

Seismological Bulletin of Syowa Station, Antarctica
1959 - 1962 and 1966 - 1967

Compiled by

Katsutada KAMINUMA

(Earthquake Research Institute, University of Tokyo)

and

Sadanori MURAUCHI

(National Science Museum)

The seismological observation at Syowa Station was started in 1959 by the 3rd party of Japanese Antarctic Research Expedition using a HES seismograph of Z component. In 1961, added with HES seismographs of two horizontal components, the seismological observation at Syowa Station was made by a three-component seismograph.

Since 1966, the observations have been continued by JARE, using HES seismographs of three components.

In this bulletin the data of the respective seismic events interpreted on the vertical component seismograms are listed in chronological order.

1. Date.
2. Identified phase name with its sharpness indication (e or i) and ground motion direction (+: UP, -: Down). If a phase was identified by horizontal components, the phase is denoted with E (detected by E - W component) or N (detected by N - S component).
3. Arrival time in G. M. T.
4. Period of the phase in seconds.
5. Amplitude in millimeters.

The instrumental constants and magnification curve of HES seismographs are shown in Table 1 and Fig. 1. The seismographs are usually operated with the attenuation factor $\mu=1/5$ in the summer season and $\mu=1/2$ in the winter season.

Table 1. Instrumental constants of HES seismographs.

Component	Z	N - S	E - W
T_1 (s)	1.0	1.0	1.0
S_1 (A/mm)	2.80×10^{-5}	2.03×10^{-5}	2.03×10^{-5}
R_1 (Ω)	940	920	930
Ω_1 (Ω)	820	1160	920
h_1	1.0	1.0	1.0
1966 - 1967			
T_2 (s)	1.06	1.04	1.04
S_2 (A/mm)	1.47×10^{-9}	1.20×10^{-9}	1.34×10^{-9}
R_2 (Ω)	600	650	630
Ω_2 (Ω)	1200	1200	1200
h_2	1.0	1.0	1.0

T_1 : Period of the pendulum. R_2 : Resistance of the galvanometer coil.
 T_2 : Period of the galvanometer. Ω_1 : External damping resistance of the transducer.
 S_1 : Sensitivity of the transducer. Ω_2 : External damping resistance of the galvanometer.
 S_2 : Sensitivity of the galvanometer. h_1 : Damping constant of the pendulum.
 R_1 : Resistance of the pendulum coil. h_2 : Damping constant of the galvanometer.

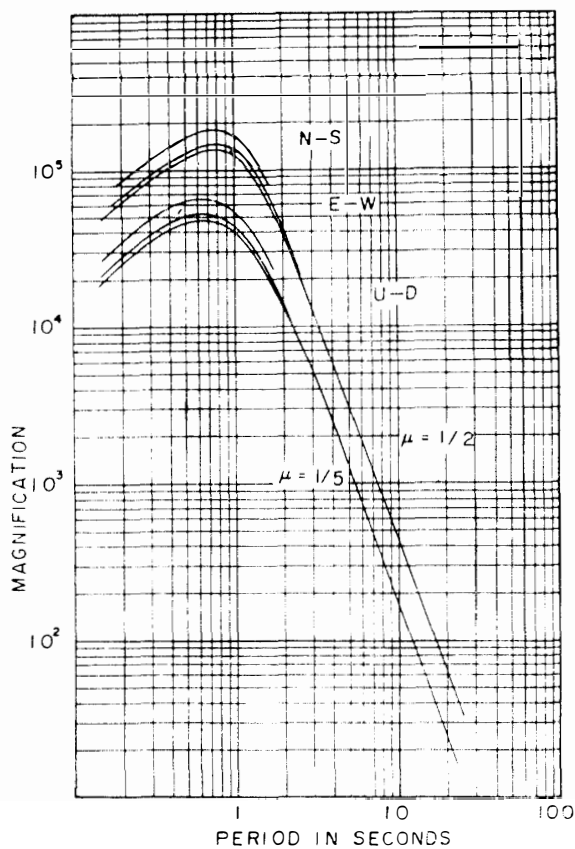


Fig. 1. Magnification curve of HES seismographs.

1959

HES seismograph of Z component was set in February and was been operated by Dr. S. MURAUCHI, a member of the 3rd Japanese Antarctic Research Expedition. The seismograph was observed with $\mu=1/5$ from February 13 to July 21 and with $\mu=1/2$ from July 22 to December 26.

Seismograms were read also by Dr. S. MURAUCHI.

February 1959

Date	Phase	Arrival time			Period s	Amplitude mm		
		h	m	s				
13	-iP	19	16	14.4	1.0	1.2		
14	+iP	04	18	21.9	1.5	1.9		
16	-iP	11	05	48.5	0.7	0.8		
	iS			51.7				
18	-iP	18	47	18.0	1.7	2.2		
	+iP			06.1				
19	eP	05	25	34.5	1.2	1.5		
	eP			06			27	35.5
	ePP						28	05.8
20	eS	03	41	55.7	0.9	1.1		
	eP			06			41	31.7
	eP			06			50	21.7
23	eS	06	53	50	0.9	1.1		
	-iP			16	24	25.7	1.3	1.6
25	-iP	19	15	06.9	0.6	0.7		
	eP			20	20	42.8	1.4	1.7
27	-iP	23	50	07.2	1.7	2.2		
	+iP			05	33	09.2	1.3	1.7
28	eP	11	52	25.8	1.5	1.9		
	eP			15	47	39.3	1.7	2.2

March 1959

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
01	-iP	01	20	57.3	1.5	1.8
02	eP	09	26	05.0	1.1	1.3
04	+iP	19	50	57.0	1.1	1.4
	eP	21	54	43.5	1.0	1.2
05	-iP	00	44	56.2		
	iX		45	11.0	0.9	1.1
	eP	23	07	57.1	1.7	2.1
06	-iP	03	46	03.1		
	iS			15.1	0.3	0.5
	iX		49	55.5		
	eP	04	07	44.4	0.6	0.7
15	eP	12	11	46.1		
	iS			51.7	0.8	1.0
	iX		14	46.8		
21	+iP	04	49	17.9	1.2	1.5
23	eP	07	30	09.6	2.1	2.7
26	eP	03	07	20.5	1.8	2.2
27	+iP	19	58	46.7	1.0	1.2
	iS	20	00	51.9		
	iX		08	14.9		

April 1959

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
07	eP	15	33	50	1.2	1.6
	iX		36	35.8	1.4	1.7
08	-iP	08	14	33.8	1.3	1.6
	esP			50.1		
	eS		15	05.0		
10	eP	06	27	54.9	2.5	3.0
11	eP	11	41	51.3	1.0	1.2
	eS		42	02		
15	-iP	19	32	09.3	1.4	1.8
	iX			22.8		
22	-iP	20	38	03.7	1.4	1.8
27	-iP	10	00	39.5	1.9	2.5
	eP	14	00	08.7	1.1	1.4
30	-iP	14	02	01.5		
	iX			44.9		
	iX		08	23.2	1.2	1.5

May 1959

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
07	+iP	20	34	55.0	1.0	1.2
11	iP	16	48	35.3	1.1	1.4
	iS			51.5		
12	ePKP	10	25	22.0	0.9	1.1
14	eP	12	01	51.4	1.0	1.3
	eP			57.9		
19	eP	15	47	12.6	1.5	1.5
21	eP	14	08	28.8	1.9	2.4
22	+iP	07	07	46.5	1.0	1.2
	iS			01.9		
	eP			15.2		
	eP	16	33	15.2	1.3	1.7

June 1959

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
01	+iP	05	44	11.7	0.8	1.0
	eP	09	14	59.3		
	iP	09	15	00.0		
	iX		16	05	0.7	0.8
	eP	12	44	57.0		
	iP	12	44	57.8		
02	iX		46	30	1.4	1.7
	eP	03	35	35.6		
	-iP	03	35	37.2	1.2	1.5
	-iP	03	44	18.3	1.4	1.8
	-iP	04	04	29.7	1.0	1.2
06	-iP	05	52	11.9	1.6	2.0
	eP	18	16	02.3	1.1	1.4
16	eP	17	04	43.8	1.0	1.3
	eP	19	03	49.6	1.2	1.5
26	eP	15	01	30	0.7	0.9
27	eP	03	47	17.8	1.4	1.8
29	eP	13	15	13	0.7	0.9

July 1959

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
01	eP	10	44	05.3	0.9	1.1
	iS			29.4		
03	+iP	18	38	03.5	1.8	2.3
	iS			45.0		
04	iP	05	06	33.4	1.0	1.3
	eS			08.9		
05	eP	23	38	03.5	0.8	1.0
	iS					
06	+iP	08	50	23.4	1.0	1.3
07	eP	11	46	32.5	0.8	1.0
	-iP			12		
	eS	16	47	21.0	1.7	2.1
	eP			55		
	eS			35.5		
09	+iP	16	17	07.9	1.8	2.2
11	eP	05	04	09.9	1.1	1.4
12	-iP	00	06	28.6	1.6	2.0
	iX			07		
13	eP	12	48	40.7	1.1	1.4
	iX			52		
14	eP	13	13	09.9	1.3	1.6
18	eP	19	38	38.6	1.4	1.8
19	eP	03	23	15.3	1.2	1.5
	eP			12		
	+iP	15	18	15.1	0.8	1.0
	eP			20		
20	iX	02	20	31.9	0.6	0.7
	+iP			52		
21	eP	01	39	25	1.0	1.2
	iP			07		
22	+iP	19	42	44.3	0.9	1.1
23	-iP	15	09	06.6	2.0	2.7
24	-iP	01	43	04.6	1.1	1.4
	-iP			23		
	iX			27.3		
28	-iP	11	00	46.7	0.9	1.1
30	-iP	13	05	49.4	0.9	1.2
	iX			14		
31	+iP	02	03	52.0	0.9	1.1

August 1959

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
01	+iP	10	12	27.3	1.2	1.5
	iX		13	02.5		
	+iP	12	48	34.0	1.0	1.3
	iS			36.9		
	+iP	18	08	20.1	0.4	0.5
eP	18	38	10.6	1.3	1.6	
iX		40	07.5			
02	-iP	02	56	19.5	0.6	0.8
	eP	18	33	07.1	0.7	0.9
	iX		35	01.6		
	eP	20	21	28.7	1.1	1.4
	iX		29	02.5		
eP	21	34	36.5	1.3	1.6	
03	eP	00	33	43.8	0.8	1.0
04	-iP	03	11	02.0	1.4	1.8
	-iP	08	14	00.6	1.4	1.7
	+ipP		16	05.9		
	eP	08	23	31.7	0.8	1.0
	iX			43.6		
	-iP	15	54	57.8	0.9	1.1
	iX	16	01	48.4		
	-iP	21	24	18.6	0.9	1.1
iX		33	02.5			
05	eP	10	55	32.1	1.0	1.3
	+iP	14	02	00.9	0.6	0.8
	eP	23	03	53.0	0.8	1.0
08	eP	16	23	09.0	0.8	1.0
	eP	21	11	13.3		
09	eP	00	09	14.2	1.3	1.6
	-iP	02	48	23.0	1.4	1.7
10	-iP	00	45	24.6	2.1	2.6
	eP	02	45	18.5	1.3	1.6
	eP	16	13	36.2	0.9	1.2
11	eP	19	02	30.5	0.8	1.0
	iX			33.4		
	-iP	21	32	47.0	1.3	1.6
12	-iP	01	32	34.0	1.0	1.2
	+eP	04	14	51.5	2.7	3.3

August 1959

Date	Phase	Arrival time			Period s	Amplitude m m
		h	m	s		
13	eP	00	25	26.0	0.7	0.9
	iX			29.0		
	-iP	03	08	48.1		
	iS iX			51.7 42.4		
eP	23	13	47.7	0.7	0.8	
14	-iP	01	11	32.2	0.9	1.2
	-iP	04	51	01.8	1.0	1.2
	eP	12	29	24.8	0.9	1.2
15	eP	03	35	53.7	1.2	1.5
	-iP	13	27	09.3	0.6	1.5
17	eP	18	03	59	1.3	3.5
19	eP	01	35	37.5	1.0	2.7
	eP	04	24	02.5	1.7	4.5
	eP	17	25	15.2	1.1	2.8
20	eP	12	27	20.0	1.7	4.4
24	+iP	07	04	27.9	1.0	2.5
	eP	11	52	51.3	1.5	4.0
	eP	15	54	46.8	2.2	6.0
	-iP	12	49	06.0	1.1	3.0
25	eP	06	20	04.2	0.9	2.5
	-iP	12	35	48.5	1.4	3.7
	-iP	13	53	20.1	1.5	4.0
	iX			33.3		
	eP	18	03	10.8	1.1	3.0
27	-iP	08	03	01.7	1.2	3.3
	eS			51.0		
	iX		06	29.3		
	eP	13	46	47.0	1.2	3.2
	eP	19	14	02.9		
28	iX			41.3	0.8	2.0
	+iP eS	16	04 16	56.5 57.1	1.7	4.5
30	-iP	21	52	33.8	0.9	2.5
	ePP		54	04.1		
	iX		57	05.6		
31	-iP	17	33	15.8	0.8	2.0

September 1959

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
01	eP	01	04	54.2	1.0	2.5
02	eP	08	01	52.9	0.7	2.0
03	-iP eS	16	08 11	51.3 51.6	1.1	3.0
04	eP	09	35	43.3	1.5	4.0
	eP	12	41	52.5	1.7	4.5
	+iP	18	38	52.2	0.9	2.3
	-iP	23	32	31.5	0.9	2.5
05	-iP	07	08	19.2		
	iX		09	11.4		
	iX			58.2	2.3	6.0
	eP	15	47	51.4	1.7	4.5
06	+iP	23	17	00.5	1.3	3.3
	iX		19	07.3		
07	-iP	00	41	21.4	1.0	2.5
	-iP iX	19	06 07	48.1 02.9	0.8	2.0
08	eP	03	57	45.2	1.4	3.7
	eP	19	18	57.5	1.4	3.7
09	-iP	13	16	14.4	1.5	4.0
	iX		19	12.3		
	+iP	19	27	15.0	1.5	4.0
	iX		30	18.0		
10	eP	20	24	36.9	1.7	4.5
	-iP	02	10	02.2	0.8	2.0
	eP	02	00	05.2	1.3	3.5
11	eP	16	32	07.6		
	eS		33	07	0.6	1.6
	-iP	05	48	19.0	1.4	3.8
12	eP	10	47	37.9	1.5	4.0
	iX			46.6		
	eP	09	28	12.1	0.7	1.8
13	+iP	01	52	47.7	0.8	2.2
	iX	02	07	04.1		
14	eP	22	53	42.8	2.0	5.0
	eP	20	07	33.8	1.2	3.2
	iX		08	12.1		
15	eP	04	24	53.8		
	iX		25	11.0	1.2	3.0
	eP	19	48	03.5	1.4	3.6

September 1959

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
17	eP	03	51	30.4	1.2	3.0
	eP	05	40	29.7	0.9	2.5
	-iP	07	22	29.1	1.1	3.0
	-iP	08	51	16.2	1.1	3.0
	eP	11	49	49.8	0.8	2.0
	eP	15	03	49.2	1.5	4.0
	eP	15	20	19.2	1.4	3.7
	iX			27.3		
	eP	17	25	25.8	1.1	3.0
18	eP	03	16	35.7	0.8	2.0
	iX		17	20.0		
	+iP	09	36	52.2	0.8	2.2
	eP	10	55	01.8	0.9	2.5
	-iP	20	18	34.5	0.8	2.2
19	eP	03	26	29.4	0.8	2.0
	eP	10	20	53.1	1.1	3.0
	eP	18	59	21.4	0.7	1.8
20	+iP	23	29	08.3	0.8	2.2
	iS			34.1		
21	eP	02	21	20.0	1.4	3.5
	+iP	13	21	32.9	1.2	3.2
24	eP	19	56	30.1	1.0	2.5
25	-iP	00	26	21.1	1.5	4.0
	eP	01	43	12.3	0.9	2.4
	eP	13	13	03.4	0.8	2.0
26	eP	05	25	07.5	1.0	2.5
	eP	08	40	47.0	1.3	3.5
	iX		41	12.8		
	+iP	10	29	54.5	1.1	3.0
27	iX		30	24.8		
	-iP	10	32	54.8	1.0	2.5
29	iX		43	06.8		
	+iP	13	08	16.7	1.1	2.8
	iX		09	18.2		
30	eP	14	43	06.3	1.3	3.5
	-iP	17	19	56.3	1.3	3.8
	eP	05	08	45.8	1.4	3.6
	iX		15	53.3		
	eP	15	05	31.2	1.3	3.5
	eP	16	42	30.0	1.0	2.6
	-iP	20	38	41.4	1.4	3.8

October 1959

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
01	+eP	17	13	28.0	0.8	2.2
03	eP	21	53	26.8	1.4	3.8
	iP	23	26	23.8	0.9	2.5
	eP	23	33	44.8	0.9	2.5
04	eP	13	23	19.9	0.7	1.8
07	eP	03	39	41.0	1.0	2.5
	iX			43.3		
	eP	07	18	26.6	0.9	2.4
08	eP	10	32	30.5	1.1	3.0
	iP	00	16	07.1	1.8	4.8
	eP	17	01	24.6	0.8	2.0
09	eP	22	04	56.6	0.6	1.5
	iP	22	22	05.2	0.6	1.5
	eP	02	00	41.0	0.6	1.5
iX		02	18.5			
11	eP	10	09	18.5	0.7	1.8
	eP	18	03	36.9	1.3	3.4
	eP	20	15	34.7	1.1	3.0
	- iP	03	34	12.0	1.3	3.5
12	+ iP	03	55	37.7	1.4	3.8
	eP	13	56	41.7	0.8	2.1
14	+ iP	15	22	05.7	0.6	1.5
	iP	15	59	30.3	0.8	2.1
	eP	17	49	48.6	1.1	3.0
	eP	00	01	36.0	0.7	1.8
15	eP	00	41	45.3	0.8	2.0
17	eP	01	31	41.1	1.3	3.5
	- iP	10	44	34.5	1.9	5.0
	eP	15	23	51.6	0.9	2.5

October 1959

Date	Phase	Arrival time			Period s	Amplitude m m
		h	m	s		
18	eP	12	29	14.1	0.7	1.8
	+ iP	17	26	05.7	1.2	3.2
19	eP	00	01	17.7	1.1	2.8
	- iP	01	37	25.4	0.7	1.8
	- iP ipP	02	25 26	17.0 14.0	1.7	4.5
	eP	09	27	32.1	1.2	3.2
	+ iP iX	13	04 06	16.3 26.0	1.0	2.5
	eP	17	52	34.3	0.8	2.2
	eP	19	30	15.8	0.7	1.8
	eP	23	27	08.1	0.6	1.5
20	eP	01	04	52.5	0.8	2.0
	eP	03	02	30.9	0.6	1.6
	eP	05	37	44.8	1.0	2.8
	eP	06	28	10.7	1.6	4.2
	eP	10	10	09.1	1.0	2.6
	eP	19	01	11.9	0.8	2.0
	+ iP	21	33	58.2	0.7	1.8
	- iP	21	50	26.6	1.3	3.5
	eP	22	30	12.8	1.5	4.0
	eP	23	41	14.3	1.0	2.5
21	eP	01	48	57.5	0.7	1.8
	eP iS	03	42	15.6 39.1	0.4	1.0
	eP	05	27	00.4	0.8	2.0
	eP	06	13	31.0	0.6	1.6
	eP	09	36	35.9	2.1	5.5
	eP iX	22	22 23	30 26.2	0.4	1.2

October 1959

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
22	eP	01	12	46.3	0.7	1.8
	eP	04	57	01.4	1.5	4.0
	eP	05	03	45.8	1.1	3.0
	eP	05	27	23.3	0.8	2.0
	eP	10	31	50.4	0.8	2.2
	eP	10	42	29.4	0.8	2.0
	eP	12	38	51.0	0.7	1.8
	eP	23	00	41.8	0.6	1.5
	eP	23	46	41.8	0.7	1.8
23	+ iP	03	56	40.3	1.3	3.5
	eP	06	29	39.0	1.3	3.5
	eP	09	28	14.6	1.3	3.4
	eP	12	54	32.9	0.7	1.6
	eP	18	02	44.5	1.3	3.5
24	eP	03	58	34.0	0.7	1.8
	eP iX	23 24	59 00	11.7 48.3		
25	- iP	01	58	46.8	0.6	1.5
	eP	03	37	10.0	1.4	3.6
	eP	05	17	07.3	0.6	1.5
	+ iP	18	44	25.0	0.8	2.0
	eP	20	33	27.4	0.7	1.8
26	eP	12	18	41.3	1.1	3.0
27	eP	06	32	12.0	2.1	5.5
	- iP iS	09	53	03.8 31.1	0.8	2.0
	- iP	14	10	05.7	1.0	2.5
28	eP	17	52	06.7	0.2	0.5

October 1959

Date	Phase	Arrival time			Period s	Amplitude m m
		h	m	s		
29	eP	00	26	59.2	1.1	2.8
	eP	03	14	40.4	0.8	2.2
	eP	19	54	12.8	1.1	2.8
	eP	22	10	42.8	1.2	3.2
30	eP	02	13	05.2	0.7	1.8
	eP	04	20	10.9	1.1	3.0
	eP	06	37	01.0	0.8	2.2
	eP	11	23	28.8	1.5	4.0
	eP	11	33	28.8	1.9	5.0
	iX		42.0			
	iSP		57.3			
	iScP		40	17.7		
	-iP	14	10	57.4	1.5	4.0
	cpP		11	53.9		
	ePP		14	18.7		
	eP	15	35	35.8	0.5	1.4
	iX		38	36.4		
+iP	21	49	27.7	1.1	2.8	
31	-iP	03	03	23.9	0.7	1.8
	eP	07	55	57.0	0.8	2.0
	+iP	21	24	11.0	0.7	1.8

November 1959

Date	Phase	Arrival time			Period s	Amplitude m m	
		h	m	s			
01	eP	04	26	40.1	0.6	1.6	
	iX		27	06.2			
	eP	15	15	23.4			
	eP	23	18	38.7	0.7	1.8	
02	eP	07	50	53.2	1.1	3.0	
	eP	08	51	55.7	0.8	2.2	
	- iP	20	16	38.6	1.5	4.0	
	iX			49.1			
	ePP			20			47.3
	iX			28			35.9
- iP	22	05	38.4	1.4	3.8		
03	eP	08	58	48.7	0.7	2.0	
	+ iP	09	51	38.0	1.1	2.8	
	iX		10	02.3			
	eP	09	17	31.7	1.0	2.5	
04	eP	01	29	09.3	0.8	2.0	
	- iP	18	34	53.7	1.0	2.6	
iX	36		42.0				
05	eP	05	58	33.6	0.8	2.2	
	eP	11	10	33.9	0.9	2.4	
	eP		59	01.3	1.1	2.8	
	- iP	12	03	11.8	1.6	4.2	
	- iPcP			22.6			
	ePP		06	48.4			
	eP	17	51	17.7	1.8	4.8	
	ePP			55			08.1
eP	22	06	17.5	0.9	2.4		
06	eP	01	20	40.1	1.4	3.8	
	ePP		24	44.6			
	+ iP	11	55	41.9	1.1	3.0	
07	eP	22	28	48.9	1.1	3.0	

November 1959

Date	Phase	Arrival time			Period s	Amplitude m m
		h	m	s		
08	eP	14	13	46.6		
	+iPKP	14	14	16.6		
	ePP		16	45.7		
	eSKP		17	39.2	2.4	6.2
	eSKSP		26	22.0		
	eP	14	30	10.0		
	eP	14	40	28.6	1.1	3.0
09	eP	18	16	26.2	0.8	2.0
	eP	19	59	39.3	1.0	2.5
10	eP	05	06	52.5	1.0	2.8
	iS			56.1		
12	eP	02	35	47.5	1.1	3.0
	eP	05	09	03.6	1.1	2.8
	eP	07	18	56.6	1.2	3.2
	eP	08	14	01.1	0.8	2.2
	eP	09	49	44.8	1.0	2.5
13	-iP	10	17	45.0	0.8	2.2
	eP	17	05	23.0	1.1	3.0
	eP	18	20	46.4	0.8	2.2
14	-iP	00	05	00.8	1.3	3.5
	eP	04	35	53.8	0.7	2.0
	eP	15	08	25.8	1.2	3.2
	eP	17	09	43.2	0.8	2.0
	eP	21	59	14.1	1.9	5.0
15	eP	04	18	57.3	1.1	3.0
	eP	07	27	22.2	1.7	4.5
	eP	13	30		0.6	1.5
	eP iX	17	23 27	22.8 31.2	2.3	6.0

November 1959

Date	Phase	Arrival time			Period s	Amplitude m m
		h	m	s		
16	- iP	01	09	51.9	1.0	2.6
	eP	03	14	33.4	0.8	2.0
	iX		17	26.2		
	eP	08	18	03.1	0.7	2.0
	eP	09	18	21.7	1.0	2.6
	eP	10	33	42.1	2.2	6.0
eP	23	56	55.0	1.0	2.6	
17	eP	01	16	34.9	1.1	3.0
	eP	02	42	46.6	1.0	2.5
18	- iP	20	46	45.0	0.6	1.5
	iX		49	43.5		
19	+ iP	05	38	28.8	0.8	2.0
	+ iP	11	21	37.5	1.1	3.0
	eS		32	17.4		
eP	22	32	10.5	1.3	3.5	
20	- iP	00	32	33.0	1.1	2.8
	eP	00	13	45.6	0.9	2.5
	eP	15	20	32.1	1.1	2.8
	+ iP	15	30	00.0	1.0	2.8
	eP	22	16	46.5	1.1	3.0
21	eP	08	22	33.0	0.6	1.6
22	- iP	02	46	10.5	0.8	2.0
	eP	09	21	08.4	0.9	2.4
	eP	13	00	58.2	1.1	2.8
	eP	16	36	16.5	1.2	3.0
	iX		37	24.0		
	+ iP	19	46	19.5	0.8	2.0
iX	48		15.6			
eP	22	55	34.0	1.4	3.8	

November 1959

Date	Phase	Arrival time			Period s	Amplitude m m
		h	m	s		
23	eP	16	27		1.5	4.6
	eP	22	07	57.8	1.0	2.6
24	eP	09	36	12.8	2.2	5.8
	eP	21	12	39.8	1.1	2.8
	iX		13	18.2		
26	eP	00	54	39.0	1.1	3.0
	eP	05	56	19.5	1.1	2.8
	-iP	06	06	16.0	1.2	3.0
	+iP	07	18	04.0	1.4	3.6
	eP	13	19	23.8	1.1	2.8
	+iP	16	18	43.0	1.2	3.0
	eP	23	21	09.5	1.3	3.4
	iX		24	33.2		
27	-iP	00	03	56.9	1.8	4.6
	eP	03	51	55.4	0.7	2.0
	-iP	05	21	55.0	0.6	1.8
	iX		22	04.3		
28	eP	00	28	13.3	1.1	2.8
	eP	02	58	29.2	1.5	3.8
	eP	06	44	07.3	1.5	3.8
	iX		45	23.2		
	-iP	12	46	10.3	1.5	4.0
	iX			18.4		
-iP	22	52	13.3	1.5	4.0	
iX		53	25.3			

December 1959

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
01	eP	15	07	29.4	1.3	3.5
	iX			36.9		
	+ iP	15	48	47.1	1.0	2.8
	iX			15.6		
02	eP	01	32	30	0.8	2.0
	eP	03	12	12.7	0.7	1.8
	- iP	04	38	11.7	0.8	2.0
	- iP	07	17	01.9	1.0	2.8
	eP	07	42	35.7	1.8	4.8
	iX			46.7		
	- iP	09	47	50.8	1.3	3.5
iX			59.0			
03	eP	02	01	20.2	1.2	3.2
	eP	03	34	37.5	0.5	1.4
	iP	10	18	30.5	0.7	1.8
	eP	14	20	44.6	1.3	3.4
	eP	18	35	35.9	1.0	2.6
	eP	19	40	54.1	1.5	4.0
05	eP	00	28	46.1	0.8	2.2
	iX		29	11.6		
	eP	08	33	38.5	0.8	2.2
	eP	08	58	26.2	0.9	2.5
	eP	13	04	11.8	0.7	1.8
	eP					
06	eP	04	37	46.8	1.3	3.4
	iX		38	19.5		
07	eP	00	46	30.5	0.8	2.0
	iX			59.6		
	eP	08	03	00.0	1.1	3.0
	eP					
08	iP	04	42	53.5	1.4	3.8
	iPcP			54.8		
	iX			43		
	eP	20	46	43.7	1.9	5.0

December 1959

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
11	- iP + iPcP	00	44	23.5 31.9	1.5	4.0
	eP ePcP iX	01	51	10.0 22.3 07.0	1.1	3.0
	eP	07	15	36.7	1.1	2.8
	eP + iPcP	10	19 20	49.6 01.6	1.3	3.5
	iP iX	14	56 57	49.6 03.1	0.8	2.0
	eP	20	31	23.1	1.1	2.8
	eP	21	10	04.2	1.2	3.0
	eP	22	09	37.5	0.9	2.5
	eP	23	28	20.7	0.6	1.5
	12	- iP	17	20	32.5	1.2
13	eP	12	33	04.5	1.1	3.0
	eP iS	16	49	10.2 17.1	0.8	2.0
	eP	17	47	16.2	1.5	4.0
	eP	23	18	07.0	1.1	2.8
14	eP	10	24	05.9	1.1	3.0
	eP	12	08	51.5	1.1	2.8
	+ iP + iPP iX	18	11 15 17	32.9 12.8 47.3	0.8	2.0
	- iP iX	22	02 21	25.7 26.0	1.5	3.8
	- iP iX	23	27 36	52.4 09.7	3.2	8.6
15	- iP iX	12	21 25	45.1 07.3	1.8	4.8
	+ iP	15	00	12.2	0.9	2.4
	+ iP iX	19	46 49	14.5 19.3	1.6	4.2

December 1959

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
16	- iP	03	50	27.7	0.6	1.6
	eP	11	31	39.1	0.9	2.4
	eP iX	19	27 30	55.9 36.1	1.1	2.8
17	eP	02	39	44.5	0.9	2.5
	- iP	03	08	16.6	0.9	2.5
	eP	06	05	34.6	1.1	3.0
	eP	10	11	37.9	0.5	1.2
	eP iX	12	56	04.0 07.0	0.7	1.8
	+ iP	17	00	19.0	1.6	4.5
18	eP iX	16	44 45	42.1 25.0	1.5	4.0
	eP	20	17	20.0	1.0	2.6
21	eP	06	13	52.1	0.7	2.0
	- iP iX	10	02 12	46.4 48.8	1.1	3.0
	- iP	10	26	28.7	1.4	3.8
	- iP iX	10	31	42.8 52.7	1.6	
	eP iX	22	22	07.2 15.1	1.1	3.0
22	eP iX	01	16	21.7 23.8	0.7	1.8
	eP	02	58	46.6	1.6	4.5
	eP eS	14	25	02.9 11.9	0.6	1.7
	eP	23	01	53	06.2	0.8
23	eP	04	09	59.0	1.0	2.6
	eP	04	43	45.0	0.7	2.0
	+ iP	14	11	14.4	2.0	5.6
	- iP	18	14	38.8	0.8	2.0

December 1959

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
24	eP	00	01	36.5	1.3	3.5
	+ iP	07	23	35.4	1.4	3.8
	iX		24	39.9		
	eP	09	26	34.3	1.5	4.2
	iX			38.8		
	eP	13	03	15.4	1.3	3.4
+ iP	15	25	32.5	0.7	1.8	
iX			04.9			
25	eP	04	01	08.9	1.3	3.5
	iX		02	25.7		
	- iP	05	19	36.2	0.7	1.8
	iX			57.5		
+ iP	09	30	08.4	1.3	3.5	
iX			57			39.9
- iP	16	07	04.5	1.1	2.8	
iX			10			56.4
26	eP	12	17	51.5	0.7	2.0
	iX			54.5		
	eP	16	27	27.2	1.1	2.8
	iX			29.9		
	eP	16	00	19.7	0.5	1.2
iX	29.9					
- iP	17	08	58.1	1.0	2.8	
eP	18	39	12.7	1.1	3.0	
iX			40			25.6

1960

The seismograph was operated by Dr. T. ISHIDA, a member of the 4th JARE. The seismograph was observed with $\mu=1/5$ from January to May and with $\mu=1/2$ from June to December. Seismograms were read by a member of the National Science Museum.

February 1960

Date	Phase	Arrival time			Period s	Amplitude m m
		h	m	s		
5	eP	02	43	18.6	0.7	0.5
	eP	05	53	06.5	1.0	1.5
8	-iP	12	52	40.7	1.5	0.5
	-iP	19	19	38.1	1.0	0.3
9	eP	12	38	52.8	2.0	2.0
10	eP	02	39	30.3	1.0	5.0
	eP	23	33	04.7	2.6	1.5
11	eP	03	49	43.2	1.6	1.8
	eP	13	04	34.0	1.0	2.2
13	eP	15	54	09.6	1.0	1.0
	-iP	20	57	20.5	0.9	0.8
14	+iP	05	31	54.9	1.2	2.0
	eP	13	34	06.9	1.2	1.1
	-iP	15	51	46.8	1.3	2.0
16	eP	00	51	32.2	1.0	0.9
	+iP	02	15	45.1	1.2	1.7
17	eP	11	12	25.5	1.2	1.9
18	-iP	21	24	56.3	0.9	1.5
19	-iP	10	54	54.2	1.2	2.6
21	+iP	00	57	25.2	1.1	5.6
	-iP	09	51	11.2	0.8	1.3
22	-iP	00	59	22.1	1.0	0.6
	-iP	05	32	12.4	1.0	0.8
23	-iP	13	56	38.7	1.4	1.3
24	-iP	08	43	43.9	1.0	1.2
	+iP	21	50	16.7	1.0	9.0
26	+iP	12	09	47.7	0.7	1.6
	+iP	14	24	19.5		0.8
	-iP	15	41	41.5	1.0	1.5

March 1960

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
1	eP	05	38	43.0	0.7	1.8
2	eP	09	38	51.6	0.5	0.3
3	eP	11	32	09.6	1.1	0.9
8	eP	16	45	58.8		
	eP	17	32	31.5	1.7	2.5
9	-iP	15	06	36.2	0.9	4.5
10	eP	05	11	18.9	0.8	1.2
	eP	13	57	35.7	2.0	2.0
19	eP	17	28	41.4	0.7	1.0
21	eP	20	00	56.0	0.9	8.4
22	-iP	02	39	12.5	1.2	2.0
23	-iP	01	46	53.6	0.8	2.5
27	-iP	02	01	25.1	2.1	2.3
	eP	18	06	34.6	1.7	4.0
	-iP	18	06	34.6	1.7	4.0
29	-iP	12	50	27.7	1.5	3.5
29	+iP	00	22	21.7	1.2	2.1
	+iP	06	43	42.0	1.6	1.2
30	-iP	15	31	56.3	1.2	1.7

April 1960

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
5	- iP	06	23	30.4	1.7	2.1
	+ iP	13	12	00.5	1.7	1.2
6	+ iP	02	17	09.6	1.3	1.1
7	+ iP	13	59	00.5	1.0	2.8
10	+ iP	07	05	11.8	1.3	1.2
15	+ iP	03	38	06.3	1.6	3.0
	- iP	22	18	05.2	2.2	6.4
22	+ iP	15	10	12.1	1.4	1.0
	- iP	20	39	10.3	0.9	1.6
24	+ iP	03	03	26.9	1.1	0.8
28	+ iP	02	16	08.2	1.3	1.7
29	+ iP	02	21	57.4	1.3	1.5
	+ iS		28	19.4	0.8	0.5
	eP	13	46	05.8	1.3	0.9
	- iP	13	50	16.0	0.8	6.5
	eP	14	58	47.1	1.3	1.5
	- iP	19	45	00.5	1.4	3.5
	- iP	20	57	15.0	1.3	5.5
30	eP	04	13	21.8	1.0	3.4

May 1960

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
2	+iP	09	54	11.8	0.8	0.5
	-iP	13	23	00.1	0.6	2.2
3	eP	08	08	13.5	0.9	3.0
	-iP	13	34	54.4	0.6	0.8
5	-iP	11	45	40.6	1.2	1.2
6	-iP	02	20	46.8	1.0	1.2
8	-iP	05	41	26.1	0.9	3.7
9	eP	18	48	50.1		
13	-iP	07	46	34.1	1.1	2.0
	eP	20	58	15.1	1.0	1.4
18	eP	12	56	35.6	1.9	1.2
19	eP	08	22	24.0	1.0	2.9
21	eP	10	34	07.8	3.0	7.5
	eS		42	24.3	1.4	9.0
	eP	11	04	21.8	0.8	3.2
	eP	13	10	28.4	1.9	5.0
22	eP	10	41	12.7	1.4	5.0
	+iS		43	06.1	2.0	8.3
23	-iP	00	14	45.3	1.3	1.9
	-iP	00	39	51.9	1.1	1.5
	+iS		48	36.5	1.5	2.0
	-iP	08	18	42.6	2.0	4.3
	-iP	11	47	51.2	0.7	1.3
24	eP	15	56	42.6	1.5	1.2
25	eP	08	44	20.4	1.5	2.2
26	+iP	12	04	45.7	1.2	1.5
	-iP	19	44	15.2	1.7	1.2
27	+iP	00	45	55.0	1.2	0.8
	+iP	01	09	32.5	0.8	0.9
	+iP	23	16	39.5	1.8	2.0
28	+iP	06	16	09.9	0.9	1.0
	-iP	09	15	42.7	0.9	2.5
	-iP	11	16	04.5	2.0	1.7

May 1960

Date	Phase	Arrival time			Period s	Amplitude m m
		h	m	s		
29	-iP	07	49	54.3	2.3	3.0
	-iP	08	44	46.3	1.4	1.5
	+iP	21	33	52.3	0.7	0.6
	-iS		50	04.8	1.3	1.2
30	+iP	07	10	47.4	1.3	0.8
	+iP	08	41	14.8	1.0	1.4
31	+iP	02	50	21.1	1.7	8.0
	-iP	13	24	15.0	1.0	3.0
	-iP	16	29	56.0	1.2	1.3
	+iP	21	11	41.8	0.4	1.0

June 1960

Date	Phase	Arrival time			Period s	Amplitude m m
		h	m	s		
1	eP	05	13	20.4	2.4	1.8
	eP	23	34	50.9	1.5	3.6
2	+iP	06	07	37.1	1.6	6.0
	+iP	19	10	54.0	0.6	3.0
	-iS		20	41.9	1.3	1.5
3	-iP	03	34	27.0	1.3	2.5
	eP	13	35	33.6	1.2	2.8
5	+iP	19	42	20.8	1.0	5.4
6	+iP	01	37	43.8	1.3	12.5
	+iP	06	05	18.9	1.0	2.5
	-iP	16	33	40.0	2.0	3.2
7	-iP	11	01	19.1		8.0
	-iP	13	06	14.2	1.1	7.0
	+iS		17	01.2		2.5
	+iP	14	12	09.7	1.3	2.0
8	-iP	19	40	01.1	1.4	2.9
9	-iP	11	36	34.8	0.9	6.0
15	eP	16	55	55.5	0.7	1.6
	eP	09	50	18.7	0.8	4.0
	-iP	23	01	25.0		8.1
	-iP	23	40	46.7	0.9	3.6
	iS		42	09.3		

June 1960

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
16	+ iP	03	11	46.1	0.9	5.2
17	- iP	05	14	31.1	0.9	6.2
	- iP	05	33	38.5	0.7	2.1
	+ iP	17	51	29.8	0.4	2.1
18	- iP	02	44	27.7	1.1	6.9
19	- iP	02	49	55.7	0.9	8.2
21	+ iP	15	11	59.9	0.9	2.9
	- iP	21	39	19.3	0.9	5.1
22	- iP	02	09	18.3	2.5	1.6
	+ iP	02	31	15.2	3.7	4.0
	- iP	06	20	26.7	0.9	4.9
	- iP	09	07	53.3	2.1	1.8
	eP	20	23	41.8	1.0	3.0
23	- iP	12	20	37.3	0.9	3.2
24	+ iP	04	31	16.3	0.9	2.8
25	- iP	02	14	33.0	0.9	2.8
	- iP	14	53	04.8	1.1	3.0
	- iP	15	10	56.2	0.7	1.0
	iP	19	46	35.2		
26	- iP	16	57	12.8	1.2	1.7
27	+ iP	17	02	05.5	0.7	2.4
	+ iP	17	10	27.8	0.9	3.2
	- iP	18	15	21.6	0.7	3.1
28	+ iP	14	18	44.5	0.8	3.8
29	- iP	02	07	09.8	0.9	4.0
	eP	02	27	19.6	0.6	0.8
	eP	09	56	07.5	0.4	1.0
30	+ iP	22	20	38.0	0.9	3.6

July 1960

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
2	eP	14	18	57.2	1.6	3.0
4	eP	03	53	10.8	2.6	6.0
	eP	20	08	32.9	1.0	2.2
5	eP	05	55	47.3	1.2	4.1
	eP	08	16	52.0	0.7	0.9
	-iP	21	45	52.0	0.3	2.3
	iX		48	47.7	0.6	3.8
6	eP	15	16	15.4	1.0	3.1
	eP	19	38	02.0	0.2	1.0
7	-iP	14	57	10.8	0.7	2.0
	-iP	18	36	13.1	0.6	1.2
10	eP	09	19	13.7	0.9	1.4
11	eP	08	13	26.8	1.2	4.9
	eP	12	08	21.1	1.2	7.1
13	eP	07	45	21.3	1.4	2.1
15	+iP	05	11	51.2	0.6	3.8
20	eP	10	23	31.8	1.0	3.0
22	eP	17	15	49.9	0.5	2.0
23	-iP	03	15	49.4	0.6	1.0
	+iP	07	43	17.1	0.5	5.8
25	+iP	13	31	34.3	0.9	3.8
26	+iP	17	19	28.9	0.9	2.0
27	+iP	10	14	41.6	0.9	7.0
29	-iP	00	36	45.2	1.2	20.2
	+iP	16	23	39.7	0.6	2.0
	+iP	15	59	01.3	0.8	1.9
	-iP	18	50	49.6	0.9	3.0
31	-iP	03	08	53.4	0.6	4.6
	eP	03	45	36.3	0.7	4.0

August 1960

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
2	eP	22	21	57.0	0.6	2.1
	eP	23	50	20.2	0.3	0.9
3	eP	00	20	56.3	0.6	1.9
	eP	01	20	43.1	0.9	1.7
4	-iP	07	54	37.8	1.5	2.8
5	-iP	05	39	31.4	1.2	3.1
6	eP	14	59	45.1	1.1	2.2
9	-iP	07	59	13.4	1.0	2.0
	-iP	16	58	48.8	0.9	2.0
10	eP	12	36	25.8	0.3	1.0
11	-iP	03	06	00.6	0.4	1.1
	-iP	05	03	58.7		12.0
13	eP	14	54	23.8	0.7	3.1
14	eP	22	57	17.6		
15	-iP	14	43	30.6	1.3	3.0
16	-iP	02	59	27.4	1.1	3.2
21	eP	13	02	30.2		
22	-iP	23	58	10.3	1.3	1.5
25	eP	03	51	29.0	0.9	1.2
	eP	18	02	24.3	0.7	1.9
	eP	18	55	56.8	1.2	1.1
27	eP	18	35	25.0		

September 1960

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
1	-iP	05	47	49.4	1.8	3.1
	-iP	07	46	47.3	0.8	1.5
	+iP	09	41	04.0	0.9	4.1
	eP	12	10	03.9	0.6	2.0
	+iP	20	15	00.8	1.0	1.8
2	-iP	11	04	55.6	0.9	4.8
5	eP	10	47	02.7	0.8	1.6
	-iP	12	17	59.2	0.4	1.0
9	+iP	17	57	12.1	0.4	2.9
10	+iP	10	56	54.3	0.6	1.8
	+iS	11	07	31.3	1.0	1.4
11	-iP	08	06	17.4	1.0	1.0
	-iP	09	23	53.3	0.4	1.2
	+iP	11	03	16.7	0.9	4.2
	-iP	12	31	23.1	0.9	2.0
	+iP	13	13	12.0	0.6	2.0
12	+iP	13	13	12.0	0.6	2.0
13	eP	22	27	58.1	0.8	1.6
14	-iP	00	27	44.8	1.3	2.0
	+iP	05	08	39.8	0.8	6.6
	-iP	23	31	22.4	0.8	1.6
16	-iP	07	24	11.7	0.5	1.4
	-iP	11	45	50.6	1.0	1.7
17	-iP	08	12	20.5	0.2	4.0
	-iP	13	11	57.6	0.2	2.1
	+iP	13	27	50.0	0.5	1.0
	-iP	20	08	54.6	1.0	2.0
20	+iP	00	53	34.7	0.8	3.0
	-iP	03	15	52.0	1.0	5.2
	-iP	03	47	34.0	0.3	0.9
21	-iP	08	05	19.1	1.0	1.2
23	-iP	23	16	03.1	0.8	1.8
26	-iP	23	02	04.1	0.7	1.0
27	+iP	02	23	31.8	0.9	3.0
28	-iP	02	27	14.2	1.2	2.0
	-iP	08	10	02.9	1.0	1.2
29	+iP	06	40	01.2	0.7	5.0
	-iPKP	11	36	41.6	0.6	2.0
	eP	22	23	08.8	0.3	1.1
30	-iP	07	46	54.2	0.7	1.8

October 1960

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
1	eP	21	45	16.8	1.3	4.0
4	-iP	10	04	15.1	1.4	3.8
	eP	14	02	04.2	0.4	1.9
6	-iP	06	19	32.9	0.4	5.0
	+iP	13	53	42.1	0.8	1.9
	-iP	14	53	24.7	0.8	1.0
	-iP	16	26	59.4	1.4	8.0
	-iP	19	01	57.1	1.6	2.7
7	+iP	20	14	07.0	0.9	1.8
8	+iP	20	52	40.6	1.2	8.8
9	-iP	08	49	41.4	1.0	5.2
13	eP	00	53	33.3	0.9	1.2
	eP	06	15	29.8	1.0	0.8
14	-iP	00	34	14.9	1.2	2.2
	eP	01	39	52.9	0.5	1.4
	-iP	21	39	03.0	2.2	11.0
17	-iP	22	56	09.2	0.7	2.0
20	+iP	11	19	02.6	0.8	15.2
21	-iP	08	57	45.6	0.8	1.2
22	-iP	08	35	57.6	1.0	10.0
24	-iP	04	09	08.0	1.3	1.6
	-iP	10	26	07.2	0.8	4.2
	+iP	22	40	11.3	0.8	2.0
25	eP	12	24	36.3	0.6	1.0
	-iP	18	38	58.7	0.4	2.0
	eP	19	34	18.5	1.0	1.1
	eP	20	47	24.0	1.0	1.2
27	eP	00	28	27.2	0.4	0.9
	-iP	13	38	22.6	0.9	2.0
	iP	22	46	39.5	0.7	4.0
28	+iP	04	38	13.2	0.3	1.0
	-iP	13	37	45.7	1.0	3.0

November 1960

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
2	eP	10	54	01.2	0.7	1.8
	eP	17	32	20.7	1.0	0.2
	-iP	19	00	05.7	1.0	1.0
	eP	19	56	48.6	0.3	1.0
3	eP	10	01	58.0	0.7	1.3
	-iP	10	38	30.2	1.0	1.0
4	-iP	18	06	34.4	1.0	3.0
	+iP	18	26	20.2	0.4	3.0
5	-iP	08	19	43.8	0.8	2.1
	-iP	08	44	29.0	0.2	1.0
	-iP	15	10	05.4	0.5	1.2
6	-iP	04	57	56.0	1.0	4.8
	-iP	06	26	38.7	0.2	2.0
	-iP	07	34	25.9	1.0	1.0
	eP	14	18	52.6	1.0	2.0
13	+iP	06	50	05.1	0.3	1.7
	+iP	09	40	27.0	2.0	8.0
14	-eP	09	47	45.3	0.9	1.2
16	+iP	16	21	39.7	1.0	3.8
	-iP	19	09	06.1	1.0	2.3
21	+iP	04	41	49.2	0.5	2.0
23	eP	02	01	37.5	0.2	0.8
	-iP	04	19	01.8	0.6	3.0
	-iP	17	05	15.2	0.4	2.1
	-iP	18	09	00.6	1.0	8.0
	-iP	20	24	32.3	0.9	1.2
	eP	22	06	44.6	0.9	1.2
24	-iP	05	03	26.0	1.2	2.0
	eP	05	37	02.0	1.0	1.7
	eP	08	29	12.8	0.8	2.0
	-iP	09	40	38.8	0.6	1.0
	-iP	12	35	28.9	0.5	1.2
	-iP	21	45	16.2	1.0	2.2
26	eP	04	26	04.2	0.7	1.0
	+iP	14	39	09.4	1.0	1.8
27	-iP	21	34	54.5	1.0	2.0
28	eP	14	10	33.6	0.6	2.6

December 1960

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
1	eP	09	50	45.2	0.3	1.0
	eP	10	52	53.2	0.6	1.0
2	-iP	22	41	37.7	1.0	1.0
3	-iP	04	43	09.8	0.4	15.0
	+iP	19	07	27.8	0.3	1.0
	+eP iX	21	07 27	39.5 38.9	0.5 2.5	1.4 4.0
4	eP	07	14	03.4	0.8	1.9
	-iP	16	00	10.1	1.0	3.2
5	+iP	00	07	15.6	0.8	3.0
	-iP	18	09	33.2	0.8	4.0
	-iP	18	27	20.0	0.8	7.0
6	-iP	09	08	03.4	1.0	20.0
9	eP	00	39	34.0	0.8	3.0
	+iP	03	11	18.4	0.7	3.0
11	-iP	19	05	47.6	0.8	4.0
12	+iP	10	15	44.0	0.8	3.0
	eP	11	44	30.1	0.3	2.0
14	-iP	15	02	29.7	0.7	5.0
18	-iP	14	32	18.7	0.8	2.0
23	-iP	09	53	30.7	0.7	4.0
24	eP	04	04	54.1	1.2	4.0
26	+iP	04	38	39.6	0.5	5.0
30	-iP	11	17	00.9	0.4	3.0
31	-iP	00	19	59.8	0.5	5.0

1961 – 1962

Two horizontal components of HES seismograph were set by Dr. T. ETO, a member of the 5th JARE.

The seismographs were operated by Mr. Z. SEINO, a member of the wintering party of the 5th JARE, and were observed with the attenuation factor $\mu=1/5$ from January to May and with $\mu=1/2$ from June to January in 1962. Seismograms were read by a member of the National Science Museum.

As Syowa Station was closed in January of 1962, the seismological observation was suspended until 1966.

February 1961

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
9	iP	02	20	17.3		
11	- iP + iS	21	13 22	09.1 59.2	1.8	1.0
12	+ iP	01	30	45.5	1.1	1.0
20	+ iP	18	36	39.1	0.4	4.0
22	+ iP + iSN	22	05 15	32.6 24.3	1.9 2.8	2.5 2.1
26	+ ePN	06	00	38.1	1.8	1.1

March 1961

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
2	ePE	18	34	21.1		
7	+ iP eSE iXE	10	22 32	42.5 13 57.1	4.0	20.0
9	+ iP PN	15	21	57.9		
10	+ iP PN	16	42	15.8	0.7	1.2
13	- iP	20	11	35.7		
20	+ eP	23	55	03.6	0.8	2.2

April 1961

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
29	+ iP	09	39	21.8	1.3	3.1

May 1961

Date	Phase	Arrival time			Period s	Amplitude m m
		h	m	s		
6	- iP	23	26	06.3		
8	- iP	19	35	10.4	1.0	1.9
10	+ eP	18	50	00.0	0.9	0.5
11	- iP	08	48	52.0		
13	+ iP	14	30	50.1	1.5	1.0
15	- iP	19	54	56.6		
	- iS	20	01	59.6	1.4	1.0
	+ iP	21	35	39.5		
17	- ePN	19	49	19.3	0.9	0.5
18	- iP	17	27	01.1	1.3	1.2
22	- ePN	17	44	56.2	1.4	2.9
	+ eSN		55	14.1	1.7	4.0
	iXN			44.7	3.3	5.0
24	+ ePN	18	00	33.2	1.0	0.2
26	eP	11	50	50.8		

June 1961

Date	Phase	Arrival time			Period s	Amplitude m m
		h	m	s		
1	+ iP	05	03	16.7	1.8	1.3
	+ iP	23	41	28.9	2.8	2.9
7	+ ePE	14	26	43.1	2.5	1.0
8	- iP	15	56	10.0		
13	+ iP	21	50	13.7	1.1	1.5
	iXN			33.9	1.3	2.5
	eXN	22	00	32.0		
	- iSN			41.0	3.5	3.5
16	+ iP	10	55	29.5	2.3	2.0
18	+ iPN	14	06	18.0	0.7	0.2
	+ eSN		15	19.3	1.5	0.3
	+ iPN	22	22	51.2	2.1	1.9
20	+ ePN	08	39	02.3	0.5	0.5
	iXN		40	09.3	1.6	3.0
21	iP	06	36	32.0		
24	- iP	16	52	08.9	0.6	0.9
	- eP	19	47	22.0	1.4	1.0
26	- iP	15	07	18.8	1.2	1.2
27	+ iP	08	12	09.6		
29	+ iP	09	35	50.2	1.5	2.0
30	- eP	21	20	10.4	0.6	2.0

July 1961

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
1	-iP	13	23	06.7	1.6	8.3
	-eP	22	11	54.9	0.7	1.1
	eX		12	34.4	2.1	2.0
2	-iP	08	57	52.7	1.3	1.0
	-eP	17	00	17.7	2.0	2.0
3	+iP	01	56	13.1	1.3	0.9
	+iP	15	02	31.4	1.3	2.0
4	-iP	20	06	40.0	2.3	3.1
5	-iP	02	36	39.9	1.7	2.1
	-iP	02	31	45.6	0.9	1.0
	+eP	19	31	27.1	1.0	1.0
6	-iP	03	32	56.7	1.3	2.0
	eP	13	20	57.4		
	ePE	16	36	08.3		
	-iP eSN	22	01 12	56.2 13	1.8	25.0
7	+iP	13	23	48.9	1.5	2.0
	iX		24	04.4	2.2	12.0
	+eSE		34	38.8	1.0	1.2
	-iP	15	40	46.6	1.2	5.0
	-iP	22	31	59.6	1.9	5.0
8	-iPN	15	47	06.5	1.5	7.0
	+eSN		53	03.7	1.6	5.0
	+ePN	22	00	10.5	1.5	1.7
9	+iPN	04	01	52.9	1.5	2.9
	+iSN		11	38.4	3.1	5.0
10	+eP	11	42	31.2	1.0	2.0
	-ePE	15	50	57.2	1.1	1.0
11	-iP	06	04	48.3	1.0	2.0
	-iP	09	44	21.1	1.3	2.0
	+iP	18	47	20.8	0.7	2.0

July 1961

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
13	- iP	21	09	17.9	0.8	2.0
	+ iP iXE	21	36 37	53.5 52.7	1.3	3.0
14	+ iP	10	42	02.5	1.3	0.9
15	+ iP	14	06	36.8	1.0	2.0
	- iSN		15	49.5	1.5	1.5
16	- eP	13	55	57.6	1.0	2.0
	+ iS	14	13	54.7	1.6	2.0
	- eP	19	22	42.0	1.6	2.5
	+ iP	20	11	33.3	1.7	2.0
	- iP	21	28	17.7	1.2	2.6
18	+ ePE	14	22	43.7	1.5	2.0
19	+ ePE	03	56	26.2	2.2	7.0
23	+ iP	14	16	14.1	1.7	5.0
	+ iP	15	42	50.8	1.4	6.1
	- iP	22	03	42.9		
25	- iP	18	52	14.2	1.6	3.5
26	+ iPE	09	29	41.8	1.4	4.0
	- iPE	19	51	55.2	1.2	5.4
28	- iP	01	18	46.3	1.2	1.5
	+ iSN		29	12.5	2.9	8.5
	+ ePN + eSN	13	33 43	29.0 55.0	1.0 3.3	2.0 1.0
29	- iP	16	39	47.4	1.7	7.5
	+ iSN		50	03.0	2.6	2.1
31	- eP	23	44	31.8	1.3	2.7

August 1961

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
1	-iP	05	52	56.2	2.2	7.5
	-iSE	06	03	58.8	2.4	4.0
	-iP	07	27	22.0	1.0	5.0
	-iSN		32	15.6	2.5	7.0
	-iP	10	10	39.2	0.6	1.5
-eSN	15		49.2	3.2	6.0	
2	-eP	03	37	45.8	1.0	4.2
	+eP	10	34	15.9	1.3	0.9
5	+iP	09	39	40.9	1.9	5.7
6	+iP	04	34	57.3	1.7	0.9
7	+iP	12	34	28.8	1.2	3.3
	-iP	17	09	51.9	1.2	3.0
8	-iP	12	38	14.3	1.3	5.1
	-iP	20	38	26.0	0.9	1.1
	-eP	23	50	11.4	1.5	1.2
9	-iP	16	14	57.1		
11	+iP	10	37	33.9	1.4	1.8
	-iP	11	17	15.9	1.2	3.5
	-eP	16	10	49.6	1.2	8.2
	-iSE		14	19.4	3.6	14.2
	+iP	22	49	56.2	1.6	1.7
+iSN	23	00	12.5	3.6	9.0	
14	-eP	02	27	28.7	1.1	1.5
	+iP	18	59	18.3	1.7	3.8
	-iP	23	41	10.4	1.0	3.0
+iSE	51		23.6	1.9	3.9	
15	-iP	18	52	53.0	1.3	3.9
16	-iP	03	45	32.4		3.8
	-eP	16	26	39.9	1.3	2.9

August 1961

Date	Phase	Arrival time			Period s	Amplitude m m
		h	m	s		
17	+ eP	01	16	20.0	1.6	3.0
	- eP	05	15	21.8	0.8	1.7
	+ eP	22	05	28.3	0.8	1.0
	- iS		07	58.0	1.0	5.0
18	+ eP	04	01	53.0	1.4	1.0
	- iP	11	12	57.8	1.2	5.0
19	+ iPE	05	21	32.2	1.8	8.0
	- iSE		30	57.2		
	+ iP	15	30	56.2	1.5	1.8
	+ iP	16	13	07.2	0.9	4.9
20	- eP	02	12	59.2	1.6	2.0
	+ iP	05	46	11.4	1.4	3.2
	- iS		48	18.5	1.8	10.0
21	- iP	16	19	48.9	1.5	3.5
	+ iSE	16	30	02.7	2.5	1.0
22	- iP	09	12	24.6	2.4	5.5
23	+ iP	12	11	01.1	0.8	3.0
24	- iP	20	40	01.0	1.5	2.1
28	+ iP	06	40	29.0		
	+ iP	19	38	40.5	2.2	5.0
	+ iP	20	39	42.1	1.7	1.4
	+ iP	21	56	32.8	1.2	2.8
31	+ iP	02	00	22.1		
	+ iS		09	01.3		
	+ iPN	03	18	23.2	1.8	4.5

September 1961

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
2	-iP	11	01	32.5	1.6	2.5
	-eP	17	10	54.0	1.8	1.5
3	-iP	09	13	30.0	0.9	2.9
4	+iP	10	09	01.4	1.4	7.9
5	+eP	03	27	28.8	2.0	2.9
	-iP	11	54	37.6	2.9	5.5
	-iP	11	55	53.7	1.1	12.1
	-eP	22	49	22.6	0.9	1.8
6	-iP	15	43	16.5	1.5	3.1
8	iP	11	32	41.9		
	iSN		37	42.6		
10	iP	04	56	08.6		
	-iSN	05	04	54.4	2.2	14.0
	+iP	11	53	26.2	1.5	4.0
	-iP	15	52	34.1	1.4	0.9
11	-iP	18	20	56.3	0.9	3.0
	-iP	14	57	33.7	1.1	2.1
	-iP	23	49	38.1	1.3	-1.9
12	-iP	00	29	11.3	0.7	4.5
	-iP	05	15	28.4	1.5	2.7
	-iP	19	35	13.1	2.4	3.5
	eSN		40	11.7		
13	+iP	21	29	20.4	1.8	7.0
14	+iP	11	32	19.9	1.3	4.0
	+eP	18	18	16.8	1.3	1.2
17	-iP	23	35	05.4	2.0	3.7
18	iP	03	06	35.1		
	-iS		15	30.1	2.0	3.2
19	-iP	21	40	26.5	1.0	3.0
	+iSE		45	05.6	3.5	8.0
20	+iP	19	16	52.2	1.8	1.2
22	-eP	19	06	01.6	1.0	4.8
	-iP	21	35	50.5	0.7	1.3
23	-iP	08	28	22.9	1.3	2.2
25	+eP	22	28	06.5	1.7	1.8
26	-iP	08	24	15.9	0.7	1.0
27	+iP	06	46	03.8	1.2	10.3
	-iP	12	13	19.4	2.4	11.0
	iS		18	08.0		
28	+iP	05	05	48.2	1.2	8.0

October 1961

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
2	-eP	05	49	06.5	1.8	4.0
	-iP	17	14	04.1	1.3	6.0
8	-iP	23	54	24.6	1.8	8.9
	+eS	24	04	44.0	1.5	2.5
9	+iP	03	28	14.1	1.8	1.2
11	+iP	00	41	36.4	1.4	5.3
	+eP	10	51	01.5	1.0	0.8
12	-iP	05	05	27.0		
13	+eP	08	23	55.8	0.8	0.7
	-iP	10	52	57.8	1.4	4.0
	+iP	17	40	40.3	1.2	3.2
16	+iP	04	32	26.7	1.3	1.5
	+eSN		36	37.0	1.8	7.0
18	+eP	00	22	00.4	0.7	0.9
	-iP	17	02	25.7		
	-iP	18	20	57.4	1.3	3.0
19	-iP	11	29	28.4	1.8	10.0
	-eS		37	44.0	1.4	3.0
	-iP	19	34	48.1	1.9	6.5
23	+iP	00	14	48.9	2.1	4.0
	-eP	14	52	47.0	2.4	1.5
	iX		56	48.1	2.4	3.0
24	+iP	07	49	13.8	1.6	4.0
25	-eP	12	16	40.7	0.8	0.5
	-eP	14	33	09.3	1.0	2.0
26	+eP	05	21	36.6	1.8	4.0
	+iP	15	39	06.7	0.7	0.8
	iX			15.6	3.8	26.2
	-iS		49	03.0	3.5	4.5
	-iP	19	40	45.1	2.5	6.0
28	-iP	14	59	32.8	1.4	5.0
	+iP	22	57	22.5	1.2	1.1
29	+iP	06	01	11.0	1.0	1.0
	-eP	09	32	15.3	2.0	1.5
30	-eP	02	36	18.3	2.8	2.7
	-iP	17	46	42.4	0.7	1.3

November 1961

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
2	+ eP	03	18	57.6	1.4	2.1
3	- iP	21	57	09.5	1.8	2.1
4	- iP	03	58	03.2	1.0	2.5
6	- iP	00	05	56.7	1.6	2.0
	iP	05	42	13.4		
	+ iP	15	06	49.0	0.8	3.0
7	- iP	00	51	42.4	1.0	3.1
	- iP	12	07	12.8	1.8	3.9
	- iP	21	21	14.6	1.0	1.5
8	- iP	11	01	41.6	1.0	3.0
	- eP	19	21	23.9	1.2	1.9
	- iP	20	47	14.0	1.7	2.9
9	- eP	01	21	36.1	1.0	1.1
	+ iP	04	11	15.0	1.5	6.1
	- iP	18	49	37.5	1.1	2.1
10	+ iP	02	20	00.3	1.5	4.0
	iX			25.5	1.4	3.1
	+ iP	11	44	43.8	0.8	0.9
	+ iP	18	12	47.5	1.8	6.0
	+ iS		14	54.1	1.2	9.0
	+ eP	23	55	44.4	0.8	1.1
12	+ iP	02	26	27.2	1.7	6.8
	- iP	10	25	14.1	1.3	3.1
	- iP	18	23	54.8	1.1	4.0
14	+ iP	12	50	19.9	0.6	5.0
	- iP	21	51	09.9	1.1	3.5

November 1961

Date	Phase	Arrival time			Period s	Amplitude m m
		h	m	s		
15	+iP	07	36	26.7	2.3	2.8
16	+eP	00	58	05.7	1.4	1.3
17	+iP	22	30	05.1	1.3	3.5
18	-iP	11	29	05.1	1.7	5.9
19	+iP	22	34	32.0	0.9	10.5
	+iSKS		44	40.5	2.1	2.5
	-iS			59.9	2.3	4.5
22	+eP	12	28	18.4	0.7	1.1
	-iP	15	12	20.4	1.1	1.0
	+iP	16	19	21.1	2.2	3.1
	-iP	20	51	24.9	1.5	1.1
23	-eP	14	32	45.8	1.7	4.3
25	+iP	13	17	59.4	1.4	4.0
	-iP	14	24	27.6	1.4	3.4
	-eP	22	21	05.0	1.7	2.1
27	iP	02	00	27.3	2.0	
	+eS		04	56.1	1.4	0.9
	-iP	17	23	31.1	0.9	4.5
29	-iP	09	36	13.7	1.9	5.5
30	-iP	10	29	01.7	1.2	1.0

December 1961

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
1	+ iP	07	54	11.0	1.2	4.0
3	+ iP	12	16	20.4	2.3	5.5
5	+ iP	13	10	34.0	1.0	6.0
6	+ iP	13	47	54.0	1.0	2.1
	- iP	16	59	05.5	1.0	1.7
9	- iP	04	11	28.2	1.4	9.9
	- iP	04	37	09.3	1.0	4.9
	+ iP	11	27	56.8	2.3	3.5
	+ iP	20	01	16.0	1.3	3.9
11	- iP	20	40	39.5	0.7	2.0
	- eS		43	32.7		
13	- eP	12	02	12.6	2.3	3.5
14	- iP	07	23	25.8	1.8	3.1
16	+ iP	10	11	43.0	1.9	2.0
17	+ eP	21	44	32.0	1.6	3.9
	- eS		50	44.2	2.4	5.0
20	+ eP	13	39	15.5	1.8	3.2
24	+ iP	02	53	09.1	2.7	5.7
	- eP	23	53	44.1	1.8	6.0
25	+ eP	08	13	36.8	2.5	6.0
26	+ iP	04	36	00.2		
	+ iP	06	22	59.2	1.8	7.7
27	+ iP	02	27	35.2	1.3	2.5
	+ iP	16	58	15.2	2.7	3.5
	+ iP	23	58	41.6	1.5	5.1
28	+ iP	22	30	20.0	4.3	4.8
29	+ iP	00	08	46.3		
30	- iP	00	59	14.7	3.1	4.2

January 1962

Date	Phase	Arrival time			Period s	Amplitude mm
		h	m	s		
1	+ iP	05	35	46.2	1.5	3.5
2	+ cP	12	42	32.9	1.4	1.5
	- iP	23	18	34.2	1.2	3.5
3	+ cP	11	33	39.9	0.8	2.9
	- cP	18	13	01.3	1.1	2.5
4	+ iP	00	32	48.3	2.2	3.5
	- iP	05	53	33.8	1.2	2.1
	- iP	08	17	58.3	1.5	5.5
5	+ cP	00	36	42.6	2.5	3.5
	- iP	12	04	13.2	1.6	3.1
	+ cP	14	43	48.0	1.8	1.5
8	- cP	01	19	03.4	1.6	1.9
	+ iP	05	55	14.8	1.0	2.5
9	- iP	09	51	55.8	1.3	3.1
	+ iP	13	00	03.6	2.5	4.0