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

March , 1969

Date	Phase	Comp.	Time(GMT) h m s
1.	iP	NEZ	02 03 48.5
	X	N	05 16
	P: S,W,C		
	39.7 N., 143.0 E.		
	Off east coast of Honshu, Japan.		
	h: 64 km.		
	H= 02 02 33.5		USCGS
1.	eP	Z	06 56 04
1.	P	Z	10 41 37
	iX	NEZ	45.7
	46.8 N., 153.6 E.		
	Kurile Is.		
	h: N.		
	H= 10 38 03.4		USCGS
1.	eP	Z	10 52 43
	iX	Z	49.3
	47.0 N., 153.7 E.		
	Kurile Is.		
	h: 82 km.		
	H= 10 49 13.4		USCGS
1.	iP NZ, P E		14 16 45.6
	iS	N	52.0
	iS	EZ	52.2
	P: N,E,D		
1.	eP	Z	19 22 39
	eX	EZ	23 24
1.	iP	EZ	21 27 30.6
	eS	N	28 02
	P: W,C		
2.	P	Z	03 15 44
	iX	Z	53
	iX	Z	16 36
	6.0 S., 148.8 E.		
	New Britain region.		
	h: 70 km.		
	H= 03 07 45.2		USCGS
2.	iP	Z	04 54 26.8
	pP	NZ	51
	PcP	Z	56 51
	eL	N	05 02 40
	P: C		
	1.5 N., 128.1 E.		
	Halmahera.		
	h: 138 km.		
	H= 04 47 37.3		USCGS
2.	iP	Z	05 40 32.7
	S	E	50
	iX	Z	53

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	P: S,E,D		
	35.8 N., 139.2 E.		
	Central Honshu, Japan.		
	h: 130 km.		
	H= 05 40 06.8		JMA
2.	eX	E	12 41 11
	iX	E	16.2
	iX	Z	18.5
	iX	E	24
	iX	E	58.8
2.	eP	NEZ	14 05 26
	iX	Z	06 47.6
	S	NE	11 38
	iX	E	12 04
	Lq	NEZ	15 05
	Lr	Z	17.6
	3.2 S., 118.8 E.		
	Celebes.		
	h: 48 km.		
	H= 13 57 24.6		USCGS
2.	P	Z	21 25 05
2.	iP	NEZ	21 53 41.9
	eS	EZ	51
	P: N,E,C		
2.	eP	Z	22 29 02
	S	E	33 26
	Lq	NE	35 16
	eLr	Z	37 16
	12.9 N., 120.8 E.		
	Mindanao, P.I.		
	h: 80 km.		
	H= 22 23 17.4		USCGS
3.	P	NZ	00 56 25
	S	Z	45
3.	P	Z	01 11 26
	S	N	21 30
	eLq	N	32.5
	eLr	NE	42.0
	40.1 N., 27.4 E.		
	Turkey.		
	h: 4 km.		
	H= 00 59 10.5		USCGS
3.	eP	Z	08 59 33
	10.6 N., 125.3 E.		
	Leyet, P.I.		
	h: 99 km.		
	H= 08 53 48.4		USCGS
3.	P	Z	10 23 24
	eX	Z	30
	S	EZ	24 13

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Date	Phase	Comp.	Time(GMT) h m s	
3.	iP	NEZ	10 43 46.4	
	eS	E	57	
	S	Z	59	
	P: N,W,C			
3.	iP NZ, P E		13 23 17.2	
	P: N,C			
	16.7 S., 172.8 W.			
	Samoa Is. region.			
	h: 54 km.			
	H= 13 12 44.8			USCGS
3.	iP	NEZ	14 54 16.6	
	S	N	58 09	
	L	E	59 34	
	P: S,W,C			
	51.6 N., 159.3 E.			
	Off east coast of Kamchatka.			
	h: 12 km.			
	H= 14 49 28.0			USCGS
3.	eP	Z	16 41 26	
	S	NZ	50 40	
	iX	N	51 25	
	Lq	E	58 43	
	Lr	Z	17 02 42	
	16.9 S., 172.5 W.			
	Samoa Is. region.			
	h: N.			
	H= 16 30 13.8			USCGS
3.	iP	Z	16 50 51.4	
	iX	Z	51 06.6	
	iS	E	18.0	
	iS	N	18.4	
	P: C			
3.	P	NZ	17 03 48	
	50.8 N., 154.3 E.			
	Kurile Is.			
	h: 197 km.			
	H= 16 59 45.0			USCGS
3.	P	NZ	20 28 44	
	S	E	34 03	
	iX	N	09	
	Lq	E	36 07	
	Lq	N	13	
	3.6 N., 128.5 E.			
	North of Halmahera.			
	h: 72 km.			
	H= 20 22 07.3			USCGS
4.	P	NEZ	06 33 50	
	23.8 S., 179.1 E.			
	South of Fiji Is.			
	h: 534 km.			
	H= 06 23 22.8			USCGS

Date	Phase	Comp.	Time(GMT) h m s	
4.	iP	Z	09 26 22.7	
	P: C			
4.	P	EZ	15 49 11	
	9.5 S., 117.9 E.			
	Sumbawa Is. region.			
	h: 26 km.			
	H= 15 40 20.2			USCGS
4.	iP Z, P NE		17 49 25.6	
	iX	N	32	
	iX	N	51	
	P: D			
5.	P	Z	13 53 40	
	iX	Z	43.3	
	PP	Z	59 59	
	S	E	14 04 00	
	iX	Z	05 07	
	Lq	E	59	
	Lq	Z	06 09	
	Lr	Z	09.5	
	Mag. $6\frac{1}{2}$ - $6\frac{3}{4}$ (Mat.)			
	4.0 N., 128.2 E.			
	North of Halmahera.			
	h: 48 km.			
	H= 13 52 04.9			USCGS
5.	P	Z	16 17 48	
	PPP	Z	19 27	
	S	E	23 06	
	eLq	N	24 18	
	Lq	E	25 05	
	Lr	N	38	
	Mag. $6\frac{1}{4}$ - $6\frac{1}{2}$ (Mat.)			
	4.1 N., 128.4 E.			
	North of Halmahera.			
	h: 49 km.			
	H= 16 11 12.2			USCGS
5.	P	Z	17 25 10	
	iX	Z	21	
	35.3 N., 141.4 E.			
	Near east coast of Honshu, Japan			
	h:N.			
	H=17 24 26.8			USCGS
5.	iP	NEZ	19 42 20.3	
	pP	Z	43 10	
	eS	E	49 20	
	iX	NE	50 54	
	P: S,E,C			
	36.4 N., 70.7 E.			
	Hindu Kush region.			
	h: 208 km.			
	H= 19 33 23.0			USCGS

Date	Phase	Comp.	Time(GMT) h m s
6.	P	Z	01 04 23
	18.0 N., 147.4 E.		
	Mariana Is. region.		
	h: N.		
	H= 00 59 46.2		USCGS
6.	P	Z	01 12 40
	4.2 N., 128.3 E.		
	North of Halmahera.		
	h: 39 km.		
	H= 01 06 01.2		USCGS
6.	P Z, eP N		01 27 24
	ePP	NZ	28 44
	4.2 N., 128.3 E.		
	North of Halmahera.		
	h: N.		
	H= 01 20 46.7		USCGS
6.	eP	Z	01 53 09
	3.9 N., 128.2 E.		
	North of Halmahera.		
	h: 32 km.		
	H= 01 46 37.7		USCGS
6.	P	NZ	03 32 31
	iX	Z	35 14
	Lq	E	39 52
	Lr	Z	42 19
	4.3 N., 128.4 E.		
	North of Halmahera.		
	h: N.		
	H= 03 25 55.1		USCGS
6.	iP Z, P NE		07 09 12.4
	P: C		
	51.4 N., 159.4 E.		
	Off east coast of Kamchatka.		
	h: N.		
	H= 07 04 26.5		USCGS
6.	P	Z	07 46 57
	15.8 N., 121.8 E.		
	Luzon, P.I.		
	h: N.		
	H= 07 41 31.2		USCGS
6.	iP	Z	09 54 13.8
	P: C		
7.	P	NEZ	01 55 09
	17.8 S., 175.4 W.		
	Tonga Is.		
	h: 264 km.		
	H= 01 44 26.7		USCGS
7.	iP	NEZ	06 43 55.4
	S	N	44 13

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	P: N,E,D		
	36.0 N., 139.7 E.		
	Central Honshu, Japan.		
	h: 50 km.		
	H= 06 43 32.9		JMA
7.	P	Z	08 35 12
	49.8 N., 78.1 E.		
	Eastern Kazahk SSR.		
	h: 0 km.		
	H= 08 26 57.5		USCGS
7.	iP Z, P N		10 34 14.6
	iX	NE	53
	P:C		
7.	P	NZ	11 03 53
7.	eP	Z	17 07 13
7.	P Z, eP N		23 01 59
	eX	E	09 07
7.	P	NZ	23 23 38
	iX	NEZ	46
	iX	EZ	24 08
	iX	N	09
7.	P	NEZ	23 45 06
	eX	Z	23
	39.8 N., 141.8 E.		
	Northern Honshu, Japan.		
	h: 50 km.		
	H= 23 43 59.3		JMA
8.	iP	Z	04 25 25.0
	P: D		
8.	iP	NEZ	10 21 25.0
	X	NZ	22 13
	S	E	23
	P: N,E,D		
	41.3 N., 139.6 E.		
	Hokkaido, Japan region.		
	h: 169 km.		
	H= 10 20 09.3		USCGS
8.	P	Z	11 36 52
	ePP	NZ	38 12
	S	E	42 04
	iX	N	14
	Lq	E	44 06
	Lq	N	10
	4.0 N., 128.3 E.		
	North of Halmahera.		
	h: 59 km.		
	H= 11 30 18.5		USCGS

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Date	Phase	Comp.	Time(GMT) h m s	
8.	P	Z	11 56 24	
	3.8 N., 128.2 E.			
	North of Halmahera.			
	h: 54 km.			
	H= 11 49 49.8			USCGS
8.	iP	NZ	15 36 18.5	
	iS N, S E		41.5	
	P: N,D			
8.	eS	NE	18 28 47	
	eL	N	36 45	
	eL	E	52	
	15.6 S., 173.7 W.			
	Tonga Is.			
	h: 154 km.			
	H= 18 09 01.8			USCGS
8.	P	NEZ	21 13 12	
	eX	NE	21 23	
	2.3 N., 126.5 E.			
	Molucca Passage.			
	h: 42 km.			
	H= 21 06 17.0			USCGS
9.	iP	NEZ	11 38 31.0	
	S	NZ	40 56	
	S	E	58	
	P: N,E,D			
	48.1 N., 148.3 E.			
	North of Kurile Is.			
	h: 388 km.			
	H= 11 35 30.4			USCGS
9.	P	Z	11 46 19	
9.	P	Z	13 13 29	
	iX	NZ	37	
	S	N	19 04	
	Lq	E	21 42	
	Lq	N	54	
	Lr	Z	24 38	
	1.5 N., 126.3 E.			
	Molucca Passage.			
	h: 33 km.			
	H= 13 06 26.7			USCGS
9.	P	NZ	13 55 38	
	iX	Z	42	
	ePP	Z	57 16	
	iX	Z	23	
	S	N	14 01 47	
	Lq	N	04 52	
	Lr	Z	07.0	
	Mag. 7 - 7¼ (Mat.)			
	4.1 S., 135.5 E.			
	West New Guinea region.			
	h: 14 km.			
	H= 13 47 59.4			USCGS

Date	Phase	Comp.	Time(GMT) h m s	
9.	iP	NEZ	14 27 48.9	
	eS	N	29 20	
	31.2 N., 141.5 E.			
	South of Honshu, Japan.			
	h: N.			
	H= 14 26 13.9			USCGS
9.	iP Z, P NE		14 42 02.9	
	S	N	43 14	
	P: N,W,C			
	31.3 N., 141.7 E.			
	South of Honshu, Japan.			
	h: 40 km.			
	H= 14 40 33.8			USCGS
9.	P	NEZ	14 46 40	
	Lq	E	56 18	
	Lr	Z	53.0	
	Mag. 6½ - 6¾ (Mat.)			
	4.1 S., 135.6 E.			
	West New Guinea region.			
	h: N.			
	H= 14 39 04.2			USCGS
9.	P	Z	16 01 32	
	4.2 S., 135.5 E.			
	West New Guinea region.			
	h: N.			
	H= 15 53 55.1			USCGS
9.	P	Z	16 07 51	
	4.2 S., 135.5 E.			
	West New Guinea region.			
	h: N.			
	H= 16 00 13.8			USCGS
10.	eP	Z	05 39 38	
	eX	Z	44	
	S	N	43 44	
	Lq	N	44 36	
	Lr	Z	45 35	
	22.8 N., 121.0 E.			
	Taiwan region.			
	h: 37 km.			
	H= 05 35 15.1			USCGS
10.	iP	NZ	07 01 55.6	
	sP	Z	03 00	
	PcP	Z	46	
	ScP	Z	07 16	
	iS	N	55	
	iS	Z	58	
	L	N	10 58	
	L	E	12 20	
	P: N,C			
	Mag. 6.8 (Mat.)			
	5.6 S., 147.2 E.			
	East New Guinea region.			

(cont.)

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Date	Phase	Comp.	Time(GMT) h m s
	h: 206 km.		
	H= 06 54 17.6		USCGS
10.	P	Z	15 53 17
	iX	NEZ	13
	S	NE	33
	iX	N	50
	36.5 N., 140.6 E.		
	Near east coast of Honshu, Japan.		
	h: 59 km.		
	H= 15 52 45.4		USCGS
11.	iP	NZ	03 30 33.4
	iX	E	42.4
	iS	NEZ	54.5
11.	iP	NEZ	09 33 37.4
	eS	Z	34 32
	eX	N	42
	X	EZ	49
	L	Z	35 13
	X	NE	39 43
	eX	Z	52
	P: N,W,C		
	31.2 N., 141.7 E.		
	South of Honshu, Japan.		
	h: 42 km.		
	H= 09 32 07.2		USCGS
11.	P	NEZ	09 42 03
	S	E	43 11
11.	iP	Z	09 45 47.0
	iX	NZ	47.7
	iX	E	48.0
	eS	E	46 51
	X	N	47 04
	X	Z	32
	P: C		
	31.1 N., 141.6 E.		
	South of Honshu, Japan.		
	h: N.		
	H= 09 44 16.3		USCGS
11.	P	NEZ	10 01 04
	S	E	02 11
11.	P	Z	10 13 08
	eS	E	14 00
11.	X	Z	10 38 53
11.	iP	NEZ	12 32 48.7
	S	NZ	33 40
	L	NE	34 11
	X	Z	18
	X	E	43

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	X	Z	12 36 00
	38.4 N., 143.1 E.		
	Off east coast of Honshu, Japan.		
	h: 49 km.		
	H= 12 31 43.2		USCGS
11.	P	NEZ	15 12 29
11.	P	NEZ	15 37 33
11.	P	NEZ	15 41 15
	X	NE	23
	S	E	52
11.	P	NZ	17 13 04
	X	E	14 13
	eX	N	15
11.	P	NEZ	18 10 16
	S	E	11 26
	X	Z	12 05
	eX	N	13 50
	X	Z	14 42
	31.2 N., 141.8 E.		
	South of Honshu, Japan.		
	h: N.		
	H= 18 08 46.1		USCGS
11.	P	NEZ	19 37 30
	S	N	53
11.	P	NEZ	19 41 31
	X	N	48
	X	E	53
	eS	NE	42 37
	31.2 N., 141.7 E.		
	South of Honshu, Japan.		
	h: N.		
	H= 19 40 00.7		USCGS
11.	iP	Z	22 01 13.6
	eS	NE	35
	P: C		
12.	iP	NEZ	06 48 38.7
	S	N	49 52
	P: N,E		
	39.2 N., 143.6 E.		
	Off east coast of Honshu, Japan.		
	h: N.		
	H= 06 47 21.9		USCGS
12.	P	Z	06 53 11
	iX	N	12.7
	iX	E	13.7
	S	NE	54 20

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	31.1 N., 141.5 E.		
	South of Honshu, Japan.		
	h: N.		
	H= 06 51 40.5		USCGS
12.	P	Z	09 20 47
	eS	N	21 23
	eX	E	28
12.	iP	NEZ	10 46 10.0
	S	NE	47 19
	P: S,E,D		
	31.1 N., 141.8 E.		
	South of Honshu, Japan.		
	h: 29 km.		
	H= 10 44 38.4		USCGS
12.	P	NEZ	10 51 06
	iX	NEZ	26
12.	X	Z	11 58 49
12.	P	NEZ	13 48 49
	S	NEZ	49 58
	31.3 N., 141.7 E.		
	South of Honshu, Japan.		
	h: 48 km.		
	H= 13 47 20.2		USCGS
12.	iP	Z	15 24 40.4
	eS	NE	25 45
	31.2 N., 141.4 E.		
	South of Honshu, Japan.		
	h: 60 km.		
	H= 15 23 11.8		USCGS
12.	iP	NZ	17 45 29.0
	X	NE	39
12.	iP	NEZ	20 25 29.4
	S	E	26 35
	P: N,W,C		
	31.3 N., 141.7 E.		
	South of Honshu, Japan.		
	h: 55 km.		
	H= 20 24 01.5		USCGS
12.	iP	NEZ	20 39 48.4
	P: S,E,D		
	35.6 N., 140.1 E.		
	Near Tokyo, Japan.		
	h: 80 km.		
	H= 20 39 17.4		JMA
12.	iP	NZ	23 19 22.0
	S	N	20 40
	P: S,C		

Date	Phase	Comp.	Time(GMT) h m s
13.	iP	NEZ	03 24 41.5
	S	N	25 49
	S	E	50
	P: S,E,D		
	31.1 N., 141.7 E.		
	South of Honshu, Japan.		
	h: N.		
	H= 03 23 09.9		USCGS
13.	iP	NEZ	07 46 34
	S	NE	56
13.	iP	NEZ	15 05 38.5
	P: S,E,D		
	35.6 N., 140.2 E.		
	Central Honshu, Japan.		
	h: 70 km.		
	H= 15 05 07.0		JMA
13.	eP	EZ	16 14 08
13.	P	Z	18 53 49
	63.5 N., 129.0 W.		
	North west Territories, Canada.		
	h: N.		
	H= 18 43 48.9		USCGS
13.	iP	Z	19 57 10.4
	S	E	35
	S	NZ	36
	P: C		
13.	iP	Z	20 48 15.8
	iX	Z	49 07
	iPCP	Z	30.4
	P: D		
	5.5 S., 110.4 E.		
	Java Sea.		
	h: 502 km.		
	H= 20 40 12.5		USCGS
13.	P	Z	21 04 08
13.	P	Z	22 38 46
14.	P	Z	04 26 21
	X	N	22
	eX	E	28 05
	X	E	35
	42.2 N., 141.9 E.		
	Hokkaido, Japan region.		
	h: N.		
	H= 04 24 45.9		USCGS
14.	P	NEZ	05 46 13

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Date	Phase	Comp.	Time(GMT) h m s
14.	X	Z	09 16 00
	X	E	40
	L	N	22 24
	L	E	33
	eL	E	23 40
	eL	E	33 30
	eL	N	40
	eL	EZ	42.5
	eL	N	44.3

12.9 N., 86.8 W.
Nicaragua.
h: 173 km.
H= 08 47 16.3 USCGS

14.	iP	NZ	11 32 54.6
	S	NE	34 04

P: N,C
31.1 N., 141.7 E.
South of Honshu, Japan.
h: N.
H= 11 31 24.1 USCGS

14.	P	NZ	12 56 34
	X	Z	57 28
	X	E	37
	X	NZ	38
14.	eP	Z	15 31 08
	X	NE	18
	S	NE	32 04

34.1 N., 135.1 E.
Central Honshu, Japan.
h: 10 km.
H= 15 30 10.1 JMA

14.	P	NZ	17 19 29
14.	iP	NEZ	19 30 21.8
	S	NE	31

P: N,E,C

14.	P	NEZ	22 10 55

7.0 S., 129.7 E.
Banda Sea.
h: 116 km.
H= 22 02 58.6 USCGS

14.	P	Z	22 57 00
	X	Z	58 39
	S	E	23 00 59
	S	E	01 08
	X	N	20

20.4 N., 121.8 E.
Philippine Is. region.
h: 70 km.
H= 22 52 13.8 USCGS

15.	iP	NEZ	01 11 23.0
15.	iP	Z	01 23 55.8
	X	NEZ	24 00
	iX	N	04.4
	S	NE	34

34.9 N., 135.6 E.
Central Honshu, Japan.
h: 10 km.
H= 01 23 09.8 JMA

15.	P	NEZ	03 03 59

42.9 N., 144.9 E.
Hokkaido, Japan region.
h: N.
H= 03 01 58.5 USCGS

15.	P	NZ	04 24 52
	P	E	53

50.8 N., 150.1 E.
Northwest of Kurile Is.
h: 520 km.
H= 04 21 26.4 USCGS

15.	P	Z	06 25 50
	X	E	51
	X	N	52
	eX	Z	26 26
	S	N	34
	eL	NZ	45
15.	P	Z	11 52 19
	P	N	20
	X	N	53 46
	PcP	Z	54 24
	S	N	58 25
	Lq	N	12 01 13
	Lq	Z	15
	Lq	E	30
	Lr	Z	03 55
	Lr	E	04 04
	Lr	N	10

Mag. $5\frac{3}{4}$ - 6 (Mat.)
2.8 S., 126.5 E.
Ceram Sea.
h: N.
H= 11 44 42.3 USCGS

15.	P	NEZ	13 42 14
	PcP	Z	44 52
	S	E	47 35
	eX	N	44
	X	Z	48 34
	eLq	N	49 28
	Lq	Z	53
	Lq	E	58
	iX	N	50 05
	Lr	EZ	51 13

Mag. $5\frac{1}{2}$ - $5\frac{3}{4}$ (Mat.)
51.2 N., 179.1 W.

(cont.)

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Date	Phase	Comp.	Time(GMT) h m s
	Andreanof Is. h: 46 km. H= 13 35 35.3		USCGS
15.	P	NEZ	23 05 19
16.	iP	NZ	00 48 01.9
	iX	NZ	11.0
	P: S,D		
16.	P	Z	03 33 44
16.	P	NEZ	06 58 16
	iX	NZ	17.4
16.	iP	Z	08 35 49.2
	S	N	36 08
	P: D 35.9 N., 140.0 E. Central Honshu, Japan. h: 50 km. H= 08 35 22.9		JMA
16.	P	EZ	13 16 01
16.	iP	NEZ	15 55 21.0
	iX	NEZ	30
	S	NEZ	56 06
	P: N,E,D Mag. 6.3 (Mat.) 38.5 N., 142.7 E. Near east coast of Honshu, Japan. h: 40 km. H= 15 54 17.2		USCGS
16.	P	NE	15 58 44
	S	NE	59 29
	38.5 N., 142.6 E. Near east coast of Honshu, Japan. h: 46 km. H= 15 57 39.7		USCGS
16.	iP	NEZ	16 58 34.8
	P: N,E,D 41.0 N., 143.1 E. Hokkaido, Japan region. h: 38 km. H= 16 57 07.0		USCGS
16.	iP	EZ	20 16 44.4
	S	NE	17 10
	P: W,D		
16.	iP	EZ	23 04 17.3
	P: E,C		

Date	Phase	Comp.	Time(GMT) h m s
17.	P	NEZ	01 06 00
	17.7 S., 179.9 E. Fiji Is. h: 614 km. H= 00 56 06.2		USCGS
17.	P	EZ	01 40 00
	iX	N	00.8
	17.6 S., 179.8 E. Fiji Is. h: 615 km. H= 01 30 07.3		USCGS
17.	eP	Z	09 16 04
17.	iP	Z	17 09 13.6
	P: D		
17.	P	EZ	17 44 15
17.	P	NZ	18 24 17
18.	P	NEZ	02 28 00
18.	P	NZ	03 43 31
	X	E	44 59
	eX	N	49 38
	S	N	52 14
	S	E	20
	SS	E	55 34
	L	E	57 51
	L	Z	04 02 34
	L	E	03 26
	Mag. $6\frac{1}{4}$ - $6\frac{1}{2}$ (Mat.) 21.4 S., 170.9 E. Loyalty Is. region. h: N. H= 03 32 50.8		USCGS
18.	PKP	Z	04 44 10
	iX	Z	22
	25.8 S., 70.8 W. Near coast of Northern Chile. h: 48 km. H= 04 24 16.5		USCGS
18.	P	Z	05 12 49
	X	N	51
	47.1 N., 153.9 E. Kurile Is. h: 35 km. H= 05 09 09.6		USCGS
18.	iP	Z	08 36 31.1
	P: S,C		
18.	P	Z	09 12 49
	S	E	13 11

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Date	Phase	Comp.	Time(GMT) h m s	
18.	P	NEZ	09 21 21	
	S	E	25	
			h: 10 km.	
			H= 03 14 04.5	JMA
18.	P	NEZ	13 42 42	
	S	EZ	43 00	
18.	iP	Z	16 19 30.0	
	iX	NE	30.6	
	X	E	21 52	
	eS	N	22 10	
	S	E	14	
	X	Z	40	
	44.1 N., 151.0 E.			
	Kurile Is. region.			
	h: 44 km.			
	H= 16 16 39.6			USCGS
18.	P	NEZ	17 41 10	
18.	iP	NEZ	19 23 17.0	
	S	NEZ	33	
18.	S	E	20 50 35	
	S	NZ	40	
	L	E	58 07	
	L	E	21 01 05	
	L	Z	16	
	50.1 N., 130.0 W.			
	Vancouver I. region.			
	h: N.			
	H= 20 31 27.3			USCGS
18.	P	NE	21 35 58	
	X	E	36 19	
	S	N	24	
18.	P	NEZ	22 47 01	
	24.0 S., 176.0 W.			
	South of Fiji Is.			
	h: 63 km.			
	H= 22 35 30.2			USCGS
18.	iP	Z	22 55 22.8	
	30.2 N., 131.2 E.			
	Kyushu, Japan.			
	h: 56 km.			
	H= 22 53 18.4			USCGS
18.	P	EZ	23 35 05	
	50.7 N., 156.7 E.			
	Kurile Is.			
	h: 90 km.			
	H= 23 30 41.2			USCGS
19.	P	NZ	03 15 13	
	X	Z	17	
	40.1 N., 141.2 E.			
	Northeastern Honshu, Japan.			

(cont.)

Date	Phase	Comp.	Time(GMT) h m s	
			h: 10 km.	
			H= 03 14 04.5	JMA
19	P	Z	03 44 24	
	S	N	50	
19.	P	Z	06 15 55	
	eL	NZ	25.0	
	7.1 N.,127.2E.			
	Philippine Is.region.			
	h: 55 km.			
	H= 06 09 42.1			USCGS
19	eP	Z	10 06 27	
19	P	NEZ	14 02 03	
	X	E	14	
	S	E	04 10	
	ScP	Z	11 02	
	ScS	N	14 07	
	Mag. 6.6 (Mat.)			
	28.8 N.,128.2 E.			
	Ryukyu Is.			
	h: 136 km.			
	H= 13 59 22.7			USCGS
19	P	NZ	14 54 28	
19	P	NZ	15 43 16	
	S	EZ	44 44	
19	P	NEZ	15 47 34	
	S	NE	49 06	
19.	iP	NEZ	18 21 50.3	
	S	E	24 51	
	P: N,E,D			
	44.1 N., 151.0 E.			
	Kurile Is. region.			
	h: 50 km.			
	H= 18 18 58.9			USCGS
20.	eP	Z	01 09 07	
	41.5 N., 142.8 E.			
	South coast of Hokkaido, Japan.			
	h: 10 km.			
	H= 01 07 31.5			JMA
20.	P	Z	02 13 59	
	X	NE	14 06	
	X	N	15	
	S	NE	21	
20.	P	Z	08 30 13	
	PP	Z	33 30	
	PPP	Z	35 30	

(cont.)

Date	Phase	Comp.	Time(GMT) h m s	
	S	EZ	08 40 40	
	PS	E	41 40	
	SS	E	46 38	
	SSS	E	49 50	
	Lq	NE	52.7	
	Lr	EZ	56.0	
	Mag. 6¼ - 6½ (Mat.)			
	31.3 N., 114.3 W.			
	Gulf of California.			
	h: 20 km.			
	H= 08 17 41.9			USCGS
20.	P	Z	09 11 24	
20.	iP	NEZ	13 32 49.0	
	S	NE	34 10	
	P: N,E,C			
	29.8 N., 138.6 E.			
	South of Honshu, Japan.			
	h: 429 km.			
	H= 13 31 06.0			USCGS
20.	iP	Z	13 38 28.7	
	iS	NEZ	40.2	
20.	P	NZ	16 24 56	
	S	N	29 28	
	L	EZ	31.0	
	L	E	35.0	
	L	N	35.5	
	Mag. 6½ - 6¾ (Mat.)			
	8.7 N., 127.3 E.			
	Philippine Is. region.			
	h: N.			
	H= 16 18 56.4			USCGS
20.	iP	NEZ	16 41 53.6	
	X	Z	42 08	
	X	NE	13	
	X	N	44 50	
	P: S,W,C			
	30.5 N., 131.3 E.			
	Near south coast of Kyushu, Japan.			
	h: 0 km.			
	H= 16 39 49.1			JMA
20.	iP	Z	18 23 05.1	
	iX	NE	05.3	
	51.6 N., 174.9 W.			
	Andreanof Is.			
	h: 59 km.			
	H= 18 16 06.4			USCGS
20.	iP	NEZ	18 43 34.4	
	S	NEZ	54	
	P: S,E,D			
	35.8 N., 139.6 E.			
	Honshu, Japan.			(cont.)

Date	Phase	Comp.	Time(GMT) h m s	
	h: 140 km.			
	H= 18 43 06.0			JMA
20.	P	NZ	21 38 28	
	X	N	40 06	
20.	S	N	23 49 30	
	S	E	40	
	X	E	51 10	
	L	Z	52 30	
	L	N	35	
	8.8 N., 127.3 E.			
	Philippine Is. region.			
	h: N.			
	H= 23 38 40.6			USCGS
21.	eP	Z	02 47 07	
	6.1 S., 147.4 E.			
	East New Guinea region.			
	h: 90 km.			
	H= 02 39 12.7			USCGS
21.	iP	NEZ	03 06 38.0	
	S	N	07 46	
	P: S,W,C			
	40.3 N., 143.7 E.			
	Off east coast of Honshu, Japan.			
	h: N.			
	H= 03 05 11.9			USCGS
21.	iP	Z	04 06 11.9	
	Lr	Z	32 00	
	Lr	E	30	
	P: D			
	Mag. 5¾ - 6 (Mat.)			
	31.2 N., 114.3 W.			
	Gulf of California.			
	h: N.			
	H= 03 53 42.4			USCGS
21.	P	Z	05 08 51	
	eX	E	16 28	
	eS	E	19 25	
	Lq	N	30.6	
	Lr	Z	34 32	
	Lr	E	48	
	Mag. 6 - 6¼ (Mat.)			
	31.2 N., 114.2 W.			
	Gulf of California.			
	h: N.			
	H= 04 56 20.3			USCGS
21.	P	Z	06 44 28	
	43.4 N., 145.0 E.			
	Hokkaido, Japan.			
	h: N.			
	H= 06 42 20.4			USCGS

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Date	Phase	Comp.	Time(GMT) h m s
21.	P	Z	06 46 57
	eS	E	57 33
	Lq	N	07 08.8
	Lr	Z	12 40
	Lr	E	13 00
	Mag. 6 - 6¼ (Mat.)		
	31.1 N., 114.3 W.		
	Gulf of California.		
	h: N.		
	H= 06 34 22.2		USCGS
21.	P	Z	07 33 39
	eX	E	42 46
	Lq	N	56.4
	Lr	Z	58 46
	Lr	E	59 48
	Mag. 6 - 6¼ (Mat.)		
	31.3 N., 114.2 W.		
	Gulf of California.		
	h: N.		
	H= 07 21 11.6		USCGS
21.	iP	NEZ	07 41 17.4
	S	NE	42 17
	P: N,E,C		
21.	iP	Z	09 55 06.2
	P: C		
	59.9 N., 152.7 W.		
	Southern Alaska.		
	h: 105 km.		
	H= 09 46 28.3		USCGS
21.	P	Z	10 22 44
	PPS	E	34 16
	Lq	N	45.3
	Lr	Z	48 30
	Lr	E	48
	Mag. 5¾ - 6 (Mat.)		
	31.2 N., 114.3 W.		
	Gulf of California.		
	h: 5 km.		
	H= 10 10 10.7		USCGS
21.	P	NZ	12 09 25
	L	N	12 52
	L	N	13 16
	L	E	48
	49.6 N., 155.6 E.		
	Kurile Is.		
	h: 50 km.		
	H= 12 05 16.3		USCGS
21.	P	NZ	13 29 58
	S	E	30 48
21.	iP	Z	14 33 23.9
	P: D		

Date	Phase	Comp.	Time(GMT) h m s
21.	P	Z	14 54 14.2
	P: D		
21.	eP	Z	15 51 46
	X	NZ	52 01
	S	N	44
21.	L	Z	17 07.5
	31.3 N., 114.1 W.		
	Gulf of California.		
	h: N.		
	H= 16 29 40.4		USCGS
21.	Lr	Z	18 39.0
	31.1 N., 114.3 W.		
	Gulf of California.		
	h: N.		
	H= 18 00 20.6		USCGS
21.	iP	NZ	18 40 28.6
	S	N	52
	S	E	53
	P: N,C		
21.	P	Z	19 53 10
	S	N	43
22.	iP	Z	01 53 56.3
	iX	N	57.0
	S	NE	59 11
	P: D		
22.	eP	Z	05 01 41
	38.9 N., 70.6 E.		
	Afghanistan - USSR border region.		
	h: 8 km.		
	H= 04 52 32.6		USCGS
22.	eP	Z	05 54 49
	S	E	06 03 54
	Lq	NE	11 06
	Lr	EZ	14 40
	Mag. 5¾ - 6 (Mat.)		
	15.5 S., 176.1 W.		
	Fiji Is. region.		
	h: N.		
	H= 05 43 57.5		USCGS
22.	P	Z	07 38 07
	31.4 N., 114.1 W.		
	Gulf of California.		
	h: N.		
	H= 07 25 35.6		USCGS
22.	P?	Z	07 57 34
	L	EZ	08 04 30

Date	Phase	Comp.	Time(GMT) h m s	
22.	iP	NEZ	13 38 28.4	
	S	E	40 48	
	P: N,E,D			
	43.4 N., 147.4 E.			
	Kurile Is.			
	h: 40 km.			
	H= 13 36 06.1			USCGS
22.	Lq	E	13 58 28	
	16.5 S., 177.5 W.			
	Fiji Is.			
	h: N.			
	H= 13 31 07.8			USCGS
22.	iP	NEZ	15 18 31.1	
	S	NE	45	
	P: S,C			
22.	L	Z	15 54 58	
	15.3 S., 176.3 W.			
	Fiji Is. region.			
	h: N.			
	H= 15 24 14.5			USCGS
22.	P	Z	17 38 38	
	S	N	44 36	
	Lq	NE	47 40	
	Lr	NZ	50 28	
	Mag. 5½ - 5¾ (Mat.)			
	0.7 S., 122.5 E.			
	Northern Celebes.			
	h: 42 km.			
	H= 17 31 07.0			USCGS
22.	P	Z	17 49 09	
	eS	NE	50 50	
	41.4 N., 142.1 E.			
	Hokkaido, Japan.			
	h: 72 km.			
	H= 17 47 40.9			USCGS
23.	P	Z	02 18 25	
	24.8 S., 179.8 E.			
	South of Fiji Is.			
	h: 550 km.			
	H= 02 07 52.6			USCGS
23.	L	N	04 52 40	
23.	iP	Z	05 14 00	
	S	NE	15 07	
	P: C			
23.	iP	Z	07 57 34.7	
	S	NE	47	
	P: S,E,D			
23.	iP	EZ	08 04 49.3	

(cont.)

Date	Phase	Comp.	Time(GMT) h m s	
	iX	N	08 04 49.8	
	S	NE	05 10	
	P: E,C			
23.	L	N	12 40 54	
23.	L	N	13 03 50	
23.	P	EZ	14 11 39.6	
	S	N	12 10	
	P: E,D			
23.	P	Z	15 47 24	
23.	P	Z	21 20 57	
	S	NE	31 06	
	SS	E	36 40	
	SSS	NE	39 55	
	Lq	E	41 20	
	Lr	E	46 50	
	P: C			
	Mag. 6½ (Mat.)			
	39.2 N., 28.5 E.			
	Turkey.			
	h: 12 km.			
	H= 21 08 42.6			USCGS
23.	iP	Z	23 06 03.5	
	S	E	23.6	
	iS	N	24.6	
24.	iP	Z	01 05 12.5	
	19.4 S., 175.7 W.			
	Tonga Is.			
	h: 205 km.			
	H= 00 54 17.5			USCGS
24.	P	Z	02 11 46	
	39.1 N., 28.5 E.			
	Turkey.			
	h: 6 km.			
	H= 01 59 30.6			USCGS
24.	L	N	02 42 20	
24.	P	Z	09 15 01	
	X	N	44.5	
	31.3 N., 114.2 W.			
	Gulf of California.			
	h: 25 km.			
	H= 09 02 32.1			USCGS
24.	P	Z	10 28 50	
24.	iP	Z	10 37 49.0	
	S	N	38 14	
	P: C			

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Date	Phase	Comp.	Time(GMT) h m s	
24.	P	Z	12 06 47	
	27.5 N., 33.8 E.			
	United Arab Republic.			
	h: 21 km.			
	H= 11 54 15.5			USCGS
24.	P	Z	13 30 05	
24.	iP	NZ	15 46 54.3	
	S	E	47 16	
	S	N	17	
	P: S,D			
24.	P	Z	22 55 05	
25.	P	Z	00 53 08	
25.	S	E	01 13 15	
25.	iP	NEZ	02 26 32.1	
	S	N	27 45	
	L	N	28 24	
	P: N,W,C			
	31.6 N., 141.7 E.			
	South of Honshu, Japan.			
	h: 59 km.			
	H= 02 25 06.1			USCGS
25.	iP	NEZ	02 30 54.5	
	S	NE	31 33	
	P: N,W,C			
25.	P	Z	07 08 29	
	iX	N	40.6	
25.	iP	EZ	07 13 59.8	
	iX	N	15 17.5	
	P: E,D			
25.	P	Z	10 01 28	
	S	N	53	
25.	P	Z	13 23 59	
	pP	Z	25 06	
	23.5 S., 177.8 W.			
	South of Fiji Is.			
	h: 291 km.			
	H= 13 13 01.4			USCGS
25.	P	Z	13 33 23	
	iX	Z	44.8	
	S	N	43 16	
	SS	NE	48 40	
	L	N	52 30	
	L	N	58 40	
	L	Z	14 00 40	
	Mag. $6\frac{1}{4}$ - $6\frac{1}{2}$ (Mat.)			
	39.2 N., 28.4 E.			

(cont.)

Date	Phase	Comp.	Time(GMT) h m s	
	Turkey.			
	h: 23 km.			
	H= 13 21 39.2			USCGS
25.	iP	Z	14 31 03.5	
	P: C			
	39.2 N., 28.4 E.			
	Turkey.			
	h: 23 km.			
	H=14 18 50.8			USCGS
25.	iP	NEZ	14 52 44.6	
	P: S,E,D			
	38.5 N., 29.3 E.			
	Turkey.			
	h: 25 km.			
	H= 14 40 19.9			USCGS
25.	iP	NEZ	15 10 05.4	
	S	NE	23	
	P: N,E,C			
25.	iP	Z	19 52 55.0	
	iX	E	56.0	
	S	N	53 33	
	P: C			
25.	iP	Z	20 26 25.7	
	S	N	28 23	
	P: C			
25.	iP	Z	21 28 20.5	
	S	NE	28	
26.	iP	NEZ	03 02 45.4	
	S	N	03 05	
	P: S,E,D			
26.	iP	Z	07 41 13.7	
	iX	N	58.5	
	P: D			
26.	P	Z	09 35 55	
	S	N	45 40	
	SS	N	50 08	
	Lq	N	55 20	
	Lr	N	58 20	
	24.6 S., 176.2 W.			
	South of Fiji Is.			
	h: 50 km.			
	H= 09 24 19.8			USCGS
26.	iP	Z	15 04 50.3	
	S	NE	05 30	
	P: D			
26.	eP	Z	15 32 59	

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	S	N	15 37 16
	Lq	E	38 30
	Mag. $5\frac{1}{4}$ - $5\frac{1}{2}$ (Mat.)		
	16.2 N., 122.2 E.		
	Luzon, P.I.		
	h: 36 km.		
	H= 15 27 40.6		USCGS
26.	P	Z	15 53 12.6
	S	NE	28
	P: D		
26.	eS	N	19 33.0
	Lq	N	34 50
	8.6 N., 127.6 E.		
	Philippine Is.		
	h: 31 km.		
	H= 19 22 09.0		USCGS
27.	iP	Z	01 48 41.5
	S	N	49 11
	S	E	12
	P: C		
27.	P	Z	03 34 43
	S	N	40 20
	L	N	42 16
	L	N	49 30
27.	iP	EZ	04 41 44.9
	iX	N	45.3
	S	NE	42 31
	P: E,C		
27.	P	Z	04 53 04
	PcP	Z	56 00
	S	N	58 32
	Lq	N	05 00 20
	Lr	E	02 20
	Mag. $6\frac{1}{4}$ - $6\frac{1}{2}$ (Mat.)		
	3.9 N., 128.5 E.		
	North of Halmahera.		
	h: N.		
	H= 04 46 26.1		USCGS
27.	P	Z	06 12 24
	iX	NEZ	25.5
	S	N	13 30
	L	N	58
	31.0 N., 141.6 E.		
	South of Honshu, Japan.		
	h: 28 km.		
	H= 06 10 50.6		USCGS
27.	iP	NZ	08 26 58.2
	P: S,D		
	19.5 N., 144.6 E.		
	Mariana Is.		
	h: 383 km.		(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	H= 08 23 13.6		USCGS
27.	eP	Z	08 29 32
27.	iP	NEZ	12 01 46.6
	P: N,W,C		
27.	iP	NEZ	12 48 10.0
	PP	NZ	49 28
	S	E	53 30
	Lq	E	55 30
	Lr	NZ	57 20
	P: N,E,C		
	Mag. $7\frac{1}{2}$ - $7\frac{3}{4}$ (Mat.)		
	4.8 N., 127.5 E.		
	Talaud Is.		
	h: 32 km.		
	H= 12 41 35.9		USCGS
27.	iP	Z	13 05 05.2
	S	N	06 19
	S	E	20
	P: D		
27.	iP	NZ	19 02 04.2
	S	NE	21.7
	P: S,D		
27.	P	NZ	20 52 09
	16.2 N., 146.1 E.		
	Mariana Is.		
	h: 66 km.		
	H= 20 47 24.5		USCGS
27.	P	NEZ	21 01 04.9
	eS	NE	02 29
	P: N,E,C		
27.	iP	Z	21 09 27.4
	P: C		
28.	iP	NZ	02 00 47.8
	S	N	10 58
	SS	N	15 56
	SSS	N	19 48
	L	E	26 50
	P: N,W,D		
	Mag. 7 (Mat.)		
	38.6 N., 28.4 E.		
	Turkey.		
	h: 9 km.		
	H= 01 48 30.4		USCGS
28.	iP	NEZ	03 08 05.8
	S	NE	50
	P: S,E,D		
	33.3 N., 140.3 E.		
	South of Honshu, Japan.		
			(cont.)

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Date	Phase	Comp.	Time(GMT) h m s	
	h: 78 km.			
	H= 03 07 09.6			USCGS
28.	X	N	05 39 40	
28.	P	Z	06 25 37	
28.	P	Z	07 28 19	
	S	N	37	
28.	P	Z	09 27 34	
	S	NE	30 09	
	22.6 N., 142.9 E.			
	Volcano Is.			
	h: 169 km.			
	H= 09 24 15.8			USCGS
28.	PKP	Z	11 31 09	
	25.9 S., 70.2 W.			
	Near coast of Northern Chile.			
	h: 49 km.			
	H= 11 11 15.0			USCGS
28.	L	NZ	11 45 56	
	4.3 N., 128.0 E.			
	North of Halmahera.			
	h: 65 km.			
	H= 11 32 18.9			USCGS
28.	eP	Z	15 32 12	
	S	NZ	42 46	
	SS	E	48 36	
	X	Z	53 30	
	L	Z	57 30	
	Mag. $5\frac{3}{4}$ - 6 (Mat.)			
	31.5 N., 114.3 W.			
	Gulf of California.			
	h: N.			
	H= 15 19 40.4			USCGS
28.	L	N	22 41 44	
28.	iP	NEZ	23 50 24.0	
	S	NE	51 00	
	P: N,W,C			
29.	P	Z	06 16 57	
	eS	N	23 10	
	L	N	25 50	
29.	P	Z	07 06 32	
	S	N	10 24	
29.	P	Z	09 28 46	
	S	E	39 16	
	SS	E	45 30	
	SSS	E	49 54	
	Lq	N	52 30	
			(cont.)	

Date	Phase	Comp.	Time(GMT) h m s	
	Lr	E	10 02 00	
	Mag. $6\frac{3}{4}$ - 7 (Mat.)			
	12.0 N., 41.2 E. Ethiopia.			
	h: N.			
	H= 09 15 54.1			USCGS
29.	P	Z	11 20 22	
	12.0 N., 41.2 E.			
	Ethiopia.			
	h: N.			
	H= 11 07 30.0			USCGS
29.	S	E	11 28 16	
	Lq1	E	33 30	
	L	E	37 00	
	Lq2	N	41 00	
	L	N	52 20	
	Mag. $6\frac{1}{2}$ - $6\frac{3}{4}$ (Mat.)			
	12.0 N., 41.3 E.			
	Ethiopia.			
	h: 4 km.			
	H= 11 04 47.9			USCGS
29.	iP	Z	11 45 24.5	
	P: D			
29.	P	Z	12 08 52	
	6.3 S., 146.8 E.			
	East New Guinea region.			
	h: 68 km.			
	H= 12 00 55.0			USCGS
29.	iP	Z	14 00 48.1	
	P: C			
	10.4 N., 56.8 E.			
	Carlsberg ridge.			
	h: N.			
	H= 13 48 57.6			USCGS
29.	P	Z	14 54 17	
	S	NE	50	
29.	eP	Z	20 57 08	
	eS	N	48	
30.	P	Z	07 17 36	
	X	N	18 54	
	4.5 N., 128.0 E.			
	North of Halmahera.			
	h: 70 km.			
	H= 07 11 04.3			USCGS
30.	P	NZ	08 01 42	
	S	Z	06 36	
	Lq	E	07 48	
	Lq	Z	09 00	
	Mag. $5\frac{3}{4}$ - 6 (Mat.)			
	4.4 N., 128.0 E.			(cont.)

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Date	Phase	Comp.	Time(GMT) h m s	
	North of Halmahera.			
	h: N.			
	H= 07 55 07.5			USCGS
30.	iP	Z	08 52 49.7	
	iP	N	50.0	
	P: C			
30.	P	Z	21 03 31	
	L	E	11 00	
	4.7 N., 127.6 E.			
	Talaud Is.			
	h: 61 km.			
	H= 20 56 59.2			USCGS
30.	P	Z	21 49 11.5	
	S	NE	28	
	P: C			
30.	P	Z	23 28 33	
	S	N	29 09	
31.	P	Z	07 28 22	
	S	E	38 44	
	SS	E	44 56	
	Lq	E	51 30	
	Lr	E	56 44	
	P: N,W,D			
	Mag. 7 - 7¼ (Mat.)			
	27.7 N., 34.0 E.			
	Red Sea.			
	h: N.			
	H= 07 15 54.4			USCGS
31.	P	Z	08 03 52	
31.	P	Z	12 01 50	
	S	N	02 33	
31.	iP	NEZ	19 26 34.5	
	S	Z	27 30	
	ScS	NEZ	39 36	
	P: N,W,D			
	Mag. 6.5 (Pas.)			
	38.3 N., 134.5 E.			
	Sea of Japan.			
	h: 417 km.			
	H= 19 25 27.2			USCGS
31.	P	Z	20 23 41	
	23.2 N., 142.7 E.			
	Volcano Is. region.			
	h: N.			
	H= 20 20 25.0			USCGS
31.	eP	Z	20 26 00	
	31.0 N., 140.6 E.			
	South of Honshu, Japan.			

(cont.)

Date	Phase	Comp.	Time(GMT) h m s	
	h: 100 km.			
	H= 20 25 38.1			USCGS
31.	P	Z	20 27 06	
	S	N	28 19	

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te	Phase	Comp.	Time(GMT) h m s	
1.	iP	Z	02 05 58.6	
	iP	E	58.8	
	P	N	59.0	
	iS	Z	06 20.4	
	iS	E	20.6	
	iS	N	20.7	
	P: E,D			
1.	iP	N	05 03 17.8	
	iP	EZ	18.2	
	iX	N	30	
	S	N	50	
	iX	Z	04 01.2	
	P: N,E,D			
	37.3 N., 141.4 E.			
	Near east coast of Honshu, Japan.			
	h: N.			
	H= 05 02 35.2			USCGS
1.	P	Z	13 16 46.0	
	P	NE	46	
	iS	NE	17 08.4	
	S	Z	09	
	P: D			
1.	eP	Z	13 35 31	
	eP	NE	32	
	eX	N	36 05	
1.	eP	NZ	17 33 48	
	eP	E	50	
1.	eP	Z	20 15 10	
	eP	N	11	
	X	Z	33	
	eS?	N	39	
1.	P	NZ	20 38 51	
	1.7 S., 100.0 E.			
	Southern Sumatra.			
	h: N.			
	H= 20 29 42.0			USCGS
1.	eP	Z	20 54 30	
	P	N	31	
	L	N	21 01 28	
	L	E	52	
	L	Z	02 00	
	Mag. 4¾ - 5 (Mat.)			
	56.6 N., 163.8 E.			
	Near east coast of Kamchatka.			
	h: 30 km.			
	H= 20 48 55.3			USCGS
1.	P Z, eP N		21 41 16	
	55.8 N., 161.3 W.			
	Alaska Peninsula.			

(cont.)

Date	Phase	Comp.	Time(GMT) h m s	
	h: 58 km.			
	H= 21 33 10.0			USCGS
2.	eP	NZ	02 56 03	
	eP	E	05	
	eS	E	57 21	
	eS	N	22	
	X	Z	24	
	30.6 N., 138.6 E.			
	South of Honshu, Japan.			
	h: 464 km.			
	H= 02 54 28.1			USCGS
2.	eP	NEZ	07 33 01	
	X	NZ	34 17	
	8.0 S., 110.4 E.			
	Java.			
	h: 105 km.			
	H= 07 24 06.4			USCGS
2.	eL	N	13 02.0	
	9.7 N., 93.9 E.			
	Nicobar Is. region.			
	h: N.			
	H= 12 36 38.2			USCGS
2.	iP	NEZ	15 24 34.8	
	S	NE	25 00	
	P: S,E,D			
2.	iP	Z	17 32 51.1	
	eP	NE	51	
	eS	E	33 48	
	eS	N	49	
	P: D			
2.	eP	NZ	19 36 19	
	X	E	22	
	eS	N	41 06	
	eS	E	08	
	L	E	42 06	
	L	Z	44	
	Mag. 5 - 5¼ (Mat.)			
	13.3 N., 121.2 E.			
	Mindoro, P.I.			
	h: 13 km.			
	H= 19 30 27.3			USCGS
2.	iP	NZ	21 31 26.6	
	iP	E	26.7	
	iS	EZ	43.2	
	iS	N	43,3	
	P: S,E,D			
3.	iP	NZ	00 20 29.8	
	iP	E	30.0	
	S	NE	30 09	
	P: N,W,C			

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	33.8 N., 139.7 E.		
	South of Honshu, Japan.		
	h: 137 km.		
	H= 00 28 40.9		USCGS
3.	eP	NZ	02 34 57
	X	E	35 03
3.	P	NE	04 16 26
	iP	Z	26.3
	P: D		
	7.2 S., 128.9 E.		
	Banda Sea.		
	h: 107 km.		
	H= 04 08 25.2		USCGS
3.	P	NEZ	07 10 39
	S	E	11 06
	S	N	07
3.	P	NZ	11 17 59
	P	E	18 00
	X	N	35
	31.3 N., 141.5 E.		
	South of Honshu, Japan.		
	h: N.		
	H= 11 16 30.9		USCGS
3.	P	NZ	12 21 48
	P	E	49
	L	Z	34 30
	eL	E	46
3.	iP	Z	14 20 09.1
	iP	E	09.3
	iP	N	09.4
	iS	E	34.6
	eS	NZ	35
	P: S,W,D		
3.	iP	Z	15 10 35.6
	iP	N	36.5
	iP	E	36.8
	eS	N	16 50
	eS	EZ	52
	L	E	19 56
	L	NZ	20 16
	P: S,E,C		
	Mag. $5\frac{1}{4}$ - $5\frac{1}{2}$ (Mat.)		
	6.5 S., 130.5 E.		
	Banda Sea.		
	h: 40 km.		
	H= 15 02 35.1		USCGS
3.	eP	NZ	15 57 04
	eP	E	06
3.	iP	Z	16 34 14.2
			(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	iP	NE	16 34 14.3
	X	E	35 26
	P: N,E,C		
3.	eP	N	17 43 26
	eP	Z	27
3.	iP	Z	17 53 31.4
	eP	N	32
	iX	Z	43
	iS	N	51.7
	iX	NZ	55
	P: D		
3.	eP	Z	18 41 17
	eP	N	18
	eS	N	46
3.	eP	NZ	19 13 01
	52.9 N., 159.6 E.		
	Off east coast of Kamchatka.		
	h: N.		
	H= 19 08 05.8		USCGS
3.	eP	NZ	19 27 20
	eS	N	32 48
	L	E	35 06
	L	N	10
	L	Z	36 40
	Mag. $5\frac{1}{4}$ - $5\frac{1}{2}$ (Mat.)		
	3.8 N., 128.1 E.		
	North of Halmahera.		
	h: 30 km.		
	H= 19 20 46.7		USCGS
3.	P	Z	22 24 54
	P	N	55
	X	N	25 11
	S	N	35 08
	X	E	24
	SS	NEZ	41 24
	Lr	NZ	53 00
	iX	NZ	23 06.0
	Mag. $5\frac{3}{4}$ - 6 (Mat.)		
	40.7 N., 19.9 E.		
	Albania.		
	h: N.		
	H= 22 12 23.8		USCGS
4.	eP	NEZ	02 45 52
	eS	Z	46 23
	X	N	34
4.	eP	NEZ	02 50 43
	eS	NE	51 09
4.	P	NZ	03 49 07
	P	E	08

Date	Phase	Comp.	Time(GMT) h m s
4.	iP	EZ	07 02 47.7
	iP	N	47.8
	S	NE	03 14
	P: S,E,D		
4.	iP	NZ	08 51 13.8
	P	E	19
	iX	N	55 34
	S	NEZ	56 08
	L	N	57 20
	L	E	32
	L	Z	58 30
	P: S,D		
	Mag. 5¾ (Mat.)		
	51.2 N., 173.7 E.		
	Near Is., Aleutian Is.		
	h: N.		
	H= 08 45 18.7		USCGS
4.	iP	Z	09 54 17.6
	iP	NE	17.8
	iS	E	43.7
	eS	Z	44
	S	N	45
	P: N,W,D		
4.	iP	Z	10 41 02.3
	iP	E	02.4
	iP	N	02.6
	iS	Z	23.9
	iS	E	24.0
	iS	N	24.3
	P: S,W,D		
4.	iP	Z	14 00 42.0
	eP	E	42
	iP	N	42.4
	iX	N	49
	iX	Z	50
	iX	N	55
	S	E	04 22
	S	Z	26
	S	N	40
	L	N	06 00
	L	Z	30
	L	E	46
	L	NE	09.0
	P: N,D		
	Mag. 5¾ (Mat.)		
	22.9 N., 120.0 E.		
	Taiwan.		
	h: 46 km.		
	H= 13 56 03.2		USCGS
4.	P	NZ	16 29 25
	eP	E	26
	24.4 N., 109.8 W.		
	Gulf of California.		
	h: 31 km.		(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	H= 16 16 17.2		USCGS
4.	iP	Z	17 23 23.8
	iP	NE	24.0
	S	NE	54.0
	P: S,E,D		
4.	iP	NEZ	23 03 07.8
	iX	Z	22
	P: S,W,C		
	54.5 N., 169.4 E.		
	Komandorsky Is.		
	h: 27 km.		
	H= 22 57 16.8		USCGS
5.	S	E	02 41 56
	X	E	48 00
	L	N	55 00
	L	E	44
	Lr	Z	03 03 00
	Mag. 6½ - 6¾ (Mat.)		
	12.2 N., 41.2 E.		
	Ethiopia.		
	h: 27 km.		
	H= 02 18 29.9		USCGS
5.	P	Z	03 51 14
	S	NE	56 32
	3.4 N., 125.4 E.		
	Talaud Is.		
	h: 150 km.		
	H= 03 44 36.7		USCGS
5.	eP	Z	04 10 50
	3.4 N., 128.2 E.		
	North of Halmahera.		
	h: 55 km.		
	H= 04 04 10.8		USCGS
5.	eP	Z	07 06 33
	X	Z	07 37
	X	E	41
	X	N	46
	L	E	33 00
	L	N	34 00
	Lr	Z	41 00
	54.7 S., 143.8 E.		
	West of Macquarie I.		
	h: N.		
	H= 06 53 39.2		USCGS
5.	iP	Z	16 46 38.2
	iP	NE	38.9
	P: N,E,C		
5.	PP	Z	23 47 00
	iX	E	54 00
	PS	EZ	58 16
			(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	SS	NEZ	00 04 00
	L	N	17 00
	L	Z	18 00
	L	E	19 00
	Lr	EZ	23 52
	Lr	N	24 39
	Mag. 6¾ (Mat.)		
	1.2 N., 85.2 W.		
	Off coast of Ecuador.		
	h: 31 km.		
	H= 23 26 11.5		USCGS
5.	iP	Z	00 08 03.2
	P	N	04
	eS	N	36
	iX	E	44
	P: C		
6.	iP	NEZ	00 47 46.0
	S	E	48 11
	P: S,E,D		
6.	iP	Z	04 01 55.7
	iP	E	56.0
	iP	N	56.4
	eS	NE	12 12
	L	NEZ	29 00
	P: S,W,D		
	Mag. 5¾ - 6 (Mat.)		
	38.5 N., 26.4 E.		
	Aegean Sea.		
	h: 14 km.		
	H= 03 49 33.5		USCGS
6.	eP	Z	09 56 09
	eS	N	10 00 32
	L	N	01 00
	L	E	24
	eL	Z	40
	13.3 N., 122.5 E.		
	Luzon , P.I.		
	h: 18 km.		
	H= 09 50 09.2		USCGS
6.	eS	NEZ	17 15 12
	SS	NEZ	21 00
	L	NE	31.0
	Lr	Z	35.0
	Mag. 5¾ - 6 (Mat.)		
	12.0 N., 41.1 E.		
	Ethiopia.		
	h: 20 km.		
	H= 16 51 45.5		USCGS
6.	iP	EZ	17 46 20.8
	iP	N	21.0
	S	NE	46
	P: N,W,D		

Date	Phase	Comp.	Time(GMT) h m s
6.	eP	E	20 20 11
	eP	NZ	13
	S	NE	51
7.	P Z, eP N		03 46 20
	X	E	23
	iX	NE	47 05
	iX	NZ	48
	eS	NE	51 40
	L	Z	53 20
	L	E	32
	L	N	54 06
	Lr	Z	55 32
	Mag. 5½ - 5¾ (Mat.)		
	4.4 N., 127.9 E.		
	Talaud Is.		
	h: 70 km.		
	H= 03 39 47.7		USCGS
7.	eP	Z	05 21 12
	16.2 S., 177.8 E.		
	Fiji Is.		
	h: 62 km.		
	H= 05 10 40.3		USCGS
7.	P	Z	09 46 38
	P	N	39
	iP	E	39.5
	54.7 N., 162.3 E.		
	Near east coast of Kamchatka.		
	h: 64 km.		
	H= 09 41 23.5		USCGS
7.	iP	NZ	10 55 35.6
	iP	E	36.3
	iX	Z	38.6
	S	N	49
	iX	E	51.4
	iX	N	51.8
	P: S,E,D		
7.	iP	Z	11 34 10.0
	iP	NE	10.4
	S	E	36
	S	N	38
	P: N,W,D		
7.	iP	NZ	18 41 58.4
	iP	E	58.8
	iX	N	42 20
	S	E	43 23
	P: N,W,D		
	42.2 N., 142.4 E.		
	Hokkaido, Japan.		
	h: N.		
	H= 18 40 19.4		USCGS

ate	Phase	Comp.	Time(GMT) h m s
7.	P	NZ	20 34 05
	P	E	06
	PP	NE	35 44
	PPP	E	36 09
	S	NEZ	40 12
	Lq	E	43 12
	L	N	49 10
	Lr	Z	50 44
	Mag. 5¾ - 6 (Mat.)		
	76.5 N., 130.8 E.		
	Laptev Sea.		
	h: N.		
	H= 20 26 29.9		USCGS
8.	eP	NEZ	06 38 13
	eS	N	58
8.	P	Z	09 35 18
	P	E	19
	iP	N	19.6
	iX	Z	29
	S	N	36 02
	S	E	05
8.	iP	NEZ	10 21 15.4
	S	N	22 24
	iX	E	29
	P: N,E,D		
	40.2 N., 143.1 E.		
	Off east coast of Honshu, Japan.		
	h: 57 km.		
	H= 10 19 54.7		USCGS
8.	iP	NZ	10 28 53.0
	iP	E	53.4
	iX	Z	29 18
	S?	N	34 44
	L	NE	37 10
	L	Z	20
	L	Z	39 10
	P: N,W,C		
	1.4 N., 126.3 E.		
	Molucca Passage.		
	h: 69 km.		
	H= 10 21 52.3		USCGS
8.	iP	NEZ	19 03 14.4
	X	N	04 30
	iX	E	42
	S	N	54
	P: S,W,C		
	41.9 N., 145.7 E.		
	Hokkaido, Japan.		
	h: 35 km.		
	H= 19 01 17.3		USCGS
8.	iP NE, P Z		22 57 00.0
			(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	S	N	22 57 26
	iS E, S Z		27.5
	iX	Z	34
	P: N,E		
9.	iP	NEZ	12 57 50.5
	iS N, S E		58 08.1
	P: S,W,C		
	Mag. 5.8 (Mat.)		
	36.8 N., 139.6 E.		
	Honshu, Japan.		
	h: 116 km.		
	H= 12 57 24.8		USCGS
9.	iP	EZ	14 44 00.6
	iP	N	00.8
	eS	N	45 23
	iX	N	55
	P: S,E,C		
9.	P	NEZ	16 36 45
	S	NE	37 28
10.	iP	Z	11 22 57.0
	P	NE	58
	P: D		
10.	iP	EZ	14 16 13.0
	iP	N	18.4
	iX	Z	25
	P: S,W,D		
	35.9 N., 135.5 E.		
	Southern Honshu, Japan.		
	h: 354 km.		
	H= 14 15 23.4		USCGS
10.	iP	NEZ	14 55 59.6
	iX	Z	57 29
	S	NEZ	33
	iScP	Z	15 04 12.4
	iScS	N	07 45.5
	iScS	E	47.0
	eScS	Z	48
	P: N,W,D		
	Mag. 5.8 (Mat.)		
	42.0 N., 130.9 E.		
	E. Russia - N.E. China border region.		
	h: 555 km.		
	H= 14 54 03.9		USCGS
10.	P	Z	22 01 10.4
	P	NE	11
	iX	NEZ	15.7
	S	NE	04 17
	L	Z	05 22
	P: C		
	25.8 N., 124.9 E.		
	North of Taiwan.		(cont.)

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Date	Phase	Comp.	Time(GMT) h m s
	h: 141 km.		
	H= 21 57 40.4		USCGS
10.	P	Z	23 59 24
	P	N	25
	iX	E	27
	iX	E	44
	iX	N	45
	iX	N	00 00 00
11.	eP	Z	04 20 45
	L	Z	48 10
11.	eL	Z	06 33 08
11.	P	Z	09 56 29
	29.5 S., 176.8 W.		
	Kermadec Is.		
	h: 44 km.		
	H= 09 44 35.6		USCGS
11.	P	NEZ	13 13 23
	iX	E	14 05
11.	eP	Z	14 08 28
	eL	Z	28 30
11.	iP	NEZ	17 24 18.4
	S	E	40
	iS	NZ	41.4
	P: N,E,D		
11.	P	Z	19 38 43
	29.5 S., 176.8 W.		
	Kermadec Is.		
	h: 43 km.		
	H= 19 26 48.2		USCGS
11.	P	Z	23 52 10
	1.3 N., 126.4 E.		
	Molucca Passage.		
	h: 53 km.		
	H= 23 45 04.4		USCGS
12.	iP	EZ	06 53 06.1
	iP	N	06.4
	iS	E	33.6
	P: S,E,D		
12.	eP	Z	09 13 39
	X	Z	14 05
	SS	NE	23 16
	L	Z	26 28
	4.9 S., 151.5 E.		
	New Britain.		
	h: 134 km.		
	H= 09 05 49.6		USCGS

Date	Phase	Comp.	Time(GMT) h m s
12.	iP	NEZ	09 30 13.2
	S	N	35
	P: N,C		
12.	P	Z	09 55 35
	S	N	56 31
	iX	E	32.4
	eX	N	10 00 24
12.	P	Z	10 51 12
	eS	E	55 44
	L	N	58 18
	10.2 N., 126.3 E.		
	Philippine Is.		
	h: 11 km.		
	H= 10 45 16.9		USCGS
12.	P	Z	18 34 12
	eS	N	31
12.	P	Z	19 47 51
	S	N	48 32
	iX	Z	36
12.	eLq	E	21 11 28
	Lr	E	18 24
	Lr	Z	20 30
	45.3 N., 25.0 E.		
	Rumania.		
	h: 8 km.		
	H= 20 38 39.6		USCGS
13.	iP	EZ	00 18 46.0
	S	N	19 23
	P: E,D		
13.	eP	Z	05 47 27
	eS	N	51 30
	19.3 N., 120.8 E.		
	Philippine Is.		
	h: 35 km.		
	H= 05 42 22.1		USCGS
13.	iP	NEZ	10 28 54.0
	eS	N	30 07
	P: N,D		
13.	P	Z	13 15 04
	iX	EZ	11
	eS	N	17 00
	eL	NE	12
	L	Z	18 00
	29.3 N., 129.5 E.		
	Ryukyu Is.		
	h: 41 km.		
	H= 13 12 37.1		USCGS

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Date	Phase	Comp.	Time(GMT) h m s	
13.	iP	NEZ	13 46 56.6	
	S	N	47 14	
	iX	E	18	
	P: S,E,D			
13.	P	Z	14 02 27.0	
	iX	NEZ	27.4	
	iS	NE	03 28.4	
	iX	Z	32	
	P: C			
	32.6 N., 136.2 E.			
	Southeast of Shikoku, Japan.			
	h: 446 km.			
	H= 14 01 08.5			USCGS
13.	P	EZ	14 59 22	
	S	N	15 00 05	
	iX	E	06.6	
	iX	Z	08	
13.	P	Z	15 34 16	
	iX	N	24	
	S	NE	41 50	
	SS	N	45 36	
	Lq	N	47 32	
	Lr	N	49 20	
	Lr	E	50 27	
	L	Z	52 13	
	L	E	54 26	
	L	Z	55 52	
	Mag. $6\frac{1}{4}$ - $6\frac{1}{2}$ (Mat.)			
	17.9 N., 80.6 E.			
	India.			
	h: N.			
	H= 15 24 55.6			USCGS
13.	P	NZ	17 13 02	
	iX	E	03.6	
	S	N	43	
14.	P	Z	17 33 02	
14.	eP	Z	15 34 13	
14.	iP	NEZ	23 41 01.6	
	PP	Z	43 12	
	iX	Z	46 24	
	S	N	47 13.0	
	L	E	50 00	
	L	Z	40	
	P: N,E,C			
	Mag. $6\frac{1}{2}$ - $6\frac{3}{4}$ (Mat.)			
	6.1 S., 129.9 E.			
	Banda Sea.			
	h: 152 km.			
	H= 23 33 15.4			USCGS
14.	eP	Z	03 05 34	
	iX	Z	06 09	

Date	Phase	Comp.	Time(GMT) h m s	
14.	P	Z	07 09 04	
	iX	Z	10 16	
	eS	N	16 24	
	5.2 S., 104.3 E.			
	Southern Sumatra.			
	h: 102 km.			
	H= 07 00 01.7			USCGS
14.	P	Z	07 14 03	
14.	iP	NZ	09 33 49.0	
	S	NEZ	34 05.2	
	P: S,W,D			
14.	P	Z	13 24 26	
	L	N	49 16	
	eL	Z	54 00	
	27.8 N., 54.7 E.			
	Southern Iran.			
	h: 44 km.			
	H= 13 13 21.8			USCGS
14.	P	Z	18 06 56	
14.	iP	Z	18 10 00.6	
	S	NEZ	11.0	
	P: C			
14.	P	Z	19 45 42	
	iX	Z	43.4	
	S	EZ	46 05.4	
14.	P	Z	20 01 46	
	iX	Z	55	
14.	iP	NZ	21 27 56.8	
	S	NE	28 14.0	
	P: S,C			
15.	iP Z, P NE		02 02 46.6	
	eS	N	03 52	
	X	Z	04 08	
	P: C			
15.	P	Z	17 17 24	
	iX	N	33	
	eS	N	18 30	
15.	iP	NEZ	17 32 17.2	
	iX	NE	33 20	
	S	EZ	29	
	P: S,W,C			
	Mag. 5.9 (Mat.)			
	39.8 N., 143.4 E.			
	Off east coast of Honshu, Japan.			
	h: 20 km.			
	H= 17 30 55.8			USCGS

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Date	Phase	Comp.	Time(GMT) h m s
15.	iP	Z	17 41 55.0
	eS	NE	43 24
	P: C		
15.	iP	NZ	17 59 00.3
	iX	E	00.8
	eS	N	18 00 05
	P: S,C		
15.	P	Z	22 23 00
	PcP	Z	24 17
	epP	Z	52
	S	NEZ	29 16
	5.9 S., 113.2 E.		
	Java Sea.		
	h: 575 km.		
	H= 22 15 09.6		USCGS
16.	eP	Z	01 24 49
	3.6 S., 151.2 E.		
	New Ireland.		
	h: N.		
	H= 01 16 59.6		USCGS
16.	P	Z	01 30 30
	PP	Z	32 10
	S	N	36 48
	L	E	40 08
	L	N	42 08
	Lr	Z	30
	Mag. 7 (Mat.)		
	3.5 S., 151.0 E.		
	New Ireland.		
	h: 39 km.		
	H= 01 22 47.5		USCGS
16.	P	Z	07 58 02
	iS	E	27.5
16.	iP Z, P N		08 32 55.2
	S	E	33 12
	P: C		
16.	eX	E	09 09 40
	eL	NZ	11 40
16.	PKP1	Z	09 47 12
	PKP2	Z	20
	16.6 S., 73.7 W.		
	Near coast of Peru.		
	h: 56 km.		
	H= 09 27 37.4		USCGS
16.	iP	NEZ	12 29 09.8
	ePP	Z	31 57
	ePPP	Z	32 48
	S	Z	36 40
	iX	N	50

(cont.)

Date	Phase	Comp.	Time(GMT) h m s
	SS	N	12 40 32
	L	EZ	43 04
	P: N,W,C		
	13.6 S., 166.9 E.		
	New Hebrides Is.		
	h: 153 km.		
	H= 12 19 40.1		USCGS
16.	P	Z	12 59 29
	S	N	13 00 15
	iX	E	20
16.	P	Z	15 14 51
	eS	E	16 17
16.	iP	NEZ	20 00 02.0
	S	NE	13
	P: S,W,D		
16.	iP	NEZ	21 33 18.8
	S	E	45
	P: N,W,D		
16.	iP	Z	22 43 09.6
	eL	E	23 38 00
	P: C		
	44.4 N., 149.4 E.		
	Kurile Is.		
	h: N.		
	H= 22 40 22.1		USCGS
16.	eP	Z	23 33 31
	eL	E	00 02 36
	35.3 N., 27.8 E.		
	Dodecanese Is.		
	h: 45 km.		
	H= 23 21 04.9		USCGS
17.	iP	NEZ	04 00 10.6
	S	N	32
	P: E,C		
17.	iP	Z	04 57 33.3
	P	NE	33.6
	S	N	58 32
	iX	Z	55
	P: S,W,C		
	Mag. 5.8 (Mat.)		
	39.5 N., 143.4 E.		
	Off east coast of Honshu, Japan.		
	h: 33 km.		
	H= 04 56 15.9		USCGS
17.	iP	NZ	12 54 23.0
	P	E	23.5
	eX	N	32
	P: S,E,C		
	55.2 N., 167.0 E.		

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