

BERMUDA-COLUMBIA UNIVERSITY

SEISMOGRAPH STATION

SIGNAL HILL
ST. GEORGES, BERMUDA



SEISMOLOGICAL BULLETIN

By

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LAMONT GEOLOGICAL OBSERVATORY
(COLUMBIA UNIVERSITY)

Contribution No. 246

STATION CONSTANTS AND INSTRUMENTS

Latitude: 32°22'46"N
 Longitude: 64°40'52"W
 Elevation: 41 meters
 Bedrock: Calcareous aeolionite

INSTRUMENTS

Three component Short Period Benioff Seismographs (N, E, Z)
 To = 1 sec., Tg = 0.2 sec.

Three component Long Period Benioff Seismographs (N, E, Z)
 To = 1 sec., Tg = 75 sec.

Three component Columbia University Long Period Seismographs
 (N, E, Z) To = 10 sec., Tg = 75 sec.

Two Milne-Shaw Horizontal Seismographs (NE, NW)
 To = 12 sec., V = 250

One Columbia University Microbarograph
 To = 10 sec., Tg = 75 sec.

Epicentral data from U. S. Coast and Geodetic Survey preliminary
 determinations.

ABBREVIATIONS

i = sudden beginning of the motion (impetus)

e = gradual beginning of the motion (emersio)

All times are G. C. T.

The Bermuda-Columbia University seismograph station, formerly known
 as the Bermuda Seismograph Station, was initially sponsored by the
 Bermuda Government, the U. S. Coast and Geodetic Survey, the Interna-
 tional Union of Geodesy and Geophysics and the Royal Society of London.
 Since 1951 new instruments have been added under the joint sponsorship
 of the Bermuda Government and Columbia University. It is requested
 that exchange bulletins and papers be mailed directly to Bermuda.

Date	Phase	h	m	s	Remarks
1956					
Oct.					
1	eP	18	08	52	0 = 18 04 40
	iS	18	11	48	18 1/2°N 77°W
	eLR	18	13	10	Jamaica, minor damage at Port Maria, St. Ann's Bay and Moneague
2	i	15	09	02	0 = 14 56 26
	i	15	19	14	53°N 159°E
	eLR	15	41	40	Near southeast coast of Kamchatka h about 60 km Mag 6 1/4 - 6 1/2 (Pas.)
3	iP	08	35	05	0 = 08 18 46
	iPcP	08	35	44	20°S 69 1/2°W
	iPP	08	37	31	Northern Chile
	iPcS	08	40	28	h about 100 km
	iSS	08	46	20	Mag 6 1/2 (Pas.)
	(eLR)	08	50	00	
7	e	07	03	26	0 = 06 52 13
	e	07	05	14	About 100 miles off coast
	e	07	07	12	of Panama
7	eLR	23	19	10	
8	eLR	01	25	18	
8	ePP	15	15	40	0 = 14 55 52
	eSKS	15	21	18	19 1/2°S 174 1/2°W
	eSKKS	15	22	42	Tonga Islands
	ePS	15	25	12	
	eSS	15	31	30	
	eLR	15	54	22	
8	eL	22	45	00	
9	eLR	07	18	22	

Date	Phase	h	m	s	Remarks
1956 Oct.					
9	iP	10	57	58	0 = 10 53 41
	iS	11	01	19	25°N 46°W
	eLR	11	01	40	Atlantic Ocean
9	iP	14	50	24	0 = 14 46 18
	iS	14	53	44	24 1/2°N 45 1/2°W Atlantic Ocean
11	iP	02	37	51	0 = 02 24 33
	iPP	02	41	40	46°N 150 1/2°E
	i	02	48	19	Kurile Islands
	i(SS)	02	55	28	Felt: Hokkaido, Japan
	eLR	03	10	16	h about 100 km Mag 7 1/4 - 7 1/2 (Pas.)
11	iP	16	57	40	0 = 16 48 46
	iPP	16	59	34	40 1/2°N 126 1/2°W
	iS	17	04	45	Off Cape Mendocino, Calif.
	iSS	17	08	22	Felt: coastal area of northern
	eLR	17	11	42	Calif. Mag 6 (Pas.)(Berk.)
12	iP	02	46	31	0 = 02 37 43
	iPP	02	48	28	15°S 74 1/2°W
	iS	02	53	27	Near coast of central Peru
	i(ScS)	02	56	27	Mag 6 1/2 (Pas.)(Berk.)
	i(SS)	02	57	19	
	eLR	03	03	22	
13	eLR	20	04	00	
16	i	20	21	40	
19	i	14	29	58	0 = 14 05 34
	i	14	38	18	56 1/2°N 122°W South Pacific Ocean Mag 6 1/2

Date	Phase	h	m	s	Remarks
1956 Oct.					
19	iP	20	59	47	0 = 20 47 33
	iS	21	09	43	52°N 177°E
	i(PS)	21	10	38	Rat Islands, Aleutian Islands
	i(SS)	21	14	48	Mag 6 3/4 (Berk.) (Pas.)
	i(SSS)	21	19	52	
	e(L)	21	22	45	
22	e	08	05	19	0 = 07 26 15
	e	08	07	11	52°N 177°E Rat Islands, Aleutian Islands
22	i(PP)	12	57	48	0 = 12 35 10
	i	12	58	19	9 1/2°S 150°E
	i	13	04	19	Near coast of Papua, New
	e(LQ)	13	33	27	Guinea
	e(LR)	13	39	40	
23	iP	08	15	17	0 = 08 07 35
	iS	08	21	22	3°N 95°W
	i(SS)	08	24	40	Northwest of Galapagos Islands
	eLR	08	27	40	Mag 5 3/4 (Pas.)
23	ePKP	09	01	32	0 = 08 41 22
	iPP	09	04	04	13 1/2°N 120 1/2°E
	iPKS	09	05	54	Mindoro Island, Philippines
	e(PS)	09	15	00	h about 100 km
	eSS	09	21	52	
	e(P'P')	09	23	00	
	e	09	24	50	
	eSSS	09	27	30	
	eLR	09	45	20	
23	i(P)	18	06	16	
	i	18	07	20	
	eLR	18	10	04	
24	iP	14	48	29	0 = 14 42 11
	iS	14	52	25	12°N 87°W
	eLR	14	56	00	Near coast of Nicaragua Minor damage at Managua Felt: southern El Salvador Mag 7 1/4 (Pas.) 7 (Berk.)

Date	Phase	h	m	s	Remarks
1956					
25	iP	05	27	42	0 = 05 21 40
	iPP	05	28	46	12°N 87°W
	iPcP	05	31	00	Nicaragua aftershock
	i	05	31	53	Felt: El Salvador and
	iS	05	32	22	Nicaragua
	eLR	05	35	28	Mag 6 1/4 - 6 1/2 (Pas.) 6 - 6 1/4 (Berk.)
26	iPP	23	11	48	0 = 22 50 24
	iPKS	23	12	57	14°S 167°E
	eLR	23	51	58	New Hebrides Islands Mag 6 1/2 (Pas.) (Berk.)
27	eLR	15	47	08	
28	eLR	04	26	25	
29	iP	15	50	06	0 = 15 42 08
	iS	15	56	25	8 1/2°S 77°W
	i	15	57	46	Central Peru
	eLQ	15	59	54	h about 60 km
	eLR	16	02	08	
30	eLR	00	30	43	
31	i(P)	14	27	54	0 = 14 03 38
	i	14	29	00	26 1/2°N 54°E
	i	14	48	12	Southern Iran
	e(LR)	14	57	00	Many killed and extensive property damage at Laristan Mag 6 3/4 (Pas.)
Nov.					
3	e	10	59	36	
4	e	08	05	10	
	i	08	10	55	

Date	Phase	h	m	s	Remarks
1956					
Nov.					
9	iP	06	07	07	0 = 06 01 51
	iS	06	11	48	36°N 34 1/2°W
	eLR	06	12	30	North Atlantic Ocean
9	iP	13	11	57	0 = 13 06 10
	iPP	13	12	16	17°N 94°W
	iSP	13	12	40	Southern Mexico
	iS	13	17	02	Slight damage in Oaxaca
	e(PS)	13	17	30	h about 150 km Province
	eL	13	18	30	Mag 6 (Berk.)
12	iP	10	44	38	
	eS	10	49	22	
	e	10	58	43	
	e	11	04	02	
	e	11	19	31	
	e	11	41	15	
13	eLR	07	40	58	
13	eLR	08	36	17	
13	iPKP	10	15	44	0 = 09 55 30
	iPP	10	20	06	48 1/2°S 124°E
	iPPS	10	33	52	Indian Ocean. About 1000
	iSS (1)	10	41	11	miles south of Australia
	iSS (2)	10	46	07	
	eLR	11	14	48	
14	i(SKS)	01	15	38	0 = 00 51 36
	eLR	01	36	42	36°N 71°E
					Hindu Kush
					h about 200 km
15	iP	17	44	27	0 = 17 27 55
	iPP	17	47	46	3°S 103 1/2°W
	iS	17	52	10	Pacific Ocean, about 900
					miles west of Galapagos
					Islands

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Date	Phase	h	m	s	Remarks
1956					
16	iP	11	59	15	0 = 11 53 54
	iS	12	03	33	8 1/2°N 71°W
	eLR	12	05	10	Northwestern Venezuela
17	iP	20	36	39	0 = 20 27 15
	iS	20	43	54	54 1/2°N 134°W
	iSS	20	47	49	Queen Charlotte Islands
	eLR	20	51	29	region. Felt: Ketchikan, Alaska. Mag 6 1/4 - 6 1/2 (Berk.) 6 1/2 (Pas.)
18	iPP	18	37	13	0 = 18 16 25
	iPS	18	46	37	27°S 176°W
	ePPS	18	47	45	Kermadec Islands region
	i	18	49	10	
	i	18	50	01	
	iSS	18	53	05	
	eLR	19	12	30	
19	eLR	13	10	40	
21	i	08	32	39	
	eLR	08	58	40	
22	e	08	46	44	0 = 08 32 22 About 200 miles off south coast of Panama
22	eLR	09	26	30	
23	e	00	50	20	
23	i	09	25	00	0 = 10 00 50
	i	09	27	13	52 1/2°N 169 1/2°W Fox Islands and Aleutian Islands
24	i	17	57	47	
24	iP	23	07	18	
	iS	23	11	51	

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Date	Phase	h	m	s	Remarks
1956					
Nov.					
26	iP	18	59	44	0 = 18 49 56
	iS	19	07	52	26°S 70 1/2°W Northern Chile h about 100 km
26	iPP	23	51	22	0 = 23 29 41
	i	23	52	24	22°S 169°E
	iPPP	23	54	25	Loyalty Islands
	eLR	00	31	21	Mag 6 3/4 (Pas.) 6 1/2 (Berk.)
27	eLR	08	11	40	
28	i(PKS)	19	51	19	0 = 19 27 11
	e	20	16	09	49 1/2°N 155°E
	e	20	19	00	Northern Kurile Islands Mag 6 3/4 - 7 (Pas.)
29	eL	10	13	30	
30	e	22	51	32	
	e	23	06	34	
Dec.					
2	iP	01	49	16	0 = 01 45 48
	iS	01	51	36	18 1/2°N 69°W Near east coast of Dominican Republic
2	e	03	38	12	
3	iP	07	31	27	0 = 07 20 08
	iS	07	41	01	53 1/2°N 169°W
	eLR	07	55	38	Fox Islands, Aleutian Islands Mag 6 1/2 - 6 3/4 (Pas.)
4	iP	10	20	41	0 = 10 07 54
	i(PS)	10	32	09	45 1/2°S 106°W
	i(SS)	10	37	04	South Pacific Ocean

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Date	Phase	h	m	s	Remarks
1956 4	iP i(SS) eLR	23 23 23	07 14 15	40 07 40	0 = 23 01 35 15°N 92°W Guatemala. Felt: western El Salvador. h about 150 km Mag 6 (Pas.)
7	i(P) i(S) i	18 18 18	00 06 08	18 30 16	
8	eLR	06	50	28	
8	iP ePPP iS iSS e(SSS) eLQ eLR	16 16 16 16 16 16 16	22 27 32 37 41 44 47	30 06 24 38 20 40 55	0 = 16 10 27 51°N 179 1/2°W Andreanof Islands, Aleutian Islands Mag 6 1/2 (Berk.)
13	eLR	13	36	30	0 = 13 15 37 31°N 115°W Lower California Mag 5 3/4 - 6 (Pas.)
16	iP eS	01 01	47 52	51 25	0 = 01 41 52 6 1/2°N 78°W Near west coast of Colombia Felt: Balboa Heights Mag 6 1/2 (Pas.) 6 1/4 (Berk.)
18	iP iS i(PS) iSS iSSS eLQ eLR	02 02 02 02 02 02 02	41 49 50 52 55 57 59	01 01 51 38 31 27 51	0 = 02 31 00 25 1/2°S 68 1/2°W Chile-Argentina border Felt: Antofagasta and Copiapo Mag 7 - 7 1/4 (Pas.) 6 3/4 - 7 (Berk.)

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Date	Phase	h	m	s	Remarks
Dec. 18	i(PKP) i e(LR)	19 19 20	39 40 27	48 51 11	0 = 19 20 06 36°S 77°E South Indian Ocean
19	i(P) i(S)	16 16	35 39	28 10	
19	(P)	19	42	21	
21	iP iS	05 06	57 00	47 00	
21	iP iPP eS eSS eLQ eLR	09 09 09 09 09 09	07 09 15 18 20 23	55 59 15 46 20 10	0 = 08 58 53 51°N 131°W Queen Charlotte Islands Mag 6 3/4 (Pas.) 6 1/2 (Berk.)
21	e(LR)	21	07	16	
22	e(LR)	23	35	28	
23	i e e(LR)	09 09 09	04 07 33	20 08 28	0 = 08 37 26 22°N 144 1/2°E Marianas Islands region Mag 6 1/2 (Pas.) h about 100 km
24	i i	09 09	43 52	07 57	
25	iP iPP iPcP iS eLR	09 09 09 09 09	40 41 42 45 48	04 19 18 17 00	0 = 09 33 37 48 1/2°N 28°W North Atlantic Ocean Mag 6 1/2 (Pas.) (Berk.)

Date	Phase	h	m	s	Remarks
Dec.					
26	eLR	08	46	00	
27	iPP	00	34	10	0 = 00 14 15
	i	00	35	20	24°S 177°W
	iSKS	00	39	21	Tonga Islands region
	iSKKS	00	40	48	Mag 7-7 1/4 (Pas.) 7 (Berk.)
	iPKKP	00	43	45	h about 300 km
	iPKKS	00	46	32	
28	eLR	04	50	20	
28	i	14	46	20	0 = 14 24 45
	iPKS	14	47	32	38°S 167 1/2°E
	i	14	48	56	Near coast of North Island,
	iSKS	14	51	30	New Zealand. h about 150 km
	iPS	14	58	48	Mag 6 1/4 (Pas.) 6 3/4 (Berk.)
	i	15	00	10	
	iSS	15	05	00	
	iPP	15	06	32	
	i(SSS)	15	11	00	
	eLQ	15	19	00	
	eLR	15	22	10	
28	ePP	19	30	56	0 = 19 21 30
	iS	19	35	36	21°N 109°W
	iSS	19	38	14	Off south coast of Lower
	eLR	19	40	40	California