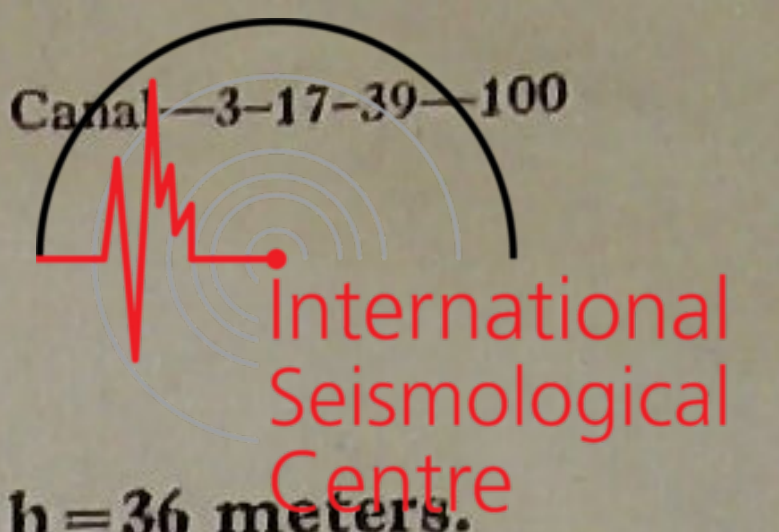


THE PANAMA CANAL
DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

h = 36 meters.

Lithologic foundation: Basalt.

Time Correction: Within 1.0 sec.

INSTRUMENTS—FIXED CONSTANTS

INSTRUMENTS	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Wood-Anderson	I	Photographic	Magnetic	60 mm. per min.	1.3 gr.
Bosch-Omori	II	Smoked Sheet	Air	15 mm. per min.	100 kg.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENTS	COMPONENT	T ₀	v	h	DETERMINED
Wood-Anderson	N-S	0.80	2740	8 to 1	August 24, 1939
Wood-Anderson	E-W	0.80	2740	12 to 1	" " "
Bosch-Omori					
Bosch-Omori		NOT OPERATING			

Month January, 1942

Page No. 1

No. and Date	Phase	Time G. M. T.			Period	AMPLI- TUDE mm	REMARKS
		h	m	s			
#1 Jan. 3	1FNE	15	58	30			
	LN	15	58	59			
	LE	15	58	58			
	MN	15	59	01		15.0	
	ME	15	59	08		10.0	
	CN	15	59	24			
	CE	15	59	27			
	FNE	16	01	00			
#2 Jan. 5		19	40				
		to					
		19	46				
#3 Jan. 5		22	34				
		to					
		22	41				
#4 Jan. 6		2	48				
		to					
		2	52				
#5 Jan. 7		6	47				
		to					
		6	51				
#6 Jan. 7	1FNE	10	10	08			
	LN	10	10	36			
	MN	10	10	38		51.0	Distance about 85 miles
	CN	10	11	19			
	FN	10	16	00			

SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Month January, 1942Page No. 2

No. and Date	Phase	Time G. M. T.			Period s	AMPLI- TUDE mm	REMARKS
		h	m	s			
#7 Jan. 7		23: 16					
		to					
		23: 19					
#8 Jan. 8		15: 16					
		to					
		15: 24					
No Record from 2:07:22 to 3:10:54 GMT, Jan. 12, 1942, due to Power failure.							
No Record from 9:23:57 to 10:50:36 GMT, Jan. 15, 1942, due to Power failure.							
#9 Jan. 15		15: 40					
		to					
		15: 42					
#10 Jan. 26	FNE MN ME FNE	5: 57: 18					
		5: 58: 03					
		5: 58: 05					
		6: 00					
#11 Jan. 27	FNE SNE MN ME FNE	0: 46: 51					
		0: 47: 44					Approximate distance 300 miles.
		0: 48: 13			2.5		
		0: 48: 21			2.5		
		0: 50					
#12 Jan. 27	FNE SNE MN ME FNE	0: 59: 28					
		1: 00: 19					Approximate distance 290 miles.
		1: 00: 52			6.0		
		1: 00: 50			4.0		
		1: 00: 4					
#13 Jan. 27	FNE MN ME FNE	3: 17: 37					
		3: 18: 20			11.0		
		3: 18: 34			6.0		
		3: 22					

THE PANAMA CANAL
DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

h = 36 meters.

Lithologic foundation: Basalt.

Time Correction: Within 1.0 sec.

INSTRUMENTS—FIXED CONSTANTS

INSTRUMENTS	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Wood-Anderson	I	Photographic	Magnetic	60 mm. per min.	1.3 gr.
Bosch-Omori	II	Smoked Sheet	Air	15 mm. per min.	100 kg.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENTS	COMPONENT	T ₀	V	h	DETERMINED
Wood-Anderson	N-S	0.80	2740	8 to 1	August 24, 1939
Wood-Anderson	E-W	0.80	2740	12 to 1	August 24, 1939
Bosch-Omori)		Not Operating			
Bosch-Omori)					

Month February 1942Page No. 4

No. and Date	Phase	Time	Period	AMPLI-	REMARKS
		G. M. T.		TUDE	
		h m s		mm	
#16 Feb. 1		20:37 to 24:40			
#17 Feb. 6		2:40 to 2:43			
#18 Feb. 7		3:07 to 3:10			
#19 Feb. 8		3:02 to 3:05			
#20 Feb. 12		12:16 to 12:18			
#21 Feb. 12		14:09 to 14:13			
#22 Feb. 14		15:50 to 15:53			
#23 Feb. 22		14:18 to 14:20			

SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Month February, 1942Page No. 5

No. and Date	Phase	Time G. M. T.			Period s	AMPLI- TUDE mm	REMARKS
		h	m	s			
#24 Feb. 23	ePNE	21	48	22			Approximate distance 135 miles
	LNE	21	49	05			
	MN	21	49	16		12.0	
	ME	21	49	17		17.5	
	CNE	21	49	54			
	FNE	21	54				
#25 Feb. 24	ePNE	15	59	16			Approximate distance 135 miles
	LNE	15	59	59			
	MN	16	00	04		5.5	
	ME	16	00	10		5.0	
	CNE	16	00	23			
	FNE	16	02				
#26 Feb. 26		9	37				
			to				
			9:41				

G. E. MATTHEW
Chief Hydrographer

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SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

h = 36 meters.

Lithologic foundation: Basalt.

Time Correction: Within 1.0 sec.

INSTRUMENTS—FIXED CONSTANTS

INSTRUMENTS	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Wood-Anderson	I	Photographic	Magnetic	60 mm. per min.	1.3 gr.
Bosch-Omori	II	Smoked Sheet	Air	15 mm. per min.	100 kg.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENTS	COMPONENT	T.	V	h	DETERMINED
Wood-Anderson	N-S	0.80	2740	8 to 1	August 24, 1939
Wood-Anderson	E-W	0.80	2740	12 to 1	August 24, 1939
Bosch-Omori)		Not operating			
Bosch-Omori)					

Month March 1942

Page No. 6

No. and Date	Phase	Time G. M. T.			Period	AMPLI- TUDE mm	REMARKS
		h	m	s			
#27 Mar. 1	ine	9	55	07			Approximate distance 850 miles
	en	9	57	33			
	n	10	00				
	fne	10	25				
#28 Mar. 2	ine	8	40	03		28.0	Felt and reported by a few residents of Panama City and Ancon on the Pacific Coast, and by residents of New Cristobal on the Atlantic coast, and also by observers at the hydrographic Station of Chico and Candelaria on the upper Chagres River. Approximate distance - about 35 miles. Intensity II Modified Mercalli Scale
	LE	8	40	11			
	ME	8	40	13			
	CE	8	40	40			
	FE	8	43				
#29 Mar. 2.	ePPE	14	08	17			Approximate distance 130 miles
	LE	14	08	59			
	ME	14	09	10			
	FE	14	11				
# 30 Mar. 3		14	15				
		to					
		14	19				
# 31 Mar. 5		18	01				
		to					
		18	04				
# 32 Mar. 7	ePNE	8	17	09			Approximate distance 70 miles
	LNE	8	17	33			
	FNE	8	19				

SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Month March 1942Page No. 7

No. and Date	Phase	Time G. M. T.			Period s	AMPLI- TUDE mm	REMARKS
		h	m	s			
# 33 Mar. 7	ePNE LNE FNE	17:17:02 17:17:12 17:18				Approximate distance 30 miles	
# 34 Mar. 9	en MN IN MN FN	10:22:31 10:22:43 10:24:43 10:24:49 10:28				Possibly 2 quakes imposed	
# 35 Mar. 13	ePNE LNE MN FNE	2:32:56 2:33:15 2:33:17 2:36			32.5	Approximate distance about 60 miles Felt locally. Intensity I Modified Mercalli Scale.	
# 36 Mar. 17		21:29 to 21:31					
# 37 Mar. 19	ePNE LNNE MN ME FNE	7:39:19 7:39:48 7:39:59 7:39:55 7:43			11.5 9.0	Approximate distance 85 miles	
# 38 Mar. 19		11:42 to 11:46					
Record lost from 23:39 G.M.T. March 24 to 17:01 G.M.T. March 26 due to failure of electric current operating seismograph clocks.							
# 39 Mar. 29		8:28 to 8:31					

G. E. MATTHEW
Chief Hydrographer

THE PANAMA CANAL
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SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

h = 36 meters.

Lithologic foundation: Basalt.

Time Correction: Within 1.0 sec.

INSTRUMENTS—FIXED CONSTANTS

INSTRUMENTS	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Wood-Anderson	I	Photographic	Magnetic	60 mm. per min.	1.3 gr.
Bosch-Omori	II	Smoked Sheet	Air	15 mm. per min.	100 kg.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENTS	COMPONENT	T _c	V	h	DETERMINED
Wood-Anderson	N-S	0.80	2740	8 to 1	Aug. 24, 1939
Wood-Anderson	E-W	0.80	2740	12 to 1	Aug. 24, 1939
Bosch-Omori	Not operating				
Bosch-Omori					

Month April 1942

Page No. 8

No. and Date	Phase	Time G. M. T.			Period	AMPLI- TUDE mm	REMARKS
		h	m	s			
#40 Apr. 2	ePNE	10	08	55		10.5 10.0	Distance about 85 miles
	LN	10	09	23			
	LE	10	09	24			
	MN	10	09	34			
	ME	10	09	27			
	FNE	10	13				
#41 Apr. 8	ENE	16	00	24			Distance estimated as about 10,000 miles. A California Seismological Station reports a distance of 7,500 miles. Vague reports indicate a major earthquake in the Phillipine Islands.
	eNE	16	14	10			
	eNE	16	56				
	eNE	17	00	20			
#42 Apr. 11	eN	1	28	14			Distant quake
	eN	1	37	11			
	eN	1	40	37			
#43 Apr. 15	ePN	3	49	08			
	MN	3	50	03			
	FN	3	52				
#44 Apr. 15	ePN	5	42	20		15.0	Distance about 135 miles
	LN	5	43	03			
	MN	5	43	20			
	FN	5	47				
#45 Apr. 19	ePN	20	17	00		27.0	Distance about 100 miles
	LN	20	17	28			
	MN	20	17	33			
	FN	20	27				

SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Month April - 1942Page No. 9

No. and Date	Phase	Time G. M. T.			Period s	AMPLI- TUDE mm	REMARKS
		h	m	s			
#46 April 19	ePN	23	17	05	37.0	Distance about 75 miles	
	LN	23	17	30			
	MN	23	17	37			
	F N	23	24				
#47 April 22	ePN	11	49	47	57.0	Distance about 85 miles	
	LN	11	50	14			
	MN	11	50	19			
	CN	11	51	04			
	FN	12	06				
#48 April 22	ePN	12	09	57	6.0	Distance about 75 miles	
	LN	12	10	22			
	MN	12	10	25			
	FN	12	13				
#49 April 22	ePN	13	22	44	16.0	Distance about 85 miles	
	LN	13	23	10			
	MN	13	23	13			
	FN	13	28				
#50 April 25	ePN	0	20	16			
	MN	0	20	47			
	FN	0	23				
#51 April 25	iPN	20	17	21	13.5	Distance about 25 miles	
	LN	20	17	30			
	MN	20	17	31			
	FN	20	19				
#52 April 26	ePN	4	11	57	7.0	Distance about 100 miles	
	LN	4	12	30			
	MN	4	12	32			
	FN	4	14				
#53 April 27		15	44				
		to	15	46			

SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

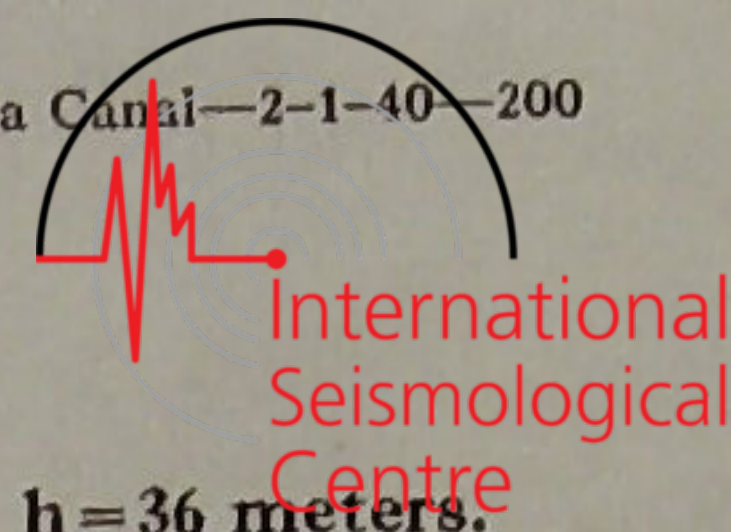
Month April - 1942

Page No. 10

No. and Date	Phase	Time G. M. T.			Period s	AMPLI- TUDE mm	REMARKS
		h	m	s			
#54 April 29		1:	06				
		To					
		1:	08				

G. E. MATTHEW
Chief Hydrographer

THE PANAMA CANAL
DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

h = 36 meters.

Lithologic foundation: Basalt.

Time Correction: Within 1.0 sec.

INSTRUMENTS—FIXED CONSTANTS

INSTRUMENTS	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Wood-Anderson	I	Photographic	Magnetic	60 mm. per min.	1.3 gr.
Bosch-Omori	II	Smoked Sheet	Air	15 mm. per min.	100 kg.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENTS	COMPONENT	T ₀	V	h	DETERMINED
Wood-Anderson	N-S	0.80	2740	8-1	August 24, 1939
Wood-Anderson	E-W	0.80	2740	12-1	August 24, 1939
Bosch-Omori			Not operating		
Bosch-Omori			Not operating		

Month May, 1942

Page No. 11

No. and Date	Phase	Time	Period	AMPLI-	REMARKS
		G. M. T.		TUDE	
		h m s		mm	
#55 May 1		17:59 to 18:01			
#56 May 2	1FNE LNE MNE FNE	20:23:50 20:24:48 20:25:14 20:31		16.0	Distance about 180 miles
#57 May 4	eFNE LNE FNE	14:56:15 14:57:17 15:01			Distance about 190 miles
#58 May 6	eFNE FNE	22:53:35 23:02			
#59 May 11	eFNE FNE	16:51:17 16:55			
#60 May 14	eFNE eSNE LNE MNE	2:15:33 2:17:22 2:17:59 2:18:14		N-25 E-14	Distance about 650 miles. Cable dispatches state that over 100 people were killed and 100 missing in towns along the Ecuadorean Pacific coast. Several modern buildings of several stories crumbled causing general panic. Quake was felt with greatest intensity in the City of Guayaquil.
#61	ePNE eSNE FNE	2:56:34 2:58:21 5:00			Superposed on end portion of No. 60

SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Month May, 1942Page No. 12

No. and Date	Phase	Time G. M. T.			Period s	AMPLI- TUDE mm	REMARKS
		h	m	s			
#62 May 14	ePNE FNE	8:41 9:00					
#63 May 14	eDNE FNE	15:48:52 15:57					
#64 May 15	eDNE FNE	10:52:45 11:12					
#65 May 15	ePNE FNE	11:53:30 12:15					
#66 May 15		18:14 to 18:19					
#67 May 16		0:26 to 0:29					
#68 May 16		5:31 to 5:35					
#69 May 16		8:01 to 8:05					
#70 May 17	ePNE eSN eSE FNE	15:16:31 15:18:01 15:17:54 16:00					Approximate distance 515 miles
#71 May 19	ePNE eSNE LNE FNE	8:53:33 8:54:12 8:54:41 8:57					Approximate distance 215 miles
#72 May 21	ePNE eSNE FNE	0:14:36 0:15:11 0:18					Approximate distance 545 miles

SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

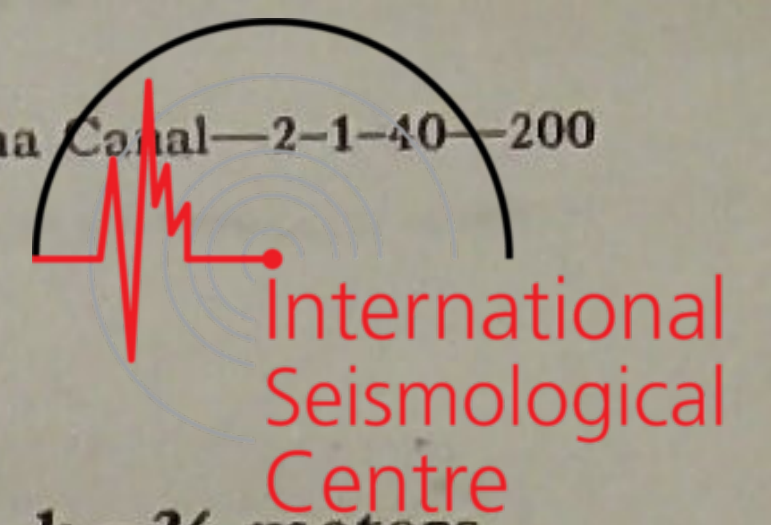
Month -----

Page No. 13 -----

No. and Date	Phase	Time G. M. T.			Period s	AMPLI- TUDE mm	REMARKS
		h	m	s			
#73 May 22	eFNE eSNE FNE	10:32:21 10:33:59 10:42				Approximate distance 560 miles	
#74 May 25	eDN eSN FN	17:36:19 17:36:31 17:38				Approximate distance 60 miles	
#75 May 28	eFNE FNE	1:20:35 1:45					
#76 May 28	eFNE FNE	11:59:10 12:02					
#77 May 30	eFNE eSNE LNE MNE CNE FNE	8:35:46 8:36:32 8:36:45 8:36:48 8:37:07 8:43				Approximate distance 260 miles	

G. E. MATTHEW
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THE PANAMA CANAL
DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



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INSTRUMENTS—FIXED CONSTANTS

INSTRUMENTS	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED		MASS
				60 mm. per min.	15 mm. per min.	1.3 gr. 100 kg.
Wood-Anderson	I	Photographic	Magnetic	60 mm. per min.		1.3 gr.
Bosch-Omori	II	Smoked Sheet	Air	15 mm. per min.		100 kg.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENTS	COMPONENT	T _c	V	h	DETERMINED
					August 24, 1939 August 24, 1939
Wood-Anderson	N-S	0.80	27.40	8 to 1	August 24, 1939
Wood-Anderson	E-W	0.80	27.40	12 to 1	August 24, 1939
Bosch-Omori					
Bosch-Omori		Not operating			

Month June 1942Page No. 14

No. and Date	Phase	Time G. M. T.			Period	AMPLI- TUDE mm	REMARKS	
		h	m	s				
#78	ePNE	10	50				Nearby, phases indistinct	
June 7	FNE	11	07					
#79	ePNE	10	24	13			Distant, phases indistinct	
June 12	FNE	10	45					
		Power off from 17:54 to 21:26 GMT, June 14, 1942						
#80	ePNE	7	44	56				
June 16	eSNE	7	46	28			Approximate distance 525 miles	
	FNE	7	54					
#81	ePNE	21	07	20				
June 16	eSNE	21	08	49			Approximate distance 510 miles	
	FNE	21	32					
#82	ePNE	23	32	42			Nearby, phases indistinct.	
June 24	FNE	23	37					
#83	ePNE	6	18	13			Nearby, phases indistinct	
June 25	FNE	6	22					
#84	ePNE	10	50	20			Nearby, phases indistinct.	
June 25	FNE	10	53					
#85	ePNE	7	09	40			Nearby, phases indistinct	
June 27	FNE	7	15					

SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Month June 1942Page No. 15

No. and Date	Phase	Time G. M. T.			Period s	AMPLI- TUDE mm	REMARKS
		h	m	s			
#86 June 29	ePN ePE eSN FNE	6	34	30 28 42 51			Distance about 2790 miles. Reported strangely felt in Santiago. Chile with some damage and one death due to heart failure
							G. E. MATTHEW Chief Hydrographer

THE PANAMA CANAL
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INSTRUMENTS—FIXED CONSTANTS

INSTRUMENTS	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Wood-Anderson	I	Photographic	Magnetic	60 mm. per min.	1.3 gr.
Bosch-Omori	II	Smoked Sheet	Air	15 mm. per min.	100 kg.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENTS	COMPONENT	T.	V	h	DETERMINED
Wood-Anderson	N-S	0.80	2740	8 to 1	August 24, 1939
Wood-Anderson	E-W	0.80	2740	12 to 1	" 24, 1939
Bosch-Omori	}	Not Operating			
Bosch-Omori					

Month July 1942Page No. 16

No. and Date	Phase	Time G. M. T.			Period	AMPLI- TUDE mm	REMARKS
		h	m	s			
#87 July 1	ePN	4	25	36		Distance about 300 miles	
	ePE	4	25	35			
	eSN	4	26	29			
	eSE	4	26	28			
	eFNE	4	31				
#88 July 4	ePNE	1	55	10		Distance about 500 miles	
	eSNE	1	56	37			
	FNE	2	13				
#89 July 4	ePNE	6	10	38		Distance about 550 miles	
	eSNE	6	12	14			
	FNE	6	31				
#90 July 5	ePNE	10	31	51		Distant, Phases indistinct.	
	FNE	10	50				
#91 July 7	ePNE	12	39	45		Distance about 600 miles	
	eSNE	12	41	14			
	FNE	13	05				
#92 July 8	eDNE	7	02	25		Distance about 550 miles	
	eSNE	7	03	59			
	FNE	7	30				
#93 July 8	ePNE	22	33	00		Distance about 300 miles	
	LNE	22	34	43			
	FNE	22	58				

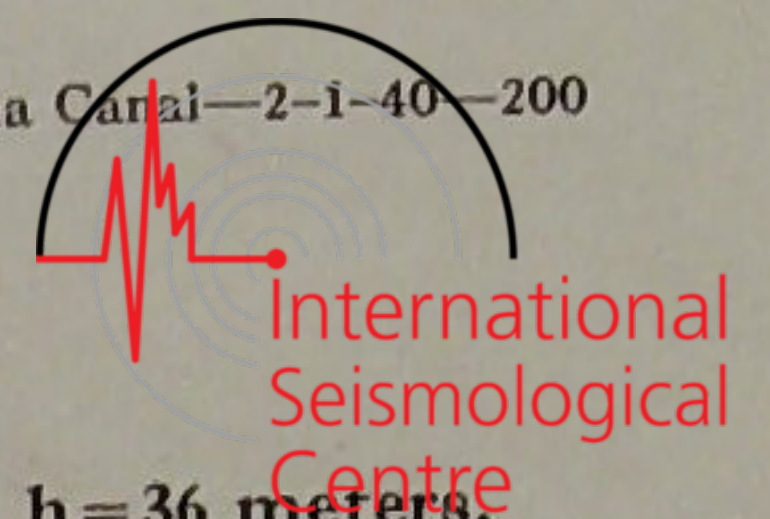
SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Month July -- 1942Page No. 17

No. and Date	Phase	Time G. M. T.			Period s	AMPLI- TUDE mm	REMARKS
		h	m	s			
#94 July 12	1PNE eSNE FNE	5:07:33 5:10:24 5:32				Distance about 1015 miles.	
#95 July 12	ePNE FNE	7:36:39 7:40				Nearby, Phases Indistinct.	
#96 July 21	ePNE FNE	8:49:09 8:58				Nearby, Phases Indistinct.	
#97 July 22	ePNE eSNE FNE	22:59:46 23:00:20 23:03				Distance about 50 miles.	
#98 July 24	ePNE LNE FNE	4:53:49 4:54:22 4:57				Distance about 100 miles.	
#99 July 25	ePNE FNE	6:42:11 6:46				Nearby, Phases Indistinct.	
No Record from 15:30 GMT, July 25 to 13:22 GMT July 26, 1942							
#100 July 29		23:09 to 23:16				Distant, phases indistinct.	

G. E. MATTHEW
Chief Hydrographer

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SECTION OF SURVEYS



SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

h = 36 meters.

Lithologic foundation: Basalt.

Time Correction: Within 1.0 sec.

INSTRUMENTS—FIXED CONSTANTS

INSTRUMENTS	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Wood-Anderson	I	Photographic	Magnetic	60 mm. per min.	1.3 gr.
Bosch-Omori	II	Smoked Sheet	Air	15 mm. per min.	100 kg.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENTS	COMPONENT	T ₀	V	h	DETERMINED
Wood-Anderson	N - S	0.80	2740	8 + 01	August 24, 1939
Wood-Anderson	E - W	0.80	2740	12 + 01	August 24, 1939
Bosch-Omori					
Bosch-Omori		Not operating.			

Month August, 1942.

Page No. 18

No. and Date	Phase	Time G. M. T.	Period	AMPLI- TUDE	REMARKS
		h m s		mm	
#101 Aug. 6	ePNE	23:39:54 to 0:15:00			Distant, phases indistinct.
#102 Aug. 8		22:39:29 to 23:15			Distant, phases indistinct.
#103 Aug. 11		4:51 to 4:56			Distant, phases indistinct.
#104 Aug. 11		7:14 to 7:17			Distant, phases indistinct.
#105 Aug. 13		19:32 to 19:36			Distant, phases indistinct.
#106 Aug. 16		20:10:45 to 20:17			Nearby, Phases indistinct.
#107 Aug. 23	ePNE FNE	9:41:31 * 9:46			Nearby, Phases indistinct.
#108 Aug. 24	ePN ePE 1SNE LN FNE	23:55:47 23:55:45 0:00:16 0:04:10 0:50			Approximate distance 1920 miles
#109 Aug. 25		20:21 to 20:25			Probably same source as No. 108.

SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Month August 1942

Page No. 19

No. and Date	Phase	Time G. M. T.			Period s	AMPLI- TUDE mm	REMARKS
		h	m	s			
#110 Aug. 25		20:56:40 to 21:00				Probably same source as No. 108.	
#111 Aug. 26		12:14 to 12:22				Probably same source as No. 108.	
#112	○PNE ○SNE FNE	11:43:15 11:43:55 11:47				Approximate distance 225 miles.	
#113 Aug. 27		16:23 to 16:25				Nearby, phases indistinct.	
#114 Aug. 29		12:26:47 to 12:32				Distant, phases indistinct.	

G. E. MATTHEW,
Chief Hydrographer.

GEM*whf.

THE PANAMA CANAL
DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

h = 36 meters.

Lithologic foundation: Basalt.

Time Correction: Within 1.0 sec.

INSTRUMENTS—FIXED CONSTANTS

INSTRUMENTS	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Wood-Anderson	I	Photographic	Magnetic	60 mm. per min.	1.3 gr.
Bosch-Omori	II	Smoked Sheet	Air	15 mm. per min.	100 kg.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENTS	COMPONENT	T ₀	V	h	DETERMINED
Wood-Anderson	N - S	0.80	2740	8 to 1	August 24, 1939
Wood-Anderson	E - W	0.80	2740	12 to 1	August 24, 1939
Bosch-Omori	} Not operating				
Bosch-Omori					

Month September 1942Page No. 20

No. and Date	Phase	Time	Period	AMPLI-	REMARKS
		G. M. T.		TUDE	
		h m s		mm	
#115 Sept. 2	1PNE LNE MNE FNE	20:46:18 20:47:14 20:47:17 20:51			Approximate distance 170 miles.
#116 Sept. 18		7:46:50 to 7:50			Nearby, Phases indistinct.
#117 Sept. 21		23:05:48 to 23:07			Nearby, Phases indistinct.
#118 Sept. 22		19:47:00 to 19:49			Nearby, Phases indistinct.
#119 Sept. 22		20:11:00 to 20:13			Nearby, Phases indistinct.
#120 Sept. 26	EPNE FNE	EPNE 3:47:35 4:03			Distant, Phases indistinct.
#121 Sept. 26		17:47 to 17:49			Nearby, phases indistinct.
#122 Sept. 27		17:28:28 to 17:31			Nearby, phases indistinct.

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DEPARTMENT OF OPERATION AND MAINTENANCE
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SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

h = 36 meters.

Lithologic foundation: Basalt.

Time Correction: Within 1.0 sec.

INSTRUMENTS—FIXED CONSTANTS

INSTRUMENTS	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Wood-Anderson	I	Photographic	Magnetic	60 mm. per min.	1.3 gr.
Bosch-Omori	II	Smoked Sheet	Air	15 mm. per min.	100 kg.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENTS	COMPONENT	T ₀	V	h	DETERMINED
Wood-Anderson	N-S	0.80	2740	8 to 1	August 24, 1939
Wood-Anderson	E-W	0.80	2740	12 to 1	" " "
Bosch-Omori	} Not Operating				
Bosch-Omori					

Month October 1942

Page No. 22

No. and Date	Phase	Time G. M. T.			Period	AMPLI- TUDE mm	REMARKS
		h	m	s			
#124 Oct. 2	1PNE	00:	01:	19		11.0	Approximate Distance 100 miles
	1SNE	00:	01:	37		49.5	Modified Mercalli Scale Intensity I
	FNE	00:	05				Felt by a few on Pacific Coast.
#125 Oct 4	ePNE	14:	33:	33			
	FNE	14:	37				Nearby Phases indistinct.
#126 Oct. 8	1PNE	3:	03:	48			
	LNE	3:	04:	32			Approximate distance 150 miles.
	MN	3:	04:	38			
	ME	3:	04:	58			
	FNE	3:	35				
Oct. 11		Power off from 12:52 to 14:13 GMT.					
#127 Oct. 16	ePNE	23:	29:	48			
	LNE	23:	30:	37			Approximate distance 150 miles.
	MNE	23:	30:	53			
	FNE	23:	39				
#128 Oct. 20	ePNE	23:	41				
	FNE	23:	49				Nearby Phases indistinct.

THE PANAMA CANAL
DEPARTMENT OF OPERATION AND MAINTENANCE
SECTION OF SURVEYS



SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

h = 36 meters.

Lithologic foundation: Basalt.

Time Correction: Within 1.0 sec.

INSTRUMENTS—FIXED CONSTANTS

INSTRUMENTS	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Wood-Anderson	I	Photographic	Magnetic	60 mm. per min.	1.3 gr.
Bosch-Omori	II	Smoked Sheet	Air	15 mm. per min.	100 kg.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENTS	COMPONENT	T ₀	V	h	DETERMINED
Wood-Anderson	N - S	0.80	2740	8 to 1	August 24, 1939
Wood-Anderson	E - W	0.80	2740	12 to 1	" " "
Bosch-Omori)	Not operating.				
Bosch-Omori)					

Month November 1942Page No. 24

No. and Date	Phase	Time G. M. T.			Period	AMPLI- TUDE mm	REMARKS
		h	m	s			
# 131 Nov. 1	1PN LN MN FN	1:	41:	16 45 47 45			Approximate distance about 90 miles
# 132 Nov. 3	ePNE LNE MNE FNE	23:	38:	37 21 40 50			Approximate distance about 125 miles
# 133 Nov. 4	ePN FNE	10:	37:	52 43			Nearby phases indistinct
# 134 Nov. 5	ePNE MNE FNE	6:	21:	11 32 28			Nearby phases indistinct
# 135 Nov. 5		10:	41 to 54				Nearby phases indistinct
# 136 Nov. 6	ePNE FNE	13:	34:	45 45			Nearby phases indistinct
# 137 Nov. 10	ePNE FNE	11:	59				Distant phases indistinct

SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Month November 1942Page No. 25

No. and Date	Phase	Time G. M. T.			Period s	AMPLI- TUDE mm	REMARKS
		h	m	s			
# 138 Nov. 11	ePNE LNE MNE FNE	13:	07:	11 59 17 20		N-31 E-29	Approximate distance 150 miles
# 139 Nov. 12	ePNE FNE	4:	59:	14 20			Nearby phases indistinct
# 140 Nov. 12	ePNE FNE	15:	28:	33 37			Nearby phases indistinct
# 141 Nov. 14	ePNE FNE	18:	01	18: 22			Nearby phases indistinct
# 142 Nov. 14	ePNE FNE	20:	59	21: 14			Nearby phases indistinct
# 143 Nov. 15	ePNE	00:	48	1: 06			Nearby phases indistinct
# 144 Nov. 15	ePNE LN LE MN ME CNE FNE	9:	04:	05 29 28 32 33 50 07:		12.0 12.5	Approximate distance 90 miles
# 145 Nov. 19	ePN eSN MN FN	8:	54:	00 50 32 45			Approximate distance 640 miles

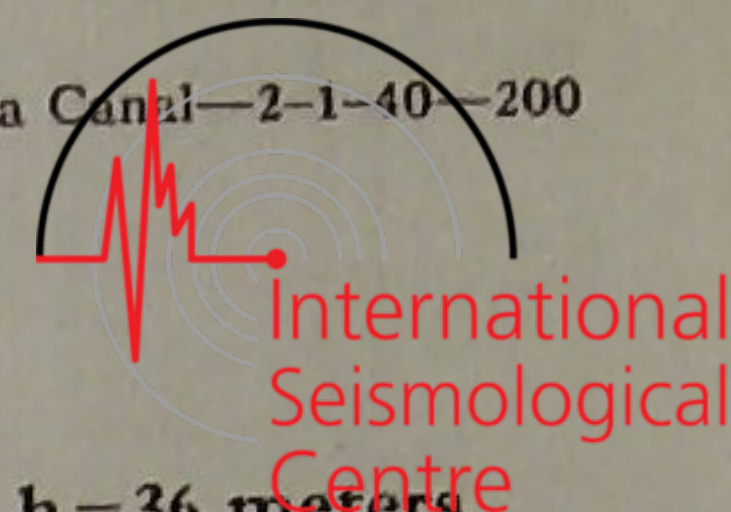
SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Month November 1942Page No. 26

No. and Date	Phase	Time G. M. T.			Period s	AMPLI- TUDE mm	REMARKS
		h	m	s			
# 146 Nov. 19	ePN FN	14:	42:	00			Nearby phases indistinct
# 147 Nov. 24	ePNE FNE	22:	37				Nearby phases indistinct
# 147 Nov. 25	ePNE FNE	1:	22				Nearby phases indistinct
# 148 Nov. 28	ePNE FNE	10:	46:	56			Nearby phases indistinct
# 149 Nov. 29	ePNE eSNE FNE	14:	46:	08			Approximate distance 80 miles

G. E. MATTHEW
Chief Hydrographer

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SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Lat. 8° 57' 39" N.

Long. 79° 33' 29" W.

h = 36 meters.

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Time Correction: Within 1.0 sec.

INSTRUMENTS—FIXED CONSTANTS

INSTRUMENTS	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Wood-Anderson	I	Photographic	Magnetic	60 mm. per min.	1.3 gr.
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INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENTS	COMPONENT	T ₀	V	h	DETERMINED
Wood-Anderson	N - S	0.80	2740	8 to 01	August 24, 1939
Wood-Anderson	E - W	0.80	2740	12 to 01	" " "
Bosch-Omori					
Bosch-Omori					

Month December - 1942Page No. 27

No. and Date	Phase	Time G. M. T.			Period	AMPLI- TUDE mm	REMARKS
		h	m	s			
#150 Dec. 3	e P N E e S N E F N E	10	03	02 24			Approximate Distance 125 miles
#151 Dec. 15	e P N E F N E	9	11	20 35			Nearby, Phases indistinct
#152 Dec. 19	e P N E L N E M N E F N E	4	40	00 12 15 41			Approximate distance 40 miles
#153 Dec. 19	e P N E e S N E F N E	19	22	34 57 25			Approximate Distance 130 miles
#154 Dec. 20	e P N E e S N e S E F N E	15	39	22 25 24 50			Approximate Distance 300 miles
#155 Dec. 21	e P N e P E e S N e S E F N E	10	09	27 29 07 06 12			Approximate Distance 220 miles
#156 Dec. 21	e P N E F N E	16	49	52 55			Nearby, May be from same source as No. 154 and No. 157

SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Month December - 1942Page No. 28

No. and Date	Phase	Time G. M. T.			Period s	AMPLI- TUDE mm	REMARKS
		h	m	s			
#157 Dec. 21	e P N	10	40	29		Approximate distance 300 miles	
	e P E	10	40	30			
	e S N E	10	41	21			
	F N E	10	46				
#158 Dec. 22	i P N E	6	25	21		Approximate distance 125 miles Felt by many Pacific Side residents Intensity III, Modified Mercalli Scale	
	i S N E	6	25	44			
	F N E	6	42				
#159 Dec. 22	e P N E	7	41	17		Approximate distance 125 miles Aftershock to #158	
	e S N E	7	41	40			
	F N E	7	44				
#160 Dec. 22	e P N E	8	46	13		Approximate distance 125 miles Aftershock to #158	
	e S N E	8	46	36			
	F N E	8	51				
#161 Dec. 22	e P N E	9	47	03		Approximate distance 125 miles Aftershock to #158	
	e S N E	9	47	25			
	F N E	9	49				
#162 Dec. 22	e P N E	10	03	03		Approximate distance 125 miles Aftershock to #158	
	e S N E	10	03	25			
	F N E	10	06				
#163 Dec. 23	e P N E	0	49	33		Approximate distance 125 miles Felt by a few Pacific Side residents Intensity I, Modified Mercalli Scale	
	i S N E	0	49	46			
	F N E	1	00	00			
#164 Dec. 23	e P N	1	13	15		Approximate distance 125 miles Felt by many Pacific Side residents Intensity II, Modified Mercalli Scale	
	e P E	1	13	14			
	i S N	1	13	28			
	i S E	1	13	27			
	F N E	1	30				

SEISMOLOGICAL RECORD AT BALBOA HEIGHTS, CANAL ZONE

Month December - 1942Page No. 29

No. and Date	Phase	Time G. M. T.			Period s	AMPLI- TUDE mm	REMARKS
		h	m	s			
#165 Dec. 23	e P N E	1	28	02		Approximate distance 125 miles Aftershock to #164	
	e S N E	1	28	25			
	F N E	1	30				
#166 Dec. 23	e P N E	3	20	32		Approximate distance 125 miles Aftershock to #164	
	e S N E	3	20	55			
	F N E	3	23				
#167 Dec. 23	e P N E	3	44	49		Nearby, Phases indistinct	
	F N E	3	51				
#168 Dec. 26	e P N E	12	32	52		Approximate distance 245 miles Felt by a few in Balboa & Cristobal Intensity I, Modified Mercalli Scale	
	e S N E	12	33	35			
	F N E	12	49				
#169 Dec. 29	e P N E	6	50	22		Approximate distance 125 miles Felt by a few in Balboa & Cristobal Intensity II, Modified Mercalli Scale	
	e S N E	6	50	44			
	F N E	6	06				

L. T. CHAPEL
Act. Chief Hydrographer