

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 - JAN. 1959

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	2	iP iS	Z NE	10-19-16G 20-47		
2	6	iP iS	Ze ne	11-16-17G 16-57		
3	7	eP	n	17-32-27		
4	7	iP	Z	23-38-10G		
5	9	eP iS	n n	02-08-56 09-32		
6	13	iP iS	ALL ALL	08-35-03D 36-05	300	USCGS: 9N 831/2W Costa Rica Felt in El Volcan, R de P
7	13	eP eS	n n	18-08-34 09-30	270	
8	13	eP eS	n n	22-53-26 54-23	270	
9	15	iP iS	ne ne	16-44-42 45-24	200	USCGS: Felt North West Panama
10	22	iP iS	N N	05-30-54 37-36		USCGS: 34N 142E Near NE Coast Honshu, Japan
11	22	iP eS	Z e	14-50-06G 50-44		
12	23	eP i	N N	08-09-45 26-55		
13	24	iP iS	ZE E	19-45-40D 50-04		



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SEISMOLOGICAL BULLETIN - JAN. 1959

h: 36 meters

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.		
14	24	iP	ZE	20-05-03C		
		iS	N	13-00		
15	28	iP	NE	10-11-39	2,750	
		iS	N	17-46		
16	30	i	N	23-36-29		

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Chief Hydrographer



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SEISMOLOGICAL BULLETIN - FEB. 1959

h: 36 meters

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)	
1	2	eP iS	e n	08-28-45 29-15		
2	66	eP iS	N S	21-14-160 17-50	1,700	
3	6	iP iS	NZE iS	23-29-26D 30-31		
4	7	iP is	ZNE ne	09-40-02C 42-19		USCGS: 4S 811/2W Near Coast of North Peru, strongly felt Guayaquil
5	15	eP eS	NE	04-14-53 21-24		USCGS: 591/2S 25W Sandwich Islands
6	16	iP iP	NEZ en	00-42-06C 44-02		USCGS: 1S 811/2W Near Coast of Ecuador
7	16	eP eP	NE	17-58-12 18-00-34		USCGS: Honduras-Nicaragua Border
8	17	eP eS	NE	02-57-14 03-01-38		USCGS: Ecuador
9	20	eP eS	NE ne	18-19-20 21-56		USCGS: 151/2N 91W Guatamala
10	26	iP iS	NEZ ne	12-55-37C 56-34	305	
11	27	iP is	NEZ ne	16-11-03 32	140	
12	27	iP is	NEZ ne	23-30-25 31-42		
13	28	iP es	NEZ ne NE	17-08-49 19-33		

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SEISMOLOGICAL BULLETIN - MARCH 1959

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	1	iP is	ALL	01-40-31 41-04	160	
2	8	eP is	ALL	05-21-58 22-46	230	
3	10	iP is	ALL	08-40-40 41-23	205	
4	10	iP is	ALL	22-52-520 57-10	1,520	USCGS: 14 N 92 1/2 W Near Coast of Guatamala
5	12	eP	NE	02-32-16D		USCGS: Felt in El Volcan
6	13	iP is	ALL	09-21-25D 22-01	173	
7	15	iP	ZNn	10-46-09		USCGS: 12 N 85 W Nicaragua
8	19	eP es	ZEe	08-34-18D 41-15	3,350	USCGS: 35 N 36 W North Atlantic Ocean
9	23	iP is	ALL	07-18-46D 25-19	3,050	USCGS: 40 N 118 W Western Nevada, Felt in Reno
10	27	iP es	ZNE	07-06-10C 09-11	1,100	USCGS: 17 N 61 W Leeward Islands
11	27	iP is	ALL	22-59-59C 23-01-54	700	USCGS: 1 N 85 W Pacific Ocean
12	28	eP es	ALL	12-49-14D 50-05	245	
13	29	iP is	ALL	05-44-01C 47-21	1,250	USCGS: 19 N 64 1/2W Virgin Islands Felt Puerto Rico and Virgin Islands
14	30	iP is	ALL	07-19-13C 20-05	250	USCGS: Near South Coast of Panama

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SEISMOLOGICAL BULLETIN - MARCH 1959

h: 36 meters

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)	
15	31	iP iS	ALL	04-28-440 29-35	245	
16	31	eP eS	NE	07-44-49 52-22	1,550	
17	31	eP es	NE	08-13-02 27-48		

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SEISMOLOGICAL BULLETIN - APRIL 1959

h: 36 meters

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)	
1	5	iP is	ALL	20-33-43D 34-25	202	USCGS: 8 N 77 1/2 W Near West Coast of Colombia
2	6	iP is	e	21-54-47C 55-13	150	
3	11	iP is	ZEe	09-26-03D 37	163	USCGS: 9 1/2 N 83 W Costa Rica - Panama Border, Felt in El Volcan, R.P.
4	11	iP is	ZEe	14-48-17D 49-49	550	USCGS: 7 N 71 1/2 W Columbia - Venezuela Border
5	12	iP is	ZEe	07-54-37D 55-07	145	USCGS: Felt in El Volcan, R. P.
6	12	iP	ZEe	09-59-04		USCGS: 17 1/2 N 95 W Mexico
7	13	iP is	ZEe	00-19-26D 20-14	230	USCGS: Felt in Puerto Armuelles, R.P.
8	19	iP is	NE	07-43-13D 48-47	2,480	USCGS: 45 S 82 W Pacific Ocean
9	20	iP is	ALL	03-20-21C 21-19	280	
10	20	iP is	ALL	04-22-04C 23-19	450	USCGS: 8 1/2 N 83 W Costa Rica
11	20	iP is	ALL	04-39-34C 40-16	155	
12	20	iP is	ALL	06-14-15C 15-15	290	
13	20	iP is	ALL	08-13-00C 14-01	295	
14	20	iP is	ALL	10-51-05C 52-00	265	

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SEISMOLOGICAL BULLETIN - APRIL 1959

h: 36 meters

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)	
15	20	iP is	ALL	16-30-14C 31-06	250	USCGS: Felt in Puerto Armuelles
16	20	iP is	ALL	17-38-32C 39-25	255	USCGS: Felt in Puerto Armuelles
17	20	iP is	ALL	18-26-28C 27-15	230	USCGS: Felt in Puerto Armuelles
18	22	iP is	ALL	17-25-53C 27-15	345	USCGS: 7 1/2 N 72 W Venezuela-Colombia Border
19	22	iP is	ALL	19-03-30C 06-23	1,075	USCGS: 11 1/2 N 86 1/2 W Near Coast of Nicaragua
20	22	iP is	ALL	20-35-31C 41-39	2,800	USCGS: 36 1/2 S 97 1/2 W Pacific Ocean
21	22	iP is	ALL	23-51-18C 52-18	287	
22	24	iP is	ALL	09-33-23C 36-10	1,020	USCGS: 11 1/2 N 86 1/2 W Near Coast of Nicaragua
23	26	iP e	ALL	20-59-44C 21-03-38		USCGS: 25 N 122 1/2 E Near North- East Coast of Formosa
24	28	iP is	ALL	11-12-48C 16-33	1,400	USCGS: 15 N 93 W Mexico-Guatemala Border
25	30	iP i	Zen	13-37-34C 38-01		USCGS: 55 1/2 S 26 W Sandwich Islands

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SEISMOLOGICAL BULLETIN - MAY 1959

h: 36 meters

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)	
1	3	IP	ZNE	04-43-24C	1,150	USCGS: 12 1/2 N 87 1/2 W Near Coast of Nicaragua
		IS	NE	46-17		
2	4	IP	ZNE	07-29-26C	7,000	USCGS: 52 1/2 N 159 1/2 E Near East Coast of Kamchatka
		IS	NE	40-34		
3	9	IP	Z	16-44-55C	275	
		IS	NE	45-52		
4	10	eP	ZN	02-02-37		
		eS	N	03-25		
5	15	eP	NE	07-52-43		USCGS: 14 N 93 W Near Coast of Mexico
6	16	i	E	06-37-24		USCGS: 4 1/2 S 153 1/2 E New Britain
		i	E	06-54-51		
		i	E	07-15-35		
7	23	IP	ZNE	19-22-08C	3,850	
		IS	NE	29-59		
8	28	IP	Z	04-08-32C	65	USCGS: Colombia
		IS	n	08-45		

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SEISMOLOGICAL BULLETIN - JUNE 1959

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	1	IP I	ALL NEne	17-55-07D 55-53		USCGS: 6 1/2 S 155 1/2 E Solomon Islands
2	2	IP	Z	05-51-25D		USCGS: 21 1/2 N 121 1/2 E Batan Islands Region
3	3	IP IS	ALL NEne	03-45-15C 46-20	310	USCGS: 4 N 77 W Near West Coast of Colombia
4	4	IP IS	ALL NEne	01-59-06D 59-58	250	USCGS: 9 N 84 1/2 W Near Coast of Costa Rica
5	4	iP eP	Z N	08-06-58D 07-39		
6	5	eP	ZNE	20-39-02D		USCGS: 12 N 86 1/2 W Near Coast of Nicaragua
7	9	IP IS	Z n	16-55-42C 56-25	205	
8	14	IP IS	ALL NEne	00-17-49C 22-47	2,050	USCGS: 20 1/2 S 68 W Southwestern Bolivia - Time Mark out, Times Approximate
9	19	IP IS	ALL NEne	01-38-58C 39-49	245	USCGS: 6 N 82 1/2 W South of Panama
10	22	IP IS	ALL NEne	17-17-16D 17-26	47	USCGS: SW Felt Force IV
11	27	IS	E	19-28-50		USCGS: 33 S 179 W South of Kermadec Islands
12	28	eP eS	NE NE	08-12-33 16-44		
13	28	IP	Z	20-03-22C		USCGS: 9 1/2 S 122 1/2 E Sawoe Sea



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SEISMOLOGICAL BULLETIN - JUNE 1959

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.			
14	29	eP	Z	15-57-15			
		eS	n	57-45			
15	30	IP	Z	22-43-57C	510	USCGS: 8 1/2 N 71 1/2 W Northern Venezuela	
		IS	ne	45-35			

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SEISMOLOGICAL BULLETIN - JULY 1959

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	3	eP	n	23-23-16			
		eS	n	23-33			
2	4	eP	n	04-23-44			
		eS	n	24-08			
3	6	iP	Zne	09-17-03D			USCGS: 26 1/2 S 61 1/2 W Chaco Province, Argentina
4	6	iP	Zne	09-30-12D			USCGS: 26 1/2 S 61 1/2 W Chaco Province, Argentina
5	6	iP	ne	22-39-12	140		
		iS	ne	39-41			
6	8	iP	Zne	09-27-45C	110		USCGS: Felt Force I
		iS	ne	28-08			
7	9	iP	Z	16-11-13D	3,550		USCGS: 20 1/2 S 68 W Chile - Bolivia Border
		iS	E	17-32			
8	14	iP	Zne	05-25-18D	65		USCGS: Felt Force I
		iS	ne	25-31			
9	16	iP	ZNne	02-35-54C	205		USCGS: Felt Force I
		iS	ne	36-37			
10	17	eP	Z	22-54-07			USCGS: 7 1/2 N 71 1/2 W Colombia-Venezuela Border
11	18	iP	Z	20-14-29C	10,000		USCGS: 15 1/2 N 120 1/2 E Luzon, P. I.
		iPR ₂	NE	24-39			
12	19	iP	Zne	15-11-28D			USCGS: 15 S 70 1/2 W Peru
13	21	iP	ZE	09-21-24C			USCGS: 19 N 68 1/2 W Near North Coast of Dominican Republic
		i	E	26-15			



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SEISMOLOGICAL BULLETIN - JULY 1959

h: 36 meters

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No.	Date	Phase	Comp.	Time	Epicentral Distance	Remarks
				G.C.T.	(miles)	
14	21	iP	ZE	12-33-38C		
15	21	iP	Z	13-08-00C		
16	22	i	Z	15-58-27C		USCGS: 15 1/2 N 97 1/2 W Near Coast of Oaxaca, Mexico
17	23	iP	Z	03-49-55C		USCGS: 3 N 71 W Colombia
18	24	iP	Z	13-06-12C		
19	25	iP eS	Z e	06-12-30D 13-16	220	
20	26	iP	Z	02-05-24D		

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SEISMOLOGICAL BULLETIN - AUGUST 1959

h: 36 meters

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)		
1	8	eP	Z	01-51-18			
2	12	iP iS	Z E	00-35-21C 39-44	1,700	USCGS: 11½ N 86 W	Near Coast of Nicaragua
3	12	iP	Z	02-03-42C		USCGS: 3 S 80½ W	Near Coast of Ecuador
4	13	iP iS	Z ne	15-52-28D 53-13	215		
5	15	iP	Z	09-16-36C			
6	17	iP iS	Z n	13-13-16C 14-22	315		
7	17	eP iS	Z E	21-25-32D 32-37	3,350	USCGS: 7½ S 156 E	Solomon Islands
8	18	iP eS	Z n	06-45-32C 52-29	3,200	USCGS: 44½ N 111 W	Yellowstone Park, Wyoming. Major property damage
9	18	iP iS	Z E	15-34-22C 41-02	3,200	USCGS: 44½ N 111 W	Yellowstone aftershock
10	19	iP iS	Z n	17-03-40D 04-07	130		
11	20	iP iS	Z E	07-22-29C 25-49	1,250	USCGS: 7 S 85 W	Off Coast of Peru
12	24	eP i	ZE E	21-51-19C 22-01-07		USCGS: 10½ S 161 E	Solomon Islands
13	26	iP iS	ZNE NE	08-29-33C 32-54	1,300	USCGS: 18 N 94½ W	Severe damage around Vera Cruz, Mexico

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SEISMOLOGICAL BULLETIN - SEPTEMBER 1959

h: 36 meters

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)	
1	1	iP iS	Z E	00-56-56C 01-00-45	1,500	USCGS: 11 S 74½ N Peru Felt: Huancayo
2	1	iP ES	Z E	10-53-53C 57-10	1,200	USCGS: 20 N 64½ W North of Puerto Rico
3	16	iP	Z	18-20-33C		
4	16	iP iS	Z N	19-15-13C 16-19	315	
5	16	iP iS	Z N	20-54-33C 55-20	215	
6	17	iP iS	Z e	01-30-01D 33-02	1,300	
7	17	iP iS	Z ne	01-35-17D 35-23	30	
8	17	iP iS	Z e	01-24-19D 24-59	190	
9	17	iP iS	Z e	06-49-37D 50-34	275	
10	17	iP	Z	21-26-53D		USCGS: 13½ N 88½ W EL Salvador
11	20	iP iS	Z ne	05-40-19C 41-04	215	
12	20	iP iS	Z ne	06-06-41C 07-25	210	
13	20	iP	Z	06-24-24D		
14	23	iP iS	Z ne	09-39-11C 39-56	215	USCGS: Panama-Colombia Border

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SEISMOLOGICAL BULLETIN - OCTOBER 1959

h: 36 meters

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)	
1	31	iP iS	Z e	18-32-51D 34-08	450	USCGS: 2 N 77½ W Southwestern Colombia

Difficulties encountered with instruments during the month.

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SEISMOLOGICAL BULLETIN - NOVEMBER 1959

h: 36 meters

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

<u>No.</u>	<u>Date</u>	<u>Phase</u>	<u>Comp.</u>	<u>Time</u> <u>G.C.T.</u>	<u>Epicentral Distance</u> <u>(miles)</u>	<u>Remarks</u>
						Difficulties encountered with instruments during the month.
1	15	iP	Z	17-21-58C		USCGS: 37½ N 20½ E Near West Coast of Greece
2	16	iP	Z	10-30-42D		USCGS: 1 N 26½ W Mid-Atlantic Ocean

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SEISMOLOGICAL BULLETIN - DECEMBER 1959

h: 36 meters

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

<u>No.</u>	<u>Date</u>	<u>Phase</u>	<u>Comp.</u>	<u>Time</u> <u>G.C.T.</u>	<u>Epicentral Distance</u> <u>(miles)</u>	<u>Remarks</u>
						Difficulties encountered with instruments during the month.
1	21	iP iS	Zne ne	17-27-06 27-27	100	USCGS: Felt Force III

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