

PANAMA CANAL COMPANY  
 Engineering and Construction Bureau  
 Meteorological and Hydrographic Branch



Balboa Heights, Canal Zone

Lat. 8° 57' 39" N  
 Long. 79° 33' 29" W

SEISMOLOGICAL BULLETIN - JANUARY 1961

h: 36 meters

Sprengnether vertical (Z); Sprengnether LP horizontal (N,E); Wood-Anderson SP horizontal (n,e).

No.	Date	Phase	Comp.	Time	Epicentral Distance (Miles)	Remarks
				G.C.T.		
1	5	iP iS	Z n	18-48-27D 48-47	145	USCGS: 8.2N 83.1W Costa Rica-Panama Border
2	6	iP iS	Z n	00-03-14D 04-02	230	
3	14	iP iS	Z ne	16-19-02D 20-14	440	USCGS: 6.7N 73.0W Colombia
4	16	iP <sup>1</sup> iPR <sub>2</sub>	E E	07-40-38 45-55		USCGS: 36.0N 141.1E Near East Coast of Honshu, Japan
5	20	iP iS	ALL NEne	11-22-10C 22-26.5	80	USCGS: Felt Force I
6	21	iP iS	ALL NEne	14-48-46D 49-33	225	USCGS: 8.6N 82.8W Cost Rica-Panama Border Region. Felt in David, R de P
7	22	eP <sup>1</sup> iPR <sub>2</sub> eSPS iS iPS iSR <sub>1</sub> iSR <sub>2</sub>	E E E E E E E	03-46-58 49-50 52-39 53-43 55-04 04-00-33 04-46		USCGS: 11.9S 166.2E Santa Cruz Islands Region
8	24	iP iS	Z N	23-13-34D 14-21	225	USCGS: 8.3N 82.9W Panama-Costa Rica Border Felt in David, R de P
9	28	iP	Z	03-29-44C		USCGS: Felt strong in El Volcan, R de P. Rumbling heard in the ground

W. H. ESSLINGER  
 Chief Hydrographer



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SEISMOLOGICAL BULLETIN - FEBRUARY 1961

h: 36 meters

Sprengnether vertical (Z); Sprengnether LP horizontal (N,E); Wood-Anderson SP horizontal (n,e).

No.	Date	Phase	Comp.	Time	Epicentral Distance (Miles)	Remarks
				G.C.T.		
1	4	iP iS	ZNE N	06-51-15D 54-05	1,000	
2	5	iP iS	ALL NEne	15-39-25D 40-11	220	USCGS: 8.0N 82.8W South of Panama Felt Force II
3	8	iP iS	Z N	08-08-23D 10-50	900	USCGS: 10.6S 71.0W Brazil-Peru Border
4	8	eP iS	Z N	15-58-57 59-47		
5	9	eP	Z	07-24-12		
6	15	iP iS	Z e	13-12-03D 12-46	205	
7	20	iP	Z	22-29-45C		USCGS: 2.5S 77.6W Ecuador
8	22	iP iS	Z ne	21-17-54 18-04	50	
9	25	iP	Z	20-24-04C		
10	26	iP i	Z N	05-27-54D 06-05-16		USCGS: 13.8S 165.7E New Hebrides Islands Region
11	26	iP iS	Z n	12-13-24D 13-47	110	
12	26	iP	Z	18-29-58D		USCGS: 31.4N 131.2E Near Coast of Kyushu, Japan
13	27	iP iS	Z n	01-09-27C 10-37	335	
14	27	iP iS	Z n	15-45-28C 46-19	245	USCGS: 9.8N 84.4W Near Coast of Costa Rica

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SEISMOLOGICAL BULLETIN - MARCH 1961

h: 36 meters

Sprengnether vertical (Z); Sprengnether LP horizontal (N,E); Wood-Anderson SP horizontal (n,e).

No.	Date	Phase	Comp.	Time G.C.T.	Epicentral Distance (Miles)	Remarks
1	1	i	E	23-56-26		
2	7	iP i	Z E	10-24-17D 26-20	750	USCGS: 28.2 S 175.7 W Kermadec Islands Region
3	9	i	E	22-02-18		
4	10	iP iS	Z n	17-03-21 03-31	50	
5	10	iP iS	Z n	23-13-21 14-00	185	USCGS: 10.1 N 83.6 W Near Coast of Costa Rica
6	13	i	N	08-16-43		USCGS: 19.2 N 107.3 W Off West Coast of Mexico
7	17	eP es	Zne ne	17-32-08 32-13	25	
8	18	eP es	EZne E	15-10-07 24-13		USCGS: 49.9 S 163.3 E South of New Zealand
9	20	iP eS	ZEne E	06-18-04 19-50	650	USCGS: 11.5 N 86.3 W Off West Coast of Nicaragua
10	20	eP eS	Z E	16-06-34 16-52		USCGS: 18.4 S 175.2 W Tonga Islands
11	21	i	E	00-06-59		
12	22	iP eS	Z E	14-21-26 22-42	600	USCGS: 11.8 N 86.8 W Near Coast of Nicaragua
13	24	iP iS	Z ne	00-57-49 58-11	120	
14	27	i	Z	09-55-45		USCGS: 36.6 N 116.3 W Southwestern Nevada
15	28	iP iS	EZne Ene	21-08-30 13-32	2,100	USCGS: 22.0 S 68.0 W Chile-Bolivia Border Region

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SEISMOLOGICAL BULLETIN - APRIL 1961

Sprengnether vertical (Z); Sprengnether LP horizontal (N,E); Wood-Anderson SP horizontal (n,e).

No.	Date	Phase	Comp.	Time	Epicentral Distance (Miles)	Remarks
				G.C.T.		
1	3	iP iS	EZne Ene	01-12-06 13-22	600	USCGS: 6.8 N 72.9 W Colombia
2	5	iP iS	ALL ALL	22-13-18 39	100	
3	8	iP iS	Z NE	03-09-38D 12-57	1,250	USCGS: 2.6 S 81.0 W Near Coast of Ecuador
4	8	iP iS	Z NE	04-24-26D 26-58	950	USCGS: 2.2 S 79.2 W Ecuador
5	8	iP iS	Z NE	04-48-42D 51-41	1,100	USCGS: 2.1 S 79.1 W Ecuador
6	8	iP iS	Z NE	09-06-29D 08-35	725	USCGS: 2.1 S 79.1 W Ecuador
7	8	iP iS	Z NE	18-08-17D 14-11	2,650	USCGS: 38.2 S 72.7 W Chile
8	12	iP iS	NEZ NE	22-22-55 25-02	800	USCGS: 13.1 N 88.9 NW El Salvador
9	19	iP iS	Z n	22-45-17D 45-29	60	
10	21	iP iS	Z n	21-38-59C 39-40	195	
11	22	iP iS	ZN N	19-04-26C 07-48	1,250	USCGS: 2.8 S 80.8 W Near Coast of Ecuador
12	29	iP iS	Z n	17-12-54C 12-58	20	

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SEISMOLOGICAL BULLETIN - MAY 1961

Sprengnether vertical (Z); Sprengnether LP horizontal (N,E); Wood-Anderson SP horizontal (n,e)

No.	Date	Phase	Comp.	Time G.C.T.	Epicentral Distance (Miles)	Remarks
1	2	i	E	23-09-11		USCGS: 27.8 S 176.5 W Kermadec Islands Region
2	7	i	Z	10-42-29C		USCGS: 5.8 N 126.8 E Off Coast of Mindanao, P.I.
3	8	iP i	Z E	19-30-25C 35-59	2,450	
4	10	i	E	08-53-42		
5	21	iP iS	Z N	17-45-22C 48-29	1,150	USCGS: 3.1 S 80.9 W Near Coast of Ecuador
6	22	iP iS	Z n	03-42-28D 43-21	255	
7	22	iP iS	n n	03-45-13 46-05	250	
8	22	iP	Z	03-54-24D 55-15	245	
9	23	iP	ZNE	16-47-57D		USCGS: 12.6 N 87.3 W Near Coast of Nicaragua
10	26	i	Z	13-17-18C		

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SEISMOLOGICAL BULLETIN - JUNE 1961

Sprengnether vertical (Z); Sprengnether LP horizontal (N,E); Wood-Anderson SP horizontal (n,e)

No.	Date	Phase	Comp.	Time	Epicentral Distance (Miles)	Remarks
				G.C.T.		
1	2	i	N	00-26-03		
		i	N	31-43		
		i	N	34-31		
2	2	i	N	05-50-30		USCGS: 10.3N 39.8 E Ethiopia
3	4	iP	Z	16-20-46C	195	
		iS	ne	21-27		
4	7	i	Z	14-26-30C		USCGS: 5.4 S 11.6 W Ascension Island Region
5	10	iP	Z	08-57-15C	1,700	USCGS: 8.1 N 103.4 W South of Mexico
		iS	NE	09-01-42		
6	10	iP'	Z	20-40-11C		USCGS: 24.1 S 112.1 W Easter Island Region
		iSPS	E	46-59		
7	11	iS	e	06-59-20		USCGS: 28.1 N 54.7 E Southern Iran
8	16	iP	ALL	10-33-23C	305	USCGS: 8.8 n 73.4 W Northern Colombia
		iS	NEne	34-28		
9	17	iP	Z	11-01-22C	1,400	USCGS: 11.9 S 75.3 W Peru
		iS	E	05-06		
10	17	iP	ZE	15-10-40D	1,050	USCGS: 14.2 N 92.2 W Mexico-Guatemala Border
		iS	N	13-29		
11	21	iP	Z	03-59-51C		USCGS: 15.3 N 87.3 W Northwestern Honduras
12	21	iP	Z	16-01-39D	130	
		iS	e	02-06		
13	23	i	N	09-27-01		USCGS: 43.9 N 128.9 W Off Coast of Oregon



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SEISMOLOGICAL BULLETIN - JUNE 1961

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No.	Date	Phase	Comp.	Time G.C.T.	Epicentral Distance (Miles)	Remarks
14	24	iS	N	05-13-35		USCGS: 13.6 N 90.2 W Near Coast of El Salvador
15	25	iP IS	Z n	10-59-32D 11-00-29	275	USCGS: 10.8 N 76.0 W Near North Coast of Colombia

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SEISMOLOGICAL BULLETIN - JULY 1961

Sprengnether vertical (Z); Sprengnether LP horizontal (N,E); Wood-Anderson SP horizontal (n,e)

No.	Date	Phase	Comp.	Time G.C.T.	Epicentral Distance (Miles)	Remarks
1	3	iP iS	Z ne	07-50-01D <sup>e</sup> 50-12	60	USCGS: Felt, Force I
2	6	eP' ePR1 iPR2 ePS	Z Z Z NE	22-23-18 26-49 28-52 38-28	8,500	USCGS: 20.0 S 169.0 E New Hebrides Islands
3	9	i	E	06-39-16		USCGS: 15.0 N 87.2 W Honduras
4	12	iP iS	Z N	01-39-43C 41-06	500	USCGS: 4.8 N 82.9 W South of Panama
5	12	iP iS	Z N	22-39-05C 40-30	500	USCGS: 4.9 N 83.0 W South of Panama
6	17	iP iS	Z NE	01-05-31D 09-15	1,400	USCGS: 16.7 N 97.7 W Oaxaca, Mexico
7	20	iP iS	Z NE	10-34-27C 35-38	340	USCGS: 4.6 N 82.1 W South of Panama
8	23	iP iPR <sub>2</sub>	ZNE E	22-05-54 10-38	5,000	USCGS: 18.3 S 168.3 E New Hebrides Islands
9	24	eP iS	Z NE	06-55-20 55-59	185	
10	28	iP iS	ZNE NE	01-08-11C 10-17	750	USCGS: 2.2 S 77.1 W Ecuador

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SEISMOLOGICAL BULLETIN - AUGUST 1961

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No.	Date	Phase	Comp.	Time G.C.T.	Epicentral Distance (Miles)	Remarks
1	1	iP	Z	07-33-28C		USCGS: 56.8 S 25.1 W Sandwich Islands Region
2	1	iS	Z	09-46-45D		USCGS: 57.1 S 26.1 W Sandwich Islands Region
3	2	iP iS	Z NE	16-57-11C 58-33	500	
4	3	iP	Z	03-11-43C		USCGS: 18.2 N 66.2 W Puerto Rico
5	11	iPR2 iSPS	E E	16-16-49 18-00		USCGS: 42.9 N 145.1 E Eastern Hokkaido, Japan
6	12	iP iS	Z ne	02-59-39D 59-48	45	
7	16	iP iS	Z ne	12-02-34D 02-44	50	
8	19	iP iS	ne n	05-14-00 17-19	1,250	USCGS: 10.7 S 71.0 W Peru-Brazil Border
9	19	iP iS	Z NE	14-55-42 58-29	1,000	USCGS: 18.0 N 68.8 W Mona Passage
10	22	iP iS	Z n	00-08-50D 09-37	225	
11	26	iP	Z	01-21-13C		USCGS: 7.0 N 73.2 W
12	26	i	E	06-57-48		
13	27	iP iS	Z e	04-21-05C 21-47	200	
14	28	iP	Z	06-33-40C		USCGS: 15.1 S 70.2 W Peru-Bolivia Border
15	28	iP iS	Z n	07-00-42C 00-55	65	



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SEISMOLOGICAL BULLETIN - AUGUST 1961

Sprengnether vertical (Z); Sprengnether LP horizontal (N.E); Wood-Anderson SP horizontal (n.e)

No.	Date	Phase	Comp.	Time	Epicentral Distance	Remarks
				G.C.T.	(Miles)	
16	28	iP	Z	21-32-22D		
17	29	iP	Z	14-45-38D	240	
		iS	n	46-28		
18	31	iP	Z	01-52-46D		USCGS: 10.6 S 70.9 W Peru-Brazil Border
		iS <sub>n</sub>	n	55-22		
		iS*	n	56-07		
19	31	iP	Z	02-01-15D		USCGS: 10.4 S 70.7 W Peru-Brazil Border
		iS <sub>n</sub>	n	03-39		
		iS*	n	04-31		

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SEISMOLOGICAL BULLETIN - SEPTEMBER 1961

Sprengnether vertical (Z); Sprengnether LP horizontal (N,E); Wood-Anderson SP horizontal (n,e)

No.	Date	Phase	Comp.	Time G.C.T.	Epicentral Distance (Miles)	Remarks
1	1	iP	Z	00-21-33C		
2	1	iP iPR1 iS iSR1	Z E E E	18-53-45C 54-27 58-28 59-20		USCGS: 13.5 N 92.5 W Off Coast of Guatemala
3	3	iP iS	Z n	08-49-57C 50-21		
4	8	iP iS	Z ZE	12-38-18 12-47-52		
5	9	iP iS	EZ EZ	19-13-57 16-39		USCGS: 1.5 N 90.6 W Galapagos Island
6	13	eP	EZ	13-28-16		
7	19	iP iS	Z Z	02-31-42 37-20		USCGS: 20.3 S 63.2 W Southern Bolivia
8	19	iP iS	Zen Zen	09-47-13 47-58	220	USCGS: 6.7 N 82.4 W Felt Force II. Reported felt in Chitre, R. de P.
9	20	eP	E	19-26-00		
10	24	eP	EZN	19-09-13		
11	27	iP	Z	12-19-49		
12	29	eP	EZN	22-40-00		USCGS: 1.7 N 79.3 W Near Coast of Southern Colombia

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SEISMOLOGICAL BULLETIN - OCTOBER 1961

Sprengnether vertical (Z); Sprengnether LP horizontal (N,E); Wood-Anderson SP horizontal (n,e)

No.	Date	Phase	Comp.	Time G.C.T.	Epicentral Distance (Miles)	Remarks
1	7	iP	EZN	09-59-10		USCGS: 0.4 S 80.2 W Near Coast of Ecuador
2	14	eP	EZN	08-57-04		
3	18	iP iS	EZN EZN	17-00-18 07-06		USCGS: 36.7 S 72.6 W Near Coast of Southern Chile Minor damage in area between Curico and Valdivia
4	19	i i	EZN EZ	11-14-06 27-36		
5	22	eP	EZN	00-01-25		
6	22	iP	EZN	13-12-06		
7	22	eP		15-15-14		
8	23	iP		00-20-31		
9	23	eP		14-59-28		
10	25	iP iS	EZN EZN	08-58-48 09-02-20	1,350	USCGS: 9.7 S 78.6 W Off West Coast of Peru
11	26	eP	EZN	00-56-47		
12	26	e	EZN	06-39-20		
13	26	eP	EZN	21-57-54		USCGS: 6.9 N 73.1 W Colombia

All instruments removed from service November 1, 1961 pending installation of new equipment.

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