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YAQUINA R.

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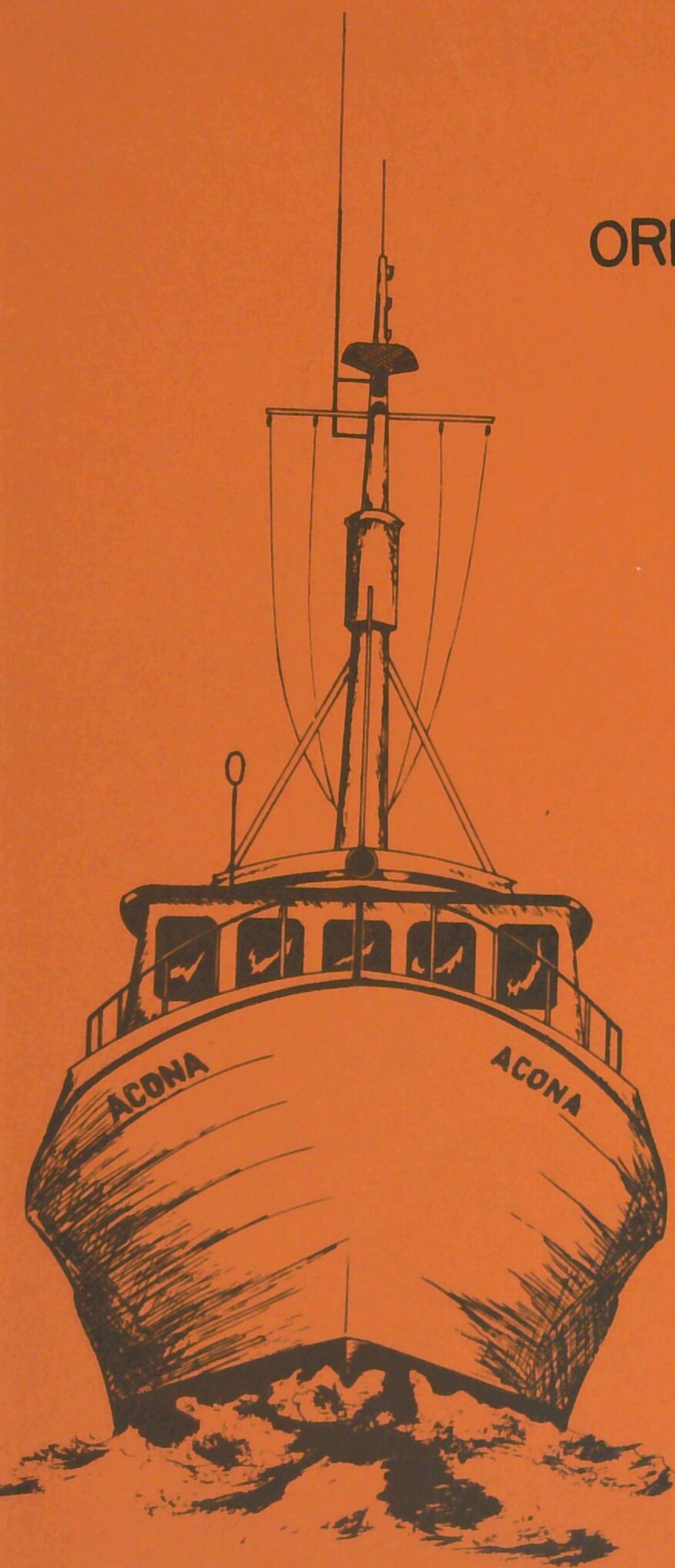
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**OREGON STATE UNIVERSITY
SEISMOLOGICAL BULLETIN No. 1
July 1 to September 30, 1963**

M. M. Collver and Peter Dehlinger

Air Force Cambridge Research Laboratories
Contract AF 19(628)-2778

Office of Naval Research
Contract Nonr 1286(10) Project NR 083-102

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Data Report No. 14

Reference 63-36

December 1963

DEPARTMENT OF OCEANOGRAPHY
Geophysics Research Group
OREGON STATE UNIVERSITY
Corvallis, Oregon

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by

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Wayne V. Burt
Chairman

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The Oregon State University seismic station at Corvallis is one of the World-Wide Cooperative Standard Seismograph Network of stations. The station includes three-component Benioff short-period seismographs ($T_0 = 1$ sec, $T_g = 0.75$ sec); three-component Sprengnether long-period seismographs ($T_0 = 30$ sec, $T_g = 100$ sec); and an additional small vertical Benioff seismograph ($T_0 = 1.0$ sec, $T_g = 1.0$ sec) with visual recording on the campus of the University.

Station Constants:

Latitude - $44^{\circ}35'08''N$

Longitude - $123^{\circ}18'12''W$

Elevation - 123 meters

Abbreviations:

i - impetus (sudden beginning of motion).

e - emersio (gradual beginning of motion).

(Z, N, E) (following phase of arrival) - recorded on vertical, north-south, east-west component seismometers, respectively.

c, r (following phase of arrival) - first motion arrived as a compression or rarefaction, respectively.

u, d, N, S, E, W (following phase of arrival) - first motion is up, down, north, south, east, or west, respectively.

M - magnitude

h - depth of focus

Δ - epicentral distance from Corvallis

-2-

DATE	PHASE	TIME (GCT) h, m, s	PERIOD sec	REMARKS
4 July 63	e P (Z) c	05:51:28.5	1.4	Off coast of Oregon. USCGS (card 56-63): 43.7°N, 126.4°W; 05:50:49.5; h about 33 km; M 4.4. Δ about 260 km.
4 July 63	e P (Z,N,E)	11:10:40.0	1.0	Tonga Islands. USCGS
	e pP (Z)	11:21.0	10	(card 54-63): 26.3°S,
	e sP (Z)	11:41.0	7	177.7°W; 10:58:13.2;
	e S (N,E)	21:06.5	13	h about 158 km; M 6.5.
	e S (Z)	21:08	11	Δ about 9700 km.
	e sS (N,E)	22:05	12	
	e sSP (Z)	23:05	32	
	e G (N,E)	33:32	42	
	e G (Z)	33:46	29	
	e LR (Z)	38:22	22	
7 July 63	e P (Z,N)	19:23:03.3	1.3	Central Utah; felt Nephi
	e PP (Z)	23:08.0	1.4	area. USCGS (card 54-63):
	e (Z)	23:38.5	3.3	39.6°N, 111.9°W;
	e S (Z,N,E)	25:09	2.7	19:20:42.3; h about 33 km;
	e LR (N,E)	25:40	22	M 4.9. Δ about 1075 km.
8 July 63	e P (Z,N,E)	01:14:49	0.7	Local.
	i S (N,E)	15:31.5	0.8	
	e (Z,N,E)	15:35.5	0.9	
8 July 63	e P (Z)	04:20:09.4	1.1	Off coast of N. California.
	e (N)	20:22		USCGS (card 55-63): 48.8°N,
	e S (E)	20:52.9	2.0	125.8°W; 04:19:08.4;
	e (E)	21:22	20	h about 33 km; M 4.7.
	e (N)	21:10	20	Δ about 480 km.
	e LR (Z)	21:32	14	
9 July 63	e P (Z)	09:33:18	1.0	Costa Rica-Panama border.
	e S (N,E)	40:42	5	USCGS (card 55-63):
	e (N)	54:09	21	8.5°N, 83.0°W; 09:24:33.3;
	e (Z,E)	55:11	25	h about 33 km; M 5.1. Δ about 5100 km.
10 July 63	e P (Z)	05:32:36.3	1.2	Kurile Islands. USCGS
	e S (N,E)	40:23.5	12	(card 55-63): 46.3°N,
	e LQ (N,E)	46:39	25	152.9°E; 05:22:57.1;
	e (Z,N,E)	49:13	24	h about 33 km; M 5.6.
	e (Z)	51:51	18	Δ about 6100 km.
10 July 63	e P (Z)	20:04:00.2	0.8	Local.
	e S (E)	04:03.8	0.9	
	e (N)	04:04.7	0.9	

DATE	PHASE	TIME (GCT) h,m,s	PERIOD sec	REMARKS
11 July 63	e P (Z,E)	01:32:01.0	0.6	Local.
	e S (E)	04:03.8	0.9	
	e (N)	04:04.7	0.9	
12 July 63	e P (Z,N,E)	14:05:22	4.0	Near coast Vancouver Island. USCGS (card 55-63): 50.3°N, 129.6°N; 14:03:38.3; h about 33 km; M 4.8. Δ about 810 km.
	e S (E)	06:40	25	
	e S (N)	06:42	25	
	e LR (Z)	07:08	20	
13 July 63	e P (Z)	17:55:26.4	1.0	Local.
	e S (Z,N,E)	55:32.3	0.8	
14 July 63	e P (Z,E)	05:51:02.6	1.0	Off coast N. Venezuela; felt Trinidad, West Indies. USCGS (card 56-63): 10.4°N, 62.6°W; 05:41:43.0; h about 24 km; M 5.5. Δ about 6800 km.
	e LQ (N)	06:07:25	16	
	e (N)	09:45	35	
	e LR (Z)	11:26	50	
16 July 63	e P (Z) u	18:40:24.6	1.5	Georgia SSR. USCGS (card 57-63): 43.1°N, 41.5°E; 18:27:18.4; h about 33 km; M 5.8. Δ about 9800 km.
	e PP (Z,N)	44:07.5	7	
	e SKS (N,E)	51:04	8	
	e PS (N)	52:39.5	14	
	e (N)	57:35	15	
	e (Z)	19:01:04	36	
	e (N)	01:46	30	
	e LQ (E)	06:06	55	
18 July 63	i P (Z,N,E)	00:04:16.0	0.4	Local.
	i S (Z,N,E)	04:24.0	0.5	
18 July 63	i P (Z,N,E) c	00:05:32.7	1.0	Vancouver Island. USCGS (card 57-63): 49.1°N, 182.9°W; 00:04:05.3; h about 33 km; M 4.8. Δ about 660 km.
	e S (E)	06:34	22	
19 July 63	i P (Z)	02:15:19.2	0.4	Local.
	i P (Z)	15:21.7		
	i S (N,E)	15:34.8	0.6	
19 July 63	e P (Z)	05:57:50.8	1.3	Ligurian Sea. USCGS (card 58-63): 44.3°N, 8.1°E; 05:46:05.2; h about 33 km; M 5.6. Δ about 9000 km.
	e SKS (N,E)	06:08:08	9	
	e S (E)	08:41	9	
	e SS (Z,N)	14:36	31	
	e LQ (N,E)	22:10	50	
	e LR (Z)	32:43	18	
20 July 63	e (Z)	00:16:25.2	1.6	

DATE	PHASE	TIME (GCT) h, m, s	PERIOD sec	REMARKS
24 July 63	i P (Z)	11:45:12.5	0.5	Small teleseism.
25 July 63	i P (Z)	07:13:58.0	0.6	Local, small
	i S (N,E)	14:03.5	0.7	
26 July 63	e S (N)	04:41:00		S. Yugoslavia. USCGS
	e LQ (E)	54:30		(card 58-63): 42.1°N,
	e LR (Z)	59:30		21.5°E; 04:17:16.7;
				h about 33 km; M 5.4.
				Δ about 9400 km.
26 July 63	i P (Z)	23:51:00		Local.
27 July 63	e P (N,E)	06:27:57.3	1.5	Off coast Oregon. USCGS
	e (Z)	28:00	10	(card 61-63): 43.9°N,
	e (E)	28:08.1		128.3°W; 06:27:03.0;
	e s (N)	28:42.7	7	h about 33; M 4.5.
	e (Z)	29:00		Δ about 410 km.
29 July 63	e P (Z)	20:27:16	8	Kermadec Islands. USCGS
	e (N)	55:08.5	15	(card 61-63): 30.2°S,
	e LR (Z)	57:27	20	177.3°W; 20:14:07.3;
	e (Z)	21:00:30	22	h about 39 km; M 5.7.
				Δ about 9850.
1 August 63	e P (Z) r	22:18:30.8	1	Δ about 450 km NW of
	e S (N,E)	19:17.5	0.9	Corvallis.
	e (Z)	19:47	22	
3 August 63	i P (Z) r	10:34:00.4	2.0	Mid-Atlantic Ocean.
	e S (Z,E)	44:24	27	USCGS (card 61-63):
	e ScS (N)	44:59	18	7.7°N, 35.8°W; 10:21:36.6;
	e SS (E)	50:20	35	h about 33; M 6.1
	(E)	11:00:08		Δ about 9150 km.
	e LR (Z)	00:46	58	
	(Z,N,E)	04:21	30	
4 August 63	e P (Z) c	12:32:40.4	1.0	Local; Δ about 120 km.
	e S (E)	53.0	1.0	
	e (N)	54.5	2.0	
4 August 63	e P	20:10:56.4	0.6	Local; Δ about 130 km
	i S (E)	11:09.9	0.8	northerly of Corvallis.
	i S (N)	11:10.0	0.8	
5 August 63	i P (Z) r	05:55:15.5	0.8	Δ about 650 km.
	e (Z)	55:20.7	0.5	
	e S (E)	55:25.8	0.6	
	e (E)	55:28.8	0.5	

DATE	PHASE	TIME (GCT) h, m, s	PERIOD sec	REMARKS
8 August 63	i P (Z) r	02:23:00.8	1	Fox Islands, Aleutian Islands. USCGS (card 63-63): 54.2°N, 168.1°E; 02:14:54.4; h about 33 km; M 5.5. Δ about 3300 km.
	e (N)	23:19.5	1.8	
	e (Z)	35:39	28	
	e LR (Z)	36:15	28	
	e (Z)	39:39	23	
8 August 63	e P (E)	17:32:00.2	0.4	Local.
	e (N,E)	32:07.5	0.7	
		32:15.0	0.7	
9 August 63	e P (Z,N,E)	22:21:11.1	0.5	Local.
	i S (Z,N,E)	21:17.5		
13 August 63	e P (Z) c	03:31:55.1	2	Kodiak Island region. USCGS (card 64-63): 55.0°N, 156.4°W; 03:26:45.4; h about 33 km; M 5.0. Δ about 2800 km.
13 August 63	e P (Z)	15:05:03.0	0.6	Local; Δ about 400 km.
	e S (Z,E)	05:43.8	0.8	
15 August 63	e P (Z) c	06:22:30.2	1.2	East coast of Honshu, Japan. USCGS (card 64-63): 37.9°N, 141.6°E; 06:11:34.6; h about 59 km. Δ about 7500 km.
	e (Z,E)	22:40.1	1.0	
	e (N)	30:49.0	1.5	
	e S (Z,N)	31:28	8	
	e LR (Z)	42:32	14	
15 August 63	i P (Z) c	17:35:59.3	0.6	Peru-Bolivia border. USCGS (card 65-63): 13.8°S, 69.3°W; 17:25:05.9; h about 543 km; M 7 3/4 (PAS), 8 (BKS). Δ about 8500 km.
	i (N,E)	36:00.7	0.6	
	e (E)	44:59	3.5	
	e (N)	45:05.7	1.8	
	e (E)	45:10	2.0	
16 August 63	i P (Z,E) r	04:03:51.6	0.5	Local; Δ about 120 km SW of Corvallis.
	i S (N,E)	04:03.9	1.2	
17 August 63	i P (Z)	11:24:46.6	1.6	Ryukyu Islands region. USCGS (card 66-63): 30.6°N, 130.9°E; 11:12:41.2; h about 33 km; M 5.6. Δ about 8700 km.
	e S (N)	34:47	12	
	e (Z)	34:51		
	e PS (N)	45:40	28	
	e (Z)	55:00	24	
	e LR (Z)	59:50	18	
17 August 63	e P (Z)	23:25:24.3	0.4	Local; Δ about 330 km.
	i s (E)	26:03.6		
18 August 63	e P (Z,N,E) c	14:44:12.5	0.8	Local; Δ about 100 km.
	i S (N,E)	44:24.7	0.8	

DATE	PHASE	TIME (GCT) h,m,s	PERIOD sec	REMARKS
18 August 63	e P (Z,N) r	18:50:17.7	0.8	Andreanof Islands, Aleutian Islands. USCGS (card 65-63): 50.3°N, 176.9°W; 18:43:16.1; h about 33 km; M 5.5. Δ about 3900 km.
	e LR (Z,N)	19:00:16	23	
21 August 63	i P (Z,E) c	03:48:34.4	1.0	
	i (E)	48:39.1	2.0	
	i (N)	48:40.0	1.0	
22 August 63	i P (Z) r	09:27:58.9	1.0	Off coast of Oregon. USCGS (card 68-63): 42.0°N, 126.2°W; 09:27:09.3; h about 33 km; M 5.6. Δ about 350 km.
	i S (N,E)	28:36.7	1.5	
	e (Z)	29:11	10	
22 August 63	e P (Z) r	12:34:22.4	0.9	Local; Δ about 350 km.
	e S (N)	34:58.7	1.3	
	e S (E)	34:59.5	1.0	
22 August 63	e P (Z) r	20:05:18	5	Solomon Islands. USCGS (card 69-63): 9.4°S, 158.0°E; 19:52:25.0; h about 33 km; M 6.1. Δ about 9800 km.
	e S (N,E)	16:12	12	
	e LQ (N)	28:52	35	
	e (Z)	32:30	36	
25 August 63	i P (Z)	12:29:24.0	2.0	Fiji Islands region. USCGS (card 67-63): 17.5°S, 178.8°W; 12:18:12.5; h about 565 km; M 6.1. Δ about 9800 km.
	e pP (N)	31:30.8	2.0	
	e (E)	31:40.7	2.0	
	e ScS (N)	38:42	8	
27 August 63	i P (Z) d	05:52:42.0	2	Off coast of Oregon. USCGS (card 68-63): 44.1°N, 129.5°W; 05:51:37.4; h about 33 km; M 4.2. Δ about 470 km.
	i S (N)	53:33.0	1	
	e (Z)	53:46	24	
29 August 63	i P (Z)	09:07:09.0	0.8	Sinkiang Province. USCGS (card 70-63): 36.9°N, 74.2°E; 08:53:48.4; h about 31 km; M 5.5. Δ about 10,500 km.
29 August 63	i P (Z,N)	15:41:04.3	1	Off coast of Peru. USCGS (card 68-63): 7.1°S, 81.6°W; 15:30:31.4; h about 23 km; M 6.1. Δ about 7100 km.
	e S (Z,N,E)	49:41	18	
	e LQ (N)	58:19	20	
	e LR (Z)	16:02:24	28	
	e (N,E)	59:42	30	

DATE	PHASE	TIME (GCT) h, m, s	PERIOD sec	REMARKS
29 August 63	e P (Z, N, E) r i S (N, E)	20:06:54.1 07:02.6	0.8 1.0	Local; Δ about 70 km.
2 September 63	e P (Z, E) r e S (N, E) e (Z)	13:29:21.8 30:47 31:12.5	1.5 10 10	Vancouver Island region. USCGS (card 77-63): 50.5°N, 129.4°W; 13:27:37.4; h about 33 km; M 4.6. Δ about 800 km.
2 September 63	e P (Z, N) r e S (N, E) e (Z)	13:31:45.8 33:17.5 33:46	1.2 20 24	Vancouver Island region. USCGS (card 78-63): 50.4°N, 129.1°W; 13:30:03.8; h about 33 km; M 4.4. Δ about 800 km.
2 September 63	e P (Z, N) r e PP (Z) e S (N, E) e SSS (N, E) e LR (N, E)	14:15:37.5 15:56.3 19:43 20:33 21:18	1.6 20 16 32	Gulf of California. USCGS (card 70-63): 25.7°N, 109.5°W; 14:10:44.7; h about 33 km; M 4.8. Δ about 2500 km.
3 September 63	i P (Z, N) r i (Z, N) i (Z) e S (N, E)	04:13:06.0 13:08.5 13:12.9 13:21.3	0.5 0.5 0.6 0.7	Local; Δ about 130 km.
3 September 63	i P (Z, N, E) r i S (E)	22:13:22.4 13:28.4	0.4 1.0	Local.
4 September 63	e P (Z) e PP (Z) e PPP (Z) e S (N) e SS (N) e SSS (N) e LR (Z)	13:39:12.7 40:19 40:49 44:46 46:58 47:33 49:14	1.0 7 6 20 18 25 28	Baffin Islands. USCGS (card 71-63): 71.4°N, 73.3°W; 13:32:12.3; h about 33 km; M 5.9. Δ about 3900 km.
5 September 63	e P (Z) e S (N, E)	14:23:35.9 23:58.0	0.6 1.0	Local; Δ about 200 km.
6 September 63	e P (Z) c e S (N, E)	20:33:27 35:00	 20	Vancouver Island. USCGS (card 71-63): 50.1°N, 129.5°W; 20:31:46.1; h about 31 km; M 4.4. Δ about 675 km.
8 September 63	i P (Z) c e sP (Z) e ScS? (N, E) e SKS (N, E)	20:02:11.6 05:02 11:46 12:03	1.0 9 8 10	Fiji Islands region. USCGS (card 72-63): 23.6°S, 179.8°E; 19:50:29.8; h about 550 km; M 5.7. Δ about 9450 km.

DATE	PHASE	TIME (GCT) h, m, s	PERIOD sec	REMARKS
9 September 63	e P (Z)	02:58:44	6	New Britain. USCGS (card 72-63): 4.4°S, 152.7°E; 02:45:45.5; h about 34 km; M 5.6. Δ about 10,000 km.
	e S (E)	03:09:05	15	
	e S (N)	09:09	8	
	e SP? (Z)	10:32	16	
	e LQ (N)	22:20	48	
	e (E)	22:40		
	e (E)	26:38	25	
	e LR (Z)	27:00	32	
11 September 63	e P (Z) d	02:10:16.9	0.7	Central Idaho. USCGS (card 76-63): 44.3°N, 114.7°W; 02:08:44.7; h about 15 km; M 4.9. Δ about 670 km.
	e Lg? (N)	12:03	1.5	
	e (Z)	12:35	8	
12 September 63	e P (Z)	06:25:27.0	1.8	Central Idaho. USCGS (card 76-63): 44.2°N, 114.8°W; 06:23:51.7; h about 33 km; M 4.4. Δ about 670 km.
	e (N)	27:26.5	1.5	
	e (Z,E)	27:54.6	2	
	e (N)	29:10	7	
13 September 63	i P (Z,N) c	17:02:20.0	1.2	Nevada. Δ about 1750 km.
	e PP (Z)	02:30		
	e S (N)	05:11.6	2	
	e S (E)	05:11.8	2	
	e SS (N,E)	05:28	10	
	e LR (Z)	06:05	12	
14 September 63	e P (Z) c	19:48:18.0		Monterey County, Calif. USCGS (card 76-63): 36.7°N, 121.8°W; 19:46:15.8; h about 15 km; M 5.3. Δ about 1000 km.
	e (N,E)	48:18.5		
	e (N)	50:31	30	
	e (Z)	50:32	28	
15 September 63	i P (Z)	00:59:22.7	2.5	Santa Cruz Islands. USCGS (card 75-63): 10.3°S., 165.6°E; 00:46:54.1; h about 43 km; M about 6.3. Δ about 9300 km.
	e S (N,E)	01:09:49	16	
	e PPS? (Z)	11:14	42	
	e LQ? (Z)	21:45	30	
	e (Z)	24:36	24	
16 September 63	e P (Z,N,E) r	17:16:18.3	0.8	Local; Δ about 300 km NW of Corvallis.
	e S (E)	16:51.3	0.8	
17 September 63	i P (Z)	19:32:43.3	2.2	Santa Cruz Islands. USCGS (card 76-63): 10.1°S, 165.3°E; 19:20:08.2; h about 17 km; M 6.1. Δ about 9300 km.
	e S (N,E)	43:13	14	
	e PS (N,E)	44:10		

DATE	PHASE	TIME (GCT) h, m, s	PERIOD sec	REMARKS
20 September 63	i P (Z, N) r i S (Z, N, E)	06:23:20.2 23:28.1	0.3	Local.
21 September 63	i P (Z, N, E) r i S (N)	23:29:09.5 29:18.5	0.6	Local.
22 September 63	e P (Z, N, E) e (E) e (N)	15:59:02.3 59:08.2 59:14.3	0.6	Off coast of N. California. USCGS (card 80-63): 41.9°N, 126.7°W; 15:58:06.1; h about 33 km; M 4.3. Δ about 410 km.
24 September 63	i P (Z, N, E) e PP (Z) e S (N, E) e G (N, E) e (N) e (E) e (N) e (Z)	16:41:12.6 44:03 50:10 58:07 59:50 17:00:08 03:04 04:45	1.2 20 48 38 40 37 40	Near coast of Peru. USCGS (card 76-63): 10.6°S, 78.0°W; 16:30:16.0; h about 80 km; M 6.0. Δ about 7700 km.
26 September 63	i P (Z, N) r e S (N) e S (E)	13:47:25.9 47:41.8 47:42.0	0.4 1.0 1.0	Local; Δ about 140 km N. of Corvallis.

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by

M. M. Collver and Peter Dehlinger

Data Report No. 16

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Reference 64-25
August 1964

Wayne V. Burt
Chairman

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Oregon State University operates a World-Wide Standard Seismograph Station at Corvallis (COR) and a seismic station at Klamath Falls (KFO), Oregon.

The Corvallis station includes three short-period Benioff seismographs ($T_o = 1$ sec, $T_g = 0.75$ sec), three long-period Sprengnether seismographs ($T_o = 30$ sec, $T_g = 100$ sec), and a small short-period vertical Benioff seismograph ($T_o = 1.0$ sec, $T_g = 0.2$ sec) to provide visual recording on the OSU campus.

The Klamath Falls station consists of a small short-period vertical Benioff seismograph ($T_o = 1.0$ sec, $T_g = 0.2$ sec), with visual recording on the campus of the Oregon Technical Institute.

Station Constants:	Corvallis	Klamath Falls
Latitude	44°35.1'N.	42°16.0'N.
Longitude	123°18.2'W.	121°44.7'W.
Elevation	123 meters	4720 meters

Abbreviations:

i - impetus (sudden beginning of motion).

e - emersio (gradual beginning of motion).

(Z, N, E) (following phase of arrival) - recorded on vertical, north-south, east-west component seismometers, respectively.

c, r (following phase of arrival) - first motion arrived as a compression or rarefaction, respectively.

u, d, N, S, E, W (following phase of arrival) - first motion is up, down, north, south, east, or west, respectively.

M - magnitude

h - depth of focus

Δ epicentral distance from Corvallis

DATE 1963	STA.	PHASE	TIME (GCT) h, m, s	PERIOD sec	REMARKS
4 Oct.	COR	iP (Z)dr e (N,E) e (N,E)	07:16:36.2 17:33 17:33.2	0.6 6 1.4	Vancouver Island region. USCGS (card 81-63): 49.0°N, 131.9°W; 07:14:53.2; h about 33 km; M 4.4. Δ about 730 km.
9 Oct.	COR	iP (Z,N)u,S eS (N,E) e (Z)	23:53:20.8 53:30.5 53:42.4	0.5 0.8 1.2	Local.
12 Oct.	COR	eP (Z) eS (E) e (N) eScS (N) eSS (E) e (E) e (N)	11:36:58.9 45:07 45:48 46:46 48:57 50:09 51:44	1.2 28 20 24 28 20 40	Kurile Islands. USCGS (card 85-63): 44.8°N, 149.0°E; 11:26:57.9; h about 40 km; M 7 (BKS). Δ about 6600 km.
	KFO	eP	11:37:14.8	1.5	
13 Oct.	COR	eP (Z)	05:27:54	1.5	Kurile Islands. USCGS (card 84-63): 44.8°N, 149.5°E; 05:17:57.1; h about 60 km; M 8 $\frac{1}{4}$ (Pas). Δ about 6600 km.
	KFO	eP	05:28:15.4	3	
14 Oct.	COR	iP (Z)r eP (N,E)S,W eS (E) eLQ (N,E) eLR (Z,E)	13:31:34.6 31:36.5 39:40 46:00 49:00	1.0 1.6 28 25 24	Kurile Islands. USCGS (card 84-63): 44.8°N, 151.0°E; 13:21:45.2; h about 60 km; M 5.9. Δ about 6400 km.
16 Oct.	COR	eP (Z)d	17:02:17.3	1.5	
	KFO	eP	17:01:41.8	1.0	
20 Oct.	COR	eP (Z,N,E) d,S	01:03:10.5	2	Kurile Islands. USCGS (card 85-63): 44.7°N, 150.7°E; 00:53:07.2; h about 25 km; M 7 $\frac{1}{4}$ (Pas). Δ about 6300 km.
29 Oct.	COR	eP (Z)c ePP (Z)r e (Z)c ePPP (Z)c iS (N,E)S,W	07:02:47.4 02:54.3 02:56.6 03:01.0 03:34.6	.8 .7 .8 1.0 1.0	Near coast of Humboldt County, Calif. USCGS (card 88-63): 40.4°N, 124.7°W; 07:01:42.7; h about 38 km; M 4.7. Δ about 480 km.
3 Nov.	COR	eP (Z)c eS (Z,E) eSS (E) e (E) eLR (N,E) e (N,E) e (Z,N,E)	03:20:36.6 29:11 33:31 38:36 40:07 44:40 47:48	2.0 12 35 36 28 18	Peru-Ecuador border. USCGS (card 90-63): 3.5°S, 77.8°W; 03:10:12.7; h about 33 km; M 6.0. Δ about 7000 km.

DATE 1963	STA.	PHASE	TIME (GCT) h,m,s	PERIOD sec	REMARKS
4 Nov.	COR	ePP (Z)d e (Z) e (Z)	01:31:27.5 35:58 36:24	3 4 14	New Hebrides Island. USCGS (card 91-63): 15.1°S; 167.3°E; 01:14:32.8; h about 154 km; M 5.8. Δ about 10300 km.
9 Nov.	COR	eP (Z,E)u,W esP (Z) esPP (Z) eS (Z,N,E) eSS (N,E)	21:25:50.9 28:53 31:22 34:28 37:56	1.0 10 20 32 30	Western Brazil. USCGS (card 93-63): 9.0°S, 71.5°W; 21:15:30.4; h about 600 km; M 5.9. Δ about 7800 km.
10 Nov.	COR	eP (Z)d epP (Z) eS (Z,N,E)S,W eScS (E) e (Z) esS (E) eSS (N)	01:10:59.9 12:58 19:30 20:08 20:44 22:31 24:08	1.2,8 10 14 10 18 9 25	Western Brazil. USCGS (card 93-63): 9.2°S, 71.5°W; 01:00:38.8; h about 600 km; M about 5.6. Δ about 7800 km.
15 Nov.	COR	eP (Z,N)u,N eS (N,E) esS (N) eSS (N) e (N,E) e (Z)	21:16:35.3 24:30 25:06 28:40 31:31 34:20	1.4,8 10 8 30 24 35	Kurile Islands. USCGS (card 93-63): 44.3°N, 149.0°E; 21:06:34.0; h about 50 km; M about 6.0. Δ about 6700 km.
	KFO	eP	21:16:49	2	
18 Nov.	KFO	eP	14:41:50.0	2	Gulf of California. USCGS
	COR	eP (Z)d eS (Z,N,E) eSS (E) eSSS (N) eLR (Z)	14:42:26.8 45:39 46:18 46:32 47:00	2.4 25 30 40 36	(card 93-63): 29.9°N, 113.6°W; 14:38:28.9; h about 14 km; M about 6.5 (PAS). Δ about 1800 km.
22 Nov.	KFO	eP	14:56:09	2	Kurile Islands. USCGS (card 93-63): 44.4°N, 149.0°E; 14:45:51.7; h about 33 km; M about 5.6. Δ about 6800 km.
23 Nov.	KFO	eP	07:54:05	1.5	Gulf of California. USCGS
	COR	eP (Z,N)d,N eS (Z,E) e (N) eLR (Z,E)	54:42 58:06 58:58 59:04	2,10 16 15 20	(card 96-63): 30.1°N, 114.0°W; 07:50:46.3; h about 14 km; M about 6. Δ about 1900 km.
24 Nov.	KFO	eP	11:17:24.3	1.5	South of Honshu, Japan. USCGS (card 96-63): 28.2°N, 140.1°E; 11:05:56.8; h about 260 km; M about 5.2. Δ about 8300 km.

DATE 1963	STA.	PHASE	TIME (GCT) h,m,s	PERIOD sec	REMARKS
26 Nov.	KFO	iP	04:17:30.2	0.4	Local.
	KFO	iP u	21:13:58	0.5	Local.
	COR	eP (Z)d	21:14:06.1	2	
		e (N)S	15:16	10	
3 Dec.	KFO	eP d	23:15:55	1.2	Northern Chili. USCGS (card 97-63): 22.4°S; 69.3°W; 23:03:41.6; h about 18 km; M about 6.1. Δ about 9100 km.
11 Dec.	COR	eP (Z)	17:15:24.5	1.5	Andreanof Island, Aleutian Islands. USCGS (card 100-63): 51.2°N, 179.3°W; 17:08:12.3; h about 32 km; M about 5.3. Δ about 4100 km.
		e (N,E)	24:08	40	
		e (Z)	25:46	32	
15 Dec.	COR	ipPP (Z)c	19:52:27.1	1.2	Java Sea. USCGS (card 103-63): 4.8°S, 108.0°E; 19:34:45.5; h about 650 km; M about 6.4. Δ about 10000 km.
		ePPP (Z)	52:44.2	1.0	
		esPP (Z)	54:03	4	
		eSKS (Z)	56:09	10	
		e (Z)	57:16	8	
		e (E)	59:56	16	
		esS (N,E)	20:00:56	12	
		eSS (E)	02:42	30	
		e (E)	05:34	12	
		eSSS (N,E)	06:58	8	
		e (Z)	08:18	16	
		eG? (N)	12:44	10	
18 Dec.	KFO	eP	00:42:28	2.0	Tonga Islands. USCGS (card 107-63): 24.8°S, 176.6°W; 00:30:02.6; h about 46 km; M about 6.5. Δ about 9000 km.
	COR	eP (Z)r	00:42:32.0	1.5, 8	
		ePP (Z,N)d	46:00	18	
		ePPP (Z)	47:26	20	
		eS (N,E)	52:46	20	
		e (N)	54:12		
		e (Z)	55:34	32	
		eSS (N,E)	59:00	36	
		eSSS (N,E)	01:02:24	48	
		eLQ (N)	04:37	40	
		e (N)	08:18	52	
27 Dec.	COR	iP (Z,E)d,W	02:36:37.7	0.7	West of Portland, Oregon.
		eS (E)	36:53	2	
	KFO	iP	02:37:16.1		
		e	38:00.3		
27 Dec.	COR	eP (Z,N)d,N	03:17:52.2	0.5	West of Portland, Oregon.
		eS (Z,N)S	18:07.1	1.0	