. Peru - Bolivia border. h:618 km ca. H=11 18 26.3										
12.	iP	NE,P Z	12	29	36.1	13.	P?	Z	11	24	41.0
	i	Z			47.7		i	Z			43.7
	eS	NE		31	24		i	NZ			48.9
	P:N,E,D 43.8 N., 147.8 E. Near east coast of Hokkaido, Japan. h:96 km ca. H=12 27 09.2										
12.	iP	Z	15	45	50.3	13.	P	Z	13	48	01
	e	Z		48	08		i	E			01.6
	P:C										
12.	iP	NZ	19	25	36.8	13.	iP	NEZ	14	13	38.6
	i	E			37.1		eL	E		26	11
	P:S,C										
12.	eP	Z	19	31	14		P:N,E,C				
	Mag. 5 $\frac{1}{4}$ - 5 $\frac{1}{2}$ (Mat.) 32.1 N., 115.1 W. Baja California. h:25 km ca. H=19 18 39.2										
12.	ePKP	Z	19	49	09	13.	P	Z	15	59	42
	i	Z			27.1		32.8 N., 47.6 E. Iran - Iraq border. h:74 km ca. H=15 48 27.2				
	ePP	Z		53	07		USCGS				
	e	E	20	12	41	13.	P	NEZ	19	52	31
	eLq	E		32	14		S	NEZ			51
	eLr	N		43	23		P:S,W,D				
	Mag. 6 (Mat.) 59.4 S., 29.2 W. Sandwich Is. h:25 km ca. H=19 29 05.2										
12.	iP	Z	20	26	56.9	13.	PKP 1	Z	21	39	06
	P:D										
12.	iP	NEZ	22	19	24.8		i	Z			14.2
	S	EZ			29		e	E			53 27
	P:S,E,C										
	Mag. 6 $\frac{1}{4}$ (Mat.) 41.6 N., 73.2 W. Southern Chile. h:154 km ca. H=21 19 26.2										
13.	eP	Z	00	11	37	13.	P	Z	22	08	20.8
	S	N			53		i	NEZ			21.1
	USCGS										
13.	P	NEZ	03	13	22		S	NE			40
	P:D										

(cont.)

Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
			h	m	s				h	m	s
13.	iP	NEZ	23	17	49.6	14.	eP?	NZ	16	44	05
	eS	E		18	08		e	Z			07
	P:S,E,D Mag. 4.6 (Mat.) 36.4 N., 139.7 E. Honshu, Japan. h:100 km ca. H=23 17 27.4										
14.	iP	Z	00	28	56.8	14.	eP	Z	18	55	16
	P:C										
14.	iP	Z,P N	01	44	40.4		23.6 S., 179.9 W. South of Fiji Is. h:521 km ca. H=18 44 47.0				
	eS	NE		45	33		USCGS				
	P:C										
14.	eP	Z	03	43	00	14.	iP	NEZ	21	51	27.0
	S	N			30		i	E			36
14.	iP	Z	03	59	06.1		i	E			52 02
	i	NEZ			15.1		i	E			13
	S	NE	04	00	00		P:N,E,D Mag. 5.1 (Mat.) 37.4 N., 141.1 E. Near east coast of Honshu, Japan. h:60 km ca. H=21 50 41.3				
14.	P	Z	05	11	47	15.	iP	NZ	01	58	17.0
	S	N		13	07		eS	E		02	08 20
14.	iP	Z,P N	07	04	26.4		eLq	E			19.0
	S	Z			44.8		eLr	E			24.0
	i	N			45.9		P:C Mag. 6 $\frac{1}{4}$ (Mat.) 35.1 N., 33.9 E. Cyprus. h:25 km ca. H=01 46 08.4				
14.	P	Z	08	14	27.6		USCGS				
	33.6 N., 43.8 E. Iran. h:30 km ca. H=08 03 09.0										
14.	iP	Z	08	20	00.6	15.	P	EZ	10	08	45
	eS?	N			40		i	E			49.6
	P:D										
14.	iP	Z	09	03	44.2	15.	P	Z	10	15	30
	i	Z			47.1		10.1 S., 160.7 E. Solomon Is. h:66 km ca. H=10 06 36.4				
	S	Z		04	10		USCGS				
	P:D										
14.	P	EZ	09	40	29.8	15.	P	NZ	11	17	04
	S	NZ		41	08		i	NZ			14
14.	iP	Z	10	38	26.1		i	Z			18 14
	i	E			26.4	15.	iP	EZ	13	30	50.9
	i	NEZ			27.4		i	N			51.3
	S	E			46		iS	N			31 18.1
	P:W,C										
	P:D										
14.	iP	EZ	16	35	20.7	15.	iP	NEZ	15	02	18.4
	S	E			49		i	Z			15 31 08.1
	i	N			50		i	NEZ			09.0
	36.1 N., 140.0 E. Ibaragi Pref., Japan. h:55 km ca. J. M. A.										
	P:E,D										



Date	Phase	Comp.	Time(GMT)		
			h	m	s
15.	eP i	Z Z	15	48	17 20
15.	P i	Z Z	17	14	21.6 29
15.	iP iS P:D	EZ NZ	18	03	46.9 04 05.4
15.	P i iS	NZ E NEZ	19	19	39.4 39.6 56.7
15.	iP i e P:E,D	EZ N Z	19	42	15.4 15.6 43
15.	iP iS P:S	NEZ Z	20	24	00.4 02.1
15.	iP	NEZ	21	24	02.0
15.	P	Z	21	33	14
10.7 S., 112.7 E. South of Java. h:100 km ca. H=21 24 08.5 USCGS					
16.	eP?	Z	06	03	02
32.9 N., 116.2 W. San Diego County, California. h:13 km ca. H=05 50 43.8 USCGS					
16.	P	Z	09	03	47.6
16.	iP eS P:N,D	NZ N	09	17	48.0 18 07
16.	eP	NEZ	12	12	01
28.3 N., 138.6 E. South of Honshu, Japan. h:388 km ca. H=12 09 49.8 USCGS					
16.	e	Z	13	51	08
14.4 N., 46.0 W. Mid - Atlantic Ocean. h:19 km ca. H=13 31 34.5 USCGS					
16.	iP P:C	Z	17	22	32.0
52.1 N., 158.5 E. Kamchatka. h:49 km ca. H=17 17 46.1 USCGS					

Date	Phase	Comp.	Time(GMT)		
			h	m	s
16.	iP iS P:E,D	EZ,P N NEZ	19	00	52.7 01 06.6
16.	PKP	Z	20	21	17
10.6 S., 69.8 W. Brazil - Peru border. h:629 km ca. H=20 02 47.8 USCGS					
17.	iP P:S,D	NZ	01	19	27.3
4.1 S., 129.7 E. Banda Sea. h:46 km ca. H=01 11 43.7 USCGS					
17.	P	NZ	02	19	38
17.	iP P:E	E,P Z	03	13	37.6
17.	P S i Lq eLr	EZ E E NE Z	08	46	12 49 40 46 50 43 51 32
Mag. 5 3/4 - (Mat.) 23.9 N., 122.2 E. Off coast of Formosa. h:35 km ca. H=08 41 53.6 USCGS					
17.	P	NZ	10	06	23
17.	iP P:S,W,C	NEZ	13	01	36.6
42.5 N., 144.0 E. Off south coast of Hokkaido, Japan. h:shallow J.M.A.					
17.	eP	Z	16	07	13
45.9 N., 122.0 W. Skamania County, Washington. h:24 km ca. H=15 55 58.9 USCGS					
17.	iP P:N,E,C	NEZ	19	15	03.3
17.	iP i S eLq eLr eLr	NEZ Z N N N Z	23	30	05.5 35 39.5 36 27 39 40 42 41 43 00
Mag. 5 3/4 - 6 (Mat.) 5.9 S., 147.4 E.					

Date	Phase	Comp.	Time(GMT)		
			h	m	s
continued					
Near east coast of New Guinea. h:45 km ca. H=23 22 06.3 USCGS					
18.	iP iS P:W,C	EZ Z	04	36	52.2 37 10.4
18.	P	Z	05	21	08
35.0 N., 26.3 E. Crete. h:83 km ca. H=05 08 37.7 USCGS					
18.	iP eS eL P:W,D	EZ E NE	11	11	46.1 20 46 34 32
Mag. 5 1/2 - 5 3/4 (Mat.) 40.8 N., 50.1 E. Caspian Sea. h:31 km ca. H=11 01 00.8 USCGS					
18.	eP i S L	Z Z E E	15	48	23 49 09.4 57 14 16 04 32
Mag. 5 1/2 (Mat.) 21.0 S., 173.6 E. Loyalty Is. region. h:28 km ca. H=15 37 33.1 USCGS					
18.	iP i S P:E	E,P NZ N Z	16	22	18.4 54.4 23 04.5
18.	iP i P:N,C	NZ EZ	17	34	08.3 08.5
18.	iP i i P:W,D	EZ N Z	20	07	52.5 08 09.5 13.0
19.	iP S P:S,E,C	NEZ NE	01	53	29.9 55.6
19.	PKP 1 PKP 2 epPKP esPKP pPPP eSS	Z Z Z Z E E	02	44	39 45 08 46 54 48 48 54 44 07 32

Date	Phase	Comp.	Time(GMT)		
			h	m	s
continued					
Mag. 6 1/2 (Pas.) 20.3 S., 63.2 W. Southern Bolivia. h:609 km ca. H=02 25 49.2 USCGS					
19.	iP i P:E,C	EZ N	03	47	56.2 56.4
19.	iP S P:W,D	EZ EZ	06	02	21.9 41
19.	P e S L	Z E E E	06	14	57 16 14 19 04 58
14.8 N., 146.8 E. Mariana Is. h:61 km ca. H=06 09 56.6 USCGS					
19.	iP eS eL ScS P:C	Z E NE E	09	25	48.5 31 17 33 56 36 04
2.4 N., 126.3 E. Molucca Passage. h:84 km ca. H=09 18 55.0 USCGS					
19.	PKP 1 PKP 2 ePP eSKKS e SSS eLq eLr eLr	Z Z E E N NE N Z	10	05	15 30 06 43 13 40 23 55 28 40 37 38 43 54 44 16
Mag. 6 1/4 (Mat.) 6.7 N., 82.4 W. South of Panama. h:33 km ca. H=09 46 17.7 USCGS					
19.	P	Z	11	05	22
19.	iP i i eL P:N,C	NZ E Z N	13	51	36.9 37.4 58.4 14 00 10
1.2 N., 125.5 E. Molucca Passage. h:54 km ca. H=13 44 28.2 USCGS					

Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
			h	m	s				h	m	s
19.	iP Z,P NE P:S,W,D		14	52	51.1	20.	iP Z,P N PP Z PcP Z S N eLq E eLr N Lr Z P:N,C Mag. 6 1/2 (Mat.) 3.6 S., 150.9 E. New Britain. h:30 km ca. H=19 03 37.1		19	11	21.1
19.	iP iS P:E,D	EZ NEZ	15	38	29.2 47.3	20.	iP Z i N iS E P:D		21	28	04.9 05.1 29.0
19.	iP S P:N,W,C	NEZ NEZ	15	45	59.1 46 07	21.	eP Z		02	09	54
19.	iP iS P:E,D	EZ NE	17	48	44.5 49 03.5	21.	P EZ i NE P:W,D		04	23	39.2 24 08
19.	iP P:N,W 21.6 S., 179.4 W. Fiji Is. region. h:639 km ca. H=18 25 29.0	NEZ	18	35	45.6	21.	P Z i NE		04	26	06 28.6
19.	P Z 41.0 N., 50.3 E. Caspian Sea. h:54 km ca. H=20 05 18.3		20	16	01	21.	eP Z e E		04	42	14 48 04
19.	iP i eS P:W,D	EZ N NE	21	19	19.5 19.9 47	21.	iP EZ i N P:W,D		05	44	43.9 44.9
19.	PKP i ePSPS eSSS eL eL P:C Mag. 5 3/4 (Mat.) 60.1 S., 22.9 W. Sandwich Is. region. h:56 km ca. H=21 34 43.3	Z Z NE N E E	21	54	31.9 39.5 04 24 10 36.5 43.5	21.	P Z e E		06	02	34 09.3
20.	P iS	NEZ E	00	28	01 56.0	21.	P Z P:W,D		06	31	09
20.	eP	Z	04	04	12	21.	iP Z,P N e E		10	26	17.6 32 18
20.	iP iS i P:S,W,C	NEZ N E	06	19	44.0 20 09 12	21.	iP P:N,E,D	NEZ	13	36	51.5
20.	P	Z	07	05	31	21.	eP EZ e E		15	15	05 19 08
						21.	P NEZ		15	24	09
						21.	P NEZ P:S,W,D		15	24	49
						21.	iPKP Z i Z P:D		18	39	15.0 27.6

(cont.)

Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
			h	m	s				h	m	s
						23.	iP Z,P NE P:D 26.2 S., 70.8 W. Off coast of northern Chile. h:18 km ca. H=18 19 15.2		08	28	12.5
						23.	iP Z,P NE P:D 28.5 S., 177.2 W. Kermadec Is. h:20 km ca. H=08 16 18.4		08	28	12.5
						21.	iP EZ i N S NEZ P:E		18	44	52.6 53.6 45 11
						22.	iP EZ i N i E P:D		01	27	53.1 53.6 28 12
						22.	iP NEZ i Z P:N,W,C		05	54	02.7 23.1
						22.	iP NEZ iS Z P:S,W,D		08	11	32.9 51.6
						22.	iP Z i NE i E P:C		11	33	54.6 54.9 34 13
						22.	eP Z eL E		15	22	06 31 46
						22.	P NEZ P:C		17	24	25
						23.	iP Z i E i N		03	02	40.8 41.0 03 08
						23.	iP EZ i Z i E PcP Z P:W,C 19.8 N., 155.2 W. Hawaii I., Hawaii. h:31 km ca. H=03 01 35.7		03	11	43.5 45 49 12 57.0
						23.	iP NEZ iS NEZ P:N,W,D 41.7 N., 131.9 E. Sea of Japan. h:527 km ca. H=03 48 29.9		03	50	18.5 51 45.0
						24.	iP Z,P E i E i Z i Z P:C		16	24	13.3 15.9 21.3 24.0
						24.	iP NEZ iS NEZ P:N,E,D		15	18	25.8 49.0
						24.	iP NEZ i E P:S,E,D		16	09	10.5 35
						24.	eP NE		16	22	23
						24.	P E i E		16	36	05.5 11
						24.	iP NEZ i E S E P:S,E,D Mag. 5.9 (Mat.) 33.3 N., 141.3 E. South of Honshu, Japan. h:93 km ca. H=21 40 58.8		21	41	55.8 42 41 50
						24.	P E		21	56	46.6
						24.	eP E e E		23	28	40 29 20
						25.	iP N,P EZ iS E P:S		01	48	27 49 53

Date	Phase	Comp.	Time(GMT)
			h m s
25.	P i eL	Z NEZ E	02 35 47 48.1 46 42
Mag. 5 3/4 - 6 (Pas.) 60.3 N., 153.0 W. Southern Alaska. h:125 km ca. H=02 27 13.4 USCGS			
25.	iP iS eL L P:E	E NE N E	05 38 46.1 47 24 54 18 55 38
Mag. 5 3/4 - 6 (Pas.) 19.9 N., 155.3 W. Hawaii I., Hawaii. h:82 km ca. H=05 29 00.8 USCGS			
25.	P	E	05 58 57.6
25.	iP S i P:N,E,C	NEZ N EZ	07 22 22.1 39 40
25.	P	EZ	08 01 22
42.1 N., 142.6 E. Off south coast of Hokkaido, Japan. h:20 km ca. J.M.A.			
25.	iP i P:S,E	NE E	13 38 08.2 26.6
25.	iP i	NE NE	16 35 28.7 47
25.	P S	NEZ E	23 29 02.9 39
25.	P S	NE N	23 34 45 35 24
26.	P iS	NEZ Z	01 51 28.7 37.7
26.	iP S P:S,E	NE Z	02 47 54.2 48 13
36.1 N., 140.0 E. Ibaragi Pref., Japan. h:80 km ca. J.M.A.			
26.	P S P:S	NE NEZ	04 01 04.0 02 11
(cont.)			

Date	Phase	Comp.	Time(GMT)
			h m s
continued			
40.3 N., 144.5 E. South of Hokkaido, Japan. h:25 km ca. H=03 59 35.0 USCGS			
26.	P i	E Z	05 51 50.5 52 07
26.	P P:D	EZ	10 57 54.0
27.	iP S P:S,W,D	NEZ NE	01 40 10.8 54
27.	iP iS P:S,W,D	NEZ NEZ	02 01 13.6 33.1
27.	iP eS	EZ NEZ	02 15 12.9 32
27.	iP pP S eScS esS eSS P:S,E,D	NEZ Z NE NE NE E	06 44 07.1 46 00 52 22 53 22 55 41 57 06
17.4 S., 178.7 W. Fiji Is. h:576 km ca. H=06 34 03.7 USCGS			
27.	iP S P:S,W,D	NEZ EZ	09 25 46.6 26 05
27.	iP i eS P:E,D	EZ N E	09 46 44.1 45.1 47 15
27.	P PP S i L L	Z Z E N E N	11 28 23.6 30 07 34 25 38 37 05 13
Mag. 5 1/2 - 5 3/4 (Mat.) 52.3 N., 168.7 W. Fox Is., Aleutian Is. h:27 km ca. H=11 20 46.8 USCGS			
27.	PKP i PP	Z Z Z	12 27 21.6 28 11 31 18
(cont.)			

Date	Phase	Comp.	Time(GMT)
			h m s
continued			
i Z 12 32 05 SKKS Z 38 03 SKSP Z 40 43 SS E 51 06 SSS E 56 10 L E 13 24 09 L N 40 L Z 32 04 P:D Mag. 6 - 6 1/4 (Mat.) 59.4 S., 24.2 W. Sandwich Is. h:110 km ca. H=12 07 39.2 USCGS			
27.	eP S L L	NEZ NE NE Z	19 28 23 34 28 37 25 42 58
Mag. 5 1/2 (Mat.) 52.5 N., 168.7 W. Fox Is., Aleutian Is. h:42 km ca. H=19 20 48.6 USCGS			
27.	iP i S ScS L L P:S,W,C	NEZ NEZ NE NE Z E	19 34 38.1 40.1 40 46 44 55 48 11 41
Mag. 6 (Mat.) 52.2 N., 168.7 W. Fox Is., Aleutian Is. h:22 km ca. H=19 27 00.7 USCGS			
27.	P eS	Z N	21 10 42.2 13 43
26.7 N., 125.0 E. Ryukyu Is. h:17 km ca. H=21 06 56.3 USCGS			
28.	P S	NZ NZ	01 28 11 27
28.	iP S P:N,E,C	NEZ Z	01 33 06.4 34 18
28.	iP S P:S,E,D	NZ,P E E	03 26 11.5 27 24
Mag. 5.7 (Mat.) 30.5 N., 141.3 E. (cont.)			

Date	Phase	Comp.	Time(GMT)
			h m s
continued			
South of Honshu, Japan. h:125 km ca. H=03 24 43.4 USCGS			
28.	P	Z	03 39 37
28.	iP S P:S,W,D	NEZ Z	03 59 47.8 04 00 20
28.	P S P:C	Z E	04 20 43 21 54
30.0 N., 141.1 E. South of Honshu, Japan. h:75 km ca. H=04 19 06.6 USCGS			
28.	P e	Z Z	05 09 42 10 30
36.5 N., 70.7 E. Hindu Kush. h:233 km ca. H=05 00 43.0 USCGS			
28.	iP P:W	E	17 01 10.0
28.	P S	NE NE	21 12 01 18
28.	iP iS P:S,W,D	NEZ Z	22 13 16.5 35.0
28.	P	N	22 47 17
27.6 N., 57.1 E. Southern Iran. h:56 km ca. H=22 36 27.5 USCGS			
29.	eP i	E Z	00 26 03 19.5
29.	P S P:N,E,C	NEZ NEZ	01 48 51.8 50 05
29.	eP S	NEZ NEZ	08 53 41 55 17
29.	P i S P:N,E,D	NEZ Z E	16 52 36.8 53 53 54 10
42.9 N., 145.4 E. (cont.)			

Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
			h	m	s				h	m	s
continued						continued					
Near east coast of Hokkaido, Japan, h:37 km ca. H=16 50 32.9 USCGS						h:21 km ca. H=13 13 06.9 USCGS					
29.	iP	N	17	12	02.6	30.	iP	NEZ	20	40	10.6
	S	NZ			08.3		eS	E		41	17
	P:N						i	Z			37
							P:S,W,C				
29.	eP	NZ	18	20	09	30.	iP	NEZ	20	59	31.2
	e	E			24 40		S	E			50
	eL	E			26 07		P:N,C				
29.	P	NEZ	19	13	25	30.	iP	NEZ	22	13	38.0
	ePcP	Z			15 38		e	NZ			48
	S	Z			19 13		P:N,E,C				
	G	E			21 58	30.	P	EZ	23	49	18
	ScS	N			23 30		i	N			22.8
	L	N			24 40	30.	P	NEZ	23	55	00
	L	Z			48		S	N			20
0.5 N., 122.4 E. Northern Celebes. h:110 km ca. H=19 06 13.4 USCGS											
29.	P	EZ	22	44	17						
28.2 N., 87.9 E. Southern Tibet. h:76 km ca. H=22 36 25.2 USCGS											
30.	P	Z	00	24	02.0						
	e	E			26 25						
	P:D										
44.4 N., 148.9 E. Kurile Is. h:49 km ca. H=00 21 13.8 USCGS											
30.	iP	EZ	01	40	25.0						
	P:E,C										
25.3 N., 124.8 E. Ryukyu Is. h:100 km ca. H=01 36 41.5 USCGS											
30.	P	NEZ	04	19	16						
30.	eP	NEZ	08	59	14						
	iS	Z			44						
30.	iP	NEZ	13	14	24.6						
	eS	E			15 28						
	i	E			34						
	eL	EZ			43						
40.6 N., 141.9 E. Near east coast of Honshu, Japan.											

(cont.)

October Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
			h	m	s				h	m	s
October						continued					
1.	eP	Z	00	21	46	7.6 S., 107.0 E. Near coast of Java. h:85 km ca. H=06 21 32.8 USCGS					
	i	N			53.0						
	i	E			54.7						
	i	E			22 14						
	e	Z			22						
	eS	E			26 22	2.	eP	Z	07	14	44
	L	E			29 16		eS	E			24 52
	L	N			31 18		i	E			25 55
34.4 N., 104.9 E. Kansu Province, China. H=00 16 03.1 USCGS						eSS E 29 32					
1.	iP	NEZ	03	34	50.2	eLq E 36 10					
	i	Z			35 07	eLr E 39 57					
P:S,W,C						eLr N 40 03					
55.8 N., 161.9 E. Kamchatka. h:25 km ca. H=03 29 24.3 USCGS						eLr Z 22					
1.	iP	NEZ	03	34	50.2	Mag. 6 - 6 1/4 (Mat.)					
	i	Z			35 07	33.8 S., 179.5 E. Off coast of North Island, New Zealand. h:57 km ca. H=07 02 44 USCGS					
P:S,W,C											
1.	S	NE	05	31	09.5						
	i	Z			53						
	P:N,C				54.2						
1.	P	Z	07	46	42	2. iP Z 07 34 24.4					
	S	NZ			47	i E 24.7					
						i N 42					
						P:C					
1.	P	EZ	10	23	50	37.2 N., 22.2 E. Near coast of Greece. h:72 km ca. H=07 21 49.4 USCGS					
	i	N			56.3						
1.	eP	Z	15	06	56	2. P NEZ 07 57 34					
	i	E			07 12.0	e N 52					
						eS NEZ 58 28					
1.	iP	Z	19	05	07.3	2. iP EZ 08 08 20.6					
	i	N			07.6	i N 20.9					
	i	E			08.0	S NZ 39					
	S	NE			59	i E 40					
	P:D					P:W,D					
2.	eP	EZ	05	39	43	2. P Z 08 15 42					
	e	N			55	51.4 N., 179.4 E. Andreanof Is. h:45 km ca. H=08 09 07.1 USCGS					
2.	eP	Z	06	05	44						
	eS	E			15 54						
	eL	E			30 54						
Mag. 5 3/4 (Mat.)						2. iP NEZ 15 04 05.3					
33.9 S., 179.6 E. Off coast of North Island, New Zealand. h:30 km ca. H=05 53 37.5 USCGS						e N 05 36					
						P:S,W,C					
2.	eP	Z	06	30	18	2. iP NZ 16 37 11.8					
	i	N			27.2	iS NE 25.8					
	e	EZ			41	P:N,D					
	i	EZ			31 53	2. e N 20 47 45 ca.					
(cont.)						3. iP Z 03 08 27.6					
						i E 27.8					
						P:D					

Date	Phase	Comp.	Time(GMT) h m s	Date	Phase	Comp.	Time(GMT) h m s
3.	P eS	NE EZ	04 39 00 14	3.	eP eS eL	Z E E	19 08 03 16 07 19 19 23 50
3.	eP ? i i	NZ NEZ NE	07 08 15 25 43	3.	eP i eS eL	EZ N Z E	23 24 45 49.6 27 23 28 18
3.	iP i eS P:N,C	NZ E NEZ	09 34 55.1 55.8 36 12	3.	eP i eS eL	EZ N Z E	22.5 N., 143.5 E. Mariana Is. region. h:25 km ca. H=23 21 14.8
3.	eP i e	Z NZ N	09 50 07 14.7 51 00 ca.	4.	eP i eS i	EZ N E N	00 28 03 05.0 36 48
3.	eP i e	NZ E N	10 09 42 44.0 10 53	4.	eP ? e e	Z NEZ N	01 02 57 03 19 03 56
3.	eP i i e	NZ E Z E N	10 26 23 26.6 29.5 28 09 48	4.	iP eS eL eL	NEZ E E N	02 32 58.2 41 06 47 16 48 42 ca.
3.	eP i i i	NEZ N Z E	12 11 00 09 12 13	4.	eP i eS eL	Z N E N	03 35 05 28.5 S., 176.7 W. Kermadec Is. region. h:100 km ca. H=03 23 18.3
3.	P N, eP E		12 48 18	4.	P S	NEZ EZ	04 13 15 33
3.	P eS	Z NE	13 19 32.5 45	4.	eP i eS eL	Z N NEZ NEZ	04 35 44 51.8 N., 158.8 E. Near coast of Kamchatka. h:25 km ca. H=04 30 42.7
3.	iP i S ? P:C	Z NE E	14 53 21.0 21.5 54 09	4.	eP e eS eL	Z N NE E	06 18 14 44 20 50 23 12 ca.
3.	eP S i	NEZ NE Z	16 42 12 43 06 08	4.	eP i eS eL	Z N NE E	22.7 N., 143.8 E. Northern Mariana Is. h:154 km ca. H=06 14 55.5
3.	eP eS	NE N	17 02 28 03 05				
3.	iP iS i P:S,D	NEZ N NEZ	18 27 45.4 28 29.8 31.2				
3.	iP i P:C	Z N	18 38 00.0 01.7				
			20.5 S., 170.7 E. Loyalty Is. region.				

(cont.)

Date	Phase	Comp.	Time(GMT) h m s	Date	Phase	Comp.	Time(GMT) h m s
4.	iP i i iS P:S,D	NZ N Z N	17 10 46.6 11 11.9 19.4 29.6	6.	P i i i eS eL	Z N Z Z E E	01 29 22.5 22.8 26.0 31.7 32 24 34 04
5.	P i S P:D	Z N E	00 09 19.4 19.8 51	6.	P	EZ	04 58 17.7
5.	eP i i i	N N Z Z	15 11 41 48.9 53 12 05.0	6.	e e	Z E	07 31 39 34 26
5.	eP i i i	NE Z NEZ Z	17 57 39 44 51.0 57.2	6.	iP i e P:S,W,C	NEZ Z E	11 05 57.9 06 07.5 07 47 ca.
5.	iP i eS ? eL P:N,C	NZ E E E	18 19 04.2 04.5 27 47 38 40	6.	iP eS e eL P:D	Z E N E	13 31 41.5 35 53 36 05 40 04
			19.4 S., 169.0 E. Loyalty Is. region. h:58 km ca. H=18 08 43.4				19.6 N., 122.1 E. Near coast of Luzon, P.I. h:70 km ca. H=13 26 46.3
5.	P i e eS eL P:W	E N N E E	19 32 11.6 12.3 34 56 35 59 37 42	6.	iP S P:E,C	EZ NE	15 00 32.7 51
			18.6 N., 146.9 E. Mariana Is. region. h:47 km ca. H=19 27 45.5	6.	eP i	Z N	16 58 32 34.5
5.	eP i i S eL eL	Z N E E E Z	22 39 15 21.1 22 42 49 44 14 58	6.	iP i iS P:W,C	EZ N NEZ	21 40 44.6 45.2 41 03.1
			24.0 N., 121.9 E. Near coast of Formosa. h:56 km ca. H=22 35 00.8	6.	P i	Z NE	22 15 19.2 32
5.	iP i iS P:C	Z NE Z	23 04 34.3 34.6 07 28	7.	iP i eS ? e	NE Z N E	00 24 55.3 55.6
			51.0 N., 149.7 E. Sea of Okhotsk. h:518 km ca. H=23 01 07.3	7.	P i eS ? e	Z N N E	01 59 35 36.8 02 00 03 08

Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
			h	m	s				h	m	s
7.	P i iS	Z E N	04	23	29.7 29.9 49.5	8.	iP E, P N eS E i N P:E		01	13	54.2 35 39.0
7.	iP i i i	EZ N NZ E	08	05	05.1 12 19 20	8.	P EZ S N		01	52	54.2 28
7.	ePKP	Z	08	34	51	8.	eP Z	51.6 N., 170.9 W. Fox Is. h:25 km ca. H=02 57 49.0	03	05	08
											USCGS
7.	iP e i P:C	Z N E	10	38	32.4 39 00 09	8.	iP E i Z i N eS ? E e N P:W		03	28	59.2 59.5 59.8 45 50
7.	iP iS P:N,E,C	NEZ E	12	55	25.6 56 03.5	8.	P EZ eS N i EZ		04	13	42 10 12
7.	eP eS eL	Z E E	16	05	00 14 04 23 49	8.	P E i Z i N S NE e E		10	07	13.1 13.4 13.9 59 50
											USCGS
7.	ePKP 1 iPKP 1 iPKP 2	NE Z Z	17	46	23 24 56	8.	eP E i Z e N e E e NE e E		10	54	53 29 30 42 20 59
											USCGS
7.	P eS	NEZ NE	17	47	18 37	8.	iP N, P E i Z iS NE e E P:S		11	23	22.7 22.9 17.3 40
7.	iP EZ, P N eS E P:W		18	23	28.0 47	8.	iP Z i E i N i E i Z eS E i N P:C		14	20	08.6 09.1 09.4 22.1 34.3 01 03
7.	iP iS P:N,W	NEZ N	19	27	58.5 17.5	8.	iP NZ S N eS EZ P:S,D		15	45	30.3 24
7.	iP i e P:E,D	EZ N N	21	41	25.9 26.0 25						

Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
			h	m	s				h	m	s
8.	P i iS	EZ N N	15	52	45 45.8 40.0	10.	iP Z iS Z P:C		01	19	57.3 15.8
8.	eP	Z	17	17	16	10.	eP Z i Z		01	50	07 16.0
8.	iP i i P:S,C	NEZ NZ E E	19	27	05.2 07.2 09.2 13.6	10.	iP NZ P:C	22.9 S., 180.0 E. South of Fiji Is. h:576 km ca. H=03 44 38.3	03	55	02.7
											USCGS
8.	iP i S i P:S,E	NEZ N NE Z	20	53	23.1 46.5 52 53.1	10.	iP Z S Z P:C		04	04	04.9 23
8.	iP eS eL P:E,D	EZ E E	22	04	26.0 11 05 14 18	10.	P NZ iP NZ i Z eS Z P:C		04	08	23.5 49.4 59.8 10
											USCGS
8.	eP i eS L	Z N E E	23	48	27 28.8 13 33	10.	P Z i N i N		13	09	49.4 50.4 13
											USCGS
8.	eP i eS L	Z N E E	23	48	27 28.8 13 33	10.	iP NZ i E eL E P:N,C	1.6 N., 127.3 E. Halmahera. h:102 km ca. H=23 41 32.2	17	32	39.4 41.7 42 33
											USCGS
9.	iP eS e P:N	NZ N EZ	03	58	19.8 30 35	10.	P NZ P:D	4.7 S., 138.2 E. New Guinea. h:36 km ca. H=17 24 58.9	18	54	48.8
											USCGS
9.	iP iS P:N,E	NE E	10	32	00.4 07	10.	P NZ P:D	16.1 S., 176.3 W. Fiji Is. region. h:361 km ca. H=18 44 28.6	18	54	48.8
											USCGS
9.	eP i i P:W,D	NEZ Z NE Z	10	35	35	11.	eP Z S NE i Z	5.9 S., 147.7 E. New Britain region. h:71 km ca. H=10 27 41.4	02	07	18 52 54
											USCGS
9.	eP i i P:S,E,C	NZ N N	10	50	22 22 22	11.	P Z P:S,E,C	6.7 S., 128.9 E. Banda Sea. h:21 km ca. H=10 42 10.6	04	57	28
											USCGS
9.	P i	Z E	11	58	59 00.4	11.	iP EZ S N P:W,D		05	52	46 53 04
9.	P i	Z E	11	58	59 00.4	11.	P Z i N i Z		07	12	38.4 39.7 53
											(cont.)

Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
continued			h	m	s	continued			h	m	s
	i	NE	07	12	55						
	57.5 N., 154.1 E. Kodiak I. h:42 km ca. H=07 03 58.6 USCGS										
11.	iP	NEZ	08	55	08.4	12.	eP	NEZ	06	09	02
	S	E			22		S	E			15 10
	i	N			23		i	Z			17
	i	Z			35		Lq	E			18 10
	P:N,W,C						eLr	Z			20 48
							eL	N			23 10
11.	P	Z	09	37	42		2.9 S., 144.9 E. Near coast of New Guinea. h:25 km ca. H=06 01 25.5 USCGS				
	11.6 S., 166.3 E. Santa Cruz Is. h:52 km ca. H=09 28 17.7 USCGS					12.	P	Z	08	32	16
11.	ePKP	Z	12	47	47		i	E			25
	13.2 S., 75.5 W. Near coast of Peru. h:130 km ca. H=12 28 34.5 USCGS						e	E			41 14
							L	E			43 20
							L	Z			46.0
11.	P	EZ	17	22	38		5.6 S., 151.9 E. New Britain. h:41 km ca. H=08 24 10.0 USCGS				
	i	Z			42.4	12.	P	NZ	09	31	27.7
	i	E			43		i	E			28.2
	i	N			46		S	NE			53
	i	EZ			24 28		P:N,D				
	S	NE			41	12.	P	NZ	10	03	21
	L	E			25 38		i	E			22.2
	29.7 N., 129.7 E. Ryukyu Is. h:52 km ca. H=17 20 15.4 USCGS					12.	ePKP	Z	14	12	35
11.	P 1	NEZ	19	48	24.3		19.1 N., 66.0 W. North of Puerto Rico. h:63 km ca. H=13 53 41.3 USCGS				
	P 2	NEZ			24.8	12.	P	NEZ	19	12	00 ca.
	i	NZ			49 16		S	E			15 51
	i	E			17		L	E			17 34
	S	EZ			29		eL	N			20.0
	i	E			50		24.4 N., 120.2 E. West coast of Formosa. h:25 km ca. H=19 07 30.0 USCGS				
	i	E			52 42	12.	P 1	Z	22	11	24.6
	i	Z			53 32		P 2	EZ			27.1
	P 1:S,E,D P 2:N,W,C 32.7 N., 142.0 E. South of Honshu, Japan. h:40 km ca. H=19 47 12.0 USCGS						P 2	N			28.1
12.	P	NEZ	02	18	31		S 1	Z			47
	S	NEZ			56		S 2	EZ			51
12.	iP NZ, P E		03	49	16.0	13.	iP	EZ	00	41	26.1
	PP	Z			50 33		i	N			27.2
	eS	E			54 40		(cont.)				
	eL	E			56 38		(cont.)				
	P:S,D						(cont.)				

Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
continued			h	m	s	continued			h	m	s
	i	Z	00	41	34.7	13.	eS	E	14	42	31
	i	N			39						
	S	EZ			54.1	13.	iP NZ, P E		16	44	27.5
	i	Z			42 03		S	N			29.3
	P:E,D						i	EZ			29.6
							P:N,E,D				
13.	eP	Z	02	28	05	13.	iP	NEZ	16	51	54.9
	6.3 N., 126.8 E. Off southeast coast of Mindanao, P. I. h:60 km ca. H=02 21 44.6 USCGS						S	NE			56.8 ca.
13.	PKP 1	Z	05	18	54.6	13.	P	EZ	17	39	28.2
	e	E			19 14		i	N			28.7
	PKP 2	NEZ			30.6		i	Z			40 16
	PP	Z			23 07		eS	E			49 19
	PP	E			10		P:E,D 22.0 S., 176.9 W. Tonga Is. region. h:155 km ca. H=17 28 21.5 USCGS				
	SS	E			42 28	14.	P	EZ	08	06	55.3
	e	E			51 35		i	N			56.3
	PKP 1:D Mag. 5 1/4 - 5 1/2 (Pal.) 55.9 S., 27.2 W. Sandwich Is. h:67 km ca. H=04 59 04.8 USCGS						i	N			07 10
13.	iP	NEZ	07	55	06.8		eS ?	NE			22
	iS	N			27.3		i	Z			23
	i	E			27.7	14.	P	NEZ	12	31	53.4
	i	Z			29.6		i	Z			32 06
	P:S,E,D						S	NEZ			47
13.	iP	EZ	09	54	29.6		L	E			33 20
	i	N			30.0		P:S,E,D Mag. 4 3/4 ca. (Mat.) 33.3 N., 142.2 E. South of Honshu, Japan. h:47 km ca. H=12 30 45.3 USCGS				
	S	N			55 24	14.	P	Z	15	09	01.6
	i	E			37		i	N			02
	P:W,D						i	E			02.3
13.	eP	Z	10	50	27		i	Z			06
	e	E			29		i	NEZ			10
	iS	NE			51 15.9		S	E			50
	i	Z			21		i	Z			54
13.	PKP	Z	11	06	36		i	NZ			56
	i	Z			45		i	E			10 12
	i	N			48	14.	iP	NEZ	16	24	09.9
	i	EZ			07 02		S	E			32 36
	SS	E			36 38		Lq	E			39 40
	L	E			12 05.0		Lr	E			45 52
	W 2	E			23.0		P:N,W,C 19.1 S., 168.4 E. New Hebrides. h:28 km ca. H=16 13 48.7 USCGS				
	Mag. 5 1/2 - 5 3/4 (Pal.) 60.3 S., 34.3 W. Sandwich Is. region. h:44 km ca. H=10 46 47.7 USCGS					13.	eP	Z	11	13	08

Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
			h	m	s	continued			h	m	s
14.	P 1	NEZ	22	03	35.2	50.9 N., 157.9 E. Kamchatka.					
	iP2	NEZ			35.9	h:44 km ca.					
	S	E	07	29		H=01 07 08.2	USCGS				
	i	N			30						
	Lq	E	09	10							
	eLr	Z	10	40							
	P 1:S,W,C										
	P 2:N,E,D										
	51.1 N., 159.1 E. Kamchatka.										
	h:80 km ca.										
	H=21 58 57.4						USCGS				
15.	iP	NEZ	07	34	15.1						
	S ?	E	35	20							
	i	NZ			26						
	P:S,W,C										
15.	P	NEZ	09	20	20.6						
	i	N			57						
	i	Z	21	30							
15.	iP NZ, P E		10	57	31.7						
	i	N			32.6						
	S	NE			55						
	P:S,C										
15.	i	EZ	13	49	18						
	i	N			20						
	i	N			42						
	i	N	51	48							
	i	EZ	52	08							
15.	iP	Z	17	17	03.7						
	i	NE			04.3						
	i	Z	18	14.7							
	P:C										
	4.1 S., 102.3 E.										
	Near southwest coast of Sumatra.										
	h:66 km ca.										
	H=17 07 55.6						USCGS				
15.	iP	NEZ	19	56	04.5						
	iS	NEZ			13.5						
	P:N,C										
15.	P	Z	21	26	21.6						
	6.9 S., 125.4 E. Banda Sea.										
	h:558 km ca.										
	H=21 18 53.3						USCGS				
16.	iP Z, P N		01	11	42.5						
	i	E			43.7						
	i	Z	15	02							
	eS	E			36						
	L	E	17	33							
	eL	Z	18	20							
	P:S,C										
	(cont.)										
16.	eP	NZ	09	09	08						
	S	NE			13.5						
	i	Z			14.0						
16.	eP	EZ	10	00	13						
	i	N			15						
	i	E			21.5						
	i	N			22						
	S	NE			50						
	i	EZ	01	09							
	i	N			13						
16.	P	EZ	11	51	48.9						
	i	N			49.5						
	i	Z			56						
	S	N	52	23							
	i	Z			29						
	i	NZ			46.5						
	P:E,D										
16.	P	Z	15	27	27.5						
	i	N			28.4						
	i	E			28.6						
	S	N			50						
	i	E			53						
	i	Z			55						
	P:D										
16.	P	Z	18	22	40						
	eS	E			27 44						
	L	E			29 06						
	L	Z			31 12						
	eL	N			35						
16.	eP	NZ	19	44	37						
	i	E			38						
	eS	E			48 57						
	e	N			49 38						
	L	E			50 20						
	L	Z			51 25						
	L	N			52 49						
16.	eP	EZ	20	47	34						
	i	N			37						
	S	NE			48 17						
17.	PKP 1	Z	04	47	08						
	PKP 2	NZ			15						
	i	E			18						
	i	N			27						
	PKS ?	EZ			51 43						
	L	Z	05		36.0						
	L	E			38.0						
	Mag. 5 3/4 (Mat.)										

Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
			h	m	s	continued			h	m	s
continued						55.8 S., 0.5 E. Bouvet Is. region.					
						h:25 km ca.					
						H=04 27 33.5	USCGS				
17.	eP	EZ	05	17	25						
	i	E			29						
	i	E			33.6						
	i	N			35						
	i	E			38.4						
	i	N			39.0						
	i	Z			40.8						
17.	eP	NEZ	10	01	30						
	i	Z			41						
	14.9 S., 168.4 E. New Hebrides Is. region.										
	h:25 km ca.										
	H=09 51 32.8						USCGS				
17.	eP	NZ	11	07	55						
	e	E			58						
	eS	N			12 08						
	i	E			18						
	Lq	E			13 41						
	L	N			14 32						
	Lr	Z			43						
	12.1 N., 143.4 E. South of Guam.										
	h:25 km ca.										
	H=11 02 32.7						USCGS				
17.	P	EZ	12	04	20.0						
	i	N			20.5						
	P:E,D										
17.	eP	EZ	16	14	38						
	i	N			44						
	i	E			55						
	i	Z			56						
	i	N			15 17						
	i	E			36						
	i	Z			40						
17.	iP	NEZ	18	46	51.9						
	S	N			47 30						
	i	E			31.5						
	i	NZ			32						
	P:N,C										
17.	eP	EZ	19	00	46						
	i	N			48						
17.	eP	EZ	19	37	30						
	i	N			35						
	i	Z			40						
	i	E			44						
	i	Z			55						
17.	iP	Z	21	22	46.5						
	i	E			46.9						
	i	N			47.1						
	S	EZ	23	06							
	i	N			06.5						
	P:D										
18.	P	Z	00	41	05.5						
	P:C										
18.	eP	NZ	01	14	20						
	i	EZ			30						
18.	iP	Z	03	01	52.5						
	i	N			53.0						
	i	E									

Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
			h	m	s				h	m	s
continued			53.6 N., 165.6 W. Fox Is. h:47 km ca. H=10 44 10.7			19.	P	Z	09	48	51.2
18.	iP	FZ	15	38	47.5	19.	P	Z	10	16	51.0
	i	N			47.9		e	E			52
	P:W,D						S	NE			49 45
	23.2 N., 94.7 E. Burma.						eL	E			51 08
	h:105 km ca.						P:D				
	H=15 31 19.2					19.	iP	NEZ	10	18	30
	USCGS						S	NE			
18.	ePKP 1	Z	17	11	45	19.	iP	NEZ	10	58	29.3
	i	EZ			49		i	Z			42.5
	i	N			12 01		i	N			59 08
	PKP 2	NEZ			19		i	Z			39
	PP	Z			15 49		i	N			45
	PP	N			52		P:S,C				
	PP	E			55		43.0 N., 139.2 E. Sea of Japan.				
	SKKS	E			22 38		h:242 km ca.				
	SKKS	Z			41		H=10' 56 53.6			USCGS	
	i	EZ			24 46	19.	PKP 1	NEZ	11	39	29.7
	SKSP	EZ			25 55		i	N			35
	i	EZ			29 00		PKP 2	Z			40 07
	i	E			30 50		i	Z			43 06.7
	SS	E			35 22		PP	Z			44
	sSS	E			36 27		SKKS	E			49 30
	i	E			37 11		SKSP or PSKS	E			53 46
	SSS	E			40 27		SSS	E			12 09 44
	Lq	E			53.0		eL	NE			31 34
	Lr	E	18	02	38		PKP :N,W,C				
	Lr	Z			03 04		Mag. 6 1/4 (Pas.)				
	Lr	N			30		37.1 S., 69.8 W.				
	Mag. 7 (Mat.)						Neuquen Province, Argentina.				
	36.7 S., 72.6 W.						h:155 km ca.				
	Near coast of southern Chile.						H=11 19 19.6			USCGS	
	h:67 km ca.					19.	iP Z, P N		14	30	40.3
	H=16 52 00.2						i	E			41
	USCGS						S	EZ			31 31
18.	ePKP	Z	18	30	27		i	N			38
	i	N			36		P:S,D				
	i	Z			43.5	19.	P	Z	19	39	38.4
	i	E			45		i	NZ			38.8
	36.9 S., 73.5 W.						i	E			39.8
	Near coast of central Chile.						PP	Z			43 36
	h:55 km ca.						i	N			49 29
	H=18 10 30.4						S or SKS	E			50 46
	USCGS						e	E			20 00 16
18.	eP	NZ	21	11	07		Lq	E			03 26
	e	E			08		P:C				
	S	NEZ			12 00 ca.		Mag. 5 1/4 - 5 1/2 (Mat.)				
	23.2 N., 94.7 E. Burma.						55.3 S., 146.4 E.				
	h:105 km ca.						South of Australia.				
	H=15 31 19.2						h:50 km ca.				
	USCGS						H=19 26 32.2			USCGS	

Date	Phase	Comp.	Time(GMT)			Date	Phase	Comp.	Time(GMT)		
			h	m	s				h	m	s
19.	P	NZ	20	14	21.1	21.	P	Z	02	16	19
	i	E			21.3		i	NE			19.5
	S	NZ			33		S	N			17 12
	i	E			15 00 ca.		i	E			12.5
	P:N,D						e	E			19 26
	P:C						P:S,E,D				
19.	iP	NEZ	23	09	52.7	21.	iP	NEZ	11	53	44.6
	S	NEZ			10 10		P:S,E,D				
	i	Z			12.2		18.0 S., 178.5 W. Fiji Is.				
	P:S,C						h:618 km ca.				
	USCGS						H=11 43 41.3			USCGS	
20.	P	Z	03	58	57	21.	iP	NEZ	17	43	42.4
	e	E			58		i	Z			44 15
	i	N			59		PP	Z			46.6
	i	Z			59 32		eS	E			51 13
	9.4 S., 160.4 E. Solomon Is. region.						P:N,W,C				
	h:21 km ca.						10.8 S., 166.0 E. Santa Cruz Is.				
	H=03 49 58.2						h:192 km ca.				
	USCGS						H=17 34 36.8			USCGS	
20.	P	Z	04	50	48.3	21.	iP	Z	22	28	49.7
	i	NE			49.3		P:D				
	P:D						51.6 N., 176.0 W. Andreanof Is.				
20.	P	Z	05	47	42		h:35 km ca.				
	51.8 N., 176.0 W. Andreanof Is.						H=22 21 52.2			USCGS	
	h:36 km ca.					22.	iP	NEZ	01	01	56.7
	H=05 40 44.1						S	NE			02 39
	USCGS						P:S,W,D				
20.	P	Z	08	14	52.1	22.	iP	NEZ	09	29	05.0
	i	E			59.3		iS	NEZ			11.7
	P:C						P:N,E				
	7.9 S., 117.9 E. Flores Sea.					22.	P	Z	10	01	06
	h:25 km ca.						i	N			07.6
	H=08 16 09.6						i	E			08.2
	USCGS						S	E			09 54
20.	eL	E	08	39	28		eLq	E			16 57
	eL	Z			50		eLr	Z			20 40
20.	iP	NEZ	09	23	38.3		eLr	E			51
	iS NE, S Z				53.0		eLr	N			21.0
	P:S,W,D						Mag. 5 3/4 - 6 (Mat.)				
20.	P	EZ	10	41	52.8		19.9 S., 172.4 E. New Hebrides Is.				
	i	N			53.2		h:181 km ca.				
	i	N			42 09		H=09 50 43.6			USCGS	
	i	E			11.3		USCGS				
	P:E,C					22.	eL	E	14	01.0	
20.	eL	E	18	02.0			eL	Z			03.0
	38.4 N., 97.3 E. Western China.						2.2 N., 95.9 W. West of Galapagos Is.				
	h:25 km ca.						h:65 km ca.				
	H=17 46 44.7						H=13 06 31.1			USCGS	
	USCGS					20.	P	Z	19	53	09.3
20.	P	Z	19	53	09.3	22.	iP	Z	14	51	04.8
	i	N			16		i	NE			05
	eS	E			44		i	Z			14.5
	i	N			48		P:C				
	P:C						(cont.)				

Date	Phase	Comp.	Time(GMT) h m s	Date	Phase	Comp.	Time(GMT) h m s
24.	iP P:S,W,D	NEZ	15 57 58.6	continued	20.3 S., 174.1 W. Tonga Is.		
					h:25 km ca.		
					H=14 20 20.8		USCGS
24.	iP i S i P:S,E,D	NEZ Z E N	18 59 54.6 19 00 05 18 20	25.	P eL	Z E	16 35 55 17 07.0
					14.4 N., 56.7 E.		
					Gulf of Aden.		
					h:40 km ca.		
					H=16 24 16.3		USCGS
24.	P	Z	20 18 06	26.	iP NZ, P E		18 15 51.7
24.	iP i S P:W,D	EZ N NEZ	21 32 22.2 22.4 41		S NE		16 25
					P:N,C		
24.	iP P:E,D	EZ	21 37 05.2	25.	P i	EZ NE	22 09 53 10 33
25.	iP e e P:D	Z E E	06 00 34.2 06 47 14.0	26.	iP EZ, P N		00 34 20.4
					iS Z		52.8
					i NEZ		53
					P:W,C		
25.	iP P:C	Z	06 46 56.7	26.	P i i S i Lq ScS ? Lr Lr	Z NEZ E E N E Z N	00 45 58 46 00 49 44 52 04 55 16 52 57 20 58 00
25.	ePKP i i	Z Z Z	09 13 37 49 17 17		Mag. 6 3/4 (Mat.)		
					3.1 S., 147.4 E. Bismarck Sea.		
					h:14 km ca.		
					H=00 38 20.3		USCGS
25.	iP EZ, P N S P:E,C	NEZ NEZ	09 34 29.5 48	26.	P i e P:C	Z NE E	02 29 32 30 06 35 19
25.	iP i S i P:S,E,D	NEZ E E Z	09 49 56.2 50 10 17 21	26.	P i	EZ Z	07 59 00 07
25.	eL	E	09 58 52	26.	iP S P:N,W,C	NEZ NEZ	10 03 55.2 58.2
25.	P S P:S,W,D	NEZ EZ	13 59 54.0 14 00 37	26.	P	Z	11 21 27
25.	iP EZ, P N eScS ? eL eL P:E,C Mag. 5 1/2 (Mat.)	E E E E	14 31 47.8 42 04 49 37 59 46		17.9 S., 167.7 E.		
					New Hebrides Is.		
					h:124 km ca.		
					H=11 11 26.2		USCGS
				26.	iP EZ, P N		13 04 55.4
					i E		05 38
					P:E,C		

(cont.)

Date	Phase	Comp.	Time(GMT) h m s	Date	Phase	Comp.	Time(GMT) h m s
26.	P eS ? Lq 1 Lq 2 Lr Lr Lr	Z E E E Z E N	15 36 12 43 21 47 46 51 10 54 15 40 56 36	continued			
					i E		03 55 19.7
					S ? Z		41
					P:E,D		
				28.	iP i P:C	Z NE	06 09 59.9 10 01.7
					11.6 S., 166.4 E.		
					Santa Cruz Is.		
					h:34 km ca.		
					H=06 00 33.7		USCGS
26.	P i S P:W,D	Z NEZ	16 14 51	28.	P P:C	Z	06 30 23.7
					18.7 S., 168.9 E. New Hebrides Is.		
					h:25 km ca.		
					H=06 20 00.8		USCGS
26.	P i i P:D	Z Z	19 37 41	28.	P i P:D	Z Z	06 58 17.7 39
					18.9 S., 178.1 W. Fiji Is.		
					h:631 km ca.		
					H=06 48 08.8		USCGS
26.	iP P:W,C	EZ	23 08 47.5	28.	iP P:C	Z	09 34 00.9
27.	iP NZ, P E i i P:S,D	E N NE	10 08 45.7 55 09 53		20.3 S., 174.1 W. Tonga Is.		
					h:76 km ca.		
					H=09 22 39.9		USCGS
27.	iP S P:N,E,C	NEZ NEZ	19 26 04.6 13	28.	iP i i P:C	Z E N	10 57 53.9 54 55
					33.7 N., 48.5 E. Iran.		
					h:34 km ca.		
					H=10 46 40.2		USCGS
27.	iP i i S ? P:C	Z E N NE	20 44 47.0 47.7 50 45 13.7	28.	iP i i i i P:C	Z NE Z E E	12 28 24.9 25 34 50 29 38
27.	iP EZ, P N P:E		21 59 42.6		13 33 11.4 12 42.7 45 47		
28.	iP NZ, P E e P:S,D	E E	00 03 37.1 04 46	28.	iP i S i i P:D	Z NE N Z E	13 59 22 36 14 00 07
28.	iP P:C	Z	01 45 00		17.7 S., 178.9 W. Fiji Is.		
					h:605 km ca.		
					H=01 34 59.5		USCGS
28.	iP EZ, P N i		03 55 11.9 14	28.	iP EZ, P N iS N P:W,C		15 12 52.4 13 22.4

(cont.)

Date	Phase	Comp.	Time(GMT)		
			h	m	s
31.	eL	E	08	56	40
	eL	E		59	20
	eL	Z	09	01	44
	eL	N		02	07
31.	P	Z	12	46	50
	i	E			50.6
	i	NZ			51.3
	S	NEZ	47	13	
	i	Z			17
31.	iP	Z	18	46	59.3
	S	NEZ		47	01.6
	P:D				
31.	iP	NEZ	20	10	50.8
	i	Z			53
	i	NE	11	42	
	P:S,W,C				
31.	iP	EZ	21	42	42.6
	i	N			43.3
	S	N	43	15	
	i	Z			16
	P:E,D				
31.	iP	Z	23	01	04.2
	i	NE			04.7
	S	N			34.9

Takeshi Honda

Director