

THE PANAMA CANAL
 DEPARTMENT OF OPERATION AND MAINTENANCE
 SECTION OF METEOROLOGY AND HYDROGRAPHY
REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.
 (AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)



Month January Year 1928

Latitude $8^{\circ} 57' 39''$ north. N-S-100K.

Longitude $79^{\circ} 33' 29''$ west. Magnification 10 35

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
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31													

NO DISTURBANCE.

P. T. Preliminary tremors. L. W. Large waves.
 Greenwich mean time five hours faster than 75th meridian time.



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Month January Year 1926.

Latitude 8° 57' 39" north.

Longitude 79° 33' 29" west

E-W-LOOK
Magnification, 35

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
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4													
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6													
7													NO DISTURBANCES.
8													
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P. T. Preliminary tremors, L. W. Large waves,
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REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)

Month.....**February**..... Year.....**1928**..

Latitude 8° 57' 39" north.

N-S-100 K

Longitude 79° 33' 29" west.

Magnification 35.

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>			
1													Heavy swells, apparently of seismic origin, occurred along the Pacific coast, beginning at about 8:00 a.m. 75th Mer. time on Feb. 25th lasting for about 48 hrs Interval between swells about 20 minutes.
2													
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30												20	
31													

Slight tremors from 16:21 to 16:25

20

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Month February Year 1928

Latitude $8^{\circ} 57' 39''$ north. **N - S - I00K**
 Longitude $79^{\circ} 33' 29''$ west. **Magnification 35**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
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11													
12													
13													
14													
15													
16													
17	5:59:08		5:59:35		5:59:39		5:59:39		6:06:00		1.7	20	Distance about 220 miles direction?
18													
19													
20													
21													
22													
23													
24													
25													
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28													
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P. T. Preliminary tremors. L. W. Large waves.
 Greenwich mean time five hours faster than 75th meridian time.

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Month February Year 1928Latitude $8^{\circ} 57' 39''$ north.**E-W-100 K.**Longitude $79^{\circ} 33' 29''$ west.**Magnification 35**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>			
1													Heavy swells, apparently of seismic origin, occurred along the Pacific coast, beginning at about 8:00 a.m. 75th Mer. time on Feb. 25th lasting for about 48 hrs Interval between swells about 20 minutes.
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29													
30													
31													

Slight tremors from 16:21 to 16:25

20

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Latitude 8° 57' 39" north. **E - W - 100K**
Longitude 79° 33' 29" west **Magnification 35**

Greenwich mean time midnight to midnight.

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DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
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5													
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9													
10													
11													
12													
13													
14													
15													
16	5:58:58		5:59:36		6:00:12		6:00:14		6:05:00		1.0	20	Distance about 220 miles direction?
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													

P. T. Preliminary tremors. L. W. Large waves.
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(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)

Month March Year 1928

Latitude 8° 57' 39" north. N - S - 100K

Longitude 79° 33' 29" west. Magnification = 35

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7													
8													
9	Slight tremors from a very distant disturbance 18:20:00 to 20:30:00												
10	Estimated distance about 10,000 miles.												
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
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Longitude $79^{\circ} 33' 29''$ west. **Magnification - 35**

Greenwich mean time midnight to midnight.

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DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7													
8													
9													Slight tremors from a very distant disturbance 18:20:00 to 20:30:00 estimated distance about 10,000 mi.
10													
11													
12													
13													
14													Slight tremors from 20:04:00 to 20:05:00
15													
16													Slight tremors from a very distant disturbance 5:30:00 to 7:20:00
17													
18													
19													
20													
21													
22													
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27													
28													
29													
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31													

P. T. Preliminary tremors, L. W. Large waves,
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Month March Year 1928Latitude 8° 57' 39" north. **N-S-100 K**
Longitude 79° 33' 29" west. **Magnification - 35**

Greenwich mean time midnight to midnight.

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DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7													
8													
9	Slight tremors from a very distant disturbance										18:20:00 to 20:50:00. Estimated distance about 10,000 miles.		
10													
11													
12													
13													
14	Slight tremors from 20:04:00 to 20:05:00												
15													
16	Slight tremors from a very distant disturbance										5:30:00 to 7:20:00		
17													
18													
19													
20													
21													
22	4:21:18		4:24:58		4:26:28		4:28:30		5:24:00		5.5	20	Distance 1400 miles Direction - N.W.
23													
24													
25													
26													
27													
28													
29													
30													
31													

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Longitude 79° 33' 29" west.**N - S - 100 K**
Magnification - 35

Greenwich mean time midnight to midnight.

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DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7													
8													
9	Slight tremors from a very distant disturbance 18:20:00 to 20:30:00											Estimated distance about 10,000 miles.	
10													
11													
12													
13													
14	Slight tremors from 20:04:00 to 20:05:00												
15													
16	Slight tremors from a very distant disturbance 5:30:00 to 7:20:00												
17													
18													
19													
20													
21													
22	4:21:18	4:24:58	4:26:28	4:28:30	5:24:00	55	20	Distance 1,400 miles Direction N.W.					
23													
24													
25													
26													
27	Very slight tremors from 5:12:40 to 5:23:00											20	
28													
29													
30													
31													

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Month **March**Year **1928**Latitude 8° 57' 39" north. **E - W - 100K**Longitude 79° 33' 29" west. **Magnification 35**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													Slight tremors from a very distant disturbance 18:20 to 20:30:00 Estimated distance about 10,000 miles
11													
12													
13													
14													
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30													
31													

P. T. Preliminary tremors. L. W. Large waves.
Greenwich mean time five hours faster than 75th meridian time.

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REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)

Month March, Year 1928.Latitude 8° 57' 39'' north. **E - W - 100 K**Longitude 79° 33' 29'' west. **Magnification 35**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.	mm.	sec.	
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													Slight tremors from a very distant disturbance 18:20:00 to 20:50:00 estimated distance about 10,000 miles.
11													
12													
13													
14													
15													Slight tremors from 20:04:00 to 20:05:00
16													
17													Slight tremors from a very distant disturbance 5:30:00 to 7:20:00
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													

P. T. Preliminary tremors. L. W. Large waves.
Greenwich mean time five hours faster than 75th meridian time.

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REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.
 (AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)



Month March Year 1928

Latitude 8° 57' 39" north. **E-W-100 K**
 Longitude 79° 33' 29" west. **Magnification 55**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													Slight tremors from a distant disturbance 18:20:00 to 20:30:00. Estimated distance about 10,000 miles.
11													
12													
13													
14													Slight tremors from 20:04:00 to 20:05:00
15													
16													Slight tremors from a very distant disturbance 5:30:00 to 7:20:00
17													
18													
19													
20													
21													
22	4:21:18		4:25:00		4:27:12		4:28:04		5:07:00		10	20	Distance 1400 miles epi center in Mexico
23													
24													
25													
26													
27													
28													
29													
30													
31													

P. T. Preliminary tremors, L. W. Large waves.
 Greenwich mean time five hours faster than 75th meridian time.

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REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)

Month March Year 1928Latitude 8° 57' 39" north. **E - W - 100 K**
Longitude 79° 33' 29" west. **Magnification 35**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													Slight tremors from a distant disturbance 18:20:00 to 20:30:00 Estimated distance about 10,000 miles.
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
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25													
26													
27													
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30													
31													

P. T. Preliminary tremors, L. W. Large waves.
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REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)



Month Apr 11 Year 1928

Latitude 8° 57' 39'' north.
Longitude 79° 33' 29'' west.

NS-100-K
Magnification 35

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS	
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.				mm.
1														
2														
3														
4														
5														
6														
7														
8														
9		17.39.39		17.44.11		17.47.54		17.49.30		18.17.00		1.5	20	Distance 1750 miles - N.W.
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
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24														
25														
26														
27														
28														
29														
30														
31														

P. T. Preliminary tremors, L. W. Large waves,
Greenwich mean time five hours faster than 75th meridian time.

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Month April Year 1928

Latitude 8° 57' 39" north.

N S - 100-K

Longitude 79° 33' 29" west.

Magnification 35

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>			
1													
2													
3													
4													
5													
6													
7													
8													
9	17.39.39		17.44.11		17.47.54		17.49.30		18.17.00		1.5	20	Distance 1750 miles Direction N W
10													
11													
12													
13	23.21.24								23.59.00			20	Distance indeterminate but about 4,000 miles
14													
15													
16													
17	3.30.44		3.34.01						4.03.00		1	20	Distance about 640 miles probably N W
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													

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REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.
 (AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)



Month April Year 1920

Latitude 8° 57' 39" north. **N - S - 100-K**
 Longitude 79° 33' 29" west. **Magnification 35**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27	20:41:20		20:45:53		20:49:48				21:10:00		.75	20	Distance 1780 miles Direction ?
28													
29													
30													
31													

P. T. Preliminary tremors, L. W. Large waves.
 Greenwich mean time five hours faster than 75th meridian time.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)

Month April Year 1928Latitude 8° 57' 39" north. **EW - 100-K**
Longitude 79° 33' 29" west. **Magnification 35**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7													
8													
9	17.39.50		17.44.00		17.47.14		17.44.21		18.15.00		1.5	20	Distance 1750 miles Direction N W
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													

P. T. Preliminary tremors, L. W. Large waves.
Greenwich mean time five hours faster than 75th meridian time.

THE PANAMA CANAL
 DEPARTMENT OF OPERATION AND MAINTENANCE
 SECTION OF METEOROLOGY AND HYDROGRAPHY
REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.
 (AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)



Month April Year 1928

Latitude $8^{\circ} 57' 39''$ north. **EW - 100-K**
 Longitude $79^{\circ} 33' 29''$ west. **Magnification 35**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7													
8													
9													Distance 1750 miles
10	17.39.30		17.44.00		17.47.14		17.44.21		18.15.00		1.5	20	Direction N W
11													
12													
13													Distance indeterminate
14	23.21.24								23.59.00			20	but above 4,000 miles
15													
16													
17	3.30.44		3.34.02						3.54.00		.75	20	Distance 640 miles probably N. W.
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													

P. T. Preliminary tremors. L. W. Large waves.
 Greenwich mean time five hours faster than 75th meridian time.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)



Month April Year 1928

Latitude 8° 57' 39" north.

E - W - 100-K

Longitude 79° 33' 29" west.

Magnification 35

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27	20:41:20		20:45:52		20:49:40		---		21:10:00		.75	20	Distance 1780 miles; Direction ?
28													
29													
30													
31													

P. T. Preliminary tremors. L. W. Large waves.
Greenwich mean time five hours faster than 75th meridian time.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)



Month May Year 1929

Latitude 8° 57' 39" north. **N-S-100 K**
Longitude 79° 33' 29" west. **Magnification 35**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7	9:36:36		9:38:47		9:36:59		9:36:47		9:39:23		1.5	20	Distance 57 miles Probably northerly; Felt by a few persons in Colon, C. Z.
8													
9	2:22:42		2:22:52		-		2:22:52		2:24:14		4.0	20	Distance about 50 miles Direction ?; felt dis- tinctly by many people in Canal Zone and vicin- ity. Intensity III to IV
10													
11													
12	2:33:00		2:34:30		-		2:34:56		2:38:30		1.5	20	Distance about 20 mi.; direc- tion ?
13	7:08:09		7:08:19		7:09:05		-		?		0.5	20	
14	22:18:30		22:21:18		22:22:34		22:24:14		0:06:00		8.0	20	Distance about 1,000 miles with epi center in Peru
15	Very slight tremors from 2:39:30 to 3:06:00											20	Distance and direction ?
16													
17													
18													
19													
20													
21													
22													
23													
24	5:39:14		5:40:03		5:40:30		5:42:56		5:54:00		2.0	20	Distance 310 miles; direction ?
25													
26													
27													
28													
29													
30													
31													

P. T. Preliminary tremors. L. W. Large waves.
Greenwich mean time five hours faster than 75th meridian time.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)



Month May Year 1933

Latitude 8° 57' 39" north. **NO-100 K**
Longitude 79° 33' 29" west. **Magnification 35**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7	9:36:36		9:36:47		9:36:59		9:36:47		9:39:23		1.5	20	Distance 57 miles Probably northerly Felt by a few persons in Colon, C. Z.
8													
9	2:22:42		2:22:52		-		2:22:52		2:24:14		4.0	20	Distance about 50 miles; direction ? Felt distinctly by a number of persons in Canal Zone and vicin- ity. Intensity III-IV
10													
11													
12	2:23:52		2:34:35		-		2:34:51		2:38:07		1.5	20	Distance about 20m; direc.?
13	7:08:07		7:08:07		7:09:10				?		0.5	20	Distance about 45 miles
14	22:16:30		22:21:22		22:23:14		22:29:56		22:30:00		10.0	20	Distance about 1,000 miles with epi center in Peru
15	Very slight tremors from 2:39:30 to 3:06:00											20	Distance & direction ?
16													
17													
18													
19													
20													
21													
22													
23													
24	5:39:17		5:40:09		5:40:42		5:40:50		5:54:00		3.0	20	Distance 210 miles Direction ?
25													
26													
27													
28													
29													
30													
31													

P. T. Preliminary tremors, L. W. Large waves,
Greenwich mean time five hours faster than 75th meridian time.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **586** Date **May 7**, 192**8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began	9:36:36	9:36:36
Second preliminary tremors began	9:36:47	9:36:47
Long waves began	9:36:59	9:36:59
Maximum	9:36:47	9:36:47
End of principal portion	9:37:24	9:37:24
End of earthquake	9:39:25	9:39:25
	mm.	mm.
Maximum amplitude	1.5	1.5
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves		
Maximum		
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	35	35

REMARKS: **100 K Bosch-Omeri Instruments**

EW damping medium

NS damping 7/8

Distance 57 miles, Direction probably northerly.

Felt by a few persons in Colon.



THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **567** Date **May 9**, 192 **8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began	2:22:42	2:22:42
Second preliminary tremors began	2:22:52	2:22:52
Long waves began		
Maximum	2:22:52	2:23:52
End of principal portion	2:23:05	2:23:05
End of earthquake	2:24:14	2:24:14
	mm.	mm.
Maximum amplitude	4.0	4.0
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves		
Maximum		
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	55	55

REMARKS: **100 K Bosch-Siemens Instruments NW Damping medium; NS damping 7/8.**
Distance about 50 miles; direction (?) Felt distinctly by a number of people in Canal Zone and vicinity; intensity III to IV.



THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **509** Date **May 10, 1929**, 192. Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began	7:08:09	7:08:07
Second preliminary tremors began	7:08:19	7:08:17
Long waves began	7:09:05	7:09:10
Maximum		
End of principal portion		
End of earthquake		
	mm.	mm.
Maximum amplitude	0.5	0.5
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves		
Maximum		
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	35	35

REMARKS: **100K Bosch-Oncori instruments, E-W damping medium; N-S damping 7/8**
Distance about 45 miles.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **568** Date **May 10, 1928**, 192... Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began	2:33:50	9:33:52
Second preliminary tremors began	2:34:30	9:34:35
Long waves began	-	-
Maximum	2:34:56	9:34:51
End of principal portion	2:36:30	9:35:47
End of earthquake	2:38:30	9:38:07
	mm.	mm.
Maximum amplitude	1.5	1.5
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves		
Maximum		
End of principal portion		
End portion		
Period of pendulum	20	35
Magnification	20	35

REMARKS: **100K Bosch-Omori instruments; E-W damping medium; N-S damping 7/8**

Distance about 200 miles; direction ?

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **570** Date **May 14, 1923**, 192 Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began	22:18:30	22:18:30
Second preliminary tremors began	22:21:18	22:21:22
Long waves began	22:22:34	22:23:14
Maximum	22:24:14	22:28:56
End of principal portion	22:39:54	22:36:16
End of earthquake	0:08:00	23:30:00
	mm.	mm.
Maximum amplitude	8.0	10.0
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves	7	6
Maximum	7	7
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	35	35

REMARKS: **100 K Bosch-Gnori instruments;**

E-W damping medium; N-S damping 7/8

Distance about 1000 miles with epicenter in Peru.



THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **571** Date **May 15, 1928**, 192... Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began		
Second preliminary tremors began		
Long waves began	Very slight tremors from	
Maximum	2:39:30 to 3:00:00	
End of principal portion		
End of earthquake		
	mm.	mm.
Maximum amplitude		
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves		
Maximum		
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	55	55

REMARKS: **100 K Bosch-Omori Instruments;**
E-W damping medium; N-S damping 7/8
Distance and direction ?

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **572** Date **May 24**, 192**8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began	5:39:14	5:39:17
Second preliminary tremors began	5:40:08	5:40:09
Long waves began	5:40:50	5:40:42
Maximum	5:41:56	5:40:50
End of principal portion	5:43:25	5:43:38
End of earthquake	5:54:00	5:54:00
	mm.	mm.
Maximum amplitude	2.0	3.0
	s.	s.
Average period of waves		
First preliminary tremors		
Second preliminary tremors		
Long waves		
Maximum		
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	35	35

REMARKS: **100 K Bosch-Omeri instruments;**
NS damping 7/8; E-W damping medium;
Distance 310 miles, direction ?

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)



Month June Year 1928

Latitude 8° 57' 39" north. **NS 100 K**
Longitude 79° 33' 29" west. **Magnification 35**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17												20	Instrument being repaired - See NW 100 K
18													
19													
20													
21													Seismic tremors from a very distant disturbance from 16:49:00 to 17:31:00
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													

P. T. Preliminary tremors, L. W. Large waves,
Greenwich mean time five hours faster than 75th meridian time.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)

International
Seismological
CentreMonth June Year 1923

Latitude 8° 57' 39" north.

B-W 100 K

Longitude 79° 33' 29" west.

Magnification 55

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.	mm.	sec.	
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17	1:24:55		1:28:45		1:30:25		1:31:45		2:28:00		12.0	20	Distance about 1435 miles with epi-center in Mexico. Considerable damage in Mexico City and vicinity.
18													
19													
20													
21	Seismic Tremors from a very distant disturbance from 16:48:00 to 17:31:00												
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													

P. T. Preliminary tremors, L. W. Large waves.
Greenwich mean time five hours faster than 75th meridian time.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **573** Date **June 17, 1928**, 192 Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began		1:24:55
Second preliminary tremors began		1:28:43
Long waves began	Instrument	1:30:23
Maximum		1:31:43
End of principal portion	Being	2:02:40
End of earthquake	Repaired	2:28:00
	mm.	mm.
Maximum amplitude		120
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves		15
Maximum		23
End of principal portion		
End portion		
Period of pendulum		
Magnification		

REMARKS: **100 K Bosch-Omeri instruments; E-W damping medium. Distance**
1425 miles with Epicenter in Mexico. Considerable damage in
Mexico City and vicinity according to Associated Press reports.



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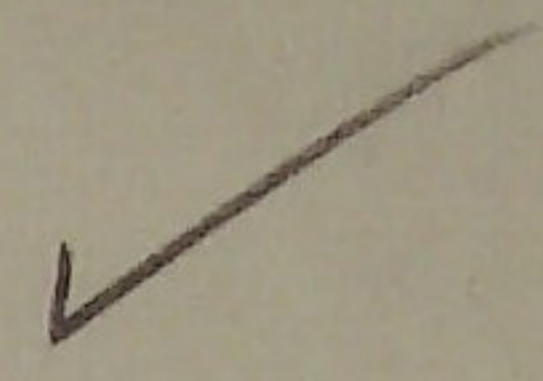
EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.



Seismic Record No. **574** Date **June 21**, 192**8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began		16:48:00
Second preliminary tremors began		17:06:00
Long waves began		
Maximum	(See E-W)	
End of principal portion		
End of earthquake		17:35:00
	mm.	mm.
Maximum amplitude		
	s.	s.
Average period of waves		
First preliminary tremors		
Second preliminary tremors		
Long waves		
Maximum		
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	10	10

REMARKS: **25K Bosch-Omori instruments; damping light. Distance about 9,000 miles.**

Note: Record of quake on E-W 25K instrument was shown more clearly than on 100K.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)

Month July Year 1928

Latitude 8° 57' 39" north.

~~Sta~~ **E-W-100-K**

Longitude 79° 33' 29" west.

Magnification 35

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1	Slight seismic tremors from a very distant disturbance 9:27:30 to 9:36:00												
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18	19:08:38		19:11:25		19:13:06		19:14:08		19:54:00		5.5	20	Distance about 1,000 mi. with epicenter probably in Peru.
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30	Slight seismic tremors 2:46:20 to 2:52:00											Distance & direction ? probably in Nicaragua	
31													

P. T. Preliminary tremors. L. W. Large waves.
Greenwich mean time five hours faster than 75th meridian time.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **575** Date **July 1**, 192**0**. Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began		
Second preliminary tremors began		
Long waves began	Slight seismic tremor from a very distant disturbance	
Maximum	9:27:50 to 9:56:00	
End of principal portion		
End of earthquake		
	mm.	mm.
Maximum amplitude		
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves		
Maximum		
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	55	55

REMARKS: **100K Bosch-Omori instruments; damping medium.**



THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS

EARTHQUAKE REPORT

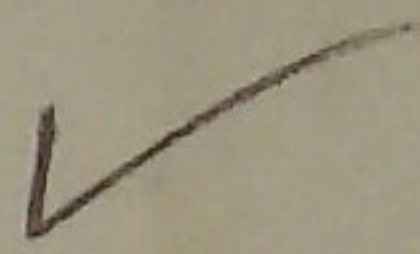
SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **376** Date **July 19**, 192**0** Greenwich mean time, midnight to midnight.



PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began.....		19:08:58
Second preliminary tremors began.....		19:11:25
Long waves began.....	Instrument	19:13:08
Maximum.....	out	19:14:08
End of principal portion.....	of	19:20:08
End of earthquake.....	order	19:54:00
	mm.	mm.
Maximum amplitude.....		5.5
Average period of waves.....	s.	s.
First preliminary tremors.....		
Second preliminary tremors.....		
Long waves.....		
Maximum.....		
End of principal portion.....		
End portion.....		
Period of pendulum.....		
Magnification.....		

REMARKS: **100K Bosch-Corri instruments, damping medium. Distance 1000 miles with epi-center probably in Peru.**



THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. 377 Date July 30, 1928 Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began.....		
Second preliminary tremors began.....		
Long waves began.....	<u>Instrument</u>	<u>Slight seismic</u>
Maximum.....	<u>clock being</u>	<u>tremors from</u>
End of principal portion.....	<u>repaired</u>	<u>2:46:20</u>
End of earthquake.....		<u>to 2:52:00</u>
	mm.	mm.
Maximum amplitude.....		
Average period of waves.....	s.	s.
First preliminary tremors.....		
Second preliminary tremors.....		
Long waves.....		
Maximum.....		
End of principal portion.....		
End portion.....		
Period of pendulum.....	<u>20</u>	<u>20</u>
Magnification.....	<u>35</u>	<u>35</u>

REMARKS: 100 K Bosch-Omori instruments, distance and direction (?)

(probably same quake reported in Nicaragua by Associated Press)

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)



Month ~~September~~ *August* Year **1928**

Latitude 8° 57' 39" north. **N-S-100K**
Longitude 79° 33' 29" west. **Magnification 35**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4	18:30:57		18:34:24		18:34:24		18:34:53		19:29:00		19	20	Distance about 1400 miles with epi-center in Mexico.
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													

P. T. Preliminary tremors, L. W. Large waves.
Greenwich mean time five hours faster than 75th meridian time.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)



Month August Year 1928

Latitude $8^{\circ} 57' 39''$ north. **EW-100K**
Longitude $79^{\circ} 33' 29''$ west. **Magnification 35**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>	<i>h.</i>	<i>m.</i>			
1													
2													
3													
4	18:30:48		18:34:36		18:34:36		18:34:50	19:18:00			12	20	Distance about 1400 miles with epi center in Mexico; considerable damage according to Press reports.
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													

P. T. Preliminary tremors, L. W. Large waves,
Greenwich mean time five hours faster than 75th meridian time.



THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **378** Date **August 4**, 192**8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began.....	18:30:57	18:30:48
Second preliminary tremors began.....	18:34:24	18:34:36
Long waves began.....	18:34:24	18:34:36
Maximum.....	18:34:53	18:34:50
End of principal portion.....	19:10:00	18:58:00
End of earthquake.....	19:29:00	19:18:00
	mm.	mm.
Maximum amplitude.....	19	12
Average period of waves.....	s.	s.
First preliminary tremors.....		
Second preliminary tremors.....		
Long waves.....	13	13
Maximum.....	12	12
End of principal portion.....		
End portion.....		
Period of pendulum.....	20	20
Magnification.....	35	35

REMARKS: **100-K Bosch-Onori instruments. Distance about 1400 miles with epicenter in Mexico. Considerable damage but no casualties according to Press reports.**

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)



Month September Year 1928

Latitude $8^{\circ} 57' 39''$ north. **100K-N-S**
Longitude $79^{\circ} 33' 29''$ west. **Magnification 30**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													Distance and direction unknown
28													
29													
30													
31													

Slight seismic tremors from 0:48:38 to 0:55:00
Very slight seismic tremors from 22:17:56 to 22:18:08

P. T. Preliminary tremors, L. W. Large waves,
Greenwich mean time five hours faster than 75th meridian time.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)

Month September Year 1938

Latitude 8° 57' 39" north.

100K-B-W

Longitude 79° 33' 29" west.

Magnification-35

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													Slight seismic tremors from 0:48:38 to 0:55:00
28													Distance and direction
28													Very slight seismic tremors from 22:17:56 to 22:18:08
28													
29													22:23:52 to 22:25:20
29													unknown
30													
31													

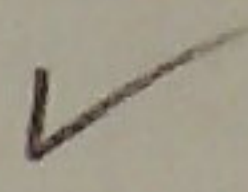
P. T. Preliminary tremors, L. W. Large waves,
Greenwich mean time five hours faster than 75th meridian time.



THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

EARTHQUAKE REPORT



SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **579** Date **September 27**, 192**8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began.....		
Second preliminary tremors began.....		
Long waves began.....	Slight seismic tremors from 0:48:38 to 0:55:00	
Maximum.....		
End of principal portion.....		
End of earthquake.....		
	mm.	mm.
Maximum amplitude.....		
Average period of waves.....	s.	s.
First preliminary tremors.....		
Second preliminary tremors.....		
Long waves.....		
Maximum.....		
End of principal portion.....		
End portion.....		
Period of pendulum.....		
Magnification.....		

REMARKS: **100K Bosch-Omori instruments; damping medium. Distance and direction ?**

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THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **300** Date **September 28**, 192**8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began.....		
Second preliminary tremors began.....		
Long waves began.....	Very slight seismic tremors from 22:17:56 to 22:19:08 and from 22:23:52 to 22:25:20.	
Maximum.....		
End of principal portion.....		
End of earthquake.....		
	mm.	mm.
Maximum amplitude.....		
Average period of waves.....	s.	s.
First preliminary tremors.....		
Second preliminary tremors.....		
Long waves.....		
Maximum.....		
End of principal portion.....		
End portion.....		
Period of pendulum.....		
Magnification.....		

REMARKS: **100-K** Bosch-Omori instruments; damping medium. Distance and direction ?

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)

Month October Year 1928Latitude 8° 57' 39" north.
Longitude 79° 33' 29" west.**NS - 100 k**
Magnification-35

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7													
8													
9	3:05:29		3:09:09		3:09:17		3:09:40		4:45:00		33.0	20	Distance about 1,350 miles, with epicenter off Mexican coast
10													
11	Very slight seismic tremors from 16:56:00 to 16:57:00 and from 22:10:00 to 22:12:00 Probably preshocks to following tremors.												
12	8:19:52		8:20:33		8:20:41		8:21:09		8:30:28		5.0	20	Distance about 240 miles
13	8:55:18		8:55:59		8:56:02		8:56:59		9:02:48		4.0	20	Distance about 240 miles
14	23:05:49		23:06:28		23:06:57		23:06:57		23:17:00		2.0	20	? Distance about 240 miles
15	2:01:08		2:01:47		2:01:51		2:01:59		2:06		1.0	20	Distance about 240 Mi.?
16													
17													
18													
19													
20													
21													
22													
23													
24													
25	12:34:58		12:36:24		12:36:52		12:37:56		13:01:00		7.5	20	Distance about 500 miles; epicenter in Nicaragua by press reports
26													
27													
28													
29													
30	6:32:04		6:32:40		6:32:52		6:33:19		6:39:01		3.5	20	Distance 250
31													

P. T. Preliminary tremors. L. W. Large waves.
Greenwich mean time five hours faster than 75th meridian time.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)

4th Quarter 1928

International
Seismological
CentreMonth October Year 1928Latitude 8° 57' 39" north. **NW - 100 K**
Longitude 79° 33' 29" west. **Magnification—55**

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1													
2													
3													
4													
5													
6													
7													
8													
9	5:05:27		5:09:09		5:09:09		5:05:37		4:05:00		21.5	20	Distance 1,550 miles with epicenter off Mexican coast
10	Very slight seismic tremors from 16:56:00 to 16:57:00 and from 22:10:00 to												
11	22:12:00; probably preshocks to tremors following.												
12	8:19:51		8:20:33		8:20:45		8:20:45		8:25:10		1.5	20	Distance about 240 mi.
13	8:55:09		8:55:52		8:56:03		8:56:08		9:03:00		1.5	20	Distance about 240 mi.?
14	23:05:48		23:06:28		23:06:35		23:07:08		23:17:00		0.5	20	Distance about 240 mi.?
15													
15	2:01:02		2:01:42		2:01:48		2:02:02		2:06:25		0.5	20	Distance about 240 mi.?
16													
17													
18													
19													
20													
21													
22													
23													
24													
25	12:34:53		12:36:23		12:37:09		12:37:55		13:00:00		1.5	20	Distance about 560 mi. epicenter in Nicaragua, according to press reports.
26													
27													
28													
29													
30	6:32:01		6:32:39		6:32:50		6:32:59		6:38:25		1.5	20	Distance, 250 miles.
31													

P. T. Preliminary tremors, L. W. Large waves,
Greenwich mean time five hours faster than 75th meridian time.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE

SECTION OF METEOROLOGY AND HYDROGRAPHY

EARTHQUAKE REPORT

International
Seismological
Centre

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **581** Date **Oct. 9**, 192**8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')			E-W COMPONENT (Azimuth 90° 07')		
	h.	m.	s.	h.	m.	s.
First preliminary tremors began.....	3	05	29	3	05	27
Second preliminary tremors began.....	3	09	09	3	09	09
Long waves began.....	3	09	17	3	09	09
Maximum.....	3	09	40	3	05	37
End of principal portion.....	3	33	40	3	25	00
End of earthquake.....	4	43	00	4	05	00
	mm.			mm.		
Maximum amplitude.....	35.0			21.5		
Average period of waves.....	s.			s.		
First preliminary tremors.....	5.5			5.5		
Second preliminary tremors.....	-			-		
Long waves.....	6.5			-		
Maximum.....	5.0			-		
End of principal portion.....	-			-		
End portion.....	-			-		
Period of pendulum.....	20			20		
Magnification.....	35			35		

REMARKS: **100 K Bosch-giori instruments; damping medium, distance about 1350 miles with epi-center in Mexico.**

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **502** Date **October 11, 1920**, Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')			E-W COMPONENT (Azimuth 90° 07')		
	h.	m.	s.	h.	m.	s.
First preliminary tremors began.....						
Second preliminary tremors began.....						
Long waves began.....	Very slight seismic tremors from 16:56:00 to 16:57:00;					
Maximum.....	and from 22:10:00 to 22:12:00					
End of principal portion.....						
End of earthquake.....						
			mm.			mm.
Maximum amplitude.....						
Average period of waves.....			s.			s.
First preliminary tremors.....						
Second preliminary tremors.....						
Long waves.....						
Maximum.....						
End of principal portion.....						
End portion.....						
Period of pendulum.....			20			20
Magnification.....			10			10

REMARKS: **100-K Bosch-Omori instruments; damping medium. Probably pre-shocks to tremors on records 503 and 504.**

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **333** Date **October 12,** 192 **8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began	8:19:52	8:19:51
Second preliminary tremors began	8:20:53	8:20:53
Long waves began	8:20:41	8:20:43
Maximum	8:21:09	8:20:45
End of principal portion	8:22:15	8:21:55
End of earthquake	8:30:23	8:25:10
	mm.	mm.
Maximum amplitude	5.0	1.5
Average period of waves	s.	s.
First preliminary tremors	-	-
Second preliminary tremors	3.5	2
Long waves	5	4
Maximum	7	7
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	35	35

REMARKS: **100-K Bosch-Onori instruments. Distance about 240 miles.**

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39'' N.

Long. 79° 33' 29'' W.

Altitude of Station, 90.5 feet.

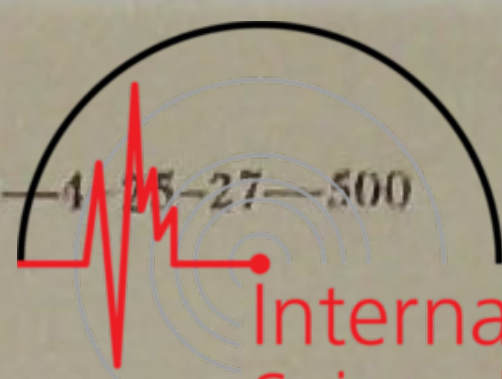
Seismic Record No. **584** Date **October 12,** 192**8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began	8:55:18	8:55:09
Second preliminary tremors began	8:55:59	8:55:52
Long waves began	8:56:02	8:56:05
Maximum	8:56:39	8:56:08
End of principal portion	8:57:30	8:57:25
End of earthquake	9:02:48	9:03:00
	mm.	mm.
Maximum amplitude	4.0	1.5
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves	7	4
Maximum	6	6
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	55	55

REMARKS: **100-K Bosch-Omeri instruments. Distance about 240 miles.**

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



International
Seismological
Centre

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **305** Date **October 12,** 192**9**. Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began	25:05:48 (?)	25:05:43 (?)
Second preliminary tremors began	25:06:25	25:06:25
Long waves began	25:06:37	25:06:35
Maximum	25:06:57	25:07:08
End of principal portion	25:07:32	25:07:50
End of earthquake	25:17:00	25:17:00
	mm.	mm.
Maximum amplitude	2	0.5
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves		
Maximum		
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	35	35

REMARKS: **100-K Bosch-Corsi instruments; damping medium. Distance about 240 miles. (?)**



THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **386** Date **October 15,** 192**8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s. (?)	h. m. s. (?)
First preliminary tremors began	2:01:08	2:01:08
Second preliminary tremors began	2:01:47	2:01:48
Long waves began	2:01:51	2:01:48
Maximum	2:01:59	2:02:02
End of principal portion	2:02:25	2:02:28
End of earthquake	2:06:00	2:06:25
	mm.	mm.
Maximum amplitude	1	0.5
	s.	s.
Average period of waves		
First preliminary tremors		
Second preliminary tremors		
Long waves		
Maximum		
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	35	35

REMARKS: **100-K Bosch-Onori instruments; damping medium. Distance about 310 miles. (?)**

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS

International
Seismological
Centre

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **337** Date **October 25,** 192**8**. Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began	12:34:58	12:34:53
Second preliminary tremors began	12:36:24	12:36:23
Long waves began	12:36:52	12:37:09
Maximum	12:37:56	12:37:55
End of principal portion	12:43:08	12:43:13
End of earthquake	13:01:00	13:00:00
	mm.	mm.
Maximum amplitude	7.5	1.5
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors	5	
Long waves	7	5
Maximum	5	5
End of principal portion	10	
End portion		
Period of pendulum	20	20
Magnification	35	35

REMARKS: **100-K Bosch-Omori instruments; damping medium. Distance about 500 miles.**
Epi-center in Nicaragua, according to press reports.

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DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **588** Date **October 30**, 192**8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began	6:32:04	6:32:01
Second preliminary tremors began	6:32:40	6:32:39
Long waves began	6:32:52	6:32:50
Maximum	6:33:19	6:32:59
End of principal portion	6:34:21	6:34:05
End of earthquake	6:39:01	6:38:25
	mm.	mm.
Maximum amplitude	3.5	1.5
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves	4	2
Maximum	7	5
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	55	55

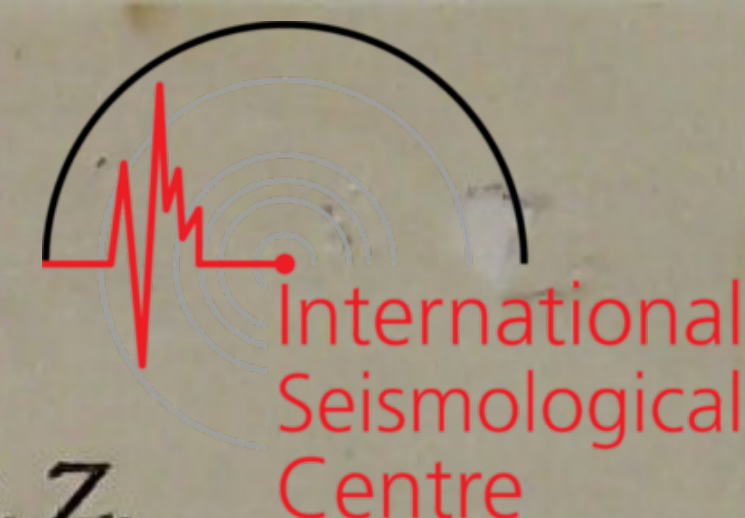
REMARKS: **100-K Bosch-Cmori instruments; damping medium. Distance about 250 miles.**

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)



Month November Year 1928

Latitude 8° 57' 39" north.
Longitude 79° 33' 29" west.

NS - 100 K

Greenwich mean time midnight to midnight.

Magnification - 35

MR 73363

DATE	P. T. COMMENCE	2D GROUP COMMENCE	L. W. COMMENCE	MAXIMUM	END	MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS	
1	Slight tremors from distant disturbance between 4:21:00 and 4:46:00. Distance and								
2	16:10:33	16:11:45	16:12:13	16:12:40	16:30:00	7.5	20	Distance = direction? Distance about 390 mi. Epi-center in Colombia?	
3									
4	Slight seismic tremors from 19:53:00 to 19:56:00							20	Distance approxi- mately 400 miles.
5									
6									
7									
8	Seismic tremors from distant disturbance between 16:28 and 19:36.								Distance and direc- tion?
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									

P. T. Preliminary tremors, L. W. Large waves,
Greenwich mean time five hours faster than 75th meridian time.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)



Month November Year 1928

Latitude 8° 57' 39" north.

EW - 100 K

Longitude 79° 33' 29" west.

Magnification - 55

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE		2D GROUP COMMENCE		L. W. COMMENCE		MAXIMUM		END		MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS
	h.	m.	h.	m.	h.	m.	h.	m.	h.	m.			
1	<i>(Slight tremors from distant disturbance between 4:21:00 and 4:46:00. Distance and direction?</i>												
2	16:10:29	16:11:35	16:12:11	16:12:25	16:28:00	5.0	20	Distance 390 miles. Epi-center in Colombia?					
3													
4	19:52:30	19:53:38	-	-	19:56:00	-	20	Distance approximately 400 miles.					
5													
6													
7													
8	<i>Seismic tremors from distant disturbance between 16:28 and 19:36</i>												
9	Distance and direction?												
10													
11													
12													
13													
14													
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22													
23													
24													
25													
26													
27													
28													
29													
30													
31													

P. T. Preliminary tremors, L. W. Large waves, Greenwich mean time five hours faster than 75th meridian time.



THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **599** Date **November 1,** 192**8** Greenwich mean time, midnight to midnight.



PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began.....		
Second preliminary tremors began.....		
Long waves began slight tremors from distant disturbance		
Maximum between 4:21:00 and 4:46:00.		
End of principal portion.....		
End of earthquake.....		
	mm.	mm.
Maximum amplitude.....		
Average period of waves.....	s.	s.
First preliminary tremors.....		
Second preliminary tremors.....		
Long waves.....		
Maximum.....		
End of principal portion.....		
End portion.....		
Period of pendulum.....		
Magnification.....		

REMARKS: **100-K Bosch-Omori instruments; damping medium. Distance and direction ?**

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **590** Date **November 1**, 1928. Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')			E-W COMPONENT (Azimuth 90° 07')		
	h.	m.	s.	h.	m.	s.
First preliminary tremors began	16	10	33	16	10	29
Second preliminary tremors began	16	11	45	16	11	35
Long waves began	16	12	13	16	12	11
Maximum	16	12	40	16	12	25
End of principal portion	16	14	51	16	15	35
End of earthquake	16	30	00	16	28	00
	mm.			mm.		
Maximum amplitude	7.5			5.0		
Average period of waves	s.			s.		
First preliminary tremors						
Second preliminary tremors						
Long waves	5.0			6.5		
Maximum	5.0			7.0		
End of principal portion						
End portion						
Period of pendulum	20			20		
Magnification	35			35		

REMARKS: **100-K Bosch - Geori instruments; damping medium.**

Distance about 590 miles; direction ?

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DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **391** Date **November 1**, 192**8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began		19: 52: 30 (?)
Second preliminary tremors began	Slight seismic	19: 53: 38
Long waves began	tremors from	-
Maximum	19: 53: 00	-
End of principal portion	to 19: 56: 00	-
End of earthquake		19: 56: 00
	mm.	mm.
Maximum amplitude		
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves		
Maximum		
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	55	55

REMARKS: **100-K Bosch-Omeri instruments; damping medium.**

Distance approximately 400 miles.



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SECTION OF METEOROLOGY AND HYDROGRAPHY

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **392** Date **November 8,** 192**6** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began.....		
Second preliminary tremors began.....		
Long waves began.....	Seismic tremors from distant disturbance between	
Maximum.....	16:23 and 19:36	
End of principal portion.....		
End of earthquake.....		
	mm.	mm.
Maximum amplitude.....		
Average period of waves.....	s.	s.
First preliminary tremors.....		
Second preliminary tremors.....		
Long waves.....		
Maximum.....		
End of principal portion.....		
End portion.....		
Period of pendulum.....		
Magnification.....		

REMARKS: **100 K-Bosch-Omori instruments damping medium.**
Distance and direction?

.....

.....

.....

.....

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)



December

1928

Month Year

Latitude 8° 57' 39" north.

NS - 100 - K

Longitude 79° 33' 29" west.

Magnification - 35

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE	2D GROUP COMMENCE	L. W. COMMENCE	MAXIMUM	END	MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS	
1	4:14:51	4:20:55	4:24:19	4:21:21	5:52:00	0.2	20	Distance 3,000 miles Ep center in Chile with considerable damage to life and property according to Press Report	
2									
3									
4	4:28:40	4:35:12	4:38:29	4:35:44	5:27:00	0.5	20	Distance 3,000 miles, direction south probably same epi-center as of December 1st.	
5									
6									
7	8:30:00	8:30:20	8:30:22	8:30:22	8:32:06	1.5	20	Distance 110 miles. Direction ?	
8	Slight tremors from distant disturbance between 12:23:00 and 12:46:00								Distance and Direction ?
9									
10	Slight seismic tremors between 13:58:00 and 14:21:00.								Distance and Direction ?
11									
12	23:41:42	23:42:16	23:42:38	23:45:00	23:50:00	1.0	20	Distance 200 miles. Direction ?	
13									
14									
15									
16	Very slight seismic tremors from distant disturbance between 0:20:00 and 0:35:00								Distance and Direction ?
17									
18									
19	Very slight seismic tremors from distant disturbance between 12:15:00 and 13:30:00								Time only approximate Trace poorly defined. Distance & Direction ?
20									
21									
22									
23									
24									
25									
26	21:37:34	21:41:26	21:43:02	21:43:50	22:04:00	0.5	20	Distance 1,450 miles. Direction ?	
27									
28									
29									
30									
31									

P. T. Preliminary tremors, L. W. Large waves,
Greenwich mean time five hours faster than 75th meridian time.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

REGISTER OF EARTHQUAKES AT BALBOA HEIGHTS, C. Z.

(AS RECORDED BY BOSCH-OMORI SEISMOGRAPH)

Month December Year 1923Latitude 8° 57' 39" north. EW - 100 K
Longitude 79° 33' 29" west. Magnification - 35

Greenwich mean time midnight to midnight.

MR 73363

DATE	P. T. COMMENCE	2D GROUP COMMENCE	L. W. COMMENCE	MAXIMUM	END	MAX. AMPLITUDE	PERIOD OF PENDULUM	REMARKS	
1	4:24:35 m.	4:31:01 m.	4:24:19 m.	4:25:05 m.	5:53:00 m.	6.0 mm.	20 sec.	Distance 3,000 miles Epi Center in Chile with considerable damage to life and property according to press reports.	
2									
3									
4	Slight tremors between 4:28:44 and 5:27:00								Distance 3,000 miles probably same epi- center as that of December 1st.
5	8:50:00	8:50:30	8:50:22	8:50:25	8:52:08	1.2	20	Distance 110 miles. Direction ?	
6									
7	Slight tremors from distant disturbance between 12:28:00 and 12:46:00								Distance and Direction?
8									
9	Slight seismic tremors between 13:58:00 and 14:21:00								Distance and Direction?
10									
11									
12	23:41:44	23:42:18	23:42:41	23:43:19	23:50:00	1.0	20	Distance 200 miles. Direction ?	
13									
14									
15									
16	Very slight seismic tremors from distant disturbance between 0:20:00 and 0:55:00								Distance and Direction?
17									
18									
19	Very slight seismic tremors from distant disturbance between 12:15:00 and 12:30:00								Trace poorly defined. Distance and Direction?
20									
21									
22									
23									
24									
25									
26	Slight Tremors between 21:37:54 and 22:04:00								Distance 1,450 miles. Direction ?
27									
28									
29									
30									
31									

P. T. Preliminary tremors, L. W. Large waves,
Greenwich mean time five hours faster than 75th meridian time.



THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF METEOROLOGY AND HYDROGRAPHY

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **393** Date **December 1**, 192**8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began.....	4:14:21	4:14:55
Second preliminary tremors began.....	4:20:55	4:21:01
Long waves began.....	4:24:19	4:24:19
Maximum.....	4:21:11	4:25:05
End of principal portion.....	4:50:00	4:46:30
End of earthquake.....	5:52:00	5:53:00
	mm.	mm.
Maximum amplitude.....	6.2	6.0
Average period of waves.....	s.	s.
First preliminary tremors.....	6	4
Second preliminary tremors.....	7	5
Long waves.....	19	19
Maximum.....	15	18
End of principal portion.....	23	20
End portion.....	12	--
Period of pendulum.....	20	20
Magnification.....	55	55

REMARKS: **100K - Bosch-Omeri instruments; damping medium.**

Distance 3000 miles

Epi-center in Chile, with considerable damage to life and property according to press reports.



THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.



Seismic Record No. **324** Date **December 8**, 192 **8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began	4:33:40	slight
Second preliminary tremors began	4:35:12	tremors
Long waves began	4:38:20	between
Maximum	4:35:44	4:33:40
End of principal portion	?	and 5:27:00
End of earthquake	5:27:00	
	mm.	mm.
Maximum amplitude	0.5	
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves		
Maximum		
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	55	55

REMARKS: **100-K-Bosch-Oneri instruments; damping medium. Distance, 300 miles. Direction probably south. Probably same epicenter as that of December 1st.**

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DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **395** Date **December 3,** 192 **8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began	8:30:00	8:30:00
Second preliminary tremors began	8:30:20	8:30:20
Long waves began	8:30:22	8:30:22
Maximum	8:30:22	8:30:25
End of principal portion	8:30:57	8:30:53
End of earthquake	8:32:06	8:32:06
	mm.	mm.
Maximum amplitude	1.5	1.2
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves	2	1
Maximum	2	1
End of principal portion		
End portion		
Period of pendulum	20	20
Magnification	35	35

REMARKS: **100 - K - Bosch - Oneri instruments, damping medium.**

Distance about 110 miles. Direction ?



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SECTION OF SURVEYS

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **396** Date **December 3**, 19**13** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')			E-W COMPONENT (Azimuth 90° 07')		
	h.	m.	s.	h.	m.	s.
First preliminary tremors began						
Second preliminary tremors began						
Long waves began Slight tremors from distant disturbance						
Maximum between 12:28 and 12:46.						
End of principal portion						
End of earthquake						
				mm.		mm.
Maximum amplitude						
Average period of waves					s.	
First preliminary tremors						
Second preliminary tremors						
Long waves						
Maximum						
End of principal portion						
End portion						
Period of pendulum						
Magnification						

REMARKS: **100-X-Bosch Onori instruments; damping medium. Distance and direction?**



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SECTION OF SURVEYS

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. 397 Date December 4, 1928 Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')			E-W COMPONENT (Azimuth 90° 07')		
	h.	m.	s.	h.	m.	s.
First preliminary tremors began						
Second preliminary tremors began						
Long waves began	Slight seismic tremors between 13:58:00 and 14:21:00.					
Maximum						
End of principal portion						
End of earthquake						
			mm.			mm.
Maximum amplitude						
Average period of waves			s.			s.
First preliminary tremors						
Second preliminary tremors						
Long waves						
Maximum						
End of principal portion						
End portion						
Period of pendulum						
Magnification						

REMARKS: **100-K-Bosch-Omori instruments; damping medium. Distance and direction?**

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DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **598** Date **December 12**, 192**8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began	23: 41: 42	23: 41: 44
Second preliminary tremors began	23: 42: 16	23: 42: 18
Long waves began	23: 42: 38	23: 42: 41
Maximum	23: 43: 00	23: 43: 19
End of principal portion	23: 47: 36	23: 47: 47
End of earthquake	23: 50: 00	23: 50: 00
	mm.	mm.
Maximum amplitude	1	1
Average period of waves	s.	s.
First preliminary tremors	-	-
Second preliminary tremors	2 ?	-
Long waves	4	3
Maximum	4	3
End of principal portion	-	-
End portion	-	-
Period of pendulum	20	20
Magnification	35	35

REMARKS: **100-K Bosch-Omori instruments; damping medium; distance about 200 miles; direction (?).**



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DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **399** Date **December 16**, 192**8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began		
Second preliminary tremors began		
Long waves began	Very slight seismic tremors from distant disturbance	
Maximum	between 0:20:00 and 0:35:00	
End of principal portion		
End of earthquake		
	mm.	mm.
Maximum amplitude		
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves		
Maximum		
End of principal portion		
End portion		
Period of pendulum		
Magnification		

REMARKS: **100-K-Bosch-Onori instruments; damping medium. Distance and direction?**

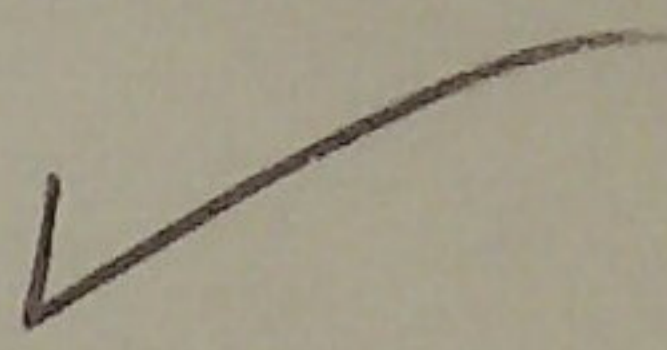


THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS



Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. ⁶⁰⁰~~400~~ Date **December 19,** 192**8** Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began		
Second preliminary tremors began		
Long waves began	Very slight seismic tremors from distant disturbance between	
Maximum	12:15:00 and 13:30:00	
End of principal portion		
End of earthquake		
	mm.	mm.
Maximum amplitude		
Average period of waves	s.	s.
First preliminary tremors		
Second preliminary tremors		
Long waves		
Maximum		
End of principal portion		
End portion		
Period of pendulum		
Magnification		

REMARKS: **100-K Bosch-Omori instruments; damping medium. Distance and direction?**
Time is only approximate as trace was very poorly defined.

THE PANAMA CANAL

DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS

EARTHQUAKE REPORT

SEISMOGRAPH STATION, BALBOA HEIGHTS

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

Altitude of Station, 90.5 feet.

Seismic Record No. **601** Date **Dec. 26, 1928**, 192... Greenwich mean time, midnight to midnight.

PHASE	N-S COMPONENT (Azimuth 180° 23')	E-W COMPONENT (Azimuth 90° 07')
	h. m. s.	h. m. s.
First preliminary tremors began	21:37:34	Slight tremors
Second preliminary tremors began	21:41:26	between
Long waves began	21:43:02	21:37:34
Maximum	21:43:50	and
End of principal portion	21:44:46	22:04:00
End of earthquake	22:04:00 ?	
	mm.	mm.
Maximum amplitude	.6	
Average period of waves	s.	s.
First preliminary tremors	-	
Second preliminary tremors	-	
Long waves	8	
Maximum	8	
End of principal portion	-	
End portion	-	
Period of pendulum	20	20
Magnification	35	35

REMARKS: **100-K- Bosch Omori instruments, damping medium. Distance about
1450 miles. Direction ?**

