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LAMONT GEOLOGICAL OBSERVATORY
COLUMBIA UNIVERSITY

PALISADES, NEW YORK

SEISMOLOGICAL BULLETIN

By

RUTH B. SIMON

1 January 1962 - 30 June 1962

L.G.O. Contribution No. 600

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STATION CONSTANTS

Latitude:	41° 00' 25" North
Longitude:	73° 54' 31" West
Elevation:	102.59 meters
Bedrock:	Palisades disbase Triassic Age

Abbreviations

i = sudden beginning of the motion (impetus)
e = gradual beginning of the motion (emersio)
Comp. = compression
Dil. = dilatation

All times are G. C. T.
Time - I. B. M. Invar pendulum clock corrected by Naval Observatory time signals every six hours.

INSTRUMENTS

Three component Columbia University seismographs, To = 12 sec., Tg = 15 sec.

Three component Benioff seismographs. Short-period, To = 1 sec., Tg = 0.2 sec. Long-period, To = 1 sec., Tg = 75 sec.

One Columbia University vertical seismograph, To = .33 sec., Tg = 0.2 sec.

Three component Columbia University visual recording seismographs, To = 12 sec.

One Columbia University vertical seismograph for visual recording, To = 1 sec.

Three component Columbia University long-period seismographs, To = 15 sec., Tg = 75 sec.

Three component Columbia University long-period seismographs, To = 30 sec., Tg = 100 sec.

Three component Columbia University long-period seismographs, To = 30 sec., Tg = 100 sec. P_2. Filter galvanometers of 6.7 sec. are in operation from October through May.

Two Columbia University microbarographs, To = 10 sec., Tg = 75 sec.

Beginning with this Bulletin, readings are reported only for P, S, PKP, and SKS. Many earthquakes for which other phases and surface waves have been recorded at Palisades are not reported here.

Date	Phase	h	m	s
Jan 2	eS	00	00	25
	eLR (NNW)	00	12	29
	Aleutians			
	USCGS 23 40 20.3			
	52.4°N 177.78°E			
	Depth 27 km Dist. 48.4°			
2	eP	12	30	39
	eS	12	39	29
	eLR (N)	12	46	39
	Svalbard Region			
	USCGS 12 22 58.7			
	80.0°N 24.3°E			
	Depth 48 km Dist. 51.3°			
3	eS	18	13	17
	eLQ	18	22	09
	eLR (NW)	18	26	39
	Aleutians			
	USCGS 17 53 05.3			
	52.2°N 177.5°E			
	Depth 68 km Dist. 68.4°			
4	eP	04	49	41
	eSKS	04	59	29
	eLQ	05	17	39
	eLR (NW)	05	22	09
	Shikoku, Japan			
	USCGS 04 35 42.6			
	33.9°N 135.2°E			
	Depth 56 km Dist. 100.7°			
	Mag. 5-1/2 - 5-3/4			
7	eS	10	22	31
	eLQ	10	31	09
	eLR (NE)	10	34	09
	Yugoslavia			
	USCGS 10 03 12.8			
	43.4°N 17.4°E			
	Depth 32 km Dist. 64.2°			
8	iP	01	05	25
	(P(Z) 6 sec 3μ dil from S)			
	iS	01	09	26
	eLR (S)	01	10	38
	S. Coast Dominican Republic			
	USCGS 01 00 24.2			
	18.5°N 70.5°W			
	Depth 63 km Dist. 22.3°			
	Mag. 6			
8	eP	02	10	28
	eS	02	14	24
	Dominican Republic			
	USCGS 02 05 21.1			
	18.5°N 70.6°W			
	Depth 50 km Dist. 22.3°			
8	eS	22	20	50
	eLR (SW)	22	24	26
	Nicaragua USCGS 22 09 00.5			
	12.1°N 85.7°W			
	Depth 104 km Dist. 30.8°			
Jan 9	eP	12	53	55
	epP	12	54	05
	eSKS	13	04	26
	eLQ	13	19	36
	eLR (NW)	13	23	46
	Hokkaido, Japan			
	USCGS 12 40 49.3			
	42.9°N 144.8°E			
	Depth 78 km Dist. 89.3°			
10	eS	06	42	30
	eLR (NW)	06	48	06
	Off Coast Oregon			
	USCGS 06 28 40.5			
	44.3°N 128.8°W			
	Depth 25 km Dist. 40.0°			
	Mag. 4-3/4			
11	eP	05	15	44
	eS	05	24	18
	eLQ	05	31	30
	eLR (ENE)	05	35	46
	Yugoslavia USCGS 05 05 01.6			
	43.5°N 17.7°E			
	Depth 25 km Dist. 64.3°			
	Mag. 5 - 5-1/4			
11	iP	06	50	00
11	eS	07	09	06
	eLQ	07	16	26
	eLR (NW)	07	23	26
	Aleutians USCGS 06 49 07.6			
	51.9°N 179.3°W			
	Depth 60 km Dist. 66.9°			
	Mag. 5-1/4			
12	eS	11	15	06
	eLQ	11	23	46
	eLR (NW)	11	25	46
	Rat Isls., Aleutians			
	USCGS 10 55 00.8			
	52.4°N 177.7°E			
	Depth 49 km Dist. 68.4°			
13	eP	04	59	37
	eLR (NW)	05	20	27
	Rat Isls, Aleutians			
	USCGS 04 48 37.3			
	52.3°N 177.4°E			
	Depth 49 km Dist. 68.8°			
16	eSKS	12	01	25
	eLQ	12	25	47
	eLR (WSW)	12	31	07
	Kermadec Isls.			
	USCGS 11 35 41.3			
	30.5°S 177.9°W			
	Depth 39 km Dist. 119.5°			
	Mag. 5-3/4 - 6			

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Date	Phase	h	m	s
Jan 17	ePKP	16	02	37
	eSKS	16	09	25
	eLR (NW)	16	35	37
	Molucca Passage			
	USCGS 15 43 18.3			
	3.9°N 126.6°E			
	Depth 74 km Dist. 131.3°			
26	eSKS	05	47	18
	eLQ	06	04	26
	eLR	06	10	36
	Honshu, Japan			
	USCGS 05 22 51.3			
	32.2°N 138.1°E			
	Depth 333 km. Dist. 101.6°			
26	eP	08	29	02
	eS	08	38	30
	eLQ	08	48	50
	eLR (ENE)	08	52	36
	Mediterranean Sea W. of Crete			
	USCGS 08 17 37.0			
	35.1°N 22.7°E			
	Depth 32 km Dist. 70.5°			
	Mag. 5 - 5-1/4			
27	eS	23	20	06
	eLQ	23	22	06
	eLR (WNW)	23	24	06
	Gulf of California			
	USCGS 23 07 42.1			
	31.0°N 114.3°W			
	Depth 22 km Dist. 33.6°			
	Mag. 5-1/4 - 5-1/2			
28	eS	05	34	36
	eLR (SW)	05	38	06
	Off Coast Guatemala			
	USCGS 05 22 55.7			
	14.0°N 92.3°W			
	Depth 133 km Dist. 31.2°			
28	eS	06	06	46
	eLQ	06	26	06
	eLR (W)	06	30	26
	Tonga Isls.			
	USCGS 05 40 08.2			
	17.2°S 172.0°W			
	Depth 25 km Dist. 106.9°			
30	eP	08	40	36
	epP	08	40	58
	eS	08	45	36
	eLQ	08	48	36
	eLR (SSW)	08	49	36
	Near Coast Nicaragua			
	USCGS 08 34 26.8			
	12.7°N 87.7°W			
	Depth 101 km Dist. 30.5°			
	Mag. 4-3/4 - 5			
Jan 30	eS	17	33	50
	eLQ	17	42	26
	eLR	17	45	36
	Laptav Sea			
	USCGS 17 15 33.8			
	79.4°N 123.5°E			
	Depth 63 km Dist. 58.8°			
Feb. 2	ePn	06	46	35
	ePg	06	47	12
	eSn	06	48	55
	eSg	06	49	31
	Lg	06	50	15
	Near New Madrid N. W. Tenn.			
	USCGS 06 43 28.8			
	36.3°N 89.4°W			
	Depth 25 km Dist. 12.8°			
2	eS	17	43	36
	eLQ	17	59	06
	eLR (NW)	18	03	06
	Kurile Isls. USCGS 17 20 11.1			
	43.7°N 148.5°E			
	Depth 49 km Dist. 86.9°			
2	eP	23	10	55
	eS	23	16	36
	eLR (WSW)	23	21	16
	Near W. Coast Mexico			
	USCGS 23 03 58.9			
	18.2°N 104.9°W			
	Depth 17 km Dist. 35.2°			
3	eP	00	54	18
	ePKP	00	57	10
	eSKS	01	04	18
	eLQ	01	34	06
	eLR (NW)	01	40	06
	eLR2 (SE)	02	26	06
	N. of New Guinea			
	USCGS 00 37 53.6			
	1.2°S 137.8°E Dist. 130.8°			
	Depth 17 km Mag. 6 - 6-1/4			
4	ePKP	03	14	14
	eLQ	03	56	06
	eLR (NW)	04	03	46
	Celebes			
	USCGS 02 54 42.1			
	4.6°S 119.0°E			
	Depth 89 km Dist. 142.3°			
4	iP	21	40	09
	epP	21	40	14
	eS	21	48	46
	eLQ	21	55	56
	eLR (SE)	21	58	36
	S. Atlantic Ocean			
	USCGS 21 29 33.2			
	0.5°S 20.2°W			
	Depth 17 km Dist. 64.3°			
	Mag. 5			

Date	Phase	h	m	s
Feb 7	eP	07	46	46
	Chile-Bolivia Border			
	USCGS 07 36 05.1			
	20.4°S 68.4°W			
	Depth 222 km Dist. 60.9°			
8	eSKS	12	15	34
	eLR1 (NW)	12	50	16
	eLR2 (SE)	13	35	46
	New Guinea			
	USCGS 11 49 13.9			
	3.2°S 141.3°E			
	Depth 87 km Dist. 130.8°			
	Mag. 5-1/2 - 5-3/4			
9	ePKP	22	10	32
	Celebes			
	USCGS 21 51 13.2			
	0.6°N 123.9°E			
	Depth 50 km Dist. 135°			
10	eP	19	37	15
	eS	19	41	52
	eLQ	19	42	22
	eLR (SSE)	19	43	46
	T	20	01	28
	Leeward Isls.			
	USCGS 19 31 56.2			
	17.9°N 62.2°W			
	Depth 70 km Dist. 25.1°			
11	eSKS	03	05	50
	eS	03	07	06
	eLR (N)	03	28	26
	Honshu, Japan			
	USCGS 02 42 36.1			
	29.6°N 139.0°E			
	Depth 400 km Dist. 103.1°			
11	eP	10	11	35
	Fox Isls., Aleutians			
	USCGS 10 01 24.8			
	52.0°N 168.0°W			
	Depth 50 km Dist. 60.0°			
11	eSKS	19	22	54
	eLQ	19	47	34
	eLR (NW)	19	53	16
	New Ireland Region			
	USCGS 18 55 32.0			
	4.5°S 153.5°E			
	Depth 100 km Dist. 124.2°			
	Mag. 6			
14	eP	06	48	00
	P(Z)12 sec 13.5 μ comp. fr. SSE)			
	iS	06	57	57
	eLQ	07	08	37
	eLR (SSE)	07	13	07
	Chile			
Feb 14	Continued			
	USCGS 06 36 01.3			
	38.1°S 73.1°W			
	Depth 44 km Dist. 78.6°			
	Mag. 6-3/4 - 7			
18	eP	14	20	14
	eS	14	21	02
18	eP	17	31	47
	P (Z) 6 sec 1.5 μ			
	epP	17	32	02
	eS	17	37	05
	eLR (SSE)	17	40	45
	N. Colombia			
	USCGS 17 25 17.3			
	8.1°N 74.6°W			
	Depth 70 km Dist. 32.9°			
	Mag. 5 - 5-1/4			
18	eP	23	33	31
	eS	23	40	33
	eLR (SW)	23	46	25
	Galapagos Islands			
	USCGS 23 25 20.1			
	0.6°S 91.7°W			
	Depth 43 km Dist. 44.9°			
19	eP	20	22	29
	epP	20	22	39
	eS	20	27	25
	eLR	20	31	45
	Off Coast Nicaragua			
	USCGS 20 16 03.6			
	11.7°N 88.1°W			
	Depth 39 km Dist 31.4°			
20	eP	16	18	00
	epP	16	18	38
	eSKS	16	29	21
	eLQ	16	44	45
	eLR (NW)	16	48	45
	Nr. Coast Hokkaido, Japan			
	USCGS 16 05 44.6			
	43.0°N 144.9°E			
	Depth 55 km Dist. 89.3°			
	Mag. 5-1/4 - 5-1/2			
27	eP	12	52	43
	(comp from S)			
	eS	13	02	41
	eLQ	13	14	03
	eLR (SSE)	13	19	03
	Nr. Coast Central Chile			
	USCGS 12 40 48.9			
	37.4°S 73.2°W			
	Depth 40 km Dist. 77.6°			
	Mag. 5-1/2			

19
09
29

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Date	Phase	h	m	s
Feb 28	eP	20	39	28
	eS	20	43	20
	T	20	55	12
	Nr. Coast Dominican Republic			
	USCGS 20 34 24.9			
	19.4°N 69.3°W			
	Depth 60 km Dist. 22.3°			
Mar 1	eP	02	22	13
	epP	02	22	32
	eS	02	30	33
	eLR	02	41	03
	S. Peru USCGS 02 12 37.2			
	15.7°S 74.4°W			
	Depth 62 km Dist. 56.7°			
2	eSKS	00	06	52
	eLQ	00	30	38
	eLR (NW)	00	36	20
	Samoa			
	USCGS 23 41 14.5 (1 Mar)			
	14.0°S 172.5°E			
	Depth 73 km Dist. 116.4°			
2	ePKP	13	22	13
	eSKS	13	29	14
	eLQ	13	58	04
	eLR (NW)	14	06	04
	Off S. Coast Mindanao P.I.			
	USCGS 13 02 59.0			
	5.4°N 126.5°E			
	Depth 30 km Dist: 130.4°			
4	eS	12	03	16
	eLQ	12	06	26
	eLR (WNW)	12	09	06
5	eS	02	03	47
	eLQ	02	06	07
	eLR (SW)	02	11	07
	250 mi S of Jalisco, Mexico			
	USCGS 01 50 50.6			
	16.0°N 104.9°W			
	Depth 25 km Dist. 36.6°			
7	iPKP	11	18	22
	eSKS	11	24	00
	Mariana Islands			
	USCGS 11 01 00.4			
	19.3°N 145.3°E			
	Depth 680 km Dist. 110.2°			
8	eSKS	21	11	49
	eLQ	21	24	09
	eLR (SE)	21	28	13
	Off Coast S. Chile			
	USCGS 20 48 38.1			
	44.9°S 79.4°W			
	Depth 25 km Dist. 85.7°			
Mar 11	eP	02	32	00
	epP	02	32	18
	eS	02	37	01
	eLQ	02	39	29
	eLR (SW)	02	40	09
	Guatemala			
	USCGS 02 26 05.7			
	14.8°N 91.2°W			
	Depth 206 km Dist. 29.8°			
	Mag. 4-1/4			
11	eP	15	34	49
	eS	15	43	19
	eLQ	15	52	09
	eLR (NW)	15	55	49
	Rat Isls., Aleutians			
	USCGS 15 23 40.7			
	52.3°N 178.0°E			
	Depth 135 km Dist. 68.4°			
11	ePKP	19	38	15
	epPKP	19	38	29
	eLQ	20	11	39
	eLR (N)	20	18	09
	Nr. E. Coast Mindanao, P.I.			
	USCGS 19 19 05.6			
	9.0°N 126.7°E			
	Depth 25 km Dist. 126.6°			
12	eP	09	48	16
	eS	09	53	45
	eLR (S)	09	57	29
	Costa Rica			
	USCGS 09 41 45.7			
	9.0°N 83.0°W			
	Depth 113 km Dist. 32.8°			
12	eP	11	46	55
	P(Z) 12 sec 7μ comp from SW			
	epP	11	47	01
	eS	11	52	31
	eLR (SSW)	11	55	09
	Nr. S. Coast Panama & Costa Rica			
	USCGS 11 40 12.8			
	8.1°N 83.0°W			
	Depth 58 km Dist. 33.8°			
	Mag. 6-1/4 - 6-1/2			
17	eP	19	11	37
	iP	19	11	40
	eLR	20	04	10
	Negros Isl., Philippines			
	USCGS 18 56 39.3			
	9.8°N 122.5°E			
	Depth 25 km Dist. 126.9°			

Date	Phase	h	m	s
Mar 17	iP	20	55	14
	P(Z) 14 sec 18μ dil from SE			
	eS	21	01	18
	eLR (SSE)	21	05	38
	N. Atlantic Ocean			
	USCGS 20 47 31.7			
	10.6°N 43.7°W			
	Depth 25 km Dist. 39.8°			
	Mag. 6-1/2			
18	eS	15	50	27
	eLQ	15	59	41
	eLR (NE)	16	02	41
	S. Albania USCGS 15 30 31.6			
	40.6°N 19.6°E			
	Depth 43 km Dist. 114.8°			
19	$ePKP_1$	06	13	29
	$ePKP_2$	06	13	42
	eLR (NW)	07	00	11
	Minahossa Peninsula, Celebes			
	USCGS 05 54 24.4			
	0.3°N 123.5°E			
	Depth 53 km Dist. 136.0°			
20	eS	10	16	01
	eLQ	10	18	41
	eLR (WSW)	10	20	47
	Gulf of California			
	USCGS 10 03 58.3			
	27.9°N 111.2°W			
	Depth 25 km Dist. 32.9°			
21	iPKP	23	16	23
	epPKP	23	18	42
	Java Sea			
	USCGS 22 57 51.2			
	5.9°S 113.0°E			
	Depth 631 km Dist. 144.6°			
22	iPKP	00	38	16
	epPKP	00	40	41
	eSKS	00	44	13
	Java Sea			
	USCGS 00 19 43.1			
	5.9°S 112.9°E			
	Depth 611 km Dist. 144.6°			
22	eP	00	54	31
	iPKP	00	56	08
	eLR (N)	01	35	13
	Java Sea			
	USCGS 00 37 36.8			
	6.0°S 113.0°E			
	Depth 595 km Dist. 144.6°			
22	eS	12	27	37
	eLQ	12	39	13
	eLR	12	43	13
	San Luis Prov., Argentina			
	USCGS 12 07 05.5			
Mar 22	Continued			
	32.2°S 66.9°W			
	Depth 249 km Dist. 72.9°			
24	ePKP	13	18	32
	eSKS	13	26	07
	eLR (NW)	14	00	37
	Nr. N. Coast New Guinea			
	USCGS 12 59 30.9			
	5.7°S 145.0°E			
	Depth 111 km Dist. 130.8°			
26	eP	12	15	32
	eS	12	24	08
	eLQ	12	31	18
	eLR (ESE)	12	33	48
	Mid Atlantic Ocean			
	USCGS 12 04 54.6			
	0.5°S 19.2°W			
	Depth 25 km Dist. 64.9°			
	Mag. 5 - 5-1/4			
26	eP	16	44	58
	epP	16	45	17
	eS	16	55	09
	eLQ	17	06	09
	eLR (SSE)	17	11	29
	Nr. Coast S. Chile			
	USCGS 16 32 43.6			
	40.6°S 73.3°W			
	Depth 32 km Dist. 81.6°			
	Mag. 5-1/4 - 5-1/2			
27	eP	21	26	03
	eS	21	31	40
	eLQ	21	34	10
	eLR (W)	21	35	40
	Guerrero, Mexico			
	USCGS 21 19 29.4			
	16.9°N 99.9°W			
	Depth 25 km Dist. 32.8°			
29	eP_n	15	00	48
	eP_g	15	00	53
	eS_g	15	01	34
	L_g	15	01	43
Apr 1	eS	05	25	56
	eLQ	05	43	10
	eLR (NW)	05	48	10
	Hokkaido, Japan			
	USCGS 05 01 56.0			
	41.9°N 143.4°E			
	Depth 55 km Dist. 90.9°			
2	eSKS	00	39	19
	eLQ	00	59	09
	eLR (N)	01	06	29
	Mariana Isls.			
	USCGS 00 14 50.4			

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Date	Phase	h	m	s
Apr 2	Continued			
	18.6°N 145.5°E			
	Depth 205 km Dist. 110.0°			
3	ePKP	16	44	34
	eLQ	17	15	24
	eLR (NW)	17	20	38
	Santa Cruz Isls			
	USCGS 16 24 55.6			
	10.6°S 164.9°E			
	Depth 36 km Dist. 120.5°			
	Mag. 5-1/2			
4	eP	14	09	17
	eS	14	14	50
	eLQ	14	17	22
	eLR (SSW)	14	19	18
	Nr. S. Coast Panama & Costa Rica			
	USCGS 14 02 32.2			
	8.0°N 83.0°W			
	Depth 23 km Dist. 33.9°			
	Mag. 5-1/2			
5	eS	03	58	08
	eLQ	04	06	18
	eLR (NW)	04	09	48
	Unimak Isl. Reg.			
	USCGS 03 40 08.9			
	53.7°N 163.6°W			
	Depth 65 km Dist. 58.2°			
5	eS	12	47	48
	eLQ	13	00	08
	eLR (SE)	13	06	18
	Near Coast S. Chile			
	USCGS 12 24 34.5			
	44.9°S 75.3°W			
	Depth 25 km Dist. 85.6°			
6	eP	17	02	08
	eS	17	11	58
	eLQ	17	22	48
	eLR (SW)	17	27	08
	Easter Isl. Reg.			
	USCGS 16 50 14.2			
	26.7°S 113.2°W			
	Depth 33 km Dist. 76.8°			
7	eSKS	06	47	38
	eLQ	07	09	38
	eLR (NW)	07	13	08
	Caroline Isls.			
	USCGS 06 21 38.4			
	10.0°N 144.4°E			
	Depth 50 km Dist. 118.4°			
	Mag. 5-1/2 - 5-3/4			

Date	Phase	h	m	s
Apr 7	eP	23	10	18
	eS	23	14	44
	eLQ	23	15	28
	eLR (SE)	23	16	58
	Windward Isls.			
	USCGS 23 04 12.2			
	15.0°N 60.5°W			
	Depth 77 km Dist. 28.2°			
	Mag. 4 - 4-1/4			
8	eP	21	57	08
	eS	22	02	42
	eLQ	22	05	18
	eLR (SW)	22	06	08
	Off Coast Mexico			
	USCGS 21 50 28.9			
	15.6°N 99.6°W			
	Depth 48 km Dist 31.9°			
9	ePKP	09	14	08
	eLQ	09	54	18
	eLR	10	02	38
	Sawoe Sea			
	USCGS 08 54 22.7			
	8.6°S 124.1°E			
	Depth 46 km Dist. 144.4°			
10	eP	04	47	24
	eS	04	56	24
	eLQ	05	05	28
	eLR (SSE)	05	09	08
	Chile-Argentine Border			
	USCGS 04 36 27.5			
	28.6°S 68.8°W			
	Depth 130 km Dist. 69.8°			
	Mag. 4-3/4 - 5			
10	ePn	14	31	36
	ePg	14	31	42
	eSn	14	32	21
	eLR (NNE)	14	33	00
	West Vermont			
	USCGS 14 30 46.4			
	44.1°N 73.1°W			
	Depth 25 km Dist. 317 km			
10	eP	21	48	20
	eS	21	57	24
	eLQ	22	04	48
	eLR (NE)	22	08	08
	Ionian Sea			
	USCGS 21 37 12.6			
	37.9°N 20.1°E			
	Depth 35 km Dist. 68.9°			
	Mag. 5 - 5-1/4			

Date	Phase	h	m	s
Apr 11	eS	11	07	44
	eLQ	11	17	52
	eLR (NE)	11	23	38
	Ionian Sea			
	USCGS 10 47 34.0			
	38.2°N 20.0°E			
	Depth 43 km Dist. 68.9°			
12	eP (comp from N)	01	06	00
	eSKS	01	16	36
	eLQ	01	32	38
	eLR (N)	01	37	38
	E. Coast Honshu, Japan			
	USCGS 00 52 47.0			
	38.2°N 142.3°E			
	Depth 68 km Dist. 94.8°			
	Mag. 6-3/4 - 7			
15	eP	18	56	36
	eS	19	05	53
	eLQ	19	15	09
	eLR (SE)	19	17	09
	Ascension Isl.			
	USCGS 18 45 17.4			
	2.9°S 11.9°W			
	Depth 25 km Dist 71.2°			
16	eSKS	13	44	23
	eLQ	14	01	09
	eLR (NW)	14	08	09
	Honshu, Japan 30.6°N 140.6°E			
	USCGS 13 20 15.1			
	Depth 176 km Dist. 101.4°			
17	eS	11	54	04
	eLQ	12	01	40
	eLR	12	05	50
	Ionian Sea			
	USCGS 11 33 51.0			
	37.8°N 19.9°E			
	Depth 25 km Dist. 68.9°			
17	eP	22	45	58
	eS	22	54	58
	eLQ	23	02	30
	eLR (ESE)	23	05	48
	Mid Atlantic Ocean			
	USCGS 22 34 56.7			
	1.5°S 14.9°W			
	Depth 25 km Dist 65.6°			
18	eP (comp. from SSE)	19	23	36
	epP	19	24	19
	eS	19	30	44
	eLQ	19	36	40
	eLR (SSE)	19	38	50
	Off Coast of Peru			
	USCGS 19 14 37.2			

Date	Phase	h	m	s
Apr 18	Continued			
	10.0°S 79.0°W			
	Depth 39 km Dist 50.9°			
	Mag. 5-3/4 - 6			
19	eS	02	35	12
	eLQ	02	38	40
	eLR (SSE)	02	43	10
	Off Coast Peru			
	USCGS 02 18 55.9			
	9.8°S 78.9°W			
	Depth 23 km Dist. 50.9°			
19	eP	23	26	59
	eS	23	35	51
	eLQ	23	43	31
	eLR (NW)	23	46	41
	Siberia, USSR			
	USCGS 23 16 04.1			
	69.8°N 138.6°E			
	Depth 0 Dist. 66.7°			
20	iP (dil from SSE)	05	52	34
	iS	05	56	23
	eLR (SSE)	05	57	51
	T (max)	06	10	51
	N. Coast Haiti			
	USCGS 05 47 55.3			
	20.6°N 72.2°W			
	Depth 25 km Dist 20.0°			
	Mag. 6			
22	eP	04	51	30
	epP	04	51	44
	eS	04	56	20
	eLR (SW)	04	59	32
	Chiapas, Mexico			
	USCGS 05 47 55.3			
	15.5°N 93.1°W			
	Depth 69 km Dist. 29.9°			
	Mag. 5-1/4 - 5-1/2			
23	eP	06	11	05
	iP (comp. from NNW)	06	11	11
	eSKS	06	21	33
	eS	06	21	56
	eLQ	06	36	42
	eLR (NNW)	06	40	42
	Hokkaido, Japan			
	USCGS 05 58 04.9			
	42.9°N 143.4°E			
	Depth 25 km Dist 89.9°			
	Mag. 7			
25	eP	16	00	43
	eSKS	16	11	17
	eLQ	16	28	33
	eLR (N)	16	34	33
	Honshu, Japan			

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Date	Phase	h	m	s
Apr 25	Continued			
	USCGS 15 47 29.4			
	38.4°N 142.5°E			
	Depth 56 km Dist. 94.4°			
26	eSKS	07	51	53
	Fiji Isls			
	USCGS 07 26 31.3			
	17.8°S 179.1°W			
	Depth 689 km Dist. 112.8°			
27	eP (dil)	07	00	01
	epP	07	00	19
	eS	07	10	33
	eLQ	07	22	13
	eLR (S)	07	27	33
	S. Chile			
	USCGS 06 47 27.0			
	44.4°S 74.8°W			
	Depth 31 km Dist. 84.6°			
28	eP	11	30	34
	eS	11	39	48
	eLQ	11	51	44
	eLR (ENE)	11	54	54
	Dodecanese Isls.			
	USCGS 11 18 57.4			
	36.4°N 26.6°E			
	Depth 40 km Dist. 74.5°			
	Mag. 5			
28	eP	12	55	23
	eS	13	05	02
	eLQ	13	16	14
	eLR (ENE)	13	16	14
	Dodecanese Isls.			
	USCGS 12 43 49.1			
	36.3°N 26.7°E			
	Depth 48 km Dist. 74.5°			
30	eP	02	39	44
	eSKS	02	50	18
	eLQ	03	06	14
	eLR (N)	03	06	14
	Honshu, Japan			
	USCGS 02 26 30.0			
	38.8°N 140.9°E			
	Depth 104 km Dist. 94.2°			
	Mag. 5-1/2			
30	ePKP	16	35	59
	eLQ	17	02	25
	eLR (W)	17	08	55
	Tonga Isls. Reg.			
	USCGS 16 16 47.8			
	17.9°S 176.1°W			
	Depth 26 km Dist. 110.6°			
	Mag. 5-3/4 - 6			

Date	Phase	h	m	s
May 1	eS	00	06	03
	eLQ	00	11	35
	eLR (ENE)	00	13	45
	Svalbard Reg.			
	USCGS (30 Apr) 23 50 33.5			
	72.0°N 7.2°E			
	Depth 25 km Dist. 48.8°			
	Mag. 4-1/2 - 4-3/4			
2	eS	03	00	26
	eLR	03	10	34
	Kodiak Isl., Alaska			
	USCGS 02 43 25.9			
	55.9°N 156.1°W			
	Depth 25 km Dist. 53.2°			
2	eS	09	15	14
	Jujuy Prov., Argentina			
	USCGS 08 56 29.0			
	23.6°S 65.9°W			
	Depth 163 km Dist. 65.1°			
3	eSKS	03	59	40
	eLQ	04	19	06
	eLR (SSE)	04	24	16
	Sandwich Isls.			
	USCGS 03 34 49.0			
	60.0°S 32.9°W			
	Depth 20 km Dist. 106.1°			
	Mag. 5-3/4 - 6			
4	eS	23	22	12
	eLR (SW)	23	28	16
	Nr. Coast Ecuador			
	USCGS 23 08 05.3			
	0.9°S 80.8°W			
	Depth 74 km Dist. 42.3°			
6	eP (dil)	19	14	22
	ePKP	19	18	08
	$eSKS_1$	19	24	40
	$eSKS_2$	19	24	56
	eLQ	19	45	16
	eLR_1	19	49	30
	eLR_2	21	02	16
	Sandwich Isls.			
	USCGS 19 00 10.2			
	60.0°S 32.8°W			
	Depth 25 km Dist. 106.1°			
	Mag. 7			
7	iP	17	52	35
	(Comp. from NNW)			
	eS	18	03	17
	eLQ	18	17	17
	eLR (NNW)	18	21	47
	Kurile Isls.			
	USCGS 17 39 50.3			
	45.3°N 146.7°E			

Date	Phase	h	m	s
May 7	Continued			
	Depth 25 km Dist. 86.8°			
	Mag. 6 - 6-1/4			
10	iP	00	12	18
	eS	00	19	16
	eLQ	00	25	38
	eLR (NW)	00	26	48
	Alaska			
	USCGS 00 03 40.2			
	62.0°N 150.1°W			
	Depth 72 km Dist. 48.5°			
	Mag. 4-3/4 - 5			
10	iP (Comp.)	05	22	40
	epP	05	22	51
	eS	05	31	08
	eLQ	05	39	18
	eLR (NW)	05	42	38
	Fox Isls., Aleutians			
	USCGS 05 12 15.9			
	52.4°N 170.9°W			
	Depth 43 km Dist. 62.8°			
	Mag. 5-1/2			
11	iP	14	18	05
	P(Z) (Comp. from WSW)			
	iS	14	23	44
	eLR (WSW)	14	27	48
	Mexico			
	USCGS 14 11 51.9			
	17.0°N 99.7°W			
	Depth 25 km Dist. 32.8°			
11	eP	16	18	15
	epP	16	18	24
	Mexico Aftershock			
	USCGS 16 11 33.2			
	16.5°N 98.6°W			
	Depth 25 km Dist. 32.3°			
11	eP	20	09	54
	eLR (W)	20	26	19
12	eS	19	08	03
	eLR (SE)	19	24	31
	S. Atlantic Ocean			
	USCGS 18 44 30.3			
	26.5°S 13.6°W			
	Depth 25 km Dist. 87.5°			
13	eP	09	19	06
	eLQ	09	23	39
	eLR	09	26	49
	Colombia			
	USCGS 09 12 34.3			
	6.9°N 73.0°W			
	Depth 183 km Dist. 33.9°			

Date	Phase	h	m	s
May 14	$ePKP_1$	10	53	06
	$ePKP_2$	10	53	12
	Sumbawa			
	USCGS 10 33 25.5			
	9.0°S 118.7°E			
	Depth 30 km Dist. 146.1°			
15	eP	05	40	36
	$ePKP_1$	05	43	10
	$ePKP_2$	05	43	18
	eLQ	06	22	00
	eLR_1(NNW)	06	29	50
	eLR_2	07	05	20
	Banda Sea			
	USCGS 05 23 45.9			
	7.3°S 128.3°E			
	Depth 34 km Dist. 140.9°			
	Mag. 7 - 7-1/4			
18	eP	12	17	50
	eS	12	23	32
	eLR (NE)	12	27	44
	N. Atlantic Ocean			
	USCGS 12 11 59.8			
	48.6°N 28.7°W			
	Depth 25 km Dist. 32.3°			
19	iP	15	04	45
	P(Z) 4 sec 12μ comp. WSW			
	iS	15	10	13
	eLQ	15	12	21
	eLR	15	13	21
	Mexico			
	USCGS 14 58 13.3			
	17.2°N 99.5°W			
	Depth 20 km Dist. 32.8°			
	Mag. 6-1/4 - 6-1/2			
20	iP	00	05	52
	eS	00	13	25
	eLQ	00	19	37
	eLR (S)	00	22	21
	Near Coast Peru			
	USCGS 19 May 23 56 32.4			
	13.4°S 76.7°W			
	Depth 70 km Dist. 53.8°			
20	eP	15	06	07
	epP	15	06	11
	eS	15	09	51
	eLR (SSE)	15	11	01
	Coast Puerto Rico			
	USCGS 15 01 20.7			
	20.5°N 66.0°W			
	Depth 38 km Dist. 21.1°			
	Mag. 4			

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Date	Phase	h	m	s
May 21	eP	12	16	47
	$eSKS_1$	12	27	35
	$eSKS_2$	12	28	01
	eS	12	28	31
	eLQ	12	45	51
	eLR (NNE)	12	51	51
	Chinghai, Prov., China			
	USCGS 12 02 50.6			
	37.3°N 96.0°E			
	Depth 25 km Dist. 101.8°			
	Mag. 6-1/2 - 6-3/4			
21	eP	21	29	49
	epP	21	31	03
	ePKP	21	33	31
	epPKP	21	34	27
	e(PKPSKS)	22	00	41
	eLQ	22	02	21
	e(LR) (WNW)	22	09	21
	Fiji Isls. Reg.			
	USCGS 21 15 31.0			
	20.0°S 177.5°W			
	Depth 379 km Dist. 113.3°			
22	eP	08	21	41
	epP	08	22	11
	ePKP	08	25	14
	epPKP	08	25	47
	eSKS	08	32	01
	eLQ	08	57	01
	eLR (WNW)	09	02	51
	Santa Cruz Isls.			
	USCGS 08 06 38.7			
	12.3°S 166.6°E			
	Depth 151 km Dist. 119.6°			
22	ePP	22	24	19
	ePKS	22	25	51
	ePPS	22	36	51
	eSS	22	42	41
	eSSS	22	47	31
	eLQ	22	56	41
	eLR (NW)	23	06	51
	eLR_2 (SE)	23	55	51
	New Britain			
	USCGS 22 03 36.0			
	5.5°S 152.0°E			
	Depth 100 km Dist. 126.3°			
	Mag. 5-3/4 - 6			
29	eP	00	00	42
	eS	00	09	32
	eLR	00	22	08
	Argentina			
	USCGS 28 May 23 49 01.0			
	31.3°S 68.3°W			
	Depth 94 km Dist. 71.8°			

Date	Phase	h	m	s
May 29	eS	22	14	37
	eLQ	22	19	47
	eLR (SW)	22	25	09
	Easter Isls. Region			
	USCGS 21 52 50.0			
	26.3°S 113.7°W			
	Depth 25 km Dist. 76.4°			
30	eP	10	08	40
	ePcP	10	11	59
	eS	10	13	23
	eLQ	10	14	25
	eLR (ESE)	10	15	21
	N. Atlantic Ocean			
	USCGS 10 02 52.2			
	30.3°N 42.4°W			
	Depth 25 km Dist. 28.2°			
	Mag. 5			
31	eP	06	42	23
	ePKP	06	46	25
	eSKS	06	52	37
	eSKS	06	53	27
	eLR (NW)	07	19	45
	Volcano Isls. Region			
	USCGS 06 28 26.2			
	22.1°N 142.6°E			
	Depth 257 km Dist. 108.5°			
	Mag. 5-1/4 - 5-1/2			
31	eS	21	40	58
	eLR	21	55	10
	Central Chile			
	USCGS 21 19 04.0			
	38.2°S 72.7°W			
	Depth 25 km Dist. 78.6°			
June 2	eP	12	33	36
	eS	12	39	59
	eLQ	12	43	22
	eLR (NNW)	12	44	50
	Vancouver Isl.			
	USCGS 12 26 09.6			
	49.8°N 129.8°W			
	Depth 25 km Dist. 39.5°			
	Mag. 5-3/4			
2	eSKS	17	40	07
	eLQ	18	03	11
	eLR (NW)	18	08	11
	Kyushu, Japan			
	USCGS 17 15 08.7			
	29.8°N 130.6°E			
	Depth 15 km Dist. 105.7°			
3	eP (comp. from SE)	15	08	40
	eS	15	13	15
	e(S)	15	13	47

Date	Phase	h	m	s
June 3	Continued			
	eLQ	15	14	51
	eLR (ESE)	15	16	11
	N. Atlantic Ocean			
	USCGS 15 02 25.5			
	22.4°N 45.2°W			
	Depth 25 km Dist. 30.8°			
	Mag. 5 - 5-1/4			
June 6	eS	18	03	44
	eLQ	18	07	32
	eLR (WNW)	18	10	32
	California			
	USCGS 17 50 08.6			
	39.1°N 123.1°W			
	Depth 23 km Dist. 37.3° Mag. 5			
7	eS	00	34	56
	eLQ	00	38	42
	eLR (WSW)	00	40	32
	Gulf of Calif. USCGS 00 22 39.4			
	30.0°N 113.4°W			
	Depth 25 km Dist. 33.4°			
8	eP	20	37	30
	eS	20	41	38
	T	20	59	57
	Dist. ~23.5°			
9	eS	20	09	03
	esS	20	09	27
	eLR (SW)	20	12	51
	Off Coast Guatemala			
	USCGS 19 57 35.5			
	13.6°N 91.2°W			
	Depth 104 km Dist. 30.7°			
11	eS	01	06	21
	eLQ	01	09	41
	eLR (NW)	01	12	51
	Vancouver Isl. Region			
	USCGS 00 52 47.3			
	49.7°N 129.3°W			
	Depth 25 km Dist. 38.8°			
11	eP	07	26	21
	eS	07	34	57
	eLQ	07	43	11
	eLR (NE)	07	46	11
	Yugoslavia			
	USCGS 07 15 37.6			
	43.5°N 18.3°E			
	Depth 21 km Dist. 64.3°			
	Mag. 5 - 5-1/4			
14	eP	08	03	10
	eS	08	12	21
	eLQ	08	22	51
	eLR (NW)	08	27	11

Date	Phase	h	m	s
June 14	Continued			
	Aleutians			
	USCGS 07 51 51.0			
	54.3°N 169.1°E			
	Depth 34 km Dist. 71.1°			
	Mag. 6 - 6-1/4			
14	eP	08	22	16
14	eP	08	35	53
	eS	08	39	57
	Puerto Rico Reg.			
	USCGS 08 30 53.2			
	19.4°N 65.0°W			
	Depth 64 km Dist. 23.2°			
14	eS	20	32	15
	Ecuador			
	USCGS 20 18 04.7			
	1.8°S 76.9°W			
	Depth 147 km Dist. 42.9°			
15	eP	06	40	51
	eS	06	49	11
	eLQ	06	57	11
	eLR (SE)	07	00	51
	Near Coast N. Chile			
	USCGS 06 30 37.0			
	20.4°S 70.9°W			
	Depth 60 km Dist. 60.8°			
	Mag. 5			
19	ePKP	00	01	28
	eLQ	00	34	38
	eLR (NW)	00	39	48
	New Britain			
	USCGS 23 42 31.3			
	4.8°S 151.8°E			
	Depth 47 Dist. 125.5°			
20	e(S)	19	40	38
	eLR	19	46	18
	Off Coast N. California			
	USCGS 19 26 01.8			
	45.6°N 128.9°W			
	Depth 25 km Dist. 39.6°			
21	eP	04	50	48
	eS	04	56	24
	eLQ	04	59	08
	eLR (S)	05	00	48
	South of Panama			
	USCGS 04 43 43.3			
	5.7°N 82.6°W			
	Depth 23 km Dist. 35.8°			
	Mag. 5 - 5-1/4			

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Date	Phase	h	m	s
June 22	eSKS	12	13	07
	eLQ	12	32	07
	eLR	12	39	37
	Off Coast Honshu			
	USCGS 11 48 55.3			
	32.2°N 142.4°E			
	Depth 25 km Dist. 100.1°			
23	eP	09	59	35
	ePKP	10	03	30
	eSKS	10	09	46
	eLQ	10	29	16
	eLR (N)	10	36	06
	Ryukyu Is.			
	USCGS 09 44 37.7			
	25.7°N 128.5°E			
	Depth 36 km Dist. 110.5°			
	Mag. 6 - 6-1/4			
24	eSKS	01	46	45
	eLQ	02	07	35
	eLR (N)	02	14	45
	Yunnan Prov., China			
	USCGS 01 21 18.2			
	25.6°N 101.1°E			
	Depth 35 km Dist. 113.2°			
25	eP	06	38	41
	eS	06	48	37
	eLQ	07	01	55
	eLR	07	05	25
	Chile			
	USCGS 06 26 49.6			
	37.3°S 73.5°W			
	Depth 40 km Dist. 77.6°			
25	eP	11	25	09
	epPP	11	30	11
	eSKS	11	35	49
	eLQ	11	59	05
	eLR (N)	12	07	15
	Formosa			
	USCGS 11 10 23.3			
	24.3°N 122.6°E			
	Depth 33 km Dist. 113.4°			
	Mag. 6 - 6-1/4			
25	eP	19	04	20
	ePcP	19	07	15
	eS	19	09	09
	eLQ	19	10	05
	eLR (SW)	19	11	35
	E. Coast Nicaragua			
	USCGS 18 58 35.6			
	14.5°N 82.4°W			
	Depth 25 km Dist. 26.8°			
	Mag. 4-1/2 - 4-3/4			
June 25	eS	23	14	01
	eLQ	23	18	55
	eLR (NE)	23	20	45
	Svalbard Region			
	USCGS 22 58 10.3			
	75.0°N 4.2°E			
	Depth 25 km Dist. 47.8°			
27	eP	01	31	49
	eS_n	01	33	50
	eS_2	01	34	28
	Lg	01	35	14
	Southern Illinois			
	USCGS 01 28 55.7			
	37.7°N 88.5°W			
	Depth 25 km Dist. 12.0°			
28	eP	04	38	34
	epP	04	38	38
	eS	04	47	51
	eLQ	04	55	51
	eLR (NW)	05	01	11
	Hawaii Is.			
	USCGS 04 27 18.4			
	20.0°N 155.6°W			
	Depth 25 km Dist. 70.7°			
	Mag. 5-1/4 - 5-1/2			
28	ePKP	19	09	38
	eSKS	19	16	31
	eLQ	19	48	32
	eLR (NW)	19	56	42
	Northern Celeves			
	USCGS 18 50 27.5			
	0.2°S 124.3°E			
	Depth 58 km Dist. 136.1			
29	eP	16	36	53
	eS	16	44	00
	Alaska			
	USCGS 16 28 04.4			
	62.3°N 152.4°W			
	Depth 39 km Dist. 49.5°			
	Mag. 4-3/4 - 5			
29	eP	22	42	30
	eS	22	48	20
	eLR	22	52	30
	Off Coast of Mexico			
	USCGS 22 35 20.3			
	15.3°N 105.4°W			
	Depth 25 km Dist. 37.4°			

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LAMONT GEOLOGICAL OBSERVATORY
COLUMBIA UNIVERSITY
PALISADES, NEW YORK

SEISMOLOGICAL BULLETIN

By

RUTH B. SIMON

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Longitude:	73° 54' 31" West
Elevation:	102.59 meters
Bedrock:	Palisades disbase Triassic Age

Abbreviations

i = sudden beginning of the motion (impetus)
e = gradual beginning of the motion (emersio)
Comp. = compression
Dil. = dilatation

All times are G. C. T.
Time - I. B. M. Invar pendulum clock corrected by Naval Observatory time signals every six hours.

INSTRUMENTS

Three component Columbia University seismographs, To = 12 sec., Tg = 15 sec.

Three component Benioff seismographs. Short-period, To = 1 sec., Tg = 0.2 sec. Long-period, To = 1 sec., Tg = 75 sec.

One Columbia University vertical seismograph, To = .33 sec., Tg = 0.2 sec.

Three component Columbia University visual recording seismographs, To = 12 sec.

One Columbia University vertical seismograph for visual recording, To = 1 sec.

Three component Columbia University long-period seismographs, To = 15 sec., Tg = 75 sec.

Three component Columbia University long-period seismographs, To = 30 sec., Tg = 100 sec.

Three component Columbia University long-period seismographs, To = 30 sec., Tg = 100 sec. P_2. Filter galvanometers of 6.7 sec. are in operation from October through May.

Two Columbia University microbarographs, To = 10 sec., Tg = 75 sec.

Beginning with this Bulletin, readings are reported only for P, S, PKP, and SKS. Many earthquakes for which other phases and surface waves have been recorded at Palisades are not reported here.

Date	Phase	h	m	s
July 1	eSKS	04	02	55
	eLR	04	41	00
	Sikang Province, China			
	USCGS 03 37 36.2			
	30.1°N 102.8°E			
	Depth 25 km Dist. 109.3°			
1	eSKS	21	47	35
	eLR	22	08	30
	Sinkian Province, China			
	USCGS 21 23 41.7			
	40.0°N 75.4°E			
	Depth 25 km Dist. 94.5°			
2	eP	08	47	45
	ePKP	08	51	22
	eLQ	09	22	37
	eLR (WNW)	09	27	43
	Santa Cruz			
	USCGS 08 32 37.9			
	10.3°S 165.9°E			
	Depth 25 km Dist. 119.1°			
5	eS	21	01	14.5
	eLR	21	06	20.5
	Off Coast Sinaloa, Mexico			
	USCGS 20 49 23.8			
	23.5° N 107.8°W			
	Depth 25 km Dist. 33.1°			
6	iP	09	27	24
	eScS	09	36	28.5
	eLR (NE)	09	49	40.5
	Ionian Sea			
	USCGS 09 16 15.0			
	38.0°N 20.2°E			
	Depth 30 km Dist. 61.2°			
	Mag. 5			
6	iP (Comp.)	23	18	38
	ipP	23	19	55
	eLR (NE)	23	50	06
	Hindu Kush			
	USCGS 23 05 32.2			
	36.6°N 70.4°E			
	Depth 203 km Dist. 95.6°			
	Mag. 6			
7	iP	06	23	41
	eS	06	32	44
	eLQ	06	42	18
	eLR (NNW)	06	46	06
	Aleutians			
	USCGS 06 12 48.9			
	51.3°N 178.6°E			
	Depth 60 km Dist. 68.5°			
July 11	eSKS	13	06	00
	eLQ	13	34	06
	eLR (NW)	13	38	16
	Philippine Islands			
	USCGS 12 40 30.7			
	11.9°N 122.1°E			
	Depth 25 km Dist. 125.2°			
12	eP	23	00	08.5
	iS	23	07	40.5
	eLQ	23	12	52.5
	eLR (SW)	23	16	36.5
	South Pacific Ocean			
	USCGS 22 50 58.8			
	3.9°S 104.1°W			
	Depth 25 km Dist. 52.6°			
	Mag. 5			
14	iP	19	51	11
	iPcP	19	53	15
	iS	19	57	02
	eLQ	20	00	43
	eLR	20	03	33
	N. California			
	USCGS 19 43 52.6			
	40.3°N 124.4°W			
	Depth 25 km Dist. 37.7°			
	Mag. 5			
15	iSKS	07	11	24
	Honshu			
	USCGS 06 47 22.5			
	39.8°N 140.9°E			
	Depth 103 km Dist. 93.3°			
16	iS	05	05	49
	eLR (S)	05	15	03
	Near Coast Peru			
	USCGS 04 49 21.5			
	11.2°S 79.8°W			
	Depth 75 km Dist. 52.1°			
16	iP	13	03	30
	iS	13	10	33
	Alaska			
	USCGS 12 54 40.6			
	62.3°N 153.1°W			
	Depth 39 km Dist. 49.9°			
	Mag. 6			
16	eS	16	39	13
	eLQ	16	54	23
	eLR	16	57	43
	550 miles S of Easter Isls.			
	USCGS 16 16 40.9			
	34.8°S 108.6°W			
	Depth 25 km Dist. 82.2°			

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Date	Phase	h	m	s
July 17	eP	04	18	55
	eS	04	24	56
	e(LR) (S)	04	27	53
	Off Coast Nicaragua			
	USCGS 04 12 45.4			
	11.6°N 87.1°W			
	Depth 25 km Dist. 31.1°			
17	iP (dil from S)	05	44	36
	eSKS	05	54	50
	eLQ	06	06	23
	eLR (SSE)	06	11	20
	Near Coast Chile			
	USCGS 05 32 08.8			
	43.0°S 74.9°W			
	Depth 26 km Dist. 83.6°			
17	eS	09	52	28
	eLR	09	55	48
	Guatemala			
	USCGS 09 41 01.4			
	14.8°N 92.9°W			
	Depth 120 km Dist. 30.7°			
17	iP (comp.)	17	33	17
	iSKS	17	43	42
	iS	17	44	00
	eLQ	17	58	30
	eLR (N)	18	02	30
	Hokkaido, Japan			
	USCGS 17 20 22.9			
	43.1°N 144.5°E			
	Depth 30 km Dist. 89.3°			
	Mag. 4-3/4 - 5			
18	iPKP	06	13	23
	ipPKP	06	13	40
	eLQ	07	06	00
	eLR_1	07	09	00
	eLR_2	07	35	00
	Sumba Isl.			
	USCGS 05 53 48.1			
	9.6°S 119.8°E			
	Depth 68 km Dist. 146.7°			
20	eS	04	55	59
	eLQ	05	08	18
	eLR	05	10	12
	Aleutians			
	USCGS 04 36 41.0			
	51.5°N 173.6°W			
	Depth 25 km Dist. 64.4°			
20	eS	09	13	36
	eLR	09	17	33
	Nevada			
	USCGS 09 02 08.3			
	39.5°N 118.3°W			
	Depth 25 km Dist. 33.3°			
July 23	eP	01	19	15
	eS	01	24	58
	eLR (SW)	01	27	55
	Off Coast Costa Rica			
	USCGS 01 12 52.6			
	10.7°N 86.5°W			
	Depth 44 km Dist. 32.0°			
23	iP	22	17	02
	eS	22	21	06
	eLR (SE)	22	21	32
	Virgin Isls. Region			
	USCGS 22 11 54.6			
	19.0°N 65.1°W			
	Depth 25 km Dist. 23.2°			
24	iP (from SSW)	21	14	21.5
	iS	21	19	12
	eLR (SSW)	21	21	41
	Mexico-Guatemala Border			
	USCGS 21 08 22.6			
	15.5°N 92.5°W			
	Depth 129 km Dist. 29.9°			
	Mag. 5-1/4 - 5-1/2			
25	iP (from SSW)	04	42	51
	iS	04	47	01
	eLR (SSW)	04	48	11
	Cayman Trench, W. of Jamaica			
	USCGS 04 37 50.7			
	18.9°N 81.1°W			
	Depth 64 km Dist. 22.8°			
	Mag. 6 - 6-1/4			
26	eP (dil fr. SSW)	08	21	30
	eS	08	26	57
	eLQ	08	28	30
	eLR	08	29	40
	S. of Panama			
	USCGS 08 14 41.8			
	7.5°N 82.7°W			
	Depth 21 km Dist. 33.9			
	Mag. 6-1/2 - 6-3/4			
28	eP	00	19	30
	eLR (WNW)	01	02	00
	Samoa Isls. Region			
	USCGS 00 05 10.8			
	16.2°S 173.2°W			
	Depth 40 km Dist. 107.1°			
	Mag. 5-1/2			
28	eP	14	04	54
	eS	14	10	02
	eLR (SSW)	14	13	36
	Near Coast Chiapas, Mexico			
	USCGS 13 58 41.2			
	14.8°N 93.0°W Mag. 4-1/2			
	Depth 71 km Dist. 30.8°			

Date	Phase	h	m	s
July 30	eP	10	25	56
	eS	10	31	18
	eLR (SSW)	10	34	40
	Mexico Mag. 4-1/2 - 5			
30	eP	17	32	42
	ePKP	17	35	55
	eSKS	17	43	30
	eLQ	18	10	00
	eLR_1	18	16	20
	eLR_2	19	04	25
	Nr. N. Coast New Guinea			
	USCGS 17 16 44.4			
	3.3°S 143.9°E			
	Depth 25 km Dist. 129.0°			
	Mag. 7			
30	iP (dil fr. SSE)	20	25	49
	eS	20	31	18
	eLQ	20	33	36
	eLR	20	35	50
	Western Colombia			
	USCGS 20 18 49.3			
	5.0°N 76.3°W			
	Depth 45 km Dist. 35.9°			
	Mag. 6			
Aug 1	ePKP	04	56	06
	eLQ	05	31	00
	eLR (NNW)	05	36	50
	Nr. N. Coast New Guinea			
	USCGS 04 36 57.6			
	3.2°S 143.7°E			
	Depth 33 km Dist. 129.0°			
	Mag. 6-1/2			
2	eP	04	46	55
	eS	04	50	41
	ePcP	04	50	57
	eLR (SE)	04	52	39
	S. of Cuba			
	USCGS 04 41 46.7			
	19.3°N 81.0°W			
	Depth 47 km Dist. 22.8°			
	Mag. 4-1/4 - 4-1/2			
3	iP	09	06	41
	(P(Z) 11.5 μ 6 sec dil from S)			
	epP	09	07	19
	iS	09	15	07
	eScS	09	16	23
	eLR (S)	09	26	29
	N. Chile			
	USCGS 08 56 12.1			
	23.2°S 67.5°W			
	Depth 71 km Dist. 63.9°			
4	eP	02	56	25
	ePcP	02	58	45
	eS	03	01	35
Aug 4	Continued			
	eLR (SW)	03	05	03
	Near Coast Guatemala			
	USCGS 02 49 44.7			
	14.1°N 93.0°W			
	Depth 30 km Dist. 31.7°			
5	eP	09	18	53
	eS	09	27	01
	eScS	09	28	27
	eLR (NNE)	09	37	19
	Novaya Zemlya			
	USCGS 09 08 45.8			
	74.2°N 52.5°E			
	Depth 0 km Dist. 59.8°			
	Mag. 5 - 5-1/4			
6	iP	01	41	19
	P(Z) 6 sec 3 μ dil from ESE)			
	eS	01	46	01
	eLQ	01	47	09
	eLR (ESE)	01	48	09
	N. Atlantic Ocean			
	USCGS 01 35 30.5			
	32.0°N 40.8°W			
	Depth 48 km Dist. 27.8°			
	Mag. 5-1/2			
6	e(P)	21	05	49
	eLQ	21	39	39
	eLR (WSW)	21	46	39
	Kermadec Isls. Region			
	USCGS 20 51 56.8			
	26.9°S 177.1°W			
	Depth 50 km Dist. 116.6°			
	Mag. 5-1/2			
8	eS	11	13	45
	eLQ	11	23	39
	eLR	11	28	09
	Fox Isls, Aleutians			
	USCGS 10 54 56.3			
	52.1°N 170.5°W			
	Depth 40 km Dist. 62.9°			
9	eP	00	31	09.5
	N. Chile			
	USCGS 00 21 10.7			
	22.4°S 70.0°W			
	Depth 160 km Dist. 62.8°			
9	eP	04	28	25.5
	eS	04	33	41.5
	eLR (S)	04	35	49.5
	Colombia			
	USCGS 04 21 55.4			
	6.7°N 73.1°W			
	Depth 180 km Dist. 33.9°			

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Date	Phase	h	m	s
Aug 9	eP	06	30	01.5
	eS	06	38	51.5
	eScS	06	40	09.5
	eLQ	06	44	39.5
	eLR (S)	06	47	39.5
	Salta Province, Argentina			
	USCGS 06 19 51.4			
	24.1°S 66.5°W			
	Depth 128 km Dist. 65.0°			
10	eP	21	10	34
	eS	21	15	42
	eLR (SE)	21	19	30
	N. Atlantic Ocean			
	USCGS 21 03 59.2			
	49.4°N 27.9°W			
	Depth 33 km Dist. 33.0°			
	Mag. 4-1/2			
11	eSKS	02	13	06
	eLQ	02	35	30
	eLR	02	42	30
	Fiji Isls.			
	USCGS 01 47 39.6			
	20.0°S 178.8°W			
	Depth 638 km Dist. 114.0°			
11	e(PKP)	08	33	20
	eSKS	08	40	34
	eSKS	08	41	34
	eLQ	09	02	10
	eLR (NNW)	09	09	50
	Off N.E. Coast Formosa			
	USCGS 08 15 43.7			
	25.2°N 123.3°E			
	Depth 140 km Dist. 112.5°			
	Mag. 5-1/2			
13	eP	06	43	28
	eS	06	49	32
	eLQ	06	53	10
	eScS	06	53	50
	eLR (SSW)	06	55	10
	300 mi. N.W. of Ecuador			
	USCGS 06 35 56.0			
	2.1°N 83.5°W			
	Depth 33 km Dist. 39.9°			
	Mag. 5-1/2 - 5-3/4			
13	eS	10	21	16
	eLR (SW)	10	24	10
	Chiapas, Mexico			
	USCGS 10 09 24.9			
	14.6°N 93.0°W			
	Depth 118 km Dist. 30.8°			

Date	Phase	h	m	s
Aug 14	ePP	01	32	46
	ePKS	01	33	22
	eLQ	02	09	30
	eLR (SW)	02	16	40
	300 mi. N. of Macquarie Isls.			
	USCGS 01 10 50.5			
	49.9°S 163.0°E			
	Depth 43 km Dist. 140°			
	Mag. 5-1/4 - 5-1/2			
17	ePP	05	25	37
	eLQ	05	58	09
	eLR (N)	06	05	19
	Panay, Philippine Isls.			
	USCGS 05 04 31.5			
	10.6°N 121.6°E			
	Depth 33 km Dist. 126.2°			
	Mag. 5-1/4 - 5-1/2			
18	eP	16	52	44
	eS	16	59	49
	eLR (NNW)	17	07	39
	Central Alaska			
	USCGS 16 43 54.3			
	62.3°N 152.5°W			
	Depth 32 km Dist. 49.9°			
	Mag. 5-1/4 - 5-1/2			
18	eP	17	55	05
	eS	18	02	13
	eLR (NNW)	18	10	09
	Central Alaska			
	USCGS 17 46 14.9			
	62.3°N 152.5°W			
	Depth 32 km Dist. 49.9°			
	Mag. 5-1/2 - 5-3/4			
19	eS	00	40	49
	eScS	00	42	29
	eLR	00	46	19
	Bolivia			
	USCGS 00 23 03.9			
	19.9°S 66.9°W			
	Depth 240 km Dist. 61.0°			
19	eP	18	39	46
	epP	18	39	57
	ePKP	18	43	33
	epPKP	18	43	43
	eSKS	18	50	13
	eLQ	19	06	39
	eLR (NNE)	19	10	57
	N.W. Sinkiang Prov.			
	USCGS 18 26 38.6			
	44.6°N 81.7°E			
	Depth 33 km Dist. 91.7°			
	Mag. 5-3/4 - 6			

Date	Phase	h	m	s
Aug 19	eP	23	23	44
	ePcP	23	44	03
	eS	23	32	31
	eScS	23	33	23
	eLQ	23	41	13
	eLR (SE)	23	45	09
	N. Coast Chile			
	USCGS 23 12 50.4			
	26.6°S 69.8°W			
	Depth 51 km Dist. 67.8°			
	Mag. 4-3/4 - 5			
20	eP	09	12	21
	eS	09	20	43
	eScS	09	21	47
	eLR (NE)	09	30	39
	Novaya Zemlya			
	USCGS 09 02 14.5			
	74.4°N 51.2°E			
	Depth 0 Dist. 59.5°			
	Mag. 4-3/4			
20	eP	13	20	39
	eS	13	26	49
	eLR	13	31	09
	Chiapas, Mexico			
	USCGS 13 14 59.2			
	13.9°N 92.9°W			
	Depth 33 km Dist. 31.7°			
21	eP	18	30	03
	eScS	18	39	21
	eLQ	18	46	19
	eLR (ENE)	18	49	49
	Italy 41.4°N 15.5°E			
	USCGS 18 19 33.3			
	Depth 34 km Dist. 64.6°			
	Mag. 5-1/4 - 5-1/2			
21	eP	21	21	50
	eS	21	31	49
	eScS	21	32	23
	eLQ	21	42	49
	eLR (SW)	21	47	09
	Easter Isl. Region			
	USCGS 21 09 50.3			
	29.6°S 111.9°W			
	Depth 33 km Dist. 78.9°			
	Mag. 5-3/4 - 6			
22	eSKS	04	57	19
	eLQ	05	19	49
	eLR (NW)	05	28	09
	Volcano Isls.			
	USCGS 04 32 29.1			
	26.1°N 142.5°E			
	Depth 29 km Dist. 105.0°			

Date	Phase	h	m	s
Aug 23	eP	19	36	23
	iP (comp fr. W)	19	36	25
	epP	19	36	42
	eS	19	42	14
	esS	19	42	22
	eLQ	19	46	08
	eLR (WNW)	19	48	24
	Del Norte Co., Calif.			
	USCGS 19 29 16.0			
	41.8°N 124.1°W			
	Depth 33 km Dist. 37.1°			
	Mag. 5-1/4 - 5-1/2			
24	ePKP	09	22	34
	eSKS	09	29	20
	eLQ	09	48	08
	eLR (W)	09	54	08
	Samoa Isls. Region			
	USCGS 09 04 22.9			
	15.0°S 173.3°W			
	Depth 33 km Dist. 106.5°			
	Mag. 5-1/4 - 5-1/2			
25	eP	08	45	18
	epP	08	47	42
	eSKS	08	56	32
	esSKS	08	57	28
	Fiji Isls.			
	USCGS 08 31 48.7			
	20.5°S 178.5°W			
	Depth 561 km Dist. 114.6°			
26	eSKS	07	13	16
	eLQ	07	32	48
	eLR (NW)	07	38	32
	E. Coast Honshu, Japan			
	USCGS 06 48 57.1			
	34.0°N 139.2°E			
	Depth 38 km Dist. 99.4°			
	Mag. 5-1/4			
27	eP	09	10	56
	eS	09	19	20
	eScS	09	20	28
	e(LQ)	09	28	28
	eLR (NE)	09	30	48
	Novaya Zemlya			
	USCGS 09 00 50.9			
	74.7°N 50.3°E			
	Depth 0 Dist. 58.6°			
	Mag. 4-3/4			
27	eS	16	44	27
	eLQ	17	02	07
	eLR	17	09	4[illegible]
	Honshu, Japan			
	USCGS 16 20 04.7			
	38.3°N 142.4°E			
	Depth 40 km Dist. 94.8°			

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Date	Phase	h	m	s
Aug 28	eP	08	27	25
	eS	08	33	07
	eLR (SW)	08	37	47
	Off Coast Mexico			
	USCGS 08 20 31.5			
	18.6°N 105.8°W			
	Depth 33 km Dist. 35.1°			
	Mag. 4-3/4 - 5			
28	iP	11	11	05
	P(Z) comp from NE 6 sec 5μ			
	epP	11	11	34
	eS	11	20	11
	eLQ	11	27	59
	eLR (E)	11	33	19
	Greece			
	USCGS 10 59 58.5			
	38.0°N 23.1°E			
	Depth 120 km Dist. 70.8°			
	Mag. 5-1/2			
30	eP (Comp.)	13	41	23
	eS	13	46	01
	eLR	13	49	07
	Utah-Idaho Border			
	USCGS 13 35 28.7			
	41.8°N 111.8°W			
	Depth 37 km Dist. 27.7°			
	Mag. 5.8			
30	ePKP	17	36	08
	eSKS	17	43	08
	eLQ	18	03	08
	eLR (SW)	18	10	08
	Tonga Isls.			
	USCGS 17 17 51.9			
	21.2°S 174.4°W			
	Depth 33 km Dist. 110.9°			
31	eP (comp.)	17	13	35
	eS	17	22	33
	eLQ	17	32	37
	eLR (NW)	17	36	39
	Aleutians			
	USCGS 17 02 43.4			
	51.3°N 179.7°W			
	Depth 26 km Dist. 68.0°			
	Mag. 6 - 6-1/4			
Sept 1	eP (comp.)	03	57	02
	ePcP	03	57	11
	eS	04	05	57
	eScS	04	07	11
	eLQ	04	16	07
	eLR (NW)	04	19	47
	Rat Isls., Aleutians			
	USCGS 03 46 05.0			
	51.3°N 179.7°W			
	Depth 25 km Dist. 68.0°			
	Mag. 6			
Sept 1	eP	04	52	37
	eLQ	05	11	37
	eLR	05	15	47
	Aleutians			
	USCGS 04 41 41.5			
	51.3°N 179.9°W			
	Depth 37 km Dist. 68.0°			
1	ePKP	05	10	39
	eL	05	43	47
	New Hebrides			
	USCGS 04 52 14.5			
	15.9°S 168.2°E			
	Depth 244 km Dist. 121.5°			
1	eP (Comp.)	08	02	03
	eS	08	10	59
	eLQ	08	22	07
	eLR (NW)	08	25	07
	Aleutians			
	USCGS 07 51 08.2			
	51.3°N Dist. 179.9°W			
	Depth 42 km Dist. 68.0°			
	Mag. 6			
1	eSKS	15	25	46
	eLQ	15	44	08
	eLR (NE)	15	50	38
	Near Coast W. Pakistan			
	USCGS 15 01 04.6			
	25.8°N 65.3°E			
	Depth 46 km Dist. 103.5°			
1	eP	19	33	29
	(comp. from NE, 6 sec 8μ)			
	epP	19	33	36
	eS	19	44	06
	eLQ	19	55	38
	eLR (NE)	20	00	48
	N. W. Iran			
	USCGS 19 20 38.5			
	35.6°N 50.0°E			
	Depth 21 km Dist. 88.5°			
	Mag. 7			
2	ePKP	15	41	39
	eLQ	16	14	08
	eLR (NW)	16	24	48
	Sumba Isl. Region			
	USCGS 15 21 55.0			
	10.2°S 120.3°E			
	Depth 33 km Dist. 146.8°			
4	eS	15	28	28
	eLR (SW)	15	30	08
	Mexico-Guatemala			
	USCGS 15 17 42.4			
	15.0°N 91.7°W			
	Depth 217 km Dist. 30.3°			

Date	Phase	h	m	s
Sept 4	eS	17	30	28
	eLQ	17	34	08
	eLR (NW)	17	36	18
	Near Coast N. California			
	USCGS 17 17 27.6			
	41.0°N 124.0°W			
	Depth 48 km Dist. 37.4°			
4	eS	23	21	48
	eLQ	23	34	48
	eLR (NE)	23	41	08
	Turkey-Armenia SSR Border			
	USCGS 22 59 19.4			
	39.9°N 44.2°E			
	Depth 33 km Dist. 81.9°			
8	eP	10	28	25
	eS	10	36	17
	eLR (NE)	10	46	29
	Novaya Zemlya			
	USCGS 10 17 57.7			
	73.7°N 53.8°E			
	Depth 0 Dist. 60.1°			
	Mag. 4-3/4			
8	eS	13	14	17
	eLR (SE)	13	15	49
	Leeward Isls. Region			
	USCGS 13 03 34.7			
	16.9°N 60.9°W			
	Depth 33 km Dist. 26.4°			
9	eP	03	31	28
	Peru			
	USCGS 03 21 55.5			
	15.6°S 73.4°W			
	Depth 98 km Dist. 56.7°			
9	ePcP	14	55	13
	eS	14	57	13
	eLR	15	00	29
	El Salvador USCGS 14 45 44.5			
	14.0°N 89.5°W			
	Depth 89 km Dist. 30.4°			
9	eS	19	28	31
	eLQ	19	36	49
	eLR (NW)	19	39	29
	Alaska USCGS 19 12 37.1			
	62.4°N 152.4°W			
	Depth 57 km Dist. 49.5°			
	Mag. 4-1/2			
10	eP	09	48	15
	eS	09	57	47
	eLQ	10	08	09
	eLR (E)	10	13	39
	Dodecanese Isls USCGS 09 36 24.3			
	35.0°N 27.1°E			
	Depth 33 km Dist. 75.2°			
Sept 10	eSKS	16	08	09
	esSKS	16	12	45
	Fiji Isls.			
	USCGS 15 43 59.4			
	21.1°S 179.2°W			
	Depth 640 km Dist. 114.6°			
10	eS	22	03	17
	eLQ	22	04	09
	eLR	22	07	39
	Nicaragua			
	USCGS 21 52 26.6			
	12.3°N 86.7°W			
	Depth 178 km Dist. 31.1°			
12	eP	21	10	23
	epP	21	10	37
	eSKS	21	20	55
	eLQ	21	37	39
	eLR (NE)	21	42	49
	Hindu Kush			
	USCGS 20 57 00.4			
	36.5°N 69.2°E			
	Depth 50 km Dist. 95.3°			
	Mag. 6			
14	ePKP	18	36	49
	epPKP	18	38	27
	eLQ	19	05	19
	eLR (W)	19	12	09
	Fiji Isls.			
	USCGS 18 17 52.1			
	19.9°S 177.6°W			
	Depth 350 km Dist. 113.3°			
15	eS	08	20	41
	eScS	08	21	49
	eLR (NE)	08	30	29
	Novaya Zemlya			
	USCGS 08 02 13.9			
	74.4°N 51.5°E			
	Depth 0 Dist. 59.8°			
15	eP (dil)	23	02	55
	epP	23	03	17
	eS	23	12	57
	esS	23	13	15
	eLQ	23	24	39
	eLR (N)	23	28	49
	Kurile Isls.			
	USCGS 22 50 46.3			
	48.5°N 156.8°E			
	Depth 33 km Dist. 79.8°			
	Mag. 5-3/4 - 6			

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Date	Phase	h	m	s
Sept 16	eP	03	12	01
	epP	03	12	20
	eS	03	17	13
	eLR (SW)	03	22	01
	Jalisco, Mexico			
	USCGS 03 05 33.0			
	19.3°N 103.1°W			
	Depth 100 km Dist. 33.2°			
	Mag. 4-3/4 - 5			
16	eP	11	09	17
	eS	11	17	41
	eScS	11	19	29
	eLR (NE)	11	28	09
	Novaya Zemlya			
	USCGS 10 59 10.5			
	74.2°N 51.6°E			
	Depth 0 Dist. 59.8°			
	Mag. 4-3/4 - 5			
16	eS	14	22	47
	eLR	14	40	29
17	eSKS	18	21	29
	Fiji Isls.			
	USCGS 17 55 45.4			
	21.0°S 179.1°W			
	Depth 601 km Dist. 114.6°			
18	eP	00	35	53
	epP	00	36	02
	ePcP	00	38	17
	eS	00	41	21
	eLR (S)	00	45	39
	eScS	00	46	39
	S. of Panama			
	USCGS 00 29 05.2			
	7.5°N 82.3°W			
	Depth 33 km Dist. 33.7°			
	Mag. 6-1/2 - 6-3/4			
19	eP	01	33	08
	eLQ	01	52	09
	eLR	01	54	09
	Aleutians USCGS 01 22 35.5			
	52.3°N 173.4°W			
	Depth 33 km Dist. 63.9°			
19	eSKS	08	14	29
	eLR	08	42	39
	Marianas USCGS 07 48 35.2			
	11.5°N 141.0°E			
	Depth 61 km Dist. 118.2°			
19	eP	11	11	09
	eS	11	19	23
	eLR (NE)	11	29	29
	Novaya Zemlya USCGS 11 00 56.4			
	73.8°N 53.8°E			
	Depth 0 Dist. 60.1°			
	Mag. 5 - 5-1/4			

Date	Phase	h	m	s
Sept 22	eSKS	07	16	49
	eLR	07	39	09
	N. Burma			
	USCGS 06 51 32.3			
	26.5°N 97.0°E			
	Depth 33 km Dist. 111.8°			
	Mag. 6			
23	ePcP	12	11	47
	eS	12	15	19
	eLQ	12	17	29
	eLR (SE)	12	19	09
	N. Atlantic Ocean			
	USCGS 12 02 34.7			
	14.7°N 45.1°W			
	Depth 33 km Dist. 36.1°			
25	eP	13	12	40
	eS	13	21	10
	eLR (NE)	13	31	10
	Novaya Zemlya			
	USCGS 13 02 31.7			
	73.7°N 55.0°E			
	Depth 0 Dist. 60.3°			
	Mag. 5-1/4 - 5-1/2			
27	eP	08	13	32
	eS	08	21	50
	eScS	08	22	58
	eLR (NE)	08	31	40
	Novaya Zemlya			
	USCGS 08 03 16.4			
	74.3°N 52.4°E			
	Depth 0 Dist. 61.5°			
	Mag. 5-1/4 - 5-1/2			
28	eP	19	02	58
	epP	19	03	27
	eS	19	08	29
	eLR (SW)	19	12	29
	W. Colombia			
	USCGS 18 56 08.7			
	5.2°N 76.2°W			
	Depth 127 km Dist. 35.9°			
29	eP (8 secs dil from S)	15	27	54
	iS	15	36	13
	eSKS	15	36	55
	Argentina			
	USCGS 15 17 47.7			
	27.0°S 63.6°W			
	Depth 575 km Dist. 68.3°			
	Mag. 6.2			

Date	Phase	h	m	s
Oct. 1	eS	12	38	45
	eLR (NE)	12	58	49
	S. Iran			
	USCGS 12 13 57.4			
	27.9°N 54.9°E			
	Depth 16 km Dist. 96.6°			
4	eS	04	54	09
	eLR (E)	04	57	09
	Azores Region			
	USCGS 04 42 05.8			
	40.4°N 29.5°W			
	Depth 33 km Dist. 33.1°			
6	eP	03	23	43
	eS	03	29	09
	eLR (E)	03	32	27
	Azores Region			
	USCGS 03 17 07.2			
	40.8°N 29.5°W			
	Depth 33 km Dist. 32.8°			
	Mag. 4-3/4 - 5			
6	ePP	04	43	51
	ePKS	04	45	25
	eLQ	05	14	51
	eLR (NW)	05	21	07
	New Hebrides			
	USCGS 04 23 24.1			
	17.4°S 167.7°E			
	Depth 33 km Dist. 122.1°			
	Mag. 6-1/2			
6-7	eSKS	23	57	27
	eLQ	00	22	07
	eLR (NW)	00	28	07
	New Hebrides			
	USCGS 23 31 27.7			
	17.5°S 167.6°E			
	Depth 42 km Dist. 122.7°			
	Mag. 5-3/4 - 6			
8	eP	22	11	11
	eSKS	22	21	47
	eLQ	22	44	17
	eLR (N)	22	50	07
	eLR_2	23	52	47
	Near E. Coast Formosa			
	USCGS 21 56 22.2			
	24.3°N 121.7°E			
	Depth 29 km Dist. 113.7°			
	Mag. 6-1/4			
9	ePP	20	35	47
	ePPP	20	39	15
	eLQ	21	06	37
	eLR (NW)	21	11	37
	Bismark Sea			
	USCGS 20 14 38.3			

Date	Phase	h	m	s
Oct. 9	Continued			
	3.2°S 148.2°E			
	Depth 33 km Dist. 126.6°			
	Mag. 6 - 6-1/4			
10	ePKP	13	52	54
	S. Coast Java			
	USCGS 13 33 11.6			
	8.9°S 110.4°E			
	Depth 41 km Dist. 147.9°			
12	eS	17	14	36
	eLR (SE)	17	29	06
	Near Coast S. Chile			
	USCGS 16 53 33.6			
	28.0°S 70.6°W			
	Depth 25 km Dist. 68.7°			
13	eSKS	10	47	12
	eLQ	11	03	36
	eLR (NE)	11	09	06
	N. W. Iran			
	USCGS 10 23 38.2			
	35.5°N 49.8°E			
	Depth 33 km Dist. 87.7°			
16	eP	18	13	17
	epP	18	13	28
	eS	18	21	55
	eScS	18	23	09
	eLQ	18	32	35
	eLR (NW)	18	36	25
	Aleutians			
	USCGS 18 02 32.9			
	51.6°N 175.8°W			
	Depth 27 km Dist. 65.4°			
	Mag. 5-1/4			
18	ePKP	04	25	41
	eLR	05	06	05
	Sumbawa			
	USCGS 04 06 00.4			
	8.9°S 117.0°E			
	Depth 33 km Dist. 146.7°			
19	eS	21	34	35
	eLQ	21	37	15
	eLR (WSW)	21	39	25
	Off W. Coast Jalisco, Mexico			
	USCGS 21 21 48.8			
	19.8°N 108.3°W			
	Depth 53 km Dist. 35.8°			
21	eP	02	14	00
	epP	02	14	17
	ePcP	02	15	39
	eS	02	20	39
	eLQ	02	26	05
	eLR (NW)	02	28	25

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Date	Phase	h	m	s
Oct. 21	Continued			
	Alaska			
	USCGS 02 05 22.7			
	61.1°N 149.7°W			
	Depth 80 km Dist. 48.7°			
22	eP	09	16	17
	eS	09	24	45
	eScS	09	25	53
	eLR (NE)	09	34	45
	Novaya Zemlya			
	USCGS 09 06 10.1			
	73.4°N 54.9°E			
	Depth 0 Dist. 60.9°			
	Mag. 5 - 5-1/4			
22				
22	eP	15	35	38
	eS	15	45	38
	eLR	15	58	46
	N. Kurile Isls.			
	USCGS 15 23 32.9			
	49.8°N 155.8°E			
	Depth 19 km Dist. 79.4°			
25	eP	15	59	10
	eS	16	04	30
	eLR (SW)	16	08	26
	Panama-Costa Rica Border			
	USCGS 15 52 29.2			
	8.4°N 82.6°W			
	Depth 51 km Dist. 33.9°			
	Mag. 5-1/4 - 5-1/2			
25	ePKP	20	25	50
	eLQ	21	08	26
	eLR (W)	21	16	06
	S. W. of Macquarie Isls.			
	USCGS 20 06 10.0			
	61.4°S 154.9°E			
	Depth 33 km Dist. 144.4°			
27	eP	08	16	32
	epP	08	16	47
	eLR (SW)	08	25	07
	Guatemala-El Salvador Border			
	USCGS 08 10 24.5			
	14.0°N 90.4°W			
	Depth 107 km Dist. 30.4°			
27	eS	14	04	27
	eLR (SW)	14	08	27
	W. Coast Nicaragua			
	USCGS 13 52 51.2			
	11.5°N 86.4°W			
	Depth 80 km Dist. 30.8°			

Date	Phase	h	m	s
Oct 28	eP	22	59	40
	eS	23	04	11
	eLR (SW)	23	07	17
	Chiapas, Mexico			
	USCGS 22 53 01.3			
	16.0°N 93.6°W			
	Depth 110 km Dist. 30.4°			
29	eS	21	22	37
	eLR (SW)	21	36	37
	Easter Isls. Region			
	USCGS 21 01 28.5			
	23.3°S 111.5°W			
	Depth 33 km Dist. 72.9°			
30	eP	08	38	04
	epP	08	38	15
	e(S)	08	43	20
	eLR (SW)	08	45	52
	Nicaragua			
	USCGS 08 31 51.8			
	12.5°N 88.0°W			
	Depth 80 km Dist. 30.5°			
31	eP	11	39	33
	eS	11	45	17
	eLR (S)	11	49	39
	S. of Panama			
	USCGS 11 32 29.0			
	5.6°N 82.6°W			
	Depth 33 km Dist. 35.8°			
	Mag. 5-1/2			
Nov. 2	eP	15	03	24
	$ePKP_1$	15	06	23
	$ePKP_2$	15	06	37
	eLR (NW)	15	50	38
	S. of Sumbawa			
	USCGS 14 46 39.2			
	10.0°S 117.8°E			
	Depth 33 km Dist. 147.4°			
4	eP	23	06	02
	eS	23	16	23
	eLQ	23	28	01
	eLR (SSE)	23	34	09
	Off Coast S. Chile			
	USCGS 22 53 34.2			
	43.2°S 75.6°W			
	Depth 33 km Dist. 83.7°			
	Mag. 5-1/2			
6	eP	03	43	43
	eS	03	49	59
	eLR (WNW)	03	53	19
	eScS	03	54	29
	Washington-Oregon Border			
	USCGS 03 36 46.9			

Date	Phase	h	m	s
Nov 6	Continued			
	45.8°N 122.5°W			
	Depth 44 km Dist. 35.5°			
	Mag. 5-1/4 - 5-1/2			
7	iPKP	16	22	26
	epPKP	16	23	15
	Flores Sea			
	USCGS 16 03 04.1			
	7.8°S 119.8°E			
	Depth 156 km Dist. 144.9°			
8	eS	00	50	09
	eLR (SW)	00	59	29
	S. W. of Galapagos			
	USCGS 00 33 13.8			
	4.4°S 105.5°W			
	Depth 33 km Dist. 53.5°			
10	eP	01	46	04
	epP	01	46	20
	eSKS	01	56	26
	eS	01	56	40
	eLQ	02	10	40
	eLR (NW)	02	15	40
	Kurile Islands			
	USCGS 01 33 19.0			
	43.8°N 147.7°E			
	Depth 60 km Dist. 87.4°			
	Mag. 5-1/2			
11	eP	11	44	19
	eS	11	54	33
	eLR (N)	12	12	09
	Lake Baikal Region			
	USCGS 11 31 44.5			
	55.8°N 113.1°E			
	Depth 33 km Dist. 83.2°			
11	eS	21	59	09
	eLQ	22	03	09
	eLR (NW)	22	05	09
	Vancouver Isl. Region			
	USCGS 21 45 20.5			
	48.9°N 128.8°W			
	Depth 33 km Dist. 39.0°			
11	eP (dil)	22	26	47
	eS	22	37	09
	eLQ	22	50	53
	eLR (SE)	22	54	09
	Off Coast S. Chile			
	USCGS 22 14 18.7			
	43.2°S 76.0°W			
	Depth 33 km Dist. 83.7°			
	Mag. 5-1/4 - 5-1/2			

Date	Phase	h	m	s
Nov 12	eS	19	52	23
	eLQ	20	03	09
	eLR	20	06	09
	Aleutians			
	USCGS 19 32 38.0			
	51.5°N 178.4°W			
	Depth 57 km Dist. 66.4°			
15	eS	16	13	49
	eLR	16	28	39
	Central Chile			
	USCGS 15 57 57.6			
	38.3°S 73.2°W			
	Depth 33 km Dist. 78.6°			
15	iP	23	34	01
	epP	23	34	22
	eS	23	41	13
	eLQ	23	47	09
	eLR (S)	23	49	09
	Near Coast N. Peru			
	USCGS 23 25 15.7			
	8.7°S 79.8°W			
	Depth 45 km Dist. 50.1°			
	Mag. 5-1/4 - 5-1/2			
16	eP	07	30	48
	eS	07	40	57
	eLQ	07	52	21
	eLR (SW)	07	55	09
	Easter Islands			
	USCGS 07 18 37.3			
	32.3°S 111.1°W			
	Depth 43 km Dist. 80.3°			
	Mag. 6			
16	eSKS	21	35	33
	eLQ	22	01	01
	eLR (NE)	22	06	09
	Andaman Islands			
	USCGS 21 10 01.8			
	13.5°N 93.2°E			
	Depth 33 km Dist. 123.9°			
	Mag. 6 - 6-1/4			
17	eP	11	13	48
	eS	11	19	09
	eLR (SW)	11	23	19
	Oaxaca, Mexico			
	USCGS 11 07 15.4			
	16.3°N 98.2°W			
	Depth 12 km Dist. 32.5°			
19	eS	10	39	27
	eLQ	10	55	39
	eLR (SW)	11	01	39
	S. Pacific Ocean			
	USCGS 10 14 29.4			
	50.0°S 114.3°W			
	Depth 33 km Dist. 97.2°			

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Date	Phase	h	m	s
Nov 22	eS	01	41	59
	eLR (SW)	01	46	29
	Nr. Coast S. Chiapas, Mexico			
	USCGS 01 30 02.5			
	14.3°N 92.7°W			
	Depth 33 km Dist. 31.7°			
23	e(P)	00	38	49
	eS	00	47	29
	eLR (SW)	00	57	39
	Near Coast S. Peru			
	USCGS 00 30 04.5			
	15.1°S 75.3°W			
	Depth 33 km Dist. 55.7°			
24	eS	16	34	17
	eLQ	16	37	07
	eLR	16	39	07
	Mid-Atlantic			
	USCGS 16 19 44.9			
	9.8°N 40.7°W			
	Depth 33 km Dist. 42.4°			
28	eS	05	25	57
	eLQ	05	38	27
	eLR (S)E	05	42	07
	S. Atlantic Ocean			
	USCGS 05 02 36.1			
	22.5°S 10.7°W			
	Depth 33 km Dist. 85.6°			
29	ePP	19	27	06
	ePS	19	37	02
	eLQ	19	57	46
	eLR	20	03	46
	New Hebrides			
	USCGS 19 06 37.6			
	17.3°S 168.5°E			
	Depth 33 km Dist. 121.3°			
	Mag. 5-3/4 - 6			
30	iP (dil from W)	21	57	49.5
	ipP	21	57	58.5
	eS	22	03	07
	esS	22	03	19
	eLQ	22	05	20
	eLR (W)	22	06	59
	Guerrero, Mexico			
	USCGS 21 51 22.9			
	17.4°N 99.6°W			
	Depth 51 km Dist. 31.1°			
	Mag. 5 - 5-1/4			
Dec 1	iP	02	00	40.5
	ePcP	02	01	21
	eS	02	09	07
	eLQ	02	16	05
	eLR (NW)	02	19	51
	Fox Islands-Aleutians			
Dec 1	Continued			
	USCGS 01 50 20.4			
	52.4°N 170.1°W			
	Depth 38 km Dist. 62.3°			
	Mag. 5-1/4 - 5-1/2			
4	eS	03	43	37
	eLQ	03	46	41
	eLR (SW)	03	48	45
	Off Coast Guerrero, Mexico			
	USCGS 03 29 40.8			
	10.1°N 103.6°W			
	Depth 33 km Dist. 40.7°			
4	eS	07	41	05
	eLR	07	49	25
	S. Bolivia			
	USCGS 07 23 04.2			
	21.8°S 65.6°W			
	Depth 300 km Dist. 63.1°			
4	eP	16	54	37
	eSKS	17	05	15
	eLQ	17	26	15
	eLR (W)	17	30	49
	Samoa Islands Region			
	USCGS 16 40 06.0			
	16.5°S 172.8°W			
	Depth 33 km Dist. 107.7°			
	Mag. 5 - 5-1/4			
5	eS	11	54	39
	eLR (SW)	12	02	05
	Peru			
	USCGS 11 38 10.6			
	10.3°S 77.9°W			
	Depth 50 km Dist. 50.9°			
7	eSKS	14	26	51
	eS	14	28	03
	eLQ	14	43	39
	eLR (NW)	14	49	23
	Bonin Isls. Region			
	USCGS 14 03 37.0			
	29.2°N 139.2°E			
	Depth 411 km Dist. 103.9°			
8	eP	18	32	49
	eSKS	18	43	23
	eLQ	19	03	09
	eLR (NW)	19	08	39
	Tonga Isls. Region			
	USCGS 18 18 29.1			
	15.2°S 173.7°W			
	Depth 33 km Dist. 107.2°			
	Mag. 6			

Date	Phase	h	m	s
Dec 8	eP	21	37	19.0
	iP	21	37	20.0
	(8 sec 4μ(PZ) dil from S)			
	ipP	21	39	01
	ePcP	21	41	37
	iS	21	45	27.2
	Salta-Santiago del Estero Prov., Argentina			
	USCGS 21 27 22.2			
	25.8°S 63.4°W			
	Depth 620 km Dist. 67.4°			
	Mag. 7			
8	iP	23	05	51.7
	iS	23	14	45
	eLR (NW)	23	28	39
	Aleutians			
	USCGS 22 55 01.2			
	50.5°N 176.8°W			
	Depth 33 km Dist. 66.5°			
10	eSKS	05	22	49
	eLQ	05	56	49
	eLR (E)	06	03	19
	Indian Ocean			
	USCGS 04 56 19.4			
	28.3°S 62.7°E			
	Depth 33 km Dist. 142.6°			
12	eP	10	24	41
	eSKS	10	34	41
	eLQ	11	00	39
	eLR (NW)	11	06	37
	New Britain			
	USCGS 10 08 48.5			
	4.8°S 153.8°E			
	Depth 94 km Dist. 124.2°			
	Mag. 6 - 6-1/4			
17	$ePKP_1$	11	18	44
	$ePKP_2$	11	18	53
	Celebes Sea			
	USCGS 11 00 16.0			
	2.1°N 122.9°E			
	Depth 393 km Dist. 134.8°			
18	eS	08	10	52
	eLQ	08	22	22
	eLR (SW)	08	26	12
	Easter Island Region			
	USCGS 07 48 36.6			
	35.2°S 104.8°W			
	Depth 33 km Dist. 80.8°			
19	ePP	13	17	27
	eLR (NW)	13	53	59
	Solomons			
	USCGS 12 56 19.7			
	4.7°S 154.0°E			
Dec 19	Continued			
	Depth 98 km Dist. 124.2°			
	Mag. 5 - 5-1/4			
21	iPKP	01	03	58.5
	epPKP	01	04	21
	$ePKP_2$	01	04	47
	eLR (N)	01	40	13
	Near S. Coast Java			
	USCGS 00 44 19.7			
	9.0°S 112.4°E			
	Depth 64 km Dist. 147.7°			
21	eP	06	38	04
	eS	06	46	23
	eLQ	06	53	13
	eLR (NW)	06	55	53
	Aleutians			
	USCGS 06 27 49.1			
	52.5°N 168.7°W			
	Depth 33 km Dist. 61.3°			
21	eP	08	53	02
	eS	09	01	21
	eScS	09	02	35
	eLQ	09	10	53
	eLR (NW)	09	14	13
	Aleutians			
	USCGS 08 42 48.3			
	52.4°N 168.5°W			
	Depth 33 km Dist. 61.3°			
	Mag. 6-3/4			
21	eP	09	10	55
	Aleutians			
	USCGS 09 00 41.4			
	52.4°N 168.5°W			
	Depth 33 km Dist. 61.3°			
21	eP	09	20	16
21	eP	09	46	17
	Japan			
	USCGS 09 33 15.5			
	42.4°N 142.3°E			
	Depth 27 km Dist. 91.2°			
21	eP	21	35	42
	eS	21	42	18
	eLR (SW)	21	47	44
	Nr. Coast Central Ecuador			
	USCGS 21 27 51.6			
	0.9°S 80.9°W			
	Depth 33 km Dist. 42.3°			
22	ePKP	02	19	32.5
	eLR (NE)	02	44	38
	Near S. Coast Java			
	USCGS 01 59 50.3			

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Date	Phase	h	m	s
Dec 22	Continued			
	9.2°S 112.4°E			
	Depth 69 km Dist. 147.7°			
22	eP	15	30	50
	eS	15	39	06
	eScS	15	40	34
	eLQ	15	47	54
	eLR (NW)	15	52	44
	Fox Isls, Aleutians			
	USCGS 15 20 31.0			
	52.5°N 168.8°W			
	Depth 74 km Dist. 61.3°			
24	eS	11	30	34
	eScS	11	31	44
	eLR (NE)	11	40	44
	Novaya Zemlya			
	USCGS 11 11 42.0			
	73.6°N 57.5°E			
	Depth 0 Dist. o0.8°			
25	eS	12	32	09
	eLQ	12	43	35
	eLR (SW)	12	45	45
	S. Pacific Ocean			
	USCGS 12 09 45.6			
	36.2°S 100.2°W			
	Depth 33 km Dist. 80.3°			
26	e(P)	06	19	18
	Windward Isls.			
	USCGS 06 12 26.5			
	12.8°N 60.9°W			
	Depth 32 km Dist. 30.1°			
26	eS	09	13	45
	eLR (SE)	09	16	55
	Off Coast Portugal			
	USCGS 08 58 11.1			
	39.3°N 10.6°W			
	Depth 19 km Dist. 47.3°			
26	eP	22	36	31.5
	eS	22	45	43
	eScS	22	46	31
	eLQ	22	55	31
	eLR (NW)	22	59	15
	Komandorskie Islands			
	USCGS 22 25 15.5			
	53.9°N 168.7°E			
	Depth 33 km Dist. 71.1°			
	Mag. 6-1/2			
26	eP	23	57	30
	eLQ	00	21	35
	eLR	00	25	15
	Komandorskie Islands			
	USCGS 23 46 14.7			
	55.0°N 168.8°E			
	Depth 33 km Dist. 71.1°			
Dec 27	eP	18	31	55
	eS	18	42	43
	eLQ	18	59	15
	eLR (N)	19	04	15
	Honshu, Japan			
	USCGS 18 18 42.0			
	39.9°N 142.0°E			
	Depth 36 km Dist. 92.1°			
29	eP	10	51	14
	(P(Z) 6 sec 3.5μ comp. fr. S)			
	ePcP	10	52	25
	eS	10	59	27
	eScS	11	01	19
	eLQ	11	06	15
	eLR (SSE)	11	10	35
	N. Chile			
	USCGS 10 41 04.1			
	20.0°S 69.9°W			
	Depth 46 km Dist. 60.8°			
	Mag. 6			
30	eSKS	18	42	06
	eLQ	19	08	14
	eLR (NW)	19	14	44
	New Britain			
	USCGS 18 16 21.4			
	4.7°S 153.7°E			
	Depth 116 km Dist. 124.2°			