

LAMONT GEOLOGICAL OBSERVATORY  
COLUMBIA UNIVERSITY  
PALISADES, NEW YORK

●

SEISMOLOGICAL BULLETIN

By

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1 January 1963 - 30 June 1963

L.G.O. Contribution No. 709



Palisades, New York				2				1963			
Date	Phase	h	m	s	Date	Phase	h	m	s		
Jan 15	eSKS	22	41	30	Jan 27	eS	15	36	21		
	eLQ	22	55	30		eLR (WNW)	15	40	01		
	eLR (SE)	23	00	10		Idaho					
	S. Atlantic Ocean					USCGS 15 24 46.5					
	USCGS 22 17 50.9					44.3°N 114.5°W					
	31.3°S 13.4°W					Depth 31 km Dist. 30.2°					
	Depth 33 km Dist. 91.0°										
16	eS	06	05	04	27	iP	19	47	41		
	eLQ	06	15	50		epP	19	47	57		
	eLR (NW)	06	19	20		eS	19	58	01		
	Aleutians					eScS	19	58	27		
	USCGS 05 44 52.3					eLQ	20	11	41		
	51.3°N 179.9°W					eLR (NE)	20	16	31		
	Depth 38 km Dist. 68.0°					Caspian Sea near Azerbaijan SSR					
16	ePKP	21	28	22		USCGS 19 35 14.3					
	S. of Java					41.2°N 49.8°E					
	USCGS 21 08 38.8					Depth 33 km Dist. 83.8°					
	11.1°S 111.6°E					Mag. 5-1/2 - 5-3/4					
	Depth 94 km Dist. 149.6°				28	ePS	12	44	01		
17	eS	03	50	00		eLQ	13	03	51		
	eLQ	04	01	50		eLR (NW)	13	10	41		
	eLR	04	06	40		New Britain					
	600 km W. Chiloe, Chile					USCGS 12 12 19.8					
	USCGS 03 27 02					2.6°S 149.9°E					
	43.6°S 83.6°W					Depth 33 km Dist. 125.3°					
	Depth 33 km Dist. 85.1°					Mag. 6-1/4 - 6-1/2					
20	eP	09	06	40	28	eP	13	10	33		
	eLQ	09	27	49		eS	13	18	11		
	eLR (NW)	09	31	29		eLQ	13	25	31		
	Aleutians					eLR (NW)	13	29	11		
	USCGS 08 56 06.2					Alaska Peninsula					
	51.9°N 173.2°W					USCGS 13 00 50					
	Depth 30 km Dist. 63.9°					54.7°N 161.6°W					
20	eS	13	28	39		Depth 33 km Dist. 58.7°					
	eLQ	13	31	29		Mag. 6-1/2					
	eLR (W)	13	34	39	29	eP	09	33	10		
	Gulf of California					epP	09	33	18		
	USCGS 13 16 27.0					eS	09	43	01		
	26.4°N 110.7°W					eScS	09	43	21		
	Depth 27 km Dist. 34.1°					eLQ	09	56	31		
24	iPKP	09	47	51		eLR (NW)	10	00	41		
	Java Sea					Kurile Islands					
	USCGS 09 29 11.6					USCGS 09 21 14.3					
	6.0°S 112.6°E					49.7°N 154.9°E					
	Depth 493 km Dist. 144.6°					Depth 126 km Dist. 79.7°					
27	eS	12	04	20		Mag. 5					
	eLQ	12	10	10	29	eP	20	43	47.5		
	eLR	12	12	10		eS	20	52	22		
	Gulf of Alaska					eLR	22	04	32		
	USCGS 11 47 36.3					Chile-Bolivia Border					
	59.4°N 153.4°W					USCGS 20 33 27.0					
	Depth 94 km Dist. 50.7°					21.5°S 68.6°W					
						Depth 73 km Dist. 62.8°					

Palisades, New York				3				1963			
Date	Phase	h	m	s	Date	Phase	h	m	s		
Jan 30	eS	04	57	12	Feb 4	eP	23	33	20		
	eLQ	05	05	32		eLQ	23	52	52		
	eLR	05	08	22		eLR	23	59	42		
	Alaska Peninsula					Kurile Islands					
	USCGS 04 39 56.3					USCGS 23 21 09.0					
	54.8°N 161.6°W					48.5°N 154.9°E					
	Depth 33 km Dist. 56.7°					Depth 85 km Dist. 80.5°					
30	eP	10	24	02	5	eP (comp. fr S)	20	51	23.5		
	epP	10	24	24		eS	21	01	23		
	ePKP	10	28	22		eLQ	21	14	12		
	eSKS	10	34	40		eLR (SSE)	21	17	52		
	eLQ	10	54	42		Near Coast Central Chile					
	eLR (SSE)	10	59	12		USCGS 20 39 21.6					
	S. Sandwich Island					38.4°S 73.2°W					
	USCGS 10 10 04.1					Depth 41 km Dist. 78.6°					
	55.6°S 28.3°W					Mag. 5-3/4 - 6					
	Depth 33 km Dist. 104.2°										
	Mag. 6-3/4				6	eP (comp)	01	33	29.5		
31	eSKS	05	31	54		eS	01	43	32		
	eLQ	05	51	52		eLQ	01	55	12		
	eLR (N)	05	57	52		eLR (SSE)	01	59	42		
	Ryukyu Islands					Near Coast Central Chile					
	USCGS 05 06 46.0					USCGS 01 21 29.0					
	27.9°N 126.3°E					38.4°S 73.6°W					
	Depth 33 km Dist. 108.9°					Depth 33 km Dist. 78.6°					
	Mag. 6 - 6-1/4					Mag. 5-1/4 - 5-1/2					
Feb 1	eS	16	50	32	6	iPKP (dil)	02	15	04		
	eLR	16	55	52		Flores Sea					
	Central Idaho					USCGS 01 55 59.2					
	USCGS 16 38 58.3					7.9°S 119.9°E					
	44.2°N 114.6°W					Depth 306 km Dist. 144.8°					
	Depth 33 km Dist. 30.2°				6	eS	07	14	12		
2	eS	19	41	34		eLR (S)	07	18	12		
	eLR (SW)	19	43	42		Near S. Coast Panama					
	Cayman Islands					USCGS 07 01 47.0					
	USCGS 19 32 15.1					7.4°N 82.6°W					
	18.8°N 81.5°W					Depth 61 km Dist. 34.8°					
	Depth 71 km Dist. 23.0°				13	eS	00	34	41		
2	eS	21	37	32		eLR (SW)	00	38	51		
	eLR (SW)	21	41	12		Near S. Coast Guatemala					
	Off W. Coast of Guatemala					USCGS 00 22 51.3					
	USCGS 21 25 38					13.4°N 91.0°W					
	13.9°N 92.1°W					Depth 116 km Dist. 31.9°					
	Depth 33 km Dist. 31.2°				13	eP (comp. fr. N)	09	04	45		
4	eS	12	41	42		ePKP	09	08	31		
	eLQ	12	44	22		eSKS	09	15	23		
	eLR	12	46	12		eLQ	09	37	51		
	S. of Panama					eLR (N)	09	43	25		
	USCGS 12 28 38.1					Northern Formosa					
	5.1°N 82.4°W					USCGS 08 50 02.2					
	Depth 45 km Dist. 36.6°					24.5°N 121.8°E					
						Depth 33 km Dist. 112.7°					
						Mag. 7 - 7-1/4					



Palisades, New York					6	1963				
Date	Phase	h	m	s	Date	Phase	h	m	s	
Mar 7	eP (dil.)	12	29	02	Mar 12	eSKS	21	06	30	
	eSKS	12	39	33		eLR	21	34	30	
	eS	12	40	31	Solomon Islands					
	eSS	12	45	21	USCGS 20 40 12.8					
	eLQ	12	51	15	7.1°S 156.0°E					
	eLR (SSE)	12	55	11	Depth 97 km Dist. 124.3°					
	Near Coast S. Chile					ePKP				00 34 55
	USCGS 12 16 28.5					eLQ				01 11 10
	44.3°S 75.3°W					eLR (NW)				01 17 50
	Depth 45 km Dist. 84.6°					eLR <sub>2</sub> (SE)				02 03 30
	Mag. 5-1/2					Mindanao, Philippines				
8	eP	15	15	45	USCGS 00 16 01.3					
	eS	15	23	39	8.4°N 126.4°E					
	eLQ	15	28	51	Depth 117 km Dist. 127.9°					
	eLR (SE)	15	31	21		eS				05 57 56
	Mid-Atlantic Ocean					eLR (SE)				05 59 10
	USCGS 15 06 05.3					N. Atlantic Ocean				
	1.1°N 29.9°W					USCGS 05 46 32.8				
	Depth 33 km Dist. 56.2°					21.7°N 45.4°W				
10	eP	01	35	58	Depth 33 km Dist. 30.9°					
	eS	01	42	35		eP [P(z) 6 sec 08				57 11
	eSS	01	43	13		ip 8 <sub>2</sub> comp. 08				57 13
	eScS	01	45	51		ipP from NW				08 57 19
	eLR (NW)	01	50	11		is				09 07 25
	Kodiak Island, Alaska					eLQ				09 19 01
	USCGS 01 26 04.1					eLR				09 24 11
	56.2°N 153.8°W					Kurile Island Reg.				
	Depth 33 km Dist. 52.1°					USCGS 08 44 48.3				
	Mag. 5					46.5°N 154.7°E				
10	ePKKP	03	22	21	Depth 26 km Dist. 82.2°					
	eLQ	03	41	31	Mag. 6-3/4 - 7					
	eLR (N)	03	47	11		eS				06 31 21
	Near E. Coast Formosa					eLQ				06 33 51
	USCGS 02 53 33.0					eLR				06 35 41
	24.7°N 122.1°E					S. of Panama				
	Depth 33 km Dist. 112.7°					USCGS 06 18 52.4				
	Mag. 5-1/2 - 5-3/4					7.1°N 82.2°W				
10	eP (comp)	11	02	59	Depth 33 km Dist. 34.6°					
	epP	11	03	15		eSKS				04 52 11
	eS	11	12	11		eLR				05 26 11
	eScS	11	12	39	Kermadec Islands					
	eLQ	11	22	31	USCGS 04 25 41.4					
	eLR (SE)	11	25	11	33.2°S 179.0°E					
	Near Coast Central Chile					Depth 33 km Dist. 122.8				
	USCGS 10 51 48.1					e(PKP)				05 01 47
	29.9°S 71.2°W					e(pPKP)				05 04 25
	Depth 70 km Dist. 70.7°					Fiji Islands				
	Mag. 5 - 5-1/4					USCGS 04 43 13.5				
11	eS	07	48	43	19.9°S 179.1°W					
	eLQ	07	59	11	Depth 680 km Dist. 114.0°					
	eLR	08	03	31	Turkey					
	USCGS 07 27 22.0									
	38.1°N 29.3°E									
	Depth 33 km Dist. 74.5°									

Palisades, New York					7	1963				
Date	Phase	h	m	s	Date	Phase	h	m	s	
Mar 20	eSKS	17	05	21	Mar 25	ePKP	20	36	46	
	eLQ	17	35	31		eLR (SW)	21	28	15	
	eLR (NW)	17	40	51	Macquarie Island Reg.					
	eLR <sub>2</sub>	18	25	11	USCGS 20 17 03.8					
	W. New Guinea				56.3°S 149.9°E					
	USCGS 16 38 55.8				Depth 39 km Dist. 147.9°					
	2.4°S 138.4°E					ePKP				23 05 40
	Depth 40 km Dist. 131.6°					ePKS				23 09 15
24	ePKP (comp)	02	26	52		eLQ				23 49 55
	ePKP <sub>2</sub>	02	27	00		eLR (NE)				23 53 15
	epPKP	02	27	28	Off S. Coast Sumatra					
	eLQ	03	09	14	USCGS 22 46 16.2					
	eLR (N)	03	14	54	0.7°N 96.5°E					
	Sumba Island Reg.					Depth 30 km Dist. 137.4°				
	USCGS 02 07 12.8					eP				10 03 29
	9.7°S 120.4°E					ePKP				10 07 04
	Depth 33 km Dist. 146.7°					ePKP <sub>2</sub>				10 08 02
	Mag. 6					eSKS				10 14 15
24	eP	02	35	23		eLQ				10 34 35
	Aleutians					eLR (W)				10 40 45
	USCGS 02 24 49.2					Kermadec				
	51.6°N 173.3°W					USCGS 09 48 19.7				
	Depth 55 km Dist. 63.9°					29.7°S 177.8°W				
24	ePKP	10	02	20	Depth 45 km Dist. 119°					
	eSKS	10	10	24	Mag. 7					
	eLR (NW)	10	40	14		ePKP				13 43 49
	Philippines					eSKS				13 50 37
	USCGS 09 43 20.2					eLQ				14 14 45
	9.0°N 125.6°E					eLR (WSW)				14 20 45
	Depth 51 km Dist. 126.9°					Kermadec				
	eP				12 56 54	USCGS 13 25 02.6				
	eS				13 07 22	29.8°S 177.9°W				
	eSS				13 07 42	Depth 42 km Dist. 119°				
	eLQ				13 20 34	Mag. 6½				
	eLR (NE)				13 26 44					
	W. Iran					eP				21 48 17
	USCGS 12 44 03.2					epP				21 48 47
	34.4°N 47.9°E					esP				21 49 19
	Depth 33 km Dist. 88.2°					eSKS				21 58 57
	Mag. 5½ - 5-3/4					eLQ				22 16 25
24	eP	21	46	10		eLR (N)				22 22 45
	epP	21	46	40	Honshu, Japan					
	eS	21	55	03	USCGS 21 34 41.1					
	eLQ	22	04	55	36.0°N 135.7°E					
	eLR (NW)	22	07	43	Depth 33 km Dist. 98.6°					
	Aleutians					Mag. 6 - 6½				
	USCGS 21 35 24.4					ip [P(z) 00				23 09.5
	51.8°N 178.1°W					epP 4 <sub>4</sub> 00				23 21.5
	Depth 57 km Dist. 66.4°					is comp 00				29 19.5
	Mag. 5					eLQ fr. NW 00				31 46
	eS				09 40 45	eLR (NE) 00				33 46
	eLR (W)				09 44 15	Iceland				
	S Nevada					USCGS 00 15 47.5				
	USCGS 09 28 44.1					66.3°N 19.6°W				
	36.0°N 114.9°W					Depth 15 km Dist. 38.8°				
	Depth 17 km Dist. 32.3°					Mag. 6½ - 6-3/4				





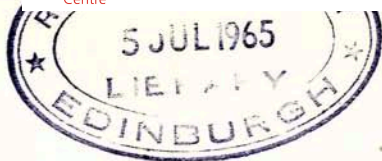




Palisades, New York				14				1963			
Date	Phase	h	m	s	Date	Phase	h	m	s		
June 6	eSKS	05	44	43	June 10	ePKP	06	58	49		
	eLQ	06	06	45		ePKP	06	58	42		
	eLR (N)	06	13	15		eLQ	07	41	28		
	Off N. Coast Luzon Philippines					eLR (SW)	07	50	36		
	USCGS	05	18	55.1		e(LR) (NS)	08	18	36		
	19.9°N 120.2°E					800 km W. Macquarie Isl.					
	Depth	33	km	Dist. 117.9°		USCGS	06	39	04.0		
						55.3°S 146.1°E					
7	eP	19	38	24		Dist. 150.3° Depth 18 km					
	eS	19	44	43		Mag. $6\frac{1}{4}$ - $6\frac{1}{2}$					
	eLQ	19	48	15	11	eS	13	24	40		
	eLR (SW)	19	50	15		eSS	13	25	14		
	Clipperton Isl. Reg.					eLQ	13	29	56		
	USCGS	19	30	35.6		eLR (NNW)	13	32	16		
	8.5°N 103.1°W					Rg	13	37	28		
	Depth	33	km	Dist. 40.9°		Central Alaska					
	Mag.	$5\frac{1}{4}$ - $5\frac{1}{2}$				USCGS	13	08	31.4		
7	ePcP	21	38	29		63.1°N 151.4°W					
	eS	21	42	55		Depth 31 km Dist. 48.8°					
	eLR (SW)	21	48	15		Mag. 4-3/4 - 5					
	Clipperton Isl. Reg.				11	eS	15	36	16		
	USCGS	21	28	48.5		eLQ	15	39	16		
	8.8°N 102.5°W					eLR (W)	15	41	16		
	Depth	33	km	Dist. 40.9°		Baja, Calif.					
						USCGS	15	23	42.3		
7	eSKS	23	02	29		31.8°N 116.2°W Mag. 4-3/4 - 5					
	eLQ	23	21	35		Depth 33 km Dist. 34.7°					
	eLR (W)	23	27	15	11	eS	18	47	16		
	Samoa Isl. Reg.					eLQ	18	49	56		
	USCGS	22	31	54.8		eLR (S)	18	52	16		
	15.2°S 173.1°W					W. Coast Colombia					
	Depth	33	km	Dist. 106.5°		USCGS	18	34	30.6		
	Mag.	5-3/4				4.9°N 77.5°W Mag. 4-3/4 - 5					
8	eS	04	45	55		Depth 33 km Dist. 35.9°					
	eLQ	05	57	35	14	eS	23	51	47		
	eLR (SE)	06	01	15		eLQ	23	55	57		
	S. Atlantic Ocean					eLR (WNW)	23	58	05		
	USCGS	04	22	53.0		Off Coast Vancouver Isl.					
	22.7°S 13.7°W					USCGS	23	37	48.5		
	Depth	33	km	Dist. 84.5°		50.8°N 129.6°W					
9	eS	20	51	56		Depth 33 km Dist. 39.3°					
	eLQ	20	55	08	15	eS	02	38	41		
	eLR (SE)	20	56	16		eLQ	02	45	17		
	Mid-Atlantic Ocean					eLR	02	51	35		
	USCGS	20	37	51.6		Aleutians					
	10.7°N 41.9°W					USCGS	02	20	11.5		
	Depth	33	km	Dist. 41.0°		53.2°N 167.0°W					
10	ePKP	04	36	25		Depth 33 km Dist. 60.3°					
	eSKS	04	43	32	15	eS	15	52	48		
	eLQ	05	18	56		eLQ	16	04	18		
	eLR (SW)	05	28	16		eLR (SSW)	16	07	48		
	800 km W. Macquarie Isls.					Off Coast Central Chile					
	USCGS	04	16	37.7		USCGS	15	30	37.7		
	55.4°S 146.4°E					36.3°S 98.9°W					
	Depth	33	km	Dist. 150.3°		Depth 33 km Dist. 80°					
	Mag.	5-3/4 - 6			10	ePKP	05	34	08.5		
						800 km W. Macquarie Isls.					
	USCGS	05	14	15.6		USCGS 05 14 15.6					
	55.2°S 146.3°E					55.2°S 146.3°E					
	Depth	33	km	Dist. 150.3°		Depth 33 km Dist. 150.3°					

Palisades, New York				15				1963			
Date	Phase	h	m	s	Date	Phase	h	m	s		
June 15	eSKS	22	13	02	June 20	eSKS	23	11	51		
	eLR (SE)	22	36	18		eLQ	23	36	19		
	Sandwich Isls.					eLR (W)	23	42	19		
	USCGS	21	47	12.1		Kermadec Isls.					
	55.7°S 28.5°W					USCGS	22	46	18.1		
	Depth	33	km	Dist. 103.9°		27.9°S 176.6°W					
						Depth	41	km	Dist. 117.2°		
17	eP	18	40	25	23	eSKS	04	15	11		
	eS	18	46	58		eLQ	04	39	31		
	eScS	18	50	30		eLR (WSW)	04	45	59		
	eLQ	18	51	30		Kermadec Isl. Reg.					
	eLR (NW)	18	53	30		USCGS	03	49	33.9		
	Rg	18	55	28		29.6°S 177.9°W					
	S. W. Yukon					Depth 55 km Dist. 119°					
	USCGS	18	32	14.5	24	eP (6 sec	04	35	29		
	60.4°N 140.8°W					iP <sup>3</sup> comp	04	35	35		
	Depth	33	km	Dist. 44.5°		ePP (NW)	04	35	53		
	Mag.	$5\frac{1}{4}$ - $5\frac{1}{2}$				eS	04	42	35		
17	ePKP	23	21	30		eScS	04	45	19		
	eLQ	00	04	18		eLQ	04	47	39		
	eLR (NE)	00	14	18		eLR (NW)	04	49	49		
	Near S. Coast Sumatra					Lg	04	54	19		
	USCGS	23	02	06.6		Rg	04	56	19		
	4.1°S 102.2°E					Northern Alaska - Cook Inlet					
	Depth	73	km	Dist. 142.9°		USCGS	04	26	37.9		
18	eP	16	59	14		59.5°N 151.7°W					
	eS	17	03	19		Depth	52	km	Dist. 49.7°		
	eLQ	17	04	27		Mag. 6-3/4					
	eLR (SSS)	17	05	49	24	eP(Z)	6	16	27		
	N. of Puerto Rico					eS sec 1A	16	36	07		
	USCGS	16	54	05.6		eScS (NW)	16	37	29		
	19.6°N 65.6°W					eLQ	16	44	19		
	Depth	33	km	Dist. 22.0°		eLR (NW)	16	47	39		
	Mag.	4				Fox Isls. Aleutians					
19	ePPS	02	45	39		USCGS	16	17	15.4		
	eLQ	03	03	19		52.3°N 171.2°W					
	eLR (SW)	03	10	19		Depth	33	km	Dist. 62.9°		
	Tonga Isls.					Mag. $5\frac{1}{4}$ - $5\frac{1}{2}$					
	USCGS	02	15	54.1	25	eS	11	03	11		
	23.6°S 174.9°W					eLQ	11	12	39		
	Depth	55	km	Dist. 113.4°		eLR	11	15	59		
	Mag.	$5\frac{1}{4}$				near Coast Peru					
19	ePKP <sub>1</sub>	09	28	10		USCGS	10	45	32.5		
	ePKP <sub>2</sub>	09	28	29		15.9°S 75.3°W					
	ePKS <sub>1</sub>	09	30	19		Depth 34 km Dist. 56.7°					
	ePKS <sub>2</sub>	09	31	29	25	ePKP <sub>1</sub>	14	51	53		
	eSKS	09	35	29		ePKP <sub>2</sub>	15	52	27		
	eLQ	10	02	59		eLR (NE)	15	48	39		
	eLR (NW)	10	12	19		S. Coast Java					
	Talaud Isls. Reg.					USCGS	14	32	14.3		
	USCGS	09	09	04.0		8.4°S 106.5°E					
	4.7°N 126.5°E Mag. $5\frac{1}{4}$ - $5\frac{1}{2}$					Depth 78 km Dist. 147.1°					
	Depth	83	km	Dist. 130.4°	26	eS	01	11	31		
19	eP	23	15	39		eLQ	01	13	59		
	epP	23	16	51		eLR	01	15	49		
	eSKS	23	26	27		S. of Panama					
	eS	23	27	29		USCGS	00	59	08.9		
	eLR (N)	23	47	59		7.1°N 82.2°W					
	S. of Honshu, Japan					Depth	33	km	Dist. 34.6°		
	USCGS	23	01	51.5							
	31.5°N 140.3°E										
	Depth	38	km	Dist. 109°							
	Mag.	$5\frac{1}{4}$									

Palisades, New York					16					
Date	Phase	h	m	s	Date	Phase	h	m	s	
June 26	eP	17	49	31						
	epP	17	49	39						
	ePcP	17	52	03						
	eS	17	55	03						
	eLR (SSW)	17	59	19						
	Near S. Coast Panama									
	USCGS	17	42	40.6						
	7.1°N 82.3°W									
	Depth 20 km Dist. 34.6°									
	Mag. 5½ - 5-3/4									
27	eS	07	22	49						
	eScS	07	26	19						
	eLQ	07	28	49						
	eLR (NNW)	07	31	29						
	Rg	07	33	59						
	Yukon Territory									
	USCGS	07	08	01.7						
	60.5°N 140.7°W									
	Depth 29 km Dist. 44.1°									
	Mag. 4-3/4									
28	e(P)	02	46	29						
	ePKP <sub>1</sub>	02	48	24						
	ePKP <sub>2</sub>	02	48	35						
	eLQ	03	30	19						
	eLR (ESE)	03	37	39						
	Indian Ocean									
	USCGS	02	28	51.6						
	27.5°S 66.1°E									
	Depth 33 km Dist. 144.8°									
	Mag. 5¼ - 5½									
28	eP [P(2)]	8	22	08	04					
	epP sec.4u	22	08	25						
	iS comp.	22	18	21						
	eLQ fr. NW	22	30	49						
	eLR (NW)	22	34	49						
	Kurile Isl. Reg.									
	USCGS	21	55	38.8						
	46.5°N 153.2°E									
	Depth 33 km Dist. 82.9°									
	Mag. 6½ - 6-3/4									
30	ePKP	07	04	45						
	eLR	07	46	19						
	Sumatra									
	USCGS	06	45	36.8						
	2.5°S 102.4°E									
Depth 160 km Dist. 141.9°										
30	eP	22	17	15						
	eSKS	22	27	33						
	eLQ	22	44	19						
	eLR (NW)	22	48	39						
	Kurile Isl.									
	USCGS	22	04	52.8						
	46.5°N 153.3°E									
Depth 33 km Dist. 82.9°										



**LAMONT GEOLOGICAL OBSERVATORY  
COLUMBIA UNIVERSITY**

**PALISADES, NEW YORK**



**SEISMOLOGICAL BULLETIN**

**By**

**RUTH B. SIMON**

**1 July 1963 - 31 December 1963**

**L.G.O. Contribution No. 802**

**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 = 15 sec.
- Three Columbia University vertical seismographs  
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<sub>2</sub>. Filter galvanometers of 6.7 sec.  
are in operation from October through May.
- Two Columbia University microbarographs, To = 10 sec.,  
Tg = 75 sec.

Palisades, New York				1963					
Date	Phase	h	m	s	Date	Phase	h	m	s
July 2	eS	00	39	20	July 7	Continued			
	eLR	00	59	20		USCGS 19 20 42.3			
						Sinkian Prov., China			
						39.6°N 111.9°W			
						USCGS 00 15 22.4			
						43.9°N 85.2°E			
						Depth 33 km Dist. 28.8°			
						Mag. 5			
2	eS	03	07	30	8	eS	11	24	26
	eScS	03	10	48		eLR (SE)	11	34	22
	eLR	03	13	20		Mid-Atlantic Ocean			
						USCGS 11 05 07.5			
						0.3°N 17.8°W			
						Depth 33 km Dist. 64.9°			
						Mag. 4 3/4			
3	eP	09	19	37	8	eS	18	05	26
	eS	09	24	51		eScS	18	09	08
	eLR	09	27	21		eLR (NNW)	18	12	32
						Central Alaska			
						USCGS 17 49 30.9			
						65.8°N 153.9°W			
						Depth 33 km Dist. 49.5°			
						Mag. 5 - 5 1/4			
4	eP	11	12	41	9	eP (comp. from S)	09	31	12
	ePKP	11	16	39		epP	09	31	26
	epPKP	11	17	25		ePcP	09	34	28
	eLQ	11	46	31		eS	09	36	38
	eLR (WSW)	11	53	21		eLR (SSW)	09	40	02
						Costa Rica-Panama Border			
						USCGS 09 24 33.3			
						8.5°N 83.0°W			
						Depth 31 km Dist. 32.9°			
						Mag. 5 1/4 - 5 1/2			
4	eP	23	08	35	9	eS	19	16	38
	epP	23	08	41		eLQ	19	24	42
	eS	23	18	55		eLR (SE)	19	28	22
	eLQ	23	30	11		Argentina			
	eLR (SE)	23	33	51		USCGS 18 56 12.6			
						29.1°S 68.1°W			
						Depth 33 km Dist. 69.9°			
						Mag. 5 1/4 - 5 1/2			
5	eP	05	57	22	9	eS	20	36	02
	epP	05	57	39		eLQ	20	39	52
	eS	06	04	33		eLR (W)	20	42	52
	esS	06	05	05		Central Utah			
	eLR (SSE)	06	12	51		USCGS 20 25 28.8			
						40.1°N 111.3°W			
						Depth 33 km Dist. 28.1°			
						Peru			
						USCGS 05 48 13.4			
						11.6°S 77.5°W			
						Depth 55km Dist. 52.8°			
						Mag. 5			
7	eS	19	31	26	10	eP	03	27	06
	eLR (WNW)	19	34	34		eSKS	03	37	22
						eLQ	03	48	52
						eLR (NW)	03	55	22
						Kurile Isls.			
						USCGS 03 14 41.8			
						46.3°N 153.4°E			
						Depth 33 km Dist. 83.8°			







Palisades, New York			8	1963					
Date	Phase	h	m	s	Date	Phase	h	m	s
Sept 17	eP	06	03	36	Sept 20	eP	22	22	05
	epP	06	03	53		eS	22	29	01
	ePcP	06	04	29		eScS	22	32	01
	eS	06	11	21		Peru-Bolivia Border			
	eScS	06	13	00		USCGS 22 11 32.2			
	eLR (SW)	06	17	39		17.8°S 68.8°W			
	Central Peru					Depth 171 km Dist. 58.9°			
	USCGS 05 54 33.7				22	eP	02	59	30
	10.6°S 78.2°W					ePcP	02	59	56
	Depth 61 km Dist. 51.9°					eS	03	08	01
	Mag. 5 1/4					eScS	03	10	09
17	eP (dil)	19	35	21		eLQ	03	16	49
	ePKP	19	39	01		eLR	03	20	29
	eLQ	20	10	29		Aleutians			
	eLR (WNW)	20	15	09		USCGS 02 49 03.4			
	Santa Cruz Isls.					52.5°N 174.9°W			
	USCGS 19 20 08.2					Depth 105 km Dist. 64.6°			
	10.1°S 165.3°E				22	eSS	03	32	39
	Depth 17 km Dist. 119.9°					eLQ	03	44	09
	Mag. 7					eLR (W)	03	52	29
18	eP	17	09	39		Fiji Isls.			
	eS	17	19	13		USCGS 02 56 24.3			
	eLQ	17	29	29		19.3°S 175.9°E			
	eLR (ENE)	17	34	09		Depth 28 km Dist. 117.2°			
	Turkey					Mag. 5 3/4			
	USCGS 16 58 12.5				23	ePKP	09	20	58
	40.9°N 29.2°E					eSKS	09	27	08
	Depth 33 km Dist. 72.6°					eLQ	09	50	28
	Mag. 5 3/4 - 6					eLR ((S)E)	09	55	08
18	iP	23	53	28		N. Rhodesia			
	ipP	23	53	32		USCGS 09 01 56.8			
19	eLQ	00	22	09		16.6°S 28.8°E			
	eLR	00	27	19		Depth 33 km Dist. 110.6°			
19	eS	11	10	19	23	eS	14	54	38
	eLR	11	17	09		eLQ	14	58	28
	Central Idaho					eLR (W)	15	00	28
	USCGS 10 59 59.5					Riverside Co., California			
	44.3°N 114.9°W					USCGS 14 41 51.5			
	Depth 33 km Dist. 30.2°					33.7°N 117.0°W			
19	eP	16	56	19		Depth 14 km Dist. 34.6°			
	eS	17	01	27	23	eS	17	22	28
	eLR (NE)	17	04	59		eLQ	17	33	08
	N. Atlantic Ocean					eLR (NW)	17	36	08
	USCGS 16 49 29.9					Aleutians			
	47.1°N 27.4°W					USCGS 17 02 36.6			
	Depth 33 km Dist. 33.9°					51.3°N 179.2°W			
20	eS	03	19	19		Depth 33 km Dist. 67.5°			
	eLQ	03	24	49	24	iP	16	39	14.5
	eLR (NE)	03	26	49		P(Z) 8 sec 2.5 $\mu$ comp. fr. S			
	Svalbard Region 76.5°N 7.9°E					epP	16	39	40
	USCGS 03 03 32.9					ePcP	16	40	18
	Depth 33 km Dist. 48.6°					iS	16	46	30
						eScS	16	48	58

Palisades, New York			9	1963					
Date	Phase	h	m	s	Date	Phase	h	m	s
Sept 24	Continued				Sept 29	Continued			
	eLQ	16	52	08		Depth 61 km Dist. 31.2°			
	eLR (S)	16	54	08		Mag. 5 - 5 1/4			
	Near Coast Peru				30	eS	03	17	41
	USCGS 16 30 16.0					eLQ	03	20	51
	10.6°S 78.0°W					eLR (SW)	03	23	11
	Depth 80 km Dist. 51.9°					Near W. Coast Guatemala			
	Mag. 6					USCGS 03 05 38.1			
25	eS	01	20	08		14.1°N 91.9°W			
	eLQ	01	21	38		Depth 86 km Dist. 31.2°			
	eLR	01	23	08	Oct 1	eS	10	42	32
	Honduras					eLR (SW)	10	46	42
	USCGS 01 09 39.7					Costa Rica			
	16.6°N 87.1°W					USCGS 10 30 31.6			
	Depth 33 km Dist. 26.5°					10.2°N 84.5°W			
25	ePKP	07	22	48		Depth 46 km Dist. 32.4°			
	eLR (SE)	07	57	08	2	eSKS	06	12	33
	N. Rhodesia					eLQ	06	35	13
	USCGS 07 03 54.6					eLR (SW)	06	41	33
	16.7°S 28.7°E					Tonga Isls.			
	Depth 33 km Dist. 110.6°					USCGS 05 47 05.5			
26	eS	04	36	49		20.8°S 174.1°W			
	eLQ	04	42	39		Depth 33 km Dist. 110.9°			
	eLR (NW)	04	50	09	3	eS	01	35	21
	Kodiak Isl. Region					eLR	01	40	13
	USCGS 04 20 21.5					Off Coast Colima, Mexico			
	56.5°N 153.4°W					USCGS 01 22 40.6			
	Depth 33 km Dist. 51.3°					18.3°N 105.6°W			
26	eP	05	38	57.3		Depth 33 km Dist. 35.8°			
	ePcP	05	39	29	3	eP	16	02	53
	eS	05	47	49		eLR (SE)	16	38	13
	eScS	05	48	25		Sandwich Isls.			
	eLQ	05	55	29		USCGS 15 48 17.2			
	eLR (NW)	05	59	19		58.5°S 25.1°W			
	Aleutians					Depth 54 km Dist. 107.6°			
	USCGS 05 28 07.3					Mag. 5 1/2			
	50.4°N 176.9°W				3	eP	23	38	33
	Depth 33 km Dist. 67.1°					eSKS	23	49	13
	Mag. 4 3/4 - 5				4	eLQ	00	07	43
29	eP	22	27	38		eLR (N)	00	12	23
	eS	22	36	45		Kyushu, Japan			
	eLR (NE)	22	50	21		USCGS 23 24 34.7			
	Ionian Sea					32.2°N 131.6°E			
	USCGS 22 16 38.6					Depth 33 km Dist. 101.5°			
	36.1°N 18.0°E					Mag. 6			
	Depth 47 km Dist. 68.8°				29	eP	22	50	15.3
29	eP	22	50	15.3		ePcP	22	52	35
	ePcP	22	52	35	5	eS	22	55	21
	eS	22	55	21		eLR (SSW)	22	59	11
	eLR (SSW)	22	59	11		Guatemala			
	USCGS 22 44 02.9					USCGS 14 57 47.4			
	14.4°N 91.9°W					11.6°N 42.8°E			



Palisades, New York				10				1963			
Date	Phase	h	m	s	Date	Phase	h	m	s		
Oct 5	Continued				Oct 11	Continued					
	Depth 33 km Dist. 101.5°					Off Coast Jalisco, Mexico					
	Mag. 5 1/4 - 5 1/2					USCGS 10 17 07.6					
6	eS	17	36	31		17.8°N 105.9°W					
	eLQ	17	49	25		Depth 33km Dist. 35.8°					
	eLR	17	53	25		Mag. 5 1/4 - 5 1/2					
	Central Chile				12	iP	11	39	37		
	USCGS 17 15 33.9					P(Z) 6 sec 3μ comp from N					
	33.9°S 70.0°W					iS	11	50	04		
	Depth 101 km Dist. 74.7°					eLQ	12	03	16		
7	eP	04	06	27		eLR (NW)	12	06	46		
	eS	04	11	55		Kurile Isls.					
	eLQ	04	13	35		USCGS 11 26 57.9					
	eLR (SW)	04	16	25		44.8°N 149.0°E					
	W. Coast Nicaragua					Depth 40 km Dist. 86.1°					
	USCGS 03 59 54.1					Mag. 6 3/4 - 7					
	11.6°N 86.9°W				13	eP	05	30	32		
	Depth 50 km Dist. 31.1°					iP (comp. fr. NNW)	05	30	38.5		
7	eS	05	48	17		iS	05	40	56		
	eLQ	05	50	35		e(LQ)	05	52	36		
	eLR (SW)	05	53	45		eLR	05	56	46		
	Revilla Gigedo Isls.					Kurile Isls.					
	USCGS 05 35 16.7					USCGS 05 17 57.1					
	19.8°N 109.1°W					44.8°N 149.5°E					
	Depth 33 km Dist. 36.4°					Depth 60 km Dist. 85.8°					
						Mag. 7 1/2 - 7 3/4					
7	eS	12	59	25	13	eP	06	18	09		
	eLQ	13	06	15		Kurile Isls.					
	eLR (S)	13	10	35		USCGS 06 05 29.5					
	Central Peru				13	eP	06	36	11		
	USCGS 12 43 53.6					Kurile Isls.					
	12.9°S 76.8°W										
	Depth 69 km Dist. 53.8°				13	iP	07	15	55		
7	ePKP	13	33	23		Kurile Islands					
	eSKS	13	38	07		USCGS 07 03 23.8					
	Fiji Isls. Region				13	eP	09	29	02		
	USCGS 13 14 24.6					Kurile Isls.					
	23.6°S 179.9°E					USCGS 09 16 25.9					
	Depth 550 km Dist. 117.1°				13	eP	09	35	31		
8	eSKS	00	41	58		Kurile Isls.					
	eLQ	01	01	46		USCGS 09 22 44.6					
	eLR (NW)	01	06	56	13	eP	13	10	56		
	Samoa Isls. Region					eS	13	21	24		
	USCGS 00 17 01.1					eLQ	13	26	46		
	15.1°S 173.2°W					eLR	13	31	16		
	Depth 33 km Dist. 106.5°					Kurile Isls.					
	Mag. 5 3/4					USCGS 12 58 21.6					
11	eP	10	24	08		45.0°N 150.1°E					
	eS	10	29	45		Depth 50 km Dist. 85.8°					
	eLQ	10	32	17							
	eLR (SSW)	10	34	29							
	Rg	10	37	17							

Palisades, New York				11				1963			
Date	Phase	h	m	s	Date	Phase	h	m	s		
Oct 13	iP	16	12	26	Oct 14	Continued					
	eSKS	16	22	44		USCGS 04 11 14.0					
	eS	16	23	00		44.7°N 150.6°E					
	eLQ	16	35	56		Depth 45 km Dist. 85.4°					
	eLR (NW)	16	40	36	14	eP	04	25	38		
	Kurile Isls.					epP	04	25	50		
	USCGS 15 59 52.9					Kurile Isls.					
	45.6°N 150.5°E					USCGS 04 13 03.1					
	Depth 35 km Dist. 84.5°					44.9°N 150.7°E					
13	eP	16	51	49		Depth 40 km Dist. 85.4°					
	e(LR) (NW)	17	07	16	14	eP	13	34	18		
	Kurile Isls.					eS	13	44	44		
	USCGS 16 28 58.2					eLQ	13	59	16		
	44.9°N 150.3°E					eLR (NW)	14	05	36		
	Depth 40 km Dist. 85.8°					Kurile Isls.					
13	eP	18	27	31		USCGS 13 21 45.2					
	eLR (NW)	18	40	46		44.8°N 151.0°E					
	Kurile Isls.					Depth 60 km Dist. 85.4°					
	USCGS 18 13 44.6				15	eP	08	12	45		
	44.2°N 149.4°E					epP	08	12	57.5		
	Depth 55 km Dist. 86.9°					Kurile Isls.					
13	eP	22	07	27.5		USCGS 08 00 11.5					
	Kurile Isls.					45.0°N 151.1°E					
	USCGS 21 55 00.8					Depth 40 km Dist. 85.4°					
13	eP	22	15	32	15	eP	09	14	42		
	eS	22	25	26		eLR (NE)	10	07	00		
	eLR (NW)	22	41	16							
	Kurile Isls.										
	USCGS 22 02 58.1										
	45.1°N 150.9°E										
	Depth 45 km Dist. 85.4°										
14	eP	00	05	02	15	eP	10	59	51		
	epP	00	05	12		eLR	11	34	16		
	eS	00	15	36		Kurile Isls.					
	eLQ	00	30	46		USCGS 10 47 12.6					
	eLR	00	33	36		44.6°N 149.0°E					
	Kurile Isls.					Depth 50 km Dist. 86.1°					
	USCGS 13 Oct 23 52 22.8										
	44.5°N 150.°E										
	Depth 50 km Dist. 85.8°				15	eP	12	30	31		
14	eP	04	18	36		eS	12	31	30.5		
	eS	04	29	06		S. W. Quebec					
	Kurile Isls.					USCGS 12 28 58					
	USCGS 04 06 01.7					46.6°N 77.6°W					
	44.9°N 150.2°E					Depth 14 km Dist. 5.5°					
	Depth 50 km Dist. 85.8°				15	eP	14	01	21.5		
14	eP	04	23	50		eS	14	02	23		
	epP	04	24	03		Quebec					
	eS	04	34	26		USCGS 13 59 50					
	eLR	04	50	46		46.3°N 77.8°W					
	Kurile Isls.					Depth 14 km Dist. ~ 5.8°					



Palisades, New York			14			1963		
Date	Phase	h m s	Date	Phase	h m s			
Oct 26	eP	07 35 17.5	Oct 30	eP <sub>n</sub>	22 38 43.5			
	eLR (NW)	08 00 12		eP <sub>g</sub>	22 38 47.7			
	Aleutians			eS <sub>n</sub>	22 38 51.5			
				eS <sub>g</sub>	22 39 21.5			
26	eP	11 34 24.5		Boston area aftershock				
	epP	11 34 37						
	eS	11 44 52	31	eSKS	03 42 58			
	eLQ	12 01 36		eLQ	04 05 40			
	eLR (NW)	12 05 32		eLR (WSW)	04 10 40			
	Kurile Isls.			Tonga Isls.				
	USCGS 11 21 47.6			USCGS 03 17 42.0				
	44.7°N 149.7°E			21.8°S 175.0°W				
	Depth 55 km Dist. 85.8°			Depth 33 km Dist. 112.3°				
	Mag. 5			Mag. 6 1/4 - 6 1/2				
27	eS	15 51 40	Nov 1	eSKS	23 04 23			
	eLR (SE)	16 08 30		eLQ	23 19 11			
	Tristan de Cunha Region			eLR (N)	23 24 11			
	USCGS 15 26 19			Kurile Isls				
	33.9°S 15.3°W			USCGS 22 41 23.8				
	Depth 33 km Dist. 92.3°			44.9°N 148.9°E				
				Depth 60 km Dist. 86.1°				
27	iP	20 18 14.5	3	iP	03 18 21.5			
	epP	20 18 27		P(Z) 6 sec 3.5μ comp. from S				
	eLR (N)	20 51 10		ipP	03 18 32			
	Kurile Isls.			ePcP	03 19 59			
	USCGS 20 05 38.1			eS	03 24 59			
	44.5°N 150.1°E			eScS	03 28 23			
	Depth 50 km Dist. 85.5°			eLR	03 32 31			
	Mag. 5 - 5 1/4			Ecuador-Peru Border				
28	ePP	08 15 40		USCGS 03 10 12.7				
	eSS	08 30 20		3.5°S 77.8°W				
	eLQ	08 41 40		Depth 33 km Dist. 44.9°				
	eLR (SW)	08 48 10		Mag. 6				
	Tonga Isls. Region		4	eP	01 29 40			
	USCGS 07 55 12.3			ePKP	01 33 08.5			
	24.3°S 176.0°W			epPKP	01 33 48			
	Depth 33 km Dist. 114.2°			ePKS	01 36 48			
	Mag. 5 1/2			eLQ	01 06 12			
28	eP	12 15 02		eLR (N)	01 14 12			
	eS	12 24 36		New Hebrides				
	eLQ	12 35 10		USCGS 01 14 32.8				
	eLR (NW)	12 39 10		15.1°S 167.3°E				
	Off E. Coast Kamchatka			Depth 80 km Dist. 121.6°				
	USCGS 12 03 19.8		4	ePKP	01 36 22.5			
	52.8°N 159.8°E			iPKP	01 36 25.5			
	Depth 33 km Dist. 75.4°			eLR (N)	01 30 12			
	Mag. 5 - 5 1/4			Banda Sea				
28	eS	21 00 10		USCGS 01 17 08.9				
	eLQ	21 15 20		6.8°S 129.6°E				
	eLR (NW)	21 21 10		Depth 154 km Dist. 139.9°				
	Kurile Isls.		6	ePKP	02 32 36			
	USCGS 20 36 56.0			ePKS	02 35 21			
	44.8°N 149.6°E			eLR (NNW)	03 17 23			
	Depth 45 km Dist. 85.8°							

Palisades			15			1963		
Date	Phase	h m s	Date	Phase	h m s			
Nov 6	Continued		Nov 12	eS	07 28 12			
	W. New Guinea			eLQ	07 39 12			
	USCGS 02 13 16.8			eLR (E)	07 44 22			
	2.6°S 138.4°E			Near SW Coast Turkey				
	Depth 33 km Dist. 132.5°			USCGS 07 06 31.2				
	Mag. 6 1/4 - 6 1/2			35.5°N 29.7°E				
				Depth 69 km Dist. 76.4°				
7	eSKS	03 48 13	14	ePP	04 56 12			
	eLR	03 53 13		eSS	05 13 32			
	Kurile Isls.			eLQ	05 27 22			
	USCGS 03 24 59.3			eLR (NW)	05 33 40			
	44.8°N 150.1°E			New Hebrides				
	Depth 40 km Dist. 85.8°			USCGS 04 35 48.5				
9	eS	02 58 01		17.5°S 167.7°E				
	eLR (NE)	03 00 25		Depth 33 km Dist. 122.7°				
	S. of Iceland			Mag. 5 1/2 - 5 3/4				
	USCGS 02 46 44.5		14	eP	09 12 02			
	56.8°N 34.6°W			eS	09 17 32			
	Depth 33 km Dist. 29.6°			eLR (SW)	09 20 12			
9	iP (Dil. from S.)	21 23 30		Chiapas, Mexico				
	iPcP	21 24 36		USCGS 09 05 47.8				
	ipP	21 24 57		15.1°N 93.9°W				
	iS	21 30 00		Depth 33 km Dist. 31.3°				
	Western Brazil		15	eP (comp.)	21 19 15			
	USCGS 21 15 30.4			eS	21 29 45			
	9.0°S 71.5°W			eLQ	21 44 13			
	Depth 600 km Dist. 49.8°			eLR (N)	21 49 23			
10	iP	01 08 39		Kurile Isls.				
	ipP	01 10 30		USCGS 21 06 34.0				
	iS	01 15 05		44.3°N 149.0°E				
	iScS	01 16 51		Depth 50 km Dist. 87.0°				
	isS	01 18 05		Mag. 6 1/4 - 6 1/2				
	Western Brazil		16	eP	02 42 43			
	USCGS 01 00 38.8			epP	02 43 02			
	9.2°S 71.5°W			eS	02 53 23			
	Depth 600 km Dist. 50.0°			eLQ	03 08 43			
10	iP (comp)	17 30 26		eLR (NW)	03 13 13			
	iS	17 41 00		Kurile Isls.				
	eLQ	17 55 35		USCGS 02 30 07.0				
	eLR	17 59 50		44.3°N 149.0°E				
	Kurile Isls.			Depth 50 km Dist. 87.0°				
	USCGS 17 17 42.7		17	eP	00 56 28			
	44.4°N 149.0°E			ipP	00 56 30			
	Depth 40 km Dist. 86.5°			ipP	00 56 42			
	Mag. 6			ePcP	00 57 26			
11	eS	20 31 48		eS	01 03 21			
	eLR (SW)	20 36 32		eLQ	01 07 29			
	Off W. Coast Colombia			eLR (SE)	01 09 13			
	USCGS 20 18 39.7			T	01 58 47			
	4.0°N 82.6°W			N. Atlantic Ocean				
	Depth 33 km Dist. 37.7°			USCGS 00 48 02.6				
				7.6°N 37.4°W				
				Depth 33 km Dist. 46.4				
				Mag. 6 - 6 1/4				

Palisades				16				1963			
Date	Phase	h	m	s	Date	Phase	h	m	s		
Nov 18	eP (comp. from W)	14	45	15	Nov 26	ePP	23	10	07		
	ePcP	14	47	53		eSS	23	29	45		
	eS	14	50	41		eLQ	23	39	45		
	eLR (W)	14	54	43		eLR (NW)	23	44	55		
	Gulf of California					Fiji Isl. Region					
	USCGS 14 38 28.9					USCGS 22 50 08.9					
	29.9°N 113.6°W					16.6°S 175.2°E					
	Depth 14 km Dist. 34.2°					Depth 33 km Dist. 109.2°					
	Mag. 6 1/2 - 6 3/4					Mag. 5 1/2 - 5 3/4					
19	eS	11	24	14	27	eS	02	37	23		
	eLR (NW)	11	42	14		eLQ	02	42	05		
	Kurile Isls.					eLR (SE)	02	47	45		
	USCGS 11 00 54.3					S. Peru					
	44.4°N 149.2°E					USCGS 02 19 41.9					
	Depth 33 km Dist. 87.0°					16.6°S 72.1°W					
						Depth 79 km Dist. 57.7°					
22	ePKP	00	37	15	Dec 2	eP	21	04	36.7		
	Near N. Coast Java					eS	21	11	24		
	USCGS 00 18 35.9					eLR (NNE)	21	17	54		
	5.9°S 107.9°E					Svalbard Region					
	Depth 323 km Dist. 145.1°					USCGS 20 55 58.8					
22	eS	11	25	35		80.1°N 0.6°W					
	eLR (SW)	11	29	55		Depth 33 km Dist. 46.9°					
	Mexico					Mag. 5 3/4 - 6					
	USCGS 11 14 03.0				3	eP	00	03	11.7		
	18.5°N 100.3°W					ePcP	00	03	25.7		
	Depth 120 km Dist. 31.3°					eS	00	11	44		
22	eP	14	58	35		eLQ	00	20	24		
	eS	15	09	23		eLR (NW)	00	24	32		
	eLQ	15	23	45		Aleutians					
	eLR (NW)	15	28	55		USCGS 23 52 38.3 (2 Dec)					
	Kurile Isls.					51.5°N 174.0°W					
	USCGS 14 45 51.7					Depth 55 km Dist. 64.4°					
	44.4°N 149.0°E				3	eS	17	25	42		
	Depth 33 km Dist. 87.0°					eLR (SW)	17	30	34		
23	eP	07	57	31		Ecuador					
	eS	08	03	05		USCGS 17 12 01.6					
	eLR (W)	08	07	15		2.2°N 84.5°W					
	Lg	08	09	15		Depth 56 km Dist. 40.1°					
	Rg	08	11	15		Mag. 4 1/2					
	Gulf of California				3	ePP	21	35	24		
	USCGS 07 50 46.3					eSS	21	52	30		
	30.1°N 114.0°W					eLQ	22	06	44		
	Depth 14 km Dist. 34.2°					eLR (NW)	22	11	54		
	Mag. 6 1/4 - 6 1/2					Santa Cruz Isls.					
23	eLR (W)	08	49	15		USCGS 21 15 10.4					
	Lg	08	51	15		12.2°S 166.0°E					
	Rg	08	53	15		Depth 32 km Dist. 120.4°					
	Gulf of California					Mag. 5 1/2					
	USCGS 08 32 31				3	eP (comp. from S)	23	14	12.2		
	29.9°N 114.0°W					ePcP	23	14	28		
	Depth 14 km Dist. 34.2°					eS	23	22	42		
	Mag. 6 - 6 1/4					eLQ	23	30	34		

Palisades				17				1963			
Date	Phase	h	m	s	Date	Phase	h	m	s		
Dec 3	Continued				Dec 5	eP	11	36	42		
	eLR (SSE)	23	33	44		eS	11	41	58		
	N. Chile					eLR (S)	11	44	34		
	USCGS 23 03 41.6					Colombia					
	22.4°S 69.3°W					USCGS 11 29 49.4					
	Depth 18 km Dist. 62.9°					7.4°N 77.3°W					
	Mag. 5 3/4 - 6					Depth 33 km Dist. 33.9°					
4	eSKS	01	50	22	8	eS	08	16	07		
	eLQ	02	04	14		eLR (NW)	08	36	35		
	eLR (NW)	02	07	54		Kurile Isls.					
	Kuriles					USCGS 07 53 15.1					
	USCGS 01 27 34.1					46.4°N 153.0°E					
	46.2°N 153.1°E					Depth 20 km Dist. 83.8°					
	Depth 20 km Dist. 83.8°				10	eSKS	06	54	35		
4	eS	04	31	44		eLQ	07	14	15		
	eLQ	04	34	24		eLR	07	20	25		
	eLR (WSW)	04	36	24		Sandwich Isls.					
	Revilla Gigedo Isls.					USCGS 06 30 54.8					
	USCGS 04 18 46.3					58.1°S 26.4°W					
	19.5°N 108.3°W					Depth 110 km Dist. 106.5°					
	Depth 33 km Dist. 35.8°				11	eSKS	01	12	40		
4	eS	08	47	14		eLQ	01	33	46		
	eLR	09	07	44		eLR (WNW)	01	37	46		
	Kurile Isls.					Tonga Isls. Region					
	USCGS 08 24 17.1					USCGS 00 47 48.3					
	46.1°N 152.9°E					15.1°S 173.6°W					
	Depth 33 km Dist. 83.8°					Depth 33 km Dist. 107.2°					
4	eP	16	12	02	11	eP	17	19	06		
	eS	16	22	04		eS	17	27	58		
	eLQ	16	33	38		eLQ	17	35	46		
	eLR (SSW)	16	37	14		eLR (NW)	17	40	16		
	Easter Isl. Region					Aleutians					
	USCGS 15 59 42.1					USCGS 17 08 12.3					
	35.5°S 102.8°W					51.2°N 179.3°W					
	Depth 33 km Dist. 81.2°					Depth 32 km Dist. 67.5°					
	Mag. 6				12	eS	00	51	26		
4	ePg	21	33	26.1		eLQ	00	53	26		
	eSg	21	34	03.7		eLR	00	55	36		
	New Hampshire					Jalisco, Mexico					
	USCGS 21 32 34.9					USCGS 00 38 24.6					
	43.6°N 71.6°W					18.7°N 107.0°W					
	Depth 33 km Dist. 3.3°					Depth 33 km Dist. 35.8°					
5	eS	04	45	42	12	eS	21	06	25		
	eLR (SW)	05	02	30		eL	21	21	17		
	Easter Isl. Region					Colombia					
	USCGS 04 23 22.2					USCGS 20 54 34.8					
	35.7°S 103.1°W					5.7°N 73.1°W					
	Depth 33 km Dist. 81.2°					Depth 140 km Dist. 34.9°					
	Mag. 5 1/4										

