



SEISMOLOGICAL BULLETIN

Lamont Geological Observatory

Columbia University

Palisades, N. Y.

September 1 - December 31, 1950

By

HENRY OWEN and FRANK PRESS

Lamont Geological Observatory

Contribution No. 28

STATION CONSTANTS, INSTRUMENTS AND
ABBREVIATIONS

Latitude 41° 00' 25" North
Longitude 73° 54' 31" West
Elevation 70 meters
Bedrock Palisades diabase Triassic Age

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 vertical Columbia University seismograph. To = 0.2 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.

ABBREVIATIONS

Dil. = Dilation

Com. = Compression

i. = Sudden beginning of the motion (impetus)

e. = gradual beginning of the motion (emersio)

Lg. = short period continental surface shear wave

Rg. = Continental Rayleigh wave

All times are G.C.T.

Time - I.B.M. mercurial pendulum clock corrected by Naval Observ-
atory time signals every 4 hours.



Date	Phase	h	m	s	Remarks
Sept.					
1	e	03	09	39	Indian Ocean 700 mi. west of Sumatra
	e	03	27	43	USCGS O = 02:46:55
2	iP	02	57	35.9	Aleutian Islands
	e	02	57	56	USCGS O = 02:47:23 56½° N, 169° W
	ePP	02	59	54	h ~ 100 km Mag. 6¼ - ½ Pas.
	iS	03	05	59	PZ 1½ μ 7 sec.
	eL	03	14.8		PPZ ¾ μ 8 sec.
3	e	05	08	37	
3	e	19	33	07	
	e	19	33	39	
	e	19	37	18	
	e	19	39	44	
4	iP	07	37	38.7	Dil. from N
9	ePKP	10	40	38	New Britain Region
	eLQ	11	14.2		USCGS O = 10 21 40 4° S, 153° E
	eLR	11	20.8		Mag. 6¼ Pas
10	eSKS	03	45	34	Near Coast Honshu, Japan
	eS	03	46	25	USCGS O = 03 21 20 35° N, 140° E
	ePS	03	47	41	Mag. 6¼ Pas
10	ePKP	15	34	51	New Hebrides Region
	iPKP	15	34	53	USCGS O = 15 15 75 14° S, 167° E
	iPP	15	36	25	Mag. 7 Pas
	iPS	15	46	15	PPZ 6¼ μ 7 sec.
	iSS	15	52	49	
12	e	02	20	44	heavy microseism activity
		02	21	08.8	
14	iP	08	01	46.7	Southeastern Bolivia
					USCGS O = 07:52:20 20° S, 63° W
					h ~ 600 km.
14	ePKP	09	25	05	Halmahera Island Region
	ePKS	09	28	39	USCGS O = 09:06:08
					h ~ 200 km.
16	iP	01	04	58	1000 miles west of Galapagos Islands
	iPcP	01	06	00	USCGS O = 00:55:36 4° S, 104½° W
	ePP	01	07	00	Mag. 6¼ Pas
	iS	01	12	20	PZ 1 μ 6 sec.

(cont'd)

Date	Phase	h	m	s	Remarks
Sept. (cont'd)					
16	ePS	01	12	35	Max H 13¼ μ 19 sec.
	eScS	01	14	37	
	eLQ	01	18.0		
	i	01	18	19	
	eLR	01	20.0		
16	eP	22	09	11	Aleutian Islands
	ePcP	22	09	34	USCGS O = 21:58:15 52½° N, 178° E
	eS	22	18	01	Mag. 6.6 Pas h ~ 100 km.
	eScS	22	18	48	Max H 3¼ μ 20 sec.
	e	22	19	35	
	eSS	22	22	26	
18	iP	19	44	37.9	Western Brazil USCGS O = 19:36:44 9° S, 71½° W Mag. 6 Pas h ~ 750 km.
19	ePKP	20	49	04	Northern Coast of New Guinea
	e	20	51	43	USCGS O = 20:29:48 2° S, 138½° E
	iSS	21	08	55	Mag. 6.9 Pas
	eL	21	28.0		Max H 13.5 μ 20 sec. Moderate microseism activity
20	iPKP	00	52	53.1	Solomon Islands Region USCGS O = 00:34:05 4° S, 157° E
21	e	01	59	20	
	e	02	06	20	
	e	02	09	25	
21	iPKP	23	10	18	Indian Ocean
	ePP	23	12	54	USCGS O = 22:51:02 9° S, 67° E
	iPKS	23	13	46	Mag. 5¼ Pas PPZ ½ μ 8 sec. Poor Surface Waves
22	iP	01	48	46.7	Kurile Islands USCGS O = 01:36:36 47½° N, 153° E h ~ 150 km.
22	e	03	54	57	
	eL	04	48.0		
22	iP	08	03	53	Easter Island Region
	Dil. from W.				USCGS O = 07:52:07 25° S, 114° W
	iPP	08	06	48	Mag. 6.8 Pas
	iS	08	13	34	PZ 2¼ μ 5 sec.

(cont'd)

Date	Phase	h	m	s	Remarks
Sept. (cont'd)					
22	eSS	08	18	36	PPZ 1¼ μ 7 sec.
	eLR	08	27.0		SH 7¼ μ 12 sec. Max H 3½ μ 20 sec.
23	eP	00	07	18	Fiji Islands
	iPP	00	12	07	USCGS O = 23:53:29 / Sept. 22 18° S, 177° W
	iSKS	00	17	25	Mag. 7 Pas
	iSKKS	00	18	29	h ~ 450 km.
	iS	00	19	14	PPZ 1¼ μ 10 sec.
	iSP	00	21	04	
	iPS	00	21	48	
	eSS	00	27	00	
	eLR	00	50.8		
24	e	22	37	24	West Central Alaska
	e	22	40	54	USCGS O = 22:13:28 64° N, 156° W
	e	22	53	25	
25	iP	02	04	11.5	
25	ePKP	23	35	04	North Coast of Mindanao
	ePP	23	36	57	USCGS O = 23:15:58 9½° N, 126° E
	eSS	23	53	33	PPZ 3¼ μ 8 sec.
	eLQ	00	08.1		
27	eP	03	44	13	Off West Coast of Mexico
	ePP	03	45	16	USCGS O = 03:36:55 20° N, 109° W
	ePcP	03	46	36	Mag. 5¼ Pas
	eS	03	49	45	PZ ½ μ 6 sec.
	eLG	03	52.3		PPZ ¼ μ 8 sec.
	eSS	03	52	27	SH 1 μ 12 sec.
28	e	04	10	02	Near East Coast of Formosa USCGS O = 03:29:36 23° N, 121° E
28	e	22	06	54	Queen Charlotte Islands
	i	22	08	40	USCGS O = 21:47:01 54½° N, 134½° W
	i	22	08	52	
	i	222	09	01	
29	iP	06	39	16.1	Colima, Mexico
	Com from W S W				USCGS O = 06:32:14 19° N, 107° W
	iP	06	39	23.6	Mag. 7 Pas
	i	06	39	37.6	PH 4¼ μ 6 sec.
	iPP	06	40	38	PPH 16¼ μ 8 sec.
	eS	06	44	59	
	eSS	06	47	07	
	iScS	06	49	14	
	eLR	06	49.8		

Date	Phase	h	m	s	Remarks
Sept. 29	e	08	01	34	
30	ePKP	07	47	20	Northern Assam, India
	ePP	07	47	55	USCGS O = 07:28:54 28° N, 94° E
	i	07	48	10	PPZ ½ μ 5 sec.
	ePPP	07	50	19	
	iSKS	07	54	04	
	ePS	07	57	33	
	i	07	57	41	
	eSS	08	03	27	
Oct. 1	eP	02	07	56	Possibly two separate shocks
	eLR	02	30.5		
2	eSS	11	58	46	Off West Coast of Mexico
	iLg	12	02	51	USCGS O = 11:43:30 21° N, 109° W
2	eP	21	54	57	
	e	22	04	40	
3	eLg	09	31	49	150 miles N.E. of Nome
	eRg	09	35	05	USCGS O = 09:04:03
3	iLg	13	00	35	Western Yukon
	iRg	13	02	59	USCGS O = 12:40:08 65½° N, 128° W
4	eL	00	01.6		
4	eLR	19	02.3		New Hebrides USCGS O = 18:03:23 19° S, 169° E heavy microseism activity
5	e	01	02	01	New Hebrides
	eSS	01	18	25	USCGS O = 00:41:07 18½° S, 170° E
	eLR	01	39.3		heavy microseism activity
5	iP	16	15	59	North West Costa Rica
	Com from S				USCGS O = 16:09:34 10½° N, 85° W
	iPP	16	17	03	Mag. 7½ Pas
	iPPP	16	17	24	h ~ 100 km.
	iPcP	16	18	35	
	i	16	20	23	
	iS	16	21	18	
	iPcS	16	21	42	
5	iP	16	54	50	Aftershock of 16 09 34
	Dil. from SSW				USCGS O = 16:48:25

Date	Phase	h	m	s	Remarks
Oct. 5	iP	20	15	45.0	Aftershock of 16 09 34 USCGS O = 20:09:22
6	eP	08	21	06	Off Northern Coast of Puerto Rico
	i	08	21	15.6	USCGS O = 08:16:02 20° N, 66° W
	iS	08	24	58.9	
	i	08	25	11.3	
	eLR	08	26.0		
6	iP	12	48	27.7	Δ = 22°
	iS	12	52	26.9	Moderate microseism activity
7	e	07	58	14	
8	i	00	15	32.3	
	i	00	15	39.2	
8	iPKP	03	42	35.2	Molucca Islands
	iPP	03	45	21	USCGS O = 03:23:09 4° S, 128° E
	iPKS	03	46	15	Mag 7.6 Pas
	iPPP	03	48	29	PPH 4 μ 12 sec.
	iPS	03	55	54	Max H 62½ μ 20 sec.
8	eLR	11	22.3		Mid-Atlantic Foreshock USCGS O = 11:09:38
8	iP	15	08	40.9	
	eL	15	51.2		
14	iP	17	49	42.9	
15	eLR	15	18.0		
15	eLR	16	58.0		Solomon Islands Region USCGS O = 15:59:53 10° S, 160° E Mag. 6½ Pas.
15	iP	20	12	32.5	
16	iP	18	51	04.6	Possibly Quarry
	i	18	51	09.8	
	e	18	51	12	
16	eP	21	53	21	
	e	22	04	38	
17	iP	02	22	06.7	Possibly Quarry
	e	02	22	11	
	e	02	22	13	

Date	Phase	h	m	s	Remarks
Oct. 17	e	10	47	45	Costa Rica Aftershock USCGS O = 10:31:46 9° N, 85° W h ~ 100 km.
17	iP e e	13 13 13	58 58 58	07.9 13 19	Possibly Quarry
17	e e eLR	15 15 15	03 10 12.4	59 45	Costa Rica Aftershock USCGS O = 14:56:16 9° N, 85° W h ~ 100 km.
17	iP	15	13	28.9	Off West Coast of Costa Rica USCGS O = 15:06:46 11° N, 88° W h ~ 150 km.
17	eL	17	37.6		Santa Cruz Island USCGS O = 16:35:17 13° S, 165° E
17	eS eLR	22 22	19 22.4	16	Off West Coast of Costa Rica USCGS O = 22:07:23 9½° N, 85° W Slightly deeper than normal
18	eL	07	14.4		
18	eP eP	09 12	42 07	24 34	
19	iP i iS iSS	03 03 03 03	53 53 57 58	33.4 49.6 45 40	Northeast coast of Puerto Rico USCGS O = 03:48:25 19° N, 64° W
19	eP i eS	09 09 09	47 47 51	37 45.6 44	Aftershock of 03:48:25 / Oct. 19
19	e	10	51	38	
20	iP i i iS iSS	07 07 07 07 07	49 49 49 53 54	42.9 48.9 58.7 55	Aftershock of 03:48:25 / Oct. 19 USCGS O 07:44:30
21	eSKS? ePS? eSS? eLR	04 04 04 05	37 41 47 04.6	59 19 30	Tonga Islands Region USCGS O = 04:12:59 18½° S, 174° W Mag. 6½ Pas h ~ 100

Date	Phase	h	m	s	Remarks
Oct. 21	iP	06	22	45.3	
21	iP eS i	09 09 09	04 09 17	11.7 52 00	Off Coast of Colima, Mexico foreshock of 90 42 58 USCGS O = 08:57:10 17½° N, 106° W Mag. 5½ ± Pas
21	iP ePP iS iSS iLg	09 09 09 09 10	50 51 55 58 02	01.6 26 41 13 48	Off Coast of Colima, Mexico USCGS O = 09:42:58 17½° N, 106° W Mag. 6½ ± Pas PZ 6.5 μ 5 sec. PPZ 6.2 μ 9 sec. SH 12.2 μ 10 sec.
23	iP i iPP iS	16 16 16 16	19 19 20 24	37 40.1 47 42	Guatemala USCGS O = 16:13:24 14½° S, 92° W Mag. 7.2 Pas h ~ 100 km.
23	iP	17	11	43.2	Aftershock of 16:13:24 USCGS O = 17:05:31 h ~ 100 km. Mag. 6.5 Pas
23	iP	17	54	10.8	Aftershock of 16:13:24 USCGS O = 17:47:57 h ~ 100 km. Mag. 6.5 Pas
23	eP eLR	19 20	57 08.3	01	Aftershock of 16:13:24 USCGS O = 10:50:56 h ~ 100 km.
23	eS eLR	21 21	43 49.7	32	Aftershock of 16:13:24 USCGS O = 21:32:06 h ~ 100 km. SH 1 μ 11 sec.
23	iP eS eLR	23 23 23	45 50 53.5	03.7 18	Aftershock of 16:13:24 USCGS O = 23:38:50 h ~ 100 km. Mag. 6.1 Pas SH 1 μ 11 sec.
24	eP iS eLR	00 01 01	58 03 08.7	22 36	Aftershock of 16:13:24 / Oct. 23 USCGS O = 00:52:07 h ~ 100 km. Mag. 6.2 Pas SH 3½ μ 10 sec.
24	eLR	06	06.0		Aftershock of 16:13:24 / Oct. 23 USCGS O = 05:50:24 h ~ 100 km. Mag. 6.0 Berk.
24	eLR	09	46.0		Aftershock of 16:13:24 / Oct. 23 USCGS O = 09:28:57 h ~ 100 km.

Date	Phase	h	m	s	Remarks
Oct.					
24	e	16	09	08	Aftershock of 16:13:24 / Oct. 23
	eLR	16	14.2		USCGS O = 15:55:12
24	iP	21	03	53.5	
24	iP	21	19	12.8	
25	iP	05	11	21	Aftershock of 16:13:24 / Oct. 23
	eLR	05	23.0		USCGS O = 05:05:08 h ~ 100 km.
25	eSKS	07	28	16	Ryuku Islands
					USCGS O = 07:03:17 26° N, 125½° E
					h ~ 100 km.
25	iPKP	09	03	08.7	Solomon Islands Region
					USCGS O = 08:44:07 6½° S, 155° E
25	e	14	39	22	
25	iP	21	28	42.8	
26	e	01	16	05	
	e	01	18	20	
	eLR	01	19.2		
26	e	03	04	27	
26	ePP?	04	10	05	Foreshock of 15:38:43
	eSKS	04	15	42	USCGS O = 03:49:55
	eSKKS	04	17	09	Mag. 6¼ Pas
	eSS	04	26	33	Max. H 3¼ μ 20 sec.
	eLR	04	50.6		
26	iPP	15	59	05	Kermadec Islands Region
	iPPP	16	01	49	USCGS O = 15:38:43 32° S, 178° W
	iSKS	16	04	35	Mag. 6½ - ¾ Pas
	eSKKS	16	06	03	PPZ 1 μ 5 sec.
	ePS	16	08	49	Max. H 8½ μ 20 sec.
	ePPS	16	10	13	
	eSS	16	15	25	
	eLR	16	39.5		
28	eL	10	08.2		Kermadec Islands Region
					USCGS O = 09:05:38 32° S, 177½° W
28	eP	22	21	58	Western Guatemala
	e	22	27	40	USCGS O = 22:15:48 15° N, 91½° W
	eLR	22	31.2		Mag. 6½ Tuscon h ~ 100 km.
30	eLR	03	19.6		Samoa Islands Region
					USCGS:O = 02:26:15 14° S, 173° W

Date	Phase	h	m	s	Remarks
Oct.					
30	eP	21	18	39	
31	eLR	05	23.3		Aleutian Islands Region
					USCGS O = 04:49:15 52° N, 174° W
31	eP	19	25	24	Mid-Atlantic Ocean
	eS	19	33	33	USCGS O = 19:15:22 1° N, 26° W
	eLR	19	42.3		
31	eLg	19	53	26	foreshock of 20:22:30
	iRg	19	56	25	USCGS O = 19:35:14
31	i	20	34	43	Gulf of California
	e	20	36	27	USCGS O = 20:22:30 23½° N, 108° W
	i	20	40	12	
	iLg	20	40	46	
	iRg	20	43	39	
31	eP	20	40	13	
Nov.					
1	e	01	40	01	Foreshock of 16:35:20 / Nov. 5
					USCGS O = 01:22:57
1	eP	12	51	58	West Coast of Costa Rica
	eLR	13	02.6		USCGS O = 12:45:32 10° N, 85° W
					h ~ 100 km.
2	e	08	06	51	
2	iPKP	15	47	10.3	Banda Sea Region
	i	15	47	12.5	USCGS O = 15:27:49 6° S, 129½° E
	iPP	15	50	17	Mag. 7½ Pas
	iPKS	15	50	37	PKPH 3¼ μ 8 sec.
	iPS	16	00	40	
	iPPS	16	02	36	
	eSS	16	08	24	
2	iP	18	33	27.2	Aftershock of 15:27:49
					USCGS O = 18:14:03
4	e	11	41	34	
4	e	13	38	53	
5	eP	16	41	39	Neav West Coast of Guatemala
	eS	16	46	47	USCGS O 16:35:20 14½ N, 92 W
	eLR	16	51.4		Mag 6½ Pas
					Max. H 15 μ 20 sec.
5	iSKS	18	01	56	Off Coast of Shikoku, Japan
	e	18	02	51	USCGS O = 17:37:25 33° N, 134½° E
	iS	18	03	01	Mag 6½ Pas
	iPS	18	04	27	Microseism activity
	iSS	18	09	56	SH 4¼ μ 18 sec.
					Max. H 15 μ 20 sec.

Date	Phase	h	m	s	Remarks
Nov.					
6	iPKP	22	41	07	Solomon Islands Region
	ePP	22	42	56	USCGS O = 22:22:05 7½° S, 155½° E
	ePPS	22	54	26	Mag 7 Pas
	eLR	23	20.3		PPZ ¾ μ 6 sec. Max. H 5½ μ 20 sec.
8	iP	01	00	18.4	
8	iP	02	09	15.8	
8	ePKP	02	37	11	Solomon Islands Region
	iPP	02	38	44.2	USCGS O = 02:18:09 9½° S, 159½° E
	i	02	40	25	Mag 7¼ - ½ Pas
	iSKS	02	44	25	PPZ 3 μ 8 sec.
	eSKKS	02	45	51	Max. H. 70 μ 18 sec.
	iPS	02	48	56	
	iSS	02	55	30	
	eLR	03	16.1		
8	iP	19	01	56.0	
10	ePP	02	22	47	Off west coast of Mexico
	eS	02	27	13	USCGS O = 02:14:12 19½° N, 110° W
	iSS	02	29	50	
	iLg	02	33	57	
	iRg	02	36	44	
11	e	04	00	39	Off east coast of New Guinea
	e	04	11	30	USCGS O = 03:38:07 6° S, 148° E
	eLR	04	39.9		
11	eP	09	35	37	Off west coast of Mexico
	eS	09	41	20	USCGS O = 09:28:23 19½° N, 110° W
	eSS	09	43	49	
	eLg	09	47	36	
	eKg	09	50	39	
11	eP?	13	57	49	Near west coast of Costa Rica
	e	13	58	59	USCGS O = 13:51:04 10° N, 85° W
	e	14	05	22	Mag 5¼ Berk.
	eLR	14	07.1		
11	eLR	23	22.7		
12	eLR	22	57.0		
14	ePP	04	44	23	Solomon Islands Region
	e	04	45	55	USCGS O = 04:23:46 11° S, 161° E
	e	04	54	29	
	eLR	05	25.0		

Date	Phase	h	m	s	Remarks
Nov.					
14	eLR	09	35.4		
14	e	13	27	00	
14	e	21	55	17	
	e	21	58	27	
	eLR	22	01.0		
14	eLR	23	06.4		
15	iP	09	49	28.5	
16	iP	05	39	49.8	Off Coast of Hokkaido, Japan USCGS O = 05:26:46 42° N, 145½° E
17	iP	19	34	55.2	Near West Coast of Mexico
	Dil from S.W.				USCGS O = 19:28:18 17° N, 100½° W
	iPP	19	36	18	Mag 6¼ - 7 Pas
	iS	19	40	17	PZ 4 μ 7 sec.
	eSS	19	42	38	SH 10 μ 11 sec.
	eLR	19	44.9		
	iLg	19	47	54	
	iRg	19	51	07	
20	iP	05	11	48.9	
22	iP	10	27	14.1	Aleutian Islands Region
	Com from NNW				USCGS O = 10:16:26 51° N, 176° W
	iS	10	36	00	Mag. 6¼ Pas SH 3 μ 11 sec. Max. H 8 μ 16 sec. Depth Probably greater than normal
24	e	10	01	37	
24	eSS	13	37	56	Samoa Islands Region
	eLR	13	56.9		USCGS O = 13:03:43 15° S, 173° W Mag 6¼ - ½ Pas
24	e	20	43	53	Samoa Islands Region
	eLR	21	10.2		USCGS O = 20:18:48 15° S, 173° W Mag. 6¼ - ½ Pas
Dec.					
1	iP	17	39	12.3	
1	iP	14	57	52	Mid-Atlantic Ocean
	Com from SE				
	iPP	14	59	05	USCGS O = 14:51:00 14° N, 47° W
	iS	15	03	32	Mag 7¼ Pas
	eLR	15	07.1		PH 9½ μ 5 sec.

Date	Phase	h	m	s	Remarks
Dec.					
2	eP	20	07	29	New Hebrides Region
	iPKP	20	10	44	USCGS O = 19:51:45 18° S, 167° E
	iPP	20	12	32	Mag 7½ - ¼ Pas
	iPKS	20	14	23.6	PPZ 10 μ 11 sec.
	eSKS	20	17	43	Max. H 84 μ 18 sec.
	iSKKS	20	19	26	
	ePS?	20	22	16	
	ePPS	20	24	03	
	eSS	20	29	28	
	eLR	20	49.1		
3	eLR	07	30.5		
3	e	08	45	00	New Hebrides Region USCGS O = 07:47:33 17½° S, 167° E Mag 6½ Berk.
4	e	02	02	26	
4	eSKS	08	04	01	Aftershock of 19:51:45 - Dec. 2 USCGS O = 07:38:02
4	iP	16	27	14.3	Virgin Islands Region
	eS	16	31	27	USCGS O = 16:22:05 18° N, 63° W
4	iPKP	16	46	55	New Britain Region
	ipP	16	47	20.8	USCGS O = 16:28:01 5° S, 154½° E
	iPP	16	48	41	Mag 7 Pas
	e	16	55	42	PPZ 7½ μ 8½ sec.
	iPS	16	58	36	Max. H 60 μ 21 sec.
	iPPS	17	00	19	h ~ 100 km.
	i	17	00	59	
	e	17	05	57	
	eLR	17	25.9		
8	eL	02	03.2		New Hebrides Region USCGS O 00:58:37
8	eL	08	10.5		Tonga Islands Region USCGS O = 07:09:12 23° S, 178° W
9	iP	21	49	18.4	North Argentina - Chile border region
	Dil from S				USCGS O = 21:38:56 24° S, 67½° W
	i	21	49	57	Mag 7½ - 8 Pas
	iPP	21	52	10	PH 27 μ 10 sec.
	iPPP	21	53	13	h ~ 200 km.
	iS	21	57	52	
	eLR	22	09.6		
9	iP	22	17	56	

Date	Phase	h	m	s	Remarks
Dec.					
10	iP	03	00	10.6	Near Southern Coast of Peru
	Dil from S				USCGS O = 02:50:40 14½° S, 76½° W
	iPP	03	02	00	Mag 7 Pas
	iPPP	03	03	31	PPZ 5½ μ 6 sec.
	iS	03	07	49	Max. & 22 μ 20 sec. h ~ 60 km.
	i	03	09	53	
	eLR	03	17.5		
10	eLR	11	38.1		
10	eLR	12	21.3		
10	iPKP	13	41	27	Kermadec Islands Region
	ePP	13	42	53	USCGS O = 13:23:10 28½° S 179° W
	iSKS	13	47	57	Mag 7½ Pas
	iSKKS	13	49	20	PPZ 8 μ 20 sec.
	i	13	50	20	Max H 31 μ 20 sec. h ~ 300 km.
	iPS	13	52	17	
	i	13	53	29	
11	iP	14	54	32.6	Western Brazil
	i	15	00	51	USCGS O = 14:46:41 8° S, 71° W
	iScS	15	03	21	Mag 7 Pas h ~ 650 km.
14	eP	02	07	06	Tonga Islands Region
	ipP	02	07	58	USCGS O = 01:52:47 19½° S, 176° W
	iPP	02	11	46	Mag 7½ - ¼ Pas 8 - 8½ Berk.
	i	02	12	32	PZ 3 μ 8 sec.
	iSKS	02	17	24	pPZ 15 μ 13 sec.
	iSKKS	02	18	26	pPH 3 μ 12 sec.
	iS	02	19	13	PPZ 15 μ 9 sec.
	iPS	02	21	02	SH 60 μ 16 sec.
	eSS	02	27	02	SKSH 34 μ 15 sec.
14	iP	02	11	03	
14	iP?	02	21	58	
14	eP	13	31	12	Northern California
	ePP	13	32	27	USCGS O = 13:24:21 40.1° N, 120.2° W
	eS	13	36	37	
	e	13	39	33	
	eLg	13	42	34	
	eRg	13	45	30	
14	iP	14	22	15.6	Southern Mexico
	Com from SW				USCGS O = 14:15:50 17° N, 98° W
	ipP	14	22	26	Mag 7½ Pas
	iPP	14	23	07	PH 24 μ 12 sec.
	iPPP	14	23	27	SH 84 μ 18 sec.
	iS	14	27	10	
15	iP	20	37	08.4	
	eS?	20	41	12	

Date	Phase	h	m	s	Remarks
Dec.					
16	eLg	11	10.5		Off West Coast of Oregon USCGS O = 10:49:01 43½° N, 127° W
18	iP	08	10	41.9	Guatemala
	iPP	08	11	39	USCGS O = 08:04:46 15° N, 90° W
	i	08	12	18	
	eS	08	15	25	
	eSS	08	17	20	
	i	08	21	36	
18	eLR	17	03.0		
19	iP	20	45	24.7	
19	e	21	43	49	North Atlantic Ocean USCGS O = 21:27:22 15° N, 35° W
20	eP	02	19	36	Aftershock of 14:15:50 / Dec. 14 USCGS O 02:13:09
21	eP	11	47	56	Central Chile USCGS O = 11:36:50 35° S, 71° W h ~ 150 km.
22	eP	00	03	46.8	
22	eP	00	46	30.1	
22	eSS	09	49	14	Nocobar Islands Region
	e	09	54	41	USCGS O = 09:10:36
26	iP	13	58	08.7	Southern Mexico
	Dil from SW				USCGS O 13:51:43 17 N, 98 W
	i	14	06	30	Mag 6½ Pas
	iLg	14	11	11	
27	eP	23	15	42	Foreshock of 20:16:29 / Dec. 29
	iS	23	20	30	USCGS O = 23:10:02
	e	23	23	10	h ~ 100 km.
27	eP	23	24	47	Foreshock of 20:16:29 / Dec. 29 USCGS O 23:19:24 h ~ 100 km.
29	e	12	46	56	
29	eP	20	21	58	Leeward Islands Region
	Com from S				USCGS O = 20:16:29 17° N, 63° W
	iP	20	22	05	High frequency P and pP phases arrive
	epP	20	22	21	earlier than corresponding low fre-
	ipP	20	22	26	quency phases.
	iPP	20	22	56	h ~ 100 km.
	eS	20	26	39	
	eLR	20	28.5		
30	eLR	07	43.0		Kermadec Islands Region USCGS O = 06:42:56 h ~ 100 km.