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# Bulletin of the Seismographic Stations

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Volume 19, No. 1, pp. 1-78

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BERKELEY—MOUNT HAMILTON—PALO ALTO  
SAN FRANCISCO—FERNDALE—FRESNO  
MINERAL—ARCATA—RENO

Earthquakes and the Registration of Earthquakes

From January 1, 1949, to March 31, 1949

BY  
CARL F. ROMNEY  
AND  
JOHN E. MEEKER

UNIVERSITY OF CALIFORNIA PRESS  
BERKELEY AND LOS ANGELES  
1950



UNIVERSITY OF CALIFORNIA PRESS  
BERKELEY AND LOS ANGELES

BULLETIN OF THE SEISMOGRAPHIC STATIONS

CAMBRIDGE UNIVERSITY PRESS  
LONDON, ENGLAND

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FERNDALE--FRESNO--MINERAL--ARCATA--RENO

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Issued March 22, 1950

Price, 50 Cents

### EARTHQUAKE INTENSITY SCALE

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EARTHQUAKES IN NORTHERN CALIFORNIA AND NEVADA

EARTHQUAKE INTENSITY SCALE

Intensities are given by Roman numerals in the list of California and Nevada earthquakes on the following page, when sufficient information on the effects of the shock is available. Criteria of the Modified Mercalli Scale which are used to rate the intensity are:

Intensity

- II Felt by a few people only. Duration or direction not appreciable.
- III Duration or direction appreciable.
- IV Rattling of doors and windows; swinging of suspended objects.
- V Disturbance of movable objects; plaster cracked.
- VI Overthrow of movable objects; cracking of chimneys and other brickwork.
- VII Fall of some chimneys; some damage to buildings.

EARTHQUAKE MAGNITUDE SCALE

Richter magnitudes given in the list of epicenters on the next page are found from the Wood Anderson amplitudes, using the nomogram by Nordquist, "Bulletin of the Seismological Society of America," 32:164.

Latitude and Longitude are given for each epicenter in the following list. Only those earthquakes are given for which epicenters were located. The letter represents the excellence with which the epicenter has been located, a indicating excellent, b good, c fair, d poor.

Date	Magnitude	Latitude	Longitude	Quality
20-07-11	2.1	37° 43'	122° 06'	b
15-15-36	3.0	37° 43'	122° 04'	a
27-08-18	3.1	36° 54'	121° 42'	c
16-08-56	3.3	36° 47'	121° 35'	c



EARTHQUAKES IN NORTHERN CALIFORNIA AND NEVADA

1949 - Pacific Standard Time

No.	Date	Time	Richter Magnitude	North Latitude	West Latitude	Quality	
1	Jan. 1	06-30-42	3.0	36° 54'	121° 42'	c	
2	6	11-01-40	2.5	37.2°	122.2°	d	
3	7	19-39-21	4.3	39° 33'	120° 05'	b	
	11	Aftershock of Verdi quake, 29 December 1948.					d
4	7	19-56-24	3.8	39° 33'	120° 05'	b	
	24	Aftershock of Verdi quake, 29 December 1948.					d
5	13	13-24-11	2.0	37.8°	122.6°	d	
	26	Blast?					d
6	13	14-23-05	2.0	37.8°	122.6°	d	
		Blast?					
7	14	15-19-53	2.4	37° 12'	122° 12'	b	
8	18	12-03-21	2.2	37° 48'	122° 34'	c	
		Blast?					
9	19	23-59-23	4.8	39° 33'	120° 05'	b	
		Aftershock of Verdi quake, 29 December 1948.					
10	23	16-10-32	3.7	36° 38'	121° 20'	c	
		IV seven miles south of Hollister.					
11	23	20-57-11	2.1	37° 43'	122° 04'	b	
12	29	01-26-58	2.0	37° 55'	122° 04'	b	
	13	Depth about 16 km.					b
13	30	14-55-44	2.8	37° 43'	122° 04'	a	
14	30	15-45-36	3.0	37° 43'	122° 04'	a	
		Last two shocks felt in Castro Valley. Small foreshock at 13-44-25. Depth about 16 km.					
15	30	22-38-18	3.1	36° 54'	121° 42'	c	
		Depth about 10 km.					
16	31	14-58-56	3.3	36° 47'	121° 35'	c	
		Depth about 10 km.					

## 1949 - Pacific Standard Time

<u>No.</u>	<u>Date</u>	<u>Time</u>	<u>Richter Magnitude</u>	<u>North Latitude</u>	<u>West Latitude</u>	<u>Quality</u>
17	Feb. 9	06-38-55	2.4	36° 54'	121° 42'	c
Depth about 10 km.						
18	9	06-55-47	2.7	37° 10'	121° 26'	c
19	10	13-16-21	2.3	37° 34'	122° 01'	b
20	11	18-56-16	3.4	37° 37'	121° 57'	d
21	12	14-39-34	3.1	36° 46'	121° 35'	c
22	23	16-37-45	1.6	38° 03'	122° 29'	d
23	24	03-49-33	4.7	40.4°	126.1°	d
24	24	18-28-02	3.9	36.9°	120.7°	d
Felt at Los Banos.						
25	26	00-30-04	3.6	37.2°	118.7°	d
26	27	05-35-47	4.8	41.2°	125.2°	d
27	March 7	09-42-20	2.0	37.2°	122.2°	d
28	8	11-32-07	2.0	37° 48'	122° 34'	c
Blast?						
29	8	14-05-31	2.0	37° 48'	122° 34'	c
Blast?						
30	9	04-28-39	5.2	37° 01'	121° 29'	b
Felt widely along the Pacific coast of central California from Santa Rosa south to Santa Margarita. Damage was confined mostly to the city of Hollister, where the intensity was rated as VII (fall of some chimneys, some damage to buildings).						
31	9	04-57-28	3.3	37° 01'	121° 29'	b
Aftershock of last.						
32	13	12-37-56	3.1	37° 01'	121° 29'	b
Foreshock of next. Minor foreshock at 07:30.						
33	13	22-10-15	4.4	37° 01'	121° 29'	b
From same source as March 9, but no damage reported.						
34	24	12-56-56	5.9	41.3°	126.0°	d
U.S.C.G.S. epicenter 42° N, 126.5° W. Felt at several locations along the Oregon and California coast.						
35	29	07-26-36	3.0	36° 54'	121° 28'	c

STROKS AND ROTATIONS EMPLOYED

1. Character of the Seismogram --

- I. Perceptible
- II. Moderately Strong
- III. Strong

d (terras motus domesticus) Local shock (origin less than 100 kilometers distant).

e (terras motus vicinus) Near shock (origin from 100 to 1,000 kilometers distant).

THE REGISTRATION OF EARTHQUAKES

f (terras motus remotus) Distant shock (origin from 1,000 to 5,000 kilometers distant).

Local shocks recorded sufficiently well to be located, all large regional shocks, and all distant earthquakes recorded are tabulated by stations on the following pages.

2. Nature of the Motion --

- i (impetiva) Sudden beginning of the motion.
- e (eurgio) Gradual beginning of the motion.

3. Trace Motion --

- c Compression.
- d Dilatation.



THE HERBERT STATION, UNIVERSITY OF CALIFORNIA  
 SYMBOLS AND NOTATIONS EMPLOYED

1. Character of the Seismogram --

- I. Perceptible      II. Moderately Strong      III. Strong

Latitude and longitude:

d (terrae motus domesticus)	Local shock (origin less than 100 kilometers distant).
v (terrae motus vicinus)	Near shock (origin from 100 to 1,000 kilometers distant).
r (terrae motus remotus)	Distant shock (origin from 1,000 to 5,000 kilometers distant).
u (terrae motus ultimus)	Very distant shock or teleseism (origin more than 5,000 kilometers distant).

2. Nature of the Motion --

i (impetus)	Sudden beginning of the motion.
e (emersio)	Gradual beginning of the motion.

3. Trace Motion --

c	Compression.
d	Dilatation.

The letter S before a reading designates that the seismogram was from the Galitsain instrument; W, Wiechert; B, Bosch-Ozori; A, Wood-Anderson; H, Benioff; S, Slichter.

BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
1	Jan. 1	Iv	iPZ	H 14	31.01.8	18	d	See list, p. 5
			iZ	H	03.6		c	
			iNE	A	04.1	30		
			iZ	H	16.8	25		
			iSZ	H	18.7			
			iSN	A	19.1			
			iE	S	19.9			
			F	14	33			
2	Jan. 2	Iu	iPZ	H 09	01 32.3		d	Vardi Aftershock
			iN	G 12	11 05.5		d	
			iE	G	18.5	8.0		
			iN	G	20.5		d	
			iZ	G	21.0	9.5		
			iZ	G 12	03.5	6.0		
			iE	G	06.5	7.0		
			iN	G	43.0			
			F	09	17			
3	Jan. 2	Iu	eN	G 13	59.1			U.S.G.C.S. at 25°S 179°E h = 600 km
			eE	G 14	00.4	24		
			eZ	G	04.9			
			F	14	21			
4	Jan. 2	Iv	iPZ	H 22	04 47.5		d	Mineral County, Nevada
			iZ	H	50.8	6.0	d	
			eE	A	51			
			iZ	H	56.8	10.0		
			iE	A 05	17.1	10.0		
			iZ	H	18.3			
			iME	A	30.6	8.5		
			F	22	08	7.0		
						9.0		
5	Jan. 5	Iu	iPZ	H 09	09 10.1			
			F	09	11			
6	Jan. 7	Iv	iPZ	H 03	40 01.5			See list, p. 5
			iZ	H	02.9			
			iZ	H	03.5			
			eE	A	05			
			iZ	H	14.1			
			iSZ	H	30.9			
			iSE	A	32.5			
			iE	A	34.0			
			F	03	42			
7	Jan. 7	Iv	iPZ	H 03	57 04.2			See list, p. 5
			iZ	H	05.2			
			eE	A	06			
			iSE	A	26.9			
			iSEZ	AH	34.0			
			F	03	59			



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
8	Jan. 7	Iu	eE	G 17	51 02.5	18		
			eN	G 18	01.1			
			eE	G	02.7	30		
			eZ	G	04.9	25	d	
			F	19	09		c	
9	Jan. 9	Iu	ePZ	H 10	46 33.0		d	
			iPZ	H	30 35.1		d	See list, p. 5
			F	10	50		c	
10	Jan. 9	Iv	iZ	H 12	06 47.4		d	Verdi Aftershock
			iZ	S	48			
			iZ	H	56 53.7		d	U.S.C.G.S.: 41° S 92° W
			iZ	H	07 16.0		c	
			iZ	S	18.7		d	
			eSE	A	58 19			
			iSZ	H	19.6			
			iME	A	17 21.2		d	Verdi Aftershock
			F	12	09		c	
11	Jan. 13	Iu	ePZ	H 08	59 01.0		d	U.S.C.G.S.: 25° S 179° E
			eN	S	02.5		c	h = 600 km
			iZ	H	02.7		c	
			iPcPZ	H 08	59 05.4		c	
			eZ	H 09	01 24			
			iSN	G	08 26.5	6.0		
			eSE	G	19 27.0			
			isSN	G	41.5	10.0		
			isSE	G	03 43.0	10.0		See list, p. 5
			isSZ	G	45.0			
			iSKSZ	G	09 40.0	8.5		
			iSKSN	G	44.0	7.0		
			iSKKSZ	G	11 07.5	9.0		
			ine	G	12 41.0			
			F	10	07		c	
12	Jan. 13	Id	iPN	H 21	24 16.2			See list, p. 5
			iPEZ	AH	24 16.8	15	c	
			iN	S	25 22.8			
			iSEZ	AH	24.1	9	c	
			iLZ	H	39 35.4	33		
			F	21	26	24		
13	Jan. 13	Id	iN	S 22	23 10.4	22		See list, p. 5
			iEZ	AH	16 39 10.8		c	
			iN	S	17.0			
			eE	A	06 39 17.6			
			iSZ	H	17 18.2	18		
			F	22	25	20		
14	Jan. 14	Iu	iPZ	H 01	16 19.3		c	
			F	01	17	18		
			eE	0	45.1			
			eE	0	45.3	20		
			F	01	55			



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No.	Date	Char-acter	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
15	Jan. 14	Iu	eNE F	G 12 35.3 12 49	22		
16	Jan. 15	Iu	iZ iZ F	H 21 08 07.2 H 21 12.5 H 21 09		d c	U.S.C.G.S.: 9° S 91° W h = 100 km.
17	Jan. 15	Id	iPZ iZ iSZ F	H 23 20 06.7 H 07 00 07.8 H 02 18.2 0 23 21		c d	See list, p. 5
18	Jan. 18	Iu	iPZ iZ iZ F	H 04 56 07.1 H 17 14.7 H 35 20.0 04 58		d c d	U.S.C.G.S.: 41° S 92° W
19	Jan. 18	Iv	iPZ iN eE iNZ iZ iSN eE iNZ iZ F	H 14 17 30.9 S 34.0 A 35.0 SH 11 37.1 H 38.1 S 18 01.6 A 03.5 SH 03.9 H 07.0 14 19		d c d	Verdi Aftershock
20	Jan. 18	Id	iPN eNEZ iE iSZ iSE iN iE F	S 20 03 26.3 SAH 27.1 A 27.8 SH 33.9 A 34.5 S 35.8 A 36.5 G 20 05		c	See list, p. 5
21	Jan. 19	Iu	eN eE eN eN eE eZ eN F	G 15 24 29.5 G 25 17.5 G 43.5 G 39.0 G 43.6 G 44.0 G 45.0 G 16 39	15 9 33 24 28 22	d c	U.S.C.G.S.: 22° S 176° W h = 100 km.
22	Jan. 22	Iu	eN eZ eE F	G 06 19.6 G 19.7 G 20.1 G 06 35	14 18 20		
23	Jan. 23	Iu	eE eZ eN F	G 01 44.1 G 45.1 G 45.3 01 55	18 20		

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No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
24	Jan. 23	Iu	eN F	G 05 23.1 05 32.0	20 28 24	d	
25	Jan. 23	Iu	iP <sup>1</sup> Z iZ	H 06 50 29.9 G 53 22.0		c d	U.S.C.G.S.: 9°S 94°E h = 100 km.
31	Jan. 27	IIa	iPPZ iE iZ iZ iZ iE iZ eE iN eE F	H 07 25.1 G 57 32.0 G 58 02.0 G 07 00 39.5 G 02 40.0 G 03 44.0 G 07 07.0 G 11.6 G 17 54.0 G 35.6 09 02.1	7.0 8.0 9.0 13.5 10.0 8.0 14.5 30.0 31.0	c d d d d d d d d d d	U.S.C.G.S.: 3°S 152°E
26	Jan. 24	Iv	iPZ iN iP* <sup>1</sup> NZ eE iN iSE iZ iN iNE F	H 00 10 57.6 S 11 09 58.2 SH 59.8 A 11 00 S 16 18.9 A 25 20.6 H 29 21.5 S 12 01 24.3 SA 27.5 H 00 09	11.0 20.0 20.0	c c d c c c c c c c	See list, p. 5 U.S.C.G.S.: 55°N 161°E
27	Jan. 24	Id	iPN iPZ iE iSNZ iE F	S 04 57 15.2 H 37 15.8 A 39 16.4 SH 16 18 18.9 A 04 58 19.4 G 04 58	9.0 20 30 24 24	c c c c c c	See list, p. 5 U.S.C.G.S.: 27.3°N 47.4°W
28	Jan. 24	IIu	iPZ iNE eE ipPZ iZ iZ iSE iSN iE iN iZ eE	GH 09 27 38.4 G 39.0 A 37 39.5 H 50 41.4 H 52 58.6 G 09 38 14.0 G 29.0 G 09 27 30.0 G 39 15.0 G 09 28 16.0 G 17.0 G 22 50.1	9.0 27 12.5 11.0	d c c c c c c c c c c c	U.S.C.G.S.: 22°S 176°W h = 100 km.
35	Jan. 29	II	iSN iE iN iZ eE	G 09 27 30.0 G 39 15.0 G 09 28 16.0 G 17.0 G 22 50.1	11.0	c c c c c	See list, p. 5
36	Jan. 30	III	eE	G 22 50.1	14	c	See list, p. 5
29	Jan. 25	Iu	eE eN	G 04 44.3 G 45.2	10 12	c c	
37	Jan. 30	III	F	H 05 02	10.9	c	See list, p. 5



BERKELEY							
No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
				h. m. s.	s.		
30	1949 Jan. 25	Iu	iPZ eE eN F	H 08 00 59.7 G 14.0 G 17.7 08 35	28 24	d	See list, p. 5
31	Jan. 27	IIu	iPZ eZ iZ eSKSE eN eZ ePSN iN iN eN eEZ F	H 07 31 16.2 G 17.5 H 24.0 G 41 44.5 G 59.5 G 42 04.5 G 43 48.5 G 47 49.5 G 48 08.5 G 56.5 G 59.1 09 00	8.0 6.0 9.0 10.0 8.0 14.0 20.0 31.0	c d	U.S.C.G.S.: 3°S 152°E See list, p. 5
32	Jan. 27	Iu	iPZ iZ eE eN eE eZ F	H 11 09 10.1 H 19.8 G 16 34.5 G 16.5 G 25.3 G 29.2 12 01	11.0 20.0 20.0	c c	U.S.C.G.S.: 55°N 164°E
33	Jan. 27	Iu	eZ eE eN eN eE F	H 15 11 36 G 22 23.0 G 24 16.0 G 37.3 G 39.4 16 18	9.0 20 30		U.S.C.G.S.: 3°S 152°E
34	Jan. 28	Iu	ePN ePE iPZ ipPZ iE eN eE F	G 08 28 55 G 29 05 H 45.8 H 51.9 G 37 36.5 G 50.8 G 52.3 09 14	9.0 27		U.S.C.G.S.: 27.3°N 47.4°W U.S.C.G.S.: 53°N 172.5°W h = 200 km.
35	Jan. 29	Id	iPNZ iSNZ F	SH 09 27 02.2 SH 05.4 09 28	7.0 7.0		See list, p. 5
36	Jan. 30	IIId	iPZ iNE iSNEZ F	H 22 55 49.2 SA 49.6 SAH 52.9 22 57	6.0 1.0 12.0 10.0	c	See list, p. 5
37	Jan. 30	IIId	iPZ iN iSNE F	H 23 45 40.9 S 41.1 SA 44.7 23 47	10.0	c	See list, p. 5



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
38	Jan. 31	Iv	iPZ	H 06 38	37.5		d	See list, p. 5
			iN	S	37.9			
			iNE	SA	39.4			
			iSN	S	52.7			
			iNZ	SH	54.0			
			iE	A	54.6			
			F	06 40				
39	Jan. 31	Iu	iPZ	H 15 05	08.5		c	
			F	15 06				
40	Jan. 31	Iv	iPZ	H 22 59	17.4	9.0	c	See list, p. 5
			iNZ	SH	19.5	20.0		
			eE	A	20			
			iN	S	34.9			
			iE	A	35.4			North of Hollister
			iE	A	36.7			
			iZ	H	37.3			
			F	23 01				
41	Feb. 1	Iv	iZ	H 13 31	26.7		c	Lassen Park
			iN	S	28.7			
			eE	A	36			
			iZ	H	44.0			
			iN	S	46.2			
			iNZ	SH	32 05.2			
			F	13 33				
42	Feb. 1	IIu	eN	G 18 41.8		9.0		U.S.C.G.S.: 2.5°S 138°E
			iE	G	43 08.5	9.0		
			iN	G	48 05.5	6.0		
			eN	G	53 59	12		See list, p. 6
			iE	G	54 13.5			
			eE	G 19 05.2		28		
			eLE	G	10.4	22		
			eLN	G	11.9	17		
			F	20 24				
43	Feb. 2	IIr	iPNEZ	SAH 17 48	31.6			U.S.C.G.S.: 53°N 172.5°W
			iPNE	G	32.0			h = 200 km.
			iN	G	45.5			
			iE	G	46.5			
			iPZ	H	49 24.9	9.0	c	
			iPPN	G	50 07.5			
			iE	G	25.5	7.0		
			iN	G	52 17.5	7.0		
			iScPZ	H	54 10.4		c	
			eN	S	10.9			
			iScPE	G	11.0	6.0		
			iScPN!	G	12.0	7.0		
			iN	G	57 15.5	12.0		
			iE	G	29.5	10.0		
			eNE	SA	58 21.0			
			iZ	H	21.9			
			iN	G	59 14.0	10.0		
			F	18 51				

BERKELEY

No.	Date	Char-acter	Phase	Time	Period	Trace motion	Remarks
				(G.C.T.)			
				h. m. s.	s.		
44	1949 Feb. 5	Iu	eN eE F	G 20 45.1 G 49.0 20 58		d	U.S.C.G.S.: 19°N 70°W
45	Feb. 6	Iu	iPZ iPZ iN iE iZ iSNE eLE F	G 09 28 22.5 H 29 21.9 S 22.5 A 23.0 H 30 04.2 SA 38 16.5 A 55.5 10 15	9.0 20.0	d	
46	Feb. 9	Iv	iZ iSN iSZ F	H 08 49 50.7 S 50 09.3 H 10.1 08 51		c	North of Hollister
47	Feb. 9	Iv	iPZ iZ eN iNZ F	H 14 39 14.2 H 18.6 S 19.0 SH 31.4 14 41		c	See list, p. 6
48	Feb. 9	Iv	iPZ iZ iZ F	H 14 55 05.9 H 06.5 H 20.4 14 57		c d	See list, p. 6
49	Feb. 10	Id	iPNZ eE iSNE iZ iZ F	SH 21 16 28.3 A 29 SA 33.8 H 34.1 H 36.1 21 18		c	See list, p. 6 165°W 177.5°W
50	Feb. 10	IIu	iPN iPZ eNE iE iE iN iN iE iN eGN eGE eN eLE F	G 22 08 01.5 H 03.1 SA 04 G 10.0 G 38 57.0 G 09 01.0 G 11 13.0 G 17 22.5 G 23.5 G 28.2 G 28.7 S 29.4 G 30.2 23 30	9.0 8.0 9.0 8.0 30.0 30.0 28 24	d	U.S.C.G.S.: 16°S 173°W



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
51	Feb. 11	IIv	iPZ	H 21 06	20.1		d	U.S.C.G.S.: 37°N 117.8°W
			eE	A	21.6			
			iNZ	SH	22.1		d	
			eN	G	23	3.0		
			eEZ	G	24.5			
			iN	S	26.6			
			iNE	SA	31.6			
			iE	G	35.5			
			iE	A	39.1			
			iZ	G	43.5			
			iE	A	07 10.3			
			iME	G	12	9.0		
			iE	A	14.4	26.0		
			iMN	G	15.5			
			iMZ	G	19.0	20.0		
			F	21 15				
52	Feb. 12	IIId	iPN	S 02 56	22.9		d	See list, p. 6
	Feb. 12	Ir	iZ	H 04 05	23.4	19.0	c	U.S.C.G.S.: 18.5°N 105°W
			iE	A	23.9	21.0		
			iSN	S 04 26	28.4			
			iE	A	28.9			
	Feb. 15	Iu	F	02 59				U.S.C.G.S.: 19°N 70°W
53	Feb. 12	Iv	iPZ	H 22 39	56.6		c	See list, p. 6
	Feb. 16	Iu	iZ	H 11 47	57.6		c	
			iSZ	H	40 13.3			
			F	22 41				
54	Feb. 13	IIu	iPZ	SH 18 37	08.2		c	U.S.C.G.S.: 33.5°N 177.5°W
	Feb. 15	Iu	eE	A	08.4			
			iPE	G 12 52	08.5			
			iN	G	53 11.5			
			iZ	S 12 55	19.9		d	
			iZ	H	21.3		c	
	Feb. 17	Iu	iE	G 20 57	31.5			
			iZ	S	59 35.4		d	
			iZ	H 21 36	36.4		c	
			iZ	H	46.1			
	Feb. 18	Iu	iZ	S 05 21	46.5	22		
			iZ	H 05 38	54.9			
			iZ	S	40 37.9			
	Feb. 18	Iu	iZ	H 09 33	39.9	12		U.S.C.G.S.: 19°N 69.5°W
			iE	G 09 46	27.5			
			iN	G	34.5			
	Feb. 19	Iu	iN	G 01 47	52.5			
			iE	G	56.5			
			eE	G 19 00	2	24		
			eN	G	03.7	28		
			eLZ	S	04.4	28		
			eLE	A	04.8	28		
			F	20 49				

BERKELEY

No.	Date	Char-acter	Phase	Time	Period	Trace motion	Remarks
				(G.C.T.)			
				h. m. s.	s.		
55	Feb. 14	IIr	iPZ	SH 18 12 54.7		d	U.S.C.G.S.: 18.5°N 105.5°W
			iPN	G 33 57.5			
			iPE	G 33 58.0			
			iZ	S 02 13 11.9	3.0	d	
			iZ	H 12.9		c	
			iE	G 02 37 58.0			
			iZ	S 02 14 01.8			
			iSE	G 17 26.5			
			iSN	G 01 19 28.5			
			iN	G 45.5		d	
			iE	G 53.5		d	
			eZ	S 18 25	9.0	d	
			eN	G 19.9	26.0		
			eE	G 20.3			
			eLZ	S 20.8	20.0		
eLZ	H 22.0						
F	20 04						
56	Feb. 14	Ir	eE	G 04 05.3	19.0		U.S.C.G.S.: 18.5°N 105°W
			eN	G 05.5	21.0		
			F	04 26			
57	Feb. 15	Iu	eN	G 14 35.8			U.S.C.G.S.: 19°N 70°W
			F	14 48			
58	Feb. 16	Iu	iPZ	SH 11 49 48.2		c	See list, p. 6
			iZ	G 50.5			
			ipPZ	H 51.1		d	
			eE	G 12 00.4			
			F	12 55			
59	Feb. 16	Iu	iPZ	H 12 52 56.1		c	See list, p. 6
			iZ	SH 53 45.8		c	
			F	12 55			
60	Feb. 17	Iu	eN	G 20 57.9			
			eE	G 59.4			
			F	21 38			
61	Feb. 18	Iu	eN	G 05 24.7	22		
			F	05 34			
62	Feb. 18	Iu	eE	G 09 33.9	12		U.S.C.G.S.: 19°N 69.5°W
			F	09 39			
63	Feb. 19	Iu	iPZ	SH 01 08 05.5		c	
			eE	A 06			
			iZ	SH 53 08.2	12.0	c	
			iZ	S 54 18.2		c	
			ipPZ	H 11 57 20.4		d	
			eE	G 34.5			
			eZ	H 11 28.4			
iPPZ	S 29.2						





BERKELEY

No.	Date	Char-acter	Phase	Time	Period	Trace motion	Remarks
				(G.C.T.)			
				h. m. s.	s.		
70	Feb. 25	Iv	iPZ	H 02 28 29.5	1.3 2.0	d	See list, p. 6
			iZ	S 30.3			
			iZ	H 30.7			
			eE	A 57 35			
			iE	A 57.0			
			iZ	S 29 00.0			
			F	02 31			
71	Feb. 26	Iv	iPZ	H 08 30 51.2	c	c	See list, p. 6
			eZ	S 54			
			eSZ	S 31 25			
			iSZ	H 25.5			
			eSE	A 27			
			F	08 32			
72	Feb. 27	Iv	iPZ	SH 13 36 49.1	c d c	c	See list, p. 6
			iZ	H 19 32 51.6			
			iZ	SH 55.3			
			eSE	A 37 33.0			
			iSZ	SH 34.9			
			iE	A 35.1			
			F	13 39			
73	Feb. 28	Iu	iP <sup>1</sup> Z	H 00 32 04.3	d d	d	U.S.C.G.S.: 58°S 27°W
			iZ	S 05.3			
			eNE	G 01 18.7			
			F	01 38			
74	March 2	Iu	eNE	G 06 30.2	c	c	U.S.C.G.S.: 72°N 3°W See list, p. 6
			F	06 42			
75	March 4	Iu	eEZ	G 02 18.3	28	c	
			eN	G 24.3			
			F	03 38			
76	March 4	IIu	iPZ	S 10 33 13.6	c c c d d d d d d d d d d d d	c	U.S.C.G.S.: 37°N 70°E h = 200 km. See list, p. 6
			iZ	H 14.1			
			eE	A 12 57 14.5			
			iPNZ	G 15.5			
			iZ	G 33.5			
			iE	G 34 31.5			
			iP <sup>1</sup> Z	S 37 14.6			
			iZ	G 50 15.5			
			iE	G 26.5			
			iN	G 28.0			
			iZ	H 12 39 29.3			
			iZ	G 31.0			
			iPPZ	H 15 00 42.1			
			iZ	G 46.0			
			iZ	S 15 00 47.6			
			iZ	H 48.1			
			iE	G 38 04.0			
eSKSE	A 43 31.0						
81	March 9	Iu	iPZ	H 15 00 42.1	c d	c	U.S.C.G.S.: 14°N 175°W
			iZ	G 46.0			



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
76	March 4 cont.	IIu	eE iZ iZ iP'P'Z iZ F	A 10 48 50.5 H 53.1 H 49 12.6 H 57 11.1 H 59 32.6 13 37	1.3 2.0	c d	
77	March 7	Iu	ePZ iZ iZ F	H 11 48 37 H 42.4 H 46.2 11 50		c d c	U.S.C.G.S.: 21.5°S 68°W h = 100 km.
78	March 7	Iu	iPZ iZ F	H 14 49 15.8 H 24.0 14 50		d d	See list, p. 6
79	March 8	Id	iPEZ iZ iE iZ iEZ F	AH 19 32 11.6 SH 11.8 A 14.2 S 17.6 AS 21.9 19 33		c c	See list, p. 6
80	March 8	Id	iPEZ iZ iE iEZ F	AS 22 05 36.3 S 42.1 A 43.6 AS 45.7 22 07		c d	See list, p. 6
81	March 9	IIv	iPNEZ iPZ iE iZ iE iS?E F	G 12 28 58.1 H 58.5 A 58.8 S 59.2 A 29 00.4 A 12.1 12 38		c	See list, p. 6
82	March 9	Iv	iPZ eE iZ iZ iZ iE iSZ iSE F	H 12 57 47.4 A 48 S 48.2 S 50.4 H 54.3 A 58 01.4 S 03.3 A 03.9 12 59		c d	See list, p. 6
83	March 9	Iu	iPZ iZ F	H 15 06 44.2 H 53.9 15 08	8.0 9.5	c d	U.S.C.G.S.: 14°S 176°W

BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
84	March 12	Iu	iPZ	H 19 33	48.1	9.5	d	
			iZ	S	48.4	9.0	d	
			iZ	H	57.4	9.0		
			iZ	H	57.9			
			F	19 34		32		
85	March 13	Iu	iPZ	H 18 54	52.8	30	d	U.S.C.G.S.: 21.5°S 68°W
			iZ	S	53.8		c	h = 100 km.
			eE	A	54.0			
			ipPZ	SH 21 55	23.1			
			iZ	H	37.6			
			iZ	S	38.3			
			F	18 56				
86	March 13	Iv	iPZ	H 20 38	14.6			See list, p. 6
			iZ	H	15.6			
			eE	A	16.1			
			iZ	H	27.2			
			eSE	A 38	31.5	30		
			iSZ	H	31.8	30		
			F	20 39				
87	March 14	Iu	iPZ	SH 03 13	21.5		c	See list, p. 6
			iZ	H	38.8			
			iZ	S	42.8		d	
			eE	G	26.5			
			F	03 46				
88	March 14	IIv	iPZ	SH 06 10	33.4		c	See list, p. 6
			iE	A	33.7			
			iE	A	34.9			
			iEZ	AS	36.6			
			iE	A	47.9			
			iSZ	S	49.4	16.5		
			iSE	A	51.7			
			F	06 16				
89	March 14	Iv	iPZ	H 19 29	34.1			Verdi Aftershock
			eE	A	41.5			
			iZ	H	54.2			
			iZ	H 30	04.6			
			eZ	S	05.0			
			eE	A	06.5			
			F	19 32				Aftershock
90	March 16	IIu	iPZ	SH 22 28	11.0		c	U.S.C.G.S.: 6°S 151.5°E
			iPZ	G	12.0	8.0	c	
			iE	G	14.0			
			iE	G 31	58.0			
			eZ	H 36	39			
			iPPZ	S	39.2			
			iSE	G 38	39.0			Aftershock
			iZ	G	42.5	9.5		



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
90	March 16 cont.	IIu	iE iN iN eN eLE eLZ eLZ F	G 22 39 03.5 G 11.5 G 41 13.0 G 52.0 G 02 55.8 S 56.6 G 05 56.7 01 11	9.5 9.0 9.0  32 30 30		
91	March 17	IIu	iPZ iZ iE iN iN iE iZ eN eZ eE eZ F	GH 21 18 09.5 S 11.0 G 29 01.5 G 05.5 G 26.5 G 30 14.5 G 26.5 G 07 44.4 G 44.8 G 45.1 H 46.4 00 16	  7.5   10 12  22 30 30		
92	March 24	IIv	iPZ iE iPNE iE iE iN iSE iSEZ iZ iN iZ eE F	SH 20 58 04.7 A 09 21 05.0 G 06.5 A 12 26 12.2 G 27 18.0 G 28 26.5 A 22 59 59.9 AS 59 02.0 H 15 28 02.9 G 27 03.5 S 33.7 A 21 00 31 23 34	35   30 24    16.5	d	See list, p. 6
93	March 24	Iv	iPZ eE iZ iZ eE F	H 21 42 04.1 A 10 05.0 H 18 10.3 H 18 56.3 A 18 59.5 21 44	8.0 23.0 21.0	d	Aftershock
94	March 25	Iv	iPZ eE iZ iZ eE iZ F	SH 00 36 29.1 A 31.5 H 35.1 S 37 19.4 A 24.0 H 26.1 00 40		c c	Veril aftershock Aftershock
95	March 25	Iv	iPZ iZ iZ F	H 02 07 53.7 H 08 50.4 H 54.4 02 10		c	Aftershock

BERKELEY

No.	Date	Char-acter	Phase	Time	Period	Trace motion	Remarks
				(G.C.T.)			
				h. m. s.	s.		
1949							
96	March 26	Iu	ePZ	S 02 32 03.5		c	
			iZ	SH 05.5		c	
			eNE	G 36.5			
			eZ	G 39.3			
			F	02 46			
97	March 27	Iu	ePZ	G 06 48 19.5			U.S.C.G.S.: 4°N 127.5°E
			iPZ	H 27.7		c	
			iP'E	G 52 21.5			
			iP'Z	G 31.5			
			eZ	S 53 06.0			
			iPPN	G 06.5	7.5		
			eZ	H 34.5			
			iZ	S 40.2			
			iSKSE	G 59 01.5	10		
			iZ	G 30.5	12		
			eZ	S 07 02 43.0			
			eN	G 03 40	22		
			iZ	H 05 27.2			
			eE	G 06.3			
			iN	G 07 30.5	12		
eZ	G 20.7	30					
eZ	S 38.9	35					
F	09 21						
98	March 27	Iu	eN	G 12 26.0			
			eE	G 27.6	30		
			eZ	G 28.8	24		
			F	12 54			
99	March 29	Iv	iPZ	H 15 26 59.7			See list, p. 6
			eE	A 27 00.0			
			iZ	H 03.0			
			iSEZ	AH 13.5			
			F	15 28			
100	March 30	Iu	iE	G 15 10 09.5	8.0		
			eN	G 10.4			
			eE	G 18.7	23.0		
			eN	G 18.9	24.0		
			F	16 33			
101	March 31	Iv	eZ	H 21 09 41.0			Verdi aftershock
			iZ	H 47.3			
			eE	A 49			
			eZ	S 53.5			
			iZ	H 10 06.9			
			eEZ	AS 11			
			F	21 11			



MT. HAMILTON

MOUNT HAMILTON

THE LICK OBSERVATORY STATION, UNIVERSITY OF CALIFORNIA  
MOUNT HAMILTON, CALIFORNIA

See list, p. 5

1 Jan. 1  
2 Jan. 7  
3 Jan. 4  
4 Jan. 2  
5 Jan.  
6 Jan. 6  
7 Jan. 7  
8 Jan. 8  
9 Jan. 8

No.	Date	Char-acter	Phase	Time	Period	Trans-lation	Remarks
1	Jan. 1	Iv	172	05 03	08.3	d	
			182	05 05	09.2	c	
2	Jan. 7	Iv	172	09 01	35.4	c	
			182	09 04	39.8	d	
3	Jan. 4	Iv	172	22 04	41.1	d	Mineral County, Nevada
			182	22 05	41.1	d	
			192	22 06	41.1	d	
			202	22 07	41.1	d	
			212	22 08	41.1	d	
			222	22 09	41.1	d	
			232	22 10	41.1	d	
			242	22 11	41.1	d	
			252	22 12	41.1	d	
			262	22 13	41.1	d	
			272	22 14	41.1	d	
			282	22 15	41.1	d	
			292	22 16	41.1	d	
			302	22 17	41.1	d	
			312	22 18	41.1	d	
			322	22 19	41.1	d	
			332	22 20	41.1	d	
			342	22 21	41.1	d	
			352	22 22	41.1	d	
			362	22 23	41.1	d	
			372	22 24	41.1	d	
			382	22 25	41.1	d	
			392	22 26	41.1	d	
			402	22 27	41.1	d	
			412	22 28	41.1	d	
			422	22 29	41.1	d	
			432	22 30	41.1	d	
			442	22 31	41.1	d	
			452	22 32	41.1	d	
			462	22 33	41.1	d	
			472	22 34	41.1	d	
			482	22 35	41.1	d	
			492	22 36	41.1	d	
			502	22 37	41.1	d	
			512	22 38	41.1	d	
			522	22 39	41.1	d	
			532	22 40	41.1	d	
			542	22 41	41.1	d	
			552	22 42	41.1	d	
			562	22 43	41.1	d	
			572	22 44	41.1	d	
			582	22 45	41.1	d	
			592	22 46	41.1	d	
			602	22 47	41.1	d	
			612	22 48	41.1	d	
			622	22 49	41.1	d	
			632	22 50	41.1	d	
			642	22 51	41.1	d	
			652	22 52	41.1	d	
			662	22 53	41.1	d	
			672	22 54	41.1	d	
			682	22 55	41.1	d	
			692	22 56	41.1	d	
			702	22 57	41.1	d	
			712	22 58	41.1	d	
			722	22 59	41.1	d	
			732	23 00	41.1	d	
			742	23 01	41.1	d	
			752	23 02	41.1	d	
			762	23 03	41.1	d	
			772	23 04	41.1	d	
			782	23 05	41.1	d	
			792	23 06	41.1	d	
			802	23 07	41.1	d	
			812	23 08	41.1	d	
			822	23 09	41.1	d	
			832	23 10	41.1	d	
			842	23 11	41.1	d	
			852	23 12	41.1	d	
			862	23 13	41.1	d	
			872	23 14	41.1	d	
			882	23 15	41.1	d	
			892	23 16	41.1	d	
			902	23 17	41.1	d	
			912	23 18	41.1	d	
			922	23 19	41.1	d	
			932	23 20	41.1	d	
			942	23 21	41.1	d	
			952	23 22	41.1	d	
			962	23 23	41.1	d	
			972	23 24	41.1	d	
			982	23 25	41.1	d	
			992	23 26	41.1	d	
			1002	23 27	41.1	d	

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 37^{\circ} 20' 4'' \text{ N.}$$

$$\lambda = 121^{\circ} 38' 6'' \text{ W.}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 1281.7 meters (4205 feet) above mean sea level.

Apparatus	Component
Wood-Anderson .....	E N
Benioff .....	Z

See list, p. 5

MT. HAMILTON

No.	Date	Character	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
1	Jan. 1	IIId	iPNEZ iSE F	14 30 51.6 58.5 14 33		d c c	See list, p. 5
2	Jan. 2	Iu	iPZ ipPZ F	05 03 04.2 09.2 05 05		d c c	
3	Jan. 2	Iu	iPZ ipPZ F	09 01 35.4 39.6 09 04		c d c	Veril Afternoon
4	Jan. 2	IIv	iPEZ iNZ iN iE iE iN iME iMN F	22 04 41.1 45.6 05 15.5 16.3 08 59 18.4 19.4 23.3 21 21 24.0 22 07		d c c c c c c c c	Mineral County, Nevada  U.S.C.G.S.: 25°S 179°E h = 500 km.  See list, p. 5
5	Jan. 4	Iu	iPZ ipPZ F	07 40 34.3 38.8 07 42		d c c	See list, p. 5
6	Jan. 6	Id	iPZ iN iE iN iSNEZ F	19 01 50.5 51.0 51.5 01 16 55.5 01 17 57.5 19 03		c c c c c c	See list, p. 5
7	Jan. 7	Iu	iPZ F	07 18 59.4 07 20		c c	
8	Jan. 8	IIv	iPZ eNE iE iN iSEZ iN iE F	03 40 05.1 06.1 09.6 23 20 22.1 39.4 23 21 41.1 41.8 03 44		d c c c c c c c	See list, p. 5  See list, p. 5  See list, p. 5
9	Jan. 8	Iv	iPZ iZ	03 57 04.8 06.2		c c	See list, p. 5
	Jan. 20	IIv	eNE iZ iSZ	08 00 08.1 22.3 38.3		d c c	See list, p. 5
	Jan. 23	Iu	iE iE iN F	06 50 38.8 40.1 03 59 40.4		c c c c	U.S.C.G.S.: 9°S 94°E h = 100 km.



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
10	Jan. 9	Iu	iPZ iZ iZ eNE iZ F	10 46	30.1 31.0 34.0 36.3 25.8		d c c c	See list, p. 5
11	Jan. 9	Iv	iPZ iZ iZ eNE iSNE iE iZ F	12 06	48.4 50.3 51.6 53 22.4 24.9 27.4		c d c	Verdi Aftershock  U.S.C.G.S.: 22°S 176°W h = 100 km.
12	Jan. 13	Iu	ePNE F	08 59	03.0			U.S.C.G.S.: 25°S 179°E h = 600 km.
13	Jan. 13	Iv	iPZ ePE eN F	21 24	27.5 29 45			See list, p. 5 U.S.C.G.S.: 23°S 152°E
14	Jan. 13	Iv	iPZ eN eE F	22 23	21.7 39 41			See list, p. 5 U.S.C.G.S.: 3°S 152°E
15	Jan. 14	Iu	ePZ F	01 16	20.9			U.S.C.G.S.: 27.3°N 174.4°W
16	Jan. 14	Iu	iPZ iZ F	21 08	05.4 40			See list, p. 5
17	Jan. 14	Iu	iPZ F	23 10	26.5			
18	Jan. 14	IIId	iPZ ePNE F	23 20	02.7 03			See list, p. 5
19	Jan. 18	Iv	iPZ ePNE F	20 03	38.1 39			See list, p. 5
20	Jan. 20	IIv	iPZ F	08 00	14.8			See list, p. 5
21	Jan. 23	Iu	iP'Z ePPZ eZ F	06 50	38.3 28 02			U.S.C.G.S.: 9°S 94°E h = 100 km.

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
22	Jan. 24	IIId	iPNZ iSN iN F	00 10	46.8 58.3 02.2			See list, p. 5
23	Jan. 24	IIId	iPZ ePN iZ iSZ F	04 57	21.1 22 23.6 28.5			See list, p. 5
24	Jan. 24	IIu	iPZ iPN eN F	09 27	38.4 38.9 32			U.S.C.G.S.: 22°S 176°W h = 100 km.
25	Jan. 24	IIId	iPNZ iSNZ F	21 40	52.9 00.7			San Benito County
26	Jan. 27	Iu	ePZ iZ F	07 31	12 43.5			U.S.C.G.S.: 3°S 152°E
27	Jan. 27	Iu	iPZ F	11 09	14.2			U.S.C.G.S.: 55°N 164°E
28	Jan. 27	Iu	ePZ eZ F	15 11	41 13			U.S.C.G.S.: 3°S 152°E
29	Jan. 28	Iu	iPZ ePNE F	08 28	43.8 45			U.S.C.G.S.: 27.3°N 47.4°W
30	Jan. 29	Id	iPZ iNEZ F	09 27	11.2 12.3			See list, p. 5
31	Jan. 30	IIId	iPEZ iSNE F	22 55	54.2 01.8			See list, p. 5
32	Jan. 30	IIId	iPNEZ iSNE F	23 45	45.9 53.7			See list, p. 5
33	Jan. 31	IIId	iPNEZ iSNE F	06 38	26.8 33.0			See list, p. 5
34	Jan. 31	IIId	iPN iSE iSN F	22 59	07.4 14.9 15.3			See list, p. 5



MT. HAMILTON

No.	Date	Char-acter	Phase	Time	Period	Trace motion	Remarks
				(G.C.T.)			
				h. m. s.	s.		
35	1949 Feb. 1	Iv	iPZ iPNE F	13 31 33.6 35 13 34			Lassen Park
36	Feb. 2	Ir	iPNZ iZ iZ iSNZ F	17 49 37.3 43.4 50 31.1 55 12.5 18 01			U.S.C.G.S.: 53°N 172.5°W h = 200 km.
37	Feb. 6	Iu	iPNZ iPPZ	09 29 25.0 30 07.2			
	Feb. 11	Ir	iZ F	18 31 26.9 09 33			U.S.C.G.S.: 18.5°N 105°W
38	Feb. 9	IIId	iPNZ iN iSNEZ F	08 49 37.7 43.6 45.0 08 50			North of Hollister
39	Feb. 9	Id	iPN eE iSN F	14 39 04.3 10 10.8 14 40			See list, p. 6
40	Feb. 9	IIId	iPNEZ iSNE iN F	14 54 51.6 55.6 59.9 14 57			See list, p. 6
41	Feb. 10	Id	iPN ePN iSNE iSZ F	21 16 28.5 29 33.7 34.2 21 18			See list, p. 6
42	Feb. 10	Iu	iPZ ePN ePE F	22 08 03.4 04 05 22 13			U.S.C.G.S.: 16°S 173°W
43	Feb. 11	IIIv	iPZ iNEZ iNE iNE iSNE F	21 06 12.3 13.9 17.4 53.1 58.9 21 15			U.S.C.G.S.: 37°N 117.8°W Southern California
44	Feb. 12	IIId	iPNEZ iSNE F	02 56 23.7 29.1 02 58			See list, p. 6
57	Feb. 24	Iv	iPZ ePNE F	11 50 48.6 43 11 57			See list, p. 6

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
45	Feb. 12	IId	iPNZ iPE iSNE F	22 39 45.5 46.4 52.7 22 41			See list, p. 6
46	Feb. 13	Iu	ePN F	18 37 08 18 42			U.S.C.G.S.: 33.5°S 177.5°W
47	Feb. 14	Iu	iPZ iZ F	16 36 57.9 40 14.2 16 41			
48	Feb. 14	Ir	iPZ ePN eZ eN F	18 12 46.8 49 22 27 32 18 36			U.S.C.G.S.: 18.5°N 105°W See list, p. 6
49	Feb. 15	Iu	iPZ F	10 59 46.1 11 00			
50	Feb. 15	Iu	iPZ F	13 17 44.0 13 19			U.S.C.G.S.: 58°S 27°W
51	Feb. 16	Iu	iPZ F	11 49 49.1 11 54			U.S.C.G.S.: 37°N 70°E h = 250 km.
52	Feb. 16	Iu	iPZ F	17 48 31.9 17 49			
53	Feb. 19	Iu	iPZ ePNE iZ F	01 08 07.1 08 10 17.0 01 12			
54	Feb. 23	Iv	iPZ iZ ePN iSN iSZ F	01 19 29.3 30.3 31 20 05.0 09.0 01 20			Verdi Aftershock See list, p. 6
55	Feb. 23	Ir	iPZ eN iSZ F	16 21 46.1 57 25 46.7 16 30			U.S.C.G.S.: 39.5°N 85°E See list, p. 6
56	Feb. 24	Iv	iPNZ iPE iSZ F	00 38 03.4 03.9 16.9 00 39			See list, p. 6 See list, p. 6
57	Feb. 24	Iv	iPZ ePNE F	11 50 42.6 43 11 57			See list, p. 6



MT. HAMILTON

No.	Date	Character	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
58	Feb. 25	IIv	iPZ iPNE iSNE F	02 28 18.5 19.7 32.8 02 31			See list, p. 6
59	Feb. 26	IIv	iPE iPZ ePN iSN iSE iSZ iZ F	08 30 43.2 44.0 45 31 12.7 13.7 14.3 29.9 08 33			See list, p. 6 U.S.C.G.S.: 14°S 176°W
60	Feb. 27	IIv	iPZ iPN iNZ iSZ iN F	13 36 58.6 59.1 37 04.8 50.3 53.6 13 40			See list, p. 6
61	Feb. 28	Iu	iP'Z F	00 32 03.5 00 33			U.S.C.G.S.: 58°S 27°W
62	March 4	Iu	iPZ iPPZ ePPN iSKSZ eSKSNE iZ F	10 33 18.1 37 41.6 06 42 43 37.8 38 48 51.0 11 04			U.S.C.G.S.: 37°N 70°E h = 200 km. Verdell Aftershock
63	March 7	Iu	iPZ iZ F	11 48 44.3 48.5 11 51			U.S.C.G.S.: 6°S 151.5°E
64	March 7	Iu	iPZ F	14 49 18.3 14 51			U.S.C.G.S.: 6°S 151.5°E
65	March 7	Id	iPZ iZ F	17 42 29.6 36.4 17 43			See list, p. 6 Verdell Aftershock
66	March 8	Id	iPZ eNE iZ eN eE F	19 32 23.1 24 36.0 00 31 36.5 41 19 34		d	See list, p. 6 Lassen Park
67	March 8	Id	iPZ eN eE iZ F	22 05 47.5 48 50 06 01.0 22 07		d	See list, p. 6

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
68	March 9	IIId	iPNZ iE F	12 28 46.3 47.0 12 41		d	See list, p. 6
69	March 9	IIId	iPN iPZ iE iSN iSE F	12 57 34.2 34.9 35.0 38.8 39.6 13 08		d	See list, p. 6
70	March 9	Iu	iPZ iZ F	15 06 44.8 07 23.0 15 17		d d	U.S.C.G.S.: 14°S 176°W
71	March 13	IIId	iPEZ iSE iZ F	20 38 02.0 07.4 39 48.8 20 42			See list, p. 6
72	March 14	Iu	iPZ F	03 13 34.3 03 16			Aftershock
73	March 14	IIIId	iPNEZ iSN iSE F	06 10 21.4 26.7 27.2 06 17			See list, p. 6
74	March 14	IIv	iPZ iZ iSZ iSNE F	19 29 34.4 30 05.1 22 10.9 27 16 11.4 19 32			U.S.C.G.S.: 4°N 127.5°E Verdi Aftershock
75	March 16	Iu	iPZ eN F	22 28 13.2 15 28 19 22 33			See list, p. 6 U.S.C.G.S.: 6°S 151.5°E
76	March 17	Iu	iPZ eN F	21 18 11.3 21 12 28 21 23			Verdi aftershock U.S.C.G.S.: 6°S 151.5°E
77	March 18	Iv	iPZ iN iZ iZ F	00 32 53.2 33 29.2 30.1 30.9 00 34			Verdi Aftershock
78	March 21	Iv	iPZ iSZ F	08 31 43.0 32 28.4 08 34			Lassen Park



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
79	1949 March 24	IIv	iPZ iPN iPE iZ iSEZ iSN eN eE F	20 58 14.8 15.5 16.0 32.0 59 20.5 21.5 29 41 21 37			See list, p. 6
80	March 24	Iv	iPZ iZ iZ F	21 42 14.6 43 17.0 19.0 21 45			Aftershock
81	March 25	Iv	iPZ ePNE iSNEZ F	00 35 39.9 41 36 43.1 00 38			Aftershock
82	March 25	Iv	iPZ iSZ F	02 08 03.2 09 08.2 02 10			Aftershock
83	March 26	Iu	iPZ F	02 31 52.3 02 33			
84	March 27	Iu	iPZ iPPZ iPSZ eLZ F	06 48 22.7 52 26.9 07 04 17.3 22 41 07 46			U.S.C.G.S.: 4°N 127.5°E Component
85	March 29	IIId	iPNEZ iSNEZ F	15 26 47.0 53.5 15 28			See list, p. 6
86	March 31	Iv	iPZ iSNEZ F	21 09 41.9 10 15.8 21 12			Verdi aftershock

PALO ALTO.

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
				PALO ALTO			
1	Jan. 2	IIV	THE BRANNER STATION, STANFORD UNIVERSITY PALO ALTO, CALIFORNIA				Alameda County, Nevada
				05	30.6		
					32.6		
					34.0		
					34.8		
				22 08			
2	Jan. 5	IIV		09 09	08.9		
					13.4		
				09 11			
3	Jan. 6	IIV	CONSTANTS OF THE STATION	19 01	45.2		See list, p. 5
					48.4		
					48.9		
					50.0		
				07 19	56.6		
					57.21		
5	Jan. 9	IIV		20 46	38.5		
					40		
6	Jan. 9	IIV		22 06	50.6		

Latitude and longitude:

$\phi = 37^{\circ} 25' 11''$  N.  
 $\lambda = 122^{\circ} 10' 18''$  W.

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 83 meters (272 feet) above mean sea level.

Apparatus	Component
Wood-Anderson .....	E N
Benioff .....	Z

7	Jan. 11	IIV		08 59	01.0		U.S.G.S. 2" S 179° E b = 600 m.
				09 0			
8	Jan. 11	IIV		21 26	33.0		See list, p. 5
					34		
					46.0		
				01 27			
9	Jan. 13	IIV		22 23	16.3		See list, p. 5
					17.0		
					23.5		
				22 25			
10	Jan. 14	IIV		23 19	57.9		See list, p. 5
					58.4		
					60.4		
					60.9		
					62.7		
					63.8		
				23 21			



PALO ALTO.

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
1	Jan. 2	IIv	iPZ eE iZ iN iZ iSN iSE F	22 04 05	52.3 55.0 58.3 30.6 32.6 34.0 34.8		d c	Mineral County, Nevada
2	Jan. 5	Iu	iPZ iZ F	09 09 09 11	08.9 13.4		c d	See list, p. 5
3	Jan. 6	IIId	iPNZ iE iN iSE iSN F	19 01 19 08 19 10 19 03	45.2 45.7 48.4 48.9 50.0		d	See list, p. 5
4	Jan. 7	Iu	iPZ ipPZ F	07 19 07 21	56.6 59.6			
5	Jan. 9	Iu	iPZ F	10 46 10 48	32.5		c	
6	Jan. 9	Iv	iPZ iZ iSEZ iSN F	12 06 07	50.6 52.9 27.3 27.7		c c	Verdi Aftershock
7	Jan. 13	Iu	ePNE F	08 59 09 00	01.0 37.0 37.5	2.0 2.5	d	U.S.C.G.S.: 25°S 179°E h = 600 km.
8	Jan. 13	Iv	iPE eN eN eE F	21 24 21 40 21 27	22.0 23 34 40.0		c	See list, p. 5 San Benito County
9	Jan. 13	Iv	iPE eN eSNE F	22 23 22 25	16.3 17.0 33.5			See list, p. 5
10	Jan. 14	IIId	iPNZ iE iZ iSN iSE iE F	23 19 20	57.9 58.4 00.4 00.9 01.7 03.8		d c	U.S.C.G.S.: 27.3°N 117.4°W See list, p. 5

PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Trace motion	Remarks	
				h. m. s.	s.			
	1949							
11	Jan. 18	Iv	iPZ iZ eNE iZ iSN iSE iZ F	14 17 18 12 09 28 14 20	29.1 36.1 37.0 42.0 12.0 13.0 13.5	c c d	Verdi Aftershock See list, p. 5	
12	Jan. 18	Iv	iPZ iNZ iE eNE iZ iNE F	20 03 04 02 20 06	30.8 31.9 32.4 49.0 58.9 02.6	c	See list, p. 5	
13	Jan. 24	IIv	iPZ iN iE iN iN iE iSNE iN F	00 10 11 01 00 13	51.0 51.5 51.8 54.1 59.6 01.6 06.3 09.1	d	See list, p. 5	
14	Jan. 24	Id	iPZ eNE iZ iSN iSE F	04 57 04 58	17.4 18.0 20.4 22.0 23.6	d	See list, p. 5	
15	Jan. 24	Iu	iPZ eNE F	09 27 09 31	37.0 37.5	2.0 2.5	d	U.S.C.G.S.: 22°S 176°W h = 100 km.
16	Jan. 24	Id	iPZ iE iN iZ iSEZ iSN F	21 40 41 00 21 42	58.3 59.2 00.0 00.6 11.9 13.3	c	San Benito County U.S.C.G.S.: 53°N 172.5°W h = 200 km.	
17	Jan. 28	Iu	iPZ iZ F	08 28 08 30	47.4 53.5	d d	U.S.C.G.S.: 27.3°N 47.4°W North of Hollister	



PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
18	Jan. 29	Id	iPZ iZ iNE iSZ iNE iE F	09 27 07.9 08.4 09.7 15.3 16.6 18.4 09 28		d c	See list, p. 5 See list, p. 5
19	Jan. 30	IIId	iPZ iN iE iN iSN iE iE iN F	22 55 50.2 50.5 51.2 52.0 53.8 56.2 58.9 59.8 22 58		d	See list, p. 5 See list, p. 6 U.S.C.G.S.: 16°S 173°W
20	Jan. 30	IIId	iPNEZ iN iNE iSNE F	23 45 42.1 43.7 45.4 46.8 23 48		d	See list, p. 5 U.S.C.G.S.: 37°N 117.8°W
21	Jan. 31	IIId	iPZ iE iN iE iN iNE F	06 38 30.6 31.0 31.3 41.0 41.4 43.2 06 40		c	See list, p. 5 See list, p. 6 See list, p. 6
22	Jan. 31	Iv	iPNZ iE iSN iEZ iNE F	22 59 11.0 11.7 22.1 23.6 28.1 23 01			See list, p. 5 U.S.C.G.S.: 33.5°S 177.5°W See list, p. 6
23	Feb. 1	Iv	iPZ iPE iPN iN F	13 31 31.6 32.7 33.7 32 03.0 13 34			Lassen Park See list, p. 6
24	Feb. 2	Ir	iPZ iPNE iScPZ iScFNE eSNE F	17 48 33.5 33.9 54 10.7 11.4 16.4 17 56			U.S.C.G.S.: 53°N 172.5°W h = 200 km.
25	Feb. 9	Iv	iPZ iPN iSNE F	08 49 45.7 46.7 50 01.7 08 51			North of Hollister

PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Trace motion	Remarks
				h. m. s.	s.		
	1949						
26	Feb. 9	Id	iPZ iPN iSN iZ F	14 39 08.5 08.9 19.1 20.8			See list, p. 6
27	Feb. 9	Id	iPNZ iSNZ F	14 54 59.7 55 10.3 14 56			See list, p. 6
28	Feb. 10	Id	iPNZ iN F	21 16 25.2 29.0 21 17			See list, p. 6 U.S.C.G.S.: 37°N 70°E h = 200 km.
29	Feb. 10	Iu	iPZ iPN F	22 08 00.7 03 ca 22 12			U.S.C.G.S.: 16°S 173°W
30	Feb. 11	IIv	iPNZ iZ iN iN F	21 06 19.2 20.1 23.6 29.3 21 14			U.S.C.G.S.: 37°N 117.8°W
31	Feb. 12	IIId	iPNZ iSN F	02 56 21.4 25.1 02 58			See list, p. 6
32	Feb. 12	Iv	iPZ iPN F	22 39 50.3 51.3 22 41			See list, p. 6
33	Feb. 13	Iu	iPZ ePN F	18 37 06.8 09 18 41			U.S.C.G.S.: 33.5°S 177.5°W See list, p. 6
34	Feb. 24	Id	iPZ iPN iN F	00 37 57.8 58.8 38 09.0 00 39			See list, p. 6 See list, p. 6
35	Feb. 24	IIv	iPNZ iSN F	11 50 37.8 51 28.3 11 56			See list, p. 6
36	Feb. 25	Iv	iPZ iPN iN iSN F	02 28 25.6 26.1 27.6 43.5 02 31			See list, p. 6 U.S.C.G.S.: 21.5°S 68°W h = 100 km. See list, p. 6



PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
37	Feb. 26	Iv	iPZ iPN iZ iN F	08 30 48.3 49.1 56.4 31 23.2 08 32			See list, p. 6
38	Feb. 27	Iv	iPZ ePN iSN iSZ F	13 36 53.9 54 37 44.9 46.4 13 40			See list, p. 6
39	March 4	Iu	iPZ eP'E iP'Z eN eSKSE eSKSN ePSNE eLN eLE F	10 33 19.3 37 19 19.7 25.7 43 37 38 45 15 48 06 48 33 10 56			U.S.C.G.S.: 37°N 70°E h = 200 km.
40	March 7	Id	iPNEZ iSNE F	17 42 24.2 27.4 17 43			See list, p. 6
41	March 8	Iv	iPZ iPNE iZ iS?E F	19 32 16.3 17.3 24.3 34.9 19 34			See list, p. 6
42	March 8	Iv	iPZ iPNE iS?E F	22 05 40.9 41.5 06 02.2 22 07			See list, p. 6
43	March 9	IIId	iPNEZ F	12 28 52.9 12 40			See list, p. 6
44	March 9	Id	iPZ iSN iSE F	12 47 41.4 51.6 52.1 12 59			See list, p. 6
45	March 13	Iu	iPZ ipFZ F	18 54 51.7 55 22.0 18 57		c d	U.S.C.G.S.: 21.5°S 68°W h = 100 km.
46	March 13	Iv	iPNE iSE iSN F	20 38 08.9 18.9 19.4 20 40			See list, p. 6

PALO ALTO

No.	Date	Character	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
47	March 14	Iu	ePZ F	03 13 30 03 16			
48	March 14	II d	iPNEZ iSE F	06 10 27.9 37.8 06 16			See list, p. 6
49	March 14	Iv	iPZ ePE ePN eSE eSN F	19 29 39.5 40 43 30 12 13 19 32			Verdi Aftershock
50	March 16	II d	iPNEZ iSNE iN F	22 02 46.4 48.3 50.1 22 04			U.S.C.G.S.: 6°S 151.5°E
51	March 21	Iv	iPZ F	08 31 42.0 08 33			Lassen Park
52	March 24	IIv	iPZ iPN iZ iE iSE iSN F	20 57 09.9 11.2 12.5 13.2 59 12.9 13.5 21 33			See list, p. 6
53	March 24	Iv	iPZ iPN ePE iSE iSN F	21 42 10.1 10.6 11 43 10.0 11.5 21 44			Aftershock
54	March 25	Iv	ePN iPZ iPE iSE iSNZ F	00 36 35 35.4 36.0 38 34.0 35.5 00 39			Aftershock
55	March 29	Id	iPZ iPNE iSNE iN F	15 26 53.0 53.3 27 03.8 05.1 15 30			See list, p. 6
56	March 31	Iv	iPZ ePNE iSE iSN F	21 09 45.8 48 20.4 21.1 21 12			Verdi aftershock



SAN FRANCISCO

SAN FRANCISCO

THE SAN FRANCISCO STATION, UNIVERSITY OF SAN FRANCISCO, Nevada  
 SAN FRANCISCO, CALIFORNIA

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 37^{\circ} 46' 14'' \text{ N.}$$

$$\lambda = 122^{\circ} 27' 12'' \text{ W.}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 100 meters (328 feet) above mean sea level.

Apparatus	Component
Wood-Anderson .....	E N

U.S.G.G.S.: 22°S 176°W  
 h = 100 km.

SAN FRANCISCO

No.	Date	Char-acter	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
1	Jan. 2	Iv	iPNE iSNE F	22 04 52.6 05 32.4 22 07			Mineral County, Nevada
2	Jan. 8	Iv	iPN iPE iSN iSE F	03 40 07.3 08.5 22 59 37.2 39.2 03 43			See list, p. 5
3	Jan. 8	Iv	iPN iSN iSE F	03 57 06.9 39.7 22 59 40.9 04 00			See list, p. 5
4	Jan. 9	Iv	iPE iSNE F	12 06 56.9 07 22.9 12 09			Verdi Aftershock U.S.C.G.S.: 53°N 172.5°W h = 200 km.
5	Jan. 13	Id	iPNE iSNE F	21 24 13.4 19.5 21 26			See list, p. 5
6	Jan. 13	Iv	iPNE iSNE F	22 23 07.2 11.4 22 25			See list, p. 5
7	Jan. 18	Iv	ePE iN iE F	14 17 34 18 07.0 10.1 14 18			Verdi Aftershock
8	Jan. 18	Id	iPNE iSNE F	20 03 24.0 27.7 20 06			See list, p. 5
9	Jan. 20	Iv	iPNE iSN iSE F	08 00 09.9 42.7 43.3 08 04			See list, p. 5
10	Jan. 24	Iv	iPN iPE iSNE F	00 10 59.0 59.5 00 11 20.1 00 13			See list, p. 5
11	Jan. 24	Id	iPNE iSNE F	04 57 17.4 22.1 04 59			See list, p. 5
12	Jan. 24	Iu	ePE F	09 27 39 09 29			U.S.C.G.S.: 22°S 176°W h = 100 km.



SAN FRANCISCO

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
13	Jan. 29	Id	iPNE iSNE F	09 27 04.7 10.7 09 28			See list, p. 5
14	Jan. 30	Id	iPNE iSNE F	22 55 50.1 54.4 22 59			See list, p. 5 See list, p. 6
15	Jan. 30	Id	iPNE iSNE F	23 45 41.8 46.0 23 47			See list, p. 5 U.S.C.G.S.: 37°N 70°E h = 200 km.
16	Jan. 31	Iv	iPNE iSNE F	22 59 18.0 35.2 23 01			See list, p. 5
17	Feb. 2	Ir	iPE iPN iSE eSN F	17 48 30.6 31.1 54 09.2 10 17 59			See list, p. 6 U.S.C.G.S.: 53°N 172.5°W h = 200 km. See list, p. 6
18	Feb. 9	Iv	iPNE iSE iSN F	14 39 16.2 30.8 31.8 14 41			See list, p. 6 See list, p. 6 See list, p. 6
19	Feb. 9	Id	iPN iPE iSE iSN F	14 55 06.3 07.2 19.8 20.2 14 56			See list, p. 6 U.S.C.G.S.: 21.5°N 68°W h = 100 km.
20	Feb. 10	Id		21 24 ca			See list, p. 6 $\bar{S} - \bar{P} = 5.4$ sec.
21	Feb. 11	IIv	iPNE iN iE iSNE iMN F	21 06 23.8 27.1 34.1 07 08.3 17.4 21 15			U.S.C.G.S.: 57°N 117.8°W See list, p. 6
22	Feb. 12	IIId	iPN iSN F	02 56 24.8 30.2 03 00			Verdi Aftercheck See list, p. 6
23	Feb. 24	Id	iPNE iSNE F	00 38 50.1 54.1 00 38			See list, p. 6 See list, p. 6
24	Feb. 24	Iv	iPNE iSN F	11 50 32.6 51 14.8 11 55			See list, p. 6

SAN FRANCISCO

No.	Date	Char-acter	Phase	Time		Trace motion	Remarks
				(G.C.T.)	Period		
1949				h. m. s.	s.		
25	Feb. 25	Iv	iNE iNE iE F	02 28 49.7 15 28 02 31	33.7 56.9		See list, p. 6
26	Feb. 27	Iv	iPNE iSN iSE F	13 36 37 13 39	50.2 35.0 35.5		See list, p. 6
27	March 4	Iu	eN eN iSKSNE F	10 36 37 43 11 10	48 34.9 33.9		U.S.C.G.S.: 37°N 70°E h = 200 km.
28	March 8	Id	iPNE F	19 32 19 34	08.4		See list, p. 6
29	March 8	Id	iPNE F	22 05 22 07	33.3		See list, p. 6
30	March 9	IIIv	iPNE iSN F	12 28 29 12 38	58.7 12.1		See list, p. 6
31	March 9	Iv	ePNE iSNE F	12 57 58 12 59	48.7 02.3		See list, p. 6
32	March 13	Iu	ePE ePN F	18 54 56 18 56	54 56.4		U.S.C.G.S.: 21.5°S 68°W h = 100 km.
33	March 13	Iv	iPNE iSE iSN F	20 38 30 31 20 40	15.9 30.8 31.7		See list, p. 6
34	March 14	IIv	iPNE iSNE F	06 10 49.5 06 16	33.6		See list, p. 6
35	March 14	Iv	ePE eSNE F	19 29 30 19 31	50 09		Verdi Aftershock
36	March 24	Iv	iPN iPE iSNE F	20 58 07 59 21 27	06.6 07.0 01.6		See list, p. 6
37	March 25	Iv	iN eE F	00 37 23 00 38	22.6		Aftershock



SAN FRANCISCO

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
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1949 h. m. s. s.

38	March 29	Iv	iPN iSNE F	15 27 01.2 15 28 15.6			See list, p. 6
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CONSTANTS OF THE STATION

Latitude and longitude:

$\phi = 40^{\circ} 34' N$   
 $\lambda = 124^{\circ} 16' W$

Time — All determinations are reduced to Greenwich Civil Time.

Altitude — 17 meters (55 feet) above mean sea level.

Apparatus	Component
Bech-Corn 25 kg. ....	E N

The station is operated by Mr. Joseph Magnuda, of  
Berkeley, in cooperation with the University of California.

FERNDALE

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
n. n. FERNDALÉ							
1	Feb. 3	Iv	1FE 1E +SB F	53 08 18 00			U.S.G.C.S.: 53°N 172.5°W h = 200 km.
2	Feb. 11	Iv	1FE 1FO F	21 08 30 46 21 11			U.S.G.C.S.: 37°N 117.0°W
3	Feb. 14	Iv	+E F	18 18 10 18 43			U.S.G.C.S.: 18.5°N 105°W
4	Feb. 24	Iv	1FNE 1SNE +E F	11 49 50 50 16 11 50			See list, p. 6

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 40^{\circ} 34' N.$$

$$\lambda = 124^{\circ} 16' W.$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 17 meters (55 feet) above mean sea level.

Apparatus	Component
Bosch-Omori 25 kg. ....	E N

The station is operated by Mr. Joseph Bognuda, of Ferndale, in cooperation with the University of California.



FERNDALE

No.	Date	Char-acter	Phase	Time (G.C.T.)		Trace motion	Remarks
				h. m. s.	s.		
	1949						
1	Feb. 2	Ir	iPE iE eSE F	17 47 50 49 39 53 06 18 00			U.S.C.G.S.: 53°N 172.5°W h = 200 km.
2	Feb. 11	Iv	iPE iPN F	21 08 30 46 21 13			U.S.C.G.S.: 37°N 117.8°W
3	Feb. 14	Ir	eE F	18 18 10 18 43			U.S.C.G.S.: 18.5°N 105°W
4	Feb. 24	Iv	iPNE iSNE eE F	11 49 58 50 16 35 11 56			See list, p. 6
5	Feb. 27	Iv	iPNE iSE iSN F	13 36 07 21 22 13 41			See list, p. 6
6	March 4	Iu	eNE iN F	10 37 10 45 04 10 33			U.S.C.G.S.: 37°N 70°E h = 200 km.
7	March 9	Iv	iN iE iN iE iN F	12 30 04 16 31 06 10 38 12 40			See list, p. 6
8	March 24	IIIv	iPE iE iSE iE F	04 57 25 32 44 49 04 21			See list, p. 6
9	March 27	Iu	eE F	19 20 19 56			U.S.C.G.S.: 4°N 127.5°E

No.	Date	Character	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
FRESNO							
1	Jan. 1	Iv	1P2 1P4 P	09 01 43.7 45 43			THE FRESNO STATION, FRESNO STATE COLLEGE FRESNO, CALIFORNIA
2	Jan. 2	Iv	1P2 1P4 1P1 1P 1P	09 01 43.7 45 43 45 45			
3	Jan. 2	Iiv	1P2 1P4 1P1 1P 1P	22 04 31.3 32.4 31.2 31.3 31.3			Mineral County, Nevada
CONSTANTS OF THE STATION							
Latitude and longitude:							
$\phi = 36^{\circ} 46!1 \text{ N.}$ $\lambda = 119^{\circ} 47!8 \text{ W.}$							
Time -- All determinations are reduced to Greenwich Civil Time.							
Altitude -- 88.4 meters (290 feet) above mean sea level.							

Apparatus	Component
Sprengnether .....	N E Z

7	Jan. 9	Iv	1P2 1P4 P	10 26 28.0 28.6 29			
8	Jan. 9	Iv	1P3 1P4 1P2 1P P	11 06 58.4 55.4 07 31.0 32.4 12 10			Verdi Aftershock
9	Jan. 13	Iv	1P3 1P4 1P2 1P 1P	08 59 05.0 06 09 08 18.0 18.5 09 13 19.0			U. S. C. O. S. : 25°S 179°E h = 600 km.
10	Jan. 18	I	1P2 P	04 55 56.2 04 58			U. S. C. O. S. : 41°S 92°W



FRESNO							
No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
1	Jan. 1	Iv	iPZ iPE iPN F	14 31 10.0 11.4 14 36			See list, p. 5
2	Jan. 2	Iu	iPZ ePNE	09 01 43.7 45			
	Jan. 20	IIv	eSE eSN F	08 11 43 46 09 15			See list, p. 5
3	Jan. 2	IIv	iPZ iPN iPE iZ iNE iSNE iN F	22 04 31.3 33.4 34.2 35.3 36.2 05 04.2 30.6 22 10			Mineral County, Nevada
4	Jan. 5	Iu	iPZ F	09 09 16.0 09 13			U.S.C.G.S.: 9°S 94°E h = 100 km.
5	Jan. 8	Iv	iPZ iPNE iSE iSZ iSN F	03 40 12.1 13.0 47.4 48.9 49.9 03 36			See list, p. 5
6	Jan. 8	Iv	iPEZ iPN iSZ iSNE F	03 57 11.4 12.4 48.6 49.2 04 01			See list, p. 5
	Jan. 24	IIu		09 27 49.2			U.S.C.G.S.: 22°S 176°W h = 100 km.
7	Jan. 9	Iu	iPNZ ePE F	10 46 22.0 24.6 10 49			
8	Jan. 9	Iv	iPZ iPNE iSNZ iSE F	12 06 54.4 55.4 07 31.0 32.4 12 10			Verdi Aftershock
9	Jan. 13	Iu	iPZ ePNE iSE iSZ iSN F	08 59 05.0 06 09 08 48.0 48.5 49.0 09 13			U.S.C.G.S.: 25°S 179°E h = 600 km.
10	Jan. 18	Iu	iPZ F	04 55 56.2 04 58			U.S.C.G.S.: 41°S 92°W

FRESNO

No.	Date	Character	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
11	Jan. 18	Iv	iPZ iN iE iSZ isNE F	14 17 39.6 41.6 43.3 18 15.9 16.9 14 21			Verdi Aftershock
12	Jan. 20	IIv	ePN iPZ ePE iZ iNE iSZ iSN iSE iN iE iZ F	08 00 14 14.9 16 16.3 17.1 51.9 52.4 53.3 01 00.9 01.3 02.0 08 08			See list, p. 5
13	Jan. 23	Iu	eP'Z eE eN ePPE eN eE F	06 50 36 48 49 53 35 55 21 43 07 03			U.S.C.G.S.: 9°S 94°E h = 100 km.
14	Jan. 24	Iv	ePNE iPZ isNE F	00 10 55 55.4 11 11.6 00 15			See list, p. 5
15	Jan. 24	IIu	iPZ ePNE eSE eSN eZ F	09 27 42.3 44 37 39 40 54 37 09 56			U.S.C.G.S.: 22°S 176°W h = 100 km.
16	Jan. 25	Iu	ePZ eSE eSN F	04 22 36 30 02 05.3 04 33			
17	Jan. 25	Iu	ePZ ePN ePE F	08 00 30 33 34 08 02			
18	Jan. 27	Iu	ePZ F	07 31 19 07 38			U.S.C.G.S.: 3°S 152°E



FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
19	Jan. 27	Iu	iPZ ePNE F	11 09 26.0 28.0 11 13			U.S.C.G.S.: 55°N 164°E
20	Jan. 28	Iu	iPZ ePN ePE F	08 28 34.2 39.0 42.2 08 35			U.S.C.G.S.: 27.3°N 47.4°W
21	Jan. 31	Iv	ePZ iPEZ iPN iSZ iSNE F	06 38 44.5 46.0 47.2 39 03.7 18 28 04.8 06 43			See list, p. 5 5°S 177.5°W
22	Jan. 31	Iv	iPZ iPN iPE	22 59 21.2 22.0 24.0			See list, p. 5
23	Feb. 11	Iv	iPZ ePNE iE	13 31 47.8 48.0 32 40.3			Lassen Park 10.5°N 105°W
24	Feb. 15	Iu	iN iZ F	14 17 42.9 43.3 13 36			U.S.C.G.S.: 19°N 70°W
25	Feb. 2	IIr	iPNZ iPE	17 48 49.6 50.4			U.S.C.G.S.: 53°N 172.5°W h = 200 km.
26	Feb. 16	Iu	iScPZ iSN iSZ iSE F	20 54 18.1 20 37 44.9 45.6 09 10 46.1 18 05			U.S.C.G.S.: 19°N 69.5°W
27	Feb. 10	Iu	iPZ iPN iPE iS?E eS?N F	09 28 32.7 33.7 34.7 38 38.4 01 15 39 09 40			Verdi Afterhook U.S.C.G.S.: 16°S 173°W

FRESNO

No.	Date	Char-acter	Phase	Time (G.O.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
28	Feb. 11	IIv	iPEZ iPN F	21 05	51.4 51.8			U.S.C.G.S.: 37°N 117.8°W
29	Feb. 12	Iv	iPZ iPE iPN F	02 56	50.8 51.8 52.2			See list, p. 6
0	Feb. 13	Iu	iPZ iPNE eSE eSN F	18 37	11.2 12.0 47 55 55.1			U.S.C.G.S.: 33.5°S 177.5°W
1	Feb. 14	Iu	iPZ iPPZ F	16 37	02.5 40 23.6 16 42			
2	Feb. 14	Ir	iPZ iPNE F	18 12	34.0 35.1 18 59			U.S.C.G.S.: 18.5°N 105°W
3	Feb. 15	Ir	iPZ F	03 57	22.5 04 02			U.S.C.G.S.: 18.5°N 105°W
4	Feb. 15	Iu	iPZ eE F	14 17	31.3 34 14 20			U.S.C.G.S.: 19°N 70°W
5	Feb. 16	Iu	ePN iPZ ePE iZ F	11 49	54 54.6 55 50 01 11 55			
6	Feb. 17	I	iPZ F	20 36	28.4 20 37			
7	Feb. 18	Iu	iPZ F	09 10	06.1 09 12			U.S.C.G.S.: 19°N 69.5°W
8	Feb. 19	Iu	iPZ ePNE ipPZ iPPZ F	01 08	12.5 13 26.0 11 41.4 01 15			
9	Feb. 23	Iv	iPN iSNE F	01 19	36.0 20 13.7 01 22			U.S.C.G.S.: 11°S 176°W Verdi Aftershock



FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
40	Feb. 23	Iu	ePZ eN eE iPPZ F	16 21 44 52 19 00 54 25 55.3 17 32				U.S.C.G.S.: 39.5°N 85°E h = 100 km.	
41	Feb. 24	Iv	iPZ iPNE iSN F	11 51 06.7 07.8 20 52 17.5 11 59				See list, p. 6	
42	Feb. 25	IIId	iPNE iSNE iN iE F	02 28 15.9 25.7 06 29 57.8 30 05.2 02 33				See list, p. 6 See list, p. 6	
43	Feb. 26	Iv	iPNE iNE iSNE F	08 30 24.7 25.3 06 33 39.6 08 33				See list, p. 6 Verdi Aftershock	
44	Feb. 27	Iv	iPZ iPNE F	13 37 19.6 20.1 13 42				See list, p. 6	
45	March 4	Iu	iPZ ePNE iZ iP'EZ iP'N iSKSN eN iE F	10 33 19.7 22 22 36 21.4 37 25.4 29.7 23 43 40.9 59 21 21 18 22.6 11 38				U.S.C.G.S.: 37°N 70°E h = 200 km. 151.5°E	
46	March 9	IIIv	iPEZ iPN iSZ F	12 29 03.3 04.4 19.7 12 46				See list, p. 6 Lassen Park	
47	March 9	Iv	ePZ iPNE iSZ iSNE F	12 57 53.6 55.0 58 11.6 13.0 13 03				See list, p. 6	
48	March 9	Iu	iZ iN iE iZ F	15 06 50.8 51.7 21 12 52.1 07 26.6 15 10				U.S.C.G.S.: 14°S 176°W Aftershock	

FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
49	March 13	Iu	iPZ iPN F	18 54	38.8 40.8			U.S.C.G.S.: 21.5°S 68°W h = 100 km.	
50	March 13	Iv	iPZ iPN iZ iSN F	20 38	20.5 21.3 37.5 38.9			See list, p. 6 127.5°E	
51	March 14	Iu	iPZ F	03 13 03 18	47.3				
52	March 14	IIv	iPZ iPN iZ iSZ iN iN F	06 10 12	38.1 38.4 50.7 54.0 55.8 57.7			See list, p. 6	
53	March 14	Iv	iPZ iPN iSZ iSN F	19 29 30	40.5 41.7 17.4 19.0			Verdi Aftershock	
54	March 16	Iu	iPZ iPN iPPZ eLZ F	22 28 31	19.4 21.2 56.3 19			U.S.C.G.S.: 6°S 151.5°E	
55	March 17	Iu	iPZ iPN F	21 18 21 25	17.9 18.6			U.S.C.G.S.: 6°S 151.5°E	
56	March 21	Iv	iN iZ F	08 32 08 34	52.5 53.3			Lassen Park	
57	March 24	IIv	iPZ iPN iZ iN iSZ iSN iMN iZ F	20 58 21 00 01 02	36.0 36.5 37.5 44.0 07.8 09.2 40.0 20.7			See list, p. 6	
58	March 25	Iv	iPNE iNE F	00 37 00 41	02.3 31.9			Aftershock	



FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
59	March 26	Iv	ePN iFZ F	02 31 35 35.8 02 35			Aftershock
60	March 27	Iu	ePZ ePN ePFZ iSKSZ iN eLZ F	06 48 25 49 27 52 47 58 30.5 07 04 28.5 23 21 07 54			U.S.C.G.S.: 4°N 127.5°E
61	March 28	Iu	iPZ eN iP'Z iZ F	19 40 50.9 56 45 04.3 56 13.4 19 59			
62	March 30	Iu	iPZ ePN iZ F	20 31 43.3 44 50.7 20 34			

Latitude and longitude

Time — All data are reduced to Greenwich Civil Time.

Altitude — 1495 meters (4906 feet), above mean sea level.

Apparatus	Component
Wood-Ingersoll .....	E N
Benioff .....	E





MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
1	Jan. 1	Iv	iPZ	14	31 46.6		c	See list, p. 5
			iZ		48.7		c	
			eNE		49.0			
	Jan. 20	Iv	iPZ	02	38 51.7		d	
			iSZ	02	32 13.8			
			iNE		27.7			
	Jan. 20	IIv	iZ	07	59 34.2			See list, p. 5
			F	14	34			
2	Jan. 2	Iu	iPZ	09	01 29.7		c	
	Jan. 20	Iu	iZ	13	38 45.3		c	
			iZ		02 21.6		c	
			F	09	06			
3	Jan. 2	Iu	eZ	13	10 04.5		c	U.S.G.O.S.: 9°S 94°E
			F	13	12		c	h = 100 km.
4	Jan. 2	IIv	iPZ	22	04 43.0		d	Mineral County, Nevada
			iE		45.2			
	Jan. 24	Iv	iZ	08	11 47.6		d	See list, p. 5
			iNE		48.5			
			iN		49.9		d	
			iE		51.0			
			iN		53.9			
			iNE	00	05 07.1			
			iNE		27.5			
	Jan. 24	Iu	iE	09	27 30.4		d	U.S.G.O.S.: 22°S 176°W
			F	22	08			h = 100 km.
5	Jan. 5	Iu	ePZ	09	09 17.5			
			F	09	11			
6	Jan. 7	Iu	iPZ	07	19 48.9		d	U.S.G.O.S.: 3°S 152°E
			F	07	22			
7	Jan. 9	Iu	iPZ	10	46 39.9		d	
			ipPZ		49.6		c	
	Jan. 27	Iu	F	10	51			U.S.G.O.S.: 55°N 164°E
8	Jan. 9	IIv	iPZ	12	06 32.0		c	Verdi Aftershock
	Jan. 27	Iu	iE	15	11 35.6			U.S.G.O.S.: 3°S 152°E
			iN		36.2			
			iSNE	15	20 42.2			
			F	12	08			
9	Jan. 18	IIv	iPZ	14	17 15.4		d	Verdi Aftershock
			eN		16			
			iZ	08	36 17.4			
			iN		18.2			
	Jan. 31	Iv	iSN	21	59 36.2			See list, p. 5
			F	14	20			
10	Jan. 19	Iu	eZ	12	51 34.0		d	
			F	12	54			

MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
11	Jan. 19	Iu	iPZ F	15 13	16.1		d	Lassen Park	
				15 18					
12	Jan. 20	Iu	iZ F	02 38	33.5		c	U.S.C.G.S.: 53°N 172.5°W h = 200 km.	
				02 40					
13	Jan. 20	IIv	iPNEZ iN F	07 59	52.9			See list, p. 5	
					13.9				
				08 06					
14	Jan. 20	Iu	iPZ iZ F	13 36	52.2		d		
					57.5		d		
				13 39					
15	Jan. 23	Iu	iP'Z iZ ePPZ F	06 50	16.0		c	U.S.C.G.S.: 9°S 94°E	
					25.8		c	h = 100 km.	
					53 33.0				
				07 00				See list, p. 6	
16	Jan. 24	Iv	iPZ eE	00 11	29.3		c	See list, p. 5	
					39				
		Iu	iZ eN	22 08	42.5		d	U.S.C.G.S.: 16°S 173°W	
					46				
			iZ F	22 12	29.0				
				00 15					
17	Jan. 24	Iu	iPZ eNE iZ F	09 27	48.9		d	U.S.C.G.S.: 22°S 176°W	
					50.0			h = 100 km.	
					28 03.6		c		
				09 33					
18	Jan. 27	Iu	ePZ eZ	07 31	12			U.S.C.G.S.: 3°S 152°E	
					34 46.5				
		Iu	eZ eG?Z F	08 46	59			U.S.C.G.S.: 33.5°S 177.5°W	
				08 07	40				
				08 13					
19	Jan. 27	Iu	iPZ F	11 08	59.0			U.S.C.G.S.: 55°N 164°E	
				11 15					
20	Jan. 27	Iu	ePZ eZ F	15 11	34			U.S.C.G.S.: 3°S 152°E	
					15 10				
				15 20					
21	Jan. 28	Iu	iPZ ePN ePE F	08 28	36.8			U.S.C.G.S.: 27.3°N 47.4°W	
					40				
					43				
				08 36					
22	Jan. 31	Iv	iPZ iZ iZ iZ F	22 59	56.2			See list, p. 5	
					59.3				
				23 00	05.0				
					59.7				
				23 03					



MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
23	Feb. 1	IIIId	iPNEZ F	13 30 43.7 13 33			Lassen Park
24	Feb. 2	IIr	iPZ iPN iZ eN iSZ iSN iZ eN F	17 48 20.9 21.9 49 48.1 54 53 48.7 52.7 54 04.4 58 12 18 03			U.S.C.G.S.: 53°N 172.5°W h = 200 km.
25	Feb. 6	Iu	iPZ ePNE F	09 28 20.2 21 09 35			Verdi Aftershock
26	Feb. 9	Iv	iPZ iSZ F	14 55 40.6 56 35.4 14 58			See list, p. 6
27	Feb. 10	Iu	iPZ ePNE F	22 08 14.0 14 22 12			U.S.C.G.S.: 16°S 173°W
28	Feb. 11	Iv	iPZ iZ iNZ iE iSNE iE F	21 06 33.1 35.6 11 50 36.6 37.4 11 07 49.2 08 01.0 21 15			U.S.C.G.S.: 37°N 117.8°W See list, p. 6
29	Feb. 13	Iu	iPZ ePNE eLN F	18 37 16.8 18 19 07 19 16			U.S.C.G.S.: 33.5°S 177.5°W
30	Feb. 13	Iu	iPZ F	20 55 06.2 20 58			See list, p. 6
31	Feb. 14	Iu	iPZ F	16 37 02.9 16 41			
32	Feb. 14	Ir	iPZ F	18 13 07.5 18 45			U.S.C.G.S.: 18.5°N 105°W
33	Feb. 14	Iu	iZ iZ F	22 39 38.2 43.4 22 41			See list, p. 6
34	Feb. 16	Iu	iPZ F	11 49 54.6 11 52			U.S.C.G.S.: 58°S 27°W

MINERAL

No.	Date	Character	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
35	Feb. 16	Iu	iPZ iZ F	12 52 55.0 53 49.2 12 55 03			U.S.C.G.S.: 37°N 70°E h = 200 km.
36	Feb. 19	Iu	iPZ ePFZ eZ F	01 08 11.3 11 26 34 01 15			
37	Feb. 19	Iu	ePZ F	02 38 02 02 40			
38	Feb. 21	Iu	iPZ F	11 51 39 11 53			
39	Feb. 23	IIv	iPZ ePNE iN iE iNE F	01 19 10.4 11 28.5 12 29 29.2 30.7 01 21			Verdi Aftershock  See list, p. 6
40	Feb. 23	Iu	iPZ iPPZ eLZ F	16 21 32.7 25 24.1 17 12 17 31			U.S.C.G.S.: 39.5°N 85°E
41	Feb. 24	IIv	iPEZ iPN F	11 50 26.8 12 58 27.4 11 59			See list, p. 6 See list, p. 6
42	Feb. 25	Iv	iZ iZ iN iE iN F	02 28 58.5 29 05.0 19 37 07.5 08.0 18 58 54.8 02 33			See list, p. 6  U.S.C.G.S.: 21.5°S 68°W h = 200 km.
43	Feb. 26	Iv	iPZ iZ iE iZ F	08 31 06.8 08 39 58.0 32 03.6 03 13 08.4 08 34			See list, p. 6
44	Feb. 26	Iu?	iPZ iZ F	18 12 28.1 31.3 18 17			See list, p. 6
45	Feb. 27	IIv	iPEZ ePN iE F	13 36 32.7 33 37 09.0 13 44			See list, p. 6
46	Feb. 28	Iu	iP'Z	00 32 07.0			U.S.C.G.S.: 58°S 27°W



MINERAL

No.	Date	Character	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
17	1949 March 4	Iu	iPZ eN iP'Z eP'E eSKSNE eSKSZ	10 33 01.7 10 37 03 14 43 22 26			U.S.C.G.S.: 37°N 70°E h = 200 km.
	March 4	Iu	eN F	45 03 11 35			U.S.C.G.S.: 6°S 151.5°W
48	March 5	Iu	eZ F	01 51 06 01 53			U.S.C.G.S.: 6°S 151.5°E
49	March 7	Iu	iPZ F	11 48 19.7 11 55			Verdi Aftershock
50	March 7	Iu	iPZ F	14 49 22.7 14 52			
51	March 9	IIv	iPZ ePN ePE iPNE iN iN iN F	12 29 31.8 32 33 33.2 44.2 55.3 20 30 16.3 21.9 12 43			See list, p. 6
52	March 9	Iv	iPZ F	12 58 23.0 13 01			See list, p. 6
53	March 12	Iu	iPZ iZ F	19 33 22.7 41.4 19 37			See list, p. 6
54	March 13	Iu	iPZ F	18 54 59.0 18 59			U.S.C.G.S.: 21.5°S 68°W h = 200 km.
55	March 14	Iu	ePZ F	00 45 37 00 49			Aftershock
56	March 14	Iu	iPZ F	03 13 18.4 03 17			Aftershock
57	March 14	IIv	iPE ePNE iZ iN iN F	06 11 06.7 08 09.4 00 38 17.8 57.8 06 18			See list, p. 6
	March 21	Iv	F	06 18			Aftershock
	March 26	Iu	iPZ	02 32 23.3			

MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
58	March 14	IIv	iPZ ePNE iZ iSNE F	19 29 17.2 32 18 07 42 20.1 38.1 19 33			Verdi Aftershock 127.5°E
59	March 16	Iu	iPZ F	22 28 14.2 22 35			U.S.C.G.S.: 6°S 151.5°W U.S.C.G.S.: 16°S 176.5°W
60	March 17	Iu	iPZ iPPZ F	21 18 12.2 21 21 47.1 21 24			U.S.C.G.S.: 6°S 151.5°E
61	March 18	IIv	iPNEZ iSNZ F	00 32 34.7 53.1 00 34			Verdi Aftershock
62	March 19	Iu	iPZ iZ F	18 31 32.4 32 10.9 18 34			
63	March 21	IIId	iPNEZ F	08 30 54.3 08 33			Lassen Park
64	March 22	Iu	iPZ iZ F	20 05 42.1 06 18.3 20 07			
65	March 24	Iu	ePZ F	17 12 24 17 15			
66	March 24	IIv	iPZ iPNE iE iSE F	20 57 47.7 49.7 51.7 58 35.8 21 02			See list, p. 6
67	March 24	Iv	iPE iSE F	21 08 45.6 09 25.5 21 10			Aftershock
68	March 24	Iv	iPE iSE F	21 41 49.7 42 29.8 21 43			Aftershock
69	March 24	Iv	iPE iSE F	00 36 14.2 56.4 00 38			Aftershock
70	March 24	Iv	iPE iSE F	02 07 36.3 08 17.2 02 09			Aftershock
71	March 26	Iu	iPZ	02 32 23.3			



MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
72	March 27	Iu	ePZ ePPZ F	06 48 06 52 30 07 42				U.S.C.G.S.: 4°N 127.5°E
73	March 27	Iu	iPZ F	11 58 34.0 12 00				
74	March 30	Iu	iPZ F	14 57 53.6 15 05				U.S.C.G.S.: 16°S 176.5°W
75	March 30	Iu	iPZ F	20 30 51.2 20 33				
76	March 31	Iu	iPZ F	21 53 08.5 21 55				

Distance and longitude:

$\Delta = 40$  km  
 $\Delta = 120$  km

Time — all determinations are reduced to Greenwich Civil Time.

Altitude — 60 meters above mean sea level.

Apparatus	Component

ARCATA

No.	Date	Character	Phase	Time (G.C.T.)	Period	Trace motion	Remarks				
	1919			U.S.G.C.S.	ARCATA						
1	Jan. 13	Iv	1P2	09 01		d	U.S.G.C.S.: 25°S 179°E h = 600 km.				
2	Jan. 30	Iv	ePE 1N 1SE 1E 1N P	08 00 26.5 56.0 01 01.3 36.0 17.2 08 01			See list, p. 5				
3	Feb. 2	Ir	1P2 1N 1E 1N 1N P	17 48 07.2 14.1 69 30.7 67.7 53 28.2 59.2		c	U.S.G.C.S.: 53°N 172.5°W h = 200 km.				
CONSTANTS OF THE STATION											
Latitude and longitude:											
$\phi = 40^{\circ} 52'6'' \text{ N.}$ $\lambda = 124^{\circ} 04'5'' \text{ W.}$											
4	Feb. 11	IIv	1P2 1E 1N P	21 07 22.0 08 26.9 47.4 21 15		c	U.S.G.C.S.: 37°N 137.8°W				
Time -- All determinations are reduced to Greenwich Civil Time.											
Altitude -- 60 meters above mean sea level.											
5	Feb. 13	Iv	eP2 1E	10 37 16.5 27.8		c	U.S.G.C.S.: 33.5°S 177.5°W				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Apparatus</th> <th style="width: 40%;">Component</th> </tr> </thead> <tbody> <tr> <td>Sprengnether .....</td> <td style="text-align: center;">N E Z</td> </tr> </tbody> </table>								Apparatus	Component	Sprengnether .....	N E Z
Apparatus	Component										
Sprengnether .....	N E Z										
6	Feb. 14	Iv	eN P	18 11 17. 18 41			U.S.G.C.S.: 18.5°N 105°W				
7	Feb. 24	IIv		11 29 02			See list, p. 6 S - P = 18 sec.				
8	Feb. 27	IIv		13 35 ca			See list, p. 6 S - P = 14.5 sec.				
9	March 4	Iv		10 33 ca			U.S.G.C.S.: 37°N 70°E h = 200 km.				
10	March 24	IIv		20 57 ca			See list, p. 6 S - P = 23.5 sec.				



ARCATA

No.	Date	Char-acter	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
1	Jan. 13	Iu	ePZ iPcPZ F	08 59 05.5 08.1 09 01		d d	U.S.C.G.S.: 25°S 179°E h = 600 km.
2	Jan. 20	Iv	ePE iN iSE iE iN F	08 00 28.5 56.0 01 01.3 14.8 17.8 08 04			See list, p. 5
3	Feb. 2	Ir	iPNZ iN iZ iN iN iSN iZ F	17 48 07.2 14.1 49 30.7 31.2 47.7 53 28.2 59.2 17 56		c	U.S.C.G.S.: 53°N 172.5°W h = 200 km.
4	Feb. 11	IIv	iPZ iN iSZ iSN iN F	21 07 22.0 53.6 08 26.9 27.7 47.0 21 15		c	U.S.C.G.S.: 37°N 117.8°W
5	Feb. 13	Iu	ePZ iZ iZ F	18 37 14.5 27.8 51.8 18 42		c c c	U.S.C.G.S.: 33.5°S 177.5°W
6	Feb. 14	Iu	eN eN eN F	18 14 17 20 02.5 25.5 18 41			U.S.C.G.S.: 18.5°N 105°W
7	Feb. 24	IIv		11 49 ca			See list, p. 6 S - P = 18 sec.
8	Feb. 27	IIv		13 35 ca			See list, p. 6 S - P = 14.5 sec.
9	March 4	Iu		10 33 ca			U.S.C.G.S.: 37°N 70°E h = 200 km.
10	March 24	IIv		20 57 ca			See list, p. 6 S - P = 23.5 sec.

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
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1929  
 1 Jan. 1 Iv THE RENO STATION, UNIVERSITY OF NEVADA list, p. 5  
 RENO, NEVADA

epf 32 13.5  
 e32 22  
 F 14 35

2 Jan. 2 Ia 1982 09 01 39.4  
 19 01 41.4  
 eSME2 02 32.0  
 F 09 16

3 Jan. 2 Iv 1982 22 04 19.9 Mineral County, Nevada  
 F 22 12

4 Jan. 4 Ia e2 CONSTANTS OF THE STATION  
 F 07 13

Latitude and longitude:

5 Jan. 5 Ia e32 09 09 23.0  
 e32  
 F  
 $\phi = 39^{\circ} 32.3 \text{ N.}$   
 $\lambda = 119^{\circ} 48.8 \text{ W.}$

6 Jan. Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 1386 meters (4546 feet) above mean sea level.

7 Jan. 8 III 1982 03 56 35.4 See list, p. 5  
 F 04 02

8 Jan. 9 Ia e32 11 46 32.5  
 12 52.7  
 F 11 32

Apparatus	Component
Sprengnether .....	N E Z

10 Jan. 13 Ia 192 08 59 13.7 U.S.C.G.S. 11°S 179°E  
 F

epf 09 01 31.2  
 1882V 09 06.2  
 1882E 09 06.7  
 e2 13.5  
 F 09 15

11 Jan. 14 Ia 192 01 16 29.0 d  
 F 01 19

12 Jan. 14 Ia e32 21 08 04  
 12 10.0 c  
 F 21 10

13 Jan. 18 Ia 192 04 56 11.5 U.S.C.G.S. 11°S 92°W  
 12 36.0 c  
 F 04 59



RENO

No.	Date	Char-acter	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
1	Jan. 1	Iv	eP*Z ePN eSZ eSN F	14 31 37.5 44 32 13.5 22 14 35			See list, p. 5
2	Jan. 2	Iu	iPEZ iN eSNEZ F	09 01 39.4 07 59 41.4 08 02 32.0 09 16			See list, p. 5
3	Jan. 2	Iv	iPNZ F	22 04 19.9 22 12			Mineral County, Nevada
4	Jan. 4	Iu	eZ F	07 40 48.5 07 43			
5	Jan. 5	Iu	ePZ eNE F	09 09 23.0 23.5 09 14	1.7 2.5		
6	Jan. 8	IIId	iPNEZ F	03 39 25.8 03 46			See list, p. 5
7	Jan. 8	IIId	iPNEZ F	03 56 35.4 04 02			See list, p. 5
8	Jan. 9	Iu	eEZ iZ F	11 46 32.5 52.7 11 52			
9	Jan. 9	IIId	iPNEZ iEZ F	12 06 09.1 11.5 12 11			Verdi Aftershock
10	Jan. 13	Iu	iPZ iPcPNE epPZ iSKSN iSKSE eZ F	08 59 13.7 15.2 09 01 31.2 09 06.2 08 23 06.7 08 23 13.5 09 15		d	U.S.C.G.S.: 25°S 179°E h = 600 km.
11	Jan. 14	Iu	iPZ F	01 16 29.0 01 19		d	
12	Jan. 14	Iu	eNZ iZ F	21 08 04 10.0 21 10		c	
13	Jan. 18	Iu	iPZ iZ F	04 56 11.5 36.0 04 59		d c	U.S.C.G.S.: 41°S 92°W

RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Time motion	Remarks
				h.	m. s.			
	1949							
14	Jan. 18	IIId	iPNZ iE iN iSE iSN F	14 16 53.1 53.5 54.4 55.8 56.0 14 22				Verdi Aftershock
15	Jan. 20	IIId	iPNEZ F	07 59 25.9 08 08				See list, p. 5 U.S.C.G.S.: 3°S 152°E
16	Jan. 20	Iu	iPZ F	13 37 02.2 13 39				
17	Jan. 23	Iu	eP'Z eE eN eE iE ePPN eZ iE F	06 50 29 41.0 58.0 51 53.0 53 23.9 31.0 31.5 53 55.4 07 01		1.7 2.5		U.S.C.G.S.: 9°S 94°E h = 100 km. U.S.C.G.S.: 27.3°S 174.4°W
18	Jan. 24	Iv	ePZ eN iZ iN iZ iZ iN F	00 11 29.0 29.5 05 39 46.1 47.0 12 04.4 11.4 22.7 00 15				See list, p. 5 See list, p. 5
19	Jan. 24	IIu	iPZ iNEZ iZ iE iSNE F	09 27 52.3 52.7 28 26.5 44.2 37 57.2 09 42				U.S.C.G.S.: 22°S 176°W h = 100 km.
20	Jan. 25	Iu	ePZ F	04 22 46 04 27				See list, p. 5
21	Jan. 27	Iu	ePZ eZ eNE eZ eN eN eE eE F	07 31 18.5 27.5 32.0 57.5 35 46.5 42 15.5 20.5 13 31 44.0 07 52				U.S.C.G.S.: 3°S 152°E Lassen Park



RENO

No.	Date	Char-acter	Phase	Time	Period	Trace motion	Remarks
				(G.C.T.)			
				h. m. s.	s.		
22	1949 Jan. 27	Iu	ePZ eNE eZ iPcPE ePPE eSN F	11 09 12.0 13.0 32.5 11 01.7 40.5 16 37.0 11 21		d	U.S.C.G.S.: 55°N 164°E
23	Jan. 27	Iu	ePZ eNE eN eE eN eN F	15 11 42.0 46.4 16 12 01.0 12.0 16 11.5 23 42.5 15 26			U.S.C.G.S.: 3°S 152°E U.S.C.G.S.: 2.5°S 138°E
24	Jan. 28	Iu	ePZ eN eZ iE iN iE iN F	08 28 29.5 33 37.5 38.6 47.1 49.6 29 09.6 08 35		d	U.S.C.G.S.: 27.3°N 47.4°W U.S.C.G.S.: 33°N 172.5°W h = 200 km,
25	Jan. 31	Iv	ePZ eE eE eZ iZ F	06 39 16.0 20.0 57.0 58.5 40 07.0 06 42			See list, p. 5
26	Jan. 31	Iu	iPZ eE ipPZ eE F	15 05 06.6 07.5 09 19.5 06 48 15 08		c c	U.S.C.G.S.: 16°S 173°W
27	Jan. 31	Iv	ePZ eN eE iZ iZ eNE iN iZ iE F	22 59 55 23 00 05 11 25.8 31.3 22 12 34.0 38.8 07 35 44.1 50.3 23 04			See list, p. 5
28	Feb. 1	IIv	iPZ eN iNEZ iEZ iN	13 31 11.0 11.5 11.7 12.9 13.6		c	Lassen Park U.S.C.G.S.: 37.0°N 127.0°W

RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
28	Feb. 1 cont.	IIv	iE iN iZ iSE	13 31 14.9 27.2 21 18 28.6 33.1			
35	Feb. 13	Iu	iE iZ iN iMZ F	18 37 34.4 34.9 36.1 45.8 13 38		c	U.S.C.G.S.: 33.5°S 177.5°W
29	Feb. 1	Iu	eZ eE eN eN eZ F	18 30 02.0 09.0 11.5 34 13.0 19 27 21.0 18 38	23 20 21		U.S.C.G.S.: 2.5°S 138°E
30	Feb. 2	Ir	iPNEZ iE	17 48 35.7 39.1			U.S.C.G.S.: 53°N 172.5°W h = 200 km.
36	Feb. 14	Iu	iNEZ iE iZ iPPN	16 37 47.7 50.8 49 00.3 16 40 15.3		c c	
37	Feb. 14	Ir	iE iSZ iZ iNE iE F	18 12 39.0 54 11.8 17.5 13 18.0 51.3 18 04		d	U.S.C.G.S.: 12.5°N 105°W
31	Feb. 6	Iu	iPZ	09 28 28.9		d	
38	Feb. 15	Ir	iEZ iE F	09 57 29.6 39.1 09 33			U.S.C.G.S.: 18.5°N 105°W
32	Feb. 10	IIu	iPZ iN iE iE	22 08 18.7 19.0 19.3 24.0		d	U.S.C.G.S.: 16°S 173°W
39	Feb. 16	Iu	iZ iE iN F	11 50 30.0 30.5 31.0 22 12		c	
33	Feb. 11	Iu	ePNZ iZ iZ F	07 35 32.5 34.3 58.3 07 37		c d	
34	Feb. 11	IIv	iPZ iE iN iZ	21 06 11.7 14.2 14.7 18.2		c d	U.S.C.G.S.: 37.0°N 117.8°W



RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
34	Feb. 11 cont.	IIv	iNE iN F	21 06 18.6 23.7 21 18			
35	Feb. 13	Iu	iPZ iNE iN iZ iE iN iE eSKKSE eSKKSN eSKKSZ eN	18 37 20.2 21.0 31.5 32.2 40.2 44.2 38 17.5 48 09.5 11 51 16.5 11 51 17.5 19 07.3		c	U.S.C.G.S.: 33.5°S 177.5°W
			eE eZ F	10.2 11.2 19 26	23 20 24		Venti Aftershock
36	Feb. 14	Iu	iPZ eN iE F	16 37 08.7 09.0 16 38 09.4 16 40		c	U.S.C.G.S.: 39.5°N 85°E
37	Feb. 14	Ir	iPZ eN eE iPPZ iN eSN F	18 12 56.6 57.0 58.5 13 15.6 38.1 17 39 18 44		d	U.S.C.G.S.: 18.5°N 105°W
38	Feb. 15	Ir	ePZ eN eE iZ iE eN F	03 57 46.0 46.5 48.0 54.4 58 02.2 25.0 04 01			U.S.C.G.S.: 18.5°N 105°W See list, p. 6
39	Feb. 16	Iu	iPZ eNE iN F	11 50 00.8 01.5 11 59 19.3 11 54			See list, p. 6
40	Feb. 16	Iu	iPZ eNE iZ eNE F	12 53 03.8 05.0 53.8 55.0 12 56		c	
41	Feb. 18	Iu	ePZ eE eN	05 17 05.5 10 21		d	

RENO

No.	Date	Char-acter	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
42	Feb. 19	Iu	iPZ iE eN ipPZ iE ePPZ eE eZ iN iN F	01 08 17.9 18.4 19.0 30.9 31.9 11 49.5 58.5 59.5 12 05.4 35.9 01 16		c           c	See list, p. 5
43	Feb. 21	Iu	ePZ F	11 51 37.5 11 53			
44	Feb. 23	IIId	iPNZ iE iSE iZ F	01 18 47.8 48.6 51.1 51.6 01 22			Verdi Aftershock
45	Feb. 23	Iu	ePZ	16 21 40.0		c	U.S.C.G.S.: 39.5°N 85°E
46	Feb. 24	IIv	ePZ iPZ eNE iN iZ iN iSNE iE iNZ F	11 50 48 10 55 52.9 55 51 01.9 10 10.0 36 23.9 33.1 37 45.0 47.3 11 59		c	See list, p. 6
47	Feb. 25	IIv	ePZ iPZ iNE iZ iE iN iSZ iSN iME F	02 28 48.8 52.8 55.8 56.2 11 29 00.9 18.8 11 46 24.8 25.3 36.8 02 34	22 15	c	See list, p. 6



RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
48	Feb. 26	Iv	iPZ eNE iZ iSE iSN iSZ iZ F	08 30 45.7 47 54.6 31 15.6 17.1 18.9 39.6 08 34		c	See list, p. 6
49	Feb. 27	IIv	iPZ eE iZ iNE iE iNZ iE iN iEZ iSZ iE F	13 36 55.9 57 59.9 37 00.4 10.2 14.1 19.7 30.6 37.7 44.9 59.6 13 43		c	See list, p. 6
50	Feb. 28	Iu	eP'Z eNE iZ eE ePPZ ePPN iE F	00 32 06.5 24.5 29.5 33 17.0 36.5 45.0 34 50.0 00 37		d	U.S.C.G.S.: 58°S 27°W See list, p. 6
51	March 3	Iu	iPZ F	04 50 47.4 04 54		c	See list, p. 6
52	March 4	Iu	iPZ eE eN iZ iN iN iP'E iP'Z iPPN iPPE iE iSKSN iSKSE iE eLN eLE F	10 33 08.7 09.0 10.5 16.2 36 13.7 46.2 37 17.2 18.9 31.7 35 06 39.5 39 00.2 43 28.7 35.2 44 06.2 11 01.3 04.4 11 46		c	U.S.C.G.S.: 37°N 70°E h = 200 km.
58	March 9	Iu	iPZ eE eN iZ iN iN iP'E iP'Z iPPN iPPE iE iSKSN iSKSE iE eLN eLE F	15 06 39.5 39 00.2 43 28.7 35.2 44 06.2 11 01.3 04.4 11 46	22 15		U.S.C.G.S.: 24°S 176°W

RENO

No.	Date	Char-acter	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
53	March 5	Iu	iPZ iZ eE eN eE eN eN F	01 51 15.3 21.5 22.0 23.5 54 52 01.5 32.5 01 54		c c d d	U.S.C.G.S.: 21.5°S 68°W h = 100 km.
54	March 7	Iu	ePZ eE eN eSZ eE eN F	11 48 36 49 59 58 49 56 59 22 12 03		c d	
55	March 7	Iu	ePZ eNE eN iE F	14 49 29.0 30.0 50 00.0 04.3 14 53		d	See list, p. 6
56	March 9	IIv	iPZ iZ iNE iNE iZ iE iN F	12 29 26.0 27.2 27.8 00 15 29.5 29.8 03 13 30.6 35.8 12 43		d c c	See list, p. 6
57	March 9	Iv	iPZ eE eN iN iE iSNE iZ iN iZ F	12 58 18.6 19.5 20.5 06 11 32.6 33.1 58.6 59 01.6 06.8 14.1 13 02		c d c	See list, p. 6 See list, p. 6
58	March 9	Iu	eZ eE iN iZ iN iE F	15 06 59.5 07 01.5 13.9 06 15 40.6 41.6 19 08 52.1 15 10			U.S.C.G.S.: 14°S 176°W Veris Aftershock



RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
59	March 12	Iu	ePNE iPZ iZ iN eE F	19 33 46.5 46.6 53.9 34 53.9 56.5 19 37				U.S.C.G.S.: 6°S 151.5°E
60	Feb. 13	Iu	iPZ iNE iZ iZ iE ipPZ iZ eSE eSN F	18 54 51.5 52.6 53.0 55 11.0 19.0 23 19 24.0 37.5 19 05 11.5 19.0 19 12				U.S.C.G.S.: 21.5°S 68°W h = 100 km.
61	Feb. 13	Iv	ePZ eZ eNE F	20 38 46 39 27.0 28.5 20 41				See list, p. 6
62	March 14	Iu	eZ eE eN F	00 45 52 46 00.0 27 00 49				
63	March 14	Iu	ePZ iE eN iZ iE F	03 13 32.5 47.8 51.0 14 18.8 21.8 03 18				Verdi Aftershock
64	March 14	IIv	iPZ iZ iNE iN iE iZ iSE iSN iEZ iN iZ F	06 11 02.9 04.7 18 35 05.3 10.2 08 31 26.9 33.8 39.3 41.6 46.3 51.5 52.3 06 19				See list, p. 6
65	March 14	IIId	iPNZ iE iN iSEZ F	19 28 54.2 54.5 56.2 57.1 19 33				Verdi Aftershock

RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
66	March 16	Iu	iPZ iNE iZ eZ iPPNE eSKSZ eSKSE eN eZ iN eE eLZ F	22 28 21.4 22.2 34.8 31 57.0 32 44.7 38 51.0 37 55.0 39 12.5 20 58 23.5 25.2 42.5 58.7 23 19			c	U.S.C.G.S.: 6°S 151.5°E	
67	March 17	Iu	iPZ iE eN iE iN iZ iPPEZ eSN iSE eN eE eZ F	21 18 19.4 19.9 20.5 28.9 35.4 49.9 21 57.4 21 29 14.0 17.4 43.3 49.9 57.9 21 58		23	c	U.S.C.G.S.: 6°S 151.5°E	
68	March 18	IId	iFNZ iE iZ iNE iMZ F	00 32 11.6 12.2 08 08 13.6 14.6 17.1 00 35				Verdi Aftershock	
69	March 19	Iu	iPZ iZ F	18 31 42.5 32 20.0 18 35			d d		
70	March 21	IIv	iPZ eNE iZ iE iN iSE iMN iMZ iME F	08 31 19.1 19.5 20.8 28.2 32.8 36.8 41.0 42.1 43.1 08 35			c c	Lassen Park	
71	March 22	Iu	iPZ iZ F	20 05 33.8 06 10.8 20 08			d d	U.S.C.G.S.: 6°S 151.5°E	



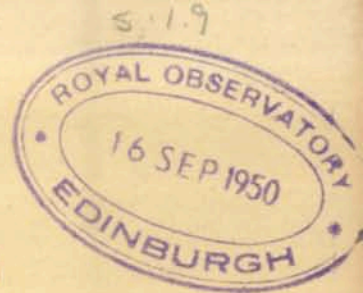
RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
72	March 24	Iu	ePZ	17	12 14			
			eE		36			
			eE	13	16			
			eN		46.5			
			iZ		55.5			
			iNE		58.5			
			F	17	17			
73	March 24	IIv	iPZ	20	58 12.9		c	See list, p. 6
			eE		13.5			
			iN		15.1			
			iZ		18.2		d	
			iE		19.4			
			iN		24.7			
			iE		29.4			
			iE		48.4			
			iZ		52.1			
			iN		57.4			
			iZ	59	19.6			
			F	22	03			
74	March 24	Iv	ePZ	21	42 25.5			Aftershock
			eNE		40.5			
			eN	43	11.5			
			eE		15.0			
			iSZ		19.9			
			iE		25.4			
			iN		47.9			
			F	21	46			
75	March 24	Iv	iPZ	02	08 06.8		c	Aftershock
			eZ		11.5			
			eE		27.5			
			iN	09	01.5			
			eE		04.0			
			iSZ		08.8			
			iSE		09.8			
			eN		13.0			
			F	02	11			
76	March 26	Iu	ePZ	02	32 05.5		d	
			iN		06.8			
			iE		08.3			
			iN		27.3			
			iE		46.4			
			iZ		47.3			
			eN	37	36.5			
			eE	40	02.5			
			F	02	43			
77	March 27	Iu	ePZ	06	48 26.5			U.S.C.G.S.: 4°N 127.5°E
			eN		28			
			eE		46			
			eN	19	07.5			

RENO

No.	Date	Char-acter	Phase	Time	Period	Trace motion	Remarks
				(G.C.T.)			
				h. m. s.	s.		
77	March 27 cont.	Iu	eE	06 52 29.5	34 22		
			ePPN	36.5			
			ePPZ	37			
			iE	53 07.3			
			iZ	09.5			
			iSKSE	58 32.3			
			eGEZ	07 23.1			
			eLZ	30.0			
F	07 53						
78	March 30	Iu	ePZ	14 59 47.5			U.S.C.G.S.: 16°S 176.5°W
			eN	50.5			
			eE	52.5			
			F	15 07			
79	March 30	Iu	ePN	20 31 11.0		c	
			iPZ	11.4			
			eE	12.0			
			iE	28.9			
			eZ	41.5			
			F	20 35			
80	March 31	IIId	iPNZ	21 09 02.0		c	Verdi Aftershock
			iE	02.2			
			iNE	02.8			
			iNE	05.1			
			iZ	05.6			
			F	21 14			
81	March 31	Iu	ePZ	21 53 15.5		c	
			eNE	16.0			
			eE	42.0			
			F	21 55			





# Bulletin of the Seismographic Stations

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Volume 19, No. 2, pp. 79-152

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BERKELEY—MOUNT HAMILTON—PALO ALTO  
SAN FRANCISCO—FERNDALE—FRESNO  
MINERAL—ARCATA—RENO

Earthquakes and the Registration of Earthquakes

From April 1, 1949, to July 31, 1949

BY

CARL F. ROMNEY

AND

JOHN E. MEEKER

UNIVERSITY OF CALIFORNIA PRESS  
BERKELEY AND LOS ANGELES  
1950

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BULLETIN OF THE SEISMOGRAPHIC STATIONS

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LONDON, ENGLAND  
BERKELEY--MOUNT HAMILTON--PALO ALTO--SAN FRANCISCO  
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EARTHQUAKES IN NORTHERN CALIFORNIA AND NEVADA

EARTHQUAKE INTENSITY SCALE

Intensities are given by Roman numerals in the list of California and Nevada earthquakes on the following page, when sufficient information on the effects of the shock is available. Criteria of the Modified Mercalli Scale which are used to rate the intensity are:

Intensity

- II Felt by a few people only. Duration or direction not appreciable.
- III Duration or direction appreciable.
- IV Rattling of doors and windows; swinging of suspended objects.
- V Disturbance of movable objects; plaster cracked.
- VI Overthrow of movable objects; cracking of chimneys and other brickwork.
- VII Fall of some chimneys; some damage to buildings.

EARTHQUAKE MAGNITUDE SCALE

Richter magnitudes given in the list of epicenters on the next page are found from the Wood Anderson amplitudes, using the nomogram given by Nordquist, "Bulletin of the Seismological Society of America", 32:164.

Latitude and Longitude are given for each epicenter in the following list. Only those earthquakes are given for which epicenters were located. The letter represents the excellence with which the epicenter has been located, a indicating excellent, b good, c fair, d poor.

Year	Date	Richter	North	West	Quality
17	17-11-07	2.9	37° 37'	121° 30'	b
23					c
26		2.5	37° 11'	121° 12'	a
28	15-11-11	3.3	36° 58'	121° 15'	b
28					b
29	09-22-18	2.0	37° 17'	122° 34'	c
29					c
30	05-30-51	3.6	39° 52'	121° 02'	b
31	03-31-56	2.7	37° 01'	121° 34'	c
32					c
33	09-02-76	2.7	36° 55'	121° 15'	c
34	10-17-31	4.3	6077	12177	d
35	10-16-31	2.9	37° 05'	121° 52'	b
36	17-51-16	1.8	3711	12211	d
37	21-06-18	2.3	36° 57'	121° 15'	b
38	05-28-35	3.5	36° 32'	121° 13'	b
39	10-05-31	3.2	36° 32'	121° 13'	b

EARTHQUAKES IN NORTHERN CALIFORNIA AND NEVADA

1949 - Pacific Standard Time

No.	Date	Time	Richter Magnitude	Latitude		Quality
				North	West	
				Latitude	Longitude	
1	April 12	23-58-25	4.9	37°3	118°6	d
IV at Bishop and Yosemite Park.						
2	17	17-33-07	1.9	37° 37'	121° 30'	b
3	23	01-18-09	3.7	36° 23'	121° 22'	c
4	26	11-59-43	2.5	37° 11'	122° 12'	a
5	28	15-35-14	3.3	36° 56'	121° 48'	b
IV at Watsonville, III at Moss Landing. Depth about 10 km.						
6	28	21-31-47	2.8	37° 39'	121° 46'	b
7	29	09-22-48	2.0	37° 47'	122° 34'	c
8	29	12-19-37	2.0	37° 47'	122° 34'	c
Last two are underwater blasts. Similar explosions from the same location occurred on July 29 (09:57, 12:32), August 31 (13:38, 14:46) and November 3 (10:34), 1948. These were listed as earthquakes. Five occurrences listed as suspected blasts during January and March 1949 are now verified as blasts. After July 1, 1949 these will not be listed in this table, but readings will be published in this bulletin under "Registration of Earthquakes".						
9	May 3	17-34-03	4.1	40°4	124°3	d
Felt over 900 square miles of southern Humboldt County. Maximum intensity of V at Cape Mendocino Light Station, Ferndale and Fields Landing.						
10	5	05-50-51	3.6	39° 52'	121° 02'	b
11	10	03-34-56	2.7	37° 01'	121° 34'	c
IV at San Martin.						
12	10	04-27-02	2.5	36° 55'	121° 45'	c
IV at San Martin.						
13	10	09-02-36	2.7	36° 55'	121° 45'	c
14	12	18-19-34	4.3	40°7	124°7	d
15	21	19-34-34	2.9	37° 05'	121° 52'	b
16	23	17-51-16	1.8	37°1	122°1	d
17	24	21-06-48	2.3	36° 57'	121° 44'	b
18	28	09-58-35	3.5	36° 32'	121° 13'	b
19	28	15-05-34	3.2	36° 32'	121° 13'	b



1949 - Pacific Standard Time

<u>No.</u>	<u>Date</u>	<u>Time</u>	<u>Richter Magnitude</u>	<u>North Latitude</u>	<u>West Longitude</u>	<u>Quality</u>
20	May 28	16-34-40	3.1	36° 32'	121° 13'	b
21	30	15-47-15	2.2	37° 09'	121° 58'	c
22	June 9	10-59-46	2.2	37° 2'	122° 2'	d
23	9	19-06-40	4.6	37° 18'	121° 40'	b

VI at San Jose, V at Morgan Hill, Mt. Hamilton and San Francisco. Felt over 8000 square miles of west central California.

24	10	13-23-12	2.0	37° 47'	122° 34'	c
----	----	----------	-----	---------	----------	---

Blast.

25	10	14-47-02	2.0	37° 47'	122° 34'	c
----	----	----------	-----	---------	----------	---

Blast.

26	15	19-47-34	3.9	36° 45'	121° 40'	b
----	----	----------	-----	---------	----------	---

IV at Hollister and San Juan Bautista. Depth about 7 km.

27	16	12-00-30	2.4	37° 2'	122° 2'	d
28	22	10-08-46	4.1	37° 20'	121° 41'	b

Felt at San Francisco, San Mateo and San Jose. Depth about 7 km.

29	27	02-35-31	4.5	35° 8'	121° 1'	d
----	----	----------	-----	--------	---------	---

V at San Ardo and San Miguel.

30	28	00-41-08	2.3	37° 20'	121° 41'	c
----	----	----------	-----	---------	----------	---

SYMBOLS AND NOTATIONS EMPLOYED

1. Character of the Seismogram --

I. Perceptible      II. Moderately Strong      III. Strong

d (terrae motus domesticus)      Local shock (origin less than 100 kilometers distant).

v (terrae motus vicinus)      Near shock (origin from 100 to 1,000 kilometers distant).

r (terrae motus remote)      Remote shock (origin from 1,000 to 5,000 kilometers distant).

a (terrae motus aerea)      Local shocks recorded sufficiently well to be located, all large regional shocks, and all distant earthquakes recorded are tabulated by station on the following pages.

2. Nature of the Motion --

i (impetus)      Sudden beginning of the motion.

e (excursio)      Gradual beginning of the motion.

3. Trace Motion --

c      Compression.

d      Dilatation.

THE REGISTRATION OF EARTHQUAKES



BERKELEY

THE BERKELEY STATION, UNIVERSITY OF CALIFORNIA  
 SYMBOLS AND NOTATIONS EMPLOYED

1. Character of the Seismogram --

I. Perceptible      II. Moderately Strong      III. Strong

- d (terrae motus domesticus)      Local shock (origin less than 100 kilometers distant).
- v (terrae motus vicinus)      Near shock (origin from 100 to 1,000 kilometers distant).
- r (terrae motus remotus)      Distant shock (origin from 1,000 to 5,000 kilometers distant).
- u (terrae motus ultimus)      Very distant shock or teleseism (origin more than 5,000 kilometers distant).

2. Nature of the Motion --

- i (impetus)      Sudden beginning of the motion.
- e (emersio)      Gradual beginning of the motion.

3. Trace Motion --

- c      Compression.
- d      Dilatation.

Apparatus	Component
Galitzin 100 kg. ....	E
Wischert 80 kg. ....	N
Wood-Anderson ....	E
Galitzin ....	E
Benioff ....	Z
Slichter ....	N

The letter S before a reading designates that the seismogram was from the Galitzin instrument; W, Wischert; B, Bosch-Omerl; A, Wood-Anderson; S, Benioff; S, Slichter.

BERKELEY

No.	Date	Char-acter	Phase	Time (U.C.T.)	Period	Trace section	Remarks
-----	------	------------	-------	---------------	--------	---------------	---------

1919

BERKELEY

1 Apr. 5 Tu THE BERKELEY STATION, UNIVERSITY OF CALIFORNIA S. 37°N 122°W  
 BERKELEY, CALIFORNIA h = 550 m

2 Apr. 6 Tu CONSTANTS OF THE STATION

Latitude and longitude:

$\phi = 37^{\circ} 52'13''$  N.  
 $\lambda = 122^{\circ} 15'16''$  W.

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 81 meters (266 feet) above mean sea level.

Apparatus	Component
Bosch-Omori 100 kg. ....	E N Z
Wiechert 80 kg. ....	E
Wood-Anderson .....	E N Z
Galitzin .....	Z
Benioff .....	N
Slichter .....	

The letter G before a reading designates that the seismogram was from the Galitzin instrument; W, Wiechert; B, Bosch-Omori; A, Wood-Anderson; H, Benioff; S, Slichter.

3 Apr. 12	12	0	06 57.5	8.0		
	12	0	15 16	24.0		
	12	0	17.7			
	12	0	19.1	21.0		
	12	0	18 28			



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
1949									
1	Apr. 5	Iu	iPZ	SH	09	37	59.8		U.S.C.G.S.: 43°N 131°E h = 550 km
			eE	A	38	00.3		c	
			iZ	S	00	56	46.3	d	
			ipPZ	S	39	58.8		d	
			F	SH	09	42		d	
2	Apr. 6	Iu	eE	G	03	45.1		22	
			F	H	03	51			
3	Apr. 10	Iu	iPZ	H	17	57	05.9		See list, p. 83
			iZ	H	01	33	23.8		
			F	H	17	58			
4	Apr. 11	IIu	iPZ	H	00	00	31.1		U.S.C.G.S.: 14°S 173.5°W
			iZ	H	21	46	35.8		
			iZ	H			42.9		
			iZ	H	03	04.1			
			iE	G	22	01.5		8.0	
			F	G	00	56			
5	Apr. 12	Iu	eZ	G	10	31.9		22	
			eE	G		32.2			
			eN	G	05	32.7			U.S.C.G.S.: 48°N 154°E
			F	G	11	00			
6	Apr. 13	Iv	iPZ	H	07	59	12.3		See list, p. 83
			iZ	H			14.5		
			eE	A	15	32	15.5		
			iE	A			48.7		
			iE	A	03	11	50.4		
			iE	A			54.3		
			F	G	08	02		9.0	
7	Apr. 13	IIIr	iPZ	H	19	57	56.8		U.S.C.G.S.: 47.1°N 122.7°W
			eE	A			57.5		
			iE	A	58	04.8			
			iN	G			05.5		
			iE	G			09.5		
			iN	G			12.0	8.0	
			iE	A	51	14.8		9.0	
			iE	G			26.5	19.0	
			iE	A	52	31.9		9.0	
			iE	A			52.1	7.0	
			iE	A	59	07.0			
			iLE	A	20	00	10.0	8.0	
			F	G	23	32		7.0	
				G				7.0	
8	Apr. 14	Iu	iN	G	16	06	57.5	8.0	Very sharp!
			eN	G	15	46		24.0	
			eN	G		17.7			
			eE	G		19.1		21.0	
			F	G	18	28			

BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
15	Apr. 22	Iu	iPZ	H 01 14	11.7	29.0	c	
			eZ	S 25	15.0			
			iZ	H 16 16	16.5		d	
			eN	G 37	4	25.0		
	23 Apr. 23	Id	eE	G 18 39	4		d	See list, p. 83
			F	02 11				
16	Apr. 22	Iu	iPZ	H 17 28	47.7		c	See list, p. 83
			iZ	S 48	4		d	
			eE	G 43 05	5			
			eE	G 51	6	24		
			eN	G 52	7	31		
			F	19 08				
17	Apr. 23	Iv	ePZ	S 09 18	42.4			See list, p. 83
			iZ	S 52	1			
	23 Apr. 23	Id	iZ	S 05 19	09.5		c	See list, p. 83
			F	09 20				
18	Apr. 23	Iu	iP'Z	S 11 34	15.0		d	U.S.C.G.S.: 8°S 120°E
			iZ	S 27	0		c	
			eZ	S 35	13.0			
			ePPN	G 33	5			
			eE	G 45 07	5	15		
			eN	G 05 33	10.5	12		
			iN	G 51	26.5			
	24 Apr. 23	Id	eN	G 12 13	4		c	See list, p. 83
			F	13 31				
19	Apr. 24	Iu	eZ	G 04 41	41			U.S.C.G.S.: 27°N 56°E
			iN	G 17 51	40.5			
			iE	G 59	5	7.0		
	25 Apr. 24	Id	eE	G 05 17	4	40.0		See list, p. 83
			eN	G 20	6	40.0		
			eZ	G 20 30	3	23.0		
			F	06 39				
	26 Apr. 24	Id	eE	G 31 37	24.6		c	U.S.C.G.S.: 6°S 120°E
20	Apr. 25	IIu	iPZ	H 14 06	40.7		d	U.S.C.G.S.: 20°S 69.5°W
			eEZ	GS 41	1.0			h = 100 km
			iEZ	AH 41	7			
			iZ	S 42	7		d	
			iE	G 43	0			
			iSPN	G 07 17	0	5.0		
			iE	G 23	0			
			iPPE	G 10 16	0			
			iPPN	G 26	0			
			iSN	G 15 27	0	11.0		
			eE	A 16 19	5			
			iScSNE	G 50 21	0	11.5		
			eZ	S 56 22	0			
			eZ	S 57	0	12.5		
			isSE	G 02 17 07	5	11.5		
			iN	G 06 21 26	0	15.0		



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m.	s.			
	1949							
20	Apr. 25 (cont.)	IIu	iSSE iSSSN F	G 14 22 G 25 30 16 46	34.0 30.0	19.0	c	Southern California
21	Apr. 26	Id	iPZ F	H 18 59 19 00	56.0		d	See list, p. 83
22	Apr. 28	Iv	iPZ iZ iE iZ iE iSZ iSE F	H 23 35 SH A S A S A 23 36	31.6 33.2 34.5 36.7 43.2 46.9 47.5		c d	See list, p. 83
23	Apr. 29	Id	iPZ iZ eE iZ iE iZ iSE iZ F	H 05 51 S A H A S A S 05 53	57.1 57.6 58 59.1 00.1 01.3 04.9 09.8	6.0 7.5	c d c d d d d	See list, p. 83 U.S.C.G.S.: 153.5°E h = 100 km
24	Apr. 29	Id	iPZ iZ iZ iZ F	H 17 22 S S S 17 25	52.9 53.4 59.9 02.2	7.0 7.5	c	See list, p. 83
25	Apr. 29	Id	iPEZ iSEZ F	AS 20 19 AS 20 21	42.1 47.9		d	See list, p. 83
26	Apr. 30	IIu	iPZ ePE iZ eE iP'Z iE iN iPPN iSKSNE eSKSE eSKSZ iScSE iZ iE iN eZ F	S 01 37 G S A S G G G G A S G S G G S G S S 02 08 04 56	24.6 56.5 20.1 36 40.9 24.5 31.5 53.5 51.5 54 54.5 51.5 34.1 07.0 17.0 08.6 56	7 8 16 15	c	U.S.C.G.S.: 6°S 120°E h = 100 km See list, p. 83

BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m.	s.			
	1949							
27	May 2	IIv	iPZ	S 11 27	25.7		c	Southern California
			eE	A	26.0			
			eNE	G	26.5			
			iEZ	AS 13 16	37.2			
			iE	A	51.6			
			iE	G 21 36	59.0	5.0		U.S.C.G.S.: 20°S 71°W
			iN	G 28 02	02.0	3.5		h = 120 km
			iE	G	05.5	6.0		
			iN	G	08.5			
			iZ	S	16.2			
			iE	G 21 16	22.0			
			iE	A	23.1			
			iSE	A 13 58	44.1			U.S.C.G.S.: 5°N 95°E
			iZ	S 11 29	04.7			
			eE	A	15.7			
			F	0 12 27				
28	May 3	Iu	iPNZ	G 06 06	33.5	21	d	U.S.C.G.S.: 49°N 153.5°E
			iPZ	SH 16 02	35.0		c	h = 100 km
			eE	A	36.5			
			iE	G 06 07	05.5	6.0	d	U.S.C.G.S.: 19°N 106.5°W
			ipPZ	SH	07.5		d	
			ipPNZ	G	08.0		d	
			iN	G 08 08	03.0	7.5		
			iZ	H 30 39	39.5			
			iSN	G 11 35	35.5	7.0		
			iSE	G 31 36	36.0			
			iSZ	G	38.5	11.0		
			iN	G 16 02	02.5			
			iE	G 22 10	10.5	7.5		
			F	0 07 17				
29	May 4	Iv	iPZ	SH 01 34	49.9	18	d	See list, p. 83
			iEZ	AS 35 25	25.1	17		
			iZ	S 01 27	35.7			
			iZ	S	45.5			
			F	0 01 38			d	See list, p. 83
30	May 5	Iv	iPZ	H 13 51	24.9		c	See list, p. 83
			iZ	H	27.5		c	
			iSZ	H	50.3			
			iZ	H 11 54	54.3			
			F	13 53				
31	May 7	Iu	iPZ	S 01 11	26.2		d	See list, p. 83
			iZ	H	27.6		d	
			iZ	H 12 29	42.2		d	
			iZ	S	42.5		c	
			iZ	SH 11 12	04.0		d	
			F	01 13				



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
32	May 7	Iu	iZ iZ eE F	H 13 13 S A 13 16	47.2 47.5 48.5		d d	See list, p. 83	
33	May 8	Iu	iPZ ipPZ isPZ iSNE iSKSNE F	S 21 36 S S G 45 G 46 21 48	11.7 42.2 55.7 53.0 45.0	8.0	d	U.S.C.G.S.: 20°S 71°W h = 120 km	
34	May 9	Iu	iPZ eN eE eN eN eE F	S 13 55 G 14 09 G 05 14 G 18 21 G 28 45 G 05 35 16 02	21.4 01 51.5 21.2 45 01 02	20 21	c d d	U.S.C.G.S.: 5°N 95°E	
35	May 10	IIr	iPZ iZ eN iZ eE eZ eE eZ iN iN eE eN eZ eZ F	H 00 29 G G 05 01 S 08 G 07 30 S 32 G 23 34 G G G G G G S 00 01 27	48.4 49.5 51.5 53.3 27.5 51 12.5 21.5 23.5 40.5 35.1 36.9 37.0 37.6	23 22 18 17	d c	U.S.C.G.S.: 19°N 106.5°W	
36	May 10	Iv	iPZ eE eE iSZ iZ F	H 11 34 A A S 22 36 H 11 36	15.9 16.0 29.0 29.7 30.2		d	See list, p. 83	
37	May 10	Iv	iPZ eE iSZ F	H 12 27 A SH 12 29	21.8 37 37.5		d	See list, p. 83	
38	May 10	Iu	iPZ F	SH 14 23 14 25	08.9	18	c		

BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
39	May 10	Iv	iPZ eE eSE iZ F	SH 17 02 A 57.5 A 03 10.0 H 12.0 17 05	56.2 57.5 10.0 12.0		c c	See list, p. 83
40	May 13	Iv	iPZ iZ iSZ iSZ iZ iZ F	H 02 20 H 26.3 S 21 05.3 H 05.8 H 15.3 S 49.2 02 24	26.0 26.3 05.3 05.8 15.3 49.2		c c	See list, p. 83
41	May 15	Iu	ePZ iZ eNE F	H 05 33 S 55.2 G 37.8 05 47	54.5 55.2 37.8	20	d d	See list, p. 83
42	May 15	Iu	eNE F	G 07 07.8 07 23	07.8	24		
43	May 15	Iu	eE eN F	G 05 01.8 G 08.8 07 03	01.8 08.8			San Benito County
44	May 17	Iv	iPZ iE iZ iZ iZ iSE iMZ F	H 23 58 A 38.1 SH 38.7 S 59 01.1 S 07.1 A 08.0 S 08 12.2 00 01	30.2 38.1 38.7 01.1 07.1 08.0 12.2		d	San Benito County
45	May 20	Iu	iPZ ipPZ F	H 08 24 S 57.8 08 27	14.0 57.8		d c	
46	May 20	Iv	iPZ iZ iE eZ iZ eE iZ F	H 22 36 S 53.5 A 56.0 S 37 32.5 H 34.3 A 51.5 H 54.5 22 39	53.0 53.5 56.0 32.5 34.3 51.5 54.5		d	U.S.C.O.S., 31°S 178°W
47	May 21	Iu	eN eZ eE F	G 08 31.6 G 31.8 G 36.9 08 53	31.6 31.8 36.9	18 18		



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
53	May 24	Iu	eN	G 02	50 45	9.0	d	See list, p. 84
			eE	G	59			
			eN	G 03	04.6	11.0		
			eE	G	04.7	10.0	d	
			F	H	04 14			
54	May 24	Iu	eN	G 14	02.6			
			eE	G	02.8			
			F		14 12			
55	May 24	Iu	eNE	G 16	25 33		d	U.S.C.G.S.: 20°S 109.5°W
			eE	G	29 57		d	U.S.C.G.S.: 17°N 106°W
			eN	G	30 01.0		c	
			iN	G	50.0		d	
			eE	G	32.7	22.0		
			eN	G	32.8	26.0		
			F	G 17	26 18.5			
56	May 25	Iv	iPZ	H 05	07 07.5		c	See list, p. 83
			iZ	H	08.5		d	
			iZ	H 21	52 17.0		d	
			iZ	SH	21.0		c	
			eSEZ	AH 21	53 21.5			
			F		05 08			
57	May 25	Iu	eN	G 08	41 11.5		c	See list, p. 84
			eE	G	48 03			
			iN	G 23	18 05.0			
			iN	G	09 51 58.0			
			F		09 51			
58	May 28	Iv	iPZ	H 17	59 01.9		d	See list, p. 83
			eZ	S	04.3			
			iZ	H 07	18 04.8			
			eE	A	06			
			iZ	S 04	03 15.8		d	
			eE	A 04	04 28.0			
			iSZ	H	28.8			
			iSZ	S 07	11 29.3			
			F		18 02			
59	May 28	Iv	iPZ	H 23	06 01.0		c	See list, p. 184 176°W
			iZ	H	03.8		d	
			eEZ	AS 21	32 04.5			
			eZ	S	14.0			
			eSE	A 03	06 21.0		d	See list, p. 84
			iSZ	SH	21.8			
			F		23 08			

BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
60	May 29	Id	iPZ	H	00 35	10.8	d	See list, p. 84
			eZ	S		12.8		
			eE	A		13		
			iZ	H		13.5	d	
			iSZ	H		20.5		
			iSZ	S		20.8		
			eE	A		22		
			F		00 37			Aftershock
61	May 30	Iu	iPZ	SH	01 44	34.0	d	U.S.C.G.S.: 20°S 69.5°W
			iPZ	G		34.5	d	h = 100 km
			eE	G		35.5		
			ipPZ	SH	01 45	01.6	c	
			ipPZ	G		04.5	d	
			iE	G	05 55	13.5	c	Aftershock
			iN	G		16.5	c	
			eZ	G		18.5		
			iN	G	02 56	02.5		
			F		02 44			
62	May 30	Iu	iPZ	SH	21 52	00.4	d	
			iZ	H		03.5	c	
			F		21 53			
63	May 30	Id	iPZ	H	23 47	29.8	c	See list, p. 84
			iSZ	H		40.2		
			eE	A		41		
			F		23 48			
64	June 1	Iu	ePZ	S	07 46	54.0	c	See list, p. 84
			iPZ	H		54.3	d	
			iZ	H	47	00.9	c	
			iZ	S		01.3	c	
			F		07 48			
65	June 4	Iu	iPZ	SH	04 03	53.3	d	See list, p. 84
			F		04 04			
66	June 6	Iu	eZ	S	07 11	05.0		
			F		07 12			
67	June 9	Iu	iPZ	SH	21 30	00.5		U.S.C.G.S.: 14°S 176°W
			eE	A		01.0		
			F		21 32			
68	June 10	IIId	iPZ	HG	03 06	53.5	d	See list, p. 84
			iEZ	AS		53.6		
			iE	G	18 04	54.0	c	U.S.C.G.S.: 27°S 64°W
			iN	G		54.5	c	
			iE	A		57.4	d	2 quakes
			iSE	G	07 04	04.0	c	
			eZ	S	06 12	12.5		



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
68	June 10 (cont.)	IId	iSE iSN iSE iZ F	A G A G 03 16	03 07 04.3 04.5 05.1 05.5			
69	June 10	Id	iPZ iZ iE iE iZ iEZ F	H S A A H AS 03 15	03 13 17.7 18.3 19.0 27.9 29.4 29.7		c	Aftershock     See list, p. 84
70	June 10	Id	iPZ iZ iE iZ iZ iSZ iE iZ F	H S A H S S A S 05 07	05 04 50.7 51.0 51.4 52.1 52.4 05 00.5 01.4 03.3		c c	Aftershock
71	June 10	Id	iPZ iSEZ F	SH ASH 05 16	05 15 10.9 21.7			Aftershock See list, p. 84
72	June 10	Id	iPEZ iSE iSZ iZ F	ASH A S H 21 25	21 23 17.4 23.7 24.0 24.4		c	See list, p. 84  U.S.C.G.S.: 16°S 168°E
73	June 10	Id	iPZ iE iZ iZ iZ iSZ iZ F	S A H S H A S 22 49	22 47 26.5 26.8 27.0 31.9 32.9 33.8 35.3		c c	See list, p. 84  U.S.C.G.S.: 7°S 105°E
74	June 11	Iu	eN eE F	G G 08 19	07 56.8 57.9	24 22		
75	June 12	Iu	iPZ iZ iZ iZ eZ	H S H S S 02 06	18 04 02.4 03.7 04.0 05.7 11.5		c c d c	U.S.C.G.S.: 27°S 64°W 2 quakes

BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
75	June 12 (cont.)	Iu	iZ iPZ iZ eE iN F	H 18 06 S 07 29.8 H 30.2 G 13 35 G 47.0 18 19	13.1 29.8 30.2 35 47.0	9.0	d d	U.S.C.G.S.: Tonga
76	June 14	Iv	iPZ iSEZ F	H 12 48 AH 49 12 50	48.1 21.3			Verdi
77	June 16	Iv	iPZ iZ eE iZ iZ iSE iZ F	H 03 47 SH A S S 48 A S 03 51	54.8 56.6 57.0 58.0 03.6 13.5 14.3		c d	See list, p. 84
78	June 19	Iu	iPZ iZ eZ F	H 22 10 H S 22 12	26.8 34.8 42.8		c d c c	See list, p. 84
79	June 22	IIId	iPZ eE iE iE F	SH 18 08 A A 09 A 18 12	59.4 59.5 03.9 11.0		d	See list, p. 84
80	June 23	Iu	iPZ iZ eE iZ eE iEZ eE eZ eE F	SH 22 39 SH 40 A G G 49 G 51 G 23 G G 23 45	31.3 16.7 17.5 17.5 24.5 05.0 08.1 09.9 10.1		d d d c	U.S.C.G.S.: 16°S 168°E
81	June 24	Iu	iPZ iZ iP'Z iZ iZ ePKSE eZ eE eN F	S 22 57 H G S 58 H G 23 G G G 02 05	47.6 48.1 50.0 09.6 11.1 21.0 28.5 37.1 40.1	21 20	c d c c c	U.S.C.G.S.: 7°S 105°E



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Trace motion	Remarks	
				h. m. s.	s.			
82	June 25	Iu	iPZ	H 19 29	03.4	c c d c	U.S.C.G.S.: Tonga	
			eZ	S	11			
			iZ	H	11.3			
			iZ	SH	15.4			
			eZ	G	20.5			
			eSE	G	38 51.5			
			eSN	G	55.5			
			eN	G	49.5			16
			eE	G	50 09			14
			eEZ	G	55.4			
			eN	G	56.5			20
F		21 05						
83	June 26	Iu	eE	G 09	06.3			
			eZ	G	09.3			
			eN	G	18 29			
			eN	G	26.1			
			eZ	G	30.6			
			eE	G	30.8			
F		10 12						
84	June 27	IIv	iPZ	H 10 36	06.7	d  c	See list, p. 84	
			iZ	S	08.0			
			iEZ	AH	08.5			
			iZ	H	12.3			
			iZ	S	15.2			
			eEZ	G	16			
			iE	A	16.9			
			eN	G	19			
			iSE	A	42.6			
			iNE	G	43.5			
			iZ	G	47			
F		10 41						
85	June 28	Id	iPZ	H 08 41	23.2		See list, p. 84	
			iS?Z	H	35.7			
			F		08 42			

	Component
	E
	N
	Z

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
MOUNT HAMILTON							
THE LICK OBSERVATORY STATION, UNIVERSITY OF CALIFORNIA							
MOUNT HAMILTON, CALIFORNIA							
1	Apr. 3	Iu	1PZ	00 42			
2	Apr. 4	Iu	1PZ	01 36	48.9	d	
			1Z	01 37	03.3	d	
			F	01 38			
3	Apr. 4	Iv	1PZ	21 30	22.9	d	Vertical
			1Z		26.3	d	
			eB		53		
			eB		59.7		
			1SZ		59.7		
			F		01.2		
CONSTANTS OF THE STATION							
Latitude and longitude:							
				$\phi = 37^{\circ} 20' 14''$ N.			
				$\lambda = 121^{\circ} 38' 16''$ W.			
4	Apr. 5	Iu	1PZ	03 30	26.3	d	
Time -- All determinations are reduced to Greenwich Civil Time.							
5	Apr.			Altitude -- 1281.7 meters (4205 feet) above mean sea level.			
			1W		05.4		
			1PZ		05.2		
			eB		05.9		
			1PpPZ		14.2		
			1Z		22.7		
			1PZ		25.9		
			eB		25.9		
6	Apr. 6	Iu	1PZ	23 58	49.5	d	
			1PZ		49.5		
			eB		51.7		
			1PpPZ		51.7		
			1Z		05 01	08.0	
			1Z			13.0	
			1Z		04 15	15.4	
			1Z			19.8	
			F		05 06		
7	Apr. 7	Iu	1PZ	07 34	04.2	d	
			1Z		12.7		
			F		07 36		
8	Apr. 9	Iu	1PZ	04 28	48.4	d	
			F		04 30		
9	Apr. 10	Iu	1PZ	04 58	21.7	d	
			1PpPZ		51.7		
			1Z		05 01	08.0	
			1Z			13.0	
			1Z		04 15	15.4	
			1Z			19.8	
			F		05 06		
10	Apr. 10	Iu	1PZ	17 57	09.1	d	
			eB		09.9		
			1PpPZ		13.5		
			F		17 59		

Apparatus	Component
Wood-Anderson .....	E
	N
Benioff .....	Z



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
1	Apr. 4	Iu	ePZ F	00 40	24.4		d	
2	Apr. 4	Iu	iPZ iZ F	01 36 00 37	44.9 03.1		d d	
3	Apr. 4	Iv	iPZ iZ	21 30	22.9 26.3		d d	Verdi
			eN eE iSZ	18 38 18 40	53 56 59.7		d	
			iZ F	02 31	01.2		d	
4	Apr. 5	Iu	iPZ F	03 30	26.3		d	
5	Apr. 5	Iu	ePZ iN iPZ	09 38	03 03.4 05.1		d c	U.S.C.G.S.: 43°N 131°E h = 550 km
			eE iPcPZ iZ ipPZ ePPZ F	07 59	05.9 14.1 27.7 40 02.9 41 05.9 09 43		c	See list, p. 83
6	Apr. 6	Iu	ePZ iPZ F	23 58	43 49.5		d	
7	Apr. 7	Iu	iPZ iZ F	07 34	04.2 11.7		c c	Seattle U.S.C.G.S.: 47.1°N 122.7°W
8	Apr. 9	Iu	iPZ F	04 28	48.4			
9	Apr. 10	Iu	iPZ ipPZ iZ iZ iZ F	04 58	27.7 51.7 05 01 08.0 13.0 00 04 45.4 49.8 05 06		c d d c d d	
10	Apr. 10	Iu	iPZ eNE ipPZ F	17 57	09.1 09.9 13.5		c d	

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
11	Apr. 11	Iu	iPZ iZ iZ iZ	00 00	31.1 42.7 04.4 09.1		d d d c	
12	Apr. 11	Iu	iPZ F	01 43 01 45	36.8		c	
13	Apr. 11	Iu	iPZ F	18 38 18 40	25.2		d	See list, p. 83
14	Apr. 12	Iu	iPZ F	02 07 02 09	51.6		c	
15	Apr. 12	Iu	iPZ F	05 11 05 13	58.1		c	U.S.C.G.S.: 14°S 173.5°W
16	Apr. 12	Iu	iPZ F	10 03 10 06	33.0		c	
17	Apr. 13	IIv	iPZ eE iN iE iN	07 59	05.9 06.4 06.7 07.7 12.0		c	See list, p. 83
18	Apr. 13	Iu	iPZ F	15 24 15 27	46.8		c	
19	Apr. 13	IIr	iPZ F	19 58 20 45	04.3		c	Seattle U.S.C.G.S.: 47.1°N 122.7°W
20	Apr. 16	Iu	eZ F	10 15 10 16	10.5		c	
21	Apr. 16	Iu	iPZ ipPZ F	18 35 18 36	16.9 21.9		c c	See list, p. 83
22	Apr. 17	Iu	iPZ iZ F	00 54 01 00	21.3 46.8 15.1		d d	
23	Apr. 17	Iu	iPZ F	02 36 02 38	41.2		d	



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
24	Apr. 17	Iu	iPZ iZ F	17 44	22.2 39.3		c	U.S.C.G.S.: 3°S 120°E	
25	Apr. 18	Iu	iPZ iZ iZ F	00 52 55	26.1 56.2 47.2		d d		
26	Apr. 18	Id	iPZ iZ iSNE F	01 33	13.6 17.5 18.0			See list, p. 83	
27	Apr. 18	Iu	iPZ eNE ipPZ iZ F	21 46	06.3 06.7 09.7 24.6		d d c	U.S.C.G.S.: 14°S 173.5°W	
28	Apr. 19	Iu	iPZ eN ipPZ eE F	15 29	18.6 30.9 31.4 32.9		c d	U.S.C.G.S.: 48°N 154°E	
29	Apr. 20	Iu	iPZ eNE iZ eZ F	03 41	49.3 54.6 09.6 03			U.S.C.G.S.: 38°S 72.5°W	
30	Apr. 22	Iu	iPZ F	01 14 01 16	13.1		d		
31	Apr. 22	Iu	iPZ eN ipPZ F	17 28	40.7 42 44.0		c d c	See list, p. 83	
32	Apr. 23	Iv	iPZ iN iE iZ iSNEZ iN F	09 18 05 51 05 53	28.1 30.2 31.2 32.2 42.2 45.1		d	See list, p. 83	

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
33	Apr. 23	Iu	eP'Z eZ iZ iZ eZ F	11 34	16.4 30.2 35 17.4 34.7 37 56 11 39			U.S.C.G.S.: 8°S 120°E
34	Apr. 24	Iu	iPZ F	04 40	55.9 04 44			
35	Apr. 25	Iu	iPZ F	11 27	58.0 11 29	d		
36	Apr. 25	Iu	iPZ iZ eNE iE iZ eSE eSN eZ F	14 06	36.7 38.7 40 47.9 07 11.2 16 12.7 14.2 15 14 21	d d   d		U.S.C.G.S.: 20°S 69.5°W h = 100 km
37	Apr. 26	Iu	iPZ F	10 24	01.6 10 26	c		
38	Apr. 26	Id	iP'EZ iN iSNE iZ F	18 59	52.0 52.5 58.7 59.2 19 01			See list, p. 83
39	Apr. 27	Iu	iPZ iZ F	01 49	17.1 26.7 01 51	c c		U.S.C.G.S.: 19°W 153.5°E h = 100 km
40	Apr. 28	IIId	iP'NZ iE iSN iSE F	23 35	22.6 23.0 28.7 29.3 23 37	d   d		See list, p. 83  See list, p. 83
41	Apr. 29	IIId	iP'NEZ iSNEZ F	05 51	54.4 59.4 05 53	d		See list, p. 83
42	Apr. 29	Id	iPZ eE eE iSZ F	17 23	04.8 05.0 18.0 18.3 17 25			See list, p. 83



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
43	Apr. 29	Id	iPZ iZ iZ F	20 20 20	19 06 22	53.6 06.7 40.4	d	See list, p. 83	
44	Apr. 30	Iu	iPZ iZ iZ eZ eEZ eN iZ F	01 42 46 47 53 02	37 29 41 54 57 24 02	24.6 29.4 41.3 54.3 57.3 59.8 24	d d	U.S.C.G.S.: 6°S 126°E h = 100 km	
45	May 2	Iu	iPZ F	05 05	53 55	27.3	c		
46	May 2	IIv	iPZ iZ iZ iZ eNE iZ iE iE iN iEZ iE iN iN iE F	11 27 28 11	26 13 25 14 15 18 24 32 36 25 32 53 57 44	25.9 29.4 48.4 13.0 14.4 15.6 18.0 24.4 32.6 36.7 25.4 32.9 53.4 57.9	c c		
47	May 3	Iu	iPZ eNE iZ iZ iZ F	06 06 07 06	06 40 44 49 24 13	40.2 40.7 44.6 49.2 24.2	c c c c	U.S.C.G.S.: 49°N 153.5°E h = 100 km	
48	May 4	Iv	iPZ eE iN iZ F	01 35 01 01	34 00 01 38	59.9 00.4 01.1 44.9	d	See list, p. 83	
49	May 5	Iu	iPZ F	06 06	31 33	16.7	c		

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949						s.		
50	May 5	Iv	iPZ iZ iSEZ eN iE F	13	51	32.0 35.0 52 03.8 04.0 07.2		c	See list, p. 83
51	May 7	Iu	iPZ ipPZ F	01	11	30.1 07.7		d d	
52	May 7	Iu	iPZ ePNE eZ F	13	13	13.9 45 16 47		d	
53	May 7	Iu	iPZ F	13	44	56.5 13 46		d	
54	May 8	Iu	iPZ ePE ePN ipPZ eN F	21	36	08.5 09 10 38.2 41		d d	U.S.C.G.S.: 20°S 71°W h = 120 km
55	May 9	Iu	iPZ F	13	55	23.1 13 58		c	U.S.C.G.S.: 5°N 95°E
56	May 10	Ir	iPZ F	08	29	40.5 08 33		d	U.S.C.G.S.: 19°N 106.5°W
57	May 10	IIId	iP̄EZ iPN iSEZ iSN F	11	34	03.0 03.2 06.9 07.3		c	See list, p. 83
58	May 10	IIId	iP̄NEZ iZ eSN F	12	27	11.0 15.8 18		c	See list, p. 83
59	May 10	Iu	iPZ F	14	23	10.3 14 24		c	
60	May 10	IIId	iP̄NEZ iNEZ F	17	02	45.2 50.3		c	See list, p. 83
61	May 12	Iu	iPZ F	10	37	42.1 10 39		c	



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
62	May 13	Iv	ePZ iPNEZ iSZ eSE eN F	02	20	35.7 36.8 23.7 24 25			See list, p. 83
63	May 13	Iu	ePZ F	06	13	50 15			
64	May 15	Iu	eZ F	06	40	09 43			
65	May 17	IIv	iPNEZ iZ iN iSZ iSN iE F	23	58	22.6 26.3 34.6 43.4 48.5 50.2	c		See list, p. 83
66	May 20	Iu	iPZ iZ ipPZ F	08	24	04.8 10.8 58.1	d d c		
67	May 20	IIv	ePZ iPNEZ iNE iZ F	22	36	51.6 52.0 53.2 55.7	d		See list, p. 83
68	May 21	Iu	iPZ F	07	55	06.2 58	c		
69	May 21	Iu	ePZ iZ iZ F	21	51	37 47.3 33.5 58	c		U.S.C.G.S.: 37°N 142°E
70	May 22	IIId	iPZ ePNE iSNE F	03	34	40.1 41 44.6	d		See list, p. 83
71	May 22	IIId	iPNEZ iSNE F	03	52	59.5 11.3 56	d		San Benito County

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
72	May 22	IId	iPZ ePNE iZ iNE iZ iZ iNE F	08 27	45.1 46 48.4 48.9 49.9 56.8 01.4		c	San Benito County
73	May 23	Iu	iPZ iZ F	04 30	07.4 23.0		c	U.S.C.G.S.: 31°S 178°W
74	May 24	Id	iPZ iN iSZ eE F	01 51	23.4 28.0 28.6 30		c	See list, p. 83
75	May 24	Iu	ePZ F	02 40	37 42			
76	May 24	Iu	ePZ F	13 02	17 04			
77	May 24	Iu	ePZ F	16 25	24 27			U.S.C.G.S.: 17°N 106°W
78	May 25	IId	iPNZ iPE iSNEZ F	05 06	55.9 56.8 01.4		d	See list, p. 83
79	May 25	Iu	iPZ F	23 45	09.5 46		d	
80	May 27	Iu	ePZ F	20 01	23 02		c	
81	May 28	Iu	ePZ F	16 13	52 15		c	
82	May 28	Iu	ePZ F	16 25	23.2 26		c	
83	May 28	IId	iPZ iPNE iSNE iZ F	17 57	52.5 53.1 05.6 25.9		c	See list, p. 83



MT. HAMILTON

No.	Date	Char-acter	Phase	Time	Period	Trace motion	Remarks
				(G.C.T.)			
				h. m. s.	s.		
84	1949 May 28	IIId	iPNZ iPE iZ	23 05 51.0 23 06 51.5 53.0		d	See list, p. 83
	June 7	Iu	iSNZ iE F	01 06 03.1 01 06 03.5 23 08			
85	1949 May 29	IIId	iPNEZ iSZ iSNE F	00 34 57.6 05 35 08.7 09.4 00 37		d	See list, p. 84
86	1949 May 30	Iu	iPZ ePN ipPZ eSZ F	01 44 30.6 33 58.2 54 13 01 55		d	U.S.C.G.S.: 20°S 69.5°W h = 100 km See list, p. 84
87	1949 May 30	Iu	iPZ iPNE iPP?Z eS?Z F	21 52 03.7 04.2 54 06 22 01 28 22 03		d	See list, p. 84 U.S.C.G.S.: 14°S 176°W
88	1949 May 30	IIId	iPNZ iSNE iZ F	23 47 21.6 26.3 23 49 28.2 23 49		d	See list, p. 84 Aftershock
89	1949 May 31	Iu	ePZ F	07 43 57 07 45			Aftershock
90	1949 May 31	Iu	iPZ F	08 56 29.0 08 57		c	See list, p. 84
91	1949 June 1	Iu	iPZ F	07 46 54.7 07 49		d	See list, p. 84
92	1949 June 1	Iu	iPZ F	08 05 42.5 08 07		d	U.S.C.G.S.: 12.5°N 87.5°W
93	1949 June 4	Iu	iPZ F	01 06 17.5 01 07		c	U.S.C.G.S.: 27°S 64°W 2 quakes
94	1949 June 4	Iu	iPZ F	04 03 56.6 04 05		c	
95	1949 June 6	Iu	iPZ iZ F	07 11 05.2 06 57 16.4 07 13		d	

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
96	June 6	Iu	iPZ F	22 58 23 00	56.7		d	Vardi
97	June 7	Iu	ePZ F	04 41 04 43	54			
98	June 7	Iu	iPZ ePP?Z F	05 33 35 05 36	26.2 36.9		d	U.S.C.G.S.: 52°N 178°W See list, p. 84
99	June 8	Iu	iPZ iZ F	05 07 10 05 11	21.9 12.5		c	See list, p. 84
100	June 9	Id	iPZ iNE F	18 59 19 00 19 01	56.3 04.4		c	See list, p. 84
101	June 9	Iu	iPZ iPNE iZ F	21 30 32 21 43	01.1 01.6 45.6		d	U.S.C.G.S.: 23°N 145°W U.S.C.G.S.: 14°S 176°W
102	June 10	IIIId	iPNEZ F	03 06 03 13	40.9			See list, p. 84
103	June 10	IId	iPNEZ	03 13	05.4		d	Aftershock
104	June 10	IId	iPNEZ	05 04	38.8			Aftershock
105	June 10	IId	iPNEZ	05 14	58.3			Aftershock
106	June 10	Iv	iPNZ F	21 23 21 25	28.7		d	See list, p. 84
107	June 10	Iv	iPNZ F	22 47 22 50	38.4			See list, p. 84
108	June 11	Iu	iPZ iPcPZ F	07 42 44 07 45	17.6 25.2		d c	U.S.C.G.S.: 12.5°N 87.5°W
109	June 12	Iu	iPZ ipPZ iPZ ePNE F	18 03 06 19 07 18 10	59.8 05.4 26.8 28		c d d	U.S.C.G.S.: 27°S 64°W 2 quakes See list, p. 84
110	June 13	Iu	iPZ iZ F	06 52 53 06 54	21.9 17.3		c	



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Trace motion	Remarks
				h.	m. s.		
	1949						
111	June 14	IIv	iPZ iSZ iNE F	12 48 49 05 12 12 51	50.4 25.2 27.0	c	Verdi et, p. 84
112	June 15	Ir	iPZ F	01 55 01 57	14.2		U.S.C.G.S.: 52°N 178°W
113	June 16	IIId	iPNEZ iSE iSN F	03 47 03 51	45.2 53.4 53.8	c	See list, p. 84
114	June 16	Id	iPZ iSZ F	20 00 20 02	39.4 46.2	c	See list, p. 84
115	June 19	Iu	iPZ eZ F	12 34 12 36	05.3 50	c	U.S.C.G.S.: 23°N 45°W
116	June 19	Iu	ePZ eZ F	19 05 19 07	53 08.8	d d	
117	June 19	Iu	iPZ iZ F	22 10 22 13	32.3 49.2	c d	
118	June 22	IIId	iPNEZ F	18 08 18 14	47.1		See list, p. 84
119	June 23	IIu	iPZ ipPZ eE eN F	22 39 22 40 22 42	32.1 17.4 19 21	d	U.S.C.G.S.: 16°S 168°E
120	June 24	Iu	iP'Z iZ F	22 57 23 01	48.7 04.2	c	U.S.C.G.S.: 7°S 105°E
121	June 25	Iu	iPZ iPcP?Z F	19 29 19 31	02.1 15.1	c d	U.S.C.G.S.: Tonga
122	June 27	IIv	iPNEZ iE iNZ iSN iSE F	10 35 10 36 10 43	58.6 00.1 00.5 23.6 24.1	d	See list, p. 84

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
123	1949 June 28	IId	iPNEZ iSNE F	08 41 10.1 11.6 08 42			See list, p. 84
124	June 28	Iu	iPZ F	20 19 18.4 20 21		d	U.S.C.G.S.: 24°N 45°W
125	June 30	Iu	iPZ F	01 35 47.8 01 37		c	

CONSTANTS OF THE STATION

Latitude and longitude:

$\phi = 37^{\circ} 25' N.$   
 $\lambda = 122^{\circ} 10' W.$

Time — All determinations are reduced to Greenwich Civil Time.

Altitude — 23 meters (272 feet) above mean sea level.

Apparatus	Component
Wood-Anderson .....	E N
Benioff .....	Z



PALO ALTO

No.	Date	Time (G.C.T.)	Phase	Period	Trace section	Remarks
						PALO ALTO
1	Apr. 3	09 11		03.5		U.S.C.G.S., 13°N 131°E h = 550 m
2	Apr. 13	07 59		11.4		See list, p. 83

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 37^{\circ} 25:1 \text{ N.}$$

$$\lambda = 122^{\circ} 10:8 \text{ W.}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 83 meters (272 feet) above mean sea level.

Apparatus	Component
Wood-Anderson .....	E N
Benioff .....	Z

5	Apr. 15	21 15		06.6		U.S.C.G.S., 14°N 173.5°W
6	Apr. 19	01 33		18.7		See list, p. 83
7	Apr. 20	03 11		03.4		U.S.C.G.S., 18°N 154°E
8	Apr. 21	09 18		20.8		U.S.C.G.S., 20°N 72.5°W
9	Apr. 25	14 06		10.6		U.S.C.G.S., 20°N 69.5°W h = 100 m
10	Apr. 26	18 59		17.1		See list, p. 83
11	Apr. 28	23 35		25.5		See list, p. 83

PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
1	Apr. 5	Iu	iPZ ePE ePN F	09 38	02.2 03.0 03.5			U.S.C.G.S.: 43°N 131°E h = 550 km
2	Apr. 13	Iv	iPE ePN eSE eSN F	07 59	11.4 11.5 45.0 47.0			See list, p. 83
3	Apr. 13	IIr	iPZ ePN ePE eSNE F	19 58	02.6 03 06.0 12.0 15.0			Seattle U.S.C.G.S.: 47.1°N 122.7°W
4	Apr. 18	Id	iPZ ePNE iSN iSE F	01 33	18.7 20 26.4 26.7			See list, p. 83
5	Apr. 18	Iu	iPZ F	21 46	04.8 21 50			U.S.C.G.S.: 14°S 173.5°W
6	Apr. 19	Iu	iPZ F	15 29	16.4 15 32			U.S.C.G.S.: 48°N 154°E
7	Apr. 20	Iu	ePZ F	03 41	43.0 03 44			U.S.C.G.S.: 38°S 72.5°W
8	Apr. 23	Iv	iPZ ePNE eN eE F	09 18	30.6 32.4 50.5 51.6			See list, p. 83
9	Apr. 25	Iu	iPZ ePN ePE eN F	14 06	40.6 41.0 41.5 07 13.0 14 10			U.S.C.G.S.: 20°S 69.5°W h = 100 km
10	Apr. 26	IIId	iPNE F	18 59	47.1 19 02			See list, p. 83
11	Apr. 28	Id	iPZ iPNE eSN F	23 35	25.5 25.9 34.7 23 38			See list, p. 83



PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
12	Apr. 29	Id	iP̄EZ ePN eSE eSN F	05 51 00 52 05 54	56.1 57.0 02.0 02.5			
13	Apr. 29	Id	iPNZ ePE eE eN F	20 18 21 51 21 19 20 22	47.5 48 59 00		See list, p. 83 U.S.C.G.S.: 37°S 142°E	
14	Apr. 29	Id	ePE iPZ ePN eNE F	17 22 03 34 03 27 23 15 17 25	57.5 58.1 58.5 15.0		See list, p. 83 San Benito County	
15	May 2	IIV	iPZ ePE ePN iE eN F	11 27 01 08 08 28 11 44	22.0 22.8 23.8 01.0 02.0		San Benito County	
16	May 4	Iv	ePN ePE F	01 34 01 36 01 39	56.0 56.5		See list, p. 83 U.S.C.G.S.: 31°S 178°W	
17	May 5	Iv	iPZ F	13 51 13 53	32.0		See list, p. 83	
18	May 8	Iu	ePZ iPZ ipPZ isPZ F	21 36 05 06 07 07 21 40	10 11.1 40.7 54.4	d c c d	U.S.C.G.S.: 20°S 71°W h = 120 km See list, p. 83	
19	May 10	Id	iP̄Z ePE F	11 34 17 28 11 37	09.3 10.0		See list, p. 83 See list, p. 83	
20	May 10	Id	iP̄NEZ eN eE F	12 27 23 08 12 30	14.5 25.1 26.0		See list, p. 83 See list, p. 83	
21	May 10	Id	iP̄NEZ eN F	17 02 03 17 05	48.9 02.0		See list, p. 83 See list, p. 84	

PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
22	May 17	Iv	iPZ ePE F	23 58 00 01	24.3 25		d	U.S.C.G.S.: 20°S 69.5°W h = 100 km
23	May 20	Iv	iPZ ePE F	22 36 22 38	49.0 50.4			See list, p. 84
24	May 21	Iu	ePZ F	21 51 21 54	35.1 35.1			U.S.C.G.S.: 37°N 142°E
25	May 22	Id	iPZ ePE iSE F	03 34 03 35	42.0 43.0 48.8			See list, p. 83
26	May 22	Id	iPZ ePE iSE F	03 53 04 09	03.1 04.0 17.9			San Benito County Aftershock
27	May 22	Id	iPZ ePE eE F	08 27 08 59	50.2 51.5 11.1			San Benito County Aftershock
28	May 23	Iu	iPZ F	04 30 04 31	05.4 05.4		c	U.S.C.G.S.: 31°S 178°W
29	May 24	Id	iPZ ePE eSE F	01 51 01 52	20.8 21.9 24			See list, p. 83
30	May 25	Id	iPZ ePE eE F	05 06 05 08	59.9 01.0 12.0			See list, p. 83
31	May 28	Id	iPZ iPE	17 58	56.9 58.0			See list, p. 83
32	May 28	Id	eSE F	18 59 18 02	13.5		d	U.S.C.G.S.: 27°S 64°W
32	May 28	Id	iPZ ePE eSE F	23 05 23 07	55.7 56.1 06 08			See list, p. 83
33	May 29	Iv	iPZ iSE F	00 35 00 37	02.2 17.7			See list, p. 84



PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
34	May 30	Iu	iPZ ipPZ F	01 44 45 01 46	32.0 00.2 01		d	U.S.C.G.S.: 20°S 69.5°W h = 100 km
35	May 30	Id	iPZ F	23 47 23 48	21.8 01			See list, p. 84
36	June 9	Id	iPE iPZ iSE F	18 59 20 01 19 01	51.2 51.5 54.8			See list, p. 84
37	June 10	IIId	iPEZ F	03 06 03 08	48.1 01			See list, p. 84
38	June 10	Id	iPEZ eSE F	03 13 23 12 03 15	12.7 20 01			Aftershock 16°S 168°E
39	June 10	Id	iPEZ eSE F	05 04 05 07	45.2 51.5			Aftershock
40	June 10	Id	iPZ ePE eSE F	05 15 08 11 05 16	04.7 05.0 12			Aftershock
41	June 10	Iv	iPZ ePE eSZ eSE F	21 23 21 25	23.2 23.5 47.0 47.5			See list, p. 84
42	June 10	Iv	iPZ ePE eSE F	22 47 22 49	31.8 33.0 49.0			See list, p. 84
43	June 12	Iu	iPZ	18 04	00.9		c	U.S.C.G.S.: 27°S 64°W
44	June 12	Iu	iPZ F	18 08 18 10	28.9		d	U.S.C.G.S.: 27°S 64°W
45	June 14	Iv	iPZ eSZ eSE F	12 48 49 12 51	55.2 24 28			Verdi aftershock

PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
46	June 16	IIId	iP̄NZ iPE eSN iSE F	03 47	49.1 49.5 01 01.9			See list, p. 84
47	June 16	IIId	iP̄Z iSNE F	20 00	34.3 37.2			See list, p. 84
48	June 22	IIId	iP̄EZ iE iE F	18 08	53.6 01.7 12.6			See list, p. 84
49	June 23	Iu	iZ F	22 40	17.2 42			U.S.C.G.S.: 16°S 168°E
50	June 27	IIv	iPZ iPE iE iSE F	10 36	01.4 01.9 03.5 28.6			See list, p. 84
51	June 28	Iv	iP̄Z ePE F	08 41	17.1 18			See list, p. 84

Station	Component
Wood-Anderson	E N



No.	Date	Time	Phase	Time (D.C.T.)	Period	Trace notation	Remarks
SAN FRANCISCO							
THE SAN FRANCISCO STATION, UNIVERSITY OF SAN FRANCISCO SAN FRANCISCO, CALIFORNIA							
1	Apr. 13	184		03 02			
		185		53.2			
		186		56.2			
2	Apr. 13	174		19 57	58.4		U.S.G.O.S.: 17.1°N 122.7°W
		175		58	51.3		
		176		20 00	58.8		
		177		18	12.3		
		178		20 36			
3	Apr. 20	184		03 13	13		U.S.G.O.S.: 30°S 72.5°W
		185		03 56			
CONSTANTS OF THE STATION							
Latitude and longitude:							
4	May 20	174		17 59	06.5		See list, p. 63
		175					
		176					
		177		18 01			
Time -- All determinations are reduced to Greenwich Civil Time.							
5	May 28	174		23 05	17.5		See list, p. 63
		175					
		176		23 07			
Altitude -- 100 meters (328 feet) above mean sea level.							
6	May 29	184		00 35	15.3		See list, p. 64
		185			30.3		
		186			30.8		
		187		00 36			
7	June 10	174		05 04	53.5		
		175		07 03.0			
8	June 10	174		03 13	18.5		Aftershock
		175			19.9		
		176			29.5		
		177			31.1		
		178		03 14			
9	June 10	174		05 06	51.0		Aftershock
		175			54.1		
		176		05 01.5			
		177			02.0		
		178			16.9		
		179			17.5		
		180		05 06			
10	June 10	174		21 23	16.5		See list, p. 64
		175			19.2		
		176			24.6		
		177			25.1		
		178		21 24			

Apparatus	Component
Wood-Anderson .....	E N

SAN FRANCISCO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
1	Apr. 13	Iv	ePNE iSN iSE	07	59	23.3 51.6 53.2		See list, p. 83	
12	June 22	IIId	iNE F	18	08	56.2		See list, p. 84	
2	Apr. 13	IIr	iPN iPE	19	57	58.4 01.1		U.S.C.G.S.: 47.1°N 122.7°W	
13	June 27	Iv	iE iN F	20	00	08.8 11.3		See list, p. 84	
3	Apr. 20	Iu	ePNE eSNE F	03	43	10 40		U.S.C.G.S.: 38°S 72.5°W	
4	May 28	Iv	ePNE iSE iSN F	17	59	06.8 24.0 25.4		See list, p. 83	
5	May 28	Iv	ePNE eSNE F	23	05	47.4 24.2		See list, p. 83	
6	May 29	Id	eNE eN eE F	00	35	15.3 30.3 30.8		See list, p. 84	
7	June 10	IIId	iPNE eSNE F	03	06	53.5 03.0			
8	June 10	IIId	ePNE eNE iSNE iNE F	03	13	18.5 19.9 29.5 31.1		Aftershock	
9	June 10	IIId	iPNE iE iSN eSE iE iN F	05	04	51.0 54.1 01.5 02.0 16.9 17.5		Aftershock	
10	June 10	IIId	iPNE iN iN iE F	21	23	14.5 19.2 24.4 25.1		See list, p. 84	
				21	24				



SAN FRANCISCO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
11	June 10	II d	iPNE F	23 02 23 04	23.9			See list, p. 84
12	June 22	II d	iPNE iSN iNE F	18 08 09 09.3 11.3 18 11	59.9			See list, p. 84
13	June 27	Iv	iPNE iN iE iN iE F	10 36 14.3 15.8 34.3 42.3 10 41	06.7			See list, p. 84

Latitude and Longitude:  $\phi = 40^{\circ} 38' N$ ,  $\lambda = 122^{\circ} 16' W$ .

Time - All observations are reduced to Greenwich Civil Time.

Altitude - 7 meters (55 feet) above mean sea level.

Apparatus	Component
Seismograph 25 kg.	B H

The station is operated by Mr. Joseph Boggs, of Ferndale, in cooperation with the University of California.

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks	
FERNDALE								
No. 1, FERNDALE								
1	Apr. 13	IIIr	1P	THE FERNDALE STATION			U.S.G.C.S. 17.1°N	
			1P	FERNDALE, CALIFORNIA			122.7°W	
			1P	50 02				
			1P	06				
			1P	15				
			1P	21 00				
2	Apr. 30	Ia	1P	01 12 16			U.S.G.C.S. 40° 34' N	
			1P	02 05 10			λ = 124° 16' W	
			1P	15 10				
			1P	26 16				
			1P	02 04				
			1P	CONSTANTS OF THE STATION				
3	May			Latitude and longitude:			See list, p. 83	
				φ = 40° 34' N.				
				λ = 124° 16' W.				
4	May			Time -- All determinations are reduced to Greenwich Civil Time.				
				Altitude -- 17 meters (55 feet) above mean sea level.				

Apparatus	Component
Bosch-Omori 25 kg. ....	E N

The station is operated by Mr. Joseph Bognuda, of Ferndale, in cooperation with the University of California.



FERNDALE

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
1	Apr. 13	IIIr	iPN iPE iN iE iSNE F	19	57	26 30 58 06 45 00			U.S.C.G.S.: 47.1°N 122.7°W
2	Apr. 30	Iu	iSKSE eSKSN eN iE iE iE F	01	47	46 04 05 40 16 08 49			U.S.C.G.S.: 6°S 126°E h = 100 km
3	May 4	IIId	iPE iSN iSE F	01	34	13 16 18 36			See list, p. 83
4	May 13	Id	iPN iPE iSN iSE F	14	19	47 48 56 57 21			See list, p. 83

Apparatus	Component
Springmeter .....	N E Z

FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
-----	------	------------	-------	---------------	--------	--------------	---------

FRESNO

THE FRESNO STATION, FRESNO STATE COLLEGE  
FRESNO, CALIFORNIA

1	Apr. 1	Ia	e1	07 16			
2	Apr. 5	Ia	eP1	03 30	17.5		
			F	03 32			
3	Apr. 5	IIa	1P1	09 35	11.8		U.S.G.S. 13°N 111°W R = 580 km
			eP1	10 13			
			1eP1	10 12.1			
			eP2	11 23.1			
			e2M	17 24.8			
			F	09 17			

CONSTANTS OF THE STATION

Latitude and longitude:

$$\begin{aligned} \phi &= 36^\circ 46' 11'' \text{ N.} \\ \lambda &= 119^\circ 47' 18'' \text{ W.} \end{aligned}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 88.4 meters (290 feet) above mean sea level.

Apparatus	Component
Sprengnether .....	N E Z

4	Apr. 6	Ia	eP1	23 58	55.4		
5	Apr. 7	Ia	e1	00 00			
6	Apr. 9	Ia	eP1	04 28	36.5		
			F	04 30			
7	Apr. 10	Ia	e1	08 58	11.5		
8	Apr. 10	Ia	e1	00 00	15.1		
			F	00 06	36.2		
9	Apr. 10	Ia	e1	00 06			
10	Apr. 11	Ia	e1	18 38	29.1		
			F	18 40	30.1		
11	Apr. 11	Ia	e1	22 03	16.4		
			F	22 06	37.4		
12	Apr. 12	Ia	e1	07 51	55.4		
			F	07 53			
13	Apr. 13	Ia	e1	07 58			



FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
1	Apr. 1	Iu	iPZ eZ F	07 13 15 25 07 16	18.7 25 16		c	See list, p. 83
2	Apr. 5	Iu	ePZ F	03 30 03 32	47.8 32			
3	Apr. 5	IIu	iPZ ePN ipPZ ePPZ eSN F	09 38 40 12.1 41 23.1 47 24.8 09 49	11.8 13.3 12.1 23.1 24.8 49		c c	U.S.C.G.S.: 43°N 131°E h = 550 km
4	Apr. 6	Iu	ePZ F	23 58 00 00	55.4 00		c	
5	Apr. 7	Iu	eZ iZ eZ F	07 34 06.6 36 54.9 07 41	00.4 06.6 54.9 41		c c c	
6	Apr. 8	Iu	ePZ F	08 30 08 32	31.0 32		d	U.S.C.G.S.: 44°S 173.5°W
7	Apr. 9	Iu	ePZ F	04 28 04 30	34.6 30		d	
8	Apr. 10	Iu	ePZ F	04 58 05 02	44.5 46.6		c	U.S.C.G.S.: 48°N 154°E
9	Apr. 10	Iu	iPZ F	17 57 17 59	17.6 59.6		c	
10	Apr. 11	Iu	iPZ eN iZ F	00 00 00 10 00 12 00 06	35.1 36.2 46.7 06		d d d	U.S.C.G.S.: 38°S 72.5°W
11	Apr. 11	Iu	iPZ eSN F	18 38 18 40	29.1 38.4		c	
12	Apr. 12	Iu	iPZ eN F	22 03 22 06	36.4 37.4		c	
13	Apr. 13	Iu	ePZ eNZ F	07 54 55 53 07 56	55.4 53 56		c	

FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period s.	Trace motion	Remarks
				h.	m. s.			
	1949							
14	Apr. 13	IIv	iPNZ iN iSN iZ F	07 58 59 59 07	46.2 59.3 01.3 07.2		c	See list, p. 83
15	Apr. 13	IIIr	ePNZ iNZ F	19 58 20 31	13.9 31.5			U.S.C.G.S.: 47.1°N Seattle 122.7°W U.S.C.G.S.: 0°S 120°E
16	Apr. 17	Iu	iPZ eZ eN F	00 54 12 50 55 00 59	42.9 51.8 10.8 31.3		d	U.S.C.G.S.: 27°N 56°E
17	Apr. 17	Iu	iPZ F	17 44 17 46	26.5		c	U.S.C.G.S.: 20°S 69.5°W Depth = 100 km
18	Apr. 18	Iu	ePZ eN F	00 52 00 53	22.0 28.0		c	
19	Apr. 18	Iu	iPZ iPN ipPZ iZ F	21 46 21 46 21 46 21 53	10.7 11.8 15.7 51.4		d c d	U.S.C.G.S.: 14°S 173.5°W
20	Apr. 19	Ir	iPZ ePN ipPZ iZ F	15 29 15 29 15 29 15 36	28.6 29.6 41.2 59.6		c c c	U.S.C.G.S.: 48°N 154°E
21	Apr. 20	Iu	ePZ ePN iPZ iZ iN eSKSN eSN eN eLZ F	03 41 03 41 03 41 23 40 44 01 52 01 52 55 04 11 04 33	41.5 44.0 44.5 58.7 30.5 19.7 44.2 13.8 11.5 07.9		d d c c c d c c c	See list, p. 83 U.S.C.G.S.: 38°S 72.5°W U.S.C.G.S.: 6°S 126°E
22	Apr. 22	Iu	ePZ F	01 14 01 15	07.3		c	
23	Apr. 22	Iu	ePZ iPZ eLZ F	17 28 17 28 00 54 18 00	37.6 39.1 54.1		c	



FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m.	s.			
	1949							
24	Apr. 23	IIv	ePZ	09 18	33.5			See list, p. 83
			iPZ		33.9		d	
			iPN		34.8			
			iSZ		51.9		c	See shock
			iSN		52.4			
			iN	21	22.8			
			F	09 24			d	
25	Apr. 23	Iu	eP'Z	11 34	31.6			U.S.C.G.S.: 8°S 120°E
			eNZ	11 35	33.1		c	
			eZ		56.6		c	
			F	11 50			c	U.S.C.G.S.: 19°N 153.5°E h = 100 km
26	Apr. 24	Iu	eZ	04 41	42.9			U.S.C.G.S.: 27°N 56°E
			F	04 46	02.1		c	
27	Apr. 25	IIu	iPZ	14 06	28.5		d	U.S.C.G.S.: 20°S 69.5°W See h = 100 km
			ePN	01 35	29.3			
			iPcPNZ		36.2		c	
			ipPNZ		56.3		c	
			isPZ	07	10.0			
			iN		22.1			
			iZ	01 10	23.3			
			eSN	15	54.8			
			eSZ	13	55.8			See list, p. 83
			eN	16	40.3			
			eN	17	04.8			
			F	14 27				
28	Apr. 26	Iu	ePZ	10 24	08.5		d	
			eZ		22.3		c	
			eZ	01 11	53.5			
			F	10 27				
29	Apr. 28	Iv	iPZ	23 35	41.0		d	See list, p. 83
			iN		45.0			
			iSN	36	01.4			
			iNZ		05.3			
			F	23 40				
30	Apr. 30	IIu	iPZ	01 37	35.7		d	U.S.C.G.S.: 6°S 126°E
			ip'Z	41	48.2		c	
			iZ	21 31	57.8		c	U.S.C.G.S.: 20°S 71°W h = 120 km
			ippZ	42	12.0		c	
			iSKSN	48	07.9			
			eLZ	02 15	1.1			
			F	02 49			d	
31	May 2	Iu	iN	00 29	19.8			
			eEZ	21 51	23.3			
			eZ		39.8			
			F	00 32				

FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
32	May 2	IIIv	ePZ	11	26 16.7		d	U.S.C.G.S.: 19°N 106.5°W  Two shocks
			iPZ		18.1		d	
			iPN		18.3		c	
			iZ		18.8		c	
			iSZ		53.7			
			iSN		56.2			
			iPZ	27	05.8		d	
			iPN		06.4			
			iZ	28	00.4			
		F	11	46				
33	May 3	IIu	iPZ	06	06 50.0		c	U.S.C.G.S.: 49°N 153.5°E h = 100 km
			ePN		50.6			
			iZ	07	20.9		c	
			eN	12	02.1			
			F	06	13			
34	May 4	Iv	iPZ	01	35 21.6			See list, p. 83
			iPN		24.2			
			iZ	37	04.4			
			iZ		22.1			
			iN		25.2			
			F	01	40			
35	May 5	Iv	eN	13	52 19.8			See list, p. 83
			eN		27.8			
			F	13	55			
36	May 7	Iu	ePZ	01	11 37.7		d	U.S.C.G.S.: 37°N 142°W
			ipPZ		12 15.4		c	
			eZ		52.7			
			F	01	14			
37	May 7	Iu	ePZ	13	13 34.6		d	San Benito County
			iZ		35.0		c	
			eN	22	05 36.1			
			eZ		44.6			
			eZ	03	53 50.6			
			eZ		57.1			
			eN	14	22.1			
			F	13	18			
38	May 8	Iu	ePZ	21	35 58.5		d	U.S.C.G.S.: 20°S 71°W h = 120 km
			iPZ		59.3		c	
			ipPZ	36	29.2		c	
			epPN		29.5			
			isPZ		42.5		d	
			iN		56.2			
			eSNE	01	45 27.0		c	
			F	21	51			



FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
39	May 10	Iu	eZ iZ iZ eN iN eSN eLZ F	00 30 02 15 00	29 02 33 38 44	26.4 32.4 02.0 02.5 43.2 25.5 54	d c c	U.S.C.G.S.: 19°N 106.5°W	
40	May 10	Iu	iZ F	14 14	23 24	14.5	c		
41	May 13	Iv	iPZ F	02 02	20 28	57.4	c	See list, p. 83	
42	May 17	IIv	iPNE iN iSN F	23 14 14 00	58 00 00 00	22.8 24.4 43.6			
43	May 20	Iu	ePN F	08 08	25 27	04.0		See list, p. 83	
44	May 20	Iv	ePN iPN iN F	22 23	37 40	04.0 04.2 12.5			
45	May 21	Iu	ePN F	07 07	55 59	11.5	c	See list, p. 84	
46	May 21	Iu	eN eN eN eN F	21 22 22 22	51 01 05	47.5 58.5 28.5 57.5	d	U.S.C.G.S.: 37°N 142°E	
47	May 22	Iv	iPN iSN eLN F	03 03	53 58	10.6 25.3 58.5		San Benito County U.S.C.G.S.: 20°S 69.5°W h = 100 km	
48	May 22	Iv	iPN iSN eN eN F	08 08	27 32	43.7 57.0 35.0 16.0		San Benito County	
49	May 23	Iu	iPZ eN eN F	04 04	30 36	10.4 12.0 27.0	c	U.S.C.G.S.: 31°S 178°W	





FRESNO

No.	Date	Char-acter	Phase	Time	Period	Trace motion	Remarks
				(G.C.T.)			
				h. m. s.	s.		
57	May 30	Iu	ePZ	21 52 11		c	See list, p. 84
			eN	12.5			
			eZ	54 06.5			
			eZ	22 01 56.5			
			eZ	02 10.5			
		F	22 03				
58	June 1	Iu	ePZ	07 46 57.0		d	U.S.C.G.S.: 16°S 168°E
			eZ	49 13.5			
			eZ	53 51.5			
			F	07 55			
59	June 2	Iu	ePNZ	16 10 54		d	U.S.C.G.S.: 7°S 105°E
			F	16 13			
60	June 4	Iu	ePZ	01 06 22.0			
			F	01 08			
61	June 4	Iu	ePZ	04 04 04.5		d	U.S.C.G.S.: Tonga
			F	04 06			
62	June 6	Iu	ePZ	07 11 10.5		d	See list, p. 84
			eZ	21.5			
			F	07 13			
63	June 7	Iu	ePZ	12 07 49.5		c	
			F	12 10			
64	June 8	Iu	ePZ	05 07 33.0		d	
			F	05 13			
65	June 9	Iu	iPZ	21 30 05.7			U.S.C.G.S.: 14°S 176°W
			iPN	07.0			
			F	21 45			
66	June 10	IIv	iPZ	03 07 05.8		c	See list, p. 84
			iPNE	06.5			
			F	03 15			
67	June 10	Iv	ePN	05 05 05.7			Aftershock
			iSN	26.9			
			iSZ	27.2			
			F	05 09			
68	June 12	Iu	ePZ	18 03 53.5			U.S.C.G.S.: 27°S 64°W
			eN	58			
			F	18 18			
69	June 16	Iv	iPZ	03 47 59.3		c	See list, p. 84
			iNZ	48 01.1			
			iZ	16.8			
			eSN	19.0			
			iN	19.7			
			F	03 54			

FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Trace motion	Remarks
				h. m. s.	s.		
	1949						
70	June 22	Iv	iPZ ePE iPN iZ iN F	18 09 13 14.1 35.6 42.2	12.6	d   c	See list, p. 84
71	June 23	IIu	iPZ ePN epPZ ipPZ F	22 39 40 40 23 22 46	37.5	d	U.S.C.G.S.: 16°S 168°E
72	June 24	Iu	ePZ eZ eN F	22 57 23 00 01 55.5 23 06	51.5	d	U.S.C.G.S.: 7°S 105°E
73	June 25	Iu	ePZ eZ F	19 29 14 19 35	07	d	U.S.C.G.S.: Tonga
74	June 27	IIr	iPZ iPNE iSNZ F	10 35 57.2 36 15.6 10 49	56.3	c	See list, p. 84
75	June 30	Iu	ePZ F	01 35 01 38	53.5	d	

Apparatus	Component
Wood-Anderson .....	E - long N
Period .....	Z



MINERAL

No.	Date	Char-acter	Phase	Time (U.T.C.)	Period	Tran-section	Remarks
	1916						
							MINERAL
1	Apr. 2	Iu	1P2 S2 P	05 14 36.3			THE MINERAL STATION MINERAL, CALIFORNIA
2	Apr. 4	Iu	1P2 P	02 36 57.7 02 38			
3	Apr. 4	Iv	1P2 P	21 30 02.3			Yerdi aftershock
4	Apr. 5	Iu	1P2 P	03 29 59.0 03 31			
5	Apr. 5	Iu	1P2 1P2 1P2 P	02 37 52.6 02 38 17.9 02 38 45.2 02 39 50			CONSTANTS OF THE STATION U.S.G.C.S.: 43°N 131°E b = 950 km
							Latitude and longitude:
							$\phi = 40^{\circ} 21' N.$ $\lambda = 121^{\circ} 35' W.$
6	Apr. 7	Iu	1P2 1P2 1P2 P	02 37 52.6 02 38 17.9 02 38 45.2 02 39 50			
							Time -- All determinations are reduced to Greenwich Civil Time.
							Altitude -- 1495 meters (4906 feet) above mean sea level.
7	Apr. 8	Iv	1P2 P	01 30 35.0 01 32			
8	Apr. 10	Iu	1P2 1P2 1P2 P	01 50 15.0 01 52.3 05 01 12.4 05 01 30.2			
9	Apr. 13	Iv	1P2 1P2 1P2 P	02 00 20.1 02 02			
10	Apr. 13	Iv	1P2 1P2 1P2 P	02 00 20.1 02 02			
							U.S.G.C.S.: 47.1°N 122.7°W
11	Apr. 20	Iu	1P2 1P2 1P2 P	03 42 02 03 44 06 52 56 04 17.1 04 20			U.S.G.C.S.: 38°S 72.5°W

Apparatus	Component
Wood-Anderson .....	E N
Benioff .....	Z

MINERAL

THE MINERAL STATION  
MINERAL, CALIFORNIA

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 40^{\circ} 21' N.$$

$$\lambda = 121^{\circ} 35' W.$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 1495 meters (4906 feet) above mean sea level.

Apparatus	Component
Wood-Anderson .....	E N
Benioff .....	Z

U.S.G.C.G.S.: 43°W 131°E  
b = 950 km

U.S.G.C.G.S.: 47.1°W 122.7°W

U.S.G.C.G.S.: 38°S 72.5°W



MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
1	Apr. 2	Iu	iPZ iZ F	09 18	16.8				
					23.1				
				09 20					
2	Apr. 4	Iu	iPZ F	01 36	57.7				
				01 38					
3	Apr. 4	Iv	iPZ F	21 30	04.3			Verdi aftershock	
				21 31					
4	Apr. 5	Iu	iPZ F	03 29	59.0		d		
				03 34					
5	Apr. 5	Iu	iPZ ePNE iPPZ iSZ F	09 37	51.6		c	U.S.C.G.S.: 43°N 131°E h = 550 km	
					54				
				40	47.9				
				46	46.2				
				09 50					
6	Apr. 7	Iu	ePZ iPZ	07 34	00		c		
					06.7				
15	May 2	Iu	ipPZ F		16.4		c		
				07 38					
7	Apr. 8	Iu	iPZ F	08 30	39.0		d		
				08 32					
8	Apr. 10	Iu	iPZ iZ iZ iZ F	04 58	15.0		c		
					32.3				
				05 01	02.4				
					04 38.4				
				05 06					
9	Apr. 13	Iv	iPNE iSNE F	07 59	32.6			See list, p. 83	
				08 00	20.4				
				08 02					
10	Apr. 13	IIr	iPN iPE iE iN iSNE F	19 57	22.9			U.S.C.G.S.: 47.1°N 122.7°W	
					24.4				
					28.6				
					36.0				
				59 07					
				20 22					
11	Apr. 20	Iu	ePN ePE eSKSN eLN F	03 42	02			U.S.C.G.S.: 38°S 72.5°W	
					06				
					52 56				
				04 17.1				See list, p. 83	
				04 20					

MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
12	Apr. 25	Iu	ePNE iPN eSNE eN F	14 06 50 55.0 16 31 22 00 14 29				U.S.C.G.S.: 20°S 69.5°W h = 100 km
13	Apr. 30	Iu	ePZ iPZ eZ	01 37 19 23.6 14 58		d		U.S.C.G.S.: 6°S 126°E h = 100 km
22	May 8	Iu	iZ eSKSNE eSKSZ eZ	14 48.2 47 53 21 56 50 34		c		U.S.C.G.S.: 20°S 71°W h = 120 km
14	Apr. 30	Iu	ePZ iPZ iZ F	03 18 38.2 46.7 24 53.5 03 26				U.S.C.G.S.: 5°N 95°E
15	May 2	Iu	iPZ F	05 53 25.2 05 54		c		
16	May 2	Iv	ePZ iPZ ePN ePE iN	11 27 46.8 49.6 50 51 28 24.3				2 shocks See list, p. 83
27	May 15	Iu	iE iZ eE	05 29 33.3 55.9 59				
28	May 17	Iu	eN iZ iZ	02 30 01 12.8 32 51.9				U.S.C.G.S.: 13°N 155°E
17	May 3	Iu	ePZ iPZ F	03 49 19 21.9 03 52				
18	May 3	Iu	iPZ ePNE iPPZ eSZ F	06 06 27.1 28 08 34.6 15 06 06 16		c		U.S.C.G.S.: 49°N 153.5°E h = 100 km
19	May 4	IIv	iPNEZ iNE iSN iSE F	01 34 38.1 39.1 35 04.3 37 05.6 01 39				See list, p. 83



MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949						s.		
20	May 5	IIId	iPZ iPNE iSNE F	13 51	03.4 03.8 13.3		d	See list, p. 83	
21	May 6	Iu	iPZ iZ F	13 13 14 00.9 13 19	53.2		d	San Benito County	
22	May 8	Iu	iPZ ipPZ F	21 36 21 42	18.5 47.6		d d	U.S.C.G.S.: 20°S 71°W h = 120 km San Benito County	
23	May 9	Iu	iPPZ ePSZ eZ F	13 55 14 05 14 08 14 11	17.8 13 49		d	U.S.C.G.S.: 5°N 95°E  U.S.C.G.S.: 31°S 178°W	
24	May 10	Iu	iPZ F	14 23 14 26	18.6		d		
25	May 12	Iu	iPZ F	10 37 10 39	37.1		d		
26	May 13	IIv	iPNZ iNZ F	02 20 21 43.7 02 23	12.7 43.7			See list, p. 83	
27	May 15	Iu	ePZ F	05 34 05 36	07		d		
28	May 17	Iu	iPPZ F	02 39 02 42	40.4		c	U.S.C.G.S.: 48°N 155°E	
29	May 18	Iv	iPZ ePN iZ iZ F	23 59 11 07 11 23 00 00 00 01	06.8 07 23.4 25.4		d	U.S.C.G.S.: 20°S 69.5°W h = 100 km	
30	May 20	Iu	iPZ iZ ipPZ F	08 24 25 06.8 08 27	14.0 20.3		d d		
31	May 20	Iv	iPZ F	22 37 22 38	27.4				
32	May 21	Iu	iPZ F	07 55 07 57	16.1		d		

MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
33	May 21	Iu	ePZ iPZ iZ	21 51	27 28.7 33.4		d	U.S.C.G.S.: 37°N 142°E
	June 8	Iu	iZ F	21 57	36.3			
34	May 22	Iv	iPZ iZ	03 53	44.6 50.4			San Benito County
	June 9	Iu	iZ F	03 56	37.5			
35	May 22	Iv	iPZ iZ iZ F	08 28	30.9 38.8 34.6			San Benito County
	June 9	Iu		08 30			d	U.S.C.G.S.: 11°S 176°W
36	May 23	Iu	iPZ eZ F	04 30	16.2 41 09 43		c	U.S.C.G.S.: 31°S 178°W
37	May 24	Iu	ePZ F	02 40	45 42			
38	May 24	Ir	iPZ eLZ F	16 25	44.7 37 06 43		c	U.S.C.G.S.: 17°N 106°W
39	May 25	Iu	iPZ iPPZ eZ F	08 37	11.2 41 02 47 54 50		c d	U.S.C.G.S.: 42°N 83°E
40	May 25	Iu	iPZ F	23 45	18.0 46		c	U.S.C.G.S.: 27°S 64°W h = 300 km 2 quakes
41	May 27	Iu	iPZ F	11 09	50.4 14		d	
42	May 30	Iu	iPZ F	01 44	40.0 49		d	U.S.C.G.S.: 20°S 69.5°W h = 100 km
43	May 30	Iu	iPZ eZ F	21 51	59.5 53 57 58		d	U.S.C.G.S.: 23°N 45°W
44	June 1	Iu	iPZ F	07 46	57.2 48		c d	See list, p. 81
45	June 7	Iu	iPZ F	04 41	31.7 43		d	
46	June 23	Iu	ePZ F	22 40	25 42			U.S.C.G.S.: 16°S 168°W



MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
46	June 7	Iu	iPZ F	05 33 11.1 05 36		d	U.S.C.G.S.: 7°N 105°E
47	June 8	Iu	iPZ	05 06 59.4		c	
	June 25	Iu	iPPZ iZ F	10 06.1 13 48.5 05 14		c	U.S.C.G.S.: Tonga
48	June 9	Iu	iPZ	10 56 15.8		c	
	June 26	Iu	iPPZ F	08 58 35.2 11 00		c	U.S.C.G.S.: Celebes
49	June 9	Iu	ePN F	21 30 12 21 31		d	U.S.C.G.S.: 14°S 176°W
50	June 10	IIv	iPZ ePN iZ iPN iN iSN F	03 07 27.9 28.5 29.6 10 16 30.4 35.1 08 12.2 03 12		c	See list, p. 84
51	June 10	Iv	iPZ ePN F	05 05 26.2 30 05 08			Aftershock
52	June 11	Iu	iPZ iPcPZ F	07 42 29.5 44 29.2 07 46		c	U.S.C.G.S.: 12.5°N 87.5°W
53	June 12	Iu	iPZ ePN epPZ iPZ eN eSN eSZ F	18 04 07.5 10 06 16 07 31.6 37 13 55 58 18 16		c d	U.S.C.G.S.: 27°S 64°W h = 600 km 2 quakes
54	June 19	Iu	iPZ iZ F	12 34 59.8 35 07.4 12 38			U.S.C.G.S.: 23°N 45°W
55	June 22	Iv	ePZ iZ iNEZ eE eN F	18 09 33.5 36.4 37.4 38 41 18 13		d	See list, p. 84
56	June 23	Iu	ePNE F	22 40 25 22 42			U.S.C.G.S.: 16°S 168°E

MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
57	June 24	Iu	iPZ ePNE F	22 57 23 03	46.5 47		c	U.S.C.G.S.: 7°S 105°E
58	June 25	Iu	iPZ iZ iZ F	19 29 19 31	08.0 13.0 21.0			U.S.C.G.S.: Tonga
59	June 26	Iu	ePZ eZ iZ F	08 59 09 00 09 16	21 09 15.2			U.S.C.G.S.: Celebes
60	June 27	IIv	iPZ ePNE iZ iN F	10 36 10 46	41.2 42 48.3 55.6		c	See list, p. 84
61	June 28	Iu	iPZ F	20 18 20 21	10.8		d	U.S.C.G.S.: 24°N 45°W
62	June 30	Iu	iZ F	01 35 01 37	55.2			

Apparatus	Component
Springmeter .....	N E Z



ARCATA

No.	Date	Observer	Phase	Time (G.C.T.)	Period	Trace Station	Remarks
				ARCATA			
1	Apr. 15	IR					THE ARCATA STATION, HUMBOLDT STATE COLLEGE ARCATA, CALIFORNIA
			1002	17.1			123.7°W
			12	33.0			
			14	35.2			
			15	39.1			
			162	42.6			
			18	45.1			
			F	50.12			

2 Apr. 17

10	51	37
12	55	11
14		22
F	50	57

CONSTANTS OF THE STATION

3 Apr. 18

Latitude and longitude:

$\phi = 40^{\circ} 52' 16''$  N.  
 $\lambda = 124^{\circ} 04' 15''$  W.

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 60 meters above mean sea level.

5 Apr. 20

10	12	10.5
12	16	
14	20	
16	24	3.3
18	28	4.8
F	32	6.3

6 Apr. 25

Apparatus	Component
Sprengnether .....	N
	E
	Z

7 Apr. 30

10	12	20.9
F	12	52

8 May 2

10	11	30
12		47
14		19
16		56
18		59
F	11	35

9 May 4

10	01	34
12		17
14		19.5
16		20
F	01	37

See list, p. 84

## ARCATA

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
1	Apr. 13	Iir	iPNEZ iNEZ iZ iN iE iNZ iE F	19 57 14.6 22.1 33.8 35.1 38.1 41.6 45.1			U.S.C.G.S.: 47.1°N 122.7°W
	May 23	Iu					U.S.C.G.S.: 31°S 178°W
2	Apr. 17	Iu	ePZ eZ eZ F	00 54 37 55 11 22 00 57			
3	Apr. 18	Iu	iPNZ ePE F	21 46 11.0 12 21 54			U.S.C.G.S.: 14°S 173.5°W
4	Apr. 19	Iu	iPZ iZ eZ F	15 28 55.8 29 07.5 37 38 15 39			U.S.C.G.S.: 48°N 154°E
5	Apr. 20	Iu	iPZ ePN ePE iPPZ eSKSNE eLZ F	03 42 10.8 16 20 44 47.3 53 03 04 16 04 04 24		d	U.S.C.G.S.: 38°S 72.5°W
6	Apr. 25	Iu	iPEZ iPN eE eSNE F	14 07 00.2 02.0 14 16 55 14 22		c c	U.S.C.G.S.: 20°S 69.5°W h = 100 km
7	Apr. 30	Iu	iPPZ F	01 41 20.9 01 52		c	U.S.C.G.S.: 6°S 126°E h = 100 km
8	May 2	Iv	ePZ ePE ePN eZ F	11 30 47 49 56 59 11 35			
9	May 4	IId	iPNEZ iNEZ iSZ iSNE F	01 34 13 17 19.5 20 01 37			See list, p. 84



ARCATA

No.	Date	Char-acter	Phase	Time (G.C.T.)			Trace motion	Remarks
				h.	m.	s.		
	1949							
10	May 13	II d	iPNZ iSNZ F	02 19	47.1 56.7		d	See list, p. 84
11	May 23	Iu	iPZ iZ F	04 30	11.9 27.4			U.S.C.G.S.: 31°S 178°W
				04 31				

CONSTANTS OF THE STATION

Latitude and longitude:

$\phi = 39^{\circ} 32' 17''$  N.  
 $\lambda = 119^{\circ} 59' 18''$  W.

Time -- All observations are reduced to Greenwich Civil Time.

Altitude -- 306 meters (1004 feet) above mean sea level.

Apparatus	Component
Springmeter .....	N E Z

No.	Date	Char-acter	Phase	Time (G.C.T. h. m. s.)	Period s.	Trace section	Remarks
RENO							
1	Apr. 1	Ia	ePE P	07 15			THE RENO STATION, UNIVERSITY OF NEVADA RENO, NEVADA
2	Apr. 1	Ir	ePE 1PH ePE eSEZ eSH P	08 13 12 47.3 51 13 11 23 08 51			
3	Apr. 1	IIId	1PNEZ 1SSE P	21 29 11.3			Verdi aftershock  CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 39^{\circ} 32' 13'' \text{ N.}$$

$$\lambda = 119^{\circ} 48' 18'' \text{ W.}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 1386 meters (4546 feet) above mean sea level.

Apparatus	Component
Sprengnether .....	N E Z

6	Apr. 7	Ia	ePE P	07 21 08.3 07			
7	Apr. 9	Ia	ePE P	04 26 16 04 32			
8	Apr. 10	Ia	ePE P	04 58 49 05 30			
9	Apr. 10	Ia	ePE eSE P	17 57 08.6 11 23 17 59			
10	Apr. 11	IIv	1PZ 1SSE 1N 1E 1S P	07 59 04.9 07.9 35.2 52.6 53.0 08 06			See list, p. 83
11	Apr. 13	IIIr	1PNEZ P	19 57 39.2 21 10			U.S.G.S.S. 19.17N 121.17W Seattle, Washington



## RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
1	Apr. 1	Iu	iPZ ePE F	07 13	28.3 29		c		
2	Apr. 1	Ir	ePZ iPN ePE eSEZ eSN F	08 43	42 47.3 51 47 14 23		d	U.S.C.G.S.: 14°N 173.5°W	
3	Apr. 4	IIId	iPNEZ iSNE F	21 29	41.3 44.0		c	Verdi aftershock	
4	Apr. 4	IIId	iPZ iSNE F	22 53	40.6 43.5		c	U.S.C.G.S.: 38°N 72.5°W	
5	Apr. 5	Iu	iPZ iPNEZ iN ePPE ePPN eSE eSN F	09 38	01.8 03.3 06.1 41 10.3 13.8 47 02 04			U.S.C.G.S.: 43°N 131°E h = 550 km	
6	Apr. 7	Iu	eZ eE eN F	07 34	09.3 05 07				
7	Apr. 9	Iu	ePNZ F	04 28	46			U.S.C.G.S.: 8°N 120°E	
8	Apr. 10	Iu	eEZ F	04 58	29				
9	Apr. 10	Iu	eZ eE eE F	17 57	08.6 11 23		d	U.S.C.G.S.: 20°N 69.5°W h = 100 km	
10	Apr. 13	IIv	iPZ iNEZ iN iE iZ F	07 59	04.9 07.9 35.2 52.6 53.0		d	See list, p. 83	
11	Apr. 13	IIIr	iPNEZ F	19 57	39.2 21 10		c	U.S.C.G.S.: 47.1°N 122.7°W Seattle, Washington	

RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
12	Apr. 17	Iu	ePZ eNZ eE F	00	54	25 55.6 01		d	U.S.C.G.S.: 6°S 126°E h = 100 km
13	Apr. 18	Iu	iPZ iPNE F	21	46	21.1 21.8 53		d	U.S.C.G.S.: 14°S 173.5°W
14	Apr. 19	Iu	ePNEZ eE eN eSNE F	15	29	17 30 32 37 26 39		c	Southern California U.S.C.G.S.: 48°N 154°E
15	Apr. 20	IIu	ePZ iPNZ iZ eSE eSN eN F	03	41	54 56.6 42 10.8 52 37 40 04 12 04 22		d	U.S.C.G.S.: 38°S 72.5°W
16	Apr. 22	Iu	ePZ iPNEZ F	17	28	52 56.9 33			U.S.C.G.S.: 19°N 153.5°E h = 100 km
17	Apr. 23	Iv	eP*Z eZ eNE eZ F	09	19	07 28 57 20 15 09 22			See list, p. 83
18	Apr. 23	Iu	eP'Z eNZ ePPZ eN eE F	11	34	17 31 35 29.8 51 55.8 40			U.S.C.G.S.: 8°S 120°E
19	Apr. 25	IIu	iPEZ eSN eSE F	14	04	40.7 16 14 16 30		d	U.S.C.G.S.: 20°S 69.5°W h = 100 km
20	Apr. 26	Iu	ePZ eZ eE eN eZ F	10	24	13 28.2 31.7 38 26 44 30		d	



## RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
21	Apr. 30	IIu	ePZ eZ ePPNZ ePPE eSKSE eSKSNZ F	01 38 41 48 02	37 11 45 03 05	29.8 11 45 03 04	d	U.S.C.G.S.: 6°S 126°E h = 100 km	
22	May 2	IIIv	eZ iNZ iE iNZ iE iSNZ iSE F	11 27 21 21 13 29 11	26 32.5 34.0 44.7 51 18.9 20.0 44	56 56 00 00 00 00 00 00	c	Southern California 2 shocks	
23	May 2	Iu	ePN ePZ eE F	18 00 18	29 34 31	26.2 34 43			
24	May 3	Iu	iPNEZ iE eZ eSNEZ F	06 14 02 06	06 08.8 20 17	38.7 08.8 11 41	c	U.S.C.G.S.: 49°N 153.5°E h = 100 km	
25	May 4	Iv	iPZ iZ iNE iN iE iZ iNE F	01 05 05 36 05 05 01	35 33 33 03.9 31 31 40	00.9 04.5 05.2 42.7 03.9 07.0 17.4	c	See list, p. 83	
26	May 5	Iu	iPZ F	06 06	31 32	27.6	d		
27	May 5	Iv	iPZ ePE iN iSZ iSNE F	13 00 00 00 13	51 00 00 00 53	10.5 11 13.5 24.0 24.5	d	See list, p. 83	
28	May 6	Iu	ePZ ePE eZ eN F	12 21 13 02 13	58 30 01 01 03	29.4 30 59.4 01 03	c		

## RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
29	May 7	Iu	iPEZ ePN F	13 13 45.0 46			d	San Benito County
30	May 8	Iu	ePZ epPZ epPN epPE eSN eSE F	21 36 10.6 39.6 41 42 45 48 50			d	U.S.C.G.S.: 20°S 71°W h = 120 km
31	May 9	Iu	ePEZ eE eN eE F	13 55 22.2 38 58 42 44				U.S.C.G.S.: 5°N 95°E U.S.C.G.S.: 31°S 178°W
32	May 10	Ir	ePNZ eNZ eE eNE F	00 29 39 50 30 02 37.7 00 46				U.S.C.G.S.: 19°N 106.5°W
33	May 13	Iv	ePZ eE eE eN F	02 20 35.3 21 13.9 32.7 39			d	See list, p. 83 U.S.C.G.S.: 17°N 105°W
34	May 15	Iu	ePN ePE eE F	05 33 45 54.7 34 11 05 37				U.S.C.G.S.: 18°N 83°E
35	May 17	Iu	ePZ eN F	02 39 53.4 40 06 02 43				U.S.C.G.S.: 48°N 155°E
36	May 17	IIv	iPZ iZ iZ eE eZ iE iN F	23 59 00 17 36.1 49 00 00 00 00.9 04.8 00 04				See list, p. 83
37	May 21	Iu	ePEZ iN eNE eSN eSE F	21 51 37 45.0 47.7 22 00 53 01 02 22 01				U.S.C.G.S.: 37°S 142°E



RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
38	May 22	Iv	eZ eNE eE F	03 53 39 54 28 29 03 57				San Benito County
39	May 22	Iv	eZ eE eN	08 28 40.5 29 04 09				San Benito County
47	May 30	Iu	eZ eN eE F	01 11 14 15 18 16 22 08 32				U.S.C.G.S.: 20°N 106°W h = 100 km
40	May 22	Iu	iPNEZ eZ eN eN eE eSN eSE F	04 30 19.5 36 43 31 48 55 41 09 13 04 44		c		U.S.C.G.S.: 31°S 178°W
41	May 24	Iu	ePEZ eN eEZ eN F	02 40 45 55 41 12 53 02 45				
42	May 24	Ir	ePZ eNE eN eN F	16 25 32 33 26 26 33 47 16 41				U.S.C.G.S.: 17°N 106°W
43	May 25	Iu	iPZ ePN iPPZ F	08 37 18.0 20 41 13.5 08 44		c c		U.S.C.G.S.: 42°N 83°E
44	May 27	Iu	ePZ F	11 10 54.2 11 13				
45	May 28	Iv	eZ eEZ eE eN eN eEZ F	17 59 40 18 00 14 03 07 18 20 38 40 18 03				See list, p. 83

RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
46	May 28	Iv	eZ eE eN eZ eN eE F	23 06 07 18.7 08 27.7 29 30				See list, p. 83
47	May 30	Iu	iPNEZ eZ eZ eSE eSN F	01 44 45 46 54 17 01 59	32.9 40.1 45 14 17	d		U.S.C.G.S.: 20°S 69.5°W h = 100 km
48	May 30	Iu	iPNEZ eNE eZ eSE eSN F	21 52 53 35 22 01 38 22 06	07.9 22.5 35 36 38	d		
49	June 1	Iu	ePZ eZ F	07 47 35 07 49	01.4 35			See list, p. 81
50	June 7	Iu	iPZ ePNE F	05 33 35	23.3 24.0	c		
51	June 7	Iu	ePZ ePN F	12 07 12 11	47 48			
52	June 9	Iu	ePNE ePZ F	10 56 10 57	04 09	d		
53	June 9	Iu	iPZ iPN iPE eN F	21 30 22 37 23 39 21 40	15.1 15.6 15.9 45.5	d		U.S.C.G.S.: 14°S 176°W
54	June 10	IIv	iPZ ePE iPN iZ iNE eZE iN eZ iSNE eSZ	03 07 19 33 09 00	23.8 24.0 24.5 27.2 27.6 33.5 33.7 41.5 08 02.5 05	c		See list, p. 84



RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
55	June 10	Iv	ePE ePZ eE eNZ F	05 05 06 07	26.0 26.5 52.5 07.5			Aftershock	
56	June 12	Iu	iPZ iPE ePN iPEZ iPN iSKSN iSKSE eSKSZ iSKSE eSKSN F	18 01 01 07 13 13 17 18	01.7 02.5 04.8 29.2 30.0 45.8 46.3 48.3 29.3 32.3 20			U.S.C.G.S.: 27°S 64°W 2 quakes	
57	June 14	IIId	iPNEZ iSNE F	12 12	09.3 12.5 51	d		Verdi	
58	June 16	Iv	eP*Z ePN iPE iN iE iSNEZ eZ iE eE F	03 03 03 03 03 49 03 03 50 03	29.0 30.5 33.8 40.3 41.5 16.5 47.5 48.0 41.5 53			See list, p. 84	
59	June 23	Iu	ePEZ eNZ iEZ eN eE F	22 40 51 22	41.5 25.5 30.5 33 34 53			U.S.C.G.S.: 16°S 168°E	
60	June 23	Iu	ePNEZ F	22 23	57 50.5 05			U.S.C.G.S.: 7°S 105°E	
61	June 25	Iu	eZ eNZ eE eZ F	19 19	16.5 23 25 56 33			U.S.C.G.S.: Tonga	
62	June 26	Iu	eZ eNE eN F	09 09	00 19 35 01 00 05			U.S.C.G.S.: Celebes	

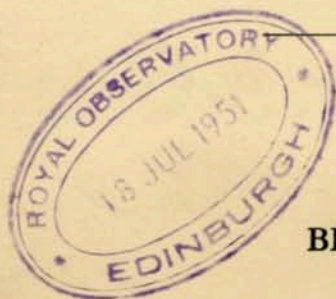
RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
63	June 27	IIv	ePZ iEZ iNEZ iSN iSE F	10 36 32 39.0 49.0 37 22.4 25.2 10 44			See list, p. 84
64	June 30	Iu	eNEZ eZ F	01 36 04 27 01 38			



# Bulletin of the Seismographic Stations

Volume 19, No. 3, pp. 153-283



BERKELEY—MOUNT HAMILTON—PALO ALTO  
SAN FRANCISCO—FERNDALE—FRESNO  
MINERAL—ARCATA—RENO

Earthquakes and the Registration of Earthquakes

From July 1, 1949, to September 30, 1949

BY  
DON TOCHER  
AND  
CARL F. ROMNEY

UNIVERSITY OF CALIFORNIA PRESS  
BERKELEY AND LOS ANGELES  
1950

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BERKELEY AND LOS ANGELES  
BULLETIN OF THE SEISMOGRAPHIC STATIONS

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MADE IN THE UNITED STATES OF AMERICA





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EARTHQUAKES IN NORTHERN CALIFORNIA, NEVADA, AND OREGON

EARTHQUAKE INTENSITY SCALE

Intensities are given by Roman numerals in the list of California, Nevada, and Oregon earthquakes on the following page, when sufficient information on the effects of the shock is available. Criteria of the Modified Mercalli Scale which are used to rate the intensity are:

Intensity	Description
II	Felt by a few people only. Duration or direction not appreciable.
III	Duration or direction appreciable.
IV	Rattling of doors and windows; swinging of suspended objects.
V	Disturbance of movable objects; plaster cracked.
VI	Overthrow of movable objects; cracking of chimneys and other brickwork.
VII	Fall of some chimneys; some damage to buildings.

EARTHQUAKE MAGNITUDE SCALE

Richter magnitudes given in the list of epicenters on the next page are found from the Wood Anderson amplitudes, using the nomogram given by Nordquist, "Bulletin of the Seismological Society of America", 32:164.

Latitude and Longitude or Descriptive Location are given for each epicenter in the following list. Only those earthquakes are given for which epicenters were located. The letter represents the excellence with which the epicenter has been located, a indicating excellent, b good, c fair, d poor.

Aftershock of No. 187

18	Aug. 8	16-37-36	2.5	36° 18'	121° 17'	d
19	Aug. 10	01-17-39	2.6	36° 17'	121° 15'	d
20	Aug. 15	21-37-13	2.7	36° 47'	121° 22'	c
		IV seven miles south of Hollister.				
21	Aug. 16	16-03-29	1.9	38° 07'	122° 27'	c
22	Aug. 16	16-19-51	2.9	37° 01'	122° 16'	c
23	Aug. 18	06-25-15	3.7	36° 18'	118° 56'	d
24	Aug. 18	16-12-21	2.2	36° 18'	121° 14'	d
25	Aug. 18	18-45-05	2.2	37° 10'	121° 23'	c
26	Aug. 21	02-51-01	1.8	40° 17'	121° 10'	b
27	Aug. 21	03-15-20	1.9	40° 17'	121° 10'	c
28	Aug. 21	12-12-36	1.5	40° 17'	121° 10'	c

Richter North West  
Magnitude Latitude Longitude  
EARTHQUAKES IN NORTHERN CALIFORNIA, NEVADA, AND OREGON

Shocks 28, 29 and 30 rated Intensity IV at Caribou, Lake  
Alman 1949 - Pacific Standard Time and Chester. "Moderately  
loud" to "Thunderous" subterranean sounds reported at all  
these places. Shock 30 was also reported felt at Mineral.  
A shock of magnitude 2.3 at Oat Mountain; one of magni-  
tude 2.0 at Oat Mountain and 3.0 at Oat Mountain and 3.0 at Oat Mountain.  
Twelve additional smaller shocks were recorded at the

No.	Date	Time	Richter Magnitude	North Latitude	West Longitude	Quality
1	July 6	11-56-54	2.3	37° 2'	122° 2'	d
2	July 9	08-45-34	2.5	36° 8'	121° 7'	d
3	July 10	07-17-07	3.0	36° 9'	121° 5'	c
4	July 18	07-31-05	4.5	39° 7'	119° 8'	d
5	July 23	05-58-05	2.3	37° 15'	121° 44'	b
6	July 23	08-07-44	2.8	Southern Washoe Co., Nevada		d
7	July 23	19-04-05	2.3	Southern Kings Co., Calif.		d
IV in Arenal and Kettleman City.						
Aftershock M = 2 ca. at 22:26.						
8	July 27	04-38-06	3.1	37° 10'	121° 53'	a
IV six miles east of San Jose.						
9	July 28	11-59-50	2.3	37° 13'	122° 11'	b
10	July 30	20-58-58	2.0	37° 21'	121° 37'	c
11	July 31	16-07-24	3.0	35° 9'	121° 2'	d
12	July 31	23-56-14	2.4	37° 0'	121° 8'	d
13	Aug. 1	19-08-36	2.4	37° 34'	121° 20'	c
14	Aug. 1	23-14-14	2.9	36° 7'	121° 1'	d
15	Aug. 6	17-36-43	2.3	Northern Monterey Co.		d
16	Aug. 6	19-42-46	2.7	37° 30'	121° 43'	b
17	Aug. 8	03-00-03	3.3	37° 57'	122° 19'	b
Felt over about 300 square miles of the San Francisco Bay region. Maximum intensity of VI in Richmond, Pinole and Vallejo.						
18	Aug. 8	16-39-27	3.6	38° 35'	122° 40'	b
19	Aug. 10	01-17-39	2.6	Central San Benito Co.		d
20	Aug. 14	00-19-58	2.5	38° 35'	122° 40'	d
Aftershock of No. 18.						
21	Aug. 15	15-52-54	2.2	38° 5'	122° 5'	d
Aftershock of No. 18?						
22	Aug. 15	21-37-13	2.7	36° 47'	121° 22'	c
IV seven miles south of Hollister.						
23	Aug. 16	16-08-29	1.9	38° 07'	122° 27'	c
24	Aug. 16	16-19-51	2.9	37° 04'	122° 16'	c
25	Aug. 18	06-25-16	3.7	38° 8'	118° 6'	d
26	Aug. 18	16-12-21	2.4	36° 8'	121° 4'	d
27	Aug. 18	18-45-05	2.2	37° 10'	121° 23'	c
28	Aug. 21	02-51-03	3.8	40° 17'	121° 10'	b
29	Aug. 21	03-45-20	3.9	40° 17'	121° 10'	c
30	Aug. 21	12-18-16	1.5	40° 16'	121° 11'	c



<u>No.</u>	<u>Date</u>	<u>Time</u>	<u>Richter Magnitude</u>	<u>North Latitude</u>	<u>West Longitude</u>	<u>Quality</u>
<p>Shocks 28, 29 and 30 rated intensity IV at Caribou, Lake Almanor, Butte, Valley, Las Plumas, and Chester. "Moderately loud" to "Thunderous" subterranean sounds reported at all these places. Shock 30 was also reported felt at Mineral. A shock of magnitude 3.2 occurred at 04-05-53; one of magnitude 3.0 at 09-27-50; and one of magnitude 2.7 at 15-29-10. Twelve additional smaller shocks were recorded at the Mineral Station between shocks 28 and 30, apparently from the same source.</p>						
31	Aug. 23	10-47-20	4.0	40° 22'	124° 28'	c
32	Aug. 28	17-56-01	3.4	37° 41'	121° 32'	a
33	Aug. 29	04-07-20	3.0	36° 0	120° 1	d
<p>IV in Avenal and Kettleman City.</p>						
34	Sept. 3	10-29-54	2.4	36° 48'	121° 47'	c
35	Sept. 6	03-20-30	4.1	40° 23'	124° 42'	c
<p>THE REGISTRATION OF EARTHQUAKES</p> <p>Felt in Eureka.</p>						
36	Sept. 7	09-13-25	2.5	37° 08'	121° 31'	c
<p>h = 15 km.</p>						
37	Sept. 7	19-28-08	3.2	36° 47'	121° 28'	b
<p>Felt in Gilroy and San Juan.</p>						
38	Sept. 10	06-40-09	2.9	38° 09'	122° 34'	b
39	Sept. 13	21-27-42	5.0	40° 4	126° 2	d
<p>U.S. C.G.S.: 40 1/2° N, 126° W.</p>						
40	Sept. 14	12-00-16	2.2	37° 11'	122° 12'	b
41	Sept. 15	23-14-49.6	1.8	37° 53'	122° 01'	a
<p>Mt. Diablo Test Station (Slichter Z) <math>\bar{S}-\bar{P} = 1.4</math> sec.</p>						
42	Sept. 18	05-03-06	2.2	36° 8	121° 7	d
43	Sept. 18	06-40-03	2.9	37° 22'	121° 33'	a
<p>h = 10 km.</p>						
44	Sept. 24	01-28-20	3.2	38° 1	118° 6	d
<p>Mineral County, Nevada</p>						
45	Sept. 24	01-44-37	3.3	38° 1	118° 6	d
<p>Mineral County, Nevada</p>						
46	Sept. 28	05-52-43	1.8	36° 9	121° 6	d

### SYMBOLS AND NOTATIONS EMPLOYED

#### 1. Character of the Seismogram —

I. Perceptible      II. Moderately Strong      III. Strong

d (terrae motus domesticus)      Local shock (origin less than 100 kilometers distant).

v (terrae motus vicinus)      Near shock (origin from 100 to 1,000 kilometers distant).

r (terrae motus remote)      **THE REGISTRATION OF EARTHQUAKES** (origin from 1,000 to 5,000 kilometers distant).

u (terrae motus universalis)      Local shocks recorded sufficiently well to be located, all large regional shocks, and all distant earthquakes recorded are tabulated by station on the following pages.

#### 2. Onset of the Motion —

s (impetus)      Sudden beginning of the motion.

g (arsensio)      Gradual beginning of the motion.

#### 3. Phase Motion —

c      Compression.

d      Distention.



BERKELEY

THE BERKELEY STATION, UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA

SYMBOLS AND NOTATIONS EMPLOYED

1. Character of the Seismogram --

I. Perceptible      II. Moderately Strong      III. Strong

Latitude and longitude:

d (terrae motus domesticus)      Local shock (origin less than 100 kilometers distant).

v (terrae motus vicinus)      Near shock (origin from 100 to 1,000 kilometers distant).

Time -- All determinations are reduced

r (terrae motus remotus)      Distant shock (origin from 1,000 to 5,000 kilometers distant).

u (terrae motus ultimus)      Very distant shock or teleseism (origin more than 5,000 kilometers distant).

2. Nature of the Motion --

i (impetus)      Sudden beginning of the motion.

e (emersio)      Gradual beginning of the motion.

3. Trace Motion --

c      Compression.

d      Dilatation.

The letter & before a reading designates that the seismogram was from the Galitsin instrument; N, Wiechert; B, Bosch-Osari; A, Wood-Anderson; R, Benioff; S, Slichter.

BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
-----	------	------------	-------	---------------	--------	--------------	---------

BERKELEY

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BERKELEY, CALIFORNIA

CONSTANTS OF THE STATION

Latitude and longitude:

$\phi = 37^{\circ} 52' 13''$  N.  
 $\lambda = 122^{\circ} 15' 16''$  W.

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 81 meters (266 feet) above mean sea level.

Apparatus	Component
Bosch-Omori 100 kg. ....	N E
Wiechert 80 kg. ....	Z
Wood-Anderson .....	N E
Galitzin .....	N E Z
Benioff .....	Z
Slichter .....	N E

The letter G before a reading designates that the seismogram was from the Galitzin instrument; W, Wiechert; B, Bosch-Omori; A, Wood-Anderson; H, Benioff; S, Slichter.

See list, p. 157

U.S.G.C.S.: 13°N 91°W



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
1	July 1	Iu	ePZ	H 03 38	48.3	27	d	U.S.C.G.S.: 72°N 0°
			iPZ	H	48.6		c	
			iZ	H 03 39	20.3		c	
			F	03 40				Surface waves.
2	July 1	Iu	iPZ	H 04 28	10.6	24	c	
			iZ	H	24.1		d	
			F	04 29				
3	July 1	Iu	eN	G 23 11	29		d	See list, p. 157
			eZ	G	12.0	20		
			eE	G	12.8			
			F	23 30				U.S.C.G.S.: 33°N 71°W
4	July 2	Iu	eZ	G 11 46	58.0		d	
			eSN	G	56 31.0			
			eSE	G	38.0			
			eN	G 12 13	0	20		
			eE	G	16.5	16		
			eZ	G	20.0	25		
			F	13 21				U.S.C.G.S.: 39°N 71°E
5	July 2	IIu	iPZ	SH 20 09	24.3		d	U.S.C.G.S.: 16°N 148°E
			iPEZ	AG	25.0			
			iNZ	SG	26.1		d	
			iZ	G	36.0		d	
			ipPZ	S	42.7		c	
			iZ	H 10 30	5		d	
			iZ	S	56.4		d	
			iZ	H	56.9		c	
			iPPZ	G	12 04	0		
			iPPZ	H	33.4			
			iSNE	G	19 28	0		
			eSZ	G	40.5			
			eZ	S	20 23			
			iN	G	22 47	0		
			iSSE	G	25 07	0	14	
			eN	G	29.9	40		
			eE	G	31.7	22	0	
			eLE	A	37.1	7.5		
			eLZ	S	37.2	21	5	
			F	22 50		11	0	
6	July 6	Iv	iPZ	H 19 57	08.1	6.5	d	See list, p. 157
			eZ	H	47.0			
			F	19 59				
7	July 8	IIu	ePZ	G 12 47	50.5		d	U.S.C.G.S.: 13°N 91°W
			iZ	G	49 18.5		d	
			iSN	G	53 40.0	9		
			eZ	G	50.5			
			eN	G	58 08.5			
			eLN	G 13 02	1	20		
			eZ	G	02.9			
			F	14 05				





BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
13	July 10	Iv	iZ iPZ eE eE iSZ F	S H A A SH F	15 17 25.3 28.3 30 43 44.6 15 19		d d	See list, p. 157	
14	July 10	IIu	eN iZ iE	G G G	16 03 11 17 07 29.0 17 09 30.5			U.S.C.G.S.: 39°N 71°E	
	July 25	Iu	iN iE iN eZ eZ iZ eE eZ F	G G G GSH S G G S F	11 13 45.5 14 59.5 17 28.5 38 01.5 42 11.0 44 25.5 48 24 17 32.5 19 05	6 9		U.S.C.G.S.: 32°S 111°W	
15	July 14	Iu	iPZ iZ F	SH SH F	23 32 29.3 34 03.2 23 36			U.S.C.G.S.: 29°N 138°E h = 200 km	
16	July 16	Ir	iPZ iSE iSN eN eMZ eZ eN F	G G G G G G G F	10 04 38.6 20 10 06.6 11.6 20 16 10 18 19 21 22 20 24.5 10 43		c	Off coast of Guatemala	
17	July 21	Iu	iPE iPN iPZ iPZ isPN isPE isPN isPZ iSE isSN F	G G G SH SH G G SH G G G F	08 12 39.0 23 00 40.0 41.0 01 26 41.6 13 09.4 18.0 04 59 19.0 20.0 20.8 21 49.0 22 04.0 08 42			U.S.C.G.S.: 16°S 74°W h = 100 km	
	July 31	Iu	iPZ ipPZ isPN	SH SH G	01 26 41.6 13 09.4 18.0		d d	U.S.C.G.S.: Near coast of central Chile.	
	July 31	Iu	isPE isPN isPZ iSE isSN F	G G SH G G F	04 59 19.0 20.0 20.8 21 49.0 22 04.0 08 42		c	See list, p. 157	
18	July 23	Iu	ePZ iPNEZ ipPZ ipPZ iPPZ iPPZ iPPZ iSKSNE F	H GH S H S H H G F	10 39 08.0 10 07 10.1 59.6 40 00.0 42 30.1 31.0 49 16.0 10 50.4		c c	U.S.C.G.S.: 18.5°S 169°E h = 200 km	

BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
19	July 23	Id	iPEZ iZ iSZ iEZ F	AH H A AH	13 58 19.5 26.6 30.2 31.4		d	See list, p. 157	
20	July 23	Iu	iSKSNE eSSN F	G G	15 27 56.0 34.8 17 00 ca			U.S.C.G.S.: 38.5°N 26.5°E U.S.C.G.S.: 17°N 96°W	
21	July 25	Iu	ePZ iZ eN iSN eSSNE eLN F	H H G G G G	11 35 54.5 36 01.5 44 22 45 19 49 57 58.5 13 00 ca		c	U.S.C.G.S.: 32°S 111°W See list, p. 157	
22	July 27	Id	iPEZ iEZ iSEZ F	SAH SA SA	12 38 21.5 22.8 32.3 12 40			See list, p. 157 See list, p. 157	
23	July 28	Id	iPZ iZ F	H S	20 00 03.0 11.9 20 01			See list, p. 157	
24	July 29	Ir	eN eE eE eN eNE eN iNE F	G G G G G G G	20 56 00 56.7 21 01 47 20 02 04 55.7 22 06.7 07 02.0 23 00 ca	14		Foreshock	
25	July 31	Iu	iPZ F	H	04 26 45.3 04 28		d	U.S.C.G.S.: Near coast of U.S.C.G.S.: central Chile. Central Ecuador quake.	
26	July 31	Id	iPZ iSZ F	H H	04 59 12.7 24.4 05 00		d	See list, p. 157	
27	July 31	Iu	iPZ eN F	H G	07 08 06.8 12.2 07 20	7.0 8.5	c		
28	Aug. 1	Iv	ePZ iPEZ iZ eZ eE iZ F	H AH H S A H	00 07 59.2 08 06.5 10.5 36.1 37.6 38.6 00 10	6.5 7.5 11 10		See list, p. 157	



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
29	Aug. 1	Id	eZ	H	07 56	33.4			See list, p. 157
			eZ	H		34.1		c	
			iZ	H		35.2			
			eZ	H		39.6			
			iSEZ	AH		47.3			
			F		07 58				
30	Aug. 1	Ir	iPZ	SH	08 09	53.4			U.S.C.G.S.: 19°N 96°W
			eN	G		18.5	28		
			eE	G		20.3			
			iZ	G		21 23.0			
			F		08 49				
31	Aug. 2	Id	iPZ	H	03 08	56.3			See list, p. 157
			iSZ	S		09 07.7	11		
			eS*E	A		10			
			iZ	H		10.7			
			iZ	H		12.4			
			F		03 10				
32	Aug. 2	Iv	iPZ	H	07 14	37.6			See list, p. 157
			iZ	H		43.2	30	c	
			eZ	S		44.5			
			eSE	A		56.0			
			iZ	H		56.5		d	
			eE	A		15 05.5			
			eZ	S		06.5			
			iZ	H		06.9			
			F		07 16				
33	Aug. 3	Iu	iPZ	G	20 43	31.4		d	U.S.C.G.S.: 19°S 174.5°W
			iZ	G		38.4		c	
			F		20 46				
34	Aug. 5	Iu	iPZ	H	19 12	39.8			Foreshock
			F		19 14				U.S.C.G.S.: 19°S 174.5°W
35	Aug. 5	IIu	iPZ	SH	19 18	28.8		c	U.S.C.G.S.: 1°S 78°W
			iPNEZ	AG		29.5			Central Ecuador quake.
			iZ	H		32.8		c	
			iZ	SH		36.3		d	
			iNZ	GH	19 25.9				blast?
			iPcPZ	G		29.0	7.0		
			iE	G	22 08.0				
			iN	G		15.0	8.5		
			eSE	A	26 31.0				
			iSE	G		35.0	6.5		
			eSZ	GS		36.0			
			iSN	G		37.0	7.5		
			eSZ	H	01 37	41.0			See list, p. 157
			iE	G	28 06.0		11		
			iN	G		29.0	10		





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No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
42	Aug. 7	Id	iPZ eZ iSZ iE iZ F	H 03 S H 43 A H	42 57.1 58.5 05.5 06.0 07.9		d	See list, p. 157	
43	Aug. 8	Iu	eN eE eZ F	G 08 G G 09	45.6 45.7 50.6 16	25			
44	Aug. 8	IIId	iPEZ iE iSZ F	SH 11 A H 11	00 05.0 05.5 06.4 03		d	See list, p. 157 Amplitude = 35 mm on EW Wood-Anderson	
45	Aug. 8	Iu	eN eE eZ F	G 14 G G 14	27.8 28.9 30.6 56	28 24			
46	Aug. 9	Id	iPZ iZ eE iSEZ iE F	H 00 S A AS A 00	39 41.4 42.2 43.5 52.0 53.2 42	23	c	See list, p. 157	
47	Aug. 9	Iv	eZ F	H 16 16	44 58 46				
48	Aug. 10	Iv	iPZ iZ iZ iSZ iZ F	H 09 H H H H 09	18 07.6 09.6 14.4 26.8 33.0 20		d d c	See list, p. 157	
49	Aug. 11	Iu	eN eE eZ F	G 14 G G 14	06.2 08.2 10.3 31	27 26		See list, p. 157	
50	Aug. 11	Iu	iPZ eLE eLN eLZ F	H 15 G G G 15	12 05.3 33.6 34.6 34.7 44	23 22	d	U.S.C.G.S.: Samoa Islands Region	
51	Aug. 11	Iv						See list, p. 157	
52	Aug. 11	Iv						See list, p. 157	
53	Aug. 11	Iv						See list, p. 157	
54	Aug. 17	Iv						See list, p. 157	

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No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
51	Aug. 12	Iu	iPZ	H 23 28	07.1		c	U.S.C.G.S.: 14°S 167.5°E	
			eZ	G	08		c		
			iZ	H 00 21	41.8		d		
			eSE	G	39 09				
			eN	G	15				
			ePSE	G	40 02				
			eN	G	50 41				
			eLE	G	54.4				
			eLN	G	55.5				
			F	00 30					
52	Aug. 13	IIu	ePZ	H 18 37	58.5		c	U.S.C.G.S.: 0° 146°E	
			ePZ	G	38 01.5			h = 100 km.	
			iZ	H	13.5		d		
			iZ	H	44.6			Long period	
			eZ	G	41 39				
			iSE	G	48 32.0	18			
			iSN	G 20 00	34.0				
			eZ	G	57.5				
			iE	G 10 09	59.0	8		U.S.C.G.S.: Bonin Island	
			eE	G	55.1			Region	
			iN	G 19 02	49.0	23			
			eE	G	03.1				
			eZ	G 13 00	04.2			U.S.C.G.S.: 8.5°N 82.5°W	
			F	21 19					
53	Aug. 14	Id	iPZ	H 08 20	13.1		d	See list, p. 157	
			iZ	H	13.9		d		
			eE	A	15				
			iZ	H	17.0		d		
			iSE	A	23.7				
			iSZ	H	24.6				
			iSZ	H	26.4				
			F	08 22					
54	Aug. 15	Id	iPZ	H 23 53	07.7		c	See list, p. 157	
			eE	A	10				
			iE	A 15 03	14.8				
			iSZ	H	17.5				
			F	23 54				See list, p. 157	
55	Aug. 16	Iv	iPZ	H 05 37	36.4		d	See list, p. 157	
			iZ	H	49.7				
			eE	A	50				
			eSE	A 00 12	54.6			See list, p. 157	
			iSZ	S	55.2				
			F	05 39					
56	Aug. 17	Id	iPEZ	AH 00 08	34.6		c	See list, p. 157	
			iSEZ	AH	38.5			See list, p. 157	
			F	00 10					



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No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
57	Aug. 17	Id	iPZ eSZ F	H 00 20 06.4 H 00 21 17.4 00 21		d	See list, p. 157 Islands Region
58	Aug. 17	Iu	iPZ ipPZ iZ iNE iNE iN iN iN eE iN iZ eZ F	SH 18 44 55.8 SH 45 15.9 SH 44.0 G 53 44.0 G 54 48.0 G 55 27.0 G 19 01 56.0 G 06 41.0 G 10 36.0 G 16 41 G 49 H 20 28 00 G 36.7 20 00 ca		c d	U.S.C.G.S.: 43°N 146°E h = 100 km  See list, p. 157  Long period See list, p. 157
59	Aug. 18	Iu	iPZ ipPZ F	H 10 09 34.2 H 11 10.6 10 13		c c d	U.S.C.G.S.: Bonin Island U.S.C.G.S.: Region Region
60	Aug. 18	Iu	ePNZ ePZ iZ iZ iE iZ iZ iSN eZ eE eN eE eZ F	G 13 41 48.0 H 04 05 50.9 G 51.5 H 52.1 G 52.5 H 42 13.1 H 43 27.3 G 11 48 42.5 G 50.0 G 06 58.3 G 06 58.4 G 58.5 15 03		d d c c c c c c d d c c c	U.S.C.G.S.: 8.5°N 82.5°W U.S.C.G.S.: 5h N 133°W  U.S.C.G.S.: Off British Columbia  U.S.C.G.S.: Aleutian Islands
61	Aug. 18	Iv	iPZ iZ iZ F	H 14 26 05.9 H 32.2 H 40.7 14 28		d c c	See list, p. 157 U.S.C.G.S.: Near coast of Northern Chile
62	Aug. 19	Iv	iPZ iZ iSZ F	00 12 47.1 H 11 50.2 13 13 04.0 00 14		d	See list, p. 157 U.S.C.G.S.: Bonin Islands Region
63	Aug. 19	Iv	iPZ iSZ F	H 02 45 24.5 H 38.3 02 46		c	U.S.C.G.S.: Off coast of Columbia See list, p. 157

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No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
64	Aug. 19	Iu	iPZ ipPZ F	H 08 37 H 08 39	10.5 15.0		c d	U.S.C.G.S.: Tonga Islands Region
65	Aug. 21	Iv	iPZ iZ iSZ iZ F	H 05 39 H 05 40 H 05 42	32.0 34.9 30.0 34.0		d c	Probably Inyo County  See list, p. 156
66	Aug. 21	Iv	iPZ iSE iZ F	H 10 51 A 05 52 H 10 54	43.4 12.6 13.4		d	See list, p. 157
67	Aug. 21	Iv	iPZ iZ iSEZ F	H 20 48 H 20 49 AH 20 53	56.5 57.0 26.8		d d	See list, p. 157
68	Aug. 22	Iu	iPZ iZ F	H 03 29 H 03 31	26.2 40.1		d d	U.S.C.G.S.: New Britain Region
69	Aug. 22	IIIr	iPZ eE iZ iE eSE iE F	SH 04 05 A 04 20 H 04 23 A 04 41 A 08 48 A 11 57 F 11 36	19.9 20.5 23.7 41.1 48.0 57.3	22	d c	U.S.C.G.S.: 54°N 133°W  U.S.C.G.S.: 53°N 132°W
70	Aug. 22	Ir	iPZ iZ F	H 06 21 H 06 24	43.6 53.3		d d	U.S.C.G.S.: Off British Columbia  U.S.C.G.S.: Off British Columbia
71	Aug. 22	Ir	iPZ iZ F	H 06 38 H 06 39 H 06 41	58.3 04.6		c d	U.S.C.G.S.: Aleutian Islands  U.S.C.G.S.: 43.5°N 127°W Off Oregon
72	Aug. 22	Iu	iPZ iZ F	H 07 23 H 07 25	07.3 55.2		c c	U.S.C.G.S.: Near coast of Northern Chile
73	Aug. 22	Iu	iPZ F	H 11 53 H 11 55	33.2		c	U.S.C.G.S.: Bonin Islands Region
74	Aug. 23	Ir	ePZ eSE iSN eZ eN F	G 03 03 G 03 07 G 03 07 G 03 15 G 03 09 G 03 24	32.5 13.0 13.5 15.5 09.5	11 8 15		U.S.C.G.S.: Off coast of British Columbia



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No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
75	Aug. 23	Iu	eE eN eE eZ F	G G G G F	15 34 04.5 48.3 48.5 49.0 16 21	26 23		U.S.C.G.S.: Near Coast of Southern Peru	
76	Aug. 23	Iv	iPZ F	H F	18 48 06.7 18 50		c	See list, p. 158	
77	Aug. 23	Ir	eE eN eN iZ iPZ iZ iZ eE eE iZ iZ iN eZ eZ F	G G G G SH H S G A S H G S G F	19 45.2 45.4 47 24.0 29.0 30.1 31.4 32.2 33.0 34.5 37.2 37.5 40.0 50 38.5 40.0 Lost in next shock		c c d c d c d c d	U.S.C.G.S.: 53°N 132°W  U.S.C.G.S.: 9°S 109°W	
78	Aug. 23	IIIr	iPZ iPNEZ eE iZ iZ iZ eE F	SH G A SH H S A F	20 28 24.2 25.0 13 05 30.0 32.2 22 42 42.2 29 30.7 31 34.5 00 37		d d d c d	U.S.C.G.S.: 53°N 132°W Region  U.S.C.G.S.: Off British Columbia	
79	Aug. 24	Ir	eE eNZ F	G G F	02 47.4 48.5 02 56			U.S.C.G.S.: Off British Columbia U.S.C.G.S.: 52.5°N 178°W Berkeley: 70 km	
80	Aug. 24	Iv	iFEZ iPNEZ eE iZ iZ eN eZ eZ iE eEZ iE F	GH GS A S H G G S G AS G F	06 08 54.6 55.5 56 58.3 09 05.2 10.3 10 21 23.5 26.0 58 59.0 07 28	23	d d c	U.S.C.G.S.: 43.5°N 127°W Off Oregon Coast	

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No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
81	Aug. 24	Iu	iPZ	H	06	37	38.4	c	U.S.C.G.S.: 22°S 176°W
			eE	A			39		h = 100 km
			iZ	H			49.0	d	
			iZ	H	38		03.1	c	
			iZ	H			04.9	c	
			ipPZ	S			05.8	d	
			F		06	40			
82	Aug. 24	Iu	iPZ	H	06	37	38.8	c	U.S.C.G.S.: 22°S 176°W
			eE	A			41		h = 100 km
			iZ	H	05		49.3	d	U.S.C.G.S.: Off British Columbia
			iZ	H	38		08.8	d	
			iZ	H			10.9	d	
			iZ	H	06		25.8	c	
			eZ	H	40		33.5		
			F		06	43			Passadena: 34.5°N 120.5°W
									Near Point Conception
83	Aug. 24	Iu	iPZ	H	09	30	53.2	c	U.S.C.G.S.: 9°S 109°W
			eZ	S			53.5		
			eE	G			31.5		
			eNZ	G	32		53		
			eN	G			44.4	18	
			eZ	S			45	50	
			F		11	11			
84	Aug. 24	Iu	iPZ	H	13	04	09.3	c	U.S.C.G.S.: Samoa Islands
			ipPZ	H			12.5	d	Region
			F		13	05			U.S.C.G.S.: Off British Columbia
85	Aug. 24	Iu	ePZ	G	22	41	16.0	d	U.S.C.G.S.: Off British Columbia
			iZ	H			19.5	d	
			eNE	G	44		32.5		
			eZ	G			34.5		
			eZ	G			48.2		
			F		23	06			
86	Aug. 25	Ir	iPNEZ	GH	04	22	13.5	c	U.S.C.G.S.: 52.5°N 178°W
			iZ	SH			14.0		Berkeley: 70 km
			iZ	H			24.7		
			ipPZ	H			36.9		
			iZ	H	23		08.3		Aftershock?
			iPPZ	H			47.5		
			iScPZ	H	27		51.0		
			iSN	G	28		30.5		
			eE	G			34.5		
			iSSN	G	31		53.5		
			iN	G	32		34.5		
			iZ	G	38		23.5		
			F		05	08			



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No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
87	Aug. 25	I	iZ	H 23	47	33.0		d	
			iNE	G	50	36.0			
			iE	G	51	29.0			
			eN	G	52	51.0	15		
			eN	G	54	19			
			eN	G	55	05			
			iE	G	59	49	11		
			eE	G	00	18.5	21		
			F		01	12			
88	Aug. 26	Ir	iPZ	H 05	30	44.3		d	U.S.C.G.S.: Off British Columbia
			iN	G	36	25.5			
			eE	G	36	5			
			F		06	07			
89	Aug. 26	Iv	ePZ	H 16	53	21	23		Pasadena: 34.5°N 120.5°W
			eE	A	19	31	24		Near Point Conception
			iZ	H	19	33.1		d	
			eZ	S	08	35	34		
			iZ	H		39.2		c	
			iSZ	S	00	54	10.7		
			eE	A	26	26			
			iN	G	30	27.5			
			iZ	S		31.2			
			eE	A	32	34.5			
			F		17	05			
90	Aug. 26	Ir	iPZ	H 22	43	58.3		d	U.S.C.G.S.: Off British Columbia
			iPZ	S		59.8		d	
			iSZ	G	46	46.5			U.S.C.G.S.: Southern Alaska
			iE	G	47	44.0	13		
			iN	G		45.0			
			eZ	G	49	8			
			eNE	G	50	6.8			
			F		23	05			
91	Aug. 27	Iv	iZ	H 15	36	46			Aftershock of Aug. 26, 1949
			iZ	H	37	07.7			at 1653 UT? 36°S 97°W
			F		15	39			
92	Aug. 27	Iv	eZ	H 15	55	26.0			Aftershock?
			eZ	S		38.5			
			iZ	H		39.2		c	
			iZ	H	32	45.0	25		
			eE	A	31	46.0	23		
			iZ	H	56	09.4	22		
			iZ	H	35	12.6	24		
			F		15	59			
93	Aug. 27	I	eZ	SH 21	34	37.5		c	
			eE	G	37	53			
			eN	G	38	07			
			eNZ	G	41	29			
			F		21	58			

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No.	Date	Char-acter	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
94	Aug. 29	Id	iPZ eE iE iE iSE F	SH 01 56 13.1 A 13.5 A 16.4 A 20.3 A 21.9 01 58		c	See list, p. 158 Islands Region
95	Aug. 29	I	iPZ iZ iZ eE eNZ eZ F	H 12 08 02.3 H 11.0 H 14.9 G 46 G 09 00 H 19.5 12 15		c c c c c c	U.S.C.G.S.: 82°W 118°W h = 100 km.
96	Aug. 30	Iu	eLN eLE eLZ F	G 08 18.7 G 19.0 G 19.7 08 35	23 24	c c	See list, p. 158
97	Aug. 31	Iu	iPZ eN eE eN eLN eLE eLZ F	H 00 20 35.0 G 26 39 G 30 52 G 56 G 42.8 G 47.4 G 49.6 00 59	12	d c	U.S.C.G.S.: Samoa Islands Region  U.S.C.G.S.: 17°N 121°E
98	Aug. 31	Ir	ePZ iZ iZ iZ iZ eNE F	H 13 53 11 H 12.9 H 25.4 H 40.0 H 59 38.8 G 14 00.7 14 07		d d c	U.S.C.G.S.: Southern Alaska
99	Sept. 1	Iu	iPZ ipPZ iZ eSE eSZ eN eN eLN eLZ eE F	H 14 10 12.8 H 17.5 H 41.1 G 19 53 G 59 G 20 09 G 32.4 G 34.5 G 34.8 G 35.8 15 05	25 23 22 24	d c d c c c c c c c	U.S.C.G.S.: 36°S 97°W U.S.C.G.S.: Off British Columbia  See list, p. 158



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No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
100	Sept. 1	Iu	iN iZ iE iZ iE eLNZ eLE F	G 18 42 G 22 G G G 44 G 49.6 G 50.3 19 20	10.0 10.5 15.0 48.5 47.5 49.6 50.3 20	11     22 20		U.S.C.G.S.: Galapagos Islands Region	
101	Sept. 3	Iu	iPZ iPZ ipPZ iZ F	H 03 12 S SH H 03 15	47.7 48.1 13 12.9 19.7 15		d d c c	U.S.C.G.S.: 62°N 148°W h = 100 km.	
102	Sept. 3	Iv	iPZ iZ iZ iSZ F	H 18 30 H 08 01 H H 18 32	16.5 20.6 28.6 31.5 32		c c  c c	See list, p. 158  Southern Monterey County	
103	Sept. 4	Iu	ePZ eSN eSE eN eLEZ F	H 15 06 G 11 16 G G G 16 24	57.5 12 14 26.2 29.2 24	12	c   c c	U.S.C.G.S.: Samoa Islands Region	
104	Sept. 5	Iu	eE eZ eN iZ iZ eN eE eZ F	G 03 G G H H G G G 04 41	18.6 20.4 21.9 31 53.8 32 37.3 35.9 42.8 44.7 41			U.S.C.G.S.: 17°N 121°E 2 shocks  Southern Monterey County	
105	Sept. 5	Ir	eNE eZ F	G 07 G 07 18	02.2 02.6 18			U.S.C.G.S.: Off British Columbia	
106	Sept. 6	Iv	iPZ iZ iZ eE iZ iZ iZ iZ iZ eZ iSZ	H 11 21 S H A H H H H H S SH	20.1 20.3 20.7 21.0 21.8 24.0 28.8 42.8 50.7 51.5 56.6		d c c  c c c	See list, p. 158	

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No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
106	Sept. 6 (cont.)	Iv	eE iE iZ iN iZ F	A G S G G	11 21 22 06.0 08.9 15.0 22.0			See list, p. 158	
			F		11 26				
107	Sept. 7	Iv	iSZ iZ iZ F	H H H	05 38 27.9 35.6 59.0		d c	Southern California?	
			F		05 40				
108	Sept. 7	I	iZ iZ eN eE F	H H G G	07 47 19.0 50 21.0 51.5 51.9		c d	See list, p. 158	
			F		08 01				
109	Sept. 7	Iv	iPZ iZ eZ iZ F	SH H S H	11 57 06.2 11.5 28.5 30.0		c c	U.S.G.C.S. 72°W 170°E Southern Monterey County	
			F		11 59				
110	Sept. 7	I	iPZ eZ eN eE F	H S G G	12 48 49.7 50.5 53.1 58.7		c d		
			F		13 04				
111	Sept. 7	I	ePZ F	SH	13 46 44.5 13 48			Underwater blast	
112	Sept. 7	Iv	iPZ iZ eEZ	H H	14 48 05.0 09.6			Southern Monterey County	
			eEZ	AS	12				
			eE	A	32.0			Underwater blast	
			iZ	H	37.3				
			iZ	H	41.0				
			iZ	S	43.3				
			F		14 50				
113	Sept. 7	Iv	iPZ eZ eSEZ iZ iZ F	H S ASH H H	17 13 44.4 45.0 57.2 58.4 59.2		d c c d	See list, p. 158	
			F		17 15				



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No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
114	Sept. 8	Iv	iPZ eEZ iZ iSZ eE F	H AS H SH A 03 30	03 28 32.9 33.5 46.6 49.7 51		d	See list, p. 158	
115	Sept. 9	Iu	iPZ iZ iZ F	H H H 20 39	20 37 47.6 55.2 38 06.4		c c c	U.S.C.G.S.: 17°S 172°W	
116	Sept. 10	Id	iPZ iZ iSZ F	H H H 14 42	14 40 17.0 19.7 22.4		d	See list, p. 158	
117	Sept. 12	IIu	ePZ iZ iSNE iE eLE eLZ eLN F	H H G G G G G 10 48	09 29 51.0 57.3 40 48.0 41 40.0 57.3 57.6 57.7		c c	U.S.C.G.S.: 22°S 170°E	
118	Sept. 12	Id	iPZ iSZ F	H SH 22 07	22 06 28.8 32.2		c		
119	Sept. 13	Id	iPZ iZ iZ iZ F	H S H S 18 37	18 34 41.9 42.1 47.7 50.4		c	Underwater blast	
120	Sept. 13	Id	iPZ iZ iZ iZ F	SH S H S 19 53	19 51 00.4 05.7 06.3 08.8		c	Underwater blast	
121	Sept. 14	Iv	iPZ iZ iZ iZ iSZ iZ iZ F	H H H SH S H S 05 32	05 28 42.6 45.6 49.1 52.1 29 01.3 25.6 36.4		d c c d	See list, p. 158	







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No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
135	Sept. 21	IIr	iPZ	SH 13 01 38.0		d	U.S.C.G.S.: 17°N 94.5°W
			ePN	G 40.5			
			ePE	G 44.5			
			iZ	H 45.8		c	
			eE	G 02 01.0			
			iZ	G 01.5		c	
			eN	A 05.5			
			iZ	H 05.6			
			iZ	S 06.1			
			iZ	H 17.8		c	
			iZ	S 18.1			
			iN	G 18.5			
			iPPZ	S 36.8			
			iZ	G 55.0			
			iN	G 03 15.5	30		
			iPcPZ	G 07 04 23.5			
			iSE	G 06 49.5	11		
			iN	G 15 55.5	6	d	
			eE	G 07 00.5		d	
			iNE	G 29.5		d	
			eN	G 07.9	27		
eZ	SH 08 47.0	7.0					
eEZ	G 08.8						
eN	A 09.2						
eZ	S 09.9						
F	04 37 31.5						
136	Sept. 21	Iu	iPZ	H 18 31 04.6	21	c	U.S.C.G.S.: 16°S 173°W
			eZ	G 05.0	20		
			eN	G 17 34 07.5			
			iZ	G 30.5			
			eN	G 03 40 26.5	22		
			eE	G 29.5			
			iN	G 04 34 43.0	14		
			iE	G 44.5			
			eN	G 49.3	22		
			eE	G 49.6			
			eZ	G 55.3	20		
F	19 52						
137	Sept. 22	Iu	ePZ	H 15 49 25.8		d	U.S.C.G.S.: 60°N 119°W U.S.C.G.S.: 42°N 142°E
			ipPZ	H 42.6		d	
			F	15 51			
138	Sept. 23	Iv	eZ	H 00 01 48.2		d	San Luis Obispo County
			eZ	H 02 21.2			
			F	00 03			



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949						s.		
139	Sept. 24	IIu	iPZ	H 04	30	36.3		d	U.S.C.G.S.: 6°S 154°E
			eE	G		37.0			
			iZ	G 13	54	38.0			
			iZ	H		38.5		c	
			iZ	H 15	30	43.9		d	
			iZ	H		48.2		d	
			eZ	G	31	43.0			
			iSN	G	41	00.0			
			iSE	G		10.0			
			eScSZ	G		23			
			iScSN	G		26.0			
			iScSE	G		28.0			
			iPPSE	G	42	02.0			
			iE	G	52	45.0			
			eN	G		56.4			
			eEZ	G		57.9	30		
			F	07	14				
140	Sept. 25	IIu	iPZ	H 15	27	58.1		d	U.S.C.G.S.: Aftershock
			iZ	H	28	00.9		d	
			iZ	G	30	01.5		d	
			iPPZ	G	32	26.0			
			iSE	G	38	30.0	7.0		
			iNE	G	39	45.5			
			iZ	G		49.0			
			iN	G	39	39.0		d	U.S.C.G.S.: 23°S 176°W
			iN	G	42	01.5			
			eN	G		54.4	21		
			eLE	G		55.9	28		
			eZ	G		57.4	20		
			F	17	32				
141	Sept. 26	Iu	eEZ	G 03	49.9		22		U.S.C.G.S.: Aftershock
			eN	G		50.4			
			F	04	34				
142	Sept. 26	Iu	eE	G 23	18.9		22		U.S.C.G.S.: Aftershock
			eN	G		19.4			
			F	23	30				
143	Sept. 27	IIIr	iPZ	H 15	36	35.1		d	U.S.C.G.S.: 60°N 149°W
			ePN	A		35.5			U.S.C.G.S.: 11°S 163°E
			iPNZ	G		39.5		d	
			iZ	S		41.8			
			iZ	H		44.9		d	
			iZ	G		50.5			U.S.C.G.S.: 21°S 170°E
			iZ	S		51.8			
			eSZ	S	41	29.0			
			iSZ	G		29.5			
			eSN	A		43.5			
			eZ	S	42	09.0			
			eLZ	S		44.2	23		
			eLN	A		44.3	22		
			F	16	53				

BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
144	Sept. 28	Iv	eSZ eZ F	H 13 53 17.6 H        22.1 13 54			See list, p. 158 176°W
145	Sept. 28	Iu	iPZ iZ iZ iZ F	H 15 20 01.2 H        05.2 H        09.0 H        16.6 15 22		c c d c	U.S.C.G.S.: 31°S 177°W
146	Sept. 28	Iu	iPZ eLNE eZ F	H 15 31 54.5 G        50.9 G        52.4 16 00	20	c	U.S.C.G.S.: Afternoon
147	Sept. 28	Id	iZ iZ F	H 00 35 10.9 H        13.7	22	d	Blast? Runs into next shock
148	Sept. 28	Id	eZ iZ iZ F	H 00 35 19.6 H        22.1 H        24.1 00 36		c	Blast?
149	Sept. 30	IIu	iPZ iPcPZ eE ePPPZ eE iSN iSE eSZ iN iE iE eLE eLN eLZ F	G 04 11 02.0 G        32.5 G        33.5 G        16 23.5 G        20 52.5 G        21 06.5 G        07.5 G        08.5 G        22 01.5 G        21.0 G        30 58.0 G        31.9 G        34.5 G        35.3 06 14	8.5 12.0 11.0 11.0 10.5 20 13 11.5	d d	U.S.C.G.S.: 23°S 176°W
150	Sept. 30	Iu	eLE eZ F	G 09 35.4 G        36.0 10 12	22 20		U.S.C.G.S.: 11°S 163°E
151	Sept. 30	Iu	eE eN eZ F	G 16 01.9 G        02.0 G        02.9 16 40			U.S.C.G.S.: 21°S 170°E



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
152	Sept. 30	Iu	iPZ	G 18 31	43.5		d	U.S.C.G.S.: 23°S 176°W
			eZ	H	48			
			iSE	G 41	42.5	6		
			iN	G	53.5	10		
			eE	G 42	01.5	9		
			eN	G	54.9	12		
			iE	G	55 37.5			
			iZ	G	56.5	8		
			eZ	G	57.9			
			eE	G	58.0	40		
			F	19	48			
153	Sept. 30	Iu	iZ	H 22 19	00.1		c	U.S.C.G.S.: Aftershock
			eE	G	45.1	23		
			eN	G	46.4			
			eZ	G	47.8	22		
			F	23	28			

Apparatus	Component
Wood-Anderson	H
	E
Series	Z

MT. HAMILTON

No.	Date	Time	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
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h. MOUNT HAMILTON

THE LICK OBSERVATORY STATION, UNIVERSITY OF CALIFORNIA 121°W 38°N  
MOUNT HAMILTON, CALIFORNIA

CONSTANTS OF THE STATION

Latitude and longitude:

$\phi = 37^{\circ} 20' 14''$  N.  
 $\lambda = 121^{\circ} 38' 16''$  W.

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 1281.7 meters (4205 feet) above mean sea level.

Apparatus	Component
Wood-Anderson .....	N E
Benioff .....	Z

6 July 5	IV	14 00	31.4	c	U.S.C.G.S.: 21°S 174°E
7 July 5	IV	14 02	31.4	c	
8 July 6	IV	19 57	03.6		See list, p. 157
			06.5		
			10.0		
			10.3		
9 July 9	IV	00 55	55.2	d	
		00 57			
10 July 9	IV	07 12	41.7	c	
			45.5		
			47.7		
			49.0		
		07 14			
11 July 9	IV	15 11	07.2	c	
		15 13			
12 July 9	IV	15 29	51.1	c	
			53.8		
		15 31			



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949						s.		
1	July 2	Iu	iPZ	20	09	27.5		d	U.S.C.G.S.: 16°N 148°E
			eNE			28.5			
			iZ			30.0		d	
			iZ			38.5		d	
			ePPZ		12	23			
			eSZ		20	06			
			F	20	47				
2	July 2	Iu	iPZ	23	10	43.7		d	
			F	23	12				
3	July 3	Iu	iPZ	04	26	14.2		c	
			iZ			24.2		c	
			F	04	28				
4	July 3	Iu	iPZ	21	56	50.1		c	U.S.C.G.S.: 12°S 76°W
			F	21	59				
5	July 4	Iu	iPZ	14	00	31.4		c	U.S.C.G.S.: 21°S 174°E
			F	14	02				Verdi aftershock
6	July 5	Iv	iPZ	03	47	09.6		d	
			iZ			11.9		d	
			iZ			20.8			U.S.C.G.S.: 39°N 71°E
			iSZ			37.0			
			eE			43.5			
			F	03	49				
7	July 5	Id	iPZ	06	08	21.4		d	
			iSEZ			22.6			
			iN			23.2			
			F	06	09				
8	July 6	Iv	iPZ	19	57	03.6			See list, p. 157
			eZ			06.5			
			eE			10.0			
			iSZ			10.3			
			F	19	59				
9	July 9	Iu	iPZ	00	55	55.2		d	
			F	00	57				
10	July 9	Id	iPZ	07	42	44.7		c	See list, p. 157
			iSEZ			46.6			
			iZ			47.7			
			iN			48.0			
			F	07	44				
11	July 9	Iu	iPZ	15	11	07.2		c	U.S.C.G.S.: 39°N 71°E
			F	15	13				
12	July 9	Id	iPNEZ	15	29	51.1		c	
			iSNEZ			53.8			
			F	15	31				

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
13	July 9	Id	iPNEZ iSEZ iN F	16 45	44.5 52.3 53.8		d	See list, p. 157
14	July 9	Iu	iPZ iZ iZ F	18 52	37.4 42.9 47.3		c d c	U.S.C.G.S.: 33°N 71°W
15	July 9	Iv	iPZ iSZ iZ F	20 32	34.6 16.4 21.7		d	
16	July 9	Iv	iPZ iSEZ F	23 02	15.6 48.4		c	Verdi aftershock
17	July 9	Iv	iPZ iSZ F	23 08	26.5 59.3		c	Verdi aftershock U.S.C.G.S.: Near Coast of Guatemala
18	July 10	Iu	iPZ eE iZ eN eE iPPZ eSKSN eSKSE ePSZ eE eLN eZ F	04 07	49.6 08 01 11 13.0 19 29 12 01.3 18 20 26 21 07 44.0 47.2 50.7	40 28	c c c c c c c c c c c c	U.S.C.G.S.: 39°N 71°E
19	July 10	Id	iPEZ iSE iSZ F	12 19	52.6 54.1 54.5		c	U.S.C.G.S.: New Britain
20	July 10	Id	iPZ iEZ iSE iEZ F	15 17	15.7 16.7 22.8 23.7		c	See list, p. 157
21	July 10	Iu	eP'Z iPPZ F	16 07	14 36.6		d c	U.S.C.G.S.: 39°N 71°E



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
22	July 10	Iu	eZ eZ iPPZ F	16 41 25 42 16.5 05 11 26.2 16 48				U.S.C.G.S.: 39°N 71°E
23	July 11	Iu	iPZ iZ F	16 23 01.2 24 01.2 16 26		d c		U.S.C.G.S.: 34°N 132°E U.S.C.G.S.: 15.5°S 166°E
24	July 13	Iv	iPZ iZ iSZ F	02 26 10.8 13 36.7 10 01 36.0 02 28		d c		U.S.C.G.S.: 42.5°N 112.5°E
25	July 13	Iu	ePZ F	10 08 55.5 10 11		c		
26	July 13	Iu	eZ F	20 41 15.0 20 43				
27	July 14	Iu	ePZ iZ iPPZ F	03 08 23 15 30 50.2 11 01.9 03 12				U.S.C.G.S.: Near Coast of Guatemala See list, p. 157
28	July 14	Iu	ePZ eZ F	19 27 48.5 28 04.0 19 30				U.S.C.G.S.: Near Coast of Central Mexico
29	July 14	Iu	iPZ iPPZ F	19 53 54.4 59.4 19 55		d d		U.S.C.G.S.: Java Sea
30	July 14	Iu	iPZ iZ iZ F	23 32 33.1 38.3 34 08.1 23 38		c c d		U.S.C.G.S.: 29°N 138°E h = 200 km U.S.C.G.S.: 16°S 74°W h = 100 km
31	July 15	Iu	ePZ F	09 28 55.5 09 31				U.S.C.G.S.: New Britain
32	July 15	Iv	iPZ iZ iZ iZ iZ F	15 40 04.1 09.3 41.2 45.5 48.2 15 42		c d		
33	July 15	Iv	iZ iZ iSZ eSE F	16 11 07.7 13.1 47.9 52.2 16 14		d c		

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
34	July 18	Iu	iPPZ eZ F	05 00 12 04.7 05 14	23.7		c	U.S.C.G.S.: 5.5°N 126°E
35	July 18	Iu	iPZ F	07 46 07 49	39.1		c	U.S.C.G.S.: Kermadec Is.
36	July 18	Iu	iPZ iZ F	08 39 41 36.7 08 42	28.5		c d	U.S.C.G.S.: 15.5°S 166°E
37	July 18	Iu	ePZ eZ F	10 04 31.5 10 07	14		c	U.S.C.G.S.: 42.5°N 142.5°E
38	July 18	Id	iPZ iSNEZ F	12 32 52.1 12 34	47.7		c	See list, p. 157 U.S.C.G.S.: 20.5°N 26.5°E
39	July 18	Id	iPZ iSNEZ F	15 29 05.0 15 30	03.6			
40	July 19	Iv	iPZ iSZ F	07 31 32 25.7 07 34	49.7		d	See list, p. 157
41	July 19	Iu	iPZ iZ F	09 48 49 11.6 09 51	52.3		c c	U.S.C.G.S.: Near Coast of Central Mexico
42	July 20	Iu	eP'Z iZ F	22 39 27.0 22 44	22		d	U.S.C.G.S.: Java Sea Islands Region
43	July 21	Iu	iPZ iZ ipPZ F	08 12 13 05.7 16.8 08 18	37.4		d c d	U.S.C.G.S.: 16°S 74°W h = 100 km.
44	July 21	Iu	iPZ F	17 19 17 21	46.5		d	See list, p. 157
45	July 21	Id	iPZ iSNZ F	20 52 53 01.7 20 54	59.9		d	U.S.C.G.S.: 29°S 177°W
46	July 23	Iu	iPZ F	07 11 07 13	36.5		c	



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
47	July 23	Iu	iPZ	10 39 11.0		c	U.S.C.G.S.: 18.5°S 169°E h = 200 km
			iN	20 06 12.0		c	
			iPcPZ	42.8		d	
			ipPZ	58.8		c	
			iZ	25 41 03.8		c	
			iPPZ	42 31.5			
			eZ	06 44 51.0			
			eSKSN	49 18.5			
			F	10 54			
48	July 23	Iu	iPZ	11 05 15.6		c	U.S.C.G.S.: Near Coast of Central Chile
			iZ	20.1		c	
			iZ	25.8		d	
			F	11 08			
49	July 23	IIId	iPNZ	13 58 08.6		c	See list, p. 157
			F	14 00			
50	July 23	Iu	ePZ	15 17 15			U.S.C.G.S.: 38.5°N 26.5°E
			eZ	21 09.5			
			eN	30 57.0		d	See list, p. 157
			F	16 12		d	
51	July 24	Iv	iPZ	03 04 38.0		d	See list, p. 157
			iSZ	05 04.3			
			F	03 06			
52	July 24	Iv	iPZ	06 27 02.4		c	See list, p. 157
			iSZ	29.6			
			F	06 29			
53	July 25	Iu	iPZ	04 02 33.7		c	U.S.C.G.S.: Marianas Islands Region
			ipPZ	36.4		d	
			iZ	04 26.9		c	
			F	04 06			
54	July 25	Iu	iPZ	11 35 51.8		d	U.S.C.G.S.: 32°S 111°W
			iZ	58.3			
			iPPZ	38 30.8			U.S.C.G.S.: 39°S 96°W
			F	11 40			
55	July 27	IIId	iPNZ	12 38 11.5		c	See list, p. 157
			F	12 40			
56	July 27	Iu	iPZ	15 24 05.4		c	U.S.C.G.S.: 29°S 177°W
			iZ	07.7		c	
			eN	08			
			eZ	50 33			
			eN	50.9			
			F	16 00			

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
57	July 28	Id	iPZ iZ iSNZ iZ F	19 59 20 00  20 01	58.9 03.9 05.5 07.9		c	See list, p. 157	
58	July 30	Iu	iPZ ipPZ F	06 40 06 43	12.0 16.5		c c	U.S.C.G.S.: 45.5°N 149°E South Southwest Pacific	
59	July 31	Iu	ePZ iZ iZ F	04 26 20 13 04 28	30.5 36.9 46.6		d c c	U.S.C.G.S.: Near Coast of Central Chile ICIS: Near 55°S 25°E	
60	July 31	IIId	iPNEZ iN iSEZ F	04 59 19 12 05 01	00.1 01.2 01.5		c c c	See list, p. 157 Foreshock	
61	Aug. 1	Iv	iPZ iP*NEZ iZ iZ eE iN F	00 07 19 18 08 19 26 00 10	50.9 53.3 14.8 16.5 20.5 21.0		d d d c	See list, p. 157 U.S.C.G.S.: 1°S 78°W Central Equator Quake	
62	Aug. 1	Iu	iPZ F	04 58 05 00	25.1		c	U.S.C.G.S.: Samoa Islands Region	
63	Aug. 1	Id	iPNE iNE iSZ F	07 56  07 58	23.3 27.8 28.1		d	See list, p. 157	
64	Aug. 1	Iu	ePZ F	08 06 08 08	48.0	1.0	d	U.S.C.G.S.: Eastern Turkistan	
65	Aug. 1	Ir	iPZ ipPZ iZ iZ F	08 09  10 08 13	46.0 52.4 57.3 16.3		c d d d	U.S.C.G.S.: 19°N 96°W	
66	Aug. 2	Id	iPNZ eE iSZ iSNE iZ F	03 08   03 10	42.9 44.0 47.7 48.2 50.3		d	See list, p. 157	



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
67	Aug. 2	Id	iPZ iPNEZ iZ iSZ iN F	07 14	29.7 30.3 35.2 40.8 42.0		d c c d c	See list, p. 157
				07 16				
68	Aug. 2	Iu	iPZ iZ iZ F	23 12	46.1 48.7 04.7		d d d	BCIS: Southwest Pacific U.S.C.G.S.: Near eastern Coast of Mexico
				23 16				
69	Aug. 3	Iu	ePZ iZ iZ F	20 43	29.5 32.0 46.0		c d c	BCIS: Near 55°S 25°E
				20 46				
70	Aug. 5	Iu	iPZ iZ F	19 12	34.1 38.6		c c	Foreshock See list, p. 157
				19 15				
71	Aug. 5	Iu	iPZ eNE iZ iZ eSE eSZ eSN F	19 18	24.2 25 29.1 16.1 22.5 24.5 25.5		c d c	U.S.C.G.S.: 1°S 78°W Central Equador Quake See list, p. 157
				19 55				
72	Aug. 6	Iu	iPZ iEZ eN iZ iZ iZ ePPZ eSZ eSN eE eZ iZ F	00 47	11.6 13.0 14.0 19.5 32.4 36.1 56.4 53 56 18 21 30.9	4.0	c c c d c c c c c c d	U.S.C.G.S.: 19°S 174.5°W U.S.C.G.S.: 50.5°W 130°W See list, p. 157
				01 00				
				01 43				
73	Aug. 6	Iu	iPZ iZ F	12 08	36.6 58.6		c d	U.S.C.G.S.: 19°S 174.5°W Region
				12 11				
74	Aug. 6	Iu	iPZ iZ iZ iZ F	16 02	46.7 51.5 04.9 13.5		c c c c	U.S.C.G.S.: 15°W 91°W U.S.C.G.S.: 19°S 174.5°W
				16 05				

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
75	Aug. 6	Iv	iPZ	18	27	29.2		d	Blast
			iZ	19	20	32.2		d	
			iZ			36.9		d	
			iZ	00	39	48.2		d	
			iZ	28	33	4			
			iZ			40.1			
			F	18	31				
76	Aug. 6	Iu	iPZ	18	59	35.3		c	U.S.C.G.S.: Near eastern
			ipPZ			40.1		d	Coast of Mexico
			F	19	01				
77	Aug. 6	Iv	eZ	23	31	14		d	Corona Blast
			iZ			24.4		d	
			eZ			29.0			
			iZ			32.8			
			F	23	33				
78	Aug. 7	Id	iPZ	01	36	57.1		d	See list, p. 157
			iPZ	01	37	58.1		c	
			eNE			59.1			
			iSNEZ	01	37	07.2			U.S.C.G.S.: 87°N, Approx.
			F	01	38				60°E
79	Aug. 7	Id	iPNEZ	03	42	49.5		c	See list, p. 157
			iSNE			52.3			
			F	03	44				
80	Aug. 7	Ir	iPZ	08	18	45.5		d	U.S.C.G.S.: 50.5°N 130°W
			ipPZ			51.3		d	U.S.C.G.S.: 1°N 78°W
			iZ			55.9		c	Aftershock
			iZ	08	19	36.3		c	
			F	08	22				
81	Aug. 7	Ir	iPZ	10	48	08.1		d	U.S.C.G.S.: 50.5°N 130°W
			iZ			14.1		d	
			F	10	50				
82	Aug. 8	IIId	iPNEZ	11	00	18.9		d	U.S.C.G.S.: Samoa Islands
			iE			28.5		d	See list, p. 157
			iSNEZ			30.2			
			iE	11	02	32.1		c	U.S.C.G.S.: 11°S 167.5°E
			F						
83	Aug. 8	Iu	iPZ	13	23	38.0		c	U.S.C.G.S.: Tonga Island
			F	13	26				Region
84	Aug. 8	Ir	iPZ	14	17	13.6		c	U.S.C.G.S.: 15°N 93°W
			ipPZ			18 26.8		c	
			F	14	21				



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
85	Aug. 8	Iu	iPZ F	19	18	23.7 19 20		d	U.S.C.G.S.: 16°S 75.5°W
86	Aug. 9	Iv	iPZ eNE iZ iZ iEZ iZ iN F	00	39	50.5 52.5 53.0 59.0 40 05.9 12.0 14.5 00 43		c d	See list, p. 157
87	Aug. 10	Id	iPZ iZ eNE iZ iSZ iNEZ iZ F	09	17	55.7 56.6 58.5 59.4 18 07.8 08.6 11.3 09 19		d d c	See list, p. 157
88	Aug. 10	Iu	iPZ eZ F	13	55	53.8 56 00.5 13 57		c	U.S.C.G.S.: 87°N, Approx. 60°E
89	Aug. 10	Id	iPZ iZ F	20	12	55.7 13 05.7 20 14		c	See list, p. 157
90	Aug. 11	Iu	iPZ ipPZ F	03	22	55.1 57.5 03 25		d c	U.S.C.G.S.: 1°S 78°W Aftershock
91	Aug. 11	Iu	iPZ iZ F	13	56	36.9 49.2 14 00		c c	U.S.C.G.S.: 15°N 93°W Aftershock
92	Aug. 11	Iu	iPZ iZ F	15	12	05.5 31.9 15 15		d c	U.S.C.G.S.: Samoa Islands Region
93	Aug. 12	Iu	iPZ ipPZ iZ ePPZ F	23	28	10.5 14.2 39.4 31 26.0 23 33		c c d	U.S.C.G.S.: 14°S 167.5°E
94	Aug. 13	Iu	iPZ iZ iZ iZ eZ F	18	38	00.7 16.7 24.2 46.9 41 40 18 45		c c c c	U.S.C.G.S.: 0° 146°E Region

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
95	Aug. 14	Iv	iPZ iZ iSZ F	08 20	22.2 26.7 39.2		c d	See list, p. 157
96	Aug. 15	Iu	ePZ iZ F	20 26 20 09	45.1 48.3		d	
97	Aug. 15	Iv	iPZ iZ iSZ F	23 53 23 55	19.2 23.0 36.9		d c	See list, p. 157
98	Aug. 16	Id	iPZ eNE iE iSNZ F	05 37 05 39	25.0 25.5 33.0 33.5		d	See list, p. 157
99	Aug. 17	Iv	iPZ eSZ F	00 08 00 10	48.4 01.6			See list, p. 157 See list, p. 157
100	Aug. 17	Id	iPZ iNEZ iSNE F	00 20 00 21	03.0 09.9 11.4		c	See list, p. 157
101	Aug. 17	Iu	iPZ F	03 26 03 29	45.1		d	See list, p. 157
102	Aug. 17	Iu	iPZ eNE ipPZ F	18 44 18 45 18 51	59.1 01 22.0		c c	U.S.C.G.S.: 43°N 146°E h = 100 km U.S.C.G.S.: Tonga Islands Region
103	Aug. 17	Iu	eP'Z eLE eLN eLZ F	19 02 19 42 19 45 19 45 19 56	23 42.9 45.3 45.9	22 18	d c c	U.S.C.G.S.: 39°N 40°E
104	Aug. 18	Iu	iPZ iZ F	02 34 02 36	12.4 20.6		d d	Probably Iyo County
105	Aug. 18	Iu	iPZ iZ F	10 09 10 12	37.8 41.6		c d	U.S.C.G.S.: Bonin Islands Region



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
106	Aug. 18	Id	iPZ	12	02 24.2		d	U.S.C.G.S.: Tonga Islands Region
			iE		08 17 26.1			
			iSZ		26.8			
		Iu	iN	08	57 27.1		d	U.S.C.G.S.: Tonga Islands Region
			F	12	03			
107	Aug. 18	Iu	iPZ	13	41 45.0		c	U.S.C.G.S.: 8.5°N 82.5°W
			iZ		46.0		d	
			eNE		47.5			
			iZ		56.0		c	
			iZ	42	26.0		c	
			iZ		35.0		c	
			F	13	46			
108	Aug. 18	Iv	iPZ	14	25 58.8		c	See list, p. 157
			eNE		26 02			
			iSZ	10	55 33.5			
			eE		36			
		Iv	iN	11	46 38.0		c	See list, p. 157
			iMZ		39.5			
			F	14	28			
109	Aug. 19	Id	iPNZ	00	12 34.0		d	See list, p. 157
			eE		34.5			
			iZ		37.7		d	
			iSNZ		43.1			
			iE		44.4			
			F	00	14			
110	Aug. 19	Id	iPNEZ	02	45 11.6		d	See list, p. 157
			iSEZ	20	43 15.6			
			iN		16.1			
			F	02	46			
111	Aug. 19	Iu	ePZ	08	37 11.0		c	U.S.C.G.S.: Tonga Islands Region
			ipPZ		17.0		c	
			F	08	39			
112	Aug. 20	Iu	iPZ	11	35 42.9		d	See list, p. 157
			iZ		49.5		c	
			iZ	36	06.2		d	
			F	11	38			
113	Aug. 21	Iv	iPZ	05	39 23.6		d	Probably Inyo County
			iEZ		28.9		c	
		Iv	iZ	18	47.9		d	See list, p. 158
			iZ	40	08.2			
			eN	18	51 13			
			iSNEZ		17.8			
		Iv	iZ	02	41 29.2		d	U.S.C.G.S.: Off British Columbia
			F	05	42			

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
114	Aug. 21	Iu	iPZ F	08 45 08 47	17.0 06.3		d	U.S.C.G.S.: Tonga Islands Region
115	Aug. 21	Iu	iPZ F	08 57 08 59	52.5 17.0		d	U.S.C.G.S.: Tonga Islands Region
116	Aug. 21	Iv	ePZ iPZ eNE	10 51	49.9 50.4 52		c d	See list, p. 157
			iZ iZ eE eE	09 52	58.5 07.2 10 27.7		d d	
			iZ iN iZ F	13 06 13 06 10 55	28.1 29.9 32.0		d c	U.S.C.G.S.: Tonga Islands Region
117	Aug. 21	Iv	iPZ eNE	11 46	06.6 08.5		c	U.S.C.G.S.: Off British Columbia See list, p. 157
			iZ iZ eE eN eE iNZ	04 22 04 27 04 31	09.2 12.6 19.5 25.0 27.0		c d	U.S.C.G.S.: 52.5°N 178°W
			iN iZ F	09 35 09 37 11 49	46.9 48.0		c	
118	Aug. 21	Iu	iPZ ipPZ iZ	20 43 20 48	25.1 33.2 51.5		c d d	U.S.C.G.S.: Near Coast of U.S.C.G.S.: 10.5°N 62.5°W
			iZ iPPZ F	23 39 20 48	56.2 46.5		d d	U.S.C.G.S.: Near 7°S 129.5°E
119	Aug. 21	Iv	ePNE	20 49	04.5		c	See list, p. 157
			iN iE iNE iSN	05 30 05 33	09.3 09.7 24.5		c	U.S.C.G.S.: Off British Columbia
			iE F	16 57 20 52	41.2 41.7		c	Pisadana: 34.5°N 120.5°W Near Point Conception
120	Aug. 23	Iv	iPZ iZ F	18 48 18 51	17.3 59.5		c	See list, p. 158
121	Aug. 24	Ir	ePZ F	02 41 02 43	57.5 17.0		d	U.S.C.G.S.: Off British Columbia



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
122	Aug. 24	Iv	iPZ	06	09	04.9		d	U.S.C.G.S.: 43.5°N 127°W
			iZ			06.3		c	Off Oregon Coast
			eNE			07.5			
			iZ			08.4		c	
			iZ			33.3		d	
			eZ	11	04				
			eE			45			
			F	06	27				
123	Aug. 24	Iu	ePZ	09	30	44.0		d	U.S.C.G.S.: 9°S 109°W
			eZ			47.5		d	
			F	09	36				
124	Aug. 24	Iu	iPZ	13	04	13.1		d	U.S.C.G.S.: Samoa Islands
			iZ			23.1		c	Region
			F	13	06				Aftershock?
125	Aug. 24	Ir	ePZ	22	41	16.5			U.S.C.G.S.: Off British Columbia
			F	22	44				Aftershock?
126	Aug. 25	Ir	iPZ	04	22	19.7		d	U.S.C.G.S.: 52.5°N 178°W
			iZ			31.4		d	
			iZ			48.6		d	
			eZ	27		54.1			Aftershock?
			F	04	31				
127	Aug. 25	I	iPZ	09	35	21.7		c	U.S.C.G.S.: Off British Columbia
			F	09	37				
128	Aug. 25	Iu	iPZ	18	44	50.7		d	U.S.C.G.S.: Near Coast of
			iZ			45		d	Northern Chili
			F	18	48				
129	Aug. 25	Iu	ePZ	23	39	59			B.C.I.S.: Near 7°S 129.5°E
			eP'Z		44	13			
			iPPZ			40.4		d	
			F	23	53				
130	Aug. 26	Iu	eZ	05	30	45.0			U.S.C.G.S.: Off British Columbia
			iZ			53.4		c	
			F	05	33				
131	Aug. 26	Iv	iPZ	16	53	15.3		c	Pasadena: 34.5°N 120.5°W
			eNE			16.0			Near Point Conception
			iZ			24.7		d	
			eN			28			
			eE			31			
			iZ			32.3			
			iSE	54		02.6			
			iSN			04.1			
			iN			17.0			
			F	16	59				

MT. HAMILTON

No.	Date	Char-acter	Phase	Time		Period	Trace motion	Remarks
				(G.C.T.)				
	1949			h.	m.	s.	s.	
132	Aug. 26	Ir	ePZ iZ F	22	44	03.5 25.4	d d	U.S.C.G.S.: Off British Columbia
133	Aug. 27	Iv	iPZ eNE iN iEZ iN iE iN F	14	52	30.0 30.5 44.5 48.0 50.3 53 16.5 25.5	c	Pasadena: 34.5°N 120.5°W Near Point Conception
134	Aug. 27	Iv	iPZ	14	56	43		Aftershock?
135	Aug. 27	Iv	iPZ	15	36	29		Aftershock?
136	Aug. 27	Iv	iPZ	15	41	16		Aftershock?
137	Aug. 27	Iv	iPZ	15	55	13		Aftershock?
138	Aug. 27	Iv	iPZ	16	34	13		Aftershock?
139	Aug. 27	Iv	iPZ	20	03	03		Aftershock?
140	Aug. 27	Ir	ePZ F	21	34	38.0 21 38		U.S.C.G.S.: Off British Columbia
141	Aug. 28	Iv	iPZ iZ eNE iZ eSNE iZ F	03	48	49.5 55.2 58.5 49 33.5 39.0 39.9	d d	Southern California?
142	Aug. 28	Iu	ePZ F	19	38	59.0 20 41	d	U.S.C.G.S.: 54°N 34°W
143	Aug. 29	IIId	iPNEZ iN iSNE F	01	56	08.2 11.6 13.2	d	See list, p. 158
144	Aug. 29	Iv	iPZ iZ iZ eN eE eN iZ F	12	07	52.1 55.7 08 01.1 02.0 24.5 26.5 27.4	d d	See list, p. 158



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
145	Aug. 30	Iu	ePZ iZ F	19 05	53.0 58.4		c	
146	Aug. 31	Iu	iPZ ipPZ iZ F	00 20 21 04	56.4 59.1 04.6		d c c	U.S.C.G.S.: Marianas Islands Region
147	Aug. 31	Ir	iPZ eZ iScPZ iZ F	13 53 59	17.6 40.5 40.6 44.6		c c d	U.S.C.G.S.: Southern Alaska
148	Sept. 1	Iu	iPZ iZ iZ iZ F	14 10	09.3 12.3 30.7 42.4		d d c	U.S.C.G.S.: 36°S 97°W
149	Sept. 1	Iu	iPZ F	17 11 17 13	38.4		c	U.S.C.G.S.: Marianas Islands Region
150	Sept. 1	Iu	iPZ iZ iZ F	18 34 35	51.6 09.9 16.6		c d d	U.S.C.G.S.: Galapagos Islands Region
151	Sept. 3	Iu	iPZ eNE ipPZ iZ F	03 12 13	53.6 59 09.0 50.0		d d	U.S.C.G.S.: 62°N 148°W h = 100 km
152	Sept. 3	Id	iPZ eNE iZ iSZ eNE F	16 44	03.5 04 06.4 11.6 12.0		d	Northern San Benito County Near Los Gatos 3-P = 12.5 sec. ca Off Coast of Monterey County?
153	Sept. 3	Id	iPZ eNE iPZ eE iSNEZ F	18 30	04.1 05 06.6 08.0 11.8		d	See list, p. 158
154	Sept. 4	Iu	ePZ F	15 06 15 08	50.5		d	U.S.C.G.S.: Samoa Islands Region

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
155	Sept. 4	I	ePZ F	18 34	59.0 18 37		d	Southern Monterey County
156	Sept. 5	I	ePZ eZ F	03 07	48.0 10 15.0 03 12		c	
157	Sept. 5	Iu	iPZ F	03 31	56.7 03 38		d	U.S.C.G.S.: 17°N 121°E
158	Sept. 5	Ir	iPZ F	06 58	22.9 07 01		c	U.S.C.G.S.: Off British Columbia
159	Sept. 6	Iv	iPZ eN iZ iE iZ iZ eNE iZ F	11 21	29.7 30.5 31.5 32.0 36.0 22 17.0 20.0 22.5 11 24		d c c c c c c c	See list, p. 158
160	Sept. 7	Iv	ePZ iZ iSZ eNE iZ iE iZ iZ eE iN F	05 37	53.0 56.8 38 17.5 18 16 12 20.8 16 14 24.0 17 40 34.3 38.3 39.5 40.8 05 40		c	Southern California? U.S.C.G.S.: 15.5°N 76°W Northern Santa Cruz County
161	Sept. 7	Id		22	51			S-P = 5 sec. Near Los Gatos
162	Sept. 7	Id		23	03.5			S-P = 12.5 sec. ca Off Coast of Monterey County?
163	Sept. 7	Iv	iPZ iZ eNE iZ eE eN F	11 56	54.8 55.9 57 57 07.9 13.7 14.8 11 59		d d	Southern Monterey County
164	Sept. 7	Iv	iPZ eNE iZ F	14 39	00.2 21.4 22.5 14 40		d	Southern Monterey County? Columbia



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
165	Sept. 7	Iv	iPZ iNEZ iZ iN iZ iSZ iN iE iZ iE F	14 47 58.8 48 05.3 06.0 10.8 14.5 17.1 19.3 21.0 21.4	55.9		c c c	Southern Monterey County  U.S.C.G.S.: South of Pinnacles Islands  U.S.C.G.S.: Off British Columbia
166	Sept. 7	Id	iPNEZ iZ iZ iSNE F	17 13 31.7 33.4 33.9 17 14	30.3		d	See list, p. 158  Underwater blast
167	Sept. 8	Iu	iPZ F	02 57 02 59	03.1		d	U.S.C.G.S.: 48°N 154°E
168	Sept. 8	IIId	iPZ iNE iSZ iNE F	03 28 21.1 27.8 28.8 03 30	20.5		d	See list, p. 158  Underwater blast
169	Sept. 8	Iu	iZ F	16 12 16 14	54.6		d	U.S.C.G.S.: 15.5°S 76°W
170	Sept. 8	Iu	iPZ iSZ F	17 40 08.8 17 41	01.7		c	Northern Santa Cruz County
171	Sept. 9	I	iPZ F	08 18 08 20	48.8		c	See list, p. 158
172	Sept. 9	Iu	iPZ iZ iZ F	20 37 47.0 48.0 58.0 20 39	47.0		c c c	U.S.C.G.S.: 17°S 172°W
173	Sept. 10	Iv	iPZ iSNEZ F	14 40 44.3 14 42	28.5		d	See list, p. 158
174	Sept. 11	I	eZ iZ iZ F	13 47 53.5 56.0 48 26.9 13 50	53.5		c c c	U.S.C.G.S.: 1°W 126°E
175	Sept. 12	Ir	eZ F	08 40 08 42	36			U.S.C.G.S.: Off British Columbia

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
176	Sept. 12	Iu	iPZ ipPZ F	09 29 09 32	52.5 59.5		c c	U.S.C.G.S.: 22°S 170°E
177	Sept. 12	Iu	iPZ iZ F	11 05 11 06	38.0 42.3		c c	U.S.C.G.S.: South of Fiji Islands
178	Sept. 12	Ir	iPZ F	14 42 14 44	21.1		d	U.S.C.G.S.: Off British Columbia
179	Sept. 13	I	iPZ F	07 05 07 07	36.3		c	
180	Sept. 13	Iv	eNE iPZ iZ eE iZ iZ eN iZ iZ F	18 34 18 35 18 35 35 20 05 20 05 14 15 12 18 36	53 53.2 55.8 06.5 06.8 09.5 14 16.2 19.3		d d c d	Underwater blast Pasadena: Mexico
181	Sept. 13	Iv	iPNEZ iZ iZ	19 51 19 51 19 51	11.6 13.6 25.6		d d d	Underwater blast
182	Sept. 14	Iv	iSZ eE eN iZ F	16 22 16 25 16 25 19 52	31.3 32.5 34 38.3		d d d	Southwestern Talara County 7 at Santa River Powerhouse No. 3 and at Karnville U.S.C.G.S.: 11°S 68.5°W h = 100 km.
182	Sept. 14	Iv	iPZ eNE iZ iZ eNE F	05 28 05 28 29 29 05 31	53.6 54.0 55.8 48.1 52.5		c d c d	See list, p. 158 See list, p. 158
183	Sept. 14	Id	iPZ iSNEZ F	20 00 20 01	25.7 32.5		c d	See list, p. 158 See list, p. 158
184	Sept. 14	Iu	iPZ iZ iZ iPPZ iZ iZ eZ F	20 04 20 04 20 04 09 20 20 24 20 29	35.2 36.5 57.0 00.5 18.0 21.5 19.0		c d d	U.S.C.G.S.: 1°N 126°E



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
185	Sept. 15	I	iPZ iZ F	16 06 16 08	43.2 47.0		c c	
186	Sept. 15	I	iPZ iZ F	18 48 18 50	54.2 17.3		c d	
187	Sept. 16	Id	iPZ iZ iSZ F	07 15 07 16	02.1 03.7 12.5			See list, p. 158
188	Sept. 16	Ir	iPZ iZ iZ F	15 46 15 52	59.3 29.2 18.8		d d	Pasadena: Mexico
189	Sept. 16	Ir	ePZ eSZ iZ eZ F	20 46 20 56	30 20 58.3 37	17		Pasadena: Mexico U.S.C.G.S.: 17°N 96.5°W
190	Sept. 17	Iu	iPZ iZ F	02 34 02 36	55.5 16.1		c d	
191	Sept. 17	Iv	iPZ iSZ F	16 22 16 25	53.3 26.7			Southeastern Tulare County V at Kern River Powerhouse No. 3 and at Kernville
192	Sept. 18	Iu	iPZ iZ ipPZ iZ F	12 57 12 59	15.1 24.2 34.7 03.6		d d d d	U.S.C.G.S.: 14°S 68.5°W h = 100 km.
193	Sept. 18	Id	iPNE iSNE iZ F	13 03 13 04	16.2 23.4 25.1		d	See list, p. 158
194	Sept. 18	IIId	iPNEZ iSNEZ iNEZ F	14 40 14 41	05.4 07.2 07.6		d	See list, p. 158
195	Sept. 19	I	iPZ F	13 17 13 19	41.0		d	U.S.C.G.S.: 42°N 112°W

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
196	Sept. 20	Iv	iPZ	04	15 23.1		d	U.S.C.G.S.: V at Yermo
			eNE		25		d	
			iZ		26.1		c	
			iZ		39.8			
			iZ	16	39.7			
			eN		41			
			eE		49.0			
		F	04	18	59.0			
197	Sept. 20	Iu	iPZ	12	07 58.5		c	U.S.C.G.S.: 30°S 178°W
			iZ		08 06.2		d	
			iZ		16.0		d	
			ePPZ		11 31.5			
			F	12	13	12.0		
198	Sept. 20	I	iPZ	12	21 59.0		d	See list, p. 158
			iZ		22 08.5		d	
			iZ		14.0		c	
			iZ		21.4		c	
			iZ		40.0		c	
			F	12	24			
199	Sept. 21	Ir	iPZ	13	01 29.2		c	U.S.C.G.S.: 17°N 94.5°W
			iZ		31.0		d	
			eNE		32.5			
			iZ		35.6		d	
			iZ		38.1		c	
			iZ		50.0		d	
			iZ		57.5		d	
			iZ	15	02 00.0		c	
			iE		02.0		d	
			iZ	15	10 06.5		d	
			iN		14.8			
			iPPPZ		55.0		c	
			eSSZ		08 46			
eZ		10 25						
	F	13	23	23.6		d		
200	Sept. 21	Iu	iPZ	18	31 05.1		c	U.S.C.G.S.: 16°S 173°W
			iZ		07.7		d	
			F	18	33			
201	Sept. 22	I	iPZ	00	45 28.9		c	
			F	00	47			
202	Sept. 22	I	iPZ	09	21 22.4		c	U.S.C.G.S.: 60°N 112°W
			F	09	22			
203	Sept. 22	Iu	ePZ	15	49 28.6		c	U.S.C.G.S.: 42°N 142°E
			ipPZ		47.9		d	
			F	15	51			





No.	Date	Character	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
204	Sept. 23	Iv	iPZ	00	01	33.0		c	San Luis Obispo County
			iZ			36.6		d	
			eNE			36.7			
			iN			57.7	28		
			iSEZ	02	00	00.7	22		
			F	00	03		22		
205	Sept. 23	Iu	iPZ	08	22	59.8			U.S.C.G.S.: Near
			F	08	24				Vladivostock,
									U.S.S.R.
206	Sept. 24	Iu	iPZ	04	30	38.9		d	U.S.C.G.S.: 6°S 154°E
			iZ			49.9		c	See list, p. 158
			ePPZ		34	12.0			
			F	04	36				
207	Sept. 24	Iv	iPZ	09	28	00.6		d	See list, p. 158 177°W
			eN			28.1			
			iSEZ			29.9			
			F	09	30				
208	Sept. 24	Iv	iPZ	09	45	17.4		d	See list, p. 158
			iSEZ			47.0			
			F	09	47				
209	Sept. 24	Id	iPZ	20	36	52.3		d	U.S.C.G.S.: 23°S 176°W
			iSNEZ			55.7			
			F	20	38				
210	Sept. 25	Iu	iPZ	15	27	57.7		d	U.S.C.G.S.: 6°S 154°E
			iZ		28	16.3		d	Aftershock
			F	15	30				
211	Sept. 26	Iu	iPZ	03	18	10.4		d	U.S.C.G.S.: 6°S 154°E
			F	03	19				
212	Sept. 26	Iu	iPZ	08	17	23.6		d	U.S.C.G.S.: 6°S 154°E
			F	08	19				
213	Sept. 27	IIId	ePNEZ	03	00	27.6		c	
			iZ			29.5			
			iSNEZ	15	28	30.7			U.S.C.G.S.: 21°S 170°E
			iNZ	15	31	32.8			
			F	03	02				
214	Sept. 27	Ir	iPZ	15	36	41.3		d	U.S.C.G.S.: 23°S 176°W
			eN			42			U.S.C.G.S.: 60°N 149°W
			eE			45			
			iZ		22	46.0		d	
			iZ		37	09.8		d	
			iPPZ		22	30.5		d	
			iZ			46.0		d	
			iZ	22	38	22.0		c	



No.	Date	Character	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
214	Sept. 27 (cont'd.)	Ir	eZ eSZ eNE eLN eLE eZ F	15 40 05 41 40 41 44 16 21 43 17 13		28 22 22			
215	Sept. 28	Id	iPZ iSNEZ F	03 28 13.1 15.1 03 29			c		
216	Sept. 28	Id	iPZ iSZ F	13 52 51.5 57.7 13 54			d	See list, p. 158	
217	Sept. 28	Iu	iPZ iZ iZ F	15 20 01.7 11.2 16.5 15 23			c c c	U.S.C.G.S.: 31°S 177°W	
218	Sept. 29	I	iPZ F	06 06 34.6 06 07			c	Component	
219	Sept. 30	Iu	iPZ iZ iZ iZ F	04 10 58.9 11 04.1 09.9 23.9 04 14			c c	U.S.C.G.S.: 23°S 176°W	
220	Sept. 30	Iu	iPZ iZ iZ iZ F	04 21 51.2 55.4 23 02.5 34.4 04 24			c d c c	Aftershock	
221	Sept. 30	Id	iPZ iN iSEZ F	04 52 07.6 10.0 10.4 04 53			c		
222	Sept. 30	Iu	ePZ F	15 28 41.5 15 31				U.S.C.G.S.: 21°S 170°E	
223	Sept. 30	Iu	iPZ iZ F	18 31 42.5 47.3 18 35			d c	U.S.C.G.S.: 23°S 176°W Aftershock	
224	Sept. 30	I	iPZ iZ iZ iZ F	22 19 00.7 12.6 22 10.7 24.7 22 23			d d d c		





PALO ALTO

THE BRANNER STATION, STANFORD UNIVERSITY  
PALO ALTO, CALIFORNIA

U.S.G.S.: 16°N 118°E

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 37^{\circ} 25' 11'' \text{ N.}$$

$$\lambda = 122^{\circ} 10' 18'' \text{ W.}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 83 meters (272 feet) above mean sea level.

Apparatus	Component
Wood-Anderson .....	N E
Benioff .....	Z

U.S.G.S.: 39°N 71°E

U.S.G.S.: 29°N 138°E  
h = 200 km

B.G.I.S.: 29.4°N 138.4°E  
h = 400-500 km

U.S.G.S.: 16°S 74°W  
h = 100 km

U.S.G.S.: 18.5°S 169°E  
h = 200 km

## PALO ALTO

From the ISC collection scanned by SISMOS

No.	Date	Character	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m.	s.			
	1949							
1	July 2	Iu	ePZ iPZ iPE eSKSE F	20 09 26.3 26.6 19 31 20 21	25.0 26.3 26.6 31 21		d	U.S.C.G.S.: 16°N 148°E  See list, p. 157
2	July 3	IId	iPEZ iSEZ F	01 43 01 44	51.5 53.3			
3	July 6	Id	iPNEZ iSE F	19 56 57 19 58	57.8 00.8		c	See list, p. 157 177°W
4	July 9	Id	iPZ iSZ iSE F	16 45 46 16 47	48.4 01.5 01.9		c	See list, p. 157
5	July 10	Iu	ePZ eZ ePPZ eN eE eN F	04 07 11 18 17 44.7 46.8 05 13	45 08.5 54.5 17 44.7 46.8 13			U.S.C.G.S.: 39°N 71°E  U.S.C.G.S.: 15.5°N 110°E  See list, p. 157
6	July 10	Id	iPEZ iPN iSEZ iSN F	15 17 05 00 05 07 15 18	21.8 22.3 32.7 33.3		c	See list, p. 157
7	July 14	Iu	iZ iZ iZ F	22 33 09.1 12.1 22 34	05.1 09.1 12.1			U.S.C.G.S.: 29°N 138°E h = 200 km
8	July 14	Iu	iPZ iZ F	23 32 34 23 34	37.1 05.5		d	See list, p. 157 B.C.I.S.: 29.½°N 138.¼°E h = 400-500 km
9	July 21	Iu	iPZ ipPZ F	08 12 13 08 14	39.1 28.7		d	U.S.C.G.S.: 16°S 74°W h = 100 km U.S.C.G.S.: 19°N 96°W
10	July 23	Iu	iPEZ iPN iPPEZ ePPN F	10 39 10 42 10 40	09.4 10.3 28.4 31.5		c	U.S.C.G.S.: 18.5°S 169°E See list, p. 157 h = 200 km





PALO ALTO

No.	Date	Character	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
11	July 23	Id	iPNEZ iSNE F	13 58	13.9 19.5			See list, p. 157	
12	July 27	IIId	iPE iPNZ iSE iSN F	12 38	16.4 16.8 21.4 22.0			See list, p. 157 U.S.C.G.S.: Near 55°S 25°E	
13	July 27	Iu	iPEZ ePN F	15 24	04.2 05.5		d	U.S.C.G.S.: 29°S 177°W	
14	July 27	IIId	iPNEZ iSNE F	19 56	00 01.4		c		
15	July 28	Id	iPNEZ iSNE F	19 59	54.2 57.2		c	See list, p. 157	
16	July 30	Iu	iPZ F	06 40	09 06 41		c	U.S.C.G.S.: 45.5°N 149°E	
17	July 31	Id	iPZ iPNZ iNE F	04 59	07 08 17.5			See list, p. 157	
18	Aug. 1	Iv	ePZ iP*Z eP*NE iSE iSNZ F	00 07	53 56+ 57 08 25 26		d c	See list, p. 157	
19	Aug. 1	Id	iPEZ ePN iSE iSZ iSN F	07 56	27 28 34 35 36		c	See list, p. 157 U.S.C.G.S.: 19°S 174.5°W	
20	Aug. 1	Ir	iPZ F	08 09	52 08 11		c	U.S.C.G.S.: 19°N 96°W	
21	Aug. 2	Id	iPZ iPNE iSZ iSNE F	03 08	50 51 09 00 01 03 10		c	See list, p. 157	

No.	Date	Char-acter	Phase	(G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
22	Aug. 2	Iv	iPNEZ iE iZ iN F	07 14 35 50 51 52			d	See list, p. 157
23	Aug. 3	Iu	eZ F	20 43 31 20 44				B.C.I.S.: Near 55°S 25°E
24	Aug. 4	Id	iPZ iNEZ iSZ iN iE F	18 31 31 32 40 42 44 18 34			c d	Blast
25	Aug. 4	Id	iZ iE eNEZ eN eNEZ iZ iN iE F	19 58 21 22 24 31 33 54 55 56 20 00				Blast See list, p. 157
26	Aug. 5	Iu	ePZ F	19 12 36.0 19 14			c	Foreshock
27	Aug. 5	IIu	iPZ eN eE iZ eSN eSE eLE eN F	19 18 26.7 27.2 27.7 30.5 26 26 29 37 40 19 47			c	U.S.C.G.S.: 1°S 78°W Central Ecuador Quake
	Aug. 9	IIv				15		
28	Aug. 6	Iu	ePZ eNZ eE iZ iNE iE iN eNEZ eE eE eN eSE eLN eE F	00 47 09.2 10.2 11.7 29.4 30.3 37.1 37.7 48 02.7 51 02 42 43 56 44 01 06.5 09 01 25			c d	U.S.C.G.S.: 19°S 174.5°W See list, p. 157



No.	Date	Character	Phase	Time (G.C.T.)			Period s.	Trace motion	Remarks
				h.	m.	s.			
	1949								
29	Aug. 6	Iv	iPNEZ	18	27	24.0		d	Blast?
			iEZ			29.8		c	
			eN			34.5			
			iZ			38.8		c	
			eE			39			
			iZ	17	28	28.3			
			F	18	32				
30	Aug. 7	Id	iPZ	01	37	01.8		c	See list, p. 157
			eN			03			
			eE			04			
			eSN			13.8			
			iZ	17	59	15.1			
			eE			16.1			
			eN	18	00	16.8			Blast?
			F	01	38				
31	Aug. 7	Id	iPZ	03	42	52.6			See list, p. 157
			eSNZ			57.5			
			iE	18	00	58.3			
			iN			59.9			
			iN	18	43	00.6			Blast?
			iS*E			02.5			
			F	03	44				
32	Aug. 8	IIId	iPNZ	11	00	13.6			See list, p. 157
			iE	18	02	14.1			
			iS?N			21.2			
			F	11	02				Blast?
33	Aug. 9	Iv	iPZ	00	39	49.4		c	See list, p. 157
			eNE			50.1			
			iSNZ		40	05.9			
			iE	18	00	06.6			
			F	00	42				
34	Aug. 9	IIv	ePZ	00	44	46.5			Blast?
			eNE			49.3			
			iZ			50.9			
			eN	18	04	53.2			
			eE			54.4			
			eN	13	45	06.2			U.S.C.G.S.: 15°N 93°W
			eNZ			18.2			Aftershock
			iZ	13	59	21.2			
			F	00	46				
35	Aug. 10	Iv	ePZ	09	18	00.9		d	U.S.C.G.S.: Samoa Islands
			iPZ	15	13	01.2		c	See list, p. 157
			eE			01.7		d	
			eN	02	20	02.1		d	See list, p. 157
			iEZ			05.4			
			eNEZ			10.7			
			iSNEZ			18.4			
			F	09	19				



No.	Date	Character	Phase	e (G.C.T.)			Period s.	Trace motion	Remarks
				h.	m.	s.			
	1949								
36	Aug. 10	Id	iPZ	17	57	38.7		c	Blast?
			iPNEZ			40.1		d	
			iSNEZ			41.7			
			iNEZ	23	51	42.9			
			eZ			44.2			
			F	17	57	46			
37	Aug. 10	Id	iPZ	17	58	54.5		d	Blast?
			iNZ			56.0		c	
			iSNZ			57.7			
			iEZ	05	38	58.8			
			iZ		59	00.1			
			F	17	59	02			
38	Aug. 10	Id	iPZ	18	00	37.8			Blast?
		Id	iEZ	00	08	39.3		c	See list, p. 157
			iNEZ	00	09	40.9			
			iNEZ			41.9			
			eZ	00	19	43.4		d	See list, p. 157
			F	18	00	45			
39	Aug. 10	Id	iPZ	18	02	06.2			Blast?
			iZ			07.8		c	
		Id	iZ	10	09	09.2		c	U.S.C.G.S.: Bonin Islands Region
			iZ	10	10	10.2			
			iZ			11.7			
			F	18	02	13		c	U.S.C.G.S.: 8.5°N 82.5°W
40	Aug. 10	Id	iZ	18	03	26.1		c	Blast?
			iZ			27.7		c	
			iZ			29.2			
			iZ			30.1			
			iZ	13	15	32.7			
			F	18	03	33			
41	Aug. 11	Id	iZ	18	04	42.5			Blast?
			iZ	20	15	43.0			
			iZ			50.5			
			iZ	21	38	53.1			
			F	18	04	55			
42	Aug. 11	Ir	ePZ	13	56	36.5			U.S.C.G.S.: 15°N 93°W
			eZ	21	57	44.3			Aftershock
			F	13	59				
43	Aug. 11	Iu	iPZ	15	12	04.2		d	U.S.C.G.S.: Samoa Islands Region
			iZ			15.5		d	
			F	15	13				
44	Aug. 11	Iv	ePZ	08	20	20.7		d	See list, p. 157
			eSNE			37.3			
			F	08	22				
			iSNEZ			28.1			
			F	02	16				





No.	Date	Character	Phase	e			Period	Trace motion	Remarks
				(G.C.T.)					
				h.	m.	s.	s.		
	1949								
45	Aug. 15	Iv	iPZ eSNE eN F	23 53	16.0 31.3 37.1			See list, p. 157	
46	Aug. 16	Id	iPZ iNE iZ iSN iE F	05 37	28.7 31.2 32.6 42.0 42.4		c	See list, p. 157	
47	Aug. 16	IIId	iPNEZ F	19 55 19 58	13.9			$\bar{S}-\bar{P} = 1.9$ sec. ca.	
48	Aug. 17	Id	iPZ F	00 08 00 09	48.3		d	See list, p. 157	
49	Aug. 17	IIId	iPNZ iPE iSE F	00 19 20 03.3 00 21	58.1 59.3		d	See list, p. 157 because the records were being changed at this time	
50	Aug. 18	Iu	iPNEZ F	10 09 10 10	35.9		c	U.S.C.G.S.: Bonin Islands Region	
51	Aug. 18	Iu	ePZ iZ eN eE eZ eNE F	13 41 42 07.7 13 44	48.2 50.0 50.7 51.4 57.1 07.7		c c	U.S.C.G.S.: 8.5°N 82.5°W	
52	Aug. 18	Id	iPZ iSZ F	20 14 20 15	27.2 30.2		d	U.S.C.G.S.: Aleutian Islands	
53	Aug. 18	Id	iPNZ iPE iSEZ iNE F	21 38	54.0 54.5 55.7 57.6		c	See list, p. 157	
54	Aug. 19	Iv	iPNEZ iSNE iZ F	00 12 00 13	38.3 51.8 54.4		d	U.S.C.G.S.: 53°N 132°W	
55	Aug. 19	Id	iPZ iPNE iZ iSNEZ F	02 45 02 46	18.7 19.1 26.1 28.4		c	See list, p. 157 U.S.C.G.S.: 13.5°N 127°W d = 100 km	

No.	Date	Char- acter	Phase	Time (G.C.T.)		Period s.	Trace motion	Remarks
				h.	m. s.			
	1949							
56	Aug. 21	Iv	iPZ iZ iSE iSZ iSN F	05 39 05 43 40 05 22 05 26 05 41	33.9 38.5 25.0 25.8 26.4			Probably Inyo County 176°W
57	Aug. 21	Iv	iPZ iNE iZ F	10 51 52 10 53	49.2 25.4 26.7	c		See list, p. 157
58	Aug. 21	Iv	iPZ eN eE F	11 46 11 52 11 48	07.0 40.6 41.0	d		See list, p. 157 Pasadena, 34.5°N 121.5°W Near Point Conception
59	Aug. 21	Iv	iSN iZ F	20 49 51 20 52	43.5 41.4			See list, p. 157 P was not recorded because the records were being changed at this time
60	Aug. 22	IIr	iPZ ePNE iN iE iSE iNE iLZ eN F	04 05 15 53 15 08 09 10 13.3 06 58	24.7 25.1 51.1 52.1 34.6 08.1 23 13.3	d		U.S.C.G.S.: 54°N 133°W After shock
61	Aug. 22	Ir	iPZ F	06 39 06 40	00.9	c		U.S.C.G.S.: Aleutian Is- lands
62	Aug. 22	I	iPZ F	15 05 15 06	23.5	d		
63	Aug. 23	Iv	iPZ iZ F	18 43 18 50	12.4 59.7	c		See list, p. 158
64	Aug. 23	Ir	iPZ ePN ePE eSNE F	20 28 20 36 20 38 20 31 21 30	31.8 36 38 59	d		U.S.C.G.S.: 53°N 132°W Northern San Benito County
65	Aug. 24	Iv	iPZ F	06 09 06 11	00.2	d		U.S.C.G.S.: 43.5°N 127°W Off Oregon Coast
66	Aug. 24	Iu	iPZ ipPZ F	06 37 38 06 39	37.2 04.3	c		U.S.C.G.S.: 22°S 176°W h = 100 km





No.	Date	Character	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
67	Aug. 25	Ir	iPZ F	04 22 04 25	16.9		c	U.S.C.G.S.: 52.5°N 178°W	
68	Aug. 25	Id	iPZ iSZ F	06 22 06 23	44.4 50.1			Santa Clara County	
69	Aug. 26	Iv	iPZ ePNE iZ iN iE F	16 53 18 22 23 54 16 57	17.9 18 24.9 56.7 19.5		d	Pasadena: 34.5°N 120.5°W Near Point Conception	
70	Aug. 27	IIv	iZ eNE eN eNE eN F	14 52 15 40 15 40 15 40 15 53 14 59	32.5 33.2 45.7 49.4 25.2		c	Pasadena: 34.5°N 120.5°W Near Point Conception	
71	Aug. 27	I	eZ F	15 36 15 38	31.6			Aftershock? Southern Monterey County	
72	Aug. 27	Iv	eZ iZ F	15 55 15 56	15.4 24.9		d	Aftershock Southern Monterey County?	
73	Aug. 29	IIId	iPZ iPNE iSNE F	01 56 01 57 01 58 01 59	11.8 12.8 20.0			See list, p. 158 Southern Monterey County	
74	Aug. 29	Iv	eZ iPZ iSZ eN F	12 07 12 08 12 11 12 11	58.1 02.6 23.3 40.3			See list, p. 158	
75	Aug. 29	IIId	iPNZ iPE iSN iSE F	20 26 20 27 20 28 20 28	41.3 41.8 44.0 44.4			See list, p. 158	
76	Sept. 3	Iv	iPZ iSEZ eSN F	16 44 16 46	07.9 21.5 23			Northern San Benito County Northern Santa Cruz County	

No.	Date	Character	Phase	Time (G.C.T.)			Period s.	Trace motion	Remarks
				h.	m.	s.			
	1949								
77	Sept. 3	Id	iPZ iN iN iE iSNE F	18 30	08.5 12.6 16.6 18 23.0			See list, p. 158	
78	Sept. 6	Iv	iPZ iPNE eNE F	11 21 11 22 11 26	25.2 26.4 07		c	See list, p. 158	
79	Sept. 7	Iv	ePZ iZ eNE eNE F	05 37 05 38 05 40	58 20.6 26 44			Southern California?	
80	Sept. 7	Id	iPZ iSNZ iSE F	06 50 06 51 06 51	10.8 14.7 15.2			See list, p. 158 Near Los Gatos	
81	Sept. 7	Iv	iPZ eN F	11 57 11 59	01 25		c	Southern Monterey County	
82	Sept. 7	Iv	iPZ eSZ F	14 39 14 41	03.8 26		c	Southern Monterey County?	
83	Sept. 7	Iv	ePZ iPZ ePN iSN iSE F	14 47 14 48 14 02 14 10 14 10 14 51	59.7 01.7 02 25.0 25.5			See list, p. 158 Southern Monterey County	
84	Sept. 7	Id	iPZ eSNE F	17 13 17 15	37.2 48		c	See list, p. 158	
85	Sept. 8	Id	iPZ iPN iPE iSNE F	03 28 03 28 03 28 03 28 03 30	24.0 24.7 26.1 35.6		c	See list, p. 158	
86	Sept. 8	Id	iPNZ iPE iSN iSE F	17 39 17 41 17 41 17 41 17 41	56.4 56.9 59.5 59.9			Northern Santa Cruz County	



No.	Date	Character	Phase	Time (G.C.T.)			Period s.	Trace motion	Remarks
				h.	m.	s.			
	1949								
87	Sept. 10	Id	iPZ ePN ePE iSN iSEZ F	14 40	24.6 25.6 26.6 36.1 36.6		d	See list, p. 158 119°W	
88	Sept. 13	Iv	iPZ eSNE F	18 34 35 01 18 37	45.7 07.1		d	Blast	
89	Sept. 13	Iv	iZ iZ eSNE iE F	19 51 19 52 19 20 19 54	04.6 05.2 19.6 40.9		c d	Blast	
90	Sept. 14	Iv	iPZ eSNE F	05 28 29 37.6 05 31	47.2 37.6		d	See list, p. 158	
91	Sept. 14	IIId	iPNZ iPE iSN iN F	20 00 20 01	19.9 21.3 23.2 27.9			See list, p. 158	
92	Sept. 16	Id	iPZ F	07 14 07 16	59.2		c	See list, p. 158	
93	Sept. 18	Id	iPZ iSN iSE F	13 03 13 04	20.3 33.4 34.0		d	See list, p. 158	
94	Sept. 18	Id	iPZ iPN iPE iSN iSE F	14 40 14 42	13.6 14.1 15.1 20.8 22.1		c	See list, p. 158	
95	Sept. 20	Iu	iPZ F	12 07 12 15	57.4		c	U.S.C.G.S.: 30°S 178°W	
96	Sept. 20	I	ePZ F	12 22 12 23	01				
97	Sept. 21	Ir	ePE ePN eE F	13 01 13 21	32 35 04			U.S.C.G.S.: 17°N 94.5°W	



PALO ALTO

No.	Date	Station	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
98	Sept. 27	Ir	iPZ	15	36	39			U.S.C.G.S.: 60°N 149°W
			iZ			43.2			
			ePNE			44			
			eSZ		41	22			
			eLN		44.4				
			eLE		44.5				
			eLZ		44.6				
			F	16	19				
99	Sept. 28	Id	iPZ	13	52	56.5		d	See list, p. 158
			iSZ		53	07.1			
			F	13	54				
100	Sept. 28	Iu	eZ	15	20	00			U.S.C.G.S.: 31°S 177°W
			eZ			15			
			F	15	21				
101	Sept. 30	IIId	iPZ	22	59	30.6		c	
			iNEZ			31.0		d	
			iSNE			34.0			
			F	23	01				

Apparatus	Component
Wood-Anderson .....	H E

Note: During the month of August, difficulties with the station radio receiver prevented reception of any Naval Observatory Time Signals. Therefore the times of earthquakes registered during this period are given only to the nearest minute of G.C.T.



SAN FRANCISCO

THE SAN FRANCISCO STATION, UNIVERSITY OF SAN FRANCISCO  
SAN FRANCISCO, CALIFORNIA

CONSTANTS OF THE STATION

Latitude and longitude:

$\phi = 37^{\circ} 46' 14''$  N.  
 $\lambda = 122^{\circ} 27' 12''$  W.

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 100 meters (328 feet) above mean sea level.

Apparatus	Component
Wood-Anderson .....	N E

Note: During the month of August, difficulties with the station radio receiver prevented reception of any Naval Observatory Time Signals. Therefore the times of earthquakes registered during this period are given only to the nearest minute of G.C.T.

No.	Date	acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
1	July 2	Iu	iPNE eNE eLE	20	09	24.8 10 29 38.0			U.S.C.G.S.: 16°N 148°E Off Oregon
18	Aug. 29	Id	F	20	49				See list, p. 157
2	July 10	Iu	eE eN F	04	43.8 44.1				U.S.C.G.S.: 39°N 71°E Surface waves
19	Sept. 6	Iv	F	05	21				
3	July 10	Iv	iPNE iSE iSN	15	17	29.5 44.5 45.0			See list, p. 157
20	Sept. 7	Iv	F	15	18				Southern California
4	July 23	Iu	ePNE F	10	39	09.0	4.0		U.S.C.G.S.: 18.5°S 169°E h = 200 km
5	July 23	Id	iSE F	13	58	30.0 35			See list, p. 157
21	Sept. 7	Iv	F	13	59				Southern Monterey County
6	July 27	Id	F	12	38	ca			See list, p. 157 S - P = 10.1 sec.
7	Aug. 1	Id	iS?	07	56	ca			See list, p. 157
8	Aug. 4	Id	F	18	30	ca			S - P = 2.6 sec.
9	Aug. 4	Id	F	19	57	ca			S - P = 2.6 sec.
10	Aug. 5	Iu	F	19	17	ca			U.S.C.G.S.: 1°S 78°W Central Ecuador Quake
24	Sept. 13	IId	F	19	31	37.8			See list, p. 157
11	Aug. 6	Iu	F	00	46	ca			U.S.C.G.S.: 19°S 174.5°W S - P = 9 <sup>m</sup> 33 <sup>s</sup>
12	Aug. 8	IId	F	10	59	ca			See list, p. 157 S - P = 3.1 sec.
25	Sept. 13	IId	F	19	50	57.1			Aftershock one minute later
13	Aug. 9	Id	F	00	39	ca			See list, p. 157 S - P = 12 sec.
14	Aug. 21	Iv	F	20	54	ca			See list, p. 157 S - P = 30.1 sec.
15	Aug. 22	Ir	F	04	10	ca			U.S.C.G.S.: 54°N 133°W S - P = 3 <sup>m</sup> 26 <sup>s</sup>
27	Sept. 16	Id	F	07	15	01.8			See list, p. 157
16	Aug. 23	Ir	F	20	28	ca			U.S.C.G.S.: Off British Columbia S - P = 3 <sup>m</sup> 50 <sup>s</sup>



No.	Date	acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
17	Aug. 24	Iv		06 11 ca			U.S.C.G.S.: 43.5°N 122°W Off Oregon Coast
18	Aug. 29	Id		01 56 ca			See list, p. 158 $\bar{S} - \bar{P} = 10.5$ sec.
19	Sept. 6	Iv	ePN iE eN iN F	11 21 21 21.4 26 27.5 11 26			See list, p. 158
20	Sept. 7	Iv	iE iN iE iN iN F	05 38 34.3 36.7 57.4 39 00.0 03.3 05 40			Southern California?
21	Sept. 7	Iv	iE iE F	14 48 10.1 36.9 14 50			Southern Monterey County
22	Sept. 8	Iv	iPNE iSNE F	03 28 31.1 47.4 03 30			See list, p. 158
23	Sept. 10	Id	iPN iSN F	14 40 17.5 23.2 14 41			See list, p. 158
24	Sept. 13	IIId	iPE iPN iE iN F	18 34 37.8 38.8 41.2 43.3 18 37			Blast
25	Sept. 13	IIId	iPNE iE iN F	19 50 57.1 51 00.9 01.8 19 53			Blast
26	Sept. 14	Iv	iPN iPE iSNE F	05 28 43.1 43.5 29 26.8 05 31			See list, p. 158
27	Sept. 16	Id	eSNE eNE F	07 15 01.8 05.6 07 16			See list, p. 158



No.	Date	Character	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
28	Sept. 18	Id	iPN iPE iSNE F	14 40 18.4 18.8 29.8 14 42			See list, p. 158
29	Sept. 21	Ir	ePN ePE eSN eSE eN eE F	13 01 36.0 47.0 06 56.0 07 13.0 11.5 11.8 13 24			U.S.C.G.S.: 17°N 94.5°W
30	Sept. 27	Ir	iPN ePE ePPE eN eSE eSN eLE eLN F	15 36 35.7 40 37 30 32.7 41 30 38 44 10 11 16 51			U.S.C.G.S.: 60°N 149°W
31	Sept. 29	Id	iPNE iSN iSE iPE iSN F	00 35 09.2 10.9 11.9 19.3 20.5 00 36			Blast?  Blast?
32	Sept. 30	Id	iPNE iSNE iSE iNE F	00 25 55.6 57.3 26 04.4 05.9 00 27			Blast?  Blast?

The station is operated by Dr. Joseph Dagnuda, of Farnhale,

in cooperation with the University of California



FERNDALE

THE FERNDALE STATION  
 FERNDALE, CALIFORNIA

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 40^{\circ} 34' \text{ N.}$$

$$\lambda = 124^{\circ} 16' \text{ W.}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 17 meters (55 feet) above mean sea level.

	Apparatus	Component
5 Aug. 6	Bosch-Omori 25 kg. ....	N E

The station is operated by Mr. Joseph Bognuda, of Ferndale,  
 in cooperation with the University of California.



No.	Date	Station	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
1	July 2	Iu	ePN ePE eSN eSE eLN eLE F	20 19 05 31 32 21	09 12 33 38 24 20	22 25 12 32 38 24 20		U.S.C.G.S.: 10°N 148°E Off Oregon Coast See list, p. 158	
2	July 10	Iu	ePN eE eN eE eN eLN eLE F	04 16 17 25 26 47.2 49.1 05	06 56 05 38 58 47.2 49.1 51	38 56 05 38 58 47.2 49.1 51		U.S.C.G.S.: 39°N 71°E See list, p. 158	
3	July 23	Iu	iPNE eSN eSE F	10 50 11	39 44 04	12 44 22		U.S.C.G.S.: 18.5°S 169°E h = 200 km.	
4	Aug. 5	Iu	ePE ePN eSE eSN eN eE F	19 13 33 37 20	18 26 34 54 14 14 14	50 54 12 14 34 54 46		U.S.C.G.S.: 1°S 78°W Central Ecuador Quake U.S.C.G.S.: 17°N 94.5°W	
5	Aug. 6	Iu	iPN iPE iSNE eLN F	00 15 56 01 01	47 20 56 09 56	18 20 56 54 22		U.S.C.G.S.: 60°N 116°W	
6	Aug. 22	IIIr	iPNE iSE iSN F	04 07 08	04 26 27	42 ca ca 27		U.S.C.G.S.: 54°N 133°W	
7	Aug. 23	Id	ePN iSNE F	18 18	47 49	31 ca 35 ca 49		See list, p. 158	
8	Aug. 23	Ir	ePN ePE eSE eSN eE eN F	19 50 50 51 54 22	47 50 12 43 05 01 10	45 50 12 43 05 01 10		U.S.C.G.S.: 53°N 132°W	





## FERNDALE

No.	Date	Character	Phase	Time			Period	Trace motion	Remarks
				(G.C.T.)					
	1949			h.	m.	s.	s.		
9	Aug. 24	Iv	ePE eSE eSN F	06	07	11 10 30		U.S.C.G.S.: 43.5°N 127°W Off Oregon Coast	
10	Sept. 6	Id	iPNE iSE iSN F	11	20	39 45 46		See list, p. 158	
11	Sept. 14	Iv	iPE iE iSN eE eN F	05	28	08 23 26 56 29 00		See list, p. 158	
12	Sept. 14	Iu	ePE ePN eE eN eLE F	20	06	10 44 08 22 38 35		U.S.C.G.S.: 1°N 126°E	
13	Sept. 21	Ir	ePE eSE eE eE eN F	13	02	31 38 32 30 46		U.S.C.G.S.: 17°N 94.5°W	
14	Sept. 27	Ir	ePE ePN eSE eSN eE eLN eLE F	15	36	12 16 44 52 04 40 44		U.S.C.G.S.: 60°N 149°W	
			F	17	46				

No.	Date	Station	Phase	(G.C.T.)	Amplitude	Remarks
	1918					FRESNO
1	July 2	In				THE FRESNO STATION, FRESNO STATE COLLEGE FRESNO, CALIFORNIA
			L <sub>1</sub>		37.5	
			L <sub>2</sub>	19	12	
			L <sub>3</sub>		50.0	
			S <sub>1</sub>	20	05	
			S <sub>2</sub>	36	10.5	
			S <sub>3</sub>	39	11	
			L <sub>2</sub>		10.3	
			P	21	11	

2 July 1 In S<sub>1</sub> CONSTANTS OF THE STATION U.S.G.O.S.: 31°N 119°W  
P 14 01

Latitude and longitude:

3 July 8 In S<sub>1</sub> U.S.G.O.S.: 31°N 119°W  
S<sub>2</sub> Q = 36° 46.11 N.  
S<sub>3</sub> λ = 119° 47.18 W.

Time -- All determinations are reduced to Greenwich Civil Time.

4 July 8 In S<sub>1</sub> U.S.G.O.S.: 31°N 119°W  
Altitude -- 88.4 meters (290 feet) above mean sea level.

5 July 9	In	S <sub>1</sub>	15	11	12.5	
		S <sub>2</sub>		14	02.5	
		P	15	15		

6 July 9 In L<sub>1</sub> U.S.G.O.S.: 31°N 119°W

Apparatus	Component
Sprengnether .....	N E Z

7 July 9	In	S <sub>1</sub>	04	07	16	
		S <sub>2</sub>			53	
		L <sub>1</sub>	11	38	7	
		L <sub>2</sub>	17	03	16	
		L <sub>3</sub>	18	08	7	
		S <sub>1</sub>	04	07	16	
		S <sub>2</sub>			53	
		L <sub>1</sub>	11	38	7	
		L <sub>2</sub>	17	03	16	
		L <sub>3</sub>	18	08	7	
		P	04	07	16	



No.	Date	Character	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
1	July 2	Iu	iPZ iPE iPN eSE iSN eSZ eP'P'Z eSKPP'Z	20 09 35.6 36.4 37.5 19 42 20 05 36 10.5 39 34		d	U.S.C.G.S.: 16°N 148°E		
	July 10	Iu	eLZ F	16 20 05 18 39 34 21 11			U.S.C.G.S.: 39°N 71°E		
	July 10	Iu	eLZ F	16 40.3 21 11			U.S.C.G.S.: 39°N 71°E		
2	July 4	Iu	ePZ F	14 00 35.9 14 01			U.S.C.G.S.: 21°S 174°E		
3	July 8	Ir	ePZ eZ eLZ F	12 47 26.5 48 51.5 13 04.6 13 11		d	U.S.C.G.S.: 13°N 91°W		
	July 11	Iu	F	13 11		d	U.S.C.G.S.: 34°N 132°E		
4	July 8	Iu	ePZ F	18 28 40.5 18 30			U.S.C.G.S.: 72°N 0°		
5	July 9	Iu	ePZ eZ F	15 11 12.5 14 02.5 15 15		c	IV at Cantal		
6	July 9	Ir	iPZ iPPZ iZ iSZ F	18 52 24.3 54 03.0 56 51.8 59 14.3 19 02		c d	U.S.C.G.S.: 33°N 71°W		
	July 15	Iv	F	19 02					
7	July 9	Iu	ePZ ePNE iZ iPPZ iPPE iPPN eSN eSE ePS?Z eZ eE eN eE eLZ eLE eLN F	04 07 48 53 10 46.1 11 58.7 12 03.4 05.9 18 20.7 31 21 13 16 47.3 16 47.7 16 54.6 55.2 56.9 58.7 59.5 05 52		c d	U.S.C.G.S.: 39°N 71°E		
	July 15	Iv							
	July 18	Iu					U.S.C.G.S.: 48.5°N 142.5°E		

No.	Date	Station	Phase	Time (G.C.T.)			Period s.	Trace motion	Remarks
				h.	m.	s.			
	1949								
8	July 10	Iv	iPZ iSZ iSNE F	15 17	32.4 49.5 50.4		d	See list, p. 157	
9	July 10	Iu	ePPZ F	16 07 16 11	38			U.S.C.G.S.: 39°N 71°E	
10	July 10	Iu	ePZ iPPZ iPPN ePPE eN eE eZ F	16 38 41 42 48 48 16 53	05 36.7 41.7 49 46 55 49.9		c	U.S.C.G.S.: 39°N 71°E	
11	July 11	Iu	iPZ ePNE eZ eSZ F	16 23 24 31 16 36	09.6 12 37.5 52		d	U.S.C.G.S.: 34°N 132°E	
12	July 12	Iv	iPZ ePNE iSZ iSE iSN F	19 18 03 07 19 20	05.3 06 32.7 33.3 34.0		c	IV at Cantil	
13	July 15	Iv	ePZ eNE iSNEZ iNEZ F	15 39 40 15 41	42.8 45.3 02.0 04.4		d	See list, p. 157	
14	July 15	Iv	iPEZ iN iSZ iNE iNE F	16 20 21 16 22	45.9 49.7 04.5 06.1 08.8		d		
15	July 18	Iu	ePZ eN eZ eE eZ F	10 04 10 06	26.5 36.5 41.5 43.5 55		d	U.S.C.G.S.: 42.5°N 142.5°E	
25	July 29	Iv	eZ F	21 54 22 00	30 30			U.S.C.G.S.: Gulf of California	



## FRESNO

From the ISC collection scanned by SISMOS

No.	Date	Station	Phase	Time (G.C.T.)			Period s.	Trace motion	Remarks
				h.	m.	s.			
	1949								
16	July 21	Iu	ePNZ ePE eEZ	08 12	26.5 28.5 54.5			U.S.C.G.S.: 16°S 74°W h = 100 km	
	Aug. 1	Iv	eNZ eE eN eE	08 13	26.0 34.0 25.0 29.0				
	Aug. 1	Iu	F	08 20					
17	July 23	IIu	iPZ iPN ePPZ F	10 39	16.0 17.0 42 41.0 10 54			U.S.C.G.S.: 18.5°S 169°E h = 200 km. Runs into following shock	
18	July 23	Iu	ePZ eN F	11 05	16.0 24.5 11 13		c	U.S.C.G.S.: 19°N 96°W See list, p. 157	
19	July 23	Iu	ePZ ePPZ eSN F	15 17	21.0 21 13.0 27 53.5 15 37			U.S.C.G.S.: 38.5°N 26.5°E U.S.C.G.S.: Near 53°N 25°E	
20	July 24	Id	iPZ eSZ iN F	03 04	22.1 34.5 35.5 03 07		c	See list, p. 157	
21	July 24	Id	ePZ eP*N eSZ eN F	06 26	47.0 48.0 27 00.0 01.0 06 30		d	See list, p. 157	
22	July 25	Iu	iPZ F	04 02	43.3 04 06		d	C.M.O.: 18°N 145°E	
23	July 25	Iu	ePZ iPZ ePN eSN F	11 35	45.5 46.2 47.0 44 57.0 11 46		c d	U.S.C.G.S.: 32°S 111°W	
24	July 27	Iu	ePZ iPZ ePN eZ eLZ F	15 24	08.0 09.3 10.0 50 29.6 51 25.6 15 35		c d	U.S.C.G.S.: 19°S 174.5°W U.S.C.G.S.: 29°S 177°W	
25	July 29	Ir	eZ F	21 54	28 22 00			U.S.C.G.S.: Gulf of California	

## FRESNO

From the ISC collection scanned by SISMOS

No.	Date	Station	Phase	Time (G.C.T.)			Period s.	Trace motion	Remarks
				h.	m.	s.			
	1949								
26	July 30	Ir	ePNZ F	06 40 06 43	22.0		c	U.S.C.G.S.: 45.5°N 149°E	
27	Aug. 1	Iv	iPNEZ iSNEZ F	00 07 00 08 00 11	49.9 08.3		c	See list, p. 157	
28	Aug. 1	Iu	eZ F	04 58 05 00	30.0			U.S.C.G.S.: Samoa Islands Region	
29	Aug. 1	Iu	ePZ F	08 06	53.3			U.S.C.G.S.: Eastern Turkestan Runs into following shock	
30	Aug. 1	Ir	ePZ F	08 09 08 13	32.0		c	U.S.C.G.S.: 19°N 96°W	
31	Aug. 2	Iv	iPZ eSZ iSNZ F	07 14 07 15 07 18	35.3 50.1 51.9			See list, p. 157	
32	Aug. 3	Iu	ePZ ePN F	20 43 20 47	25.0 28.0			B.C.I.S.: Near 53°N 25°E	
33	Aug. 4	Iu	iPZ eN F	10 59 11 00	02.5 04.0		d		
34	Aug. 5	Iu	iPZ F	19 12 19 15	22.3		d	Foreshock: Tonga Islands Region	
35	Aug. 5	IIu	ePZ iZ eN eNZ	19 18	11.5 12.1 13.0 34.0		c	U.S.C.G.S.: 1°S 78°W Central Ecuador Quake	
36	Aug. 6	IIu	eSZ eSN eLZ F	19 26 19 39 19 54	00 04.0 24.0		c	U.S.C.G.S.: 15°N 93°W	
36	Aug. 6	IIu	ePZ ePN iPZ iPN iZ iN eN eSZ eSN eLZ F	00 47 00 50 00 53 00 56 01 00 01 01 01 02 01 03 01 04 01 05 01 06 01 07 01 08 01 09 01 10 01 11 01 12 01 13 01 14 01 15 01 16 01 17 01 18 01 19 01 20 01 21 01 22 01 23 01 24 01 25 01 26 01 27 01 28 01 29 01 30 01 31 01 32 01 33 01 34 01 35 01 36 01 37 01 38 01 39 01 40 01 41 01 42 01 43 01 44 01 45 01 46 01 47	16.0 17.0 18.0 19.0 27.7 28.2 53 08.5 56 55.5 57.5 34.5		c d	U.S.C.G.S.: 19°S 174.5°W See list, p. 157	



## FRESNO

From the ISC collection scanned by SISMOS

No.	Date	Station	Component	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
37	Aug. 6	Iu	ePZ eZ F	12 08 09 03 12 11	40.0 03.0		c	U.S.C.G.S.: 19°S 174.5°W	
38	Aug. 6	Iu	iPZ iPN ePE iZ F	16 02 51.6 52.1 54 03 10.1 16 06			c	U.S.C.G.S.: 19°S 174.5°W	
39	Aug. 7	Ir	iPZ eE eN iE iZ eS?Z F	08 19 03 06 21.3 26.8 22 38 08 24	01.0		d	U.S.C.G.S.: 50.5°N 130°W	
40	Aug. 7	Ir	iPZ ePNE F	10 48 29 10 50	27.5			U.S.C.G.S.: 50.5°N 130°W See list, p. 157	
41	Aug. 8	Iv	iPZ ePN eE eSN iS*E iSNE F	11 00 47 59 01 08.4 16.1 20.0 11 04	39.8			See list, p. 157 U.S.C.G.S.: 15°N 146°E h = 100 km.	
42	Aug. 8	Iu	iPZ iZ iN iE iZ F	13 23 56 58.9 24 00.3 25 17 13 28	41.1		d c	U.S.C.G.S.: Tonga Islands Region	
43	Aug. 8	Ir	iPZ ePNE iZ iZ F	14 16 17 04.3 18 29 18 54 14 19	57.8		c	U.S.C.G.S.: 15°N 93°W U.S.C.G.S.: Benin Island Region	
44	Aug. 9	Iv	iPZ eN eE eSNE eZ iN iEZ F	00 40 13 47 46 52 41 05.2 06.2 00 44	13.3			See list, p. 157 U.S.C.G.S.: 8.5°N 82.5°W	

No.	Date	Locater	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
45	Aug. 10	Iv	eSZ eSNE eZ	09 18 15 16 19 41			See list, p. 157
	Aug. 19	Iu	eN F	10 37 49.5 09 21			
46	Aug. 12	Iu	ePN ePPN F	23 28 14 31 35 23 33			U.S.C.G.S.: 14°S 167.5°E
47	Aug. 13	Iu	iPZ ePNE eSN eSE eN eZ eLZ F	18 38 07.6 10 48 37 42 49 14 50 28 19 08.4 19 17			U.S.C.G.S.: 0° 146°E  See list, p. 157
48	Aug. 16	Iv	ePZ iSN F	05 37 39.6 57.9 05 39			See list, p. 157
49	Aug. 17	Iu	iPNZ ePE ipPZ eSN eSZ eSSZ F	18 45 08.5 09 30.0 54 10.9 11 50 14.6 58 18 19 02	c d		U.S.C.G.S.: 43°N 146°E h = 100 km.  See list, p. 157
50	Aug. 17	Iu	iP'Z eE eN eSKSE eSKSN eLZ F	19 02 12.1 22.9 26.9 09 33 36 41.4 20 23			U.S.C.G.S.: 39°N 40°E  U.S.C.G.S.: 54°N 133°W
51	Aug. 18	Iu	iPZ F	10 09 45.9 10 12		c	U.S.C.G.S.: Bonin Island Region
52	Aug. 18	Iu	iPZ ePN ePE F	13 41 30.8 33.2 34.2 13 47		c	U.S.C.G.S.: 8.5°N 82.5°W
53	Aug. 18	Iv	iPZ iPN iPE iSE iSN F	14 25 51.9 52.6 56.2 26 20.0 23.2 14 29		c	See list, p. 157 U.S.C.G.S.: Off British Columbia





No.	Date	Station	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
54	Aug. 19	Iu	iPZ F	08 37 08 38	15.2		c	U.S.C.G.S.: Tonga Islands Region	
55	Aug. 19	Iu	iZ iE iN F	10 59 11 01	44.8 45.2 45.7				
56	Aug. 21	Iv	iPZ ePE ePN	05 39 00	00.6 01.3		d	Probably Inyo County	
	Aug. 23	I	iSN iSZ eSE F	20 28 05 42	27.6 27.9 29		d	U.S.C.G.S.: 53°N 120°W	
57	Aug. 21	Iv	ePZ ePNE eZ iNE F	10 52 10 55	05.5 07 51.5 53.5		c	See list, p. 157 U.S.C.G.S.: 43°N 122°W Off Oregon Coast	
58	Aug. 21	Iv	iPZ ePN	11 46	22.8 23.6		d	See list, p. 157	
	Aug. 24	Iu	iE iZ iN F	06 47 11 50	10.4 11.2 12.8		c	U.S.C.G.S.: 22°S 176°W h = 100 km	
59	Aug. 21	Iv	iPNZ ePE iN iZ iN iNE F	20 49 20 56	19 20.2 21.8 57.7 58.2 06.8		c	See list, p. 157 U.S.C.G.S.: 9°S 109°W	
60	Aug. 22	IIr	iPNE ePE F	04 05 07 14	41.0 41.5		d	U.S.C.G.S.: 54°N 133°W	
61	Aug. 22	Ir	iPZ iPN iZ iE iN F	06 21 06 25	32.8 34.7 07.6 08.7 09.8			U.S.C.G.S.: Off British Columbia	
62	Aug. 22	I	iPZ ePN iZ F	12 26 12 30	41.1 44 10.9		c	U.S.C.G.S.: Off British Columbia	

No.	Date	Station	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
63	Aug. 22	Ir	iPZ ePN F	13 45 13 47	03.2 04		c	U.S.C.G.S.: Off British Columbia
64	Aug. 23	Iu	iPZ F	19 41 19 44	45.1		c	U.S.C.G.S.: Off British Columbia
65	Aug. 23	Ir	iPZ ePNE F	19 48 19 59	50.2 52		c	U.S.C.G.S.: 53°N 132°W
66	Aug. 23	I	iPNZ ePE iZ iZ F	20 28 20 27 22 17 22 34 21 59	48.0 49 53.1 45.1		d	U.S.C.G.S.: 53°N 132°W
67	Aug. 24	Iv	iPNZ ePN eN eE eZ F	06 09 06 12 06 15 06 14 06 18	27.4 28.0 29 42 30		c	U.S.C.G.S.: 43.5°N 122°W Off Oregon Coast
68	Aug. 24	Iu	iPZ ePNE ipPNZ ipPE F	06 37 06 38 06 42	43.2 44.0 10.0 12.0		c	U.S.C.G.S.: 22°S 176°W h = 100 km
69	Aug. 24	Iu	iPZ eZ F	09 30 09 35 09 55	36.9 40.9			U.S.C.G.S.: 9°S 109°W
70	Aug. 24	Ir	iPZ eN F	22 41 22 44	29.9 33.4		c	U.S.C.G.S.: Off British Columbia
71	Aug. 25	Ir	iPZ ePN ePE	04 22 04 21 04 21	32.1 33 34			U.S.C.G.S.: 52.5°N 178°W
72	Aug. 25	Iu	iSZ iSN eSE F	03 29 04 04 04 33	02.6 03.1 04		d	Southern California?
73	Aug. 25	Iu	iPPZ eN	23 44 23 44	51.1 53.4		d	
74	Aug. 29	Iv	iZ iZ eZ eN F	01 46 01 50 01 51 01 23 01 58	13.3 46.4 38 43		c	See list, p. 158





No.	Date	Station	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
73	Aug. 26	Iu	iPZ eN F	05 30 31 05 35	55.0 05 05.0		d	U.S.C.G.S.: Off British Columbia	
74	Aug. 26	IIv	iPNZ ePE iNE eE iSE iNZ F	16 53 09.0 20.0 08 21.0 09 29.7 14 45.1 17 03	08.2 09.0 20.0 21.0 29.7 45.1		c	Pasadena: 34.5°N 120.5°W Near Point Conception	
75	Aug. 26	Ir	iPZ F	22 47 22 47	16.9 16.9			U.S.C.G.S.: Off British Columbia	
76	Aug. 27	IIv	iPNZ ePE	14 52 24	22.9 24		c	Pasadena: 34.5°N 120.5°W Near Point Conception	
77	Aug. 27	Iv	iNZ eE iNZ F	13 53 13 57 15 00 15 00	27.0 28.3 46.4 28		c	U.S.C.G.S.: Southern California	
77	Aug. 27	Iv	iPZ iPN iZ iNE F	15 36 15 36 15 36 15 43 15 43	20.3 21.3 26.3 46.5		c	Aftershock?	
78	Aug. 27	Iv	iPZ iPN ePE iZ iE F	15 55 15 55 16 15 17 11 17 17 16 02	06.3 06.9 10 16.3 32.3 39.1 43.0 28.5		d	Aftershock? 36°N 97°W	
79	Aug. 27	Ir	ePZ F	21 35 21 37	00 00		d	U.S.C.G.S.: Off British Columbia	
80	Aug. 28	Iv	iPZ iPN iPE iSZ iSNE F	03 48 03 48 03 48 11 30 03 50	27.6 28.1 29.5 50.0 50.7		d	Southern California?	
81	Aug. 29	Iv	ePZ eNE iSZ F	01 56 01 56 02 00 02 00	40 58 04.5 04.5		d	Off Monterey Bay See list, p. 158	

No.	Date	Locater	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
82	Aug. 29	IIId	iPZ iPN iPE iE iSZ iSNE	12 07 36.2 37.0 38.0 44.2 47.0 47.7		d	See list, p. 158 County
	Sept. 1	Iv	iNZ iE iN F	08 24.0 09 17.2 11 33 41.5 12 14		c	Off Monterey County
83	Aug. 30	Iv	iPNEZ iSZ iSNE F	20 57 13.3 29.9 30.6 20 59		c	See list, p. 158 Inyo County
84	Aug. 31	Ir	ePZ F	13 53 56 13 57		c	U.S.C.G.S.: Southern Alaska
85	Aug. 31	Iv	ePZ eE eZ eE	15 12 44 13 28 14 34.5 14 13		c	U.S.C.G.S.: Off British Columbia
	Sept. 12	Iu	eN eZ F	09 28 15 01.9 15 17		c	U.S.C.G.S.: 22°S 170°E
86	Sept. 1	Iu	ePZ eZ F	14 10 01 12 18 14 15		c	U.S.C.G.S.: 36°S 97°W
87	Sept. 1	Iu	ePZ eZ F	17 11 46 15 08.1 17 17		c	U.S.C.G.S.: Marianas Islands Region
88	Sept. 5	Ir	ePNEZ F	06 58 38 07 02		c	U.S.C.G.S.: Off British Columbia
89	Sept. 6	Iv	iPZ iPNE eN eZ iZ iN F	11 21 51.6 52.5 22 23 31 24 04.4 06.7 11 30		d	See list, p. 158 Panama; Mexico
90	Sept. 7	Iv	iPZ iPN eZ eE iN F	07 02 47.3 47.7 59.8 03 14.8 24.1 07 38		c	Off Monterey County?



## FRESNO

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No.	Date	Manner	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
91	Sept. 7	Iv	iPZ iE iNZ eE F	11 56 57 58 12	53.3 06.6 07.6 16 01			Southern Monterey County	
92	Sept. 7	Iv	iPNZ ePE iSNEZ F	14 47 58 14 53	56.3 16.1	c		Southern Monterey County	
93	Sept. 8	Iv	iPZ ePN iSN iSE F	03 28 37 53.7 54.8 03 33	34.5	c		See list, p. 158	
94	Sept. 9	Iu	iPNZ ePE F	20 36 53 20 43	51.7	d		U.S.C.G.S.: 17°S 172°W	
95	Sept. 12	Ir	ePZ F	08 40 08 43	42			U.S.C.G.S.: Off British Columbia house V at Kern R. Columbia house No. 3 and at Kernville	
96	Sept. 12	Iu	iPZ ePN eN eSZ eLZ F	09 29 16 25 32 09 40 10 00.5 10 15	56.6 58 51 48	c		U.S.C.G.S.: 22°S 170°E	
97	Sept. 12	Ir	iPZ ePN F	14 42 08 13 14 46	26.9 29	d		U.S.C.G.S.: Off British Columbia	
98	Sept. 14	Iu	ePZ eZ iPPN iPPZ ePPE eE eZ eLZ F	20 04 08 09 09 06.4 12 18 43.5 20 23	43 06 03.9 05.9 06.4 11 37.4 43.5 23	c		U.S.C.G.S.: 1°N 126°E	
99	Sept. 16	Ir	ePZ iSN iZ eN F	15 46 48 12 38 49 16 00	53.6 25.1 35.6 35 00	d		Pasadena: Mexico	

No.	Date	Station	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
00	Sept. 16	Ir	ePN ePZ eE eN F	16 09	13.6 15 49.6 54			Aftershock? 177°E 94.5°W	
01	Sept. 16	Ir	ePZ eZ iZ iE iN eSEZ eN eNE eZ F	20 46	12.4 30.4 21.5 32.0 34.7 06.7 59 59 04 04			Pasadena: Mexico	
02	Sept. 17	Iu	ePNZ ePE F	02 35	13.7 15.2			U.S.C.G.S.: 16°S 173°W	
03	Sept. 17	Iv	iPZ iPNE iSZ iSNE F	16 22	23.6 24.6 41.6 42.6			Southeastern Tulare County V at Kern River Powerhouse No. 3 and at Kernville	
04	Sept. 20	Iv	iPZ iPNE iSE eSZ iSN F	04 15	09.7 10.4 44.3 45 49		d	U.S.C.G.S.: V at Yermo San Luis Obispo County	
05	Sept. 20	Iu	iPZ ePNE eN eE eZ eN eE F	12 08	01.8 03 41 03 44 52 06 18		c	U.S.C.G.S.: 30°S 178°W	
06	Sept. 20	I	iPZ ePN ePE	12 22	21.4 21.9 22		d		
	Sept. 21	Iv	iZ F	12 26	28.3		d	See list, p. 158	



No.	Date	Station	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
107	Sept. 21	Ir	iPZ	13	01	15.0		c	U.S.C.G.S.: 17°N 94.5°W
			ePE	13	01	21			
			ePN			22			
108	Sept. 22	Iir	iZ	15	36	38.9		c	U.S.C.G.S.: 16°N 117°W
			iN	15	36	43.9			
			iE	15	36	46.8			
			iPPZ	02	07	07.9			
			eSZ	06	28	28.8			
			eSE	17	02	40.4			
110	Sept. 23	Iu	eLN	10	46	46.9		c	U.S.C.G.S.: 31°N 177°W
			eLZ	15	23	56.4		d	
			eLE	11	06				
			eE	14	01				
			eZ	15	05				
			F	13	25				
108	Sept. 21	Iu	iPZ	18	31	11.5		c	U.S.C.G.S.: 16°S 173°W
			ePE			13			
			ePN			15			
			eZ	18	35	08			
			F	18	37				
109	Sept. 22	Iu	iPZ	15	49	38.3			U.S.C.G.S.: 42°N 142°E
			iPcPZ			56.6			
119	Sept. 30	I.	ePcPNE	23	19	57			Afternoon
			eN	51	19	3			
			F	15	55				
110	Sept. 23	Iv	iPZ	00	01	34.1		c	San Luis Obispo County
			iSZ			52.7			
			iSNE			53.7			
			iNE			59.0			
			iZ	02	02	1			
			eZ			55			
			F	00	06				
111	Sept. 24	Iu	iPZ	04	30	45.6		d	U.S.C.G.S.: 6° 154°E
			ePE			47			
			ePN			49			
			F	04	38				
112	Sept. 24	Iv	iPZ	09	27	54.8			See list, p. 158
			iPN			55.3			
			iSNEZ	28	14	4			
			F	09	29				
113	Sept. 24	Iv	iPNZ	09	45	11.9			See list, p. 158
			iSZ			30.8			
			iSNE			31.7			
			F	09	46				



FRESNO

No.	Date	Station	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
14	Sept. 25	Iu	ePZ F	15 28 06 15 31			U.S.C.G.S.: 6°S 154°E
15	Sept. 27	IIr	iPNEZ iN iSE iSZ eLZ F	15 36 52.6 38 08.6 41 59.8 42 00.5 45 03 17 06		d	U.S.C.G.S.: 60°N 149°W
16	Sept. 28	Iu	ePZ iPZ ePNE F	15 20 03 04.7 05.7 15 24		c d	U.S.C.G.S.: 31°S 177°W
17	Sept. 30	Iu	iPZ iPPZ iSZ eLZ F	04 11 04.1 14 05.9 21 54.5 40.0 05 21			U.S.C.G.S.: 23°S 176°W
18	Sept. 30	Iu	ePZ F	18 31 47 18 34			Aftershock
19	Sept. 30	I	iPZ iZ F	22 19 05.7 22 15.7 22 23			

Apparatus	Component
Woodwardson	N E
Benioff	Z

Note: Between July 2 and July 10, 1949, difficulties with the station radio receiver prevented reception of Naval Observatory Time Signal. Therefore the times of earthquakes registered during this period are given only to the nearest minute of G.C.T.



MINERAL

THE MINERAL STATION  
MINERAL, CALIFORNIA

CONSTANTS OF THE STATION

Latitude and longitude:

$$\begin{aligned} \phi &= 40^{\circ} 21' \text{ N.} \\ \lambda &= 121^{\circ} 35' \text{ W.} \end{aligned}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 1495 meters (4906 feet) above mean sea level.

Apparatus	Component
Wood-Anderson .....	N E
Benioff .....	Z

Note: Between July 2 and July 18, 1949, difficulties with the station radio receiver prevented reception of Naval Observatory Time Signals. Therefore the times of earthquakes registered during this period are given only to the nearest minute of G.C.T.



## MINERAL

No.	Date	Station	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
1	July 1	Iu	iPZ F	03	38	54.2			
				03	41				
2	July 1	Iu	iPZ iZ eZ F	04	28	19.4			
						20.4			
					30	40			
				04	31				
3	July 2	Iu	eP	20	10	ca	d	U.S.C.G.S.: 16°N 148°E	
4	July 4	Iu	eP	14	00	ca		U.S.C.G.S.: 21°S 174°E	
5	July 6	Iv	iP	19	57	ca		See list, p. 157	
6	July 8	Ir	eP	12	47	ca		U.S.C.G.S.: 13°N 91°W	
7	July 9	IIId	iP	11	30	ca	c	$\bar{S} - \bar{P} = 2.9$ sec.	
8	July 9	Ir	eP	18	52	ca	c	U.S.C.G.S.: 33°N 71°W	
9	July 9	Iv	iP	23	02	ca	d	S - P = 22.3 sec. Verdi aftershock	
10	July 9	Iv	iP	23	08	ca	d	S - P = 22.5 sec. Verdi aftershock	
11	July 10	Iu	iP	04	07	ca	d	U.S.C.G.S.: 39°N 71°E	
12	July 10	Id	iP	13	15	ca	c	$\bar{S} - \bar{P} = 4$ sec.	
13	July 10	I	iP	15	58	ca	d	U.S.C.G.S.: 39°N 71°E	
14	July 11	Id	iP	00	44	ca	c	$\bar{S} - \bar{P} = 3.6$ sec.	
15	July 11	Id	iP	04	34	ca		$\bar{S} - \bar{P} = 1$ sec.	
16	July 12	Id	iP	11	21	ca		S - P = 10.8 sec.	
17	July 12	Id	iP	11	22	ca		$\bar{S} - \bar{P} = 6.7$ sec.	
18	July 12	Id	iP	11	24	ca	c	$\bar{S} - \bar{P} = 1.5$ sec.	
19	July 12	Id	iP	11	26	ca	d	$\bar{S} - \bar{P} = 1.7$ sec.	
20	July 12	IIId		11	27	ca	c	$\bar{S} - \bar{P} = 1.5$ sec.	
21	July 12	Id		11	32	ca	c	$\bar{S} - \bar{P} = 1.5$ sec.	
22	July 12	Id		11	38	ca	c	$\bar{S} - \bar{P} = 1.4$ sec.	
23	July 12	Id		13	22	ca	c	$\bar{S} - \bar{P} = 1.4$ sec.	
24	July 12	Id	iP	18	45	ca	d	$\bar{S} - \bar{P} = 2$ sec.	



## MINERAL

No.	Date	Station	Phase	Time		Period	Trace motion	Remarks
				(G.C.T.)				
	1949			h.	m.	s.		
25	July 15	IId	iP	04	46	ca	c	$\bar{S} - \bar{P} = 1.4$ sec.
26	July 16	Id	iP	11	53	ca	c	$\bar{S} - \bar{P} = 3.9$ sec.
27	July 17	Iv	iP	19	39	ca	d	S - P = 18.8 sec. Verdi aftershock?
28	July 18	Iv	iPZ	07	46	48.2	d	
	July 25	Iu	iZ			53.7	d	C.H.D.: 18°N 145°E
			F	07	48			
29	July 18	Iu	iPZ	08	39	35.6	c	U.S.C.G.S.: 15.5°S 166°E
			F	08	41			
30	July 18	Iv	iPZ	07	31	31.2	c	See list, p. 157
			iNEZ			33.7	d	
			iZ			48.7		
			iZ			50.5		
			iZ			52.7		
	July 26	IId	F	07	35			
31	July 19	Iu	iPZ	08	35	03	d	
			F	08	36			
32	July 21	Iu	ePZ	08	12	48.0	d	U.S.C.G.S.: 16°S 74°W
			iPZ			48.8	c	h = 100 km.
			iZ			52.0	c	
			iZ	13	06	06.7	c	
			iZ			17.2	d	
	July 27	Iu	iZ			26.5	d	
			F	08	18			
33	July 23	Iu	ePZ	07	00	59.5	c	U.S.C.G.S.: 29°N 177°W
			F	07	03			
34	July 23	Iu	ePZ	07	11	30.5	d	
			F	07	13			
35	July 23	Iu	iPZ	09	00	36.8	d	
			F	09	04			
36	July 23	Iu	iPZ	10	39	16.5	c	U.S.C.G.S.: 18.5°S 169°E
			eNE	15	42	17.0		h = 200 km
			iN			20.9		
	July 28	Iv	iE	15	50	27.8		
			iZ	15	40	33.9	c	
			iZ		42	43.5		
	July 29	Iu	iZ	07	57	07.2		
			iZ			18.2		
			iZ	11	05	13.5		
			iZ			16.9		
			iZ			21.0		
			F	11	29			



## MINERAL

No.	Date	Station	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
37	July 23	Iu	ePZ eLZ F	15 16 59.0 16 00.3 16 15 ca	20		U.S.C.G.S.: 38.5°N 26.5°E
38	July 23	Iv	iPZ iSZ F	16 08 09.7 31.5 16 09			See list, p. 158
39	July 25	Iu	iPZ iZ iZ iZ F	04 02 30.4 34.8 36.8 03 27.0 04 06		d d c c	C.M.O.: 18°N 145°E
40	July 25	Iu	ePZ iZ iZ F	11 36 07.5 15.4 25.8 11 40		c c c	U.S.C.G.S.: 32°S 111°W
41	July 26	IIId	iPNEZ iSNE F	01 56 03.9 05.9 01 57			U.S.C.G.S.: Santa Islands Region
42	July 26	IIId	iPNZ iE iE iN F	02 20 59.6 21 00.2 01.5 02.2 02 22		c c c c	U.S.C.G.S.: Eastern Turkistan U.S.C.G.S.: 19°N 96°W
43	July 27	Iu	iPZ F	05 47 55.3 05 49		c	U.S.C.G.S.: Near 53°N 75°W
44	July 28	Iu	ePZ ePNE iZ iZ iZ iZ iZ F	15 24 15.0 15.5 18.1 34.3 26 50.3 27 01.3 09.3 16 01 ca		c c d d c d c	U.S.C.G.S.: 29°N 177°W
45	July 28	Iu	iPZ F	15 42 22.3 15 44		c	Parasitic
46	July 28	Iu	ePZ F	15 50 28.5 15 52		c	U.S.C.G.S.: 1°S 107°W Central Indian Ocean
47	July 29	Iu	ePZ iZ F	07 19 06.5 19.5 07 21		c c	



## MINERAL

No.	Date	Character	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
48	July 29	Iu	iPZ iZ F	11 11	00.6 11.6		c c		
49	July 30	Iu	iPZ iZ iZ iZ eZ F	06 40	00.0 06.0 17.4 39.7 42 19.0		c d d d	U.S.C.G.S.: 45.5°N 149°E	
50	July 31	Iu	ePZ F	00 02	10 00 04				
51	July 31	Iu	ePZ F	04 26	42.2 04 29		c	U.S.C.G.S.: Near Coast of Central Chili	
52	July 31	Iu	ePZ iPZ F	07 08	13.0 14.1 07 10		d c		
53	Aug. 1	Iu	ePZ F	04 58	35.6 05 00		c	U.S.C.G.S.: Samoa Islands Region	
54	Aug. 1	Iu	eZ F	08 07	02.1 08 08		c	U.S.C.G.S.: Eastern Turkestan	
55	Aug. 1	Ir	ePZ iZ F	08 10	00.6 40.4 08 14		c d	U.S.C.G.S.: 19°N 96°W	
56	Aug. 3	Iu	ePZ iZ iZ F	20 43	30.0 35.5 57.6 20 45		d c	B.C.I.S.: Near 53°S 25°E	
57	Aug. 4	Iu	iPZ F	10 59	07.3 11 01		d		
58	Aug. 5	Iu	ePZ F	07 04	13.1 07 06		d		
59	Aug. 5	Iu	iPZ F	19 12	45.0 19 15		c	Foreshock	
60	Aug. 5	Iu	iPZ eE iNZ iPPZ eSN eZ F	19 18	34.9 35.5 40.0 20 52.5 27 46.5 43.1 19 50		c d	U.S.C.G.S.: 1°S 78°W Central Ecuador Quake	





## MINERAL

No.	Date	Manner	Phase	Time (G.C.T.)		Period s.	Trace motion	Remarks
				h.	m. s.			
	1949							
72	Aug. 10	Iu	ePZ iZ F	13 54 13 56	35.5 42.5		c	U.S.C.G.S.: 87°N Approx. 60°E
73	Aug. 10	Iu	ePZ F	16 55 16 56	01.5		d	U.S.C.G.S.: Tonga Islands Region
74	Aug. 10	Iu	ePZ F	20 43 20 45	06.4		c	U.S.C.G.S.: 87°N Approx. 60°E
75	Aug. 11	Iu	iPZ F	12 35 12 37	39.8		d	
76	Aug. 11	Iu	eZ F	15 06 15 08	15.0		c	U.S.C.G.S.: 45°N 29°W
77	Aug. 11	Iu	iPZ iZ F	15 12 15 14	16.0 20.6		d c	U.S.C.G.S.: Samoa Islands Region
78	Aug. 12	Iu	iPZ F	07 07 07 09	35.8		c	U.S.C.G.S.: Tonga Islands Region
79	Aug. 13	Iu	iPZ F	12 23 12 25	47.5		d	U.S.C.G.S.: Kiribati Islands Region
80	Aug. 13	Iu	iPZ F	12 36 12 38	44.8		c	
81	Aug. 13	Iu	ePZ F	18 28 18 32	59.5		c	
82	Aug. 13	Iu	ePZ iZ F	18 38 18 45	00.0 14.6		c	U.S.C.G.S.: 0° 146°E
83	Aug. 14	IIId	iPZ iSNEZ F	03 24 03 25	21.0 22.6			
84	Aug. 17	Iu	iPZ iZ F	03 26 03 29	39.2 16.2		c c	U.S.C.G.S.: Tonga Islands Region
85	Aug. 17	Iu	iPZ iZ ipPZ F	18 44 18 45	48.5 55.8 10.2		d c c	U.S.C.G.S.: 43°N 146°E h = 100 km Runs into next quake
86	Aug. 17	Iu	eP'Z ipPZ eSZ F	19 01 19 02 19 10 19 59	57.6 06.8 10.8		d c	U.S.C.G.S.: 39°N 40°E

## MINERAL

No.	Date	Locality	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
87	Aug. 18	Iu	iPZ iZ F	02 33 34 02 36	57.9 06.0		d d	See list, p. 157	
88	Aug. 18	Iu	iPZ iPcPZ F	10 09 10 13	29.9 43.4		c c	U.S.C.G.S.: Bonin Islands Region	
89	Aug. 18	Iu	iPZ iZ iZ iZ F	13 41 42 43 13 46	57.4 07.3 17.1 29.8		c d c d	U.S.C.G.S.: 8.5°N 82.5°W	
90	Aug. 18	Iv	iPZ iZ eE iSE F	14 26 14 29	02.3 08.3 33.1 43.2		c c	See list, p. 157	
91	Aug. 19	Iu	iPZ ipPZ F	08 37 08 39	20.9 25.4		c c	U.S.C.G.S.: Tonga Islands Region	
92	Aug. 20	Iu	iPZ F	02 06 02 08	09.9		c c	U.S.C.G.S.: Kurile Islands Island Region	
93	Aug. 20	Iu	iPZ iZ F	04 10 04 12	30.2 36.5		c d	U.S.C.G.S.: 54°N 133°W	
94	Aug. 20	Iu	iPZ F	11 35 11 38	39.0	36 34	c		
95	Aug. 21	Iu	iPZ F	08 45 08 47	28.1		d	U.S.C.G.S.: Tonga Islands Region	
96	Aug. 21	Iu	iPZ F	08 52 08 54	29.2		c	U.S.C.G.S.: Off British Columbia	
97	Aug. 21	Iu	iPZ ipPZ F	08 57 09 01	46.1 03.1		c d	U.S.C.G.S.: Tonga Islands Region	
98	Aug. 21	IIId	iPNEZ iSNE F	10 51 10 54	09.0 13.6		c	See list, p. 157	
99	Aug. 21	IIId	iPNEZ iSNE F	11 45 11 48	26.3 31.1		c	See list, p. 157	



## MINERAL

No.	Date	Character	Phase	Time (G.C.T.)			Period s.	Trace motion	Remarks
				h.	m.	s.			
	1949								
100	Aug. 21	IId	iPNEZ iSNE F	12 05 06 12 08	59.5 04.2		c	See list, p. 157	
101	Aug. 21	IId	iPNEZ iSNEZ F	17 27 28 17 29	56.2 00.9		c	See list, p. 157	
102	Aug. 21	IId	iPNZ iSNEZ F	18 26 26.9 18 27	25.2				
103	Aug. 21	IId	iPNEZ iSNE F	20 48 20 53	22.3 26.3		c	See list, p. 157	
104	Aug. 21	IId	iPNEZ iSNEZ F	23 29 23 30	17.3 21.6		c	See list, p. 157	
105	Aug. 21	Iu	iPZ ipPZ F	20 43 20 46	47.9 56.1		c c	U.S.C.G.S.: 10.5°N 62.5°W	
106	Aug. 21	Iu	ePZ iZ F	03 29 03 31	29.9 32.4		d c	U.S.C.G.S.: New Britain Island Region	
107	Aug. 22	Iir	ePZ iPZ eNE eE eN MN ME F	04 04 06 07 08 00 06 07 08 00 06 37 08 03	53.9 54.9 56.0 07.8 08.0 58.6 59.5		d c    28.5 55.0	U.S.C.G.S.: 54°N 133°W	
108	Aug. 23	I	ePZ iZ F	03 03 03 07	05.9 13.8		c d	U.S.C.G.S.: Off British Columbia	
109	Aug. 23	Iv	iPZ iNE iSZ iSNE F	18 47 18 48 18 51	56.3 57.4 22.5 23.1			See list, p. 158	
110	Aug. 23	Ir	ePZ iZ F	19 40 19 44	53 53.7			U.S.C.G.S.: Off British Columbia	

MINERAL

No.	Date	Station	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
111	Aug. 23	Ir	iPZ	19	47 01.1		c	U.S.C.G.S.: 53°N 132°W
			eNE		02.0		d	
			iZ	23	46 08.0		d	
			iZ		46.2		d	
			F	20	01			
112	Aug. 23	Ir	iPZ	20	27 57.7		d	U.S.C.G.S.: 53°N 132°W
			iZ	28	00.7		c	
			eNE		01.0			
			eN	32	.4			
			F	22	17			
113	Aug. 23	I	ePZ	20	44 14			
			iZ		19.5		d	
			F					Lost in next shock
114	Aug. 23	I	iPZ	20	44 15.9		d	
			F	20	48			
115	Aug. 23	I	iPZ	21	37 04.6		c	
			F	21	39			
116	Aug. 24	Ir	ePZ	02	40 57.5			U.S.C.G.S.: Off British Columbia
			iZ	41	55.1		d	
			F	02	43			
117	Aug. 24	Iv	iPZ	06	08 35.7		c	U.S.C.G.S.: 43.5°N 127°W
			iZ		37.8		d	Off Oregon Coast
			eNE		39.5			
			eN	10	26.5			
			eZ		36.5			
			F	06	31			
118	Aug. 24	Iu	iPZ	06	37 48.6		c	U.S.C.G.S.: 22°S 176°W
			eNE		49.5			h = 100 km
			iZ		54.3		d	
			ipPZ	38	13.7		d	Aftershock?
			F	06	44			
119	Aug. 24	Iu	ePZ	09	31 05.0		d	U.S.C.G.S.: 9°S 109°W
			F	09	34			
120	Aug. 24	Iu	eZ	13	04 22.0		d	U.S.C.G.S.: Samoa Islands
			eZ	05	53.8		d	Region
			F	13	07			
121	Aug. 24	Ir	ePZ	22	40 40.5		d	U.S.C.G.S.: Off British Columbia
			iZ		47.8		d	
			iZ		53.0		c	
			F	22	44			
122	Aug. 25	Ir	iPZ	04	22 04.9		c	U.S.C.G.S.: 52.5°N 178°W
			iZ	23	13.6		c	
			F	04	30			



No.	Year	Station	Component	Time (T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
23	Aug. 25	Iu	eP'Z ePPZ F	23	44	11.6 38.2 46		c d	
24	Aug. 26	Iu	iPZ F	05	30	13.4		d	U.S.C.G.S.: Off British Columbia
25	Aug. 26	Iv	iPZ eE eN iZ	16	53	58.0 01 03 03.8		d c	Pasadena: 34.5°N 120.5°W Near Point Conception
	Aug. 29		iZ iZ iZ eE F	01	56	43.9 55.4 26.4 27.0 59		d d d	See list, p. 158
26	Aug. 26	Ir	ePZ iZ	22	43	31.0 34.6		d	U.S.C.G.S.: Off British Columbia
	Aug. 29	Iv	eNE iZ F	12	48	35 50.6 48		d	See list, p. 158
127	Aug. 27	Iv	iPZ eN eE	14	53	13.0 13.5 15.0		d	Pasadena: 34.5°N 120.5°W Near Point Conception
	Aug. 31	Iu	iZ iN	00	20	32.7 37.6		c	U.S.C.G.S.: Marianas Islands Region
	Aug. 31	Iv	iE iEZ iZ iN iN F	13	54	01.4 35.9 43.8 49.9 03.9 00		d c c c	U.S.C.G.S.: Southern Alaska
128	Aug. 27	Iv	iPZ iZ F	15	37	06.5 16.7 41		c c	Aftershock?
129	Aug. 27	Iv	ePZ iZ F	15	55	55.7 33.4 00		d c	Aftershock
130	Aug. 27	IIId	iPZ iE iSNE F	20	02	26.5 27.3 32.9 04		d	Eastern Shasta County?
131	Aug. 27	Ir	ePZ iZ F	21	34	09.7 15.5 38		d	U.S.C.G.S.: Off British Columbia

## MINERAL

				Line	Period	Trace	Remarks
		acter		(G.C.T.)		motion	
1949				h. m. s.	s.		
32	Aug. 28	I Id	iPZ F	09 51 43.3 09 53		c	
33	Aug. 28	II Id	iPNZ iSN iMN F	19 02 17.5 19.1 20.0 19 03 50.0		d	Probably S of ...
34	Aug. 28	Iu II Id	ePZ F	19 38 43.8 19 40		d	U.S.C.G.S.: 54°N 34°W
35	Aug. 29	Iv	iPZ iZ iZ iN iZ eN F	01 56 43.0 48.2 06 57 52.6 57 27.3 07 03 28.8 34.5 02 00		d d c	See list, p. 158 U.S.C.G.S.: Off British Columbia Southern Monterey County
36	Aug. 29	Iv	ePZ eN iZ iSZ eN F	12 08 39 12 08 43 46.1 02 09 42.8 02 59 43 12 14		c d	See list, p. 158 U.S.C.G.S.: 48°N 151°E
37	Aug. 31	Iu	iPZ F	00 20 30.0 00 23		d	U.S.C.G.S.: Marianas Islands Region
38	Aug. 31	Ir	iPZ iZ iZ iZ iZ iScPZ F	13 53 55.8 59.9 16 54 23.0 39.2 08 39 50.2 08 59 31.4 14 01		d d c c d c	U.S.C.G.S.: Southern Alaska U.S.C.G.S.: Off British Columbia
39	Sept. 1	Iu	ePZ F	14 10 22.2 14 14		c	U.S.C.G.S.: 36°S 97°W
40	Sept. 2	II Id	iPNEZ F	02 21 20.2 02 22		c	U.S.C.G.S.: South of Fiji Islands
41	Sept. 3	II Id	iPNEZ iZ iNZ F	02 37 51.1 52.4 55.0 02 39		d	U.S.C.G.S.: Off British Columbia See list, p. 158
42	Sept. 3	Ir	iPNEZ iPZ iPPZ iZ iPcPZ F	03 12 30.1 54.0 05 13 07.5 55.2 15 42.3 03 17		d!	U.S.C.G.S.: 62°N 148°W h = 100 km



No.	Date	Character	Phase	Time (G.C.T.)			Period s.	Trace motion	Remarks
				h.	m.	s.			
	1949								
43	Sept. 4	IIId	iPZ iZ iSEZ iN iE iZ iN F	06	00	24.4 25.8 31.9 34.0 47.4 48.4 50.0		Probably S of another shock	
44	Sept. 4	IIId	iPZ iSNEZ F	12	56	04.1 07.6	d		
45	Sept. 5	Ir	ePZ iZ F	06	57	48 53.1		U.S.C.G.S.: Off British Columbia	
46	Sept. 7	Iv	ePZ iZ iZ F	11	57	39 48 58 31 12 00		Southern Monterey County	
47	Sept. 8	Iu	ePZ F	02	56	50 59	d	U.S.C.G.S.: 48°N 154°E	
48	Sept. 8	Iv	iZ iZ F	03	29	10 16 03 31		See list, p. 158	
49	Sept. 11	IIId	iPNEZ iSNE F	16	38	52 55 16 40		Verdi aftershock	
50	Sept. 12	Ir	ePZ F	08	39	59 08 43	d	U.S.C.G.S.: Off British Columbia	
51	Sept. 12	Iu	ePZ F	09	29	59 09 35	c	U.S.C.G.S.: 22°S 170°E	
52	Sept. 12	Iu	ePZ F	11	05	46 11 07	c	U.S.C.G.S.: South of Fiji Islands	
53	Sept. 12	Ir	ePZ iPZ F	14	41	39 44 14 46		U.S.C.G.S.: Off British Columbia	
54	Sept. 14	IIv	iPZ iPNE iSNE iNE F	05	28	37 38 29 17 20 05 34		See list, p. 158	

MINERAL

No.	Date	Station	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
155	Sept. 14	Iu	ePZ ePPZ ePSZ eZ	20 04.6 08 32 15 18 07+ 33 02+			U.S.C.G.S.: 1°N 126°E
156	Sept. 23	Iu	eLZ F	08 39.5 21 18		d	U.S.C.G.S.: Near Vladivostok, U.S.S.R.
156	Sept. 16	Id	iPZ iSZ F	18 40 04 18 06 18 41		c	Off Cape Mendocino
157	Sept. 17	Iu	ePZ F	02 34 19 02 38		c	U.S.C.G.S.: 6°S 154°E
158	Sept. 17	Id	iPZ iSZ F	08 04 58 05 01 08 06			See list, p. 158
159	Sept. 17	Id	iPZ iSZ F	08 09 28 09 30 08 10			See list, p. 158
160	Sept. 21	Iv	iPZ eE iZ iSZ	06 29 21 23 09 23+ 40		d	Verdi aftershock
161	Sept. 27	Ir	eSE F	15 36 41 06 31		d	U.S.C.G.S.: 60°N 119°W
161	Sept. 21	Iv	iPZ iSZ F	06 45 11 29 06 46			Verdi aftershock
162	Sept. 21	Iv	ePZ iZ iEZ iSZ eSE F	07 39 47 49 51 40 14 15 07 42		c c	Oregon, North of Goose Lake U.S.C.G.S.: 23°N 126°W
162	Sept. 30	Iu	F	07 42		c	Aftershock
163	Sept. 21	Ir	ePZ ePE iZ iZ eZ eZ eE iZ F	13 01 44 48 18 54 02 22 11 34 12 31 13 10 32 13 29			U.S.C.G.S.: 17°N 94.5°W
163	Sept. 30	Iu	F	13 29			Aftershock
164	Sept. 21	Id	iPZ iSE F	14 41 00 04 14 43		d	



## MINERAL

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No.	Date	Station	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
165	Sept. 22	Iu	ePZ ipPZ F	15 49 18 33 15 53			c	U.S.C.G.S.: 42°N 142°E
166	Sept. 23	Iu	iPZ F	08 22 48 08 27			d	U.S.C.G.S.: Near Vladivostok, U.S.S.R.
167	Sept. 23	Iv	iPEZ iSEZ F	10 39 31 58 10 43			c	Off Cape Mendocino
168	Sept. 24	Iv	ePZ ePPZ F	04 30 39 34 15 04 38			c	U.S.C.G.S.: 6°S 154°E
169	Sept. 24	Iv	iPZ iZ iSZ F	09 28 11 43 47 09 31				See list, p. 158
170	Sept. 24	Iv	iPZ iSZ iSE F	09 45 28 46 02 07 09 48				See list, p. 158
171	Sept. 27	Ir	iPEZ eE eSE eSZ eLE eLZ F	15 36 18 25 40 58 59 41 19 44 17 08			d	U.S.C.G.S.: 60°N 149°W
172	Sept. 30	Iu	ePZ iPZ F	04 11 08 10.8 04 17				U.S.C.G.S.: 23°S 176°W
173	Sept. 30	Iu	iPZ eZ F	04 22 00.8 37.0 04 58			c	Aftershock
174	Sept. 30	Iu	ePZ F	18 31 52.6 18 37				Aftershock

NO.	Date	acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
1	Aug. 15	Iv		07 30	ca			S - P = 13.5 sec.
2	Aug. 21	Iv		10 53	ca			$\bar{S} - \bar{P} = 32$ sec. See list, p. 157
3	Aug. 21	Iv		11 47	ca			$\bar{S} - \bar{P} = 32.5$ sec. See list, p. 157
4	Aug. 21	Iv		20 50	ca			$\bar{S} - \bar{P} = 32.6$ sec. See list, p. 157
5	Aug. 23	IIId		18 49	ca			$\bar{S} - \bar{P} = 8.6$ sec. See list, p. 158
6	Sept. 14	Iv		05 29	ca			S - P = 18.2 sec. See list, p. 158
7	Sept. 23	Id		10 39	ca			S - P = 8.5 sec. Off Cape Mendocino
8	Sept. 27	IIr	iPEZ iE iE iSE eZ eE F	15 36	06.7 10.7 24.5 40 41.7 42.9 43.1 17 17		d	U.S.C.G.S.: 60°N 149°W

Apparatus	Component
Springmeter	1 2



RENO

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RENO, NEVADA

CONSTANTS OF THE STATION

Latitude and longitude:

$$\begin{aligned} \phi &= 39^{\circ} 32' 13'' \text{ N.} \\ \lambda &= 119^{\circ} 48' 18'' \text{ W.} \end{aligned}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 1386 meters (4546 feet) above mean sea level.

Apparatus	Component
Sprengnether .....	N E Z

No.	Date	Station	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
1	July 1	Iu	eZ F	03 38	46.5 41		c	
2	July 2	Iv	iPZ iN iE iEZ iEZ F	03 33	35.2 38.5 39.0 42.7 51.7		d	
3	July 2	IIu	iPNE iPZ iN iEZ eN eE eZ eE eN eSNZ eSE eN eNE eZ eLZ eLN eLE F	20 09	33.1 33.5 37.7 57.2 47 53 53.5 32.4 39.2 46 51.5 59 21.5 23.7 34.7 35.0 35.6 29		d	U.S.C.G.S.: 16°N 148°E
4	July 3	Iu	ePNZ eE eE eZ F	21 56	51.6 01.8 27 34.1 59			U.S.C.G.S.: 12°S 76°W
5	July 4	Iu	ePEZ eE eZ F	14 00	43.8 23.6 25.2 02			U.S.C.G.S.: 21°S 174°E
6	July 8	Ir	ePNZ iN eE eZ iNZ eE iZ eN eLNEZ F	12 47	41.5 52.6 54 58.5 39.8 41.5 19.6 20.0 01.0 15		c	U.S.C.G.S.: 13°N 91°W



no.	Date	Station	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
7	July 8	Id	iPZ	19 09	13.2		d	See list, p. 157
			iSEZ		18.3			
			iNE		18.7			
			F	19 10				
8	July 9	Id	iPZ	11 34	06.7			U.S.C.G.S.: 39°N 71°E
			iNE		07.4			Verdi aftershock?
			iSNE		10.0			
			iZ		10.9			
			F	11 35				
9	July 9	Ir	ePNZ	18 52	22.5			U.S.C.G.S.: 33°N 71°W
			ePE		23.5			
			eEZ		33.3			
			eN		47.6			
			iZ		52.1			
			eSZ	58	28			
			eZ	19 05	28.5			
			iN		34.6			
			eN	17 07	15.8			
			eLZ		09.6			
			F	19 16				
10	July 9	IIId	iPNEZ	23 01	35.2		d	Verdi aftershock
			iNEZ		37.5			
			iSNE		40.2			
			iZ		41.1			
			F	23 04				
11	July 9	IIId	iPNZ	23 07	46.3		d	Verdi aftershock
			iPE		46.7			
			iZ		47.5			
			iNE		47.9			
			iN		51.3			
			iSZ		53.3			
			iSE		54.4			
			F	23 11				
12	July 10	IIu	ePZ	04 07	29.5			U.S.C.G.S.: 39°N 71°E
			ePN		33			
			ePE	19 27	34.5			
			iZ		35.5			
			iP'E	11	38.0			
			iPPZ		48.5			
			iPPN	19 30	49.3			
			iSKSN	18	05.0			
			eSKSZ	23 32	24.5			B.C.I.S.: 29°N 138°E
			ePSZ		20 05			h = 400-500 km
			eZ		34.3			
			eNE		34.4			
			eNZ		57.0			
			F	06 35				

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NO.	Date	Locater	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
13	July 10	Id	eP*Z iSE F	15 18 15 20	01.2 45.5			See list, p. 157
14	July 10	Iu	ePZ iZ eN	16 03 06 21	02 35.5			U.S.C.G.S.: 39°N 71°E
15	July 15	Iu	eZ eN eE F	09 08 19 39 16 12	04.2			U.S.C.G.S.: New Britain
15	July 10	Iu	ePZ ePN eE ePPNZ eN eE eZ eMN eMZ eME F	16 37 38 10.5 42 07 48 41.5 49 06.5 17 20.5 21.9 22.7 17 43	53.5 56.5			U.S.C.G.S.: 39°N 71°E
16	July 11	Iu	ePNZ iPE iZ iE iN iE iZ iN iPPZ eSZ eSE eLZ eLN iN F	16 23 03 40 04 24 05 05 05 08 05 11 05 13 26 12.5 33 40.2 42.7 46.4 46 47.5 47 09.4 16 50	01.0 01.6 15.1 35.1 36.2 09.1 11.1 13.7 12.5 40.2 42.7 46.4 47.5 09.4		d	U.S.C.G.S.: 34°N 132°E
17	July 14	Iu	ePZ eN iNE iZ F	19 27 28 05 24 19 30	50.6 01.2 24.5 27.8			d
18	July 14	Iu	ePZ eN eE ipPEZ iN	23 32 37 39 34 10.3 43.3	34.9 37 39			B.C.I.S.: 29½°N 138¼°E h = 400-500 km



No.	Date	Station	Phase	Time	Period	Trace motion	Remarks
				(G.C.T.)			
				h. m. s.	s.		
18	1949 July 14 (cont'd.)	Iu	iN iE eSNZ iNZ iE F	23 35 42.3 41 59.5 42 00.1 43.9 44.9			
19	July 15	Iu	iPZ ePE iPN eN eE F	09 29 04.6 05.0 06.1 18.5 19.5		c	U.S.C.G.S.: New Britain
20	July 16	I	ePN eE eNZ iZ eN eN eZ eN F	10 04 11.8 19.5 22 05 45.7 18 23.5 19 16 22.5 22.7			
21	July 17	Id	iZ eZ iSNEZ F	03 39 24.7 29 30.1			Verdi aftershock?
22	July 18	Iu	iPZ eZ eZ eE eN eZ eE eZ eSKSE eSKSN iZ eN eE F	04 56 38.2 58 07.5 05 00 07 17.5 39 43 05 40.5 06 29 07 15 21.5 12 02.7 07.5 17.5		c	U.S.C.G.S.: 5.5°N 126°E
23	July 18	I	iPZ iNE iZ F	07 46 52.8 53.5 47 08.1			
24	July 18	Iu	ePZ eZ eE eZ eE F	08 39 41 40 43 41 22 42 03 46 08.5			U.S.C.G.S.: 15.5°S 166°E

RENO

No.	Date	Character	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949					s.		
25	July 18	Iu	iPEZ eE eZ eN iE eN eE F	10 04	16.8 26.5 30.5 34 51.7 06 27 07 48 10 09		c	U.S.C.G.S.: 42.5°N 142.5°E h = 200 km
26	July 19	IIId	iPNEZ iE iN iSNE F	07 31	08.3 08.7 09.3 10.9 07 33			See list, p. 157
27	July 20	I	eN eE eE eN iN eE F	21 39	29.5 32 41 43.5 52.5 43 04.9 16.5 21 46			U.S.C.G.S.: 38.5°N 26.5°E
28	July 21	IIu	ePE ePN ipPN ipPE iE iN iN iE eE eE F	08 12	40.8 41.2 54.8 55.5 13 11.6 12.2 16 23.3 28.9 22 34 44.5 08 25			U.S.C.G.S.: 16°S 74°W h = 100 km See list, p. 157
29	July 22	Id	iPE iPN iSNE F	14 47	03.7 04.5 10.3 14 48			U.S.C.G.S.: 18°N 145°E
30	July 23	I	ePE eN eN eE eN F	09 13	57 14 12 43 46 15 41.5 09 18			U.S.C.G.S.: 32°S 111°W



RENO

No.	Date	Character	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
31	July 23	IIu	ePE iPN iNE ipPN ipPE iE iN iE eN eSN eN eE eN eE F	10 39 22.5 22.9 34.3 40 01.2 08.2 41 02.6 04.2 15 46 06.1 08.0 49 18.3 50 01.5 02.5 51 02 14 11 15				U.S.C.G.S.: 18.5°S 169°E h = 200 km	
32	July 23	Iu	ePE ePN eN eE eNE eSKSN eSKSE eE eN eLN eLE F	15 17 01.7 06.8 20 54.6 16 55.2 24 50.7 19 27 38.5 40.5 29 42.5 44 51.3 51.4 16 30				U.S.C.G.S.: 38.5°N 26.5°E	
33	July 23	IIId	ipNE isNE F	16 07 47.8 50.3 16 10				See list, p. 157	
34	July 24	IIId	ipZ isNEZ iZ F	22 37 43.1 45.8 48.1 22 40			c		
35	July 25	Iu	ipZ eNE F	04 03 40.0 40.5 04 08			d	C.M.O.: 18°N 145°E	
36	July 25	Iu	ipZ iNE iE iZ iN F	11 36 03.3 04.0 10.6 08 18.1 22.5 11 41			c     d	U.S.C.G.S.: 32°S 111°W	

RENO

No.	Date	Character	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
37	July 27	Iv	ePZ eN eE eNZ eE	12	39	02 18 26 33.5 35.0			See list, p. 157
38	July 27	Iu	F iPZ iE iN iZ iE iZ iN eZ iN eSN eSEZ eLZ F	15	24	18.3 19.0 19.7 47.3 57.0 25 06.3 12.1 27 32.5 34.3 34 57.0 11 35 04.5 52.2 16 15	53	c c c	U.S.C.G.S.: 29°N 177°W
39	July 27	Id	iPZ iE iN iSZ iE F	19	37	31.6 32.8 33.8 40.4 44.1		c	See list, p. 157
40	July 28	Iu	ePZ eN F	03	47	43.5 52.5			U.S.C.G.S.: 16°S 76°W
41	July 28	Iu	eZ eE eZ F	20	18	33.0 56.5 19 13.0 20 21			U.S.C.G.S.: Near 53°S 25°W
42	July 29	Ir	ePZ F	21	51	44.5			U.S.C.G.S.: Gulf of California
43	July 30	Iu	iPZ iE eN iZ iE F	06	40	11.9 12.2 27.0 37.6 59.1		d	U.S.C.G.S.: 45.5°N 149°E
44	July 31	Iu	ePZ eN eE F	00	01	41.5 44.0 55.5			



RENO

No.	Date	Station	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
45	July 31	Iu	iPZ eE eN F	04 26	36.2 36.5 39.5		d		
46	Aug. 1	Iv	eNZ eE eZ eN F	00 08 09 25	42.5 35.0 37.0			See list, p. 157	
47	Aug. 1	Ir	ePNEZ eN eME eMN F	08 09 10 05 20 03 10	48.0 05.5 03 10		c	U.S.C.G.S.: 19°N 96°W	
48	Aug. 1	IIId	iPNEZ iSNE F	11 35 19 11 11 37	05.2 07.5				
49	Aug. 2	Iv	eSZ eE eN iN F	07 15 16 10	26 33 38 10.5			See list, p. 157	
50	Aug. 2	Iu	ePNZ eE F	23 13 14 08 23 17	59.0 08			B.C.I.S.: Southwest Pacific	
51	Aug. 3	Iu	ePZ iZ iN eE iN iE F	20 43 20 18 44 05 20 23 20 48	30.5 33.6 34.5 35.5 05.0 28.0		d d	B.C.I.S.: Near 53°S 25°E	
52	Aug. 4	Iu	iPZ F	10 59 11 01	11.4		c		
53	Aug. 4	Iu	ePZ eN eE F	18 12 18 15	41.0 44.5 47.5				
54	Aug. 5	Iu	eZ eE eN F	03 00 03 03	18 37 46.0				

## RENO

No.	Date	Character	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
55	Aug. 5	IId	iPEZ eN iZ iNE iN iE iZ F	13	43	44.8 45 46.8 47.2 53.7 54.4 55.8			
56	Aug. 5	Id	iPZ iSNE iE iN F	18	46	30.2 32.7 35.9 39.1	c	Verdi aftershock?	
57	Aug. 5	Iu	ePZ eN eE F	19	12	35.5 36.5 36.0	c	Foreshock	
58	Aug. 5	Iu	iPNEZ iE iZ iN iN iPPE eSN eSE eLN eE eZ F	19	18	25.7 45.9 47.2 50.9 38.0 53.9 22.0 34.5 38.3 38.6 39.9	c	U.S.C.G.S.: 1°S 78°W Central Equador Quake	
59	Aug. 5	Iu	ePZ eE eN F	20	18	05.5 08.5 11.5	c	Verdi aftershock?	
60	Aug. 6	IIu	ePNEZ iE iE iN iZ iE iSNE eZ iE eN F	00	47	26.5 28.3 39.2 47.0 50.8 58.8 15.7 18 42.2 43.5	c	U.S.C.G.S.: 19°S 174.5°W	
				01	47				



RENO

No.	Date	Character	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
61	Aug. 6	Id	iPZ iSNE eZ F	05 34	54.5 57.4 58.0		c	Verdi aftershock	
62	Aug. 6	Iu	ePNEZ eE iN F	12 08 10 09 12 13	51.5 33.5 46.3			U.S.C.G.S.: 19°S 174.5°W	
63	Aug. 6	Id	iPZ iSNE iN iE F	14 52 00 53 14 55	54.8 57.2 00.9 05.3		c	Verdi aftershock	
64	Aug. 6	Iu	ePZ eE eN eE F	16 03 06 11 16 06	01.5 02.0 14.5 18.5			U.S.C.G.S.: 19°S 174.5°W	
65	Aug. 6	Iv	ePNEZ eE F	18 28 18 31	46.0 48.5			U.S.C.G.S.: Indian Ocean Blast? miles east of Madagascar	
66	Aug. 6	IIId	iPZ iN iSE iN iZ iE F	19 11 09 30 09 31 09 33 19 13	21.7 22.8 23.5 30.1 31.5 33.2		c	Verdi aftershock	
67	Aug. 7	Id	iPZ iSNE F	00 48 00 49	08.2 10.7		c	Verdi aftershock?	
68	Aug. 7	Iv	eZ F	02 46 02 48	07.5				
69	Aug. 7	Ir	ePNEZ iE iE iZ F	08 18 13 27 19 08 08 23	29.7 44.5 53.9 08.0		d	U.S.C.G.S.: 50.5°N 130°W	
70	Aug. 7	Id	iPZ iSNE F	09 33 09 35	32.0 34.5		c	Verdi aftershock?	

## RENO

From the ISC collection scanned by SISMOS

No.	Date	Character	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
71	Aug. 7	Id	iSNEZ F	09 35 17.4 09 39		o	Verdi aftershock?
72	Aug. 7	Ir	ePZ eE eN F	10 47 51.5 19 10 53.5 58.5 10 52		d	U.S.C.G.S.: 50.5°N 130°W
73	Aug. 7	Id	iPZ iSNE F	15 36 11.8 14.1 15 38		c	Verdi aftershock?
74	Aug. 8	Iu	ePZ eNE iNE eN eE iZ eN F	06 09 54.5 10 02.5 19.3 11 46.0 47.0 49.8 23.0 06 14		c	See list, p. 157
75	Aug. 8	Iu	iP'E eN ePPZ eN F	07 29 35.6 55 34 02 18 07 36			U.S.C.G.S.: Indian Ocean 1100 miles east of Madagascar
76	Aug. 8	I	eZ eN	09 30 43 55			
77	Aug. 8	Iv	eP*NE iPZ iN iE iSE iZ F	11 00 57.0 58.2 11 01 13.6 14.3 23 08 19.1 22.1 11 05			See list, p. 157
78	Aug. 8	Iu	ePZ eE eN F	13 24 07.0 11 56 08 57 11.5 13 27			U.S.C.G.S.: Tonga Islands Region
79	Aug. 8	IIr	iPZ eN eE eN F	14 17 14.9 16 26 13 56 48.5 14 21		c	U.S.C.G.S.: 15°N 93°W



No.	Date	Character	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
80	Aug. 8	I	ePZ eNE F	17 25	25.5 26.5		c		
81	Aug. 8	Iu	ePZ eN F	19 18	33 44.0			U.S.C.G.S.: 16°S 75.5°W	
82	Aug. 8	Id	iPZ iNE F	19 26	41.5 44.3			Verdi aftershock	
83	Aug. 9	IIV	iPZ eE eNE iEZ iN iE iN iZ iE iN F	00 40	06.1 08.5 11.4 25.0 30.6 37.3 45.5 48.5 53.8 54.8		c	See list, p. 157	
84	Aug. 9	I	eZ eE eN F	02 05	22 44.0 55.5			U.S.C.G.S.: 0° 146°E	
85	Aug. 9	Id	iP iP iP iP iP iP iP	08 34	40 31 33 35 59 14 17 25			Verdi aftershocks	
86	Aug. 10	Iu	ePNE F	20 43	40 46			U.S.C.G.S.: 87°N Approx. 60°E	
87	Aug. 11	Iv	ePNE iE iN iE iN F	11 56	44.5 06.3 08.3 23.3 35.8				
88	Aug. 11	Ir	ePE eN iE iN eLN F	13 56	44.0 51.5 59.7 02.7 09.6 15			U.S.C.G.S.: 15°N 93°W Aftershock	

RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Trace motion	Remarks	
				h.	m.	s.			
	1949								
89	Aug. 11	Iu	ePE eE F	14 50 51 14 54	57 32			U.S.C.G.S.: 45°N 29°W	
90	Aug. 11	Iu	iPE iN iN F	15 12 15 16	21.3 21.6 38.5			U.S.C.G.S.: Samoa Islands Region	
91	Aug. 11	Iv	eN eE eN iE F	20 07 08 20 11	45.5 47 04.0 10.9			Mt. Lassen shock	
92	Aug. 11	Iv	eE eN eE eE eN iE F	23 17 23 21	05.0 08.5 10.5 25.5 28.5 32.0			Mt. Lassen shock	
93	Aug. 13	Iu	ePE eN iN eE iE iN eE eN F	18 38 18 54	08.5 10.5 20.6 23.0 32.0 32.7 48 41.5 49 04.5			U.S.C.G.S.: 0° 146°E	
94	Aug. 14	Iv	eSN eE eSN F	08 21 08 22	06.0 07.0 19			See list, p. 157	
95	Aug. 17	Iu	ePN iE iE iN eSN eE F	18 45 53	00.0 00.4 13.9 16.4 51.5 53.5			U.S.C.G.S.: 43°N 146°E h = 100 km	
				Runs into next shock					
96	Aug. 17	Iu	eP'E eN eSKSN eSE eLE eN F	19 02 09 11 38.9 40.0 20 06	01.0 04.5 39 04 38.9 40.0			U.S.C.G.S.: 39°N 40°E	
						23 25			



RENO

No.	Date	Character	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
97	Aug. 18	Iu	ePNE ePcPNE F	10 09 39.5 52.5 10 13			U.S.C.G.S.: Bonin Islands Region
98	Aug. 18	Iu	ePNE iE F	13 41 47.0 42 51.4 13 48			U.S.C.G.S.: 8.5°N 82.5°W
99	Aug. 18	IIv	ePNE iSNE F	14 25 37.8 53.6 14 29			See list, p. 157 U.S.C.G.S.: 51°N 133°W
100	Aug. 18	Id	ePNE iSNE F	15 06 45.0 56.5 15 10	17		U.S.C.G.S.: Off British Columbia
101	Aug. 19	Iu	ePNE F	08 37 26.5 08 40			U.S.C.G.S.: Tonga Islands Region
102	Aug. 21	Iv	iPE iN iE iSE iN iN F	05 39 22.5 26.1 31.1 40 06.6 07.1 13.4 05 43			Probably Inyo County See list, p. 157
103	Aug. 21	IIv	iPE iN iN iE iSN iE iNE F	10 51 27.3 28.3 31.4 42.4 42.8 43.9 45.0 46.4 10 55			See list, p. 157 U.S.C.G.S.: Off British Columbia U.S.C.G.S.: 53°N 132°W
104	Aug. 21	IIv	iPNE iE iN iN iE iNE F	11 45 43.6 47.6 48.3 59.6 46 00.4 02.2 11 51	6		See list, p. 157 U.S.C.G.S.: 53°N 132°W
105	Aug. 21	Iv	eSN eE F	12 06 33.0 34.5 12 08	15		U.S.C.G.S.: 43.5°N 127°W Off Oregon Coast
	Aug. 21	Iv	iPNE iE iSN eE F	06 09 02.2 15.2 10 25.9 16 06 30			

RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
106	Aug. 21	IIv	iPN iE iN iE iE	20 48	40.2 40.5 41.6 44.7 55.4			See list, p.157	
115	Aug. 21	I	iSN iN iE F	20 56	56.4 58.4 59.4				
107	Aug. 22	IIIr	iPNE eZ eLZ	04 05	13.6 15	17		U.S.C.G.S.: 54°N 133°W	
108	Aug. 23	Ir	iPNE F	03 03 03 07	23.0			U.S.C.G.S.: Off British Columbia	
109	Aug. 23	Ir	ePN eE F	15 24 15 28	44 54.0			U.S.C.G.S.: Near Coast of Southern Peru	
110	Aug. 23	Iv	eE eN eS?NE iNE iN iE iN F	18 48 21 49	46 50 04.7 06.1 06.4 24.2 28.0			See list, p.158	
111	Aug. 23	Ir	eNE F	19 41 19 44	30.0			U.S.C.G.S.: Off British Columbia	
112	Aug. 23	Ir	ePN iE iN iN F	19 47 19 49	20.0 21.4 26.9 24.4			U.S.C.G.S.: 53°N 132°W	
113	Aug. 23	IIr	ePE iN iE iN	20 28	17.0 17.9 27.9 28.4			U.S.C.G.S.: 53°N 132°W	
124	Aug. 23	Ir	eSN eE eLE F	05 30 05 32 22 31	33 36 33.2	6 15		U.S.C.G.S.: Off British Columbia	
114	Aug. 24	Iv	iPNE iE iSN eE F	06 09 10 16 06 30	02.2 18.2 25.9 16			U.S.C.G.S.: 43.5°N 127°W Off Oregon Coast	



RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
115	Aug. 24	Iu	iPE iN eSNE F	06 37	53.1 53.7 47 55.0			U.S.C.G.S.: 22°S 176°W h = 100 km.	
116	Aug. 24	I	eN eE F	09 24	00 03				
117	Aug. 24	Iu	eNE iE F	09 31	02.5 31.5			U.S.C.G.S.: 9°S 109°W	
118	Aug. 24	I	eN eE F	12 46	31 47 27 12 49			Pasadena: 34.5°N 120.5°W Near Point Conception	
119	Aug. 24	Iu	eN eE F	13 04	23 36			U.S.C.G.S.: Samoa Islands Region	
120	Aug. 24	I	eE eN F	21 55	48 56 12 21 57				
121	Aug. 24	Ir	eN eE eN F	22 40	58.5 41 14.5 48 06 22 53			U.S.C.G.S.: Off British Columbia	
122	Aug. 25	Ir	iPE eN iE iSE iSN F	04 22	20.2 20.5 23 27.3 28 38.0 38.7 04 35			U.S.C.G.S.: 52.5°N 178°W	
123	Aug. 25	Iu	eP'N eE eE eN F	23 44	28 46 50 44 51 00 23 56			U.S.C.G.S.: Off British Columbia	
124	Aug. 26	Ir	ePNE F	05 30	31.5 05 42			U.S.C.G.S.: Off British Columbia	
125	Aug. 26	IIv	ePNE iE iN iE iN iE iE F	16 53	53 54 15.6 18.6 03 52 34.9 49.4 57.1 55 14.6 17 02			Pasadena: 34.5°N 120.5°W Near Point Conception	

RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Time motion	Remarks
				h.	m.	s.			
	1949								
126	Aug. 26	Ir	eN eE F	22	43	51.0 55			U.S.C.G.S.: Off British Columbia
127	Aug. 27	IIId	iPZ eNE iNE iZ iSN iSE iNZ F	10	05	12.1 12.5 14.7 16.9 21.3 21.8 22.9		c	See list, p. 155
128	Aug. 27	IIv	ePZ eNE iNE	14	53	03 06 23.3			Pasadena: 34.5°N 120.5°W Near Point Conception
135	Aug. 30	Iv	iE iN iZ	20	59	45.1 58.8 54 12.2			Inyo County
137	Aug. 31	Iv	iN iE F	00	40	35.8 43.8			U.S.C.G.S.: Marianas Islands Region
129	Aug. 27	Iv	eNEZ iE eN F	15	37	28 38 24.2 31.0			Aftershock? Southern Alaska
130	Aug. 27	Iv	eNEZ eE eZ iN F	15	56	08 33.0 57 57 17.1			Aftershock?
131	Aug. 27	Iv	ePZ iE iN iN iZ iNE F	20	02	46.5 49.9 54.9 03 01.4 03.9 14 52 05.1			Eastern Shasta County?
132	Aug. 27	Ir	ePN eZ eE F	21	34	23 29 41			U.S.C.G.S.: Off British Columbia Aftershock?
133	Aug. 28	Iv	eZ eNE eZ F	03	49	05 50 08 03 16 09.5			Southern California?



RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
134	Aug. 29	Iv	eZ eE iN iE iZ iN iE F	01 56	52.5 55.5 15.1 16.7 19.9 20.5 27.9			See list, p. 158	
135	Aug. 29	Iv	ePZ eNE eZ iSE eN F	12 08	26.0 37.5 14.0 15.0 15.5			See list, p. 158	
136	Aug. 30	Iv	iNEZ F	20 59	24.0 07.7			Inyo County	
137	Aug. 31	Iu	ePNEZ F	00 20	41 30			U.S.C.G.S.: Marianas Southern Islands Region	
138	Aug. 31	Ir	eZ eZ eNE F	13 53	12 36.5 38			U.S.C.G.S.: Southern Alaska	
139	Aug. 31	IIId	iPNEZ iZ iSNE F	15 37	26.4 29.0 29.8		c	Southern Monterey County	
140	Sept. 1	Iu	ePZ eE eN F	14 10	17.5 24.5 26.5		c	U.S.C.G.S.: 36°S 97°W	
141	Sept. 2	Iv	iP?Z iNEZ iNE F	14 52	33.3 41.4 55.3		c	Southern Monterey County	
142	Sept. 2	Iv	iNEZ F	17 40	29.6 29.0			Aftershock?	
143	Sept. 3	Iu	ePZ eNE F	03 12	42.2 43.0		d	U.S.C.G.S.: 62°N 148°W h = 100 km.	

RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
144	Sept. 3	Id	iPNEZ iSZ iNE F	04	54	15.0 17.7 18.3		c	Verdi aftershock
			F	04	56				
145	Sept. 5	Ir	eN eZ eE iE iN F	06	58	05.5 06.0 11.0 35.0 41.0			U.S.C.G.S.: Off British Columbia
			F	07	02				Verdi aftershock?
146	Sept. 6	IIv	ePEZ iZ iNE iZ iN F	11	21	29.5 33.7 34.2 47.6 02.7 07.7		c d	See list, p. 158
			F	11	35				U.S.C.G.S.: 17°S 172°W
147	Sept. 7	Iv	eE eNZ F	05	39	38 40 02			Southern California?
			F	05	42				Verdi aftershock
148	Sept. 7	Iv	eZ eN eE F	07	04	45 48 51			Off coast of Monterey County?
			F	07	06				
149	Sept. 7	Iv	eN eEZ F	11	58	13.5 15.5			Southern Monterey County
			F	12	00				U.S.C.G.S.: Off British Columbia
150	Sept. 7	I	eEZ eN F	12	49	15.5 20.5			
			F	12	52				U.S.C.G.S.: 22°S 170°E
151	Sept. 7	I	eE eZ F	13	46	54.5 56.0			U.S.C.G.S.: Off British Columbia
			F	13	49				
152	Sept. 7	Iv	eZ eE eN eE eZ F	14	48	42.5 46.5 20.5 29.0 36.5			Southern Monterey County
			F	14	53				
153	Sept. 8	Iv	eE eZ eNEZ F	03	29	04 09 48.0			See list, p. 158
			F	03	32				



RENO							
No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
154	Sept. 8	I	eZ eE eN F	07 31 14.5 16 22 07 33			
155	Sept. 8	Iu	eZ eE eN F	16 13 03.5 06 08 16 15			U.S.C.G.S.: 15.5°S 76°W
156	Sept. 9	Id	iNE F	06 03 13.2 06 05			Verdi aftershock?
157	Sept. 9	I	eE F	08 18 59.0 08 22			
158	Sept. 9	Iu	ePE eN iN F	20 38 02 05 20.4 20 42			U.S.C.G.S.: 17°S 172°W
159	Sept. 10	IId	iPNE iSNE F	20 08 59.0 09 01.9 20 12			Verdi aftershock
160	Sept. 11	Iv	ePNE iE iN iE F	15 28 29.0 39.8 45.4 47.5 15 32			Mt. Lassen Region
161	Sept. 12	Ir	ePZ eN eE F	08 40 13.5 15 44 08 44			U.S.C.G.S.: Off British Columbia
162	Sept. 12	Iu	ePNEZ F	09 30 03.5 09 35			U.S.C.G.S.: 22°S 170°E
163	Sept. 12	Ir	ePZ eNE F	14 41 57.5 59.0 14 48		d	U.S.C.G.S.: Off British Columbia
164	Sept. 13	I	eZ eE eN F	07 05 52 06 02 26 07 08			
165	Sept. 14	Iv	ePZ eE eN iE iSZ	05 29 01.5 02.5 04.0 24.6 56.3			See list, p. 158

## RENO

No.	Date	Character	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
165	Sept. 14 (Con'd.)	Iv	iE iN iE iN F	05 29	57.1 59.1 02.1 17.9			Southeastern Palms Group V at Kern River Powerhouse No. 3 and at Kernville.	
166	Sept. 14	I	eZ eN eE F	16 57	41 59 00 06			U.S.C.G.S.: 14°N 88.5°W h = 100 km.	
167	Sept. 14	Iu	ePZ iE eN iPPZ iE iN eN ePSE eLZ eE F	20 04	39.5 41.0 47.5 05.5 07.8 08.7 47.0 03.0 40.9 41.8 16			U.S.C.G.S.: 1°N 126°E	
168	Sept. 16	Ir	eN eE eZ iE eZ iN F	15 48	13 25 33 49 47.8 51.5 50 09.8 55			U.S.C.G.S.: 30°N 178°W Pasadena: Mexico	
169	Sept. 16	Ir	eNZ eE F	16 11	13 23 15	26 28		Aftershock?	
170	Sept. 16	IIr	ePZ eN eE eN eZ eE eZ iN F	20 46	51 58 59.5 47 50 48 05.0 56.0 49 07.5 24.5 04			Pasadena: Mexico	
171	Sept. 17	I	eE eN F	01 22	04.5 13.5 25				
172	Sept. 17	Iu	eN eZ eE F	02 33	41.5 45.5 47.0 37			U.S.C.G.S.: 17°N 96.5°W	



## REMO

No.	Date	Character	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
182	Sept. 21	Iu	ePZ eN iE F	18	31	21.5 22.5 23.1			U.S.C.G.S.: 16°S 173°W
183	Sept. 22	Iu	ePZ eN eE ipPZ iE F	15	49	28.5 42.5 44.0 47.3 48.4			U.S.C.G.S.: 42°N 142°E
184	Sept. 23	Iv	eE eN F	00	03	11.5 14.5			San Luis Obispo County
185	Sept. 23	Iv	eSZ eZ eNE eE eN F	10	40	20.0 39.5 41.5 59.0 41 04.5			Off Cape Mendocino <i>(After shock of 03 58 52 GMT, which was missed because of delay in changing records.)</i>
186	Sept. 23	I	eE eNZ F	21	48	08.5 11.0			
187	Sept. 24	Iu	ePZ eE iN iN iZ eZ F	04	30	47.5 48.0 50.3 31 02.0 15.5	17	d c	U.S.C.G.S.: 6°S 154°E
188	Sept. 24	Iv	iPZ eNE iNE iZ F	09	27	47.9 49.0 28 08.6 10.8		d	See list, p. 158
189	Sept. 24	Iv	iPZ eNE eNZ eN F	09	45	05.1 07.0 25.5 26.0		d	See list, p. 158
190	Sept. 25	Iu	ePZ eN eE ePPZ eE eSE F	15	28	08.0 12 15 32 00 15 39 05 15 42			U.S.C.G.S.: 6°S 154°E



## RENO

No.	Date	Station	Phase	Time (G.C.T.)		Period s.	Trace motion	Results
				h.	m. s.			
	1949							
191	Sept. 25	Iu	iPZ eE F	16 10 16 12	38.6 39.5		d	U.S.C.G.S.: 6°S 154°E
192	Sept. 27	IIR	iPNEZ iN eSN eZ eLN eLEZ F	15 36 41 44.5 44.6 17 12	31.7 51.9 20.5 21.0		d	U.S.C.G.S.: 60°N 149°W
193	Sept. 30	Iu	iPZ eNE F	15 20 15 23	14.3 15.0		d	U.S.C.G.S.: 31°S 177°W
194	Sept. 30	Iu	ePZ eE eN F	18 31 18 32 18 35	57.0 00.5 03.0			U.S.C.G.S.: 23°S 176°W (Aftershock of quake at 03 58 52 GCT, which was missed because of delay in changing records.)
195	Sept. 30	I	eZ eE eN F	22 19 22 22	16.0 28.5 31.5			



# Bulletin of the Seismographic Stations

Volume 19, No. 4, pp. 284-404



BERKELEY—MOUNT HAMILTON—PALO ALTO  
SAN FRANCISCO—FERNDAL—FRESNO  
MINERAL—ARCATA—RENO

Earthquakes and the Registration of Earthquakes

From October 1, 1949, to December 31, 1949

BY  
DON TOCHER

UNIVERSITY OF CALIFORNIA PRESS  
BERKELEY AND LOS ANGELES  
1951



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BULLETIN OF THE SEISMOGRAPHIC STATIONS

CAMBRIDGE UNIVERSITY PRESS

LONDON, ENGLAND

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EARTHQUAKES IN NORTHERN CALIFORNIA, NEVADA, AND OREGON

EARTHQUAKE INTENSITY SCALE

Intensities are given by Roman numerals in the list of California and Nevada earthquakes on the following page, when sufficient information on the effects of the shock is available. Criteria of the Modified Mercalli Scale which are used to rate the intensity are:

- Intensity
- II Felt by a few people only. Duration or direction not appreciable.
  - III Duration or direction appreciable.
  - IV Rattling of doors and windows; swinging of suspended objects.
  - V Disturbance of movable objects; plaster cracked.
  - VI Overthrow of movable objects; cracking of chimneys and other brickwork.
  - VII Fall of some chimneys; some damage to buildings.

EARTHQUAKE MAGNITUDE SCALE

Richter magnitudes given in the list of epicenters on the next page are found from the Wood Anderson amplitudes, using the nomogram given by Nordquist, "Bulletin of the Seismological Society of America", 32:164.

Latitude and Longitude are given for each epicenter in the following list. Only those earthquakes are given for which epicenters were located. The letter represents the excellence with which the epicenter has been located, a indicating excellent, b good, c fair, d poor.

No.	Date	Lat.	Long.	Magnitude	Quality
18	Oct. 26	36° 35'	121° 15'	2.6	a
19	Oct. 28	36° 35'	121° 0'	3.4	d
20	Nov. 5	36° 35'	121° 15'	2.7	b
21	Nov. 5	36° 35'	121° 15'	2.2	c
22	Nov. 5	37° 55'	121° 14'	1.8	b
23	Nov. 5	37° 55'	121° 14'	1.9	b
24	Nov. 4	37° 55'	121° 14'	1.8	b
25	Nov. 7	36° 35'	121° 38'	2.6	c
26	Nov. 8	36° 35'	121° 38'	2.5	d
27	Nov. 9	36° 35'	121° 08'	3.3	b
28	Nov. 9	36° 35'	121° 08'	3.9	a

EARTHQUAKES IN NORTHERN CALIFORNIA, NEVADA, AND OREGON

1949 - Pacific Standard Time

<u>No.</u>	<u>Date</u>	<u>Time</u>	<u>North Latitude</u>	<u>West Longitude</u>	<u>Richter Magnitude</u>	<u>Quality</u>
1	Oct. 2	12-36-46	37°48'	122°08'	1.7	b
	Felt at San Leandro Airport					
2	Oct. 3	18-47-06	36°59'	121°38'	3.1	c
	IV at Morgan Hill					
3	Oct. 11	03-45-01	37°47'	122°03'	1.9	b
4	Oct. 11	11-59-31	38°.0	122°.5	1.8	d
5	Oct. 15	20-15-05	37°49'	122°34'	1.8	c
6	Oct. 16	15-32-07	36°41'	120°42'	2.6	c
7	Oct. 16	18-41-45	37°00'	121°13'	3.8	a
	Aftershock of Mag. 2.9 at 18-44-52 P.S.T.					
8	Oct. 16	20-38-06	37°00'	121°13'	3.6	a
	Aftershock. Another of Mag. 3.0 at 20-45-04 P.S.T.					
9	Oct. 18	04-25-38	37°00'	121°13'	3.6	a
	Aftershock.					
10	Oct. 19	07-38-08	36°41'	121°19'	2.8	b
11	Oct. 21	19-42-32	40.5°	126.6°	4.4	d
12	Oct. 21	19-47-35	36°42'	121°07'	3.2	b
13	Oct. 22	13-45-20	36°35'	121°10'	4.7	c
	V at Hollister. IV at Big Sur and Morgan Hill.					
14	Oct. 23	01-35-22	37°31'	121°42'	2.3	c
15	Oct. 24	20-18-52	40.6°	125.2°	3.9	d
16	Oct. 26	18-22-26	36°46'	121°13'	2.8	c
17	Oct. 27	18-29-16	40.9°	124.2°	4.5	d
	V in Eureka					
18	Oct. 28	00-07-02	36°18'	120°54'	2.6	c
19	Oct. 28	16-06-20	37.5°	121.0°	3.4	d
20	Nov. 1	03-56-00	39.9°	126.1°	4.7	d
21	Nov. 1	15-07-34	39°56'	121°43'	2.0	c
22	Nov. 1	17-36-01	36.7°	121.4°	2.2	d
23	Nov. 2	05-45-01	37.9°	123.0°	2.7	d
24	Nov. 4	01-31-21	36°45'	121°45'	2.7	b
25	Nov. 5	09-23-38	36°35'	121°18'	2.2	c
26	Nov. 6	00-26-09	37°55'	121°44'	1.8	b
27	Nov. 6	00-42-57	37°55'	121°44'	1.9	b
28	Nov. 6	01-11-18	37°55'	121°44'	1.8	b
29	Nov. 7	00-00-08	36°55'	121°38'	2.6	c
	IV near Watsonville (San Miguel Canyon Road)					
30	Nov. 8	04-41-16	38.5°	122.7°	2.5	d
31	Nov. 9	10-48-54	36°38'	121°08'	3.3	b
	Foreshock. Another tiny foreshock $\frac{1}{2}$ min. before shock #32					
32	Nov. 9	21-16-35	36°38'	121°08'	3.9	a
	IV 7 miles south of Hollister					



<u>No.</u>	<u>Date</u>	<u>Time</u>	<u>North Latitude</u>	<u>West Longitude</u>	<u>Richter Magnitude</u>	<u>Quality</u>
33	Nov. 12	11-28-37	39.8°	119.0°	3.2	d
34	Nov. 12	12-42-34	39.8°	119.0°	3.1	d
35	Nov. 13	06-58-04	37°56'	121°59'	2.2	b
36	Nov. 13	13-04-02	38.2°	123.1°	2.3	d
37	Nov. 14	02-41-59	39°23'	119°42'	3.5	c
38	Nov. 14	10-11-06	37°26'	122°15'	1.8	b
h = 15 km						
39	Nov. 16	00-04-20	40°32'	121°35'	3.2	c
Felt at Mineral, California. Foreshock of magnitude 2.6 also felt there at 0001. 110 Aftershocks recorded on Mineral seismographs by 0800.						
40	Nov. 18	11-45-54	37°55'	122°00'	2.2	c
41	Nov. 18	15-57-48	38.3°	122.0°	2.0	d
42	Nov. 21	16-38-09	40.2°	124.2°	3.5	d
Felt in Petrolia and Ferndale						
43	Nov. 27	06-06-46	37°23'	121°36'	3.0	b
44	Nov. 27	13-53-19	37°23'	121°40'	2.2	c
h about 15 km						
45	Nov. 28	22-51-38	37°21'	121°42'	2.0	c
h about 10 km. IV in San Jose						
46	Nov. 28	23-14-33	36°48'	121°23'	2.7	b
IV 7½ miles south of Hollister						
47	Nov. 28	00-31-54	38°37'	122°08'	4.0	b
IV in Fairfield. Also felt in Sacramento.						
48	Dec. 4	14-38-54	40.3°	124.3°	3.8	d
Felt in Ferndale and Petrolia						
49	Dec. 6	14-07-04	38.3°	117.7°	3.7	d
50	Dec. 7	10-44-40	39.0°	119.8°	3.8	d
V in Carson City						
51	Dec. 9	15-52-56	37.0°	122.6°	2.8	d
52	Dec. 9	15-53-24	37.0°	122.6°	3.0	d
53	Dec. 9	20-05-39	40.5°	125.3°	3.9	d
54	Dec. 12	21-05-16	38°40'	119°50'	3.4	c
IV at Markleeville						
55	Dec. 21	15-08-41	40.4°	124.3°	3.6	d
Possibly deeper than normal. IV at Bridgeville, Ferndale and Scotia.						
56	Dec. 25	01-47-12	37°20'	121°38'	2.1	b
57	Dec. 28	01-17-12	36.2°	120.7°	2.6	d
58	Dec. 28	03-58-39	39.4°	118.0°	2.9	d
59	Dec. 28	08-48-11	39.2°	119.6°	2.6	d
III at Carson City, Nevada.						

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SYMBOLS AND NOTATIONS EMPLOYED

1. Character of the Seismogram --

I. Perceptible      II. Moderately Strong      III. Strong

- d (terrae motus domesticus)      Local shock (origin less than 100 kilometers distant).
- v (terrae motus vicinus)      Near shock (origin from 100 to 1,000 kilometers distant).
- r (terrae motus remotus)      Distant shock (origin from 1,000 to 5,000 kilometers distant).
- u (terrae motus ultimus)      Very distant shock or teleseism (origin more than 5,000 kilometers distant).

2. Nature of the Motion --

- i (impetus)      Sudden beginning of the motion.
- e (emersio)      Gradual beginning of the motion.

3. Trace Motion --

- c      Compression.
- d      Dilatation.

Apparatus	Component
Bosch-Omori 100 kg. ....	E
Wischert 50 kg. ....	N
Wood-Anderson	Z
Galitsin	E
	N
	Z
Bardoff	E
Slichter	N

The letter G before a reading designates that the seismogram was from the Galitsin instrument; W, Wischert; B, Bosch-Omori; A, Wood-Anderson; H, Bardoff; S, Slichter.



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CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 37^{\circ} 52' 13'' \text{ N.}$$

$$\lambda = 122^{\circ} 15' 16'' \text{ W.}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 81 meters (266 feet) above mean sea level.

Apparatus	Component
Bosch-Omori 100 kg. ....	E N
Wiechert 80 kg. ....	Z
Wood-Anderson .....	E
Galitzin .....	E N Z
Benioff .....	Z
Slichter .....	N

The letter G before a reading designates that the seismogram was from the Galitzin instrument; W, Wiechert; B, Bosch-Omori; A, Wood-Anderson; H, Benioff; S, Slichter.

BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
1	Oct. 2	Id	iPZ	H 20 36	49.2			See list, p. 288
			eE	S 30	50.0			
			iE	S 31	50.4			
			iSEZ	SH 32	51.4			
			iN	A 32	52.5			
			F	20 38				
2	Oct. 3	Iu	iPZ	H 09 34	31.4		c	
			iZ	H 35	32.9			
			iZ	H 35	51.8			
			iZ	H 35	10.2			
			iZ	H 37	25.4			
			iZ	H 37	55.7			
			F	09 39				
3	Oct. 4	Iv	iPZ	H 02 47	24.3	18	d	See list, p. 288
			iZ	H 02	25.5			
			iSZ	H 02	38.3			
			iZ	H 02	42.3			
			F	02 48				
4	Oct. 4	Iu	iPPEZ	G 10 38	11.5		d	
			iSKSE	G 20 44	52.5			
			eScSN	G 45	53.5			
			eE	G 09 47	00.5		c	U.S.C.G.S.: 43°N 144°E
			ePSN	G 09 19	19.5			
			eZ	G 11	24.5			
			eZ	G 11 48	25.5		c	See list, p. 288
			eE	G 52	34.5			
			eN	G 11 40	40.5			
			eZ	G 11	46.5			
			eN	G 11 03.4			c	U.S.C.G.S.: 33°S 179°W
			eE	G 11 09.4				
			eZ	G 11	11.8			
			F	11 54			c	See list, p. 288
5	Oct. 7	Iu	iPZ	H 02 29	49.3		c	
			F	02 30.5				
6	Oct. 7	IIu	iP'Z	GH 12 22	33.5		d	U.S.C.G.S.: 33°S 56½°E
			iZ	H 23	34.5			
			iN	G 23 36	39.0			
			eE	G 23	41.0			
13	Oct. 23	Iu	iP½Z	GH 04 24	10.5			U.S.C.G.S.: Samoa Islands Region. Trace of surface waves.
			iZ	H 04 28	18.1			
			iE	G 04	33.0			
			iE	G 25	00.0			
14	Oct. 26	Iu	iPPNEZ	GH 04 28	04.0		c	See list, p. 288
			iZ	G 04	10.5			
			iE	G 04 16	22.0			
			iN	G 29	03.0			



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No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949						s.		
6	Oct. 7 (cont.)	IIu	iE iSKSZ iPcPP'NZ iPPPZ iN iE iSKKSN iN iZ iE iN	G 12 G 30 G 31 G 32 G G 34 G G G G G	29 56.0 08.5 14.0 06.5 15.0 35.0 53.0 45.0 18.0 33.0 39.0		d	See list, p. 288	
	Oct. 17	Iv	iN iN eN eE eN eE eN F	G G G G G G G G	39.0 07.0 55.6 57.5 31.9 33.9 42.4 14 32	34	d	See list, p. 288 SSS?	
7	Oct. 10	Id	iPZ iSZ iZ F	H H H H	20 15 25.9 29.2 36.4 20 16		c	Blast? See list, p. 288	
8	Oct. 11	Iu	iPZ F	H H	09 16 10.2 09 19		c	U.S.C.G.S.: 43 $\frac{1}{2}$ °N 144°E	
9	Oct. 11	Id	iPEZ iSEZ F	SH SH H	11 45 05.0 07.9 11 46		c	See list, p. 288	
10	Oct. 11	Iu	iPZ F	H H	11 49 47.8 11 52		c	U.S.C.G.S.: 33°S 179°W	
11	Oct. 11	Id	iPZ iSZ iMZ F	H H H H	19 59 36.0 39.5 40.5 20 00		c	See list, p. 288	
12	Oct. 11	Id	iEZ iSEZ F	SH SH H	23 35 39.9 41.7 23 36		c	Western Contra Costa County	
13	Oct. 13	Iu	eNE F	G G	04 06.0 04 48		c	U.S.C.G.S.: Samoa Islands Region. Trace of surface waves.	
14	Oct. 16	Id	iPEZ iSE F	SH S H	04 15 10.1 14.0 04 16		c	See list, p. 288	

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No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
15	Oct. 17	Iv	iPZ	H 02 42	07.0		d	See list, p. 288
			eE	S	07.5		d	
			iZ	H	10.3		d	
			iE	S	12.2			
			iSE	S	21.8			
			eN	A 13 01	24.5			
			iZ	H	25.1			
			iNZ	AH	26.7			
			F	02 44		16		
16	Oct. 17	Iv	iPZ	H 04 38	27.9		d	See list, p. 288
			iZ	H	30.0		d	
			eE	S	32.0			
			eSE	S	45.0			
			iZ	H	46.1			
			eZ	H	47.0			
			iZ	H	47.5			
			F	04 40		12		357
						16		
17	Oct. 18	Iv	iPZ	H 12 26	00.0		d	See list, p. 288
			eNE	AS	02			
			iZ	H	02.3			
			iE	S 15 15	15.4			
			iSNE	A	16.8			
			iZ	H 02 48	17.7	21		
			iNZ	AH 02 53	19.1			
			F	12 27				
18	Oct. 19	Iv	iPZ	H 15 38	33.4		c	See list, p. 288
			iZ	H	54.8			
			F	15 39.5				U.S.C.G.S.: 51°S 154°E
19	Oct. 19	Iu	iPZ	G 21 13	11.5		d	U.S.C.G.S.: 51½°S 154°E
			iN	G	22.5			
			iZ	G	32.0		c	
			iZ	H 22 09	38.4	32	c	pP?
			eE	S	39	33		
			iZ	H 15 48.3			d	
			eN	A 00 21	49			
			iZ	H	50.9		c	
			iZ	G 20 42	59.0		c	Distant shock?
			iPPN	G	17 43.5			
			iSKSN	G 20 23	09.0			
			iN	G	53.0			
			eN	A 03 24	44			See list, p. 288
			iN	G	58.0			
			eE	S	40.8	45ca		
			eZ	H	50.0	20		
			F	00 50				



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No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
20	Oct. 20	Iu	iPEZ	G 12 57	49.0		c	U.S.C.G.S.: 5 $\frac{1}{2}$ °S 154°E
			iPZ	H	52.9		d	
			iZ	H 58	03.4		c	
			iZ	H 59	01.4		c	
			iN	G	41.0			
			ePPEZ	G 13 01	25.0			
			iN	G 07	48.0			
			iN	G 08	08.0	8		
			iE	G	09.0	16		
			iSZ	G 16 25	11.0			
			eSE	S	30.0			
			iSE	G	32.0			
			iPSE	G 16 09	28.0			
			iZ	G	30.0			
			iZ	G 21 12	03.5			See list, p. 288
			iZ	G	49.0			
			eE	G	14 11.0			
			iE	G	29.0	12		SS?
			iN	G	30.0	16		
			eLE	G	24.9	43		
			eLZ	G	25.0	42		
			eLE	S	25.5	33		
			F	15 45	ca			
21	Oct. 21	Iu	eE	G 02 48.0		21	c	See list, p. 288
			F	02 53				
22	Oct. 21	Ir	iPZ	H 03 39	13.3		c	
			F	03 41				U.S.C.G.S.: 4°S 144°E
23	Oct. 21	IIu	iPZ	G 21 47	15.5		d	U.S.C.G.S.: 5 $\frac{1}{2}$ °S 154°E
			iPZ	H	16.2		d	
			iPPZ	G 15 50	42.5			
			eSE	G	57 53.5			
			iPSE	G 15 59	19.5			
			eGN	G 22 09.8		32		
			eLE	G 02 14.6		33		Pasadena; Southeast of Benton
			eLZ	G	15.0			
			F	00 21				
24	Oct. 21	I	iPZ	H 20 42	45.0		d	Distant shock?
			iZ	H	58.1			
			F	20 44				
25	Oct. 22	Iv	iPZ	H 03 43	34.9		c	See list, p. 288
			eE	S	36		d	
			iZ	H	36.9			
			iZ	H	41.3			
			iZ	H	50.4			
			eE	S	44 43			
			F	03 46				

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No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
26	Oct. 22	Iv	iPZ	H 03 48	00.8		d	See list, p. 288
			eE	S 10 01	02	18		
			iZ	H 01 17	0	20		
			iZ	H 10 37	18.9			
			iSE	S	19.5			
	Oct. 25	Iu	iEZ	S 13 19	24.4			U.S.C.G.S.: 36°N 140°E
			iNPZ	A	25.6			
			F	03 50				
27	Oct. 22	Iv	iPZ	H 16 25	59.2		c	Northern San Benito County
			eE	S 26 14	7			
			eEZ	SH	16.5			
			F	16 27				
28	Oct. 22	IIv	iPEZ	SH 21 45	46.4		c	See list, p. 288
	Oct. 27	I	iNEZ	ASH 04 11	46.9			
			iNE	AS 04 50	50.7			
			iN	A	57.6			
	Oct. 27	IIr	iE	S 08 26	58.2		d	U.S.C.G.S.: Gulf of California
			iN	A 46	01.1			
			iSE	S	04.7			
			iSN	A	05.2			
			F	21 52		67.5		
29	Oct. 23	Id	ePZ	H 09 35	33.3		c	See list, p. 288
			eSE	S 30	43.1			
			F	09 37				
30	Oct. 23	Iu	iPZ	H 05 25	31.6	18	c	U.S.C.G.S.: 4°S 144°E
			ipPZ	H 26	06.5		c	
			F	05 28				
31	Oct. 23	Iu	iPZ	H 15 31	17.8		c	U.S.C.G.S.: 23.5°S 180°
			iZ	H 15 16	29.1		d	
			F	15 32				
32	Oct. 24	Iv	iPZ	H 02 23	29.0		c	U.S.C.G.S.: 49°N 155°E
			iZ	H	37.1			Pasadena: Southeast of Benton
	Oct. 28	Iu	iZ	H 00 23	40.1		c	U.S.C.G.S.: 34°N 142°E
			iSEZ	AH 00 24	06.9			
			iZ	H	10.9			
	Oct. 28	Iv	F	02 26	09.		d	See list, p. 288
33	Oct. 25	Iv	iPZ	H 04 19	47.6		d	See list, p. 288
			iEZ	SH	48.3		c	
			iZ	H	50.8		d	
			iZ	H 20	11.8			
			iSZ	H	27.2			
			eE	S	29			
			iZ	H 02 33	30.8			
			F	04 22				



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No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
34	Oct. 25	Iu	eN eZ eE F	G 09 59.0 G 10 01.5 G 01.8 10 37		18 20	d	See list, p. 288
35	Oct. 25	Iu	iPZ ipPZ F	H 13 19 08.3 H 13 35 35.0 13 21			d	U.S.C.G.S.: 36°N 140°E
36	Oct. 27	Iv	iPZ eE iZ iE F	H 02 22 50.7 S 55 H 19 03 56.1 S 23 03.8 02 25			d d d	See list, p. 288
37	Oct. 27	I	eE F	G 04 44.0 04 50				
38	Oct. 27	IIr	iPZ eZ eZ iE eMEZ eE eN eZ F	H 08 26 53.5 G 00 28 19.0 G 40.0 G 06 44 50.0 G 29.3 A 30.2 S 30.5 H 07 30.8 08 50		20	d	U.S.C.G.S.: Gulf of California
39	Oct. 27	I	iPZ eE eZ F	H 00 06 54.7 G 10 11.7 G 12.8 10 18		18	d	U.S.C.G.S.: 34°S 179°W
40	Oct. 27	Iu	iPZ F	H 10 14 26.2 10 16			d	U.S.C.G.S.: 23.5°S 180° Region
41	Oct. 27	Iu	iPZ F	H 18 45 57.1 18 47			c	U.S.C.G.S.: 49°N 155°E go with quake 49.
42	Oct. 28	Iu	iPZ F	H 00 23 45.0 00 25			c	U.S.C.G.S.: 34°N 142°E
43	Oct. 28	Iv	iPZ eE eN iZ iZ eE iZ eN F	H 02 30 09.3 S 10 A 14 H 17.7 H 31.5 S 40 H 42.0 A 51 02 33			d d d	See list, p. 288

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No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
44	Oct. 28	Iv	iPZ	H 08 07	34.2		d	See list, p. 288
			iZ	H	43.3		c	
			eZ	H	55.5			
			eSE	S	56.5			
			F	08 09				
45	Oct. 28	Iu	iPZ	H 16 39	11.7		d	U.S.C.G.S.: 6°S 153°E
			F	16 40				
46	Oct. 28	Iu	iPZ	H 18 59	12.6		c	U.S.C.G.S.: 20°S 179°W
			iZ	H	14.3		d	
			F	19 01				U.S.C.G.S.: 56°N 135°W
47	Oct. 29	Iv	iPZ	H 00 06	40.3		c	See list, p. 288
			eE	S	41.5			U.S.C.G.S.: 5°S 152°E
			iZ	H	45.7		c	
			iN	A	49.2		d	
			iSEZ	SH	55.2		d	
			iN	A	56.7			
			F	00 08				
48	Oct. 29	Iu	iPZ	H 06 44	35.7		d	U.S.C.G.S.: 10°S 160°E
			eN	G	51.0	43		
			eZ	G	51.5			
			eE	G	52.0	36		
			F	07 22				
49	Oct. 31	Iu	iPZ	H 00 06	54.7		c	U.S.C.G.S.: 34°S 179°W
			iZ	H	07 08.7		d	
			iZ	H	18.9		c	See list, p. 288
			eE	S	20			
50	Oct. 31	Iu	ePZ	H 00 14	20.0			U.S.C.G.S.: Samoa Islands Region
			eE	S	25			
			iZ	H	26.9		d	
			eE	G	24.9			These phases may also go with quake 49.
			eN	G	25.0			
			eN	G	34.0			
			eNEZ	G	38.0			
			F	01 23				U.S.C.G.S.: Outer Mongolia
51	Oct. 31	Ir	ePZ	G 01 44	02.0		c	U.S.C.G.S.: 56°N 135°W
			ePZ	H	07.0		d	See list, p. 288
			eE	S	08.0			
			eN	AG	10.0			
			iZ	H	14.6			
			iZ	G	18.0			See list, p. 288



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No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks	
	1949			h. m. s.	s.			
51	Oct. 31 (cont.)	Ir	iE	G 01 44 19.5		d	U.S.C.G.S.: 3°S 134°E	
			iN	G 01 47 39.0				
			eSE	S 03 48 01				
			iSNE	G 03 50 03.0				
			eSZ	H 03 51 06.0				
			iSNZ	G 03 50 09.0				
			eSN	A 03 50 10				
			eE	S 13 50.4		d		See list, p. 288
			eLNEZ	ASH 13 52.0				
			F	A 04 15 23.3				
52	Oct. 31	Ir	ePZ	H 02 36 50.5			U.S.C.G.S.: 56°N 135°W	
			F	02 38				
			iPZ	H 02 37 57.8		d		U.S.C.G.S.: 48°N 151°E
53	Oct. 31	Iu	ePZ	G 18 08 25			U.S.C.G.S.: 5°S 152½°E	
			iZ	H 18 28 31.5		c		
			ipPZ	H 18 26 47.7		d		
			iZ	H 01 27 53.3		d		
			eE	G 18 46.0				
			iSN	G 09 19 04.0				
			eZ	G 19 10.0				
			eZ	G 19 46.0				
			eG?E	G 18 35.5	43			
			eN	G 18 35.6				
eZ	G 18 35.9	36						
eE	G 18 49.2							
eN	G 19 53.3							
F	19 14							
54	Nov. 1	Iv	iPEZ	SH 11 56 56.1			See list, p. 288	
			eN	A 12 16 57.0				
			iZ	H 11 57 01.4				
			iE	S 20 01 08.0				
			eE	S 20 46				
			iSN	A 20 48.4				
			iSE	S 20 51 48.7				
			iZ	H 20 51 49.2				
F	12 05							
55	Nov. 1	Iu	ePZ	H 13 17 22			U.S.C.G.S.: Outer Mongolia	
			F	13 19				
56	Nov. 1	Iv	iPZ	H 23 07 53.9	16	9	See list, p. 288	
			iSEZ	SH 23 08 08.3				
57	Nov. 2	Iv	F	H 23 08 08.8			See list, p. 288	
			ePZ	H 01 36 25.2				
			iZ	H 01 36 28.9				
			iZ	H 17 26 49.2				
			F	01 38				

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No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
58	Nov. 2	Iu	iPZ iZ eEZ eZ eN	H 02 46 31.5 H 47 55.7 G 03 23.6 G 06 30.6 G 31.6		d	U.S.C.G.S.: 3°S 134°E
59	Nov. 2	Id	iPNEZ iSEZ	ASH 13 45 13.8 SH 22.7		d	See list, p. 288
60	Nov. 3	Iu	iPZ ipPZ iZ iZ F	H 01 22 22.8 H 06 23 02.4 H 24 22.9 H 26 55.1 H 01 27		d	U.S.C.G.S.: 48½°N 154°E U.S.C.G.S.: 14°S 166°E
61	Nov. 4	Iv	iPZ eE iZ iP*Z eEZ iZ eE iZ F	H 09 31 43.1 S 23 43.7 H 44.2 H 26 46.9 SH 59.3 H 32 03.7 S 04.3 H 38 05.2 G 09 33			See list, p. 288
62	Nov. 4	Iu	ePZ F	H 12 14 57.3 G 12 16			
63	Nov. 4	IIv	ePN eZ eN eZ	G 20 44 27 G 42 G 06 45 19 G 54 10			U.S.C.G.S.: 32°N 116½°W
64	Nov. 5	Iv	eNE eN MN F	G 04 39.5 G 41.5 G H 04 45	16	9	Aftershock See list, p. 288
65	Nov. 5	Iv	ePZ iZ iZ iZ F	H 17 24 04.8 H 12 07.2 H 34.1 H 40.8 H 17 26			See list, p. 288





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No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
72	Nov. 9	Iv	ePZ eE eSE F	H 18 49 S S 18 18 18 50	24.2 24.8 45.8		d	See list, p. 288	
73	Nov. 10	Iv	iPZ ePE iE iE F	H 05 17 S S S 05 19	01.6 02.0 10.9 27.5			See list, p. 288	
74	Nov. 13	Ir	iPZ eE iZ iZ iPPZ iZ iSN iSE eLN eLE eLZ F	H 04 50 S H H 01 51 H 01 52 G 05 57 G 05 19 G 05 05 G 05 07 G 05 07 05 33	31.2 32.2 39.0 01.5 24.9 33.7 01.0 03.0 04.6 05.8 07.5 33		c c c d c 10 10 22	U.S.C.G.S.: 11°N 86°W Sighting reported at a depth of about 1700 feet on Terminal Island. See list, p. 289	
75	Nov. 13	Id	iPEZ iSNEZ F	SH 14 58 ASH 14 59	08.6 11.9		c	See list, p. 289 75°W	
76	Nov. 13	Iu	ePZ iPZ F	H 20 55 H 20 56	50.6 51.0		c d	U.S.C.G.S.: New Hebrides Region	
77	Nov. 13	Id	iPZ iSZ iSE F	H 21 04 H S 21 05	16.7 27.3 28.5		c	See list, p. 289	
78	Nov. 14	Iv	ePZ eE iZ iZ eSNE iZ F	H 10 42 S H H AS H 10 45	41.5 43.5 43.7 53.1 43 12.5 14.5		c c c	See list, p. 289	
79	Nov. 14	Iv	iPZ eSE iEZ F	H 17 13 S SH 17 15	33.2 10.5 16.5			Pasadena: 37°29'N 118°25'W	



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No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
80	Nov. 14	Id	iPZ iSZ F	H 18 11 H 18 12	14.1 19.6		d	See list, p. 289
81	Nov. 16	Iv	iPZ iPZ iN iSN F	H 08 05 H 01 01 A A 08 07	04.9 18.3 39.3 42.5		d	See list, p. 289
82	Nov. 18	Iv	eE eZ eZ eE F	G 01 22 H 23 00 G G 01 27	40 00 01 17.6			Pasadena: 33°45'N 118°45'N Press: 35 to 50 oil well casings ruptured at a depth of about 1700 feet on Terminal Island.
83	Nov. 18	Id	iPEZ iSNEZ F	SH 19 45 ASH 46 19 47	57.9 01.4		c	See list, p. 289
84	Nov. 18	Id	iPZ iSE F	H 23 57 S 58 23 59	58.4 05.6	10	c	See list, p. 289
85	Nov. 20	Iu	iPZ F	H 04 54 04 56	46.3	14	d	U.S.C.G.S.: 11°S 75°W
86	Nov. 20	IIIr	ePN ePEZ ePNEZ iPNEZ	G 07 12 SH ASHG 08 15 ASHG	44 47.6 50.0 55.0		d	U.S.C.G.S.: 28½°N 112°W
88	Nov. 23	Ir	eZ eN eE iZ eE eNE	H 06 13 A S H S AS	00.7 04.7 12.7 20 15 12 24	50		U.S.C.G.S.: 19°N 78½°W
89	Nov. 27	IIu	iNE iZ iZ eN eE eN eZ eN eE eNZ eN	AG 08 53 G G A S A H G G G G G	29.9 37 16 28 18 45.2 56 20 40 43 21 23 22 19 20 23 38	10 10	d	U.S.C.G.S.: 18°S 173°W
						24	46	

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No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
86	Nov. 20 (cont.)	IIIr	eE eN F	G 07 24 15 G 30 54 Max amplitude 09 30		200	
87	Nov. 22	IIu	ePNEZ iPZ iPNE iZ iE iNZ ePPZ ePPEZ ePPN iPPE eSNE eSNZ iSE iSZ iPSZ iPSN ePSE iPSE eN eGNE eGNEZ eNZ eNE eEZ F	ASH 01 04 07.3 G 08.0 G 11.0 G 05 00 G 22.5 G 14 09 26 H 07 26 SG 21 53 30 A 30.6 G 32 AS 14 12 GH 18 G 06 51 29 G 30 G 15 10 G 06 51 23 S 36 G 07 11 37 G 18.9 AS 26.9 G 27.0 G 33.0 G 07 35.0 G 47 H 02 15 58.4		d	U.S.C.G.S.: 29°S 178°W
	Nov. 27	Id	ePPEZ ePPN iPPE eSNE eSNZ iSE iSZ iPSZ iPSN ePSE iPSE eN eGNE eGNEZ eNZ eNE eEZ F	SG 21 53 30 A 30.6 G 32 AS 14 12 GH 18 G 06 51 29 G 30 G 15 10 G 06 51 23 S 36 G 07 11 37 G 18.9 AS 26.9 G 27.0 G 33.0 G 07 35.0 G 47 H 02 15 58.4		d	See list, p. 289
	Nov. 29	Id	iSE iSZ iPSZ iPSN ePSE iPSE eN eGNE eGNEZ eNZ eNE eEZ F	G 06 51 29 G 30 G 15 10 G 06 51 23 S 36 G 07 11 37 G 18.9 AS 26.9 G 27.0 G 33.0 G 07 35.0 G 47 H 02 15 58.4	10	42	See list, p. 289
	Nov. 29	Iv	iPSE eN eGNE eGNEZ eNZ eNE eEZ F	G 07 11 37 G 18.9 AS 26.9 G 27.0 G 33.0 G 07 35.0 G 47 H 02 15 58.4			See list, p. 289
	Nov. 30	Id	F	H 02 15 58.4			Foreshock?
88	Nov. 23	Ir	eLN eN eE eE F	G 06 40 40 G 42 28 G 43.8 G 07 45.2 G 06 47			U.S.C.G.S.: 19°N 78½°W
	Nov. 30	IIu	ePNEZ iPNEZ ePPZ eZ eN eSNE iSN eSZ eSZ eSE eLNE eLEZ	GH 08 32 09.8 GH 08 32 09.8 H 56 29.1 H 57 02.6 G 58 38 AS 09 03 19 G 08 32 20 H 21.1 G 12 50 23 G 26 ASG 15.1 G 15.4		d d	See list, p. 289 U.S.C.G.S.: 18°S 173°W
	Dec. 5	Iu	eSZ eSE eLNE eLEZ	G 12 50 23 G 26 ASG 15.1 G 15.4	24	46	U.S.C.G.S.: 6°N 81½°W



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No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
89	Nov. 27 (cont.)	Ilu	eE eE iE F	G G G 10	08 26 32 35.0 30			
90	Nov. 27	Id	ePZ iPEZ eN iSE iSNEZ F	H SH A S ASH H	14 06 59.4 15 59.8 07 00.1 15 09.2 14 10.8 14 09			See list, p. 289
91	Nov. 27	Id	iPZ iSEZ iNZ F	H SH AH H	21 53 33.3 42.3 42.9 21 55	d		See list, p. 289
92	Nov. 29	Id	iPZ iEZ iSEZ F	H SH SH H	06 51 50.7 18 51.8 52 00.0 06 53			See list, p. 289
93	Nov. 29	Iv	iPZ iZ iEZ iS?EZ eE F	H H SH SH S S	07 14 56.8 15 08.4 18 10.7 13.8 08 21.5 07 16			See list, p. 289
94	Nov. 30	Id	iPZ eZ iZ eSE iSNEZ F	H H H S ASH A	07 52 58.4 08 53 01.8 04.1 12 08.2 07 09.0 07 54			Foreshock?
95	Nov. 30	IId	iPEZ iPN iE eN iN iSE iSN F	GH A S G AG SG A H	08 32 09.8 10.1 12 10.5 12 19 19.1 20 20.0 21.0 08 36			See list, p. 289
96	Dec. 5	Iu	iPZ ePZ iZ iZ	H G H H	12 50 51 35 52 20 53.5 52 56.7	c		U.S.C.G.S.: 6°N 84½°W

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No.	Date	Char-acter	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
96	Dec. 5 (cont.)	Iu	eLE eLN F	G 13 08.0 G 08.6 13 30		c	See list, p. 289
97	Dec. 6	Iu	iZ eZ eN eNZ F	H 14 39 14.6 H 40 11.6 G 15 01.4 G 10.0 15 28		d d	U.S.C.G.S.: Tonga Island Region
98	Dec. 6	Iv	iPZ iE iZ eSEZ eN eE F	H 22 07 59.9 S 08 00.5 H 06.9 SH 14 19 39.8 A 40.4 S 43.9 22 10		d	Southern Santa Clara County See list, p. 289
99	Dec. 7	Iv	ePEZ iPZ eZ eZ eSN iE F	SH 18 45 19.1 H 19.7 H 23.5 H 44.6 A 52.4 S 53.6 18 47		c c	See list, p. 289 71°W Foreshock
100	Dec. 9	Iv	iPNEZ iSE iZ eN F	ASH 08 42 08.3 S 47.9 H 48.6 A 49.1 08 46		d	Pasadena: 37°28'N 118°22'W Foreshock.
101	Dec. 9	Iv	iPZ eE eN iSNE iE eN F	H 12 39 52.2 S 52.3 A 52.8 AS 40 29.9 S 32.3 A 33.7 12 43		d	Pasadena: 37°28'N 118°22'W U.S.C.G.S.: V North of Bishop
102	Dec. 10	Iu	iPZ eZ eN eNE eE eZ eZ F	H 19 22 34.5 H 25 10.9 G 28.1 G 30.7 G 32.0 G 34.4 G 35.5 20 00		d d	U.S.C.G.S.: 54°S 71°W



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
103	Dec. 13	Iv	iPZ iZ iEZ iSE eZ eN iZ F	H 05 05 H SH S 06 H A H 05 08	54.1 55.5 56.2 22.7 23.9 25.0 29.6		c d	See list, p. 289
104	Dec. 13	Iv	iPZ eSEZ F	H 09 13 SH 09 14	29.6 43.3		d	Southern Santa Clara County
105	Dec. 16	Iu	ePZ eLNEZ eMNEZ F	H 14 19 G G 15 15	01.5 08 52.9 15	19 16	d 4 1/2	U.S.C.G.S.: Kermadec Islands Region
106	Dec. 17	IIu	iPZ iPZ iPPZ ePPE ePPN eE eSKSN iE eE eN eE eLNEZ eE eE F	H 07 07 G H 11 G 08 G S 12 G 08 G S A 04 S ASH 12 S S 08 30	18.5 36 36.5 48 50 00.0 08 18.5 21.5 26.5 37.0 45 31.5 46 46.5 52 16.5	15	c d	U.S.C.G.S.: 54°S 71°W Foreshock
107	Dec. 17	Iu	eLN eN F	G 14 03 G 14 16	30 40	14 19		Foreshock? 18°S 168°E
108	Dec. 17	IIIu	ePZ eNZ iPPZ ePPZ ePPNE ePPZ iPPPE iNE iSE eSE iPSNZ ePSN iSSNEZ	G 15 21 G H 25 G G H 26 G G G S G A G	55 15 34 52 56 14 32 31 42 52 14 16 40.9		c d d d c	U.S.C.G.S.: 54°S 71°W

BERKELEY

No.	Date	Char-acter	Phase	Time	Period	Trace motion	Remarks	
				(G.C.T.)				
				h. m. s.	s.			
108	Dec. 17 (cont.)	IIIu	eSSSE	G 15 44.2	34		See list, p. 289	
			iZ	G 48 32				
			iZ	H 23 33.8				
			eGE	G 50.9				
			eGE	S 09 51.1				
			iGN	G 51.8				
			eZ	G 51.9				
			eE	S 56.9				
			eN	A 57.4				
			eLNZ	G 57.5				
			eLZ	H 57 37				
			eNZ	AH 16 02.4				15
			eE	S 02.6				
			iNEZ	SG 05.3				16
			eN	A 06.3				14
F	G 19 00							
109	Dec. 18	Iu	iPEZ	SH 05 51 46.3	1.1		U.S.C.G.S.: 34°S 179½°E	
			iN	G 57 04				
			F	06 08				
110	Dec. 19	Iu	eL?E	G 08 33 19				
			eN	G 20 26				
			eE	G 40 39				
			F	08 42				
111	Dec. 21	Iu	iZ	H 04 51 29.3		d		
			F	04 52				
112	Dec. 21	Iu	eLE	G 12 58 18.4			U.S.C.G.S.: 18½°N 67°W	
			eN	G 13 01 55				
			eZ	G 05 58				
			F	13 11				
113	Dec. 21	Iu	iPZ	H 13 30 50.1			U.S.C.G.S.: 18½°S 168°E	
			eZ	H 31 44.9				
			F	13 32				
114	Dec. 21	IIu	iPZ	H 19 44 12.0		c	U.S.C.G.S.: 20°S 64°W	
			iPEZ	G 23 15 13.9				
			iNEZ	ASH 14.0				
			iPoPZ	H 23 29 22.3				
			ipPZ	GH 46 22.2				
			ipPPZ	H 49 29				
			eSNZ	G 23 53 22				
			eSNE	AS 27				
			iSNE	G 27 27.4				
			iSKSZ	H 45.1				
			eSPE	G 54 27				
			esSE	G 56 56				
			eZ	G 57 00				
			eE	G 20 05.9				
F	20 08							



BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
115	Dec. 21	Iv	ePZ iZ F	H 23 09 28.5 H 23 12			c d	See list, p. 289	
116	Dec. 22	IIr	ePE ePEZ ePN ipPNZ epPE ePPZ	G 09 37 25.4 GH G GAH S H 38 45			d	U.S.C.G.S.: 16°N 93°W	
123	Dec. 27	Iu	iZ eZ iSNE	H 09 40 02.6 H G 42 49.9			c	U.S.C.G.S.: 37°N 139°E	
124	Dec. 27	Iu	iZ eSSE eLE	G 43 21.4 G 46 09 G 47.3		21		U.S.C.G.S.: Phoenix Islands	
125	Dec. 27	Iu	iN eZ eE eE F	G 21 47 44 G A 21 48 40 AG 52 22 H 10 30		21 14		U.S.C.G.S.: Tonga Islands	
127	Dec. 28	Iu	F	H 10 30			c	U.S.C.G.S.: 60°S 22°W	
117	Dec. 24	Iu	eN eE	G 00 24 15 G 25 46				S?	
128	Dec. 26	Iv	eZ eN F	G 09 28 55 G 29 15 00 40			c	See list, p. 289	
118	Dec. 25	Iv	iPZ iZ iSZ F	H 09 47 24.6 H H 09 48			d	See list, p. 289	
119	Dec. 25	IIr	iPZ iSNE eE iN iZ eN F	GH 22 46 00 G 50 36 G 52 22 G 54 39 G 43 G 55 55 23 15		9			
120	Dec. 25	Iu	iPZ F	H 23 29 09			d	U.S.C.G.S.: 37°N 139°E Runs into next shock	
121	Dec. 25	IIu	iPZ iPPZ eSN eN eZ eZ F	H 23 36 32.8 H 39 22.0 G 46 05 G 49 14 G 52 32 G 00 00.9 01 00		8 7 9 12 13	c d	U.S.C.G.S.: 37°N 139°E	

BERKELEY

No.	Date	Char-acter	Phase	Time (G.C.H.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
122	Dec. 26	IIu	iPZ iSN iPSZ eGN eLZ F	H 06 35 G 45 22 G 46 25 G 54.9 G 58.0 09 20	42.3 22 25 9 0 20		c	U.S.C.G.S.: 14½°S 180°
123	Dec. 27	Iu	ePZ F	H 08 52 08 54	24.5 54		d	
124	Dec. 27	Iu	iPZ F	H 09 07 09 09	44 09		c	U.S.C.G.S.: 37°N 139°E
125	Dec. 27	Ir	iPZ F	H 10 59 11 02	50 02		c	U.S.C.G.S.: Aleutian Islands
126	Dec. 27	Iu	iPZ iZ F	H 21 15 H 21 17	08.3 40.8 17		d d	U.S.C.G.S.: Tonga Islands
127	Dec. 28	Iu	iP'Z ePPZ F	H 00 16 H 00 18 00 23	16.6 17 23		c d	U.S.C.G.S.: 60°S 22°W
128	Dec. 28	Iv	ePZ F	H 09 17 09 19	47 19		c	See list, p. 289
129	Dec. 29	IIu	iPZ ePZ iZ eE eE iZ iN iZ eN iZ iZ iP'N iP'Z iE iZ iZ iZ iZ iSKSE eSKSN iN iE iSKKSN iN ME F	H 03 17 G 34.0 H 35.6 G 37 S 38 H 44.3 G 51.0 G 55.0 A 18 01 H 20 53.3 H 21 12.0 G 45.0 G 47.0 G 53.5 G 22 19.0 G 50.7 G 24 03.0 G 26 53.0 G 28 14.0 A 17 G 25.0 G 49.0 G 29 17.0 G 36 05.0 G 07 20	33.0 34.0 35.6 37 38 44.3 51.0 55.0 01 53.3 12.0 45.0 47.0 53.5 19.0 50.7 03.0 53.0 14.0 17 25.0 49.0 17.0 05.0 20		d c c   d       9  7   8  7 9 12 13 22 20	U.S.C.G.S.: 18½°N 121°E



MOUNT HAMILTON

MOUNT HAMILTON  
 THE LICK OBSERVATORY STATION, UNIVERSITY OF CALIFORNIA  
 MOUNT HAMILTON, CALIFORNIA

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 37^{\circ} 20' 14'' \text{ N.}$$

$$\lambda = 121^{\circ} 38' 16'' \text{ W.}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 1281.7 meters (4205 feet) above mean sea level.

Apparatus	Component
Wood-Anderson .....	E N
Benioff .....	Z

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
1	Oct. 1	I	iPZ F	03	42	44.6		c	
2	Oct. 1	Iu	iPZ iZ ipPZ F	07	14	58.7 15 03.1 45.1		d d c	U.S.C.G.S.: South of Bonin Islands
3	Oct. 2	Iu	iPZ F	01	10	22.3 01 42		d	U.S.C.G.S.: 18°N 49°W
4	Oct. 2	Id	iPZ F	20	36	58.3 20 38		c	See list, p. 288
5	Oct. 3	Iu	iPZ F	09	34	30.2 09 40		d	Northwest Santa Cruz County
6	Oct. 3	Iu	ePZ iZ ePPZ F	12	57	44 58 59.5 13 01 16 13 02		d c	U.S.C.G.S.: Near Northeast coast of New Guinea U.S.C.G.S.: IV at Borrego Valley (San Diego County)
7	Oct. 3	Iu	iPZ F	13	51	03.5 13 52		d c	Southern Fresno County?
8	Oct. 3	Iu	iPZ F	23	40	21.3 23 42		c	
9	Oct. 4	IIId	iPNEZ iSNEZ F	02	47	13.8 19.0 02 48		c	See list, p. 288
10	Oct. 4	Iu	eZ F	04	39	54.5 04 41		c	U.S.C.G.S.: Samoa Islands Region
11	Oct. 4	Iu	iPZ F	07	11	33.3 07 13		c	See list, p. 288
12	Oct. 4	Iu	iZ F	10	10	51.4 09 13		d	U.S.C.G.S.: 30°S 70°W
13	Oct. 4	Iu	iPZ iZ iZ iPPZ F	10	34	02.6 20.6 43.8 38 05.1 10 42		d d d c	U.S.C.G.S.: IV at Bishop U.S.C.G.S.: 1°S 21°W
14	Oct. 7	Iu	eP'Z iP'Z eNE iP <sub>2</sub> 'Z ePPNZ	12	22	33.5 35.0 37 24 14.9 28 05.5		d c c	U.S.C.G.S.: 33°S 56½°E



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
14	Oct. 7 (cont.)	Iu	eE ePPPZ eN eZ F	12 28 12 31 14.4 35 02 13 43.9 13 47		19		See list, p. 288 SKKS?	
15	Oct. 11	Iu	iPZ F	09 16 14.8 09 18			d	U.S.C.G.S.: 43 $\frac{1}{2}$ °N 144°E	
16	Oct. 11	Id	iPZ iZ F	11 45 12.5 18.2 11 46				See list, p. 288	
17	Oct. 11	Iu	iPZ F	11 49 47.8 11 51			d	U.S.C.G.S.: 33°S 179°W	
18	Oct. 13	Id	iPZ iSZ F	19 59 39.1 46.5 20 01			d	Northwest Santa Cruz County	
19	Oct. 14	Iv	iZ eZ F	00 31 21.7 32 24.5 00 34			c	U.S.C.G.S.: IV at Borego Valley (San Diego County)	
20	Oct. 14	Iv	iPZ iNEZ iZ iE iZ iN F	01 26 44.5 52.0 27 18.2 01 46 21.2 22.9 12 25 23.7 01 29			c d	See list, p. 288 Southern Fresno County?	
21	Oct. 15	IIId	iPZ iSNEZ F	12 54 21.3 22.6 12 55			c		
22	Oct. 16	Id	iPZ iSZ F	04 15 20.4 32.6 04 16			c	See list, p. 288	
23	Oct. 16	Id	iPZ eNE iZ iSZ eNE F	16 06 02.9 03.5 09.1 15 38 34.0 34.5 16 08			c	U.S.C.G.S.: IV at Bishop See list, p. 288	
24	Oct. 16	Iv	iPZ eNEZ eNE iZ iZ F	23 32 26.9 27.8 41.0 15 40 41.4 44.2 23 34			c c	See list, p. 288	

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
25	Oct. 17	IIId	iPZ eNE iE iN iSE iSNZ iME iMN F	02 41	54.0 54.5 55.0 55.3 00.6 01.3 02.5 03.0		c	See list, p. 288 154°E
26	Oct. 17	Id	iPNEZ iZ iSNEZ iNE F	02 45	01.8 02.5 08.4 10.1		c	See list, p. 288 U.S.G.O.S.: 54°E 154°E
27	Oct. 17	IIId	iPNEZ iZ iSNEZ iE iMN F	04 38	15.4 20.1 22.2 23.7 24.1		c c	See list, p. 288 U.S.G.O.S.: 54°N 149°W Southern San Mateo County
28	Oct. 17	Id	iPZ eN iSNEZ iNE F	04 45	13.6 14 20.5 22.3			See list, p. 288 U.S.G.O.S.: 54°E 154°E
29	Oct. 18	IIId	iPNEZ iZ iN iZ iE iSNE iME iMN F	12 25	46.9 47.4 48.0 50.0 52.4 53.5 55.5 55.9		c c	See list, p. 288 U.S.G.O.S.: 54°E 154°E
30	Oct. 19	Iv	iPZ iSZ F	05 48	37.5 51.2		d	See list, p. 288
31	Oct. 19	Id	iPZ iNE iZ iZ iZ iSNE iN F	15 38	22.3 23.3 24.6 26.7 31.5 33.4 35.9		c d d	See list, p. 288 Northern San Benito County



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
32	Oct. 19	Iu	iPZ	21	13 11.0		d	U.S.C.G.S.: 5½°S 154°E
			iZ		38.5		d	
			eNE		53			
			eSN	23	24			
	23	Iv	eLE		41.6	32		
			eLZ		41.7			
			F	22	19			
33	Oct. 20	Iv	iPZ	03	27 15.8		c	III in Bishop
			iZ		17.3		d	
			eNE		18.5			
			iSNEZ		45.8			
			F	03	29			
34	Oct. 20	Iu	iPZ	12	57 59.9		c	U.S.C.G.S.: 5½°S 154°E
			ePSZ	13	09 36			
			F	13	12			
35	Oct. 21	Ir	iPZ	03	39 19.1			U.S.C.G.S.: 54°N 169°W
			F	03	42			
36	Oct. 21	Id	ePZ	20	00 30.5		c	Southern San Mateo County
			eN		37.2			
			iSEZ		37.8			
			F	20	02			
37	Oct. 21	Iu	ePZ	21	47 15.5			U.S.C.G.S.: 5½°S 154°E
			ePPZ		50 59.0			
			F	21	55			
38	Oct. 21	Iu	ePZ	21	47 15.5			U.S.C.G.S.: 5½°S 154°E
			ePPZ		50 59.0			
			F	21	55			
39	Oct. 22	Iv	iPZ	03	43 44.9		d	See list, p. 288
			eNE		45.5			
			iSZ	44	39.8			
			eNE		41.0			
			F	03	46			
40	Oct. 22	Iv	iPZ	03	47 49.9		d	See list, p. 288
			iNE		51.3			
			iZ		59.5			
			iSNEZ	48	01.4			
			iNE		03.1			
			F	03	50			
41	Oct. 22	Id	iPZ	16	25 46.4			Northern San Benito County
			iNEZ		47.3			
			iSNZ		53.4			
			iE		53.9			
			iN		55.2			
			F	16	27			

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
42	Oct. 22	IId	iPNEZ iSNE F	21 45	36.4 48.3			See list, p. 288
43	Oct. 23	Iv	iPZ iZ iZ F	01 32	54.7 58.6 16.6		c	S?
44	Oct. 23	Iu	iPZ ePPZ F	05 25	34.0 29 28.0		c	U.S.C.G.S.: 4°S 144°E
45	Oct. 23	IId	iPNEZ iSNEZ F	09 35	25.8 28.2		c	See list, p. 288
46	Oct. 23	Iu	iPZ eZ F	15 31	19.2 29.0		d	U.S.C.G.S.: 10°N 155°E
47	Oct. 24	Iv	iPZ iZ eE eN iSZ F	01 53	48.0 53.7 21 22.5 25.2		c c	Northern Monterey County Pasadena: Near Benton
48	Oct. 24	Iv	iPZ eNE iZ iZ iSEZ iN iZ F	02 23	21.0 22 24.6 30.0 54.6 56.0 58.4		c c c	Pasadena: Southeast of Benton
49	Oct. 24	Iu	ePZ F	15 45	39.0		c	See list, p. 288
50	Oct. 25	Iv	iPZ eNE iZ iZ eSNE F	04 19	57.7 59.5 03.2 42.7 43.0		c d	See list, p. 288
51	Oct. 26	Iu	iPZ ipPZ F	00 14	26.0 32.8		c c	U.S.C.G.S.: 11°N 41°W



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
63	Oct. 29	IId	iPNEZ iN iSN iE iE F	00	06	30.9 33.5 39.7 41.2 48.7		c	See list, p. 288
64	Oct. 29	Iu	eZ F	00	33	12.5			Afternoon
65	Oct. 29	Iu	iPZ iZ F	06	44	36.9 38.6		d c	U.S.C.G.S.: 10°S 160°E
66	Oct. 29	Iu	e'PZ F	14	24	36.8		c	See list, p. 288
67	Oct. 30	Ir	iPZ F	05	41	13.6		d	U.S.C.G.S.: Aleutian Islands
68	Oct. 30	Iu	iPZ F	05	46	03.0		d	U.S.C.G.S.: New Hebrides Region
69	Oct. 31	Iu	iZ iZ F	00	06	54.4 18.2		d d	U.S.C.G.S.: 34°S 179°W
70	Oct. 31	Iu	eZ F	00	14	22.0		d	U.S.C.G.S.: Samoa Islands Region
71	Oct. 31	Ir	iPZ eNE eSE eSN eZ eZ F	01	44	15.5 18 22.0 29.0 27.0 26.0	11	c	U.S.C.G.S.: 56°N 135°W Trace "copy" at St. George, Utah
72	Oct. 31	Ir	ePZ F	02	36	57			U.S.C.G.S.: 56°N 135°W
73	Oct. 31	Iu	ePZ F	07	54	01.5		d	U.S.C.G.S.: 49°N 156°E
74	Oct. 31	Iu	ePZ ipPZ F	18	08	27.5 58.6		d	U.S.C.G.S.: 5°S 152½°E See list, p. 288
75	Nov. 1	Iu	ePZ F	07	45	36.0			U.S.C.G.S.: New Britain Region
76	Nov. 1	Iv	ePZ	11	31	27			Foreshock?

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
77	Nov. 1	Iv	iPZ	11	57 05.3		d	See list, p. 288 County
			eNE		06			
			iZ		23.3		d	
			iSEZ	11	58 02.9			
			iNE		04.6			
77	Nov. 1	Id	iZ	11	58 05.2			See list, p. 288 Santa Cruz County
			F	12	05			
78	Nov. 1	Iv	ePZ	13	56 56			Aftershock
79	Nov. 1	Iu	iPZ	15	37 14.4		d	
			F	15	38			
80	Nov. 1	Id	iPZ	23	07 42.2		d	See list, p. 288
			eNE		43			
			eSNEZ	23	07 48.1		d	U.S.C.G.S.: 40°N 154°W
			iZ		50.8		d	
			F	23	09		d	
81	Nov. 2	Id	iPZ	01	36 15.3		d	See list, p. 288
			eNE		16.0			
			iZ		18.4		d	
			iSZ		25.4			
			iSN		26.3			
			eE		27.0			
			F	01	38			
82	Nov. 2	Iu	iPZ	02	16 02.7		d	
			ipPZ		14.1		d	
			F	02	17			
83	Nov. 2	Ir	iPZ	02	31 20.6		d	Press: "Sharp" at St.
			iZ		45.9		c	George, Utah
			eNE		48			
			iSZ	02	33 07.4			
			eN		15.0			
			iZ		15.3			
			eE		16.5			
			F	02	36			
84	Nov. 2	Iu	iPZ	02	46 33.8		d	U.S.C.G.S.: 3°S 134°E
			iZ		48 01.1		d	
			eZ		50 46.0			
			F	02	53			
85	Nov. 2	Iv	iPZ	13	45 24.5		c	See list, p. 288
			eNE		26			
			iZ		30.2		c	
			iSNEZ		42.2			
			iMZ		42.9			
			F	13	47			



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
86	Nov. 2	Id	iPNEZ eNE iSZ F	15	05	27.5 35 36.3		d	Northern Monterey County
87	Nov. 2	Id	iPZ eNE iSNZ iE F	17	53	45.4 46 52.0 53.4		c	Northern Santa Cruz County
88	Nov. 2	Iv	iPZ iSZ F	23	09	08.2 26.1		c	Pasadena: Southwest of Santa Rosa Island
89	Nov. 3	Iu	iPZ iZ ipPZ F	01	22	28.0 29.8 07.7		d d d	U.S.C.G.S.: 48½°N 154°E
90	Nov. 4	Id	iPNEZ iZ iZ iN iEZ iSZ F	09	31	31.8 33.0 37.2 38.9 39.4 40.0		d d	See list, p. 288
91	Nov. 4	Iu	ePZ iZ F	12	14	54.5 00.5		d	
92	Nov. 4	Iu	iPZ F	14	44	14.7		c	See list, p. 288
93	Nov. 4	Iv	iPZ eNE iZ iEZ iN eE eN F	20	44	16.8 18.0 18.7 12.3 31.3 47.1 47.6		d c	U.S.C.G.S.: 32°N 116½°W
94	Nov. 5	Iv	iPZ eNE iZ iZ eE eN F	04	37	02.4 07 13.1 50.3 34.5 35 38		d d	Aftershock

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
95	Nov. 5	Id	iPZ iNEZ iZ iSNZ iE F	17 23 54.3 54.8 24 00.7 05.6 06.4 17 25		d d	See list, p. 288	
96	Nov. 6	Id	iPZ iSZ F	08 26 21.1 29.0 08 27		c	See list, p. 288	
97	Nov. 6	Id	iPZ iSZ F	08 43 08.9 16.9 08 44		c	See list, p. 288	
98	Nov. 6	Id	iPZ iSZ F	09 11 30.0 38.0 09 12		d	See list, p. 288	
99	Nov. 7	Iu	iPZ ipPZ ePPZ eLE eLZ F	06 12 12.8 30 17.5 19 15 43.0 39.4 39.9 06 55		d d	U.S.C.G.S.: 14°S 166½°E	
100	Nov. 7	Id	iPNZ iE iSE iSN iZ F	08 00 16.4 16.9 22.4 22.8 25.4 08 02		d	See list, p. 288	
101	Nov. 8	Iv	ePZ eZ eSZ F	12 41 41.3 43.9 42 00.6 12 43		d c c	See list, p. 288	
102	Nov. 8	Iu	ePZ F	14 54 15.5 14 56		c d	U.S.C.G.S.: New Hebrides Region	
103	Nov. 9	Id	iPZ iNE iZ iSN iE iN iME F	18 49 09.9 10.9 21 01 20.4 21.2 21 06 22.3 22.8 23 05 25.4 18 51		c	See list, p. 288	



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
104	Nov. 10	IId	iPZ	05	16	51.4		c	See list, p. 288
			iN			52.2		c	
			iE			57.2		c	
			iN	00	25	57.9		c	
			iZ		17	01.9		c	
115	Nov. 10	Iu	iSN	02	17	03.2		c	Southwest Kirgizstan
			iSE	02	22	03.6		c	
			F	05	19			c	
105	Nov. 11	Iu	iPZ	11	06	13.8		c	U.S.C.G.S.: Faroe Islands Region
			eZ		07	41.0		c	
118	Nov. 11	Iv	F	11	08			c	See list, p. 289
106	Nov. 11	Iu	iPZ	17	07	06.5		c	U.S.C.G.S.: 15 $\frac{1}{2}$ °N 93°W
			F	17	08			c	
107	Nov. 11	Iu	iPZ	18	08	37.0		c	
			F	18	09			c	
108	Nov. 12	Iv	iPZ	19	29	31.0		c	See list, p. 289
			iZ		30	03.5		c	
			F	19	31			c	
109	Nov. 12	Iv	iPZ	20	43	28.0		c	See list, p. 289
			iZ		44	59.8		c	
			F	20	45			c	
110	Nov. 13	Id	iPZ	14	58	16.7		d	See list, p. 289
			eSEZ	14	58	28.4		d	
			eN			29.1		d	
			F	14	59			d	
111	Nov. 13	Ir	ePZ	04	50	24.5		d	U.S.C.G.S.: 11°N 86°W
			iPZ			25.6		d	
			iZ			34.6		c	
			iZ	04	52	24.6		c	
			F	04	54			c	
112	Nov. 13	Iu	ePZ	20	55	51.5		c	U.S.C.G.S.: New Hebrides Region
			iPZ			52.3		d	
			iZ			53.8		d	
			F	20	57			d	
113	Nov. 13	Iv	ePZ	21	04	29.1		c	See list, p. 289
			eZ			34.1		c	
			F	21	06			d	Southwest Kirgizstan
114	Nov. 13	Iu	iPZ	23	05	59.1		c	
			iZ		06	02.6		c	
			iZ			30.9		c	
			iZ			34.7		c	
			F	23	08			c	

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
115	Nov. 14	Iv	iPZ iZ eZ F	00 22	38.4 41.1 52.0		d c	Pasadena: 34°55'N 116°46'W San Benito County (1130 1952)
116	Nov. 14	Iu	eZ F	02 19 02 22	31			U.S.C.G.S.: Near Coast of Ecuador
117	Nov. 14	Iu	iPZ F	02 59 13 01	43.1		c	U.S.C.G.S.: Samoa Islands Region
118	Nov. 14	Iv	iPZ iZ eNE iSNEZ iZ F	10 42	43.3 46.1 47.0 18.4 21.6		d c	See list, p. 289
119	Nov. 14	Iv	iPZ eNEZ iZ iZ iSZ eSNE iZ iN F	17 13	26.2 27.0 29.6 34.3 57.1 58.5 00.5 01.6		c d c d	Pasadena: 37°29'N 118°25'W See list, p. 289 U.S.C.G.S.: Tonga Island Region.
120	Nov. 14	Id	iPNEZ iSZ iSNE F	18 11	15.4 22.2 22.6		c	See list, p. 289 U.S.C.G.S.: 11°3 75°N
121	Nov. 16	Iv	iPZ iZ F	08 01	49.4 22.6		d	Foreshock U.S.C.G.S.: 26°N 112°W
122	Nov. 16	Iv	iPZ eNE iZ iZ iZ eNE F	08 05	10.4 12.5 12.9 18.4 35.1 36.5		d c d	See list, p. 289
123	Nov. 16	Iv	iPZ iZ iSZ iZ F	23 47	57.0 02.4 24.0 26.7		d c	Southwest Kings County San Benito County
				00 39	03.4 41.9			See list, p. 289



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
124	Nov. 17	Iv	eZ iZ iZ F	05 06	47.0 56.2 42.0		c	Pasadena: 34.8°N 120.7°W V at Santa Maria (2130 PST)	
125	Nov. 18	Iv	ePZ eZ eZ F	01 21	11.0 48.5 18			Pasadena: 33°45'N 118°45'W	
126	Nov. 18	Iu	iPZ iZ F	08 10 11	42.5 15.5		d c	U.S.C.G.S.: 14°S 167°E	
127	Nov. 18	Id	iPZ iZ eSZ F	19 46	06.3 10.5 15.2		d c	See list, p. 289 U.S.C.G.S.: Fiji Islands Region	
128	Nov. 18	Iv	iPZ iZ F	23 58	09.7 26.3		d	See list, p. 289	
129	Nov. 19	Iu	iPZ ipP?Z F	07 37	21.7 36.5		c	U.S.C.G.S.: Tonga Island Region.	
130	Nov. 20	Iu	iPZ iZ F	01 05	10.9 17.5		d c		
131	Nov. 20	Iu	ePZ iPZ iZ F	04 54	41.0 41.8 46.6		c d c	U.S.C.G.S.: 11°S 75°W	
132	Nov. 20	IIr	ePZ eNE iPZ iZ eSN eSE iZ eZ F	07 12	37.5 42.0 42.5 52.3 15 27 37 16 06.3 16.8		c d d c	U.S.C.G.S.: 28½°N 112°W See list, p. 289 Six aftershocks recorded up to 2000 OCT. See list, p. 289	
133	Nov. 21	Iv	ePNEZ iZ iSNEZ F	03 50	45.8 46.8 59.2		d d c	San Benito County See list, p. 289	
134	Nov. 22	Iv	iPZ eSZ F	00 39	03.4 41.9			See list, p. 289	

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MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
135	Nov. 22	Iu	iPNEZ iZ iZ ePPNZ eSN	01 04	07.6 11.9 01.1 07 30 14 18.1		d d c d	U.S.C.G.S.: 29°S 178°W
			eSZ eSE eZ		23.1 27.6 22 15.1			
			eNE iZ F		27.0 30 28.1 01 35	16		
136	Nov. 23	Ir	iPZ iZ F	06 22	30.7 40.7 06 26		d d	U.S.C.G.S.: 19°N 78½°W
137	Nov. 26	Iu	iPZ F	01 21 01 23	44.8		c	U.S.C.G.S.: Fiji Islands Region
138	Nov. 26	Ir	iPZ F	04 31 04 32	06.2			U.S.C.G.S.: 16°N 95°W
139	Nov. 26	Iu	iPZ F	06 32 06 34	36.3		d	
140	Nov. 27	Iu	iPZ ePNE iZ iZ ePPZ	08 53	49.4 50.0 07.9 37.7 56 30.0		d d c	U.S.C.G.S.: 18°S 173°W
			eSE eN eLE eLN eLZ F		09 03 23 04 19 15.6 15.7 16.0 09 48	26		
141	Nov. 27	IIId	iPNEZ iSNE F	14 06 14 09	47.7 49.2		d	See list, p. 289 Six aftershocks recorded up to 2000 GCT.
142	Nov. 27	IIId	iPNEZ iSNE F	21 53 21 55	22.2 24.2		c	See list, p. 289
143	Nov. 28	Iu	iPZ F	17 01 17 03	45.4		d	U.S.C.G.S.: 8°N 83°W
144	Nov. 29	Id	iPNEZ iSNEZ F	06 51 06 53	41.2 43.4		c	See list, p. 289



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Trace motion	Remarks
				h. m. s.	s.		
	1949						
145	Nov. 29	Id	iPNEZ iSE iNZ F	07 14	44.4 52.5 55.9	d c	See list, p. 289
146	Nov. 29	Iu	ePZ F	10 08 10 11	58.5	c	U.S.C.G.S.: 17 1/2°S 167 1/2°E
147	Nov. 30	Iv	iPZ eNE iZ iZ iN iE iSE iN	08 32	17.7 19.0 20.7 23.4 31.1 32.3 35.4 37.1	d d c d	See list, p. 289
148	Dec. 1	Id	ePZ eSZ F	20 02 20 03	23.2 30.2	c	Northern Santa Cruz County
149	Dec. 2	Iu	ePZ F	02 56 02 57	14.0	d c	U.S.C.G.S.: 22°S 172°E
150	Dec. 2	Ir	ePZ	22 34	02.5	d	U.S.C.G.S.: 50 1/2°N 130°W
151	Dec. 3	Iu	iPZ F	02 59 03 01	49.0	c	
152	Dec. 3	Iu	iPZ F	12 13 12 15	13.5	d c	See list, p. 289
153	Dec. 5	Iu	iPZ iZ F	11 30 11 31 11 32	04.5 22.4	d c	U.S.C.G.S.: 6°N 84 1/2°W
154	Dec. 5	Iu	iPZ iZ iZ iZ F	12 50 12 51 12 52 12 53	43.2 44.6 53.2	c d c	U.S.C.G.S.: 6°N 84 1/2°W
155	Dec. 5	Iu	iPZ iZ iZ iZ F	12 50 12 51 12 52 12 53	43.2 44.6 53.2	c d c	U.S.C.G.S.: 6°N 84 1/2°W
156	Dec. 10	Iv	F	12 53	43.7	d	See list, p. 289

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
156	Dec. 6	Iu	iPZ iZ eZ	00 00	33.7 34.8 36.5		c c	
157	Dec. 6	Iu	iPZ F	13 45 13 47	41.4		d	U.S.C.G.S.: 17½°S 167½°E
158	Dec. 6	Iu	ePZ iZ F	14 39	10.0 15.5 19.9		d d d	U.S.C.G.S.: Tonga Islands Region
159	Dec. 6	Iu	iPZ F	20 25 20 26	05.8		c	See list, p. 289
160	Dec. 6	Iv	iZ iZ eNE iZ iSNEZ iNZ F	22 07 22 08	51.4 56.9 59.5 09.9 33.5 36.1		d d c	Part of quake? P? See list, p. 289
161	Dec. 6	Iu	iPZ F	22 36 22 38	18.4		c	Southern Santa Clara County
162	Dec. 7	Iv	iPZ iZ iSZ iZ F	10 22	34.3 36.3 06.5 08.5		c d	Verdi aftershock
163	Dec. 7	Iv	iPZ eNEZ iZ	18 45	19.5 20 25.4		d c c	See list, p. 289
164	Dec. 7	Iv	iZ eSE iN iZ iE F	14 45 14 47	44.6 51.0 51.5 52.5 57.1		c d	U.S.C.G.S.: Off Coast of Colima, Mexico.
165	Dec. 9	Iv	iPZ iZ F	23 53	13.0 20.5		d d	See list, p. 289
165	Dec. 9	Iv	iPZ F	23 53 23 55	40.7		c	Runs into next shock
166	Dec. 10	Iv	iPZ iZ F	04 06 04 07	43.7 26.1		d d	See list, p. 289



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
167	Dec. 10	Iu	iPZ F	05 40	24.4		c	U.S.C.G.S.: 182°W 67°N
				05 41			c	
168	Dec. 10	Iu	iPZ	19 22	29.9		d	
	Dec. 21	Iu	iZ		34.5		c	U.S.C.G.S.: 181°E 160°E
			iZ	25	09.4		d	
			iZ		18.6		c	
			iZ		21.5		c	
	Dec. 21	Iu	F	19 26			c	
169	Dec. 11	Iu	iPZ	11 46	38.0		d	U.S.C.G.S.: Loyalty Islands
	Dec. 21	Iu	iZ		42.0		c	Region
			F	11 48			c	
170	Dec. 13	Iv	iPZ	05 05	52.7		c	See list, p. 289
			iNEZ		54.5		c	
			iZ	06	03.4		c	
	Dec. 22	Ir	iSZ	09 37	19.0		d	U.S.C.G.S.: 16°N 93°W
			eE		19.5		c	
			iN		20.0		c	
			iZ		22.5		c	
			F	05 08			c	
	Dec. 25	Id	iPZ	09 17	13.6		c	See list, p. 289
171	Dec. 13	Id	iPZ	09 13	15.9		d	Southern Santa Clara County
			iSEZ		18.9		c	
			iN		20.0		c	
			F	09 14			c	
172	Dec. 13	Iu	iPZ	23 45	12.3		d	U.S.C.G.S.: 195°W 106°N
			iZ		20.3		c	
			F	23 46			c	
173	Dec. 14	Iu	iPZ	00 25	04.8		c	
			iZ		29.1		c	
			F	00 27			c	
174	Dec. 14	Ir	ePZ	14 45	29.0		c	U.S.C.G.S.: 37°N 139°E
			iZ		30.6		d	U.S.C.G.S.: Off Coast of Colima, Mexico.
			F	14 47			c	
175	Dec. 14	Iv	iPZ	17 33	41.4		c	Pasadena: 37°52'N 116°20'W
			eNEZ		43.0		c	
	Dec. 25	Iu	iSZ	23 34	32.6		c	U.S.C.G.S.: 37°N 137°E
			iZ		39.2		c	
			eNE		40.5		d	
			F	17 36			d	
176	Dec. 15	Ir	iPZ	03 38	01.0		c	U.S.C.G.S.: Off Coast of Colima, Mexico.
			F	03 39			c	
177	Dec. 18	Iu	iPZ	05 51	44.8		c	U.S.C.G.S.: 34°S 179½°E
			iZ		48.2		d	
			iZ	52	52.9		d	
			F	05 55			c	

## MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
178	Dec. 21 (cont.)	Iu	ePZ iZ F	12 40 12 42	15.5 17.9		c	U.S.C.G.S.: 18½°N 67°W
179	Dec. 21	Iu	iPZ ipPZ F	13 30 13 32	51.9 56.0		c d	U.S.C.G.S.: 18½°S 168°E
180	Dec. 21	Iu	ePZ F	17 57 17 59	28.0		c	
181	Dec. 21	Iu	iPZ iZ iZ ipPZ F	19 44 19 45	07.8 10.1 14.2 46 06.5		d d c	U.S.C.G.S.: 20°S 64°W
182	Dec. 22	Ir	iPZ ipPZ eZ F	09 37 09 39	20.0 40.6 42		d c	U.S.C.G.S.: 16°N 93°W
183	Dec. 25	IIId	iPZ iSZ iSE iN F	09 47 09 47 09 49 09 48	13.6 14.3 14.7 15.1		c	See list, p. 289
184	Dec. 25	Ir	iPZ eNE iZ iPPZ iZ F	22 45 22 46	53.7 55 00.1 23.7 55.2		c c c d	U.S.C.G.S.: 19½°N 104°W
185	Dec. 25	Iu	iPZ iZ eE eN iZ F	23 29 23 32	12.2 13.3 14 18 38.6		c c	U.S.C.G.S.: 37°N 139°E
186	Dec. 25	Iu	iPZ eNE iZ iZ eZ F	23 36 23 38	36.1 38 39.8 45.2 37 50.0		c	U.S.C.G.S.: 37°N 139°E
187	Dec. 26	Iu	iPZ iZ eNE iZ	06 35 06 46	40.2 42.2 46 56.4		d c d	U.S.C.G.S.: 14½°S 180°



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
187	Dec. 26 (cont.)	Iu	ePPZ	06 38	38.5			
			eSE	45	51			
			eGN	54.9		36		
			eLE	57.7		23		
	Dec. 26	Iu	eN	58.1		23		
			eZ	58.9		25		
			F	07 32				
188	Dec. 27	Iv	iPZ	02 08	23.7		c	Southern Monterey County
			eNE		25.5			
			iZ		26.6		c	
			iSZ		42.5			
			eNE		43.5			
			F	02 10				
189	Dec. 27	Iu	iPZ	08 49	07.0		d	U.S.C.G.S.: Aleutian Is-
			iZ		18.7		d	lands
			eZ		33.5			
			F	08 50				
	Dec. 28	Iv						See list, p. 289
190	Dec. 27	Iu	iPZ	08 52	26.5		d	
			F	08 54				
191	Dec. 27	Iu	iPZ	09 07	49.2		c	U.S.C.G.S.: 37°N 139°E
			F	09 09				
192	Dec. 27	Ir	iPZ	10 59	56.6		c	U.S.C.G.S.: Aleutian Islands
			F	11 02				
193	Dec. 27	Iu	iPZ	21 15	08.8		d	U.S.C.G.S.: Tonga Islands
			iZ		31.6		c	
			F	21 17				
194	Dec. 28	Iu	iP'Z	00 16	15.8		c	U.S.C.G.S.: 60°S 22°W
	Dec. 29	Iu	eNE		21		c	
			iZ		29.7			
			ePPZ	18	12.5		d	
			iZ		39.8		d	
			iZ	19	12.6			
			F	00 25				
195	Dec. 28	Iu	ePZ	04 02	06.0			U.S.C.G.S.: Azores Islands
			F	04 03				Region
196	Dec. 28	Iu	ePZ	06 36	31.5			U.S.C.G.S.: Azores Islands
			F	06 38				Region
197	Dec. 28	Iv	iPZ	09 17	36.9		c	See list, p. 289
			eNE		39.5			
			iZ		40.0		d	
			iZ		56.5			
			iN		57.3			

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
197	Dec. 28 (cont.)	Iv	iE iMZ F	09 17 18 01.5 09 19	57.8 01.5			U.S.C.G.S.: Kermadec Is-lands Region
198	Dec. 28	Iu	ePZ F	10 43 10 46	58.0			Small aftershock
199	Dec. 28	Iv	ePZ iZ iSZ iZ eN eE F	11 59 12 00 12 00 12 02	35.0 40.6 15.1 23.6 28.0 31.5		d	See list, p. 289
200	Dec. 28	Iu	ePZ iZ F	13 49 13 51	10.0 23.1		c	U.S.C.G.S.: Aleutian Is-lands
201	Dec. 28	Iv	iPZ eSZ F	16 48 16 49 16 50	52.9 24		c	See list, p. 289
202	Dec. 29	Iu	ePZ iZ iPPZ F	03 17 03 18 03 21 03 49	38.0 33.3 48.8			U.S.C.G.S.: 18½°N 121°E
203	Dec. 29	Iu	ePZ iZ ipPZ eZ F	16 54 16 55 16 56 17 03	59.0 01.2 41.7 36.5		d c	U.S.C.G.S.: 27°S 176½°W
204	Dec. 29	Iu	iPZ iZ iZ eZ eZ F	22 24 22 26 22 34 22 37 22 38 22 41	27.4 10.6 25.8 51 23.7		d d d d	
205	Dec. 30	Iu	ePZ F	01 53 01 55	21.9		c	U.S.C.G.S.: Fiji Islands Region
206	Dec. 30	Iu	iPZ iZ eZ F	06 36 06 37 06 39	25.6 31.8 05.5			



MT. HAMILTON

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
207	Dec. 30	Iu	iPZ iZ F	10 53	26.3 30.2		c c	U.S.C.G.S.: Kermadec Islands Region
208	Dec. 30	Iv	iPZ iZ iSZ eNEZ F	13 22 13 24	04.2 07.5 31.0 38.0		c c	Verdi aftershock

CONSTANTS OF THE STATION

Latitude and Longitude:

$\phi = 37^{\circ} 25' N.$   
 $\lambda = 122^{\circ} 10' W.$

Time — All determinations are referred to Greenwich Civil Time.

Altitude — 11 meters (272 feet) above mean sea level.

Apparatus	Response
Wood-Anderson	1
Benford	2

PALO ALTO

PALO ALTO

THE BRANNER STATION, STANFORD UNIVERSITY  
PALO ALTO, CALIFORNIA

list, p. 288

CONSTANTS OF THE STATION

U.S.C.G.S.: 33°S 56.5°E

Latitude and longitude:

$$\phi = 37^{\circ} 25' 11'' \text{ N.}$$

$$\lambda = 122^{\circ} 10' 18'' \text{ W.}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 83 meters (272 feet) above mean sea level.

Apparatus	Component
Wood-Anderson .....	E N
Benioff .....	Z

Western Santa Cruz County

? Southern Fresno County?

See list, p. 288

See list, p. 288

See list, p. 288



PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
1949									
1	Oct. 2	Id	iPZ	20	36	53.8		d	See list, p. 288
			iSEZ			59.3			
			iN	37	00	02			
			iZ			01.2			
			F	20	38				
2	Oct. 4	Id	iPEZ	02	47	17.4		d	See list, p. 288
			iNE			18.1			
			iSNEZ			26.5			
			F	02	49				
3	Oct. 7	Iu	iP'Z	12	22	34.7		d	U.S.C.G.S.: 33°S 56.5°E
			iP <sub>2</sub> 'Z	24	14	3		d	
			iPPZ	27	50	0			
			ePcPP'Z	31	17	0		d	See list, p. 288
			eZ	33	49				
			F	12	39				
4	Oct. 11	Id	iPZ	11	45	08.5		d	See list, p. 288
			eNE			11.0			
			eSNE			14.3			
			F	11	46				
5	Oct. 12	IIId	iPNZ	23	18	09.9		d	See list, p. 288
			iE			10.7			
			iN			11.1			
			iSNE			12.0			
			F	23	19				
6	Oct. 13	Id	iPNEZ	19	59	34.0		c	Northwestern Santa Cruz County
			iN			36.9			
			iSE			37.5			
			iN			42.1			
			iE			42.7			
			F	20	00				
7	Oct. 14	Iv	iZ	01	26	55.3		c	P? Southern Fresno County?
			F	01	28				
8	Oct. 16	Id	iPZ	04	15	14.6		c	See list, p. 288
			iSZ			23.5			
			F	04	16				
9	Oct. 16	Iv	iPZ	23	32	34.1			See list, p. 288
			eSZ			54.1			
			F	23	34				
10	Oct. 17	IIId	iPNZ	02	42	01.9		c	See list, p. 288
			iPE			03.4			
			iSNE			15.3			
			F	02	43				

PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
11	Oct. 17	Iv	iPZ iSEZ iE iN iZ F	02 45	09.7 23.2 25.8 26.2 27.5		c d	See list, p. 288
12	Oct. 17	Id	iPZ iPNE iN iSZ iNE F	04 38	23.3 23.8 24.1 35.5 36.7		c	See list, p. 288 Northern San Mateo County
13	Oct. 17	I	iPZ iEZ iN iE iN iZ F	04 45	21.6 34.4 36.0 37.7 38.3 39.3		d	See list, p. 288 See list, p. 288
14	Oct. 18	Id	iPNZ iPE iSNE iN F	12 25	55.0 56.6 08.4 11.2		d c	See list, p. 288 See list, p. 288
15	Oct. 19	Iv	iPZ iSEZ iE iN iZ F	18 38	ca 35.8 31.8		c	See list, p. 288 S - P = 13.8 sec.?
16	Oct. 19	IIId	iPNEZ iSNE F	20 15	41.6 42.8		c	
17	Oct. 19	Iu	eZ iZ	21 13	31.7 47.2		d d	pP? U.S.C.G.S.: 5½°S 154°E
	Oct. 27	Iv	eLZ F	02 41	21.6 22.0		c c	See list, p. 288
18	Oct. 20	Iv	iPZ iZ iSZ F	03 27	22.8 31.6 55.5		c c	III in Bishop
19	Oct. 21	Id	iPNEZ iSNE iN F	20 00	25.6 28.6 32.9		d	Northern Monterey County Southern San Mateo County
20	Oct. 22	Iv	iPZ iZ iSZ F	03 43	39.8 40.1 31.6		d c!	See list, p. 288



PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
21	Oct. 22	Iv	ePZ iZ eNE iSN iSE iN F	03 08 18 03	47 08 59 51	55.8 56.2 57.0 12.0 12.5 15.3		c d      See list, p. 288	
22	Oct. 22	Id	iPZ iSZ eE eN iZ F	16 19 00 16	25 26 06 28	54.8 06.4 09 11.0 24.9		Northern San Benito County  See list, p. 288	
23	Oct. 22	IIV	iPZ eN iE iN iSNE F	21 00 00 00 21	45 09 11 16 53	41.3 41.4 42.4 43.2 43.7 58.1		See list, p. 288  U.S.G.O.S.: Santa Islands Region  U.S.G.O.S.: 56°W 135°W	
24	Oct. 23	Id	iPZ iZ iSNEZ F	09 16 09	35 36 37	30.0 31.6 35.1	c	See list, p. 288	
25	Oct. 24	Iv	iPZ iZ iSN iSEZ F	02 02 24 02	23 24 03 26	27.1 35.8 03.8 04.3	c	Pasadena: Southeast of Benton	
26	Oct. 25	Iv	iPZ F	04 04	19 21	53.2	c c	See list, p. 288	
27	Oct. 27	Iv	iPZ iZ iSN iSE iN F	02 23 12 02	22 00 00 24	45.6 46.4 00.0 00.5 05.7	c c	See list, p. 288	
28	Oct. 27	Iv	iPZ iSNEZ F	19 19	20 22	48.7 01.8	d	Aftershock Northern Monterey County	
29	Oct. 28	Iv	iPZ eN eE F	02 03 02	30 31 32	15.5 49.5 04.5	d	See list, p. 288	

PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
30	Oct. 28	Iv	iPZ iZ F	08 07 08 08	29.1 50.8		d	See list, p. 288
31	Oct. 28	Iu	iPZ iZ epPZ eZ ePPZ F	18 59 19 00 19 00 19 02 19 04	13.0 27.6 45.5 57.5		d c	U.S.C.G.S.: 20°S 179°W
32	Oct. 29	Iv	iPZ iPNE iE iSN iSE F	00 06 00 09	38.5 39.3 47.5 52.5 53.3		c	See list, p. 288
33	Oct. 30	Iu	eZ F	00 14 00 16	23		d	U.S.C.G.S.: Samoa Islands Region
34	Oct. 31	Ir	iPZ ePN ePE ePPE eN eSN eSE eLE eZ eN F	01 44 01 44 01 44 01 46 01 48 01 50 01 52 02 00	13.1 14 17 33.5 07.5 11 12.5 40 25 30		c	U.S.C.G.S.: 56°N 135°W
35	Nov. 1	Iv	iPZ ePNE iZ iZ iE iN iNZ iE F	11 56 11 57 11 58 11 59 12 00 12 01 12 02 12 03 12 04	58.9 00 00.2 15.6 18.4 20.2 56.3 57.1		c c	See list, p. 288 116°W
36	Nov. 1	Iv	iPZ iSZ F	13 56 13 57 13 58	50.9 51.8		c	Aftershock
37	Nov. 1	Id	iPZ iNEZ iSNE F	23 07 23 08 23 09	46.3 47.0 57.0		c c	See list, p. 288
		Iv	iPZ iNE F	17 23 17 24 17 25	59.1 15.3		d	See list, p. 288



PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
38	Nov. 2	Iv	iPZ ePNE iEZ iNZ iN iE F	01	36	20.2 21 33.1 34.9 36.9 39.7		c	See list, p. 288
39	Nov. 2	Id	iPZ ePNE iN eE F	13	45	17.3 18 30.0 31.3		d	See list, p. 288
40	Nov. 2	Id	iPZ eSZ eSE eSN F	15	05	32.4 44.5 45.5 46.0		c	Northern Monterey County
41	Nov. 2	Id	iPZ ePN iPE eSN iSEZ iE iN F	17	53	39.7 40.0 40.4 43.0 43.9 45.4 46.9		d	Northern Santa Cruz County
42	Nov. 4	Id	iPZ eSZ F	09	31	35.9 48.4		c	See list, p. 288
43	Nov. 4	Iv	iPZ iZ ePNE iN iE iN eZ eE F	20	44	19.9 21.3 22.7 45 44.3 46 33.3 36.1 50 47.5 52 27.0		c c	U.S.C.G.S.: 32°N 116½°W
44	Nov. 5	Iv	iPZ iZ eE eN eE iZ F	04	37	02.1 38 30.7 34.3 39 09.5 19.0 44.5		d	Aftershock
45	Nov. 5	Iv	iPZ iNE F	17	23	59.1 24 15.3		d	See list, p. 288

PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
46	Nov. 6	Id	iPZ iSZ F	08 26 29.8 08 27	21.2		d	See list, p. 288
47	Nov. 6	Id	iPZ iSZ F	08 43 08 44	08.6 17.0			See list, p. 288
48	Nov. 6	Id	iPZ iSZ F	09 11 09 12	29.8 38.5		d	See list, p. 288
49	Nov. 7	Ir	iPZ F	04 37 04 48	29.2		c	U.S.C.G.S.: 18½°N 95°W
50	Nov. 7	Iu	iPZ ePSZ F	06 12 23 06 24	10.9 37.1		d	U.S.C.G.S.: 14°S 166½°E
51	Nov. 7	Id	iPZ iN iE iN iNE iE iN F	08 00 18 12 18 28 18 30 08 02	20.6 21.6 22.8 28.3 31.0 32.6 34.7		d	See list, p. 288
52	Nov. 8	Iv	iPZ iZ	12 41	37.5 38.9		d	See list, p. 288
	Nov. 10	Id	iZ F	12 42	51.6			See list, p. 289
53	Nov. 9	Iv	iPNE iSNE F	18 49 18 50	15.7 31.8		d	See list, p. 288
54	Nov. 10	IIv	iPN ePE iSNE F	05 16 05 17 05 19	56.5 57.7 12.3		d	See list, p. 288
55	Nov. 13	Ir	iPZ iZ iZ F	04 50 04 52 04 53	29.1 36.2 24.7		d d d	U.S.C.G.S.: 11°N 86°W
56	Nov. 13	Id	iPZ eSZ F	14 58 14 59	14.9 26.6			See list, p. 289
57	Nov. 13	Iu	iPZ F	20 55 20 58	48.7		c	U.S.C.G.S.: New Hebrides Region



PALO ALTO

No.	Date	Char-acter	Phase	Time	Period	Trace motion	Remarks
				(G.C.T.)			
				h. m. s.	s.		
	1949						
58	Nov. 13	Iv	iPZ eSZ F	21 04 27.1 31 41.8 21 05		d	See list, p. 289
59	Nov. 14	Iv	iPZ eE eN F	10 42 47.2 53.3 43 16.2 10 44		d	See list, p. 289 178°W
60	Nov. 14	Iv	iPZ iZ iSE iN iE iN F	17 13 32.3 40.6 14 09.1 14.5 01 18 23.6 25.6 17 16		d	Pasadena: 37°29'N 118°25'W
	Nov. 27	Iu				d	U.S.C.G.S.: 18°S 173°W
61	Nov. 14	IIId	iPZ iPNE iSNE F	18 11 09.7 09 03 10.1 13.1 18 12		c	See list, p. 289
62	Nov. 15	IIId	iPNEZ iSNE iNE F	18 28 29.7 14 06 30.9 07 32.5 18 30		d	See list, p. 289
63	Nov. 16	Iv	iPZ F	08 05 10.8 08 08		c	See list, p. 289
64	Nov. 18	Id	iPZ F	19 46 04.0 19 47			See list, p. 289
65	Nov. 18	Iv	iPZ iSZ eZ F	23 58 06.7 06 33 19.7 20.9 23 59		d	See list, p. 289
66	Nov. 20	Iu	iPZ F	04 54 44.6 04 55		d	U.S.C.G.S.: 11°S 75°W
67	Nov. 20	IIr	iPZ eN iZ eE eN eE eSNE eZ eZ eN F	07 12 42.9 48.0 53.5 54.0 59.0 13 05.0 15 18.5 16 29.4 08 17 04.0 17.8 08 10		c	U.S.C.G.S.: 28½°N 112°W

PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
68	Nov. 21	Iv	iPZ iSZ F	03 50 51 03 52	50.9 10.6 22.4		d	San Benito County - County
69	Nov. 22	Iu	iPZ iPNE epPN ipPZ epPE ePPN eSN eSE eSZ F	01 04 18 42 18 42 05 01 07 23 14 12 14 18 01 18	06.3 07.1 59.1 59.9 01.1 23 12.0 15.5 18 18.4		d!	U.S.C.G.S.: 29°S 178°W  Sinusoidal train
70	Nov. 27	Iu	iPEZ iN iE eSN eSE eLE F	08 53 19 27 19 27 09 03 09 17 09 30	47.9 49.9 50.4 15 17 15.8		d!	U.S.C.G.S.: 18°S 173°W PcP
71	Nov. 27	Id	iPNEZ iSNZ iSE F	14 06 20 07 14 08	54.9 00.0 01.2	1.4	d	See list, p. 289  Paradise: 37°25'N 118°23'W Forehook
72	Nov. 27	Id	iPNEZ iSNE F	21 53 21 54	27.7 33.0		c	See list, p. 289
73	Nov. 29	Iv	iPZ ePNE F	06 51 06 53	45.1 45.8		c	See list, p. 289
74	Nov. 29	Iv	iPZ iSNEZ F	07 14 17 15 07 16	49 02 58.7		c	See list, p. 289 Paradise: 37°25'N 118°22'W 0.1-0.2 km N north of
75	Nov. 30	IIv	iPZ iE iN iE iN iE iN eSE eSN F	08 32 12 45 23 53 23 53 23 53 23 53 08 35	16.2 16.6 17.1 18.9 20.2 24.1 24.6 33.7 34.6 42.7		c	See list, p. 289  See list, p. 289  See list, p. 289
		Iv	iPZ F	04 06 04 07	38.9		d	See list, p. 289



PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
76	Dec. 1	Id	iPNEZ iSNZ iE iZ F	20 02	18.0 20.6 22.6 23.1		c	Northern Santa Cruz County
	Dec. 17	Iu	F	20 03				U.S.G.C.S.: 54°S 71°W
77	Dec. 8	Id	iPZ iPaNEZ iE eZ eE eN eN eEZ F	18 42 08 10 15 43 16 40 16 44 19 44 18 45	56.8 57.7 58.6 12.3 13.2 29.9 01.9 02.4 11.9		c c      d d	Blast
	Dec. 17	Iu	eZ eE eN eN eEZ F	15 43 16 40 16 44 19 44 18 45	12.3 13.2 29.9 01.9 02.4 11.9			U.S.G.C.S.: 54°S 71°W
78	Dec. 8	Id	iPZ iPaEZ iPaN iNZ eN eN eEZ eZ F	19 57 19 48 23 58 23 10 09 59 20 00	58.7 59.6 59.8 14.3 27.6 31.8 03.3 04.6		c c     d d	Blast
	Dec. 21	Iv	iNZ eN eN eEZ eZ F	23 58 23 10 09 59 20 00	14.3 27.6 31.8 03.3 04.6			See list, p. 289
	Dec. 22	Ir	eEZ eZ F	09 59 20 00	03.3 04.6	1.4	3mm	U.S.G.C.S.: 16°N 93°W Sinusoidal train
79	Dec. 9	Iv	iPZ iPN iPE iZ iE iN iSN iSE iSZ F	08 42 09 45 09 47 09 48 08 44	06.4 07.5 08.0 14.7 16.0 32.5 43.5 44.5 46.6		c	Pasadena: 37°28'N 118°22'W Foreshock
	Dec. 25	Id	iN iSN iSE iSZ F	09 47 09 48 08 44	32.5 43.5 44.5 46.6		c	See list, p. 289
	Dec. 25	Ir	F	08 44	57.6		d	U.S.G.C.S.: 19°N 104°W
80	Dec. 9	Iv	iPNEZ iZ iE iSN F	12 39 23 40 12 43	50.0 58.7 00.2 27.0		d d	Pasadena: 37°28'N 118°22'W U.S.G.C.S.: V north of U. Bishop.: 37°N 139°E
	Dec. 25	Iu	iE iSN F	23 40 12 43	00.2 27.0		d	U.S.G.C.S.: 37°N 139°E
81	Dec. 9	Id	iPZ iPNE iSN F	23 53 23 38 23 53.3	07.0 07.7 14.2		c	See list, p. 289 139°E
	Dec. 26	Iu	F	23 53.3			c	U.S.G.C.S.: 114°S 130°
82	Dec. 9	Id	iPNE iSNE F	23 53 23 54	34.5 42.7		c	See list, p. 289
	Dec. 10	Iv	iPZ F	04 06 04 07	38.9		d	See list, p. 289

PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
84	Dec. 15	IId	iPNE iSN F	18 40 18 42	44.1 46.8			U.S.C.G.S.: Tonga Islands
85	Dec. 17	Iu	eLN eE eN F	07 43 08 10	2 44.5 45.3			U.S.C.G.S.: 54°S 71°W Foreshock
86	Dec. 17	Iu	eN eGE F	15 44 16 40	4 51.2			SSS? U.S.C.G.S.: 54°S 71°W
87	Dec. 21	Iu	iPZ iZ iZ ipPZ F	19 44 19 48	10.2 11.9 15.9 19.9	d d! d		U.S.C.G.S.: 20°S 64°W U.S.C.G.S.: 18°N 121°E
88	Dec. 21	Iv	eZ F	23 09 23 10	36.7			See list, p. 289
89	Dec. 22	Ir	iPZ ipPZ iPPZ iPcPZ eSN eSE eSZ F	09 37 09 45 09 38 09 40 09 42 09 45 09 47 09 45	24.0 45.1 34.4 01.1 44 45 47	d d		U.S.C.G.S.: 16°N 93°W U.S.C.G.S.: 27°S 176°W
90	Dec. 25	Id	iPZ iSZ F	09 47 09 48	20.3 26.7	c		See list, p. 289
91	Dec. 25	Ir	iPZ iZ F	22 45 22 48	57.6 03.3	d c		U.S.C.G.S.: 19½°N 104°W
92	Dec. 25	Iu	iPZ iZ F	23 29 23 31	09.8 11.3	d d		U.S.C.G.S.: 37°N 139°E
93	Dec. 25	Iu	iPZ F	23 36 23 38	33.5	c		U.S.C.G.S.: 37°N 139°E
94	Dec. 26	Iu	ePZ ePN eZ eGN eLE F	06 35 06 40 06 44 06 55 06 58 07 30	37 40 06 5.2 8.7	c		U.S.C.G.S.: 14½°S 180°



PALO ALTO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
95	Dec. 27	Iu	iPZ F	21 15 21 16	07.1		c	U.S.C.G.S.: Tonga Islands
96	Dec. 28	Iu	iP'Z iPPZ F	00 16 18 22.0 00 20	17.7			U.S.C.G.S.: 60°S 22°W
97	Dec. 28	Iv	iPZ iZ F	09 17 18 09.8 09 19	43.0		c	See list, p. 289
98	Dec. 28	IIId	iPNZ iPE iSNE F	23 46 11.6 12.6 23 47	10.7			
99	Dec. 29	Iu	ePZ iZ eZ ePPZ eSKSE F	03 17 18 28.2 20 48.3 21 45 28 14 03 41	35.3			U.S.C.G.S.: 18½°N 121°E
100	Dec. 29	Iu	ePZ epPZ F	16 54 55 40 17 00	57			U.S.C.G.S.: 27°S 176½°W

Apparatus	Component
Wood-Anderson	S N

SAN FRANCISCO

SAN FRANCISCO

THE SAN FRANCISCO STATION, UNIVERSITY OF SAN FRANCISCO  
SAN FRANCISCO, CALIFORNIA

CONSTANTS OF THE STATION

Latitude and longitude: 12 28 04 U.S.C.G.S.: 33° 8' 56" N  
12 30

$$\phi = 37^{\circ} 46' 14'' \text{ N.}$$

$$\lambda = 122^{\circ} 27' 12'' \text{ W.}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 100 meters (328 feet) above mean sea level.

Apparatus	Component
Wood-Anderson .....	E N



SAN FRANCISCO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
1	Oct. 1	Id	iPNE iSNE iE F	01 00	02.7 05.0 07.0			Blast?
2	Oct. 2	Id	ePNE iSNE F	20 36 20 38	51.6 55.5			See list, p. 288
3	Oct. 4	Iv	iPN iPE iSN iSE F	02 47 02 49	24.5 25.0 38.4 38.9			See list, p. 288
4	Oct. 7	Iu	ePPNE F	12 28 12 30	04			U.S.C.G.S.: 33°S 56½°E
5	Oct. 10	Id	iPN iN iE F	20 15 20 16	24.2 26.0 27.4			Blast?
6	Oct. 11	Id	iPNE eSN iSE iNE F	11 45 11 46	06.7 09.7 10.7 14.7			See list, p. 288
7	Oct. 11	Id	ePNE eSNE F	19 59 20 00	35.4 38.4			See list, p. 288
8	Oct. 11	Id	iPE iSNE F	23 35 23 36	44.3 48.3			Western Contra Costa County
9	Oct. 14	Id	iPNE iSN iSE iE F	00 56 00 57	14.8 16.4 16.8 17.8			Blast?
10	Oct. 15	Id	iPNE iSN iSE F	00 35 00 36	20.9 22.7 23.1			Blast?
11	Oct. 16	Id	iPNE iSNE F	04 15 04 16	07.1 08.9			See list, p. 288

SAN FRANCISCO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
12	Oct. 17	Iv	eN	02	42 05.0			See list, p. 288
			eE		09.0			
			iN	02	33 10.5			
			iE		16.8			
		Iv	iSN	00	06 23.8			See list, p. 288
			iSE		25.1			
			iN		26.6			
			F	02	44			
13	Oct. 17	Iv	eNE	04	38 30			See list, p. 288
			iSNE		45.3			
			iN	01	44 48.4			
			F	04	40			
14	Oct. 18	Iv	eNE	12	26 02.0			See list, p. 288
			iSE		16.6			
			iN		17.3			
			iE		18.0			See list, p. 288
			F	12	28			
15	Oct. 19	Iv	e $\bar{P}$ E	15	38 36.0			See list, p. 288
			eSE		53.0			
			eN		55.8			
			F	15	40			
16	Oct. 19	Iu	eLE	21	41.1			U.S.C.G.S.: 5 $\frac{1}{2}$ °S 154°E
			eN		48.6			
			F	22	12			
17	Oct. 22	Iv	ePNE	03	43 34.0			See list, p. 288
			eSNE		44 21.5			
			F	03	46			U.S.C.G.S.: 32°N 116°W
18	Oct. 22	Iv	ePN	03	48 01.5			See list, p. 288
			ePNE		03.0			
			iE	20	57 16.5			
			iSN		22.0			
			iSE	12	41 22.5			See list, p. 288
			F	03	50			
19	Oct. 22	IIv	ePN	21	45 46.7			See list, p. 288
			iPN		47.7			
		Iv	iN	05	47 49.0			See list, p. 288
			iN		50.6			
			iN	46	02.4			
			iSN	05	49 05.2			
			iN		08.9			
			F	21	52			See list, p. 289
20	Oct. 24	Iv	e $\bar{P}$ E	02	23 40			Pasadena: Southeast of
			eN		58.0			Benton p. 289
			eE	21	24 13.0			
			eN		20.0			
			F	02	26			



SAN FRANCISCO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
21	Oct. 28	Iv	eNE eN F	02 30 31 02 33	28.5 31.5			See list, p. 288
22	Oct. 29	Iv	ePN eE iE iSN iE F	00 06 23 59 07 12 07 08 00 09	42.5 47.0 56.0 58.8 08.1			See list, p. 288 U.S.C.G.S.: 70°N 112°W
23	Oct. 31	Ir	ePN eE eSNE eN F	01 44 08 48 02 10	09 21 08 53.2 06.5			U.S.C.G.S.: 56°N 135°W U.S.C.G.S.: 79°S 170°W
24	Nov. 1	Iv	iPN eE iN iSN iE iN F	11 56 01 57 08 53 09 31 11 59	55.5 56.0 08.4 41.0 42.0 42.5			See list, p. 288 U.S.C.G.S.: 18°S 173°W
25	Nov. 2	Id	ePE iE iSN iSE F	13 45 09 39 14 07 13 46	11.1 16.4 18.0 18.7			See list, p. 288
26	Nov. 4	Iv	ePNE iNE eN eE F	20 44 08 45 46 20 57	26.6 49.5 37 40			U.S.C.G.S.: 32°N 116½°W
27	Nov. 8	Id	eE eN iSNE F	12 41 18 42 12 42	37.0 39 41.0			See list, p. 288
28	Nov. 10	Iv	iPN iPE iSNE F	05 17 05 19	03.9 04.4 24.3			See list, p. 288
29	Nov. 13	Id	eSNE F	14 58 14 59	17.4			See list, p. 289 110°22'W
30	Nov. 13	Id	eSNE F	21 04 21 05	28.3			See list, p. 289

SAN FRANCISCO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
31	Nov. 18	Id	iSNE F	19 46 19 47	06.3			See list, p. 289 U.S.C.G.S.: 7 North of Blanca
32	Nov. 18	Id	eSNE eNE F	23 58 23 59	12.0 13.1			See list, p. 289
33	Nov. 20	IIr	ePN ePE iPN iPE eSN eSE F	07 12 52 13 00.8 01.8 15 04.7 13 08 24				U.S.C.G.S.: 28½°N 112°W
34	Nov. 22	Iu	ePN ePE eSN eSE F	01 04 07 14 13 22 01 39	06.5			U.S.C.G.S.: 29°S 178°W
35	Nov. 27	Iu	ePNE eSE eSN eLN eLE F	08 53 09 03 16 14 49 54 09 39	48 15 16 49 54			U.S.C.G.S.: 18°S 173°W
36	Nov. 27	Id	ePE iSNE F	14 07 14 08	01.0 10.1			See list, p. 289
37	Nov. 30	IIId	iPNE iNE iSN iSE F	08 32 15.0 24.5 25.2 08 35	11.8 15.0 24.5 25.2			See list, p. 289
38	Dec. 8	IIId	iPNE iSNE F	18 42 18 45	49.6 54.5			Blast
39	Dec. 8	IIId	iPNE iSNE iNE F	19 57 58 00.1 20 00	51.7 56.3 00.1			Blast
40	Dec. 9	Iv	ePN ePE eSE eSN F	08 42 11 50.4 54 08 45	10.4 11 50.4 54			Pasadena: 37°28'N 118°22'W Foreshock



SAN FRANCISCO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h. m. s.	s.			
	1949							
41	Dec. 9	Iv	iPNE iE iN eSNE F	12 39 54.4 40 19.4 20.2 35 12 42				Pasadena: 37°28'N 118°22'W U.S.C.G.S.: V North of Bishop

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 10^{\circ} 34' N.$$

$$\lambda = 124^{\circ} 16' W.$$

Time — All determinations are reduced to Greenwich Civil Time.

Altitude — 27 meters (55 feet) above mean sea level.

Apparatus	Component
Bosch-Omari 25 kg.	E N

The station is operated by Mr. George Reynolds, of Ferndale,

in cooperation with the University of California.

FERNDALE

THE FERNDALE STATION  
FERNDALE, CALIFORNIA

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 40^{\circ} 34' \text{ N.}$$

$$\lambda = 124^{\circ} 16' \text{ W.}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 17 meters (55 feet) above mean sea level.

Apparatus	Component
Bosch-Omori 25 kg. ....	E N

The station is operated by Mr. Joseph Bognuda, of Ferndale,  
in cooperation with the University of California.



FERNDALE

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
1	Oct. 19	Iu	eSE eLE F	21	23	20 40 33			U.S.C.G.S.: 5 $\frac{1}{2}$ °S 154°E
2	Oct. 28	Id	iPE iSNE F	02	29	32 38 30			See list, p. 288
3	Oct. 31	Ir	iSE iSN eLE F	01	46	58 47 04 48 50 02 40			U.S.C.G.S.: 56°N 135°W
4	Nov. 1	Iv	ePE iSNE F	11	56	30 50 58			See list, p. 288
5	Nov. 4	Ir	eSE eSN F	20	48	18 28 00			U.S.C.G.S.: 32°N 116 $\frac{1}{2}$ °W
6	Nov. 20	IIr	ePE ePN eSE eSN eE eN eE eN F	07	13	32 38 36 46 26 14 25 36 07 50			U.S.C.G.S.: 28 $\frac{1}{2}$ °N 112°W
7	Nov. 21	Id	iPE iPN iSNE F	21	38	17 18 25 39			Foreshock? Felt at Petrolia
8	Nov. 22	Id	iPNE iSNE F	00	38	17 23 39			See list, p. 289
9	Nov. 22	Iu	ePNE iSE eSN F	01	04	20 39 40 50			U.S.C.G.S.: 29°S 178°W
10	Dec. 4	Id	iPNE iSNE F	22	39	01 06 40			See list, p. 289
11	Dec. 10	Iv	iE eN F	04	06	10 28 07			S? See list, p. 289

FERNDALE

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
12	Dec. 17	Iu	eSKSE eE eN eE F	07	18	32 40 45 24 51		U.S.C.G.S.: 54°S 71°W Foreshock PS?	
13	Dec. 17	Iu	eE eE eLE eE F	15	33	28 42 41 52 10		U.S.C.G.S.: 54°S 71°W	
14	Dec. 21	Id	iPNE iSNE F	23	08	48 52 10		See list, p. 289	
15	Dec. 26	Iu	ePE eSE eSN eN eE eLN eLE F	06	35	37 07 29 32 41 46 46 50		U.S.C.G.S.: 14½°S 180°	

Apparatus	Component
Springmeter	N E Z



FRESNO

THE FRESNO STATION, FRESNO STATE COLLEGE  
FRESNO, CALIFORNIA

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 36^{\circ} 46' 11'' \text{ N.}$$

$$\lambda = 119^{\circ} 47' 18'' \text{ W.}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 88.4 meters (290 feet) above mean sea level.

Apparatus	Component
Sprengnether .....	N
	E
	Z

FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
1	Oct. 7	Iu	iP'Z	12	22	33.6		d	U.S.C.G.S.: 33°S 56.5°E
			iP'E			35.2			
			iP'N			36.5			
			iZ			53.6		c	
			iZ	23	15.7			d	
			iP <sub>2</sub> 'Z	24	15.4			c	
			iP <sub>2</sub> 'NE		18.9				
			eN	25	43				
			eE	26	50				
			iPPZ	28	06.6			d	
			iPPN	01	11.0				
			ePPPE	30	54				
			iPPPZ	31	16.9				
			iZ	32	24.6				
			iN		51.2				
			iZ	34	56.1				
			eN	01	35 07				
			eZ	38	47				
			2	Oct. 7	I	ePZ	22	56	
eZ	23	01				48.6			
F	23	03							
3	Oct. 13	Iu	ePZ	03	47	07			U.S.C.G.S.: Samoa Islands Region
			F	03	49				
4	Oct. 13	Iv	iZ	00	30	51.9			P? U.S.C.G.S.: IV at Borego Valley (San Diego County)
			eN			52.5			
			eE	31	01				
			eN			47.0			
			iSZ			49.0			
			eE			49.5			
			F	00	34				
5	Oct. 14	IIId	iPNZ	01	26	27.4			Southern Fresno County?
			iPE			28.0			
			iSZ			36.7			
			iSNE			37.1			
			F	01	29				
6	Oct. 16	Iv	iPNEZ	16	05	44.3		c	U.S.C.G.S.: IV at Bishop
			iSZ			59.0			
			iSNE			59.6			
			F	16	07				
7	Oct. 16	Id	iPZ	23	32	21.7		d	See list, p. 288
			iPE			22.4			
			iSNE			32.3			
			iN			40.3			
			iE			46.5			
			F	23	34				



FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks			
				h.	m. s.						
8	1949 Oct. 17	Iv	iPZ	02	42 06.6			See list, p. 288			
			iPN		07.1						
			iPE		07.6						
			iSNE	21	23.0						
			eN	43	17.0						
			eE	44	49.5						
			eN	22	57.5						
			eZ	22	45 03.5						
F	02	46			A waves						
9	Oct. 17	Iv	iPNEZ	04	38 30.1			See list, p. 288			
			iSNZ		43.6						
			iSE		44.1						
			eN	40	59.5						
			eN	41	15.5						
			eZ	03	22.5						
			F	04	43						A waves
											A waves
10	Oct. 18	Iv	iPZ	12	25 59.7			See list, p. 288			
			iPE		26 00.3						
			iPN		00.8						
			iSNEZ		15.4						
			eZ	21	28 44						
			eN		59						
			F	12	31						A waves
11	Oct. 19	Iv	ePNE	15	38 33.1			See list, p. 288			
			iSNEZ		47.5						
			F	15	40						
12	Oct. 19	Iu	ePZ	21	13 17.5			U.S.C.G.S.: 5 1/2°S 154°E			
			eZ		35.5						
			eN	01	22 39.2						
			iZ		51.2						
			eE	02	23 59.0						
			eN	14	04.0						
			iN	02	15 44.0						
			eE	17	21.5						
			eE	00	19 18.5						
			ePSZ	00	24 52						
eLZ		41 42									
13	Oct. 20	Id	eMZ	02	48 31			See list, p. 288			
			F	22	34						
			iPZ	03	26 56.9						
			iPNE		57.4						
14	Oct. 20	Iu	iSZ	27	11.3			III at Bishop California			
			iSNE		12.2						
			F	03	29						
			ePZ	12	57 57.5						
			eZ		58 22.5						
			ePSZ	13	09 49.5						
			F	13	34						U.S.C.G.S.: 23°S 100°

FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
15	Oct. 21	Ir	iPZ F	03 39 32.1 03 42			d	U.S.C.G.S.: 54°N 169°W	
16	Oct. 21	Iu	ePZ iPPZ eZ eLZ F	21 47 16.0 50 40.7 52 53.0 22 21.9 22 37				U.S.C.G.S.: 5½°S 154°E PPP?	
17	Oct. 22	Id	iPZ iPE iSZ iSNE eN eZ F	03 47 56.8 57.6 48 11.8 12.3 50 37 51 00 03 52			c	See list, p. 288 A waves	
18	Oct. 22	IIv	iPEZ eN iE iN iSNE F	21 45 42.6 43.4 43.7 44.3 58.6 21 58			c	See list, p. 288	
19	Oct. 23	Iv	iPEZ iPN eN F	01 32 56.5 57.5 34 27.5 01 36				See list, p. 288	
20	Oct. 24	Iv	iPEZ ePN iSNE F	01 53 27.8 28 45.5 01 55				Pasadena: Near Benton	
21	Oct. 24	IIv	iPNEZ iSNE F	02 23 00.5 18.6 02 29			d	Pasadena: Southeast of Benton	
22	Oct. 26	Iu	ePZ F	00 14 16.0 00 16			c	U.S.C.G.S.: 11°N 41°W	
23	Oct. 27	Iv	iSNE F	02 23 06.1 02 24				See list, p. 288	
24	Oct. 27	Ir	ePZ eSE eSN eSZ eLZ F	08 26 23 29 03.0 08 37 08.5 09.0 30 59 08 39				U.S.C.G.S.: Gulf of California	
25	Oct. 27	Iu	iPZ eZ F	10 14 31.1 16 26 10 18			d	U.S.C.G.S.: 23½°S 180°	



FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
26	Oct. 28	Iu	iPZ F	00	23	58.1		d	U.S.C.G.S.: 34°N 142°E Region
27	Oct. 28	Iv	ePZ ePN ePE iZ iN iN iE iZ eZ F	02	30	36 39 41.5 46.0 31 25.3 56.1 32 00.9 02.0 34 45 02 37			See list, p. 288  U.S.C.G.S.: Outer Mongolia  A waves Present "Sharp" at St. George, Utah.
28	Oct. 28	Iv	iSNE eZ eE eN F	08	07	37.6 47.5 49.9 51.0 08 11			See list, p. 288  Location: Southwest of Papeete, Tahiti.
29	Oct. 28	Iu	iPZ epPZ F	18	59	19.0 19 01 01.0 19 03		d	U.S.C.G.S.: 20°S 179°W
30	Oct. 29	Iv	iPZ iNE F	00	06	43.8 56.5 00 12		c	See list, p. 288 Sn?
31	Oct. 31	Iu	ePZ ePPZ F	00	06	58.0 10 36.0 00 12		c	U.S.C.G.S.: 34°S 179°W
32	Oct. 31	Iu	iPZ ePN ePE iN F	00	14	25.3 30.5 31.0 59.5 00 18		c	U.S.C.G.S.: Samoa Islands Region
33	Oct. 31	Ir	iPZ ePNE iSE eSN eSZ F	01	44	27.7 29 48 34.9 40.0 53 57.5 02 28			U.S.C.G.S.: 56°N 135°W
34	Oct. 31	Ir	iPE ePE ePN F	02	37	07.6 09 10 02 44		c	U.S.C.G.S.: 56°N 135°W
35	Oct. 31	Iu	iPZ epPZ eSZ F	18	08	36.3 57.5 20 28.0 18 22		d	U.S.C.G.S.: 5°S 152½°E

FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
36	Nov. 1	Iu	ePZ F	07 45 07 49	42.0			U.S.C.G.S.: New Britain Region
37	Nov. 1	Iv	iPZ eN eE eN F	11 57 58 59 12 03	25.2 45.1 57.5 37.0			See list, p. 288
38	Nov. 1	Iu	ePZ F	13 17 13 20	26.5			U.S.C.G.S.: Outer Mongolia
39	Nov. 2	Iv	iPEZ ePN iSZ iSE iSN F	02 31 32 32 34 34 02 37	00.0 00.5 26.5 27.5 28.0		c	Press: "Sharp" at St. George, Utah.
40	Nov. 2	Iv	eZ iSE eSN eSZ F	23 09 09 09 23 14	21.5 37.1 38.5 39.0			Pasadena: Southwest of Santa Rosa Island
41	Nov. 3	Iu	iPE ePE ePN ipPZ eZ eSN F	01 22 23 23 23 29 30 01 35	37.4 38.5 39.5 16.8 30 49.5		d	U.S.C.G.S.: 48 $\frac{1}{2}$ °N 154°E
42	Nov. 4	I	iPZ iZ eZ F	12 14 15 21 12 22	46.5 31.1 00.5			See list, p. 288
43	Nov. 4	IIv	iPZ ePNE iN iE iN F	20 43 44 45 05 21 08	58.6 59.0 13.1 21.7 22		d	U.S.C.G.S.: 32°N 116 $\frac{1}{2}$ °W
44	Nov. 5	IIv	iPZ iZ iZ iE iNE iE iNZ F	04 36 37 38 38 04 50 53 53 04 49	44.8 09.3 24.5 29.9 42.7 07.3 08.8			Aftershock
	Nov. 13	Iv	iNE iE iNZ F	04 50 53 53 04 49	42.7 07.3 08.8		d	U.S.C.G.S.: 11°N 86°W



FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
45	Nov. 5	I	ePZ ePE iN eZ eN F	17 24	03.0 04.5 17.9 25 27.5 40.2			U.S.C.G.S.: New Helvidon See list, p. 288 Pasadena: 34°55'N 116°16'W	
46	Nov. 7	Ir	ePZ F	04 37 04 40	10.0		d	U.S.C.G.S.: 18½°N 95°W	
47	Nov. 7	Iu	ePZ ePN ePE eE eZ ePSZ eZ eLZ F	06 12 16 20.0 10 13 02 18 49 17 24 12 38 29 39 29.0 07 30			c	U.S.C.G.S.: 14°S 166½°E Pasadena: 37°29'N 118°25'W	
48	Nov. 7	Iv	ePZ ePNE iZ iE iN F	08 00 08 05	35.0 35.5 50.9 53.7 54.4			See list, p. 288 See list, p. 289	
49	Nov. 9	Iv	iPZ iPE iSNE eN eE F	18 49 23 12 51 07.5 18 53	16.5 17.1 32.0 07.5 08.0		d	See list, p. 288 Southwest Kings County A waves	
50	Nov. 10	IIv	iPEZ iPN iSZ iSE iSN eN eZ F	05 16 17 12.3 13.0 13.7 19 16 24 05 29	57.5 58.5 12.3 13.0 13.7 16 24		c	See list, p. 288 A waves	
51	Nov. 11	Iv	ePZ ePN iSZ iSNE F	14 34 07 35 14 36	53.5 55.0 16.6 17.2			Pasadena: 35°45'N 118°06'W North of Walker Pass U.S.C.G.S.: 20½°N 112°W	
52	Nov. 13	Ir	iPZ iPNE eN eLZ F	04 50 05 00 05 02	12.6 13.1 41.0 17.5		d	U.S.C.G.S.: 11°N 86°W	

FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
53	Nov. 13	Iu	iPZ F	20 55 20 59	58.3			U.S.C.G.S.: New Hebrides Region	
54	Nov. 14	Iv	iPZ iPN iSZ iSE iSN F	00 22 00 23 00 23 00 23 00 25	23.8 24.8 03.3 03.8 04.3		d	Pasadena: 34°55'N 116°46'W	
55	Nov. 14	Iv	iPZ iPN iSZ iSNE F	10 42 10 43 10 43 10 45	50.7 51.2 25.1 25.8		d	See list, p. 289	
56	Nov. 14	IIv	iPEZ iPN iN iSZ iSNE F	17 13 17 17	06.3 06.7 07.2 21.2 22.0		c	Pasadena: 37°29'N 118°25'W	
57	Nov. 16	Iv	ePZ ePE iN eZ eE F	08 05 08 06 08 08	30.5 33.5 19.1 20 23			See list, p. 289	
58	Nov. 16	Id	iPNE iEZ iN F	23 47 23 51	42.2 52.8 53.6		d	Southwest Kings County	
59	Nov. 18	Iv	ePZ ePN eE eZ eN iN F	01 20 01 21 01 21	45.5 51.0 32.0 37.1 39.5 52.3			Pasadena: 33°45'N 118°45'W	
60	Nov. 18	Iu	ePZ F	08 10 08 13	48			U.S.C.G.S.: 14°S 167°E	
61	Nov. 20	IIr	ePZ ePN ePE eE eN	07 12 07 12 07 12 07 13	19.0 21.5 22.5 24.5 14.6		d	U.S.C.G.S.: 28½°N 112°W Long period	





FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period s.	Trace motion	Remarks
				h.	m. s.			
	1949							
69	Dec. 6	Iu	iPZ F	14 39 14 45	18.7		c	U.S.C.G.S.: Tonga Islands Region
70	Dec. 6	Iv	iPZ iSN F	22 07 08 22 11	45.4 14.7			See list, p. 289
71	Dec. 7	IIv	ePZ eNEZ iSEZ iNE F	18 45   18 48	23.3 31.5 53.4 55.1			See list, p. 289
72	Dec. 8	Iv	iPZ iPNE iSN iSEZ iZ F	20 45    20 47	18.8 20.3 44.7 46.8 58.2			Pasadena: 36°55'N 117°15'W
73	Dec. 9	Iv	iPEZ ePN iSE iSN iSZ F	04 34    04 37	25.5 27 48.7 49.5 50.3			Pasadena: 36°04'N 117°40'W
74	Dec. 9	IIv	iPEZ iPN iZ iSNE F	08 41   08 47	40.7 42.0 42.9 55.8		c	Pasadena: 37°28'N 118°22'W Foreshock
75	Dec. 9	IIv	iPNEZ iSNE F	12 39 12 45	24.7 39.5		c	Pasadena: 37°28'N 118°22'W U.S.C.G.S.: V North of Bishop
76	Dec. 10	Iu	ePZ F	17 31 17 33	07.0		d	U.S.C.G.S.: 13°S 173°W
77	Dec. 10	Iu	ePZ eZ eZ F	19 22 25 26 19 27	28.0 08.1 42.0			
78	Dec. 11	Iu	ePZ F	11 46 11 49	42			U.S.C.G.S.: Loyalty Islands Region
79	Dec. 13	Iv	iPZ eSZ iSE iSN F	05 05 06  05 08	50.6 15.0 15.6 16.6			See list, p. 289



FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
80	Dec. 14	I	iPZ iPE iPN iN iZ F	17 33 18.3 18.8 19.7 45.6 34 19.1 17 36			Pasadena: 37°52'N 116°20'W Region	
81	Dec. 17	Iu	ePZ ePN ePE ePPZ eE eNZ eSKSN eZ eE eLZ eN eE F	07 08 22 12 45 50 53 11 19 27.5 12 15 18 16.5 19 38 20 18 21 03 45 09 46 08 51 13 09 15			U.S.C.G.S.: 54°S 71°W Foreshock	
82	Dec. 17	Iu	eE eZ ePPZ eE eE eN eN eSKSZ eZ eN eE F	15 22 06 24 53.5 25 45 26 02 27 18.0 29 00.0 32 12 33 42.0 50.8 53.7 58 05 17 00			U.S.C.G.S.: 54°S 71°W	
83	Dec. 18	Iu	iPZ ePE ePN ipPE ipPZ eSKSN eSKSE eN eN F	05 51 48.8 49.5 51.0 52 11.7 37.6 06 02 32.0 33.0 03 45 05 04.0 06 10			U.S.C.G.S.: 34°S 179½°E	
84	Dec. 18	Iu	iPZ F	19 05 07.9 19 06			U.S.C.G.S.: 60°S 82°W	
85	Dec. 18	Iv	ePZ ePNE iSE F	19 13 33.3 33.8 14 10.4 19 15			Pasadena: 35°02'N 116°53'W	

FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
86	Dec. 20	Iu	ePZ epPZ eSZ F	04 30 37 04	27 00 16.0 48			U.S.C.G.S.: Fiji Islands Region	
87	Dec. 21	Iu	ePZ F	13 13	30 31	56.4		U.S.C.G.S.: 18½°S 168°E	
88	Dec. 25	Ir	iPNZ ePE eZ eLN eLZ F	22 37 48 53 23	45 37 23 30 45 02	30.9	d	U.S.C.G.S.: 19½°N 104°W	
89	Dec. 25	Iu	iPZ ePE ePN F	23 23	29 29	22.0 22.6 23.6	c	U.S.C.G.S.: 37°N 139°E	
90	Dec. 25	Iu	iPZ iPE ePN eZ eN iN eN eSZ F	23 46 47 37 26 38 47 46 23	36 46.2 47 13 26 18.2 47 10 47		c	U.S.C.G.S.: 37°N 139°E	
91	Dec. 26	Iu	iPEZ ePN eSZ eN eGN eLZ eLN eLE F	06 48 45 55 58 59 52 08	35 48 00 56.2 35 42 35 52 10	46.5	d	U.S.C.G.S.: 14½°S 180°	
92	Dec. 27	Iu	iPZ ePNE eN F	21 21	15 15	12.7 14.9 15.9		U.S.C.G.S.: Tonga Islands	
93	Dec. 28	Iu	eP'Z eP'N eP'E eN eZ iPPZ eE eN	00 16 21 17 18 18 19	16 16 21 48 00.4 06.2 37 04	11.0	c	U.S.C.G.S.: 60°S 22°W	



FRESNO

No.	Date	Char-acter	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
93	Dec. 28 (cont.)	Iu	eN eN eZ eLZ F	00 29 37 32 05 33 01 59.0 01 10			
94	Dec. 28	Iv	iPZ iPNE iSNE iE eZ eN F	09 17 30.3 32.2 43.2 52.6 18 26 42 09 22		d	See list, p. 289
95	Dec. 28	Ir	eZ F	13 49 29.8 13 51			U.S.C.G.S.: Aleutian Islands
96	Dec. 29	Iu	ePZ ePN ePE iZ iZ eE iZ eN iPSZ eZ F	03 17 32 50 18 00 44.0 20 54.6 21 11.0 22 01.2 09.5 30 48.0 42.8 04 50			U.S.C.G.S.: 18½°N 121°E

Apparatus	Component
Woodward	
Benlioff	

MINERAL

No.	Date	Char-acter	Phase	Time	Period	Trace motion	Remarks
MINERAL							
1	Oct. 1	Iu	ePZ 12 P	07 11 53.0 07 12 37.0 07 13 29.4			THE MINERAL STATION MINERAL, CALIFORNIA
2	Oct. 1	Iu	1PZ 12 P	07 12 53.0 07 13 37.0 07 14 29.4			U.S.G.O.S.: South of Bonin
3	Oct. 1	Iu	ePZ 12 P	07 14 53.0 07 15 37.0 07 16 29.4			
4	Oct. 2	Iu	1PZ 12 P	07 17 53.0 07 18 37.0 07 19 29.4			U.S.G.O.S.: 18°N 127°W

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 40^{\circ} 21' N.$$

$$\lambda = 121^{\circ} 35' W.$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 1495 meters (4906 feet) above mean sea level.

Apparatus	Component
Wood-Anderson .....	E N
Benioff .....	Z

7	Oct. 4	Iu	ePZ 12 P	07 11 43.0 07 12 27.0 07 13 19.4			U.S.G.O.S.: 18°N 127°W
8	Oct. 4	Iu	ePZ 12 P	10 11 01.5 10 11 45.5 10 12 38.0			U.S.G.O.S.: 30°S 70°W
9	Oct. 4	Iu	1PZ 12 P	07 15 53.0 07 16 37.0 07 17 29.4			U.S.G.O.S.: 1°S 21°W
10	Oct. 6	Iu	1PZ 12 P	11 20 16.0 11 20 59.5 11 21 52.0			
11	Oct. 7	Iu	1PZ 12 P	02 29 47.4 02 30 30.9 02 31 23.4			
12	Oct. 7	Iu	ePZ 1PZ 12 12 1PZ ePZ 12 1PFPZ ePFPZ P	12 22 31.5 12 23 15.0 12 23 58.5 12 24 51.0 12 25 43.5 12 26 36.0 12 27 28.5 12 28 21.0 12 29 13.5 12 30 6.0 12 30 58.5			U.S.G.O.S.: 33°S 56°E



MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
1	Oct. 1	Iu	ePZ iZ F	03	42	55.5 09.0 44		d c	Centered about 10 miles northwest of Mineral. Between 0408 OCT, Oct. 11, 1949, and 0530 OCT
2	Oct. 1	Iu	iPZ iZ ipPZ F	07	14	52.9 57.0 39.4 17		d c c	U.S.C.G.S.: South of Bonin Islands shocks were recorded, apparently from the same source.
3	Oct. 1	Iu	ePZ F	07	38	51.0 39			
4	Oct. 2	Iu	iPZ F	02	40	20.5 42		d	U.S.C.G.S.: 18°N 49°W
5	Oct. 3	Iu	iPZ eZ F	23	57	42.8 02.8 00		c	U.S.C.G.S.: Alaskan Peninsula
6	Oct. 4	Iu	iPZ iZ F	04	40	05.8 12.8 42		c d	U.S.C.G.S.: 33°S 179°W Samoa Islands
7	Oct. 4	Iu	eZ F	07	11	43.8 15.0 14		d	U.S.C.G.S.: Samoa Islands
8	Oct. 4	Iu	ePZ F	10	11	01.5 32.0 13		d c	U.S.C.G.S.: 30°S 70°W Southern French County?
9	Oct. 4	Iu	iPZ eZ iZ F	10	34	05.1 17.5 39.5 41		d d d	U.S.C.G.S.: 1°S 21°W
10	Oct. 6	IIId	iPZ iSZ F	11	26	36.0 40.8 47.2 28		d	See list, p. 288
11	Oct. 7	IIu	iPZ iZ F	02	29	47.8 50.6 25.6 28		d d	
12	Oct. 7	Iu	eP'Z iP'Z iZ iZ iP <sub>2</sub> 'Z iPPZ eNE iZ iPcPP'Z ePPPZ F	12	22	31.5 33.2 44.0 59.3 13.0 51.6 55 03.0 09.7 01.5 45		d c d d c d d c c c	U.S.C.G.S.: 33°S 56½°E See list, p. 288 U.S.C.G.S.: Aleutian Islands

MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949					s.		
13	Oct. 10	IId	iPNEZ iSNEZ F	04 18 04 20	47.6 49.6		d c c	Centered about 10 miles northeast of Mineral. Between 0408 GCT, Oct. 11, 1949, and 0530 GCT, Oct. 11, 1949, about 40 smaller shocks were recorded, apparently from the same source.
14	Oct. 11	Iu	iPZ ipPZ F	09 16 09 19	02.9 37.0		c d	U.S.C.G.S.: 43 $\frac{1}{2}$ °N 144°E
15	Oct. 11	Iv	iPZ iZ iSNEZ F	11 47 11 50	55.4 59.4 18.0		d c	
16	Oct. 11	Iu	iPZ F	11 49 11 53	57.4		d	U.S.C.G.S.: 33°S 179°W See list, p. 288
17	Oct. 12	Iu	ePZ F	03 02 03 04	43.5		c	
18	Oct. 13	Iu	ePZ F	03 47 03 49	15.0			U.S.C.G.S.: Samoa Islands Region
19	Oct. 14	Iv	iPZ iZ eNE iSZ iZ F	01 27 01 28 01 30	32.0 44.4 27.5 32.9 39.6		c d	Southern Fresno County?
20	Oct. 17	Iv	ePZ eNE iZ eSE eN iZ iZ F	02 42 02 43 02 45	36.5 44.5 47.2 22.5 24.0 24.8 26.6		d	See list, p. 288 U.S.C.G.S.: 47°S 144°E
21	Oct. 17	Iv	eZ iNEZ iSNE F	04 39 04 41	03.3 08.0 48.3		d	See list, p. 288 P*? P?
22	Oct. 17	Iu	iPZ F	12 00 12 02	34.5		d	U.S.C.G.S.: Aleutian Islands



MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
23	Oct. 18	Iv	iPZ iZ iZ iSEZ eN iZ eNE F	12	26	36.3 39.2 47.9 16.7 17.5 20.7 25.0		c c c	See list, p. 288 Benton
24	Oct. 19	Iu	ePNE eSE eGE F	21	13	44 56 41.9	32		U.S.C.G.S.: 5½°S 154°E
25	Oct. 20	Iv	ePNE iSE iN F	03	27	46.0 27.1 29.1		d d	III in Bishop
26	Oct. 22	Iv	iPE iNE iSE iN iE iN F	03	43	29.9 39.8 11.1 12.5 15.0 16.5		c	See list, p. 288 See list, p. 288
27	Oct. 22	IIv	ePZ iPNZ iNZ iE iN iE eE iN iNE F	21	46	18.7 19.3 23.2 30.2 32.3 38.7 08.7 17.6 18.7		d d	See list, p. 288 U.S.C.G.S.: 12°N 127°W
28	Oct. 23	Iu	iPZ iZ F	05	25	33.8 44.7		c c	U.S.C.G.S.: 4°S 144°E See list, p. 288
29	Oct. 24	Iv	iZ iZ iZ iNE F	01	54	06.4 15.4 48.3 12.2		d d	Pasadena: Near Benton U.S.C.G.S.: Gulf of California
30	Oct. 27	Iu	iPZ iZ iZ F	10	26	31.5 22.5 19.5		d d c	U.S.C.G.S.: 23½°S 100°W

MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
30	Oct. 24	Iv	iPZ iZ iZ eN iZ iE iZ iE F	02	23	40.1 46.4 50.2 24 20.5 21.1 26.6 29.1 36.4		c c c c c c c c c	Pasadena: Southeast of Benton U.S.C.G.S.: 34°N 142°W
31	Oct. 24	Iu	ePZ iZ iZ F	02	36	35.5 38.6 47.6		d c c	
32	Oct. 24	IIId	iPNEZ iZ iSNZ F	23	19	09.7 11.5 13.0		d d	
33	Oct. 25	IIv	iPZ iN iE iSNE iE iN F	04	19	39.2 47.4 50.1 20 13.4 15.2 16.7		c d d d d d	See list, p. 288 See list, p. 288
34	Oct. 26	Iu	iPZ iZ iZ F	00	14	23.5 25.5 30.9		d d d	U.S.C.G.S.: 11°N 41°W
35	Oct. 26	Iv	iPZ eE iSNEZ iMZ F	06	50	39.7 43 59 51 01.1 52		d	Southern Washoe County, Nevada Southern Washoe County, Nevada
36	Oct. 27	Iv	iPZ iSZ F	02	23	21.7 24 01.7 26		c	See list, p. 288
37	Oct. 27	Ir	ePZ eZ eZ F	08	27	29.0 31 11.0 33 30 41		c c c	U.S.C.G.S.: Gulf of California
38	Oct. 27	Iu	iPZ iZ iZ F	10	14	35.9 40.4 49.5		d d c	U.S.C.G.S.: 23½°S 180°



MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
39	Oct. 27	Iu	iPZ F	18 45	49.2		c	U.S.C.G.S.: 49°N 155°E	
40	Oct. 28	Iu	ePZ F	00 23	10.0	15	d	U.S.C.G.S.: 34°N 142°E	
41	Oct. 28	IIv	iPEZ	02 29	48.5		c	See list, p. 288	
51	Oct. 31	Ir	iNE	02 36	50.5		c	U.S.C.G.S.: 56°N 135°W	
			iE		53.5		d		
			iSE	30	11.6		d		
			iN		12.1		d		
			iN		16.1		d		
52	Oct. 31	Iu	F	02 33			c	U.S.C.G.S.: 49°N 156°E	
42	Oct. 28	I	eZ	08 08	19.0			See list, p. 288	
			eZ	09	05.0				
53	Oct. 31	Iu	F	08 11			d	U.S.C.G.S.: 5°S 152°E	
43	Oct. 28	Iu	ePZ iPZ eZ F	18 59	24.0		d	U.S.C.G.S.: 20°S 179°W	
					24.9		c		
				19 01	06.0				
				19 03					
44	Oct. 29	Iv	iZ	00 07	09.0		d	U.S.C.G.S.: Off British See list, p. 288	
			eN		10				
55	Nov. 1	Iu	iZ	07 15	11.6		c	U.S.C.G.S.: New Britain Region	
			eNEZ		15.2		d		
			iE	07 21	20.5				
			iE		50.3				
56	Nov. 1	I	iN	11 23	51.7		d		
			iZ		53.3				
			F	00 10					
45	Oct. 29	Iu	iPZ F	06 44	41.1		d	U.S.C.G.S.: 10°S 160°E	
				06 47					
46	Oct. 29	Iv	iPZ eSZ F	09 05	32.8			Southern Washoe County, Nevada	
					50.9				
				09 06					
47	Oct. 29	Iu	iPZ F	14 24	36.4		c		
58	Nov. 1	Iu	F	14 26				U.S.C.G.S.: Outer Mongolia	
48	Oct. 31	Iu	ePZ F	00 07	03.5		c	U.S.C.G.S.: 34°S 179°W	
59	Nov. 3	Iu	F	00 10			d	U.S.C.G.S.: 10°N 152°E	
49	Oct. 31	Iu	ePZ iZ F	00 14	31.0		d	U.S.C.G.S.: Samoa Islands Region	
					37.4		d		
				00 18			c		
50	Oct. 31	Ir	ePZ iPZ eNE iZ	01 43	45.5		d	U.S.C.G.S.: 56°N 135°W	
					46.2		c		
					47.5				
					51.5		c		

## MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
50	Oct. 31 (cont.)	Ir	eSE	01 47 20			
			eZ	01 50 35			
			eLN	49.5			
61	Nov. 3	Iu	eLZ	11 49.7	15		
			eE	50.1	15		
			F	02 37 ca			
51	Oct. 31	Ir	ePZ	02 36 25.5		c	U.S.C.G.S.: 56°N 135°W
			iPZ	26.9		d	
			iZ	33.9		d	
63	Nov. 4	Iu	F	02 41			
52	Oct. 31	Iu	iPZ	07 53 48.9		c	U.S.C.G.S.: 49°N 156°E
			iZ	54 02.4		c	
64	Nov. 4	Ir	F	07 57			U.S.C.G.S.: 32°N 116°W
53	Oct. 31	Iu	ePZ	18 08 30.5		d	U.S.C.G.S.: 5°S 152½°E
			iZ	37.7		d	
			ipPZ	54.4		d	
			iZ	09 09.1		c	
			F	18 18			
54	Nov. 1	Ir	ePZ	01 55 51.0		c	U.S.C.G.S.: Off British Columbia
			F	01 58			
55	Nov. 1	Iu	ePZ	07 45 41			U.S.C.G.S.: New Britian Region
			eZ	48 48			
65	Nov. 5	Ir	F	07 51			Afternoon
56	Nov. 1	I	iPZ	11 23 04.6		d	
			F	11 25			
57	Nov. 1	IIv	iPZ	11 56 52.5		c	See list, p. 288
			iE	56.9			
			iN	57 00.6			
			iE	02.1			
			iSZ	57 33.3			
66	Nov. 6	Iu	iZ	01 40.1			U.S.C.G.S.: Near West Coast of Guatemala
			iNE	41.9			
			F	12 03			
58	Nov. 1	Iu	ePZ	13 17 12.0		d	U.S.C.G.S.: Outer Mongolia
			F	13 21			
59	Nov. 3	Iu	iPZ	01 22 14.9		d	U.S.C.G.S.: 48½°N 154°E
			eNE	17.0		d	
			iZ	43.6		c	
			ipPZ	23 04.3		d	
			iPPZ	24 24.7		c	
			eZ	31 23			S?
			F	01 34			



MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
60	Nov. 3	Iu	ePZ F	01 51 01 55	47.5			Superimposed on trace of No. 58
61	Nov. 3	Iu	eZ F	11 38 11 40	15.0			Superimposed on trace of No. 58
62	Nov. 4	Iu	iPZ iZ F	00 04 27.9 00 06	20.4		d c	
63	Nov. 4	Iu	ePZ iZ F	12 15 17.6 12 18	06.5		d c	See list, p. 288
64	Nov. 4	Ir	ePZ iPZ eNE iZ iZ iZ	20 44 44.6 45.5 45 00.3 05 20 18.4 38.7	43.5		c c d d	U.S.C.G.S.: 32°N 116½°W
73	Nov. 11	Ir	eE eN iZ iNZ iE F	17 46 45.0 47 00.2 17 09 24.0 26.5 21 05 10.3	38.5		c d d d	U.S.C.G.S.: 15½°N 93°W
65	Nov. 5	Ir	ePZ iZ eN eZ	04 37 40.5 20 15 50.0 38 30.0	38.5		c c	Aftershock Nov. 13 at 01:00:59; 07:23:00.
75	Nov. 13	Ir	iZ iZ eE iNZ	01 39 52 32.8 01 40 00.0 08.0	00.3		c c	U.S.C.G.S.: 12°N 85°W
66	Nov. 6	Iu	ePZ iZ	01 18 54.0	49.5		c c	U.S.C.G.S.: Near West Coast of Guatemala
67	Nov. 7	Ir	ePZ F	04 37 04 40	39.0		d c	U.S.C.G.S.: 18½°N 95°W
68	Nov. 7	Iu	iPZ iPcPZ eNE iZ ePPZ eE eZ F	06 12 16.0 19 27.9 15 13.5 40.1 40.4 06 55 19.8 10 16	13.0		d d c	U.S.C.G.S.: 14°S 166½°E

MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
69	Nov. 7	Iu	ePZ F	06 30 20 06 33			d	Superimposed on trace of No. 68	
70	Nov. 7	Iu	ePZ F	06 38 25.0 06 41			d	Superimposed on trace of No. 68	
71	Nov. 8	Iu	ePZ F	05 26 54.0 05 29					
72	Nov. 10	Iv	iZ eNE iP*Z	05 17 43.2 44.5 46.6			c	See list, p. 288 Islands Region	
73	Nov. 11	Ir	iPNZ iE	06 01 48.9 50.0			c	Foreshock	
74	Nov. 11	Ir	iSE eNE iZ iZ	18 15.2 22.0 22.4 40.2			c	Foreshock	
75	Nov. 11	Ir	F	05 20 23.1			c	See list, p. 289 120 aftershocks recorded by U.S.C.G.S.: 15½°N 93°W	
76	Nov. 12	Iv	ePZ iZ	17 06 26.0 29.9			c		
77	Nov. 12	Iv	iZ F	23 18 34.5 17 09			d	Southwest Kings County	
78	Nov. 12	Iv	iPZ	20 43 10.3			c	See list, p. 289	
79	Nov. 12	Iu	iNEZ iZ iSNEZ	22 43 10.9 17.6 31.1			d	Probable aftershocks recorded Nov. 13 at: 01:06:59; 07:23:52.	
80	Nov. 13	Iv	F	20 45			c	Longitude: 33°45'W 118°45'W	
81	Nov. 13	Ir	iPZ	04 50 37.0			c	U.S.C.G.S.: 11°N 86°W	
82	Nov. 13	Iu	iPPZ F	04 52 27.0 04 55			c		
83	Nov. 13	Iu	ePZ iZ F	20 55 58.5 00 56 04.0 20 58			c	U.S.C.G.S.: New Hebrides Region	
84	Nov. 14	Iu	eZ F	02 20 46.0 02 22			c	U.S.C.G.S.: Near Coast of Ecuador	
85	Nov. 14	Iu	ePZ F	02 59 53.5 03 01			c	U.S.C.G.S.: Samoa Islands Region	
86	Nov. 14	Iv	iPZ iN iE iE iNZ iSNE iEZ F	10 42 28.3 30.3 31.5 41.5 45.4 49.3 49.8 10 46			d	See list, p. 289 Islands Region	



MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
80	Nov. 14	Iv	iPZ eNEZ iEZ iE iZ iE iN F	17 13	48.4 53.5 00.3 37.9 44.5 52.1 53.1		d d d	Pasadena: 37°29'N 118°25'W Magnitude 2.2
81	Nov. 15	Iu	iPZ F	13 31 13 33	09.3		c	U.S.C.G.S.: Fiji Islands Region
82	Nov. 16	IIId	iPNZ F	08 01 08 03	00.7		c	Foreshock
83	Nov. 16	IIId	iPNZ F	08 02 08 04	59.0		c	Foreshock
84	Nov. 16	IIId	iPNZ F	08 04 08 06	23.1		c	See list, p. 289 110 aftershocks recorded by 1600 GCT
85	Nov. 16	Iv	iPZ iSZ F	23 48 23 51	50.6 31.4		d	Southwest Kings County
86	Nov. 17	Iu	iPZ F	22 40 22 42	22.1		c	
87	Nov. 18	Iv	ePZ F	01 22 01 29	57.5			Pasadena: 33°45'N 118°45'W
88	Nov. 18	Iu	ePZ F	06 25 06 27	17.5			Foreshock
89	Nov. 18	Iu	ePZ F	08 10 08 14	48.5			U.S.C.G.S.: 14°S 167°E
90	Nov. 18	Iu	ePZ iZ F	14 28 14 30	03.0 11.0		d c	See list, p. 289
91	Nov. 19	Iu	ePZ F	05 15 05 17	28.0			
92	Nov. 19	Iu	iPZ iZ eZ F	07 37 07 40	32.6 41.4 24.0		d d c	U.S.C.G.S.: Tonga Islands Region U.S.C.G.S.: 29°S 170°W

MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
93	Nov. 19	Iv	iPZ eNE iZ eNE iSZ iZ	08 59	47.3 48.5 59.4 06.0 06.4 08.6		c  c	Southern Washoe County, Nevada. Magnitude 2.4	
103	Nov. 22	Iu	F	09 02					
94	Nov. 19	Iu	ePZ eZ F	09 32	15.5 21.0		d		
95	Nov. 19	Iv	iZ iZ iZ	22 40	22.4 39.3 44.0		d		
105	Nov. 23	Iu	F	22 42					
96	Nov. 20	Iu	iPZ F	01 05 01 07	16.8		c		
106	Nov. 26	Iu							
97	Nov. 20	Iu	ePZ F	04 54 04 58	47.0		d	U.S.C.G.S.: 11°S 75°W	
98	Nov. 20	Iu	ePZ F	05 24 05 26	32.5		d		
107	Nov. 26	Iu							
99	Nov. 20	IIR	ePZ eNEZ eSNE eINE eZ	07 13	12.0 16.5 16.9 16.9 17.4		d d	U.S.C.G.S.: 28½°N 112°W	
108	Nov. 26	Iu				25			
109	Nov. 27	Iu	eZ F	08 29			d	U.S.C.G.S.: 18°S 173°W	
100	Nov. 21	Iv	iPEZ iZ iZ iSEZ	21 38	45.5 54.9 03.6 12.6		d d	Foreshock? Felt at Petrolia	
110	Nov. 27	Iu	F	21 42				PT Superimposed on No. 109	
101	Nov. 22	Iv	iPEZ iZ iZ iSE	00 38	41.4 52.6 59.6 06.1		c	See list, p. 289	
111	Nov. 27	Iu						PT Superimposed on No. 109	
112	Nov. 29	Iu	iZ iE	10 11	08.7 10.1				
113	Nov. 30	IIR	F	00 47				See list, p. 289	
102	Nov. 22	Iu	iPZ eE iPcPZ iZ iZ	01 04	17.0 17.5 22.2 40.3 11.3		d  c c c	U.S.C.G.S.: 29°S 178°W	



## MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
102	Nov. 22 (cont.)	Iu	iPPZ eSE eE eZ F	01 07 14 27.5 43.5 15 12.0 01 46			d		
103	Nov. 22	Iu	ePZ F	07 21 04.5 07 23					
104	Nov. 23	Ir	iPZ iZ iZ	06 22 35.2 38.2 49.7			d c d	U.S.C.G.S.: 19°N 78½°W	
105	Nov. 23	Iu	ePZ iZ F	17 04 25.0 29.8 17 06			d d	U.S.C.G.S.: 39°N 26°E	
106	Nov. 26	Iu	ePZ iPEZ eN iZ F	01 21 53.5 54.1 56.0 58.1 01 24			c d d	U.S.C.G.S.: Fiji Islands Region	
107	Nov. 26	Ir	iPZ F	04 31 21.2 04 33			c	U.S.C.G.S.: 16°N 95°W	
108	Nov. 26	Iu	ePZ F	06 32 46.5 06 35					
109	Nov. 27	Iu	iPNEZ iPPZ eLNE eLZ F	08 54 00.2 56 47.0 09 16.7 17.0 09 41		28 27	d d	U.S.C.G.S.: 18°S 173°W	
110	Nov. 27	Iu	iZ F	09 00 30.6 09 05			c	P? Superimposed on No. 109	
111	Nov. 27	Iu	eZ F	09 21 12.0 09 23				P? Superimposed on No. 109	
112	Nov. 29	Iu	iPZ F	10 09 09.5 10 11			c	U.S.C.G.S.: Kurile Islands Region	
113	Nov. 30	IIv	iPZ iNZ iE iNZ iNEZ iE iE iN	08 32 24.5 26.8 27.3 30.5 33.9 37.6 43.6 46.7			d c d c	See list, p. 289	

## MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
113	Nov. 30 (cont.)	IIv	iSE iN iE F	08 32	48.6 50.5 51.0			U.S.C.G.S.: Tonga Islands Region
114	Dec. 1	Iu	ePZ F	23 19 23 20	17.0			Part of quake?
115	Dec. 2	Iu	ePZ iZ F	19 54	07.5 17.9		d	U.S.C.G.S.: Fiji Islands Region
116	Dec. 2	Ir	ePZ eNE iZ iZ iZ F	22 33	23.0 24.0 33.8 40.8 48.5		c c d d	U.S.C.G.S.: 50 $\frac{1}{2}$ °N 130°W
117	Dec. 3	Iu	iPZ F	02 59 03 01	53.5		c	
118	Dec. 3	Iu	iPZ F	12 13 12 15	23.1		c	Vardi aftershock
119	Dec. 4	Iv	iPZ iNE iNE iN iE iSZ iSE iN F	22 39	29.1 29.7 30.9 34.1 36.4 54.4 55.7 57.7		d	See list, p. 289
120	Dec. 5	Iu	ePZ F	11 30 11 31	16.1		d	U.S.C.G.S.: 6°N 84 $\frac{1}{2}$ °W
121	Dec. 5	Iu	iPZ iZ F	12 50 12 52	56.7 03.6		d c	U.S.C.G.S.: 6°N 84 $\frac{1}{2}$ °W Pasadena: 37°25'N 118°24'W Forehook
122	Dec. 5	Iu	ePZ F	17 47 17 48	01.5		d	U.S.C.G.S.: Kurile Islands Region
123	Dec. 6	Iu	iPZ iZ F	08 03 08 05	30.9 40.7		d c	
124	Dec. 6	Iu	iPZ F	13 45 13 47	48.3		d	U.S.C.G.S.: 17 $\frac{1}{2}$ °S 167 $\frac{1}{2}$ °E



MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
125	Dec. 6	Iu	ePZ iZ F	14 39	16.4 26.2		d d	U.S.C.G.S.: Tonga Islands Region: V north of Bishop
126	Dec. 6	Iv	iZ eNE iZ iZ eNE iE iZ iSZ eN iMZ iE F	22 07	47.8 48.5 54.4 59.7 08 00.5 28.0 30.0 35.8 38.5 39.7 40.0		c c d	} Part of quake? P?
127	Dec. 6	Iu	iPZ iZ eZ iZ F	22 36	12.9 18.9 37 21.5 32.0		c c	Obscured by local shock
128	Dec. 7	Iv	iPZ eNEZ iE iSZ	10 22	17.2 18.0 26.3 34.2			Verdi aftershock
129	Dec. 7	Iv	ePNEZ iE iZ iE iSEZ iNE F	18 45	12.4 15.1 19.5 30.7 35.6 36.9		c d	See list, p. 289
130	Dec. 9	Iv	iPZ iNEZ iE iNZ iZ iSZ iE iN iE iN F	08 42	23.3 26.4 31.6 34.8 57.9 43 13.2 05 05 17.5 18.3 25.1 27.1		d d	Pasadena: 37°28'N 118°22'W Foreshock
131	Dec. 10	Iv	F	22 10	25.0		d	See list, p. 289
132	Dec. 10	Iu	iE iNE iMZ F	10 23	35.0 36.7 37.5			U.S.C.G.S.: 13°S 173°W
133	Dec. 11	Iu	iPZ					
134	Dec. 13	Iu	iNZ iZ iSZ	04 05	34.8 57.9		d	
135	Dec. 13	Iv	iE iN iE iN F	05 05	17.5 18.3 25.1 27.1			See list, p. 289
136	Dec. 13	Iv	F	08 46	12.0			

MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace m	Remarks
				h.	m. s.			
	1949							
131	Dec. 9	Iv	ePZ	12	40 05.5			Pasadena: 37°28'N 118°22'W U.S.C.G.S.: V north of Bishop
	(cont.)		iZ		08.3		i	
			eNE		09.5			
			iZ		13.3		i	
			eN		14			
139	Dec. 10	Iu	iZ		17.3		i	
			iN		19.1			
			iE		19.6			
140	Dec. 15	Iu	iZ		35.7			
			iSZ		59.9			
			iE	21	41 01.1			
			iN		02.7			
141	Dec. 16	Iu	iE		09.2			
			F	12	45			
132	Dec. 10	Iv	iPZ	04	06 25.0			See list, p. 289
			eNE	07	05 25.5			
			iE		27.2			
143	Dec. 16	Iu	iZ	14	19 27.6			U.S.C.G.S.: Hawaiian Islands Region
			iN		27.9			
			iN		31.1			
			F	14	21			Obscured by local shock
133	Dec. 10	IIId	iPNEZ	08	42 09.6			U.S.C.G.S.: 51°S 71°W
			iSNEZ		11.8			
			F	08	45			
134	Dec. 10	Iu	iPZ	17	31 12.5			U.S.C.G.S.: 13°S 173°W pP?
			iZ		22.7			
			F	17	33			
135	Dec. 10	Iu	iPZ	19	22 55.7			U.S.C.G.S.: 51°S 71°W
			iZ		23 01.4			
			iZ		05.8			
			iZ		20.1			
146	Dec. 17	Iu	iZ	15	26 23.9			
			eZ		25 03.0			
			F	19	27			
136	Dec. 11	Iu	ePZ	11	46 43.5			U.S.C.G.S.: Loyalty Islands Region
			iZ		59.5			
			F	11	49			
137	Dec. 13	Iu	iPZ	04	05 40.1			U.S.C.G.S.: 34°S 179°E
			F	04	07			
138	Dec. 13	Iv	iPZ	05	05 57.5			See list, p. 289 Hawaiian Islands Region
			eN		58.5			
			iE		59.8			
			iZ	06	08.6			
			iN	04	29 12.0			
145	Dec. 21	Iu	iPZ	04	43 12.4			U.S.C.G.S.: New Hebrides Region
			F	04	45			



MINERAL

No.	Date	Character	Phase	Time (G.C.T.)	Period	Trace motion	Remarks
	1949			h. m. s.	s.		
138	Dec. 13 (cont.)	Iv	iE iSNEZ iEZ	05 06 16.0 27.1 30.2			
139	Dec. 14	Iu	ePZ F	02 17 59.0 02 19		d	
140	Dec. 15	Iu	iPZ eZ F	21 48 25.8 39.3 21 50		d c	
141	Dec. 16	Iu	ePZ F	02 04 23.2 02 06		d	
142	Dec. 16	Iu	ePZ F	07 04 39.1 07 05		d	
143	Dec. 16	Iu	iPZ iZ iPcPZ F	14 19 11.9 15.0 24.7 14 21		d c c	U.S.C.G.S.: Kermadec Islands Region
144	Dec. 17	Iu	ePZ F	03 29 56.7 03 31		c	
145	Dec. 17	Iu	ePPZ eZ eSKSN eN eLZ eLE eN F	07 11 32 44.5 17 57 44.5 45.0 45.8 47.5 08 44	25 23 20		U.S.C.G.S.: 54°S 71°W Foreshock
146	Dec. 17	Iu	ePPZ eZ eN eN eE eZ F	15 26 21.0 32 26.5 32.0 49.8 52.6 58.7 17 07 ca	23 21		U.S.C.G.S.: 54°S 71°W
147	Dec. 18	Iu	ePZ F	05 51 56.0 05 58		d	U.S.C.G.S.: 34°S 179½°E
148	Dec. 20	Iu	iPZ iZ eZ eSZ F	04 27 59.6 28 43.0 12 29 04.5 37 29 04 39		c c d	U.S.C.G.S.: Fiji Islands Region
149	Dec. 21	Iu	iPZ F	04 43 12.6 04 45			U.S.C.G.S.: New Hebrides Region

MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
150	Dec. 21	Iu	iPZ F	12 40	19.5 12 44		d	U.S.C.G.S.: 18½°N 67°W
151	Dec. 21	Iu	iPZ iZ F	13 30	57.9 31 12.9 13 33		c c	U.S.C.G.S.: 18½°S 168°E Atlantic Ocean
152	Dec. 21	Iu	iPZ eN iZ	19 44	16.2 16.5 17.3		c d	U.S.C.G.S.: 20°S 64°W
	Dec. 21	Iu	eE iNZ iZ iN iZ iZ		18.5 20.7 26.1 35.4 38.7		c d d d c	
	Dec. 21	Ir	ipPZ iZ iZ iPPZ iZ iSZ F		45 02.5 46 26.4 36.9 47 05.8 26.4 32.3 53 22.3 19 59		d d c d d d c	U.S.C.G.S.: 17½°N 104°W
153	Dec. 21	Iv	iPZ iNE iN iZ	23 09	14.8 15.3 23.6 26.2		c d	See list, p. 289
	Dec. 21	Iu	iN iSNE iNE F		29.2 39.3 43.3 23 12		c c c	
154	Dec. 22	Ir	ePZ iPZ eN eE ipPZ	09 37	34.0 34.9 36.0 38.5 55.2		d c	U.S.C.G.S.: 16°N 93°W
	Dec. 22	Iu	iSPZ iPPZ eN eE F		38 06.0 18.9 47 47 50 31 10 05		d c d d d	U.S.C.G.S.: 37°N 139°E
155	Dec. 22	Iu	iPZ iZ F	11 31	34.5 43.9 11 33		d	U.S.C.G.S.: 11½°S 180°
156	Dec. 22	Iu	eZ F	12 29	11 12 30		c d	
157	Dec. 22	Iu	eZ F	12 56	33.5 12 58		d	



MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
158	Dec. 24	Iu	eZ F	23 43	40.5 45	30 25		
159	Dec. 25	Iu	eZ F	02 02	38.5 03	27		U.S.C.G.S.: Azores region, Atlantic Ocean
160	Dec. 25	Iv	ePZ eSZ F	02 30	38.1 57.6		d	Verdi aftershock
161	Dec. 25	IIId	iPZ iNE iSZ iSNE F	21 40	43.4 43.9 46.9 47.4		c	U.S.C.G.S.: Honshu, Japan
162	Dec. 25	Ir	iPZ eNE iZ iZ iZ iZ iZ eZ F	22 46	14.9 15.5 20.8 24.3 36.3 46.0 47 17.0 22.9 55.5 55 56.5		d c d c c c d c	U.S.C.G.S.: 19½°N 104°W
163	Dec. 25	Iu	iPZ F	23 06	37.2 08		c	
164	Dec. 25	Iu	ePZ iZ eNE iZ iZ F	23 29	01.9 03.5 04.5 10.4 55.2		c c	U.S.C.G.S.: 37°N 139°E
165	Dec. 25	Iu	iPZ eNE iZ iZ F	23 36	26.3 27.0 30.0 37 01.2 10.6		c	U.S.C.G.S.: 37°N 139°E
166	Dec. 26	Iu	ePZ iZ eNE iPcPZ iZ ePPZ eZ	06 35	50.0 54.8 55.5 36 00.7 05.2 37 22.8 39 06.5 41 08.5		d d c d d	U.S.C.G.S.: 11½°S 180°

MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
180	Dec. 28	Iu	eP'Z iZ iPPZ iZ F	00 16 19.0 32.6 18 28.5 52.0 00 24			c	U.S.C.G.S.: 60°S 22°W
181	Dec. 28	Iu	ePZ ePPZ F	06 36 16.0 38 43.7 06 40				U.S.C.G.S.: Azores Region; Atlantic Ocean
182	Dec. 28	Iv	ePZ iZ iSZ iZ F	09 18 23.5 30.5 19 14.2 25.2 09 21			c	See list, p. 289 Islands Region
183	Dec. 28	Iu	ePZ F	10 44 31.5 10 46				Verdi afternoon
184	Dec. 28	Iv	iPZ eNZ iZ iZ iSZ iNE iZ F	11 59 26.4 29.5 32.9 36.4 12 00 13.4 14.4 29.4 12 02			d d d	See list, p. 289 Verdi afternoon
185	Dec. 28	Iu	iPZ F	12 36 07.1 12 38			c	
186	Dec. 28	Iu	ePZ iZ eZ F	13 49 01.0 08.9 51 14.5 13 53			d	U.S.C.G.S.: Aleutian Islands PcP?
187	Dec. 28	Iv	iPZ iZ iSZ F	16 48 45.6 47.0 49 11.0 16 50			d d	See list, p. 289
188	Dec. 28	Iu	iPZ F	22 30 21.3 22 32			d	
189	Dec. 29	Iu	ePZ eNE iZ iZ iPPZ eN eZ ePSZ F	03 17 30.5 47.5 52.2 57.3 21 26.4 44 23 48.5 29 48.0 04 25			d c d	U.S.C.G.S.: 18½°N 121°E PPP?



MINERAL

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
190	Dec. 29	Iu	iPZ iZ ipPZ F	16 55	12.3 52.8 07.3		c d d	U.S.C.G.S.: 27°S 176½°W
191	Dec. 30	Iv	iPZ iZ iZ F	09 42	23.5 32.7 12.7			Central Nevada
192	Dec. 30	Iu	ePZ iZ F	10 53	36.5 41.9			U.S.C.G.S.: Kermadec Islands Region
193	Dec. 30	Iv	iPZ iZ eNE iSEZ iNEZ F	13 21	47.0 48.3 48.5 05.4 06.7		c c	Verdi aftershock
194	Dec. 30	Iv	ePZ iZ eNE iSZ iNE iZ F	16 59	34.5 36.0 38.5 50.3 53.5 54.6		d	Verdi aftershock
195	Dec. 31	Iu	ePZ F	04 20	52.5			U.S.C.G.S.: Kermadec Islands Region
196	Dec. 31	Iu	iPZ F	09 57	04.4		d	

No.	Date	Char-acter	Phase	Time (G.C.T.)	Period	Trans-mission	Remarks								
ARCATA															
1	Oct. 24	Iv					THE ARCATA STATION, HUMBOLDT STATE COLLEGE ARCATA, CALIFORNIA See list, p. 266 S - P = 21.4 sec.								
2	Oct. 25	Iv		02 19 ca		c	See list, p. 266 S - P = 13.2 sec.								
3	Oct. 28	IIIc	SP	02 29 ca		c	See list, p. 266 S - P = 1.2 sec.								
4	Oct. 31	Iv		21 44 ca			U.S.C.G.S.: 56°N 135°W S - P = 3 min., 25 sec.								
5	Nov. 1	Iv		11 56 31			See list, p. 266								
CONSTANTS OF THE STATION															
Latitude and longitude:															
6	Nov. 3	Iv		01 28 05.2		d	U.S.C.G.S.: 40° 52' 16" N. λ = 124° 04' 5" W.								
Time -- All determinations are reduced to Greenwich Civil Time.															
Altitude -- 60 meters above mean sea level.															
7	Nov. 10	Iv		20 48 11			U.S.C.G.S.: 32°N 116°W								
8	Nov. 16	Iv		00 46 59.4			See list, p. 269								
9	Nov. 20	Iv		08 39			U.S.C.G.S.: 26°N 112°W								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Apparatus</th> <th style="width: 40%;">Component</th> </tr> </thead> <tbody> <tr> <td>Sprengnether .....</td> <td>N</td> </tr> <tr> <td></td> <td>E</td> </tr> <tr> <td></td> <td>Z</td> </tr> </tbody> </table>								Apparatus	Component	Sprengnether .....	N		E		Z
Apparatus	Component														
Sprengnether .....	N														
	E														
	Z														
10	Nov. 21	Ic		21 36 26			Foreshock? Felt at Petrolia								
11	Nov. 22	Ic		00 30 21			See list, p. 269								
12	Nov. 22	Ic		01 04 17			U.S.C.G.S.: 29°N 178°W								



No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
1	Oct. 22	Iv		03	44 ca			See list, p. 288 S - P = 21.4 sec.
2	Oct. 25	Iv		04	19 ca		c	See list, p. 288 S - P = 13.2 sec.
3	Oct. 28	IIIId	iPZ	02	29 ca		c	See list, p. 288 S - P = 1.2 sec.
4	Oct. 31	Ir		01	44 ca			U.S.C.G.S.: 56°N 135°W S - P = 3 min., 25 sec.
5	Nov. 1	Iv	ePZ eSZ F	11 56 31 53 12 06				See list, p. 288
6	Nov. 3	Iu	iPZ ipPZ ePPZ F	01 22 05.2 39.7 24 11 01 25			d c	U.S.C.G.S.: 48½°N 154°E
7	Nov. 4	Ir	eE eZ eZ F	20 48 11 48 22 50 45 20 56				U.S.C.G.S.: 32°N 116½°W
8	Nov. 16	Iv	iP'NEZ iNEZ F	08 04 59.2 05 33 08 07				See list, p. 289
9	Nov. 20	IIr	ePZ iNEZ eN eN eZ F	07 13 28 36 16 48 17 40 18 22 08 29			c d	U.S.C.G.S.: 28½°N 112°W
10	Nov. 21	Id	iP'NEZ iSNEZ F	21 38 26 34 21 40				Foreshock? Felt at Petrolia
11	Nov. 22	Id	iP'NEZ iSNEZ F	00 38 24 32 00 40			d	See list, p. 289
12	Nov. 22	Iu	iPZ iZ iZ ePPZ eSE F	01 04 17 05 10 06 40 07 38 14 22 01 24			d d	U.S.C.G.S.: 29°S 178°W

ARCATA

No.	Date	Character	Phase	Time (G.C.T.) h. m. s.	Period s.	Trace motion	Remarks
	1949						
13	Dec. 4	Id	iPZ	22 39 ca		d	See list, p. 289 S - P = 7.0 sec.
14	Dec. 10	Iv		04 06 ca			See list, p. 289 S - P = 14 sec.
15	Dec. 17	IId		16 47 ca			S - P = 5.5 sec.
16	Dec. 21	IId	iPZ	23 08 ca		d	See list, p. 289 S - P = 6.3 sec.
17	Dec. 22	Ir	iPZ	09 37 ca		d	U.S.C.G.S.: 16°N 93°W pP - P = 21 sec. PP - P = 55 sec.

COORDINATES OF THE STATION

Latitude and Longitude:

$\phi = 19^{\circ} 32' N.$   
 $\lambda = 117^{\circ} 48' W.$

Time - All determinations are reduced to Greenwich Civil Time.

Altitude - 100 meters (328 feet) above sea level.

Apparatus	Component
Springometer .....	H V Z



No.	Date	Operator	Photo	Time (G.M.T. or L.M.T.)	Period	Trace duration	Remarks
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RENO

THE RENO STATION, UNIVERSITY OF NEVADA  
RENO, NEVADA

1	Oct. 3	II	11 12 13 14	09 30 09 31.0 09 32 09 33			
2	Oct. 3	IV	15 16	13 57 34.5 13 58			U.S.G.C.S.: Near-Northeast Coast of New Guinea
3	Oct. 4	IV	17 18	10 39 55 10 40	d		U.S.G.C.S.: 30°S 70°W
4	Oct. 4	IV	19	07.0 37 58.5			U.S.G.C.S.: 1°S 21°W

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 39^{\circ} 32' 13'' \text{ N.}$$

$$\lambda = 119^{\circ} 48' 18'' \text{ W.}$$

Time -- All determinations are reduced to Greenwich Civil Time.

Altitude -- 1386 meters (4546 feet) above mean sea level.

Apparatus	Component
Sprengnether .....	N E Z

6	Oct. 7	I	20 21 22 23	09 34.5 09 35.0 09 35.7 09 36			
7	Oct. 11	I	24 25	09 37.0 09 38			San Diego
8	Oct. 11	I	26 27 28 29	09 39.5 09 40 09 40.5 09 41			San Diego County?
9	Oct. 17	IV	30 31 32	09 42 34.0 09 43 34.1 09 44			See list, p. 288
10	Oct. 17	IV	33 34 35	09 45 54.0 09 46 54.7 09 47	d		See list, p. 288
11	Oct. 18	IV	36 37 38	12 26 29.0 12 27 29.1 12 28			See list, p. 288

RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Trace motion	Remarks
				h. m. s.	s.		
	1949						
1	Oct. 3	Iu	iPZ eZ iZ eZ F	09 34 32.4 36 17.5 48.9 38 34.0 09 40		d	
2	Oct. 3	Iu	ePZ ePPZ F	12 57 54.5 13 01 30 13 03			U.S.C.G.S.: Near Northeast Coast of New Guinea
3	Oct. 4	Iu	ePZ F	10 10 55 10 13		d	U.S.C.G.S.: 30°S 70°W
4	Oct. 4	Iu	ePZ eE eP'Z eZ F	10 34 00.5 07.0 37 52.5 11 25 49 11 38		d	U.S.C.G.S.: 1°S 21°W
5	Oct. 7	Iu	iP'Z iZ ePPZ ePcPP'Z eZ eZ eLZ F	12 22 32.4 24 03.0 27 48.0 31 07.5 34 33.5 41 36.0 13 34.7 14 08		c d c	U.S.C.G.S.: 33°S 56.5°E
6	Oct. 7	I	ePZ F	22 56 13.0 22 58		c	
7	Oct. 14	Iv	eE F	00 33 05.0 00 35			S? U.S.C.G.S.: IV at Borego Valley (San Diego County)
8	Oct. 14	Iv	iZ iE	01 27 18.4 28 03.0			Southern Fresno County?
	Oct. 22	Iv	iN iE iNZ F	21 08.5 19.2 21.1 01 30			See list, p. 288
9	Oct. 17	Iv	iPNEZ iSNEZ F	02 42 34.6 43 10.1 02 45			See list, p. 288
10	Oct. 17	Iv	iZ iSNEZ F	04 38 56.2 39 31.7 04 41		d	See list, p. 288
11	Oct. 18	Iv	iPZ iSNEZ F	12 26 29.3 27 03.1 12 29			See list, p. 288



RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
12	Oct. 20	Iv	iPZ eSE eSN F	03 27	17.3 49.4 52.7		c	III in Bishop
13	Oct. 20	Iu	ePZ iZ iE eE eSZ iPSN eLZ F	12 57 58 13 08 09 13 53	58.5 23.5 45.3 11.5 37.5 41.1 26.7 53		c	U.S.C.G.S.: 5 $\frac{1}{2}$ °S 154°E
14	Oct. 21	Ir	iPZ iN iPePNZ F	03 39 41 03 43	16.4 01.3 51.2		d c	U.S.C.G.S.: 54°N 169°W
15	Oct. 21	Iu	ePZ ePZ eLZ F	21 47 22 23 00	31.5 34.0 17.3 00			U.S.C.G.S.: 5 $\frac{1}{2}$ °S 154°E
16	Oct. 22	Iv	eN eZ eSNE eZ eZ F	03 44 05 45 03 47	01.5 05 50.5 57 51.5			See list, p. 288
17	Oct. 22	Iv	eE eNZ eE eNZ F	03 48 49 03 50	29.0 32.0 10.0 12.0			See list, p. 288
18	Oct. 22	IIv	ePNEZ iZ iZ iN iN F	21 46 22 23 24 25 21 56	12.1 22.1 31.6 42.3 55.8			See list, p. 288
19	Oct. 24	Iv	iPZ eSN F	01 53 54 01 56	47.1 14.5		d	Pasadena: Near Benton
20	Oct. 24	Iv	iPZ iZ iSNEZ F	02 22 23 02 27	17.9 23.1 41.4		c c	Pasadena: Southeast of Benton

REMO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Trace motion	Remarks
				h. m. s.	s.		
	1949						
21	Oct. 25	Iu	iPZ ipPZ F	13 19 12.5 38.9		d	U.S.C.G.S.: 36°N 140°E
22	Oct. 26	Iu	iPZ eZ F	00 14 16.7 19 33		d	U.S.C.G.S.: 11°N 41°W
23	Oct. 26	Id	iPZ iSNEZ F	06 50 16.0 19.5		c	Southern Washoe County, Nevada
24	Oct. 27	Ir	iPZ ePNE iSZ iSE iSN eLEZ F	08 26 59.8 27 05.5 30 27.0 28.0 33.5 30.1		d	U.S.C.G.S.: Gulf of California
25	Oct. 27	Iu	eZ F	10 11 54.5			Runs into following quake.
26	Oct. 27	Iu	iPZ iPNE eSZ eSE F	10 14 40.0 40.4 24 06 07		d	U.S.C.G.S.: 23½°S 180°
27	Oct. 28	Iu	iPZ F	00 23 50.4 00 26		c	U.S.C.G.S.: 34°N 142°E
28	Oct. 28	Iv	iPZ iNEZ iE iZ iE iN iZ F	02 30 11.0 15.0 33.9 59.7 31 02.8 07.0 09.4		c d	See list, p. 288
29	Oct. 28	Iu	iPEZ ipPE F	18 59 28.2 19 00 49.6 19 03		d	U.S.C.G.S.: 20°S 179°W
30	Oct. 29	Iv	iEZ iZ iN iE iZ iNZ iE F	00 07 02.6 19.0 26.0 36.1 40.1 44.3 47.6		c c	P? See list, p. 288
				00 11			



RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
31	Oct. 29	Iu	iPEZ F	06 44 06 47	47.3		d	U.S.C.G.S.: 10°S 160°E	
32	Oct. 29	Id	iPNEZ iSNEZ F	09 05 09 06	08.8 11.5		c	Southern Washoe County, Nevada	
33	Oct. 31	Iu	ePZ F	00 07 00 11	06.5		d	U.S.C.G.S.: 34°S 179°W	
34	Oct. 31	Iu	ePNZ F	00 14 00 20	34.5		c	U.S.C.G.S.: Samoa Islands Region	
35	Oct. 31	Ir	iPEZ eSE iSZ eLNEZ F	01 44 47 49 50.3 50.5 02 28	00.9		c	U.S.C.G.S.: 56°N 135°W	
36	Oct. 31	Ir	iPZ F	02 36 02 43	41.9			U.S.C.G.S.: 56°N 135°W	
37	Oct. 31	Iu	ePZ epPEZ eN eN eE F	18 08 09 12.5 19 40.5 18 24	38.0 59.0 40.5 57.0			U.S.C.G.S.: 5°S 152½°E	
38	Nov. 1	Iu	ePZ eZ F	07 45 46 10.5 07 51	46			U.S.C.G.S.: New Britain Region	
39	Nov. 1	Iv	iPZ iEZ iZ iE iN iZ F	11 57 24 37.3 45.7 58 25.2 12 06	16.8			See list, p. 288 U.S.C.G.S.: 1100 miles North of Easter Island	
40	Nov. 1	Iu	iPZ F	13 17 13 20	19.3		c	U.S.C.G.S.: Outer Mongolia	
41	Nov. 2	Iv	ePZ eN iZ iEZ iN eE eNEZ iEZ F	02 31 21 37 31.9 38.9 40.2 32 02 40 53.1 02 37	06.5			Press: "Sharp" at St. George, Utah U.S.C.G.S.: 122°W 93°W See list, p. 289	

RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
42	Nov. 3	Iu	iZ ipPE eSEZ F	01 22 26.1 23 06.6 30 28.5 01 36				U.S.C.G.S.: 48½°N 154°E Probably a low frequency recorded with a 20 sec 20:51:00; 21:00:00; 21:00:00 13 - 21:06:30 - 21:07:00	
43	Nov. 4	Iu	iPZ F	12 15 02.1 12 19			d		
44	Nov. 4	Iv	iPNEZ iNZ iE iZ iE iE iN F	20 44 37.5 41.7 57.5 45 09.0 46 06.7 40.0 45.6 21 08			d c c	U.S.C.G.S.: 32°N 116½°W U.S.C.G.S.: 11°N 86°W U.S.C.G.S.: New Hebrides	
45	Nov. 5	Iv	ePZ ePZ eN iN iE iN iZ F	04 37 23.5 27.0 38 01.5 51.1 39 22.4 30.8 32.0 04 48				Aftershock See list, p. 289 Easter Island 30°29'N 118°25'W	
46	Nov. 7	Iu	ePZ iPZ iN ePPZ eN eLEZ F	06 12 22.5 24.1 30.5 15 51 19 43 39.8 07 23				U.S.C.G.S.: 14°S 166½°E Aftershock See list, p. 289	
47	Nov. 9	Ir	iPZ F	23 12 25.4 23 14			d	U.S.C.G.S.: 1100 miles North of Easter Island	
48	Nov. 10	Iv	ePE eZ eNE F	05 17 36 18 12.3 20 05 20				See list, p. 288 Easter Island 33°45'N 118°45'W	
49	Nov. 11	Iu	iZ eZ F	11 06 28.0 08 33.5 11 09			c	Long period	
50	Nov. 11	Ir	iPZ eZ F	17 06 14.2 08 18.5 17 09			c	Long period U.S.C.G.S.: 15½°N 93°W Southern Washoe County, Nevada, Magnitude 2.4	
51	Nov. 12	IIId	iPNEZ iSN F	19 28 48.5 56.4 19 31				See list, p. 289	



RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
52	Nov. 12	IIId	iPNEZ iSN F	20 42 20 45	45.2 53.3			See list, p. 289 Probable aftershocks recorded at: Nov. 12 - 20:51:03; 21:09:06; Nov. 13 - 01:06:33; 07:23:27.
53	Nov. 13	Id	iPNEZ iSNZ F	01 06 01 08	33.0 43.3		c	
54	Nov. 13	Ir	iPEZ iZ eN F	04 50 04 58	25.9 33.3 52 27		c c	U.S.C.G.S.: 11°N 86°W
55	Nov. 13	Iu	ePNEZ eNZ eE F	20 56 21 01	03.5 09.0 58 05		c c	U.S.C.G.S.: New Hebrides Region
56	Nov. 14	IIId	iPNEZ F	10 42 10 46	03.1		c	See list, p. 289
57	Nov. 14	Iv	ePZ eNZ eE F	17 13 17 17	31.7 14 01 08			Pasadena: 37°29'N 118°25'W
58	Nov. 16	Iv	ePZ eSNEZ F	08 01 08 03	29.5 50		d	Foreshock
59	Nov. 16	Iv	ePZ iEZ iN iE iNZ F	08 04 08 08	49 50.6 05 06.9 10.4 14.7		c	See list, p. 289
60	Nov. 18	Iv	eE eZ eN eN eZ eE eZ F	01 21 01 28 01 28 01 23 01 23 01 28 01 28 01 31	42 46 28 55.5 07.5 11.5 42			Pasadena: 33°45'N 118°45'W  Long period Long period
61	Nov. 19	IIId	iPNEZ iSNEZ F	08 59 09 01	24.5 27.5		c	Southern Washoe County, Nevada. Magnitude 2.4

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
62	Nov. 19	II d	iPNEZ iN iSZ F	22 39	57.4 59.7 40 07.2 22 42	s.		No records available for Dec. 1-3. 37°20'N 128°30'W Foreshock
63	Nov. 20	Iu	ePZ F	04 54	44.0 04 58			U.S.C.G.S.: 11°S 75°W
64	Nov. 20	II r	ePEZ iE eLN eE F	07 12	51.5 13 14.3 16 36.0 17 04.5 08 12	d		U.S.C.G.S.: 28½°N 112°W Elastic
65	Nov. 21	Iv	eE eE eN F	21 39	55 40 10 15.5 21 42			Foreshock? Felt at Petrolia
66	Nov. 22	Iv	ePN eZ eE F	00 39	07.0 24.5 39 00 42			See list, p. 289
67	Nov. 22	Iu	iPEZ iNZ eZ eZ iSE eN eZ eZ F	01 04	20.0 24.6 09 15 14 26 31.0 53.5 30 22 36.7 02 08	d		U.S.C.G.S.: 29°S 178°W See list, p. 289
68	Nov. 23	Ir	ePNZ F	06 22	29 06 27			U.S.C.G.S.: 19°N 78½°W Petrolia 17°S 110°W
69	Nov. 27	Iu	iPZ iZ ePPZ eSZ eSE eSN eLZ F	08 54	04.0 15.0 56 52.5 09 03 30 37.5 43.5 17.1 09 58	d c		U.S.C.G.S.: 18°S 173°W U.S.C.G.S.: 22°S 77°W
70	Nov. 30	II v	iPZ iNEZ iSE iZ iNE iZ iN F	08 32	31.0 37.8 54.5 57.0 33 01.5 04.4 11.9 08 38	d c		See list, p. 289



RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
71	Dec. 9	Iv	ePNZ iSN iSZ iE iZ F	08 42	04.1 41.3 43.8 45.8 55.3			No records available for Dec. 4-8. Pasadena: 37°28'N 118°22'W Foreshock	
72	Dec. 9	Iv	iPZ iNZ iSZ iSE F	12 39	48.8 50.0 27.7 29.8		c	Pasadena: 37°28'N 118°22'W U.S.C.G.S.: V north of Bishop	
73	Dec. 10	Iu	ePZ F	17 31	17.2			U.S.C.G.S.: 13°S 173°W	
74	Dec. 10	I	ePNZ eE eE eN eZ F	19 22	53.6 00 04 54.5 18.5			U.S.C.G.S.: Fiji Islands Region	
75	Dec. 12	Iu	ePNEZ F	11 24	53.4			U.S.C.G.S.: 18°S 168°E	
76	Dec. 13	Iv	iPZ iSN iSE iE iZ iN F	05 05	33.9 46.1 47.1 51.6 53.2 06 05.8		d	See list, p. 289	
77	Dec. 14	Iv	ePZ iSNEZ F	17 33	35 13.7			Pasadena: 37°52'N 116°20'W	
78	Dec. 16	Iu	ePNEZ eZ F	11 07	42 04.0			U.S.C.G.S.: 18°S 173°W	
79	Dec. 17	Iu	ePZ eE eN iPPZ eN eZ eE eLZ eN eE F	07 07	56 09 36 10 13 11 40.0 16 31 18 21 26 32.0 36 33 42 38 44 38 47 32 09 48		c	U.S.C.G.S.: 54°S 71°W	

RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
80	Dec. 17	Iu	ePZ	15	21	55.0			U.S.C.G.S.: 54°S 71°W
			eN		22	52.0			
			ePPN		25	56.0			
			eZ		26	05.0			
			eE			31			
			eZ		28	30.0			
			eSKSN		32	35.0			
			eSKSZ			38.0			
			eZ		34	58			
			eZ		45.4				
			eE			51.1			
			F	17	43				
81	Dec. 18	Iu	ePZ	05	51	58.0			U.S.C.G.S.: 34°S 179½°E
			epPZ		52	23.5			
			F	05	55				
82	Dec. 20	Iu	ePZ	04	28	02			U.S.C.G.S.: Fiji Islands Region
			epFE		30	04			
			eSZ		38	29.0			
			eSN			36.0			
			eSE			40.0			
			F	04	42				
83	Dec. 21	Iu	ePZ	13	31	03.0			U.S.C.G.S.: 18½°S 168°E
			F	13	33				
84	Dec. 21	Iu	ePE	19	44	08.2			U.S.C.G.S.: 20°S 64°W
			eN		53	00			
			eSE			22.0			
			F	19	59				
85	Dec. 21	Iv	ePN	23	09	39			See list, p. 289
			ePEZ			41			
			iE		10	24.8			
			eZ			41.4			
			iN			44.8			
			F	23	14				
86	Dec. 22	Ir	iPZ	09	37	22.0			U.S.C.G.S.: 16°N 93°W
			iN			37.5			
			ipPZ			42.9			
			eN		47	40			
			eE			44			
			eZ		52	07			
			F	10	04				
87	Dec. 22	Iu	ePZ	11	31	53.8			U.S.C.G.S.: Aleutian Islands
			F	11	34				
88	Dec. 22	Iu	ePZ	21	42	20.0			U.S.C.G.S.: Tonga Islands
			eZ		44	26.3			
			F	21	45				



RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
89	Dec. 25	Id	i $\bar{P}$ EZ i $\bar{S}$ NE F	02 30	15.7 18.7		c	Verdi aftershock
90	Dec. 25	Id	i $\bar{P}$ Z i $\bar{S}$ Z F	02 40	13.0 15.8			Verdi aftershock
91	Dec. 25	Iu	ePNEZ eEZ eN F	19 53	24.4 28.0 32.5			See list, p. 289
92	Dec. 25	Ir	iPNEZ eN eZ F	22 46	02.1 46.0 38		c	U.S.C.G.S.: 19 $\frac{1}{2}$ °N 104°W
93	Dec. 25	Iu	ePZ F	23 29	12.0		c	U.S.C.G.S.: 37°N 139°E Islands
94	Dec. 25	Iu	ePZ eE eZ F	23 36	36.0 09 13		c	U.S.C.G.S.: 37°N 139°E
95	Dec. 26	Iu	iPNZ iN eSPE eN eZ eLZ eLE F	06 35	55 14.9 20.0 48.0 55 42 51			U.S.C.G.S.: 14 $\frac{1}{2}$ °S 180° U.S.C.G.S.: 18°N 121°E
96	Dec. 27	IIId	iPNEZ iZ iSNEZ iNEZ iE F	04 06	02.4 04.0 07.8 13 21.5		c	Storey County, Nevada
97	Dec. 27	Iu	ePZ eZ F	09 07	48.5 32.5		c	U.S.C.G.S.: 37°N 139°E U.S.C.G.S.: 27°S 176°W
98	Dec. 27	Ir	ePZ F	10 59	53.5		c	U.S.C.G.S.: Aleutian Islands
99	Dec. 27	Iu	eFE iPNZ F	21 15	20.5 23.5		d	U.S.C.G.S.: Tonga Islands

No.	Date	Char-acter	Phase	Time (G.C.T.)			Period	Trace motion	Remarks
				h.	m.	s.			
	1949								
100	Dec. 28	Iu	eP'Z iEZ eN eN iPPZ eZ F	08 16 07.5 17.0 21.5 26.5 18 22.3 22 56.0 08 32			d	U.S.C.G.S.: 60°S 22°W	
101	Dec. 28	IIv	ePZ iNEZ iE eSN iE iZ iNE iZ F	11 59 03.8 05 07.4 22.0 23.3 24.1 24.8 25.5 12 02			d	See list, p. 289	
102	Dec. 28	Ir	ePZ F	13 49 21.0 13 53				U.S.C.G.S.: Aleutian Islands	
103	Dec. 28	Id	iP̄Z iZ iSNE iZ iZ F	16 48 18.4 20.6 23.8 25.2 34.2 16 50				See list, p. 289	
104	Dec. 29	Iu	ePNEZ eE eE eN eZ eN ePPEZ eSKSN eZ eE eZ eZ eZ F	03 17 40 53.5 21 02 05.3 34 43 57 28 30 38.5 46.5 42 55 51.0 04 01.4 04 48				U.S.C.G.S.: 18½°N 121°E	
105	Dec. 29	Iu	ePZ ePE ePN eZ epPE eE eSKSN eSZ eZ F	16 55 13.0 15 19.0 49 56 02.0 27 17 05 50.5 06 31.0 24 31.0 18 04				U.S.C.G.S.: 27°S 176½°W	





RENO

No.	Date	Char-acter	Phase	Time (G.C.T.)		Period	Trace motion	Remarks
				h.	m. s.			
	1949							
106	Dec. 30	Iv	iPZ iSZ F	09 42 09 43	02.1 24.7			Central of Nevada
107	Dec. 30	Iu	ePZ F	10 53 10 55	15			U.S.C.G.S.: Kermadec Islands Region
108	Dec. 30	IIId	iPNEZ iN iE iSZ iSE F	13 21 13 24	24.4 27.2 29.1 34.7 35.5			Verdi aftershock
109	Dec. 30	IIId	iPNEZ iNEZ iZ F	16 59 17 01	11.6 14.1 21.5	c		Verdi aftershock