SEISMOLOGICAL BULLETIN
OF
MATSUSHIRO

JANUARY , FEBRUATY
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Matsushiro Seismological Observatory
Matsushiro-machi , Nagano-shi,
Nagano-ken , Japan

Matsushiro Seismological Observatory , Japan

Seismological Bulletin

Latitude	36°	32′	30″N.
Longitude	138°	12′	32″E.
Elevation			440 M.

Instrumental Constants

Instruments	Comp.	Period (sec.)	Damping ratio	Magnification
Benioff Seismograph (Short Period)	N	$T_1 = 1.0$ $T_2 = 0.23$	$h_1 = 0.63$ $h_2 = 1.7$	46.000 (max)
	E	$T_1 = 1.0$ $T_2 = 0.22$	$h_1 = 0.64$ $h_2 = 1.6$	46.000 (max)
	Z	$T_1 = 1.0$ $T_2 = 0.21$	$h_1 = 0.67$ $h_2 = 1.2$	57.000 (max)
Benioff Seismograph (Long Period)	N	$T_1 = 1.0$ $T_2 = 85$	$h_1 = 0.63$ $h_2 = 2.5$	3,200 (max)
	E	$T_1 = 1.0$ $T_2 = 55$	$h_1 = 0.64$ $h_2 = 2.5$	4,700 (max)
	Z	$T_1 = 1.0$ $T_2 = 64$	$h_1 = 0.67$ $h_2 = 2.7$	3,500 (max)
WWSS Seismograph (Short Period)	N	$T_1 = 1.0$ $T_2 = 0.75$		100,000
	E	$T_1 = 1.0$ $T_2 = 0.75$		100,000
	Z	$T_1 = 1.0$ $T_2 = 0.75$		100,000
WWSS Seismograph (Long Period)	N	$T_1 = 15$ $T_2 = 100$		3,000
	E	$T_1 = 15$ $T_2 = 100$		3,000
	Z	$T_1 = 15$ $T_2 = 100$		3,000
Short Period Vertical Seismograph	Z	$T_1 = 1.0$ $T_2 = 2.82$	$h_1 = 1.4$ $h_2 = 1.2$	32,000 (max)
Wood-Anderson Seismograph	N	$T = 0.8$	$h = 0.8$	1,300
	E	$T = 0.8$	$h = 0.8$	1,200

January , 1969

Date	Phase	Comp.	Time(GMT) h m s
1.	eP	Z	05 01 03
	L	Z	15 20
1.	P	EZ	09 13 42
	ePcP	Z	16 22
	Lr	NZ	22 00
	51.2 N., 179.4 W.		
	Andreanof Is.		
	h: 34 km.		
	H= 09 07 04.3		USCGS
1.	eP	Z	12 22 00
	29.3 N., 130.1 E.		
	Ryukyu Is.		
	h: 36 km.		
	H= 12 29 27.8		USCGS
1.	iP Z, P NE		14 59 12.0
	iX	Z	33
	S	NE	34
	P: D		
1.	P	NEZ	17 54 37
1.	iP	NEZ	22 24 38.8
	eX	E	25 18
	eX	N	37
	P: C		
1.	iP	NZ	23 57 40.4
	iX	E	40.8
	iX	E	49.3
	iX	Z	50.0
	iX	Z	58 00.2
	P: S,D		
	4.3 N., 125.5 E.		
	Talaud Is.		
	h: N km.		
	H= 23 50 55.3		USCGS
2.	iP	NZ	10 37 24.9
	S	E	48
	P: S,D		
2.	P	NZ	12 37 40
	S	E	38 12
2.	P	NEZ	14 12 06
	iX	Z	16.8
	eS	Z	16 40
	L	NE	18 00
	L	Z	19 00
	53.9 N., 160.6 E.		
	Near east coast of Kamchatka.		
	h: 76 D km.		
	H= 14 07 05.2		USCGS
2.	eP	NEZ	15 56 45

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	12.9 N., 169.1 E.		
	Santa Cruz Is.		
	h: 635 km.		
	H= 15 47 55.4		USCGS
2.	P	NEZ	18 08 42
	eX	Z	11 10
	42.0 N., 142.4 E.		
	Hokkaido , Japan.		
	h: 70 km.		
	H= 18 07 07.9		USCGS
2.	iP Z, P NE		19 10 38.1
	P: C		
2.	iP Z, P NE		19 59 10.8
	S	NE	52
	P: C		
3.	eP	Z	03 27 01
	eL	Z	47 20
	L	Z	54 28
3.	iP	Z	05 10 41.8
	iP	NE	42.0
	S	N	11 29
	P: C		
	36.4 N., 143.1 E.		
	Off east coast of Honshu, Japan.		
	h: N km.		
	H= 05 09 41.5		USCGS
3.	iP	NEZ	09 34 54.0
	P: N,W,D		
	37.2 N., 135.1 E.		
	Sea of Japan.		
	h: 370 km.		
	H= 09 33 55.9		USCGS
3.	P	NEZ	12 51 08
3.	P	Z	13 19 28
3.	P	Z	13 34 50
	P	E	52
	iPP	Z	36 08
	S	NE	40 14
	Lq	NZ	42 28
	Lr	E	44 15
	Lr	Z	20
	Mag. $5\frac{1}{2}$ - $5\frac{3}{4}$ (Mat.)		
	51.2 N., 179.4 W.		
	Andreanof Is.		
	h: 29 km.		
	H= 13 28 12.8		USCGS
3.	P	Z	14 52 39
	S	NE	53 27

Date	Phase	Comp.	Time(GMT) h m s	
3.	P	NEZ	16 05 50	
	eS	NE	06 37	
3.	eP	Z	16 56 44	
3.	P	NEZ	18 45 37	
	S	NE	46 25	
3.	P	NEZ	19 10 20	
	6.3 S., 104.6 E.			
	Sunda Strait.			
	h: N km.			
	H= 19 10 04.9			USCGS
4.	iP	Z	00 30 25.7	
	iX	N	35	
	P: D			
4.	P	NEZ	02 35 49	
	eX	N	37 17	
4.	eP	NEZ	09 15 40	
	eX	Z	18 23	
4.	iP	NZ	11 13 02.8	
	eS	N	14 49	
	P: D			
4.	P	NEZ	11 29 16	
	S	NEZ	56	
4.	P	NEZ	14 02 46	
	S	NE	03 13	
	35.0 N., 140.2 E.			
	Near east coast of Honshu, Japan.			
	h: 83 km.			
	H= 14 02 09.3			USCGS
4.	iP	EZ	16 33 43.7	
	P	N	49	
	S	NZ	34 26	
	S	E	28	
	P: E,D			
4.	iP	NEZ	22 44 44.3	
	iX	Z	45 00	
	iPP	Z	46 29	
	iX	Z	47 50	
	eX	Z	50 10	
	P: S,W,D			
	6.8 S., 129.8 E.			
	Banda Sea.			
	h: 107 km.			
	H= 22 36 47.9			USCGS
5.	eP	Z	01 39 35	
	1.1 N., 125.9 E.			
	Molucca Passage.			
	h: N km.			
	H= 01 32 56.8			USCGS
5.	P	Z	07 35 29	
	L	NE	43 13	
	Lq	N	53 52	
	4.1 N., 125.6 E.			
	Talaud Is.			
	h: 50 km.			
	H= 07 28 55.8			USCGS
5.	P	NEZ	11 53 25	
5.	P	Z	12 35 45	
	S	N	36 42	
5.	iP	NEZ	13 35 18.0	
	pP	Z	37 09	
	S	N	42 14	
	iX	E	40	
	eLq	N	46 00	
	L	Z	49 30	
	L	N	50 40	
	P: S,E,D			
	Mag. 7¼ (Mat.)			
	8.0 S., 158.9 E.			
	Solomon Is.			
	h: 47 km.			
	H= 13 26 39.9			USCGS
5.	P	Z	16 21 37	
	PcP	Z	23 58	
	P: D			
	1.6 N., 126.6 E.			
	Molucca Passage.			
	h: N km.			
	H= 16 14 30.4			USCGS
5.	P	NEZ	16 59 16	
	eX	Z	17 04 30	
	P: N,C			
	8.9 S., 123.5 E.			
	Flores Is.			
	h: 27 km.			
	H= 16 30 42.8			USCGS
6.	P	NEZ	04 17 35	
	S	NE	18 13	
	eX	Z	34	
6.	iP	NEZ	04 24 11.2	
	P: S,W,C			
6.	iP Z, P NE		05 55 17.5	
	P: D			

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
6.	iP	NZ	06 51 39.8
	P	E	41
	L	NEZ	58 34
	P: N,C		
	11.8 N., 143.1 E.		
	South of Mariana Is.		
	h: N km.		
	H= 06 46 18.2		USCGS
6.	iP NZ, P E		12 16 31.6
	P: N,D		
6.	iP	Z	12 39 29.8
	P: C		
	22.5 S., 179.2 E.		
	South of Fiji Is.		
	h: 586 km.		
	H= 12 29 12.5		USCGS
6.	eP	NZ	13 48 38
	S	NE	49 12
6.	iP EZ, P N		15 42 14.4
	P: E,D		
	30.2 S., 178.0 W.		
	Kermadec Is.		
	h: 137 km.		
	H= 15 30 29.7		USCGS
6.	iP	NEZ	15 48 14.9
	ePP	N	50 45
	S	EZ	55 46
	S	N	54
	L	E	16
	Lr	NZ	16 03 42
	L	NE	06 54
	P: N,W,C		
	Mag. 7½ (Mat.)		
	10.5 S., 164.5 E.		
	Santa Cruz Is.		
	h: 32 km.		
	H= 15 39 00.9		USCGS
6.	eP	Z	17 15 31
	10.9 S., 164.4 E.		
	Santa Cruz Is.		
	h: N km.		
	H= 17 06 15.8		USCGS
6.	eP	Z	17 30 16
6.	iP	Z	17 42 55.0
	iP N, P E		55.8
	P: S,C		
6.	iPKP Z, PKP N		20 38 12.2
	iX	Z	25.4
	P: C		(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	18.4 S., 70.7 W.		
	Near coast of northern Chile.		
	h: 72 km.		
	H= 20 18 31.3		USCGS
6.	P	Z	21 02 02
7.	P	NEZ	01 02 09
	eX	Z	19
	iX	Z	37
	S	NE	50
	iX	N	03 12
	33.9 N., 141.4 E.		
	Off east coast of Honshu, Japan.		
	h: N km.		
	H= 01 01 11.3		USCGS
7.	iP	NZ	01 22 06.5
	iX	N	30
	eX	N	53
	eS	NE	28 23
	Lq	E	32 45
	L	Z	33.0
	Lr	N	33 12
	P: S,W,D		
	6.2 S., 146.4 E.		
	East New Guinea.		
	h: 97 km.		
	H= 01 14 14.1		USCGS
7.	P	Z	03 34 33.0
	P	NE	33.5
	S	N	35 08
7.	iP	Z	04 50 18.2
	P: C		
	16.0 S., 167.5 E.		
	New Hebrides Is.		
	h: 45 km.		
	H= 04 40 21.4		USCGS
7.	P	NE	04 50 38
	iX	N	58 28
	L	NE	05 05 12
	L	Z	07 00
7.	eP	EZ	05 39 56
	eX	N	40 53
7.	eP	Z	07 04 55
	eX	NEZ	06 20
	eS	N	08 40
	eL	Z	56
	L	NZ	09 40
	26.1 N., 129.5 E.		
	Ryukyu Is.		(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	h: 61 km.		
	H= 07 01 55.2		USCGS
7.	iP	NZ	07 30 55.5
	iX	E	56.2
	S	NE	31 57
	S	Z	59
	P: N,D		
7.	P	NEZ	17 56 01
	S	NE	18 03 40
	Lq1	E	08 40
	Lr1	N	11 38
	Lr1	EZ	48
	Lq2	E	16 44
	10.8 S., 164.4 E.		
	Santa Cruz Is.		
	h: 29 km.		
	H= 17 46 45.8		USCGS
7.	P	NZ	21 30 13
	P	E	14
7.	iP	NEZ	22 01 52.0
	L	E	08 04
	L	Z	40
	P: S,E,C		
	51.6 N., 159.5 E.		
	Off east coast of Kamchatka.		
	h: N km.		
	H= 21 57 05.8		USCGS
8.	iP	NZ	01 26 16.1
	P	E	17
	eX	N	28 07
	P: S,C		
8.	iP	Z	02 29 39.0
	P	NE	39
	S	NZ	30 11
	P: C		
8.	iP	NZ	07 27 15.2
	iP	E	15.4
	iS	NEZ	41
	P: S,W,D		
8.	eP	NEZ	11 06 13
8.	iP	NEZ	14 04 06.6
	P: D		
	3.6 S., 127.8 E.		
	Ceram.		
	h: 74 km.		
	H= 13 56 28.0		USCGS
8.	iP	NZ	18 28 08.4
	P: S,C		

Date	Phase	Comp.	Time(GMT) h m s
8.	iP	NEZ	18 28 15.0
	eX	E	55
	P: S,E,D		
8.	eP	NEZ	18 51 06
	eS	NE	44
8.	P	NEZ	20 29 38
	S	NE	30 06
8.	iP	NEZ	22 01 09.0
	S	N	05 40
	eL	E	07 12
	L	Z	08 08
8.	eP	Z	23 44 22
9.	iP	NEZ	00 44 01.4
	iX	EZ	48
	iX	NEZ	45 09.0
	iX	NEZ	35.0
	iX	NEZ	46 04
9.	eP	NZ	00 54 21
9.	iP EZ, P N		01 18 16.0
	P: N,E,D		
9.	iP EZ, P N		01 26 19.5
	e	Z	50
	iX	NZ	27 15.0
	P: W,C		
9.	iP	NEZ	03 29 21.4
	iX	Z	33
	S	NE	48
	P: S,E,D		
	34.9 N., 140.3 E.		
	Near east coast of Honshu, Japan.		
	h: 23 km.		
	H= 03 28 43.4		USCGS
9.	P	Z	04 12 16
	S	NEZ	33
9.	iP Z, P NE		05 28 16.0
	P: C		
9.	iP Z, P NE		12 07 13.6
	S	NE	36
	P: C		
9.	iP	Z	12 31 42.2
	P	NE	43
	P: D		
	6.6 S., 148.1 E.		
	New Britain.		

(cont.)

Date	Phase	Comp.	Time(GMT) h m s	
	h: 68 km.			
	H= 12 23 40.5			USCGS
9.	eP	Z	13 14 32	
9.	iP Z, P NE		13 51 03.8	
	iX	N	25	
	P: C			
	6.6 S., 143.0 E.			
	New Britain.			
	h: 66 km.			
	H= 13 43 03.3			USCGS
9.	P	NZ	15 56 02	
	6.7 S., 148.1 E.			
	New Britain.			
	h: 68 km.			
	H= 15 48 00.4			USCGS
9.	iP NZ, P E		16 41 31.0	
	P: N,C			
	7.3 S., 153.7 E.			
	Solomon Is.			
	h: 31 km.			
	H= 16 32 51.7			USCGS
9.	iP	Z	20 00 37.4	
	iP	NE	38.4	
	S	NE	01 23	
	P: N,E,C			
9.	iP NZ, P E		21 34 40.1	
	iX	Z	35 00	
	P: N,E,D			
	41.4 N., 140.3 E.			
	Hokkaido, Japan.			
	h: 132 km.			
	H= 21 33 24.4			USCGS
9.	iP Z, P NE		23 16 00.8	
	P: C			
10.	P	Z	00 15 18	
	P	NE	19	
	eX	Z	16 25	
	eX	NZ	52	
10.	iP	NEZ	01 40 56.1	
	eS	N	42 04	
	iX	N	06	
10.	P	NEZ	03 23 16	
	iX	N	24	
	S	NE	25 16	
	iX	Z	26 44.0	
	L	Z	27 12	
	L	E	30 48	
	29.0 N., 130.6 E.			
	Ryukyu Is.			(cont.)

Date	Phase	Comp.	Time(GMT) h m s	
	h: N km.			
	H= 03 20 54.9			USCGS
10.	P	NEZ	06 16 19	
	eX	Z	17 52	
10.	iP	Z	10 39 37.2	
	P: D			
	16.1 S., 169.7 E.			
	New Hebrides Is.			
	h: 24 km.			
	H= 10 29 29.7			USCGS
10.	iP Z, P NE		13 10 20.3	
	eX	N	11 05	
	P: D			
10.	iPKP Z, PKP NE		13 55 55.4	
	13.2 S., 69.2 W.			
	Peru-Bolivia border.			
	h: 636 km.			
	H= 13 37 24.0			USCGS
10.	iP	NEZ	14 30 36.6	
	iX	N	45.0	
	eX	N	31 40	
	eX	N	32 10	
	P: S,W,C			
10.	iP	Z	19 23 23.5	
	iS	NE	42.4	
10.	P	NEZ	19 38 37	
	iX	Z	38.0	
11.	iP NZ, P E		04 38 14.3	
	S	N	47 42	
	iX	E	48 04	
	SS	N	53 00	
	L	NE	58 38	
	L	Z	05 02 10	
	P: N,W,C			
	Mag. 6½ (Mat.)			
	28.4 S., 177.0 W.			
	Kermadec Is.			
	h: 68 km.			
	H= 04 26 26.8			USCGS
11.	eP	Z	04 50 37	
	S	EZ	51 50	
11.	iP Z, P NE		04 59 30.8	
	iX	Z	40.3	
	P: C			
	28.5 S., 176.8 W.			
	Kermadec Is.			
	h: 68 km.			
	H= 04 47 42.7			USCGS

Date	Phase	Comp.	Time(GMT) h m s
11.	P	Z	05 14 43
	iX	NEZ	15 11
	28.5 S., 176.7 W.		
	Kermadec Is.		
	h: 76 km.		
	H= 05 02 55.9		USCGS
11.	iP	Z	06 37 33.0
	P: C		
	17.7 S., 178.8 W.		
	Fiji Is.		
	h: 529 km.		
	H= 06 27 29.0		USCGS
11.	eP	Z	13 19 00
	eX	N	23 10
11.	iP	NZ	16 43 17.6
	eX	E	45 16
	P: S,C		
	41.4 N., 142.5 E.		
	Near south coast of Hokkaido, Japan.		
	h: 20 km.		
	H= 01 41 44.0		J.M.A.
11.	iP	NZ	23 49 33.1
	iX	E	34.0
	S	N	50 48
	iS	NEZ	49.7
	P: N,C		
	31.1 N., 138.2 E.		
	South of Honshu, Japan.		
	h: 469 km.		
	H= 23 48 02.2		USCGS
12.	iP	NZ	05 07 02.0
	iX	E	03
	eS	N	08 47
	P: L		
	41.4 N., 142.4 E.		
	Near south coast of Hokkaido, Japan.		
	h: 0 km.		
	H= 14 05 25.7		J.M.A.
12.	iP	NZ	09 06 42.8
	S?	E	47.0
	P: N,D		
12.	ePKP	Z	11 11 06
	2.4 N., 84.5 W.		
	Off coast of Central America.		
	h: N km.		
	H= 10 50 59.9		USCGS
12.	iPKP	Z	14 32 16.8
	P: C		
	14.1 S., 72.7 W. (cont.)		

Date	Phase	Comp.	Time(GMT) h m s
	Peru.		
	h: 113 km.		
	H= 14 12 53.0		USCGS
12.	iP	NZ	15 00 09.0
	S	E	29
	P: S,C		
12.	iP	NEZ	22 04 55.7
	iS	E	05 16.5
	S	N	16.8
	P: N,W,C		
13.	iP	NEZ	00 58 10.5
	P: N,W,D		
13.	ePKP	Z	06 56 57
	ePP	Z	07 00 20
	eSKKS	E	07 14
	eL	N	47 20
	L	EZ	50
	L	Z	54 28
	Mag. 6 - 6½ (Mat.)		
	37.1 S., 73.6 W.		
	Near coast of Central Chile.		
	h: N km.		
	H= 06 36 37.0		USCGS
13.	iP	NZ	09 03 41.5
	iX	Z	55
	eS	N	10 46
	eL	E	16 06
	L	Z	17 08
	P: S,D		
	Mag. 5¾ (Mat.)		
	8.0 S., 158.9 E.		
	Solomon Is.		
	h: 48 km.		
	H= 08 55 03.9		USCGS
13.	L	NE	10 19 44
	12.6 N., 122.9 E.		
	Luzon P.I.		
	h: 24 km.		
	H= 10 08 23.6		USCGS
13.	eP	Z	12 36 32
	19.3 N., 120.8 E.		
	Philippine Is.		
	h: N km.		
	H= 12 31 30.7		USCGS
13.	eP	Z	20 18 13
	eS	N	38
13.	iP	Z	20 58 57.8
	S	N	59 17
	P: D		

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Date	Phase	Comp.	Time(GMT) h m s
14.	P	Z	00 35 08
	iX	Z	14
	S	E	51
	38.4 N., 141.1 E.		
	Honshu, Japan.		
	h: 0 km.		
	H= 09 34 12.3		J.M.A.
14.	L	E	03 00 20
14.	iP	EZ	03 59 18.2
	S	Z	57
	P: W,D		
14.	P	Z	12 44 57
	S	E	52 32
	L	E	13 01 30
	10.9 S., 164.4 E.		
	Santa Cruz Is.		
	h: 16 km.		
	H= 12 35 37.2		USCGS
14.	eP	NEZ	14 34 18
	18.5 N., 145.3 E.		
	Mariana Is.		
	h: 221 km.		
	H= 14 30 08.0		USCGS
14.	iP	NEZ	16 02 45.1
	iX	NEZ	55
	S	N	03 18
	P: N,E,D		
	37.5 N., 141.5 E.		
	Near east coast of Honshu, Japan.		
	h: 60 km.		
	H= 16 02 00.7		USCGS
14.	P	Z	21 02 22
14.	P	NEZ	22 33 11
14.	iP	Z	23 24 26.4
	S	N	34 36
	Lq	E	46 20
	Lr	N	52 50
	P: C		
	Mag. $6\frac{3}{4}$ (Mat.)		
	36.2 N., 29.2 E.		
	Turkey.		
	h: N km.		
	H= 23 12 07.9		USCGS
15.	P	Z	03 37 33
	iX	N	35
15.	iP EZ, P N		11 51 04.6
	iX	N	06.8

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	S	E	11 51 27
	P: W,C		
15.	P	Z	13 07 07
	S	N	13 20
	L	N	16 52
	Mag. $5\frac{1}{2}$ - $5\frac{3}{4}$ (Mat.)		
	3.2 S., 118.9 E.		
	Celebes.		
	h: N km.		
	H= 12 59 06.7		USCGS
15.	iP Z, P NE		16 45 31.5
	iX	Z	40.0
	P: D		
15.	iP	NZ	18 13 22.8
	S	NEZ	41.6
	P: S,C		
15.	iP N, P EZ		19 06 30.5
	S	NE	51
	P: C		
15.	iP Z, P N		19 42 08.0
	P: C		
16.	P	NEZ	06 27 52
	S	NEZ	28 02
16.	iP	NEZ	07 25 32.7
	iS	NE	49.6
	P: S,W,C		
	36.4 N., 139.2 E.		
	Honshu, Japan.		
	h: 140 km.		
	H= 07 25 09.2		J.M.A.
16.	eP	Z	07 30 26
	iX	N	37
16.	P	Z	09 34 34
16.	P	Z	10 37 09.2
	2.2 N., 126.6 E.		
	Molucca Passage.		
	h: N km.		
	H= 10 30 12.1		USCGS
16.	eSS	N	11 32 20
	eL	N	40 50
	L	Z	41 18
	23.6 S., 176.1 W.		
	South of Fiji Is.		
	h: 45 km.		
	H= 11 06 35.7		USCGS

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Date	Phase	Comp.	Time(GMT) h m s	
16.	iP	Z	12 32 10.2	
	iX	N	33 07	
	P: D			
16.	iP	EZ	14 33 01.2	
	P: E,C			
16.	P	Z	14 58 40	
	50.6 N., 159.9 E.			
	Kurile Is.			
	h: 50 km.			
	H= 14 53 58.0			USCGS
16.	eP	Z	15 23 36	
	S	NE	25 40	
	L	Z	26 28	
	27.6 N., 129.2 E.			
	Ryukyu Is.			
	h: 38 km.			
	H= 15 20 42.6			USCGS
16.	iP	Z	15 36 29.7	
	P	N	30.0	
	iX	E	30.2	
	S	E	37 41	
	P: N,C			
	40.1 N., 142.3 E.			
	Near east coast of Honshu, Japan.			
	h: 45 km.			
	H= 15 35 15.5			USCGS
16.	P	NEZ	16 29 48	
	iX	N	50	
	S	NEZ	30 03	
16.	P	NZ	17 10 25	
	S	N	13 29	
	20.8 N., 144.9 E.			
	Mariana Is.			
	h: 165 km.			
	H= 17 06 39.8			USCGS
16.	iP	EZ	20 32 41.2	
	S	NE	33 05	
	P: E,C			
16.	P	Z	23 39 18	
	S	N	40 05	
17.	iP NZ, P E		07 14 57.2	
	S	N	15 13	
	S	EZ	14	
	P: S,E,D			
	35.2 N., 138.4 E.			
	Honshu, Japan.			
	h: 10 km.			
	H= 16 14 31.9			J.M.A.
17.	iP NZ, P E		08 30 41.8	
	P: N,D			
	47.7 N., 154.0 E.			
	Kurile Is.			
	h: N km.			
	H= 08 26 54.8			USCGS
17.	iP	NEZ	14 23 04.5	
	iS	N	16.4	
	P: S,E,D			
17.	iP	NEZ	20 42 36.3	
	S	N	43 03.2	
	S	E	03.8	
	P: N,E,C			
17.	eP	Z	21 05 46	
	eX	N	10 50	
	L	E	12 22	
	L	Z	13 14	
	8.3 N., 124.1 E.			
	Mindanao , P.I.			
	h: 41 km.			
	H= 20 59 35.7			USCGS
17.	eP	Z	21 16 29	
	S	N	17 08	
	S	E	10	
18.	iP	EZ	02 19 44.4	
	P: E,D			
18.	PKP	Z	03 22 17	
	pPKP	NZ	31	
	PP	Z	26 22	
	eSS	E	46 14	
	56.8 S., 26.8 W.			
	South Sandwich Is.			
	h: 141 km.			
	H= 03 02 38.7			USCGS
18.	P	NEZ	03 57 55	
	S	N	04 04 28	
	L	NE	07 38	
	iX	Z	55	
	Mag. 6 (Mat.)			
	3.0 S., 118.9 E.			
	Celebes.			
	h: N km.			
	H= 03 49 55.5			USCGS
18.	iP	Z	04 03 42.6	
	P	N	43	
	P: C			
	3.0 S., 118.9 E.			
	Celebes.			
	h: N km.			
	H= 03 55 43.8			USCGS

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Date	Phase	Comp.	Time(GMT) h m s	
18.	eX	N	06 14 28	
18.	eP	Z	08 38 20	
	iX	NEZ	32	
18.	eP	Z	17 20 23	
	iX	NEZ	33.8	
	S	NEZ	51	
18.	iP	NZ	17 21 29.5	
	iX	E	34.6	
	S	NEZ	22 02.4	
	P: N,C			
18.	eL	Z	17 51 00	
18.	iP	Z	17 59 59.8	
	S	N	18 00 14.4	
	S	EZ	15.2	
	P: D			
19.	eP	Z	03 27 29	
	S	NE	31 32	
	S	Z	38	
	19.3 N., 121.2 E.			
	Philippine Is.			
	h: N km.			
	H= 03 22 29.0			USCGS
19.	iP	EZ	05 04 49.7	
	iX	N	50.4	
	iX	Z	53.5	
	iX	E	55	
	S	N	05 13	
	P: E,C			
19.	iP	NEZ	07 04 15.8	
	S	NE	05 56	
	PcP	Z	10 14	
	ePKPPKP	Z	40 49	
	P: S,W,C			
	Mag. 6.9 (Mat.)			
	45.0 N., 143.2 E.			
	Hokkaido, Japan.			
	h: 204 km.			
	H= 07 02 04.4			USCGS
19.	iP NZ, P E		07 33 05.4	
	P: N,C			
	1.9 N., 126.7 E.			
	Molucca Passage.			
	h: 39 km.			
	H= 07 26 05.9			USCGS
19.	P	Z	07 35 32	
19.	eP	Z	09 22 36	

Date	Phase	Comp.	Time(GMT) h m s	
19.	iP	Z	12 27 43.6	
	P: C			
19.	iP	EZ	15 17 29.8	
	P	N	30.0	
	S	NE	50.8	
	P: E,D			
	35.4 N., 140.1 E.			
	Honshu, Japan.			
	h: 80 km.			
	H= 15 17 00.0			J,M.A.
19.	iP	Z	17 26 18.0	
	P: D			
	1.7 N., 127.1 E.			
	Halmahera.			
	h: 86 km.			
	H= 17 19 23.1			USCGS
19.	iP	NEZ	18 05 50.3	
	S	Z	06 56	
	iX	E	07 45	
	P: N,E,D			
	41.1 N., 142.6 E.			
	Hokkaido, Japan.			
	h: 55 km.			
	H= 18 04 24.7			USCGS
19.	P	Z	18 21 15	
	S	E	50	
19.	iP Z, P N		19 00 34.0	
	iX	NEZ	34.7	
	iX	Z	01 00	
	iX	NZ	14	
	S	E	08 26	
	ScS	N	10 18	
	L	N	14 49	
	ePKPPKP	Z	30 00	
	PKP2PKP2	Z	24	
	P: S,D			
	Mag. 6.2 (Mat.)			
	14.9 S., 167.2 E.			
	New Hebrides Is.			
	h: 112 km.			
	H= 18 50 52.1			USCGS
20.	iP	Z	01 14 34.1	
	eL	N	39 28	
	P: D			
	28.7 S., 176.8 W.			
	Kermadec Is.			
	h: 73 km.			
	H= 01 02 45.7			USCGS
20.	iP	NEZ	03 13 33.5	
	iS	N	52.0	
	P: S,W,C			

Date	Phase	Comp.	Time(GMT) h m s	
20.	iP	NEZ	04 08 53.0	
	eS	E	09 34	
	eS	N	37	
	P: W,D			
	35.5 N., 135.4 E.			
	Southern Honshu, Japan.			
	h: 354 km.			
	H= 04 07 56.8			USCGS
20.	P	Z	04 55 22	
	eS	N	05 02 40	
	L	NE	07 44	
	10.2 S., 164.5 E.			
	Santa Cruz Is.			
	h: N km.			
	H= 04 46 10.2			USCGS
20.	iP	EZ	10 22 45.4	
	P	N	46	
	S	EZ	23 03	
	P: E,D			
20.	P	Z	12 33 52	
	P	NE	53	
	S	NEZ	41 22	
	Lq	N	46 12	
	Lq	E	36	
	Lr	Z	49 00	
	Mag. 6½ (Mat.)			
	10.3 S., 164.6 E.			
	Santa Cruz Is.			
	h: 4 km.			
	H= 12 24 35.2			USCGS
20.	iP	NEZ	14 25 48.8	
	PcP	Z	29 12	
	S	N	30 08	
	iX	E	22	
	iX	Z	40	
	P: S,W,C			
	Mag. 5½ - 5¾ (Mat.)			
	54.9 N., 166.0 E.			
	Komandorsky Is.			
	h: 23 km.			
	H= 14 20 11.5			USCGS
20.	eP	Z	16 30 30	
	7.4 S., 128.3 E.			
	Banda Sea.			
	h: 125 km.			
	H= 16 22 31.1			USCGS
20.	iP	Z	16 39 24.9	
	iX	NZ	28	
	eS	N	53	
	P: D			
20.	eP	Z	17 42 35	

(cont.)

Date	Phase	Comp.	Time(GMT) h m s	
	eL	NE	17 55 20	
	10.2 S., 164.7 E.			
	Santa Cruz Is.			
	h: 40 km.			
	H= 17 33 16.8			USCGS
20.	P	NEZ	18 56 12	
	P	NEZ	24	
20.	P	Z	22 33 18	
	eS	NE	34 40	
	40.7 N., 144.2 E.			
	Off east coast of Honshu, Japan.			
	h: 5 km.			
	H= 22 31 41.6			USCGS
20.	iP	NEZ	23 11 44.5	
	eS	N	12 48	
	P: S,W,C			
	39.4 N., 144.7 E.			
	Off east coast of Honshu, Japan.			
	h: N km.			
	H= 23 10 16.6			USCGS
21.	iP	EZ	00 13 52.6	
	S	NE	14 28	
	P: W,C			
21.	iP	Z	01 55 34.0	
	iP	N	34.5	
	iP	E	35.0	
	pP	Z	56 06	
	pP	N	08	
	iX	Z	30	
	S	N	02 01 56	
	L	E	04 40	
	L	NZ	05 14	
	P: N,W,C			
	7.3 S., 128.3 E.			
	Banda Sea.			
	h: 91 km.			
	H= 01 47 29.6			USCGS
21.	P	NZ	03 10 00	
	iX	E	05	
	S	N	22	
	iX	E	27	
21.	P	Z	04 18 05	
	iX	Z	19 52	
21.	eL	Z	04 45 26	
	15.1 S., 166.5 E.			
	New Hebrides Is.			
	h: 45 km.			
	H= 04 01 29.6			USCGS

Date	Phase	Comp.	Time(GMT) h m s
21.	L	NEZ	09 02 00
	23.7 N., 43.6 W.		
	North Atlantic Ridge.		
	h: N km.		
	H= 08 05 40.1		USCGS
21.	P	Z	12 50 35
	P	E	36
	8.8 S., 124.1 E.		
	Timor.		
	h: 16 km.		
	H= 12 42 02.2		USCGS
21.	eL	NE	15 04 00
	eL	Z	06 00
	38.3 N., 69.7 E.		
	Tadzhik , SSR.		
	h: 52 km.		
	H= 14 37 15.1		USCGS
21.	P	Z	15 23 42
	eX	N	44
	eX	E	50
	0.8 N., 120.0 E.		
	Northern Celebes.		
	h: N km.		
	H= 15 16 15.7		USCGS
21.	iP	E	17 14 23.7
	P Z, eP N		24
	S	N	52
	P: W		
21.	P	NZ	20 48 42
	P	E	43
	S	E	57 26
	iX	Z	36
	iX	E	42
	L	NE	21 05.0
	eL	Z	07.5
	21.9 S., 169.9 E.		
	Loyalty Is. region.		
	h: 33 km.		
	H= 20 38 00.7		USCGS
21.	eP	Z	21 22 40
	S	NE	23 14
21.	eP	Z	21 48 32
	iX	N	36
21.	iP	Z	23 17 38.4
	iP N, P E		39.0
	iX	N	48
	S E, eS N		22 12
	eL	Z	25 14
	P: S,D		
	55.9 N., 163.0 E.		(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	Off east coast of Kamchtka.		
	h: 23 km.		
	H= 23 12 10.0		USCGS
22.	iP	Z	00 47 57.4
	iP	N	57.8
	iP	E	58.1
	iX	Z	51 28
	S	E	52 22
	iX	E	24
	iX	N	32
	iX	Z	36
	L	N	54 18
	L	E	36
	Lr	Z	56 28
	P: S,E,C		
	55.9 N., 163.0 E.		
	Off east coast of Kamchatka.		
	h: N km.		
	H= 00 42 30.0		USCGS
22.	iP	NZ	03 23 00.8
	iP	E	01.2
	iX	Z	09
	eS	E	27 40
	L	NE	30.0
	L	Z	32 00
	P: N,W		
	55.9 N., 163.0 E.		
	Off east coast of Kamchatka.		
	h: 25 km.		
	H= 03 17 33.3		USCGS
22.	P	N	03 59 58
	iP	Z	58.7
	P	E	59
	iX	Z	04 01 26
	eX	N	28
	eL	E	07 20
	eL	N	28
	P: D		
	55.9 N., 163.1 E.		
	Off east coast of Kamchatka.		
	h: 25 km.		
	H= 05 54 29.9		USCGS
22.	eL	E	04 21 38
	eL	N	23 30
	eL	Z	24 30
	6.0 S., 153.7 E.		
	New Britain.		
	h: 17 km.		
	H= 04 02 52.0		USCGS
22.	iP	Z	17 18 49.0
	P	NE	49
	S	EZ	22 16
	eX	N	25
			(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	Lq	E	17 22 44
	Lr	Z	24 30
	Lr	N	44
	P: D		
	Mag. 5½ - 5½ (Mat.)		
	49.4 N., 155.5 E.		
	Kurile Is.		
	h: 50G km.		
	H= 17 14 42.8		USCGS
22.	P	Z	18 07 28.6
	53.7 N., 164.4 W.		
	Unimak I.		
	h: N km.		
	H= 17 59 33.0		USCGS
23.	P	Z	01 46 26
	P	N	27
	iX	Z	33
	iX	NE	35
	S	NEZ	57
23.	iP	NEZ	02 01 16.2
	iX	E	18.7
	S	NE	02 23
	L	Z	37
	L	NE	42
	P: S,D		
	29.1 N., 139.2 E.		
	South of Honshu, Japan.		
	h: 408 km.		
	H= 01 59 26.6		USCGS
23.	P	N	04 01 14
	iP	Z	14.0
	iX	E	27
	S	NEZ	49
23.	P?	Z	13 41 41
	iX	Z	49
23.	eP	Z	13 44 48
	S?	N	46 12
	S?	E	26
23.	iP	Z	14 02 23.4
	iP	E	24.0
	iP	N	24.3
	S	N	36
	S	E	37
	S	Z	38
	P: N,E,D		
	36.1 N., 139.6 E.		
	Honshu, Japan.		
	h: 60 km.		
	H= 14 01 58.0		J.M.A.
24.	iP	EZ	00 32 29.7
			(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	P	N	00 32 29.9
	iX	NE	40
	iX	Z	42
	S	EZ	55
	P: N,W,C		
	35.1 N., 140.1 E.		
	Honshu, Japan.		
	h: 90 km.		
	H= 00 31 55.5		J.M.A.
24.	iP	NEZ	02 43 20.5
	pP	Z	45 25
	PP	NZ	46 04
	iS	N	51 48
	iS	E	50
	ScS	E	52 35
	sS	N	55 22
	sS	E	32
	sS	Z	38
	L	Z	59 20
	L	NE	40
	PKPPKP2	Z	03 11 09
	P: S,E,D		
	Mag. 7.0 (Mat.)		
	21.9 S., 179.6 W.		
	Fiji Is.		
	h: 595 D km.		
	H= 02 33 03.5		USCGS
24.	P	Z	02 56 20
	iX	E	31
	iX	NZ	32.5
24.	P	Z	19 46 14
	iX	Z	23
	iX	NE	24
	eS	N	47 20
	eL	E	48 06
	L	Z	49 00
	30.0 N., 130.0 E.		
	Kyushu , Japan.		
	h: N km.		
	H= 19 43 57.5		USCGS
24.	P N, eP E		23 03 44
	iP	Z	44.2
	eS	NE	05 20
	P: D		
25.	iP	NEZ	01 17 24.4
	iX	NZ	27.5
	iS	E	32.5
	P: N,E,C		
25.	iP	NZ	05 26 27.3
	P	E	28
	PP	Z	27 55
	PP	Z	28 00
			(cont.)

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Date	Phase	Comp.	Time(GMT) h m s
	iX	N	05 28 13
	PcP	Z	51
	S	N	32 08
	S	EZ	14
	Lq	NEZ	35 00
	Lr	Z	37 00
	P: N,C		
	Mag. 6¼ (Mat.)		
	0.8 N., 126.1 E.		
	Molucca Passage.		
	h: 24 km.		
	H= 05 19 17.1		USCGS
25.	P	NZ	10 09 21
	iX	NZ	29.4
	iX	N	10 34
25.	P	Z	10 10 50
25.	P	NZ	10 45 50
25.	iP Z, P N		12 15 40.6
	P	E	41
	iX	N	48
	iX	Z	49
	iX	E	50
	iX	E	16 00
	eS	NE	20 24
	L	N	22 00
	L	E	24
	L	Z	23 38
	P: C		
	55.9 N., 162.9 E.		
	Near east coast of Kamchatka.		
	h: N km.		
	H= 12 10 13.3		USCGS
25.	eP	EZ	17 47 47
	eX	N	50
	iX	EZ	48 08
25.	P	NEZ	20 00 03
	iX	N	42
	iX	E	47
	iX	N	58
25.	iP	EZ	23 42 12.5
	P	N	13
	iX	E	28
	iX	Z	44 10
	eL	N	52 00
	eL	EZ	56 00
	P: E,C		
	22.9 N., 92.3 E.		
	India - East Pakistan border.		
	h: 50 G km.		
	H= 23 34 28.4		USCGS

Date	Phase	Comp.	Time(GMT) h m s
26.	eL	E	00 31.0
	54.4 S., 143.8 E.		
	West of Macquarie I.		
	h: N km.		
	H= 23 52 42.4		USCGS
26.	iP	Z	05 07 43.5
	iP	NE	43.7
	eL	N	19.0
	L	E	20.0
	P: N,W,C		
	10.2 S., 161.5 E.		
	Solomon Is.		
	h: 75 G km.		
	H= 04 58 45.8		USCGS
26.	P	Z	06 12 21.5
	P	NE	22
	eS	N	17 16
	L	E	19 00
	L	Z	21 00
	L	N	22 00
	6.6 N., 127.4 E.		
	Philippine Is.		
	h: 50 km.		
	H= 06 06 05.9		USCGS
26.	P	NZ	09 41 09
	P	E	10
	5.6 S., 149.6 E.		
	New Britain.		
	h: 152 km.		
	H= 09 33 21.2		USCGS
26.	P	Z	10 07 56
	38.2 N., 73.8 E.		
	Tadzhik - Sinkiang border.		
	h: 138 km.		
	H= 09 59 12.1		USCGS
26.	iP	Z	12 40 21.9
	P	E	22
	iP	N	22.2
	P: S,C		
	6.1 S., 125.1 E.		
	Banda Sea.		
	h: 554 km.		
	H= 12 33 01.3		USCGS
26.	iP	NZ	15 11 02.5
	iP	E	03.6
	iX	Z	06
	S	E	15 28
	S	N	30
	S	Z	40
	Lq	E	17 00
	Lq	N	26
	Lr	Z	18 42

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	Lr	N	15 19 32
	Lr	E	44
	P: N,W,D		
	Mag. 5¼ - 5½ (Mat.)		
	55.8 N., 162.9 E.		
	Near east coast of Kamchatka.		
	h: 16 km.		
	H= 15 05 32.7		USCGS
26.	P	NEZ	15 24 13
	iX	Z	22
	55.9 N., 163.0 E.		
	Off east coast of Kamchatka.		
	h: N km.		
	H= 15 18 45.5		USCGS
26.	eP	NEZ	15 43 57
	25.1 N., 122.6 E.		
	Taiwan.		
	h: 146 km.		
	H= 15 39 58.5		USCGS
26.	P	NEZ	15 49 54
26.	P	NEZ	15 54 27
	55.9 N., 162.9 E.		
	Near east coast of Kamchatka.		
	h: N km.		
	H= 15 49 00.1		USCGS
26.	P Z, eP N		16 31 42
	P	E	43
	iX	EZ	51
	55.9 N., 162.9 E.		
	Near east coast of Kamchatka.		
	h: N km.		
	H= 16 26 13.7		USCGS
26.	P NZ, eP E		16 45 46
	1.9 N., 126.5 E.		
	Molucca Passage.		
	h: 87 km.		
	H= 16 38 50.7		USCGS
26.	iP	Z	16 50 42.4
	iP	NE	43.0
	iX	Z	49
	iX	E	50
	iX	N	52
	P: S,W,D		
	56.0 N., 163.1 E.		
	Near east coast of Kamchatka.		
	h: N km.		
	H= 16 45 15.1		USCGS
26.	P	NZ	16 54 21
	P	E	22
	55.9 N., 163.0 E.		

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	Off east coast of Kamchatka.		
	h: 21 km.		
	H= 16 48 52.7		USCGS
26.	P	NZ	20 21 22
	iP	E	22.5
	eS	N	48
	iX	E	52
	P: E		
27.	P	NEZ	03 06 36
	S	N	16 38
	iX	E	17 12
	SS	N	31 06
	SS	E	42
	SS	Z	32 04
	L	Z	35 04
	L	E	42
	30.6 S., 177.2 W.		
	Kermadec Is.		
	h: N km.		
	H= 02 54 40.2		USCGS
27.	eX	E	07 02 32
	eX	Z	03 20
	eX	N	36
	80.8 N., 121.9 E.		
	East of Severnaya Zemlya.		
	h: 37 km.		
	H= 06 37 57.6		USCGS
27.	eP	Z	07 15 02
	P	N	03
	iX	Z	08
	56.1 N., 163.0 E.		
	Near east coast of Kamchatka.		
	h: N km.		
	H= 07 09 34.0		USCGS
27.	P	NZ	10 12 30
	30.9 S., 179.7 W.		
	Kermadec Is.		
	h: 300 G km.		
	H= 10 01 05.7		USCGS
27.	P	NZ	10 39 14
	eX	E	20
	55.8 N., 162.8 E.		
	Near east coast of Kamchatka.		
	h: N km.		
	H= 10 33 46.3		USCGS
27.	P	NZ	13 21 12
	P	E	14
	iX	NZ	22 09
	PP	E	13
	iX	E	25 04
	iX	Z	22

(cont.)

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Date	Phase	Comp.	Time(GMT) h m s
	S	N	13 25 34
	L	E	27 00
	L	N	14
	Lr	Z	29.0
	Lr	N	29 40
	Mag. 5½ (Mat.)		
	8.8 N., 137.7 E.		
	West Caroline Is.		
	h: 5 km.		
	H= 13 15 24.4		USCGS
27.	P	Z	13 24 31
27.	P	N	18 33 52
	iP	EZ	53.0
	P: E,C		
	13.2 S., 166.9 E.		
	New Hebrides Is.		
	h: 130 G km.		
	H= 18 24 23.0		USCGS
27.	iP	NZ	18 39 30.0
	iP	E	30.4
	eS	N	40 24
	iX	Z	30
	iX	N	54
	P: S,E,C		
	43.7 N., 140.7 E.		
	Hokkaido, Japan.		
	h: 220 km.		
	H= 18 37 42.2		USCGS
27.	iP	Z	20 26 24.4
	iX	E	26.0
	iX	N	26.2
	eX	E	49
	iX	N	27 05
	iX	E	07
	P: C		
28.	P	Z	00 30 26
	eX	E	31
	eS	NZ	34 46
	eX	E	35 06
	19.0 N., 121.1 E.		
	Philippine Is.		
	h: 76 km.		
	H= 00 25 26.5		USCGS
28.	P	Z	00 38 35
	S N, eS E		47 40
	14.8 S., 173.4 W.		
	Samoa Is.		
	h: 13 km.		
	H= 00 27 31.2		USCGS
28.	P	NEZ	02 24 37
	56.0 N., 162.8 E.		(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	Near east coast of Kamchatka.		
	h: N km.		
	H= 02 19 09.5		USCGS
28.	eP	Z	03 01 30
	eX	N	36
	iX	Z	39
28.	P	E	04 07 36
	iP	Z	36.2
	iP	N	36.3
	iS	NE	08 01.5
	P: N,D		
28.	eP	Z	05 19 13
	iX	EZ	24
	iX	N	33
	iX	E	42
	iX	N	48
28.	P	NEZ	05 40 50
	eS	E	42 44
	eX	N	47
	43.9 N., 145.9 E.		
	Hokkaido, Japan.		
	h: 51 km.		
	H= 05 38 34.5		USCGS
28.	iP	EZ	06 53 45.2
	iP	N	45.3
	iS	NE	54 01.5
	P: N,W,D		
28.	iP	Z	07 57 03.6
	iP N, P E		04.0
	S	E	58 20
	eS	N	21
	P: S,C		
28.	P	NZ	09 56 30
	P	E	31
	iX	Z	45
	S	Z	57 43
	S	NE	45
	29.9 N., 140.4 E.		
	South of Honshu, Japan.		
	h: 130 G km.		
	H= 09 54 49.1		USCGS
28.	P 1	Z	10 07 44.4
	P 2	NEZ	45.3
	S	E	08 42
	iX	N	50
28.	P	EZ	11 39 58
	P	N	40 00
	21.9 S., 179.7 W.		
	Fiji Is.		(cont.)

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Date	Phase	Comp.	Time(GMT) h m s	
	h: 640 G km.			
	H= 11 29 44.7			USCGS
28.	eP	EZ	11 42 16	
	iX	N	23	
28.	iP	EZ	16 36 14.5	
	P	N	15	
	P: W,D			
28.	P	NEZ	16 49 21	
28.	iP	Z	17 21 15.2	
	iP	NE	15.4	
	iX	Z	25	
	S	EZ	35	
	P: N,W,D			
	35.5 N., 140.1 E.			
	Near east coast of Honshu, Japan.			
	h: 67 km.			
	H= 17 20 45.4			USCGS
28.	eP	Z	19 39 31	
	iX	E	34	
	eX	N	43	
	7.7 S., 106.7 E.			
	Java.			
	h: 80 km.			
	H= 19 30 21.9			USCGS
28.	eP	Z	21 01 08	
29.	eP	Z	05 24 25	
	iX	NE	33	
	iX	Z	38	
	PP	Z	25 39	
	eL	NE	30 22	
	eL	Z	31.5	
	56.0 N., 163.1 E.			
	Near east coast of Kamchatka.			
	h: N km.			
	H= 05 19 09.4			USCGS
29.	iP NZ, P E		07 33 38.8	
	P: N,D			
29.	P	NEZ	08 25 04	
29.	eP	Z	08 29 30	
29.	eL	NEZ	08 55 00	
	4.7 S., 153.2 E.			
	New Ireland.			
	h: 70 km.			
	H= 08 34 51.3			USCGS
29.	P N, eP E		10 38 12	
	iX	N	30.4	
	iX	Z	30.8	
	eX	E	31	
	iX	Z	39 13	
29.	eP	NZ	11 26 52	
	iX	E	57	
	eL	NE	31 44	
	eL	Z	32.0	
	24.6 N., 121.8 E.			
	Taiwan			
	h: 77 km.			
	H= 11 22 42.1			USCGS
29.	eP	Z	17 55 50	
	iX	E	56	
	iX	NZ	58	
	S NZ, eS E		18 05 08	
	Lq	NE	13 00	
	Lr	NEZ	17 00	
	Mag. $5\frac{3}{4}$ - 6 (Mat.)			
	17.2 S., 171.6 W.			
	Tonga Is.			
	h: N km.			
	H= 17 44 31.1			USCGS
29.	P	NZ	19 39 40.4	
	P	E	40	
	PcP	Z	40 41	
	P: N,C			
	11.4 S., 166.4 E.			
	Santa Cruz Is.			
	h: 153 km.			
	H= 19 30 26.5			USCGS
29.	iP	Z	22 17 05.5	
	P	E	06	
	S	N	18 29	
	S	Z	31	
	L	N	55	
	L	E	57	
	P: C			
	32.5 N., 132.1 E.			
	Shikoku , Japan.			
	h: 13 km.			
	H= 22 15 29.3			USCGS
30.	P	EZ	02 04 42	
30.	P	NEZ	02 40 11	
	iX	Z	42 52	
	eS?	N	45 28	
	L	E	47 44	
	eL	Z	48.0	
	4.1 N., 126.4 E.			
	Talaud Is.			
	h: 68 km.			
	H= 02 33 34.1			USCGS

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Date	Phase	Comp.	Time(GMT) h m s
30.	P NZ, eP E		04 50 27
	S	N	52 18
30.	P	NEZ	05 36 14
30.	P	NZ	07 04 20
30.	P 1	Z	10 36 09.2
	P 1	N	10
	iP2	NZ	11.3
	iP2	E	12.2
	PP	Z	37 32
	PP	E	44
	iX	N	54
	iX	Z	38 03
	S	N	41 49
	S	E	51
	ScP	Z	42 04
	Lq	E	43 40
	Lq	N	44 00
	Lq	Z	15
	Lr	Z	46 44
	Lr	N	46
	Lr	E	50
	W	Z	13 08.0
	W	N	12.0
	W	NE	15 43.0
	P: C		
	Mag. 7.0 (Mat.)		
	4.8 N., 127.4 E.		
	Talaud Is.		
	h: 70G km.		
	H= 10 29 40.4		USCGS
30.	P	Z	11 08 03
	iX	E	25
30.	eP	Z	11 19 19
30.	P	Z	11 22 27
30.	P	NZ	12 44 58
	iX	Z	47 42
	4.7 N., 127.7 E.		
	Talaud Is.		
	h: 65G km.		
	H= 12 38 26.6		USCGS
30.	iP Z, P N		13 28 55.6
	iP	E	55.8
	S	NEZ	29 51
	P: W,C		
30.	P	Z	14 30 14
	P	N	15
	iX	E	28
	55.7 N., 163.0 E.		
	Off east coast of Kamchatka.		

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	h: N km.		
	H= 14 24 47.5		USCGS
30.	iP	E	14 57 49.4
	iP Z, P N		50.2
	S Z, eS E		58 03
	P: E,D		
30.	P	Z	15 39 32
	P	NE	33
30.	P	Z	17 26 03
	P	N	04
	P	E	05
	PP	NE	27 18
	PP	Z	24
	S	N	31 32
	iX	Z	33 12
	L	NE	35 03
	L	Z	12
	4.9 N., 127.5 E.		
	Talaud Is.		
	h: 72D km.		
	H= 17 19 35.0		USCGS
30.	P	Z	18 17 28
	52.7 N., 169.5 W.		
	Fox Is.		
	h: 59 km.		
	H= 18 10 01.6		USCGS
30.	iP	NEZ	18 42 50.0
	iX	Z	43 08
	iX	Z	35
	ScP	NEZ	47 45
	P: S,W,C		
	4.0 N., 123.0 E.		
	Celebes Sea.		
	h: 521 km.		
	H= 18 36 37.3		USCGS
30.	iP	Z	20 56 18.5
	iP	N	18.8
	eS	NE	57 49
	P: S,D		
	42.8 N., 145.3 E.		
	Hokkaido, Japan.		
	h: 8 km.		
	H= 20 54 13.5		USCGS
31.	iP	Z	00 50 51.1
	iP	N	51.6
	iP	E	52.7
	iX	N	52 00
	iX	Z	14
	iX	E	24
	S	NE	56 04
	S	Z	12

(cont.)

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Date	Phase	Comp.	Time(GMT) h m s
	iX	Z	00 57 16
	Lq	E	58 10
	Lq	Z	18
	Lq	N	30
	Lr	NZ	01 01 26
	P: N,W,C		
	Mag. 6.3 (Mat.)		
	4.2 N., 128.1 E.		
	North of Halmahera.		
	h: N km.		
	H= 00 44 13.3		USCGS
31.	iP	NEZ	04 15 11.0
	P: S,W,C		
	53.5 N., 158.7 E.		
	Near east coast of Kamchatka.		
	h: 145G km.		
	H= 04 10 26.3		USCGS
31.	P Z, eP N		09 03 20
	P	E	22
	iS	N	08 48
	eLq	E	10 20
	Lq	N	11 08
	iX	Z	16
	Lr	NZ	12 40
	Lr	E	13 13
	4.3 N., 128.1 E.		
	North of Halmahera.		
	h: N km.		
	H= 08 56 42.8		USCGS
31.	eP	Z	10 52 19
	eL	NE	59 30
	4.1 N., 128.0 E.		
	North of Halmahera.		
	h: 36 km.		
	H= 10 45 42.1		USCGS
31.	P Z, eP NE		11 28 05
	S N, eS E		33 16
	L	E	35 12
	L	Z	28
	4.2 N., 128.1 E.		
	North of Halmahera.		
	h: N km.		
	H= 11 21 26.7		USCGS
31.	iP	NEZ	13 21 10.4
	iX	E	28
	L	NE	33 10
	L	Z	16
	P: S,W,C		
31.	P	Z	13 54 58
	P	N	55 00
	iX	E	03
	PPP	NZ	56 29

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	PcP	Z	13 57 23
	S	EZ	14 00 12
	iX	N	30
	Lq	E	02 08
	Lq	N	24
	Lq	Z	44
	Lr	Z	04 16
	Lr	N	05.0
	Lr	E	40
	Mag. $5\frac{1}{2}$ - $5\frac{3}{4}$ (Mat.)		
	4.3 N., 128.1 E.		
	North of Halmahera.		
	h: N km.		
	H= 13 48 22.2		USCGS
31.	P	NZ	13 59 29
	iX	E	33
	iX	E	44
	S?	N	14 04 50
	4.3 N., 128.3 E.		
	North of Halmahera.		
	h: N km.		
	H= 13 52 52.5		USCGS
31.	eP	NZ	14 41 30
	eS	N	58
31.	iP EZ, P N		15 10 07.0
	P: W,D		
	15.5 S., 175.0 W.		
	Tonga Is.		
	h: 262 D km.		
	H= 14 59 34.3		USCGS
31.	iP NZ, P E		15 40 01.4
	iX	Z	10
	iX	E	36
	iX	Z	41 12
	S	N	28
	S	E	36
	L	E	58
	iX	Z	51.0
	P: S,C		
	Mag. 4.6 (Mat.)		
	39.7 N., 143.9 E.		
	Off east coast of Honshu, Japan.		
	h: 47 km.		
	H= 15 38 38.8		USCGS
31.	eP	NZ	20 44 27
	S	N	50 06
	Lq	E	51 32
	Lq	NZ	52 12
	Lr	N	55 00
	Lr	Z	08
	4.4 N., 128.1 E.		
	North of Halmahera.		

(cont.)

Date	Phase	Comp.	Time(GMT) h m s	Date	Phase	Comp.	Time(GMT) h m s
	h: N km.						
	H= 20 37 50.5		USCGS				
31.	P	Z	22 26 48				
	S	NZ	28 31				
	S	E	34				
	27.0 N., 140.5 E.						
	Bonin Is.						
	h: 377 km.						
	H= 22 24 31.9		USCGS				
31.	P	E	23 42 35				
	iP	Z	35.6				
	iP	N	35.8				
	P: N,D						
	32.1 S., 179.6 W.						
	South of Kermadec Is.						
	h: 391D km.						
	H= 23 31 16.2		USCGS				

Mineo Takehana

Director

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Date	Phase	Comp.	Time(GMT) h m s
1.	P	NZ	03 39 39
	eS	NE	43 19
	17.8 N., 145.9 E.		
	Mariana Is.		
	h: 115 km.		
	H= 03 35 14.9		USCGS
1.	eP	Z	04 29 00
	21.7 S., 179.3 W.		
	Fiji Is. region.		
	h: 616 km.		
	H= 04 18 45.0		USCGS
1.	eP	Z	07 31 06
	eL	E	38 40
	eScS	N	41 24
	eL	N	43 52
	eL	E	46 20
	eL	N	24
	4.1 N., 123.0 E.		
	North of Halmahera.		
	h: N.		
	H= 07 24 34.4		USCGS
1.	P	NEZ	09 01 07
	eS	NE	45
1.	P	NEZ	16 25 53
	PP	Z	27 00
	PPP	N	32
	S	NE	31 12
	L	E	33 12
	L	NZ	32
	L	N	34 24
	L	Z	35 00
	Mag. 6½ (Mat.)		
	4.0 N., 123.1 E.		
	North of Halmahera.		
	h: N.		
	H= 16 19 13.3		USCGS
1.	iP	EZ	16 32 41.5
	iX	N	42
	P: E,D		
1.	iP	EZ	23 22 31.6
	iX	NEZ	23 32
	eS	N	31 30
	eL	E	42 08
	eL	E	53 32
	P: W,D		
2.	P	Z	00 24 07
	iX	NE	27
	eL	N	31 20
	eL	E	24
	eL	NZ	56
	eScS	NE	34 20
			(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	eL	N	00 40 16
	3.9 N., 123.1 E.		
	North of Halmahera.		
	h: N.		
	H= 00 17 29.1		USCGS
2.	iP	Z	01 45 25.0
	PP	Z	46 52
	S	E	50 28
	iX	NZ	52
	L	NZ	52 36
	P: C		
	Mag. 6½ - 6¾ (Mat.)		
	3.9 N., 128.2 E.		
	North of Halmahera.		
	h: N.		
	H= 01 38 44.2		USCGS
2.	P	Z	02 13 40
	4.0 N., 128.3 E.		
	North of Halmahera.		
	h: N.		
	H= 02 07 01.0		USCGS
2.	P	Z	02 40 50
	4.1 N., 128.3 E.		
	North of Halmahera.		
	h: N.		
	H= 02 34 10.5		USCGS
2.	eP	Z	03 15 39
	4.5 N., 129.2 E.		
	North of Halmahera.		
	h: N.		
	H= 03 09 02.9		USCGS
2.	P	NZ	05 28 05
	PP	Z	29 27
	S	EZ	33 12
	L	NEZ	35 32
	Mag. 6 - 6¼ (Mat.)		
	3.9 N., 128.3 E.		
	North of Halmahera.		
	h: N.		
	H= 05 21 26.2		USCGS
2.	iP	Z	07 58 07.6
	iX	NEZ	12.8
	iX	Z	18
	S	E	59 31
	P: D		
	41.3 N., 142.8 E.		
	Hokkaido , Japan region.		
	h: 62 km.		
	H= 07 56 39.9		USCGS
2.	P	Z	16 27 55
	PP	NE	29 36
			(cont.)

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Date	Phase	Comp.	Time(GMT) h m s	
	S	NEZ	16 33 16	
	L	N	35 08	
	L	E	20	
	L	Z	28	
	3.8 N., 128.4 E.			
	North of Halmahera.			
	h: N.			
	H= 16 21 15.4			USCGS
2.	P	Z	16 55 25	
	iX	NE	28	
	3.4 N., 128.3 E.			
	North of Halmahera.			
	h: 93 km.			
	H= 16 48 50.8			USCGS
2.	P	NEZ	19 08 47.3	
	eS	E	09 24	
2.	eP	Z	20 06 33	
	eSKS	N	17 00	
	L	N	29 32	
	17.2 S., 66.5 E.			
	Mascarene Is. region.			
	h: N.			
	H= 19 53 53.6			USCGS
2.	eP	Z	20 56 56	
	4.3 N., 128.2 E.			
	North of Halmahera.			
	h: N.			
	H= 20 50 21.3			USCGS
3.	iP	NZ	00 51 09.7	
	P: S,C			
3.	P	NZ	03 47 04	
	24.9 N., 141.3 E.			
	Volcano Is. region.			
	h: 90 km.			
	H= 03 44 14.1			USCGS
3.	P	EZ	04 07 01	
	eS	N	12 32	
	eL	NZ	14 52	
	3.7 N., 128.5 E.			
	North of Halmahera.			
	h: 93 km.			
	H= 04 00 25.6			USCGS
3.	iP EZ, P N		08 01 51.4	
	P: W,C			
	25.8 S., 178.1 E.			
	South of Fiji Is.			
	h: 629 km.			
	H= 07 51 25.4			USCGS
3.	iP	Z	08 03 56.8	
	S	NE	10 28	
			(cont.)	

Date	Phase	Comp.	Time(GMT) h m s	
	eL	N	08 14 12	
	P: C			
3.	P	NEZ	08 24 11	
	ePP	Z	26 07	
	25.7 S., 178.3 E.			
	South of Fiji Is.			
	h: 610 km.			
	H= 08 13 44.2			USCGS
3.	iP	NEZ	08 28 39.4	
	eX	N	32 50	
	P: S,E,D			
	25.7 S., 178.3 E.			
	South of Fiji Is.			
	h: 654 km.			
	H= 08 18 14.7			USCGS
3.	P	NEZ	08 33 06	
	iX	EZ	15	
	eS ?	N	34 43	
	41.5 N., 142.6 E.			
	Hokkaido, Japan region.			
	h: 39 km.			
	H= 08 31 35.8			USCGS
3.	eP	Z	08 51 26	
	iX	NEZ	52	
3.	iP Z, P NE		09 01 14.3	
	S	NE	04 40	
	eL	N	07 16	
	P: C			
	49.4 N., 155.6 E.			
	Kurile Is.			
	h: N.			
	H= 08 57 06.8			USCGS
3.	P	Z	09 50 51	
	S	N	54 52	
	iX	E	56	
	iX	Z	55 06	
	eL	N	58 12	
	19.2 N., 121.2 E.			
	Philippine Is. region.			
	h: 57 km.			
	H= 09 45 52.0			USCGS
3.	eP	Z	10 58 07	
3.	P	NZ	15 20 14	
	eX	E	21 31	
3.	eP	Z	17 18 28	
	eX	N	24 32	
	eL	E	25 40	
	4.3 N., 128.5 E.			
	North of Halmahera.			
	h: N.			
	H= 17 11 51.4			USCGS

Date	Phase	Comp.	Time(GMT) h m s
3.	iP Z, P	NE	19 08 06.3
	PP	Z	09 20
	PPP	Z	32
	S	NE	13 12
	L	E	15 20
	L	Z	28
	P: C		
	Mag. 6¼ - 6½ (Mat.)		
	4.4 N., 128.1 E.		
	North of Halmahera.		
	h: N.		
	H= 19 01 29.4		USCGS
3.	eP	Z	19 37 41
	4.4 N., 128.2 E.		
	North of Halmahera.		
	h: N.		
	H= 19 31 04.1		USCGS
3.	iP	NZ	20 27 06.0
	eS	EZ	28 24
	P: N,C		
3.	P	NEZ	21 21 41
	eX	N	23 03
3.	iP	NEZ	21 48 15.1
	iX	NE	18
	PP	NZ	49 30
	iX	N	50 23
	S	E	53 26
	iX	NZ	36
	L	E	55 26
	L	Z	36
	L	N	48
	ScS	NE	58 43
	P: N,E,C		
	Mag. 7 (Mat.)		
	4.9 N., 127.4 E.		
	Talaud Is.		
	h: N		
	H= 21 41 41.9		USCGS
3.	P	Z	21 54 42
3.	P	Z	22 12 58
4.	P	NEZ	01 07 50
	S	E	08 28
4.	P	NZ	01 45 58
	PP	NE	47 40
	S	NE	52 08
	L	N	55 10
	L	E	20
	L	Z	57 14
	L	N	50
	Mag. 6½ - 6¾ (Mat.)		
	0.6 S., 121.7 E.		(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	Northern Celebes.		
	h: N.		
	H= 01 38 26.2		USCGS
4.	P	EZ	04 02 23
	eS	EZ	03 03
4.	PKP1	Z	04 29 13
	PKP2	Z	26
	eX	Z	32 08
	eX	N	50 24
	eX	E	40
	Lr	Z	05 13 00
	Lr	E	20
	Mag. 6½ - 6¾ (Mat.)		
	8.2 S., 80.2 W.		
	Off coast of Northern Peru.		
	h: 16 km.		
	H= 04 10 13.3		USCGS
4.	eP	NEZ	07 21 41
	eS	N	22 20
4.	iP	EZ	08 45 06.0
	eS	E	46 35
	P: W,C		
4.	iP	NEZ	09 27 10.2
	S	E	28
	P: N,E,D		
4.	P	Z	11 38 52
	19.8 S., 178.9 W.		
	Fiji Is. region.		
	h: 623 km.		
	H= 11 28 44.5		USCGS
4.	eP	Z	17 04 28
	eS	E	09 04
	eL	NE	15 00
4.	iP	NEZ	20 35 05.4
	S	NE	27
	P: N,W,C		
4.	P	NEZ	23 05 13
	S	Z	52
5.	eP	NEZ	10 43 05
	eL	E	50 20
	eL	Z	57 20
	3.8 N., 128.6 E.		
	North of Halmahera.		
	h: 35 km.		
	H= 10 36 24.6		USCGS
5.	iP	EZ	18 48 20.0
	S	E	34
	P: E,D		

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Date	Phase	Comp.	Time(GMT) h m s	
5.	eP	Z	23 58 52	
	eS	E	59 45	
6.	eP	Z	00 49 59	
	iX	N	50 25	
	iX	N	35	
6.	P	NEZ	04 32 11	
	42.2 N., 142.4 E.			
	Hokkaido, Japan region.			
	h: 20 km.			JMA
6.	iP	EZ	04 37 13.5	
	S	NE	25	
	P: E,D			
6.	iP	NEZ	05 27 15.7	
	S	NE	28 26	
	P: S,W,D			
6.	P	Z	07 36 43	
	iX	NE	45	
	eS	E	39 31	
	eX	N	34	
	21.8 N., 145.7 E.			
	Mariana Is. region.			
	h: 56 km.			
	H= 07 33 00.5			USCGS
6.	iP	NEZ	08 37 29.5	
	eS	E	39 10	
	P: S,W,C			
	42.2 N., 142.9 E.			
	Hokkaido, Japan region.			
	h: 70 km.			JMA
6.	iP	Z	09 40 39.0	
	P: C			
	51.6 N., 176.2 W.			
	Andreanof Is.			
	h: 58 km.			
	H= 09 33 46.5			USCGS
6.	P	Z	14 50 15	
	iX	Z	28	
	55.2 N., 160.4 W.			
	Alaska Peninsula.			
	h: N.			
	H= 14 42 01.8			USCGS
6.	eP	Z	16 20 42	
	24.7 S., 175.2 W.			
	South of Tonga Is.			
	h: N.			
	H= 16 09 01.7			USCGS
6.	eP	Z	17 50 13	
	eS	EZ	52	

Date	Phase	Comp.	Time(GMT) h m s	
6.	iP Z, P N		19 12 11.0	
	P: D			
7.	P	Z	05 01 20	
	eL	E	09 52	
	0.7 N., 125.8 E.			
	Molucca Passage.			
	h: 36 km.			
	H= 04 54 10.1			USCGS
7.	eP	NEZ	05 29 58	
	S	E	30 19	
	iX	N	20	
7.	P	Z	06 22 59	
	0.7 N., 125.7 E.			
	Molucca Passage.			
	h: 41 km.			
	H= 06 15 50.7			USCGS
7.	eP	Z	13 46 44	
	iX	Z	47 22	
7.	P	NEZ	13 48 01	
7.	iP	Z	14 58 43.0	
	eS	E	59 58	
	P: D			
7.	iP	NEZ	16 13 06.2	
	iX	Z	16	
	S	NEZ	30	
	P: N,E,C			
8.	P	Z	19 21 52	
	3.9 N., 128.6 E.			
	North of Halmahera.			
	h: 56 km.			
	H= 19 15 16.1			USCGS
8.	iP	EZ	23 10 11.1	
	S	E	45	
	P: W,C			
9.	eP	Z	03 50 59	
9.	P	NZ	04 13 41	
	L	N	26 12	
	eL	N	31 20	
	4.5 N., 128.3 E.			
	North of Halmahera.			
	h: 51 km.			
	H= 04 12 07.4			USCGS
9.	P	Z	09 20 42	
	S	NEZ	48	
9.	P	NZ	10 14 47	

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Date	Phase	Comp.	Time(GMT) h m s
9.	P	Z	14 33 37
	5.7 N., 127.3 E.		
	Philippine Is. region.		
	h: 136 km.		
	H= 14 27 19.2		USCGS
9.	iP	NZ	15 06 37.0
	iX	E	37.8
	S	NE	07 09
	P: S,D		
9.	eP	Z	15 41 39
	eS	E	47 12
	eL	N	49 56
	21.6 N., 101.3 E.		
	Burma-China border region.		
	h: N.		
	H= 15 34 44.4		USCGS
9.	eP	NZ	16 12 50
9.	P	NEZ	16 14 54
	iX	NZ	15 17
10.	iP	Z	04 11 17.6
	iX	NE	18
	S	N	56
	P: D		
10.	P	Z	06 11 56
	52.0 N., 152.1 E.		
	Northwest of Kurile Is.		
	h: 500 km.		
	H= 06 08 13.1		USCGS
10.	P	Z	07 25 17
	iX	Z	25
	eL	N	43 32
	2.1 N., 96.8 E.		
	Northern Sumatra.		
	h: N.		
	H= 07 16 12.9		USCGS
10.	eP	Z	10 00 52
	S	NE	01 21
10.	iP	Z	10 06 07.5
	iX	NE	08
	P: C		
10.	P	NZ	14 15 53
	eL	E	23 10
	eL	N	12
	eL	N	25 43
	eL	E	27 56
	3.7 N., 128.2 E.		
	North of Halmahera.		
	h: 78 km.		
	H= 14 09 17.4		USCGS

Date	Phase	Comp.	Time(GMT) h m s
10.	iP	NZ	14 26 47.5
	P: N,C		
	2.7 N., 125.3 E.		
	Talaud Is.		
	h: 57 km.		
	H= 14 19 52.3		USCGS
10.	P	Z	21 17 15
	eX	Z	18 23
10.	iP	NZ	21 50 34.2
	iX	Z	44
	eS	E	52 35
	P: N,D		
	44.2 N., 148.5 E.		
	Kurile Is.		
	h: N.		
	H= 21 47 55.9		USCGS
10.	iP	NEZ	23 08 15.5
	PcP	Z	50
	pP	Z	11 00
	iX	Z	13 10
	S	NE	16 42
	sS	E	21 00
	sSS	NE	24 42
	P: S,E,D		
	Mag. 6.9 (PAS)		
	22.7 S., 178.6 E.		
	South of Fiji Is.		
	h: 673 km.		
	H= 22 58 05.8		USCGS
10.	iP	NZ	23 32 37.3
	iX	NZ	50
	P: N,C		
10.	eP	Z	23 35 30
	eX	N	53
10.	P	Z	23 38 21
10.	P	NEZ	23 41 02
11.	iP	NZ	10 31 01.7
	eX	Z	32 40
	P: S,D		
	32.8 N., 141.6 E.		
	South of Honshu, Japan.		
	h: 37 km.		
	H= 10 29 51.8		USCGS
11.	P	Z	11 29 55
11.	P	NEZ	11 37 35
	iX	NEZ	51.5
11.	P	Z	14 40 48
	S	NZ	58

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Date	Phase	Comp.	Time(GMT) h m s
11.	iP Z, P NE		15 42 14.5
	iS N, S EZ		44.0
	P: C		
11.	P	NZ	19 50 19
	eS	N	52 15
11.	iP Z, P E		22 17 10.8
	iX	N	12.0
	iX	E	14.6
	iX	NZ	15.0
	iX	Z	35.7
	iX	Z	18 54
	P: C		
11.	iP	NEZ	22 23 43.0
	iX	NEZ	24 20
	PP	Z	25 07
	PPP	Z	31
	S	NE	29 47
	L	N	23 03 30
	Lr	N	05 05
	Lr	E	12
	Lr	Z	24
	P: S,W,D		
	Mag. $7\frac{1}{4}$ - $7\frac{1}{2}$ (Mat.)		
	6.7 S., 126.8 E.		
	Banda Sea.		
	h: 450 km.		
	H= 22 16 13.5		USCGS
11.	P	NZ	22 28 31
	iX	E	32.0
11.	eP	Z	22 54 04
	eX	Z	50
	eX	Z	56 32
	eX	Z	58 09
12.	iP	NEZ	04 08 49.5
	S	NE	59
	P: N,C		
12.	P	Z	09 47 15
	S	NE	48 25
12.	iP	NEZ	15 36 22.8
	iX	N	37 04.5
	P: N,W,D		
	36.8 N., 135.6 E.		
	Sea of Japan.		
	h: 345 km.		
	H= 15 35 29.9		USCGS
12.	P	NE	15 45 20.0
	iX	NEZ	21.0
	S	N	49 58
	L	N	51 40

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	L	E	15 52 40
	P: S,C		
	Mag. $5\frac{1}{4}$ - $5\frac{1}{2}$ (Mat.)		
	55.9 N., 162.9 E.		
	Near east coast of Kamchatka.		
	h: 44 km.		
	H= 15 39 54.6		USCGS
12.	P	Z	16 17 22
	5.8 S., 107.8 E.		
	Java.		
	h: 303 km.		
	H= 16 08 50.1		USCGS
12.	P	Z	16 30 23
12.	P	NEZ	16 34 14
	eS	N	46
12.	P	NEZ	16 44 15
	eX	NE	45 45
	eX	Z	47
12.	iP	NEZ	17 48 51.0
	S	NE	49 01
	P: N,E,C		
12.	P	Z	19 15 58
12.	P	NEZ	21 04 16
	S	NE	42
12.	P	Z	22 43 33
13.	iP	NZ	01 28 20.5
	S	N	41
	P: N,D		
13.	P	NEZ	01 43 21
	PPP	Z	45 28
	S	N	49 36
	eL	N	52 08
	Mag. $5\frac{1}{2}$ (Mat.)		
	52.2 N., 169.9 W.		
	Fox Is.		
	h: 16 km.		
	H= 01 35 52.4		USCGS
13.	iP	Z	02 51 33.5
	iX	Z	52 28
	P: C		
	7.4 S., 107.0 E.		
	Java.		
	h: 15 km.		
	H= 02 42 17.7		USCGS
13.	P	Z	05 16 09
	S	NEZ	33

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Date	Phase	Comp.	Time(GMT) h m s
13.	P	NZ	06 40 43
13.	P	Z	10 14 54
	iX	Z	15 11.8
	30.1 S., 178.0 W.		
	Kermadec Is. region.		
	h: 23 km.		
	H= 10 02 57.9		USCGS
13.	eP	Z	10 29 04
	PP	Z	30 22
	PcP	Z	31 55
	S	N	34 24
	L	N	36 36
	L	Z	48
	L	E	37 20
	Mag. 6¼ (Mat.)		
	5.0 N., 126.9 E.		
	Mindanao, P.I.		
	h: N.		
	H= 10 22 31.1		USCGS
13.	eP	Z	11 22 11
	eX	E	33 30
	eX	N	38 20
	L	N	43 20
	L	E	44 00
	Mag. 6 - 6¼ (Mat.)		
	25.0 N., 62.9 E.		
	Western Pakistan.		
	h: N.		
	H= 11 11 25.5		USCGS
13.	P	Z	23 38 22
	S	NE	39 58
	28.0 N., 139.7 E.		
	Bonin Is. region.		
	h: 408 km.		
	H= 23 36 18.7		USCGS
14.	eL	Z	01 43 36
	eL	N	52
14.	eL	E	03 36 28
	eL	Z	40
	16.1 S., 173.0 W.		
	Tonga Is.		
	h: N.		
	H= 03 04 04.1		USCGS
14.	iP NZ, P E		11 02 27.2
	P: S,C		
14.	P	NZ	12 52 38.6
	S	NEZ	54
	P: D		
14.	iP	NEZ	13 30 25.6

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	eS	E	13 31 16
	P: S,W,C		
	39.3 N., 143.0 E.		
	Off east coast of Honshu, Japan.		
	h: 60 km.		
	H= 13 29 14.2		USCGS
14.	eP	Z	14 09 53
	eS	Z	10 09
	iX	E	10.0
	iX	N	25
14.	iP	NZ	16 07 36.0
	S	NE	55
	P: N,C		
14.	iP	Z	17 33 32.4
	eS	N	34 07
	P: D		
14.	iP	Z	19 13 44.6
	iX	NZ	45.6
	iX	E	46.5
	S	E	14 29
	P: D		
14.	eP	Z	21 22 55
	iX	NE	23 08.3
15.	iP	NZ	05 45 51.0
	S	Z	46 15
	P: S,C		
15.	iP	Z	07 10 49.6
	P: C		
15.	iP	NZ	08 54 04.2
	P: D		
	24.1 S., 180.0 W.		
	South of Fiji Is.		
	h: 550 km.		
	H= 08 43 34.4		USCGS
15.	iP	NZ	13 29 13.3
	iX	Z	25
	P: N,C		
	10.4 S., 161.2 E.		
	Solomon Is.		
	h: 127 km.		
	H= 13 20 19.4		USCGS
15.	iP	NZ	13 58 38.8
	iX	N	50.3
	iX	Z	59 25
	S	N	14 06 06
	P: N,C		
	13.6 S., 167.2 E.		

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	New Hebrides Is.		
	h: 205 km.		
	H= 13 49 13.6		USCGS
15.	P	Z	14 17 24
15.	eP	Z	19 04 12
	eX	Z	50
15.	iP Z, P N		20 33 52.4
	P: C		
16.	eP	Z	06 00 08
16.	iP	NEZ	06 30 52.6
	P: S,W,C		
	39.0 N., 142.5 E.		
	Near east coast of Honshu, Japan.		
	h: 40 km.		JMA
16.	P	Z	06 59 45
	eX	Z	07 06 44
	eL	Z	11 26
16.	P	Z	11 12 03
	18.3 S., 178.2 W.		
	Fiji Is. region.		
	h: 650 km.		
	H= 11 02 02.2		USCGS
16.	P	Z	11 37 48
	iX	Z	52.5
	S	NEZ	38 27
16.	eP	Z	15 29 40
	10.0 S., 107.8 E.		
	South of Java.		
	h: 33 km.		
	H= 15 20 19.1		USCGS
17.	iP	NZ	00 49 40.0
	iX	NEZ	50 24.0
	PP	NE	51 07
	S	E	55 00
	L	NE	57 12
	L	Z	17
	P: S,D		
	Mag. 7¼ (Mat.)		
	3.8 N., 128.4 E.		
	North of Halmahera.		
	h: 14 km.		
	H= 00 42 59.2		USCGS
17.	P	Z	00 56 08
17.	eP	Z	00 58 55

Date	Phase	Comp.	Time(GMT) h m s
17.	eP	Z	01 00 30
	eX	Z	45
17.	P	Z	01 10 17
	iX	Z	37
	iX	N	41.5
17.	iP	NE	01 22 28.0
	PP	Z	23 51
	PcP	Z	25 00
	eS	N	27 52
	P: N,C		
	3.9 N., 128.6 E.		
	North of Halmahera.		
	h: 88 km.		
	H= 01 15 55.1		USCGS
17.	eP	Z	01 32 44
	3.8 N., 129.1 E.		
	North of Halmahera.		
	h: N.		
	H= 01 26 06.3		USCGS
17.	P	Z	01 43 08
	3.9 N., 128.5 E.		
	North of Halmahera.		
	h: N.		
	H= 01 36 28.4		USCGS
17.	P	Z	01 45 15
	3.6 N., 128.1 E.		
	North of Halmahera.		
	h: N.		
	H= 01 38 33.7		USCGS
17.	P	Z	02 04 36
	iX	Z	46.8
	eS	N	05 00
17.	P	NZ	02 07 09
	3.9 N., 128.6 E.		
	North of Halmahera.		
	h: 79 km.		
	H= 02 00 35.5		USCGS
17.	eP	Z	02 15 36
17.	P	Z	02 41 51
	eX	N	42 06
	3.7 N., 128.9 E.		
	North of Halmahera.		
	h: 33 km.		
	H= 02 35 11.0		USCGS
17.	P	Z	03 10 48
	eX	NE	17 40
	eL	E	25 52
	3.9 N., 128.4 E.		

(cont.)

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Date	Phase	Comp.	Time(GMT) h m s
	North of Halmahera.		
	h: 54 km.		
	H= 03 04 12.2		USCGS
17.	P	Z	04 25 53
17.	iP NZ, P	E	06 26 18.0
	S	E	27 54
	P: S,C		
	42.8 N., 144.9 E.		
	Hokkaido, Japan region.		
	h: 40 km.		JMA
17.	P	Z	06 33 53
	S	E	39 40
	eL	E	41 30
	3.4 N., 128.6 E.		
	North of Halmahera.		
	h: 72 km.		
	H= 06 27 14.1		USCGS
17.	P	Z	07 02 12
	iX	NEZ	21
	46.8 N., 152.5 E.		
	Kurile Is.		
	h: 54 km.		
	H= 06 58 47.9		USCGS
17.	iP	NEZ	07 29 46.6
	S	Z	30 08
	P: N,E,D		
	37.6 N., 141.0 E.		
	Honshu, Japan.		
	h: 30 km.		JMA
17.	P	EZ	09 23 41
	iX	NZ	41.6
	eS	N	24 34
	eX	N	46
	33.9 N., 25.2 E.		
	Eastern Mediterranean Sea.		
	h: 13 km.		
	H= 09 11 43.4		USCGS
17.	iP	Z	11 43 47.0
	P: C		
17.	iP	NEZ	13 21 25.3
	PP	N	46
	P: N,E,D		
	52.3 N., 158.8 E.		
	Near east coast of Kamchatka.		
	h: N.		
	H= 13 16 39.1		USCGS
17.	iP	NEZ	13 31 14.5
	S	NE	32 16
	iX	E	29.5

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	P: N,E,D		
	41.6 N., 139.8 E.		
	Hokkaido, Japan region.		
	h: 186 km.		
	H= 13 29 55.9		USCGS
17.	P	Z	16 13 39
	iX	Z	52
	iX	NE	14 06.5
	iX	N	15.0
17.	iP	NEZ	17 27 57.0
	iS	NE	28 19.5
	P: S,E,D		
17.	P	NE	20 20 27
	eS	E	25 32
	eX	E	27 32
	eX	N	36
	L	NE	32 06
	P: N,D		
	5.5 N., 127.6 E.		
	Philippine Is. region.		
	h: 72 km.		
	H= 20 14 01.7		USCGS
17.	iP	Z	21 58 10.0
	iX	Z	16.8
	iX	E	18.3
	iX	NEZ	21.5
	S	N	59 06.3
	P: C		
17.	iP	EZ	22 47 56.0
	S	N	48 16
	P: E,D		
18.	iP	Z	00 50 45.3
	iX	EZ	53.2
	iX	N	54.3
	S	E	45
	P: C		
18.	iP	Z	01 47 08.0
	eS	N	48 35
	P: C		
18.	P	Z	01 54 42
18.	P	Z	02 35 28
	iX	Z	40.4
18.	P	NZ	04 54 41
18.	P	Z	05 26 20
	eS	E	35 40
	24.0 S., 176.7 W.		
	South of Fiji Is.		

(cont.)

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Date	Phase	Comp.	Time(GMT) h m s	
	h: 99 km.			
	H= 05 14 55.9			USCGS
18.	P	Z	05 50 44	
	iX	N	50.4	
	iX	Z	52.4	
	S	NE	51 23	
	iX	Z	32.5	
18.	P	Z	08 51 43	
18.	iP	NZ	12 19 28.8	
	eS	E	20 27	
	P: N,E,D			
18.	P	Z	15 30 43	
	iX	NEZ	51	
	S	NE	31 24	
18.	eP	Z	16 23 50	
18.	iP	NZ	18 14 41.5	
	S	N	15 10	
	P: N,C			
18.	eX	E	20 19 32	
	eL	E	36 42	
	4.9 S., 153.2 E.			
	New Ireland region.			
	h: 108 km.			
	H= 20 06 30.5			USCGS
18.	iP	NZ	20 53 16.8	
	P: S,D			
	17.9 S., 178.6 W.			
	Fiji Is. region.			
	h: 569 km.			
	H= 20 43 13.6			USCGS
18.	P	Z	21 10 46	
	24.5 N., 95.4 E.			
	Burma.			
	h: 160 km.			
	H= 21 03 37.6			USCGS
19.	eP	Z	01 43 48	
	eS	N	44 07	
19.	eP	Z	08 42 45	
	eL	Z	48 00	
	23.9 N., 122.2 E.			
	Taiwan region.			
	h: 61 km.			
	H= 08 38 27.4			USCGS
19.	P	NZ	15 00 44	
	eS	N	02 06	

Date	Phase	Comp.	Time(GMT) h m s	
19.	iP	NZ	21 10 35.1	
	iS	NE	40.6	
	P: N,E,C			
20.	P	Z	03 10 33	
	S	Z	19 54	
	L	N	28 50	
	L	Z	32 48	
	Mag. 5¼ - 5½ (Mat.)			
	20.1 S., 173.9 W.			
	Tonga Is.			
	h: N.			
	H= 02 59 14.0			USCGS
20.	iP	Z	10 02 15.4	
	iX	N	16.0	
	PP	Z	03 38	
	PPP	Z	56	
	PcP	Z	04 33	
	S	N	07 44	
	L	E	09 56	
	L	Z	10 08	
	L	N	12	
	P: C			
	Mag. 7 - 7¼ (Mat.)			
	3.5 N., 128.2 E.			
	North of Halmahera.			
	h: 33 km.			
	H= 09 55 33.8			USCGS
20.	eP	Z	10 13 04	
20.	P	Z	10 35 35	
20.	iP	Z	10 36 59.0	
	PP	Z	38 24	
	PPP	Z	32	
	S	N	42 32	
	L	NZ	44 20	
	L	E	38	
	iX	N	55	
	P: S,W,D			
	Mag. 7 - 7¼ (Mat.)			
	3.5 N., 128.4 E.			
	North of Halmahera.			
	h: 77 km.			
	H= 10 30 22.1			USCGS
20.	eP	Z	11 00 04	
	3.5 N., 128.0 E.			
	North of Halmahera.			
	h: 33 km.			
	H= 10 53 21.8			USCGS
20.	P	Z	11 10 52	
	3.5 N., 128.1 E.			
	North of Halmahera.			
	h: 73 km.			
	H= 11 04 08.0			USCGS

Date	Phase	Comp.	Time(GMT) h m s
20.	P	Z	11 13 33
20.	P	Z	11 26 54
20.	P	Z	12 37 24
	iX	Z	38 28
	L	NZ	45 12
	Mag. 5¼ - 6 (Mat.)		
	3.5 N., 128.2 E.		
	North of Halmahera.		
	h: 79 km.		
	H= 12 30 43.3		USCGS
20.	P	Z	13 02 08
	iX	Z	48
	eS	N	07 36
	L	N	10 00
	L	E	11 20
	L	Z	36
	3.6 N., 128.5 E.		
	North of Halmahera.		
	h: 56 km.		
	H= 12 55 29.6		USCGS
20.	iP Z, P N		13 12 18.8
	iX	Z	48
	P: D		
	19.9 S., 177.7 W.		
	Fiji Is. region.		
	h: 579 km.		
	H= 13 02 04.1		USCGS
20.	P	Z	13 34 59
	L	N	43 06
	L	Z	45 10
	3.6 N., 128.1 E.		
	North of Halmahera.		
	h: 83 km.		
	H= 13 29 07.6		USCGS
20.	P	Z	15 11 16
	49.5 N., 156.6 E.		
	Kurile Is.		
	h: 45 km.		
	H= 15 06 59.7		USCGS
20.	P	NZ	15 17 18
	iX	E	23.5
	iX	N	24
20.	P	Z	15 44 43
	PP	Z	46 04
	S	N	50 08
	S	Z	10
	L	N	52 36
	Lr	Z	54 10
	Mag. 5¾ - 6 (Mat.)		
	3.5 N., 128.6 E.		(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	North of Halmahera.		
	h: 59 km.		
	H= 15 38 02.4		USCGS
20.	P	Z	17 04 54
	iX	NZ	55.8
	iX	E	57.0
	PP	Z	06 16
	PPP	Z	28
	PcP	Z	07 40
	S	NZ	10 00
	L	N	12 32
	L	Z	44
	L	E	13 00
	Mag. 6½ - 6¾ (Mat.)		
	3.7 N., 128.2 E.		
	North of Halmahera.		
	h: 48 km.		
	H= 16 58 13.8		USCGS
20.	iP	Z	17 15 55.0
	iX	E	16 04.5
	eS	N	17 22
20.	P	Z	19 16 54
	eX	E	24 16
	eL	N	29 10
	L	Z	32 00
	3.8 N., 128.4 E.		
	North of Halmahera.		
	h: 72 km.		
	H= 19 10 19.1		USCGS
20.	eP	Z	19 33 38
	3.4 N., 128.4 E.		
	North of Halmahera.		
	h: 76 km.		
	H= 19 27 00.4		USCGS
21.	iP	NEZ	03 38 37.9
	iS	N	39 04.8
	P: N,W,C		
21.	iP	EZ	06 40 36.5
	eX	N	41 14
	eX	E	19
	eX	N	28
	P: E,D		
21.	iP Z, P E		06 43 12.5
	eS	N	50
	eX	E	55
	P: D		
21.	iP	Z	06 46 34.0
	P: C		
21.	ePKP	Z	06 52 14
			(cont.)

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Date	Phase	Comp.	Time(GMT) h m s
	62.9 S., 60.2 W.		
	South Shetland Is.		
	h: 23 km.		
	H= 06 32 23.5		USCGS
21.	eP	Z	07 16 52
	eL	N	25 00
	eL	Z	04
	3.5 N., 128.1 E.		
	North of Halmahera.		
	h: 90 km.		
	H= 07 10 20.7		USCGS
21.	P	Z	07 31 13
	eX	N	51
	eX	Z	32 01
21.	eP	Z	08 27 14
	eL	E	35 00
	eL	N	08
	eX	Z	14
	3.2 N., 128.0 E.		
	North of Halmahera.		
	h: 61 km.		
	H= 08 20 35.7		USCGS
21.	iP	Z	10 11 55.6
	eX	Z	12 29
	P: C		
21.	P	EZ	12 37 22
	iX	EZ	22.7
	eS	N	38 00
	X	N	14
	X	E	18
21.	P	EZ	14 59 19
	eS	N	58
	X	N	15 00 11
21.	eP	Z	16 41 07
	eX	Z	32
	ePcP	Z	43 45
	eX	E	45 42
	eL	Z	48 12
	eL	E	38
	eL	N	48
	3.3 N., 128.3 E.		
	North of Halmahera.		
	h: 36 km.		
	H= 16 34 29.3		
21.	P	NZ	18 53 26
21.	P	NZ	20 57 36
	eL	N	15 14
	eL	E	22
	eL	Z	19.0

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	16.1 S., 173.0 W.		
	Tonga Is.		
	h: 33 km.		
	H= 20 46 27.1		USCGS
22.	P	NEZ	02 03 49.8
	X	EZ	57
	eS	N	04 56
22.	P	EZ	03 07 28
	iX	N	28.7
	S	N	08 07
	eX	E	10
22.	P	NEZ	03 21 00
22.	P	EZ	04 29 32
	eX	Z	30 49
	eX	N	58
22.	eP	Z	07 48 45
	eX	NEZ	52
22.	P	NEZ	08 01 53
22.	eP	Z	08 17 40
	iX	Z	19 19.7
	8.6 S., 129.7 E.		
	Timor Sea.		
	h: N.		
	H= 08 09 23.2		USCGS
22.	iP	Z	13 25 26.8
	iX	N	26 01
	P: D		
22.	eP	Z	18 00 23
	eS	NZ	05 50
	eL	Z	08 20
	eL	E	28
	3.5 N., 128.2 E.		
	North of Halmahera.		
	h: 96 km.		
	H= 17 53 51.4		USCGS
22.	P	NZ	18 22 21
	eX	Z	23 31
	24.8 S., 177.0 W.		
	South of Fiji Is.		
	h: 138 km.		
	H= 18 11 01.2		USCGS
22.	iP	NEZ	23 06 12.6
	PcP	Z	07 42
	PP	Z	08 06
	X	N	07
	S	E	12 06

(cont.)

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Date	Phase	Comp.	Time(GMT) h m s
	eX	Z	23 15 50
	eX	E	17 46
	P: S,W,D		
	6.9 S., 124.9 E.		
	Banda Sea.		
	h: 540 km.		
	H= 22 58 44.0		USCGS
23.	P	Z	00 44 59
	iX	EZ	45 00.3
	iX	N	00.5
	X	Z	46 48
	ScP	Z	50 22
	S	N	51 10
	X	E	24
	L	Z	54 45
	L	NE	50
	Mag. 7¼ - 7½ (Mat.)		
	3.1 S., 118.9 E.		
	Celebes.		
	h: 13 km.		
	H= 00 36 56.6		USCGS
23.	P	Z	01 21 16
	3.3 S., 119.1 E.		
	Celebes.		
	h: N.		
	H= 01 13 15.4		USCGS
23.	iP	NEZ	02 10 45.2
	iS	N	11 05.9
	iX	EZ	07.5
	iX	N	09.2
	P: N,W,C		
	35.5 N., 139.6 E.		
	Near south coast of Honshu, Japan.		
	h: 33 km.		
	H= 02 10 18.5		USCGS
23.	P	Z	02 25 00
	3.1 S., 118.8 E.		
	Celebes.		
	h: N.		
	H= 02 17 01.4		USCGS
23.	eP	NZ	02 58 58
	S	N	03 05 28
	L	Z	07 36
	L	NE	40
	3.4 S., 119.1 E.		
	Celebes.		
	h: 22 km.		
	H= 02 50 54.4		USCGS
23.	eP	Z	06 11 53
	eS	NE	18 12
	L	Z	22 06

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	L	NE	06 22 36
	3.4 S., 119.0 E.		
	Celebes.		
	h: 7 km.		
	H= 06 03 47.0		USCGS
23.	iP	NEZ	06 30 57.5
	iS	Z	31 08.0
	S	E	08.5
	P: N,E,C		
23.	iP	Z	09 13 14.1
	eS	EZ	14 31
	eX	N	33
	P: C		
23.	iP	NEZ	10 31 14.5
	iS	EZ	22.8
	P: E,C		
23.	P	NEZ	12 44 01
	iX	NEZ	12.4
	eS	EZ	46 08
	28.7 N., 128.1 E.		
	Ryukyu Is.		
	h: 111 km.		
	H= 12 41 17.5		USCGS
23.	P	NEZ	19 50 13
24.	iP	Z	00 16 42.6
	iX	NZ	43.7
	iX	E	43.9
	X	NZ	19 04
	S	NE	22 52
	L	N	25 26
	L	EZ	26 20
	P: D		
	Mag. 6½ (Mat.)		
	6.2 S., 131.0 E.		
	Tanimbar Is. region.		
	h: 38 km.		
	H= 00 08 45.6		USCGS
24.	P	Z	01 08 15.4
	eL	N	18 48
	eL	Z	58
	P: C		
	1.7 N., 126.4 E.		
	Molucca Passage.		
	h: 16 km.		
	H= 01 01 10.9		USCGS
24.	eP	Z	01 21 25
	X	Z	31
	eS	EZ	54
	iX	N	55.6

Date	Phase	Comp.	Time(GMT) h m s	
24.	eX	Z	04 26 01	
	eS	N	32 30	
	eL	E	35 50	
	eL	N	54	
	3.2 S., 119.0 E.			
	Celebes.			
	h: N.			
	H= 04 18 03.7			USCGS
24.	eX	Z	05 49 52	
	eX	E	50 16	
	X	NE	34	
24.	P	NZ	07 33 46	
	S	NE	34 10	
	S	Z	11	
24.	P	NZ	09 54 08	
	eS	NE	53	
24.	P	NZ	12 10 56	
	S	NEZ	11 10	
24.	eP	Z	15 31 47	
	eL	E	39 12	
	eL	Z	41 12	
	5.4 N., 126.4 E.			
	Mindanao, P.I.			
	h: 52 km.			
	H= 15 25 08.7			USCGS
24.	iP	Z	16 44 54.1	
	eS	NE	45 14	
	P: C			
24.	eP	EZ	16 48 27	
	eX	N	52 44	
	eS	E	53 46	
	eL	NEZ	56 00	
	3.7 N., 128.8 E.			
	North of Halmahera.			
	h: 30 km.			
	H= 16 41 45.2			USCGS
24.	P	Z	20 55 27	
	eX	Z	51	
	6.4 S., 130.2 E.			
	Banda Sea.			
	h: 70 km.			
	H= 20 47 29.7			USCGS
25.	eP	Z	01 41 34	
	eS	N	47.1	
	eL	E	48 48	
	eL	Z	49 16	
	5.2 N., 126.3 E.			
	Mindanao, P.I.			
	h; 65 km.			
	H= 01 35 03.0			USCGS

Date	Phase	Comp.	Time(GMT) h m s	
25.	P	NEZ	04 03 14	
	32.4 S., 180.0 E.			
	South of Kermadec Is.			
	h: 325 km.			
	H= 03 51 45.6			USCGS
25.	P	Z	08 10 20	
	eS	E	11 02	
	eS	N	03	
25.	P	Z	10 47 04	
	25.8 S., 176.3 W.			
	South of Fiji Is.			
	h: 55 km.			
	H= 10 35 26.3			USCGS
25.	iP	NEZ	12 01 29.7	
	iS	N	38.5	
	P: N,E,C			
25.	ePKP	Z	14 25 41	
	19.3 S., 12.1 W.			
	South Atlantic Ridge.			
	h: N.			
	H= 14 05 59.8			USCGS
25.	iP	NZ	14 52 12.3	
	eX	Z	55	
	eS	NEZ	15 00 00	
	L	E	06 36	
	L	NZ	48	
	P: N,C			
	15.0 S., 167.4 E.			
	New Hebrides Is.			
	h: 132 km.			
	H= 14 42 30.4			USCGS
25.	iP	Z	16 37 31.5	
	iX	N	32.0	
	P: C			
	53.9 N., 161.3 E.			
	Off east coast of Kamchatka.			
	h: 53 km.			
	H= 16 32 25.2			USCGS
25.	iP	NEZ	16 40 38.0	
	iS	NEZ	53.6	
	P: S,E,D			
25.	iP	NZ	17 39 05.0	
	S	NEZ	27	
	P: N,C			
26.	P	Z	01 37 23	
	eS	Z	42 11	
	eS	NE	13	
	4.3 N., 122.1 E.			
	Celebes Sea.			
	h: 636 km.			(cont.)

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Date	Phase	Comp.	Time(GMT) h m s
	H= 01 31 18.1		USCGS
26.	P	NEZ	08 26 49
	eS	N	32 20
	eL	E	34 20
	eL	Z	40
	eL	N	48
	3.6 N., 123.5 E.		
	North of Halmahera.		
	h: 99 km.		
	H= 08 20 15.1		USCGS
26.	P	EZ	10 25 36
26.	P	NEZ	13 41 01
	S	NE	28
	S	Z	29
26.	eP	Z	22 54 33
	eX	Z	43
	eS	NZ	23 02 40
27.	P	NEZ	02 34 49
	S	E	35 18
	X	N	27
27.	P	NEZ	03 18 59
	X	Z	19 05
	eS	N	42
	eX	E	57
27.	P	Z	05 28 49
	13.9 S., 74.3 W.		
	Peru.		
	h: 111 km.		
	H= 05 09 30.5		USCGS
27.	P	Z	20 23 17
	eX	Z	26
	X	N	27
	S	N	24 10
27.	iP	NEZ	21 07 13.5
	eS?	N	08 24
	eX	E	41
	P: N,E,C		
27.	P	Z	22 42 22
	12.1 S., 12.15 E.		
	South of Timor.		
	h: N.		
	H= 22 33 23.8		USCGS
28.	P	Z	02 54 26
	eX	Z	57 31
	X	E	58 23
	X	N	30
	PP	Z	36

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	eSKS	NE	03 05 03
	eX	Z	08
	eX	E	07 25
	eX	Z	29
	X	N	50
	SS	N	13 16
	X	Z	14 32
	X	N	17 08
	X	Z	10
	X	N	21.0
	X	E	22 26
	L	E	23 23
	L	Z	40
	Lr	Z	32 25
	Lr	N	34 12
	P: C		
	Mag. 8¾ (Mat.)		
	36.0 N., 10.6 W.		
	North Atlantic Ocean.		
	h: 22 km.		
	H= 02 40 32.5		USCGS
28.	eX	Z	03 10 28
	eX	Z	52
	eX	N	54
28.	eP	Z	04 39 31
	36.2 N., 10.5 W.		
	North Atlantic Ocean.		
	h: N.		
	H= 04 25 36.9		USCGS
28.	eX	Z	04 43 24
28.	iP	EZ	06 05 40.5
	iX	N	41.3
	eS	N	06 11
	eX	E	18
	X	E	35
	X	N	38
	P: E,C		
28.	iP	Z	08 29 31.5
	S	E	51
	S	NZ	52
	P: C		
28.	eP	EZ	13 26 07
	S	N	32 36
	X	E	40
	X	Z	56
	eL	N	35 40
	eL	E	54
	3.4 S., 119.0 E.		
	Celebes.		
	h: 51 km.		
	H= 13 18 07.4		USCGS

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Date	Phase	Comp.	Time(GMT) h m s	Date	Phase	Comp.	Time(GMT) h m s
28.	iP	NZ	13 51 49.0				
	P: S,C						
	51.7 N., 158.0 E.						
	Near east coast of Kamchatka.						
	h: 58 km.						
	H= 13 47 11.7		USCGS				
28.	P	Z	16 58 56				
	16.8 S., 167.9 E.						
	New Hebrides Is.						
	h: 48 km.						
	H= 16 48 53.2		USCGS				
28.	iP	EZ	19 52 16.5				
	S	N	41				
	X	E	45				

Mineo Takehana

Director