J. BERROCAL

THE PENNSYLVANIA STATE UNIVERSITY
MINERAL INDUSTRIES EXPERIMENT STATION
DEPARTMENT OF GEOLOGY AND GEOPHYSICS
GEOPHYSICAL LABORATORY
Project B-130

Seismograph Report XXXIII

1 January 1963 — 31 December 1963

Code — SCP

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Locality: The station is located in a vault in the College of Mineral Industries storage shed. The instruments are mounted on a concrete pillar separated from the foundations and set on sub-soil. The geographic coordinates are:

ϕ = 40° 48' 35.5" N λ = 77° 52' 09.8" W H = 353 m

The geocentric coordinates are:

ϕ = 40° 37' N λ = 77° 52' W

Height above sphere of equal volume = -1.63 km

Please address all communications to:

Geophysical Laboratory
220 Mineral Sciences Building
University Park, Pennsylvania, U.S.A., 16802

In January 1962, the old State College Observatory was replaced by a new one equipped by the Advanced Research Projects Agency of the U. S. Department of Defense through the U. S. Coast and Geodetic Survey under the VELA-Uniform program. The new instruments were put into use on January 19, 1962 and were in continuous operation throughout 1963 except for interruptions to change records and to make minor adjustments. One instrument remains in operation at the old site to operate a visible recorder. The present setup is temporary until 1965, when the observatory will move to a permanent location 100 yards from the location of the old observatory.

The instruments have been maintained at the following characteristics throughout the year:

Component	Seismometer Period	Galvanometer Period	Overall damping (overshoot ratio) A_1/A_2	Sensitivity
SPN	1 sec.	0.76 sec.	16	100,000
SPE	1 sec.	0.76 sec.	24	100,000
SPZ	1 sec.	0.71 sec.	15	100,000
LPN	30 sec.	100 sec.	critical	750
LPE	30 sec.	100 sec.	critical	750
LPZ	30 sec.	100 sec.	critical	750

The time is controlled by a crystal clock which is checked daily against radio station WWV. Time signals are recorded automatically on the SPN component. The amount of drift of the station clock is such that the recorded time marks are correct at all times to within 0.005 seconds.

The recorded seismograms are filed with the U. S. Coast and Geodetic Survey in Washington, D. C. Copies of individual seismograms may be obtained from them. The list which follows shows the earliest observed motion of each earthquake recorded, and lists the components on which this earthquake is observable. Where readable, the direction of first motion is indicated by the following symbols:

N and S = North and South

E and W = East and West

U and D = Up and Down

i means readable to 0.1 sec. on at least 1 trace

e means not readable to 0.1 sec.

RF means record failure. No seismogram exists for this earthquake on this component.

* means earthquake recorded by this component, direction of first motion not read (no implication that it is unreadable).

\- means seismogram exists, but body waves not strongly or not clearly recorded. Surface waves may be clearly recorded.

From October 6 to December 31, no record was kept of which components had readable records. The directions of first motion for this period were usually taken from the short-period seismograms.

Date	GMT of 1st motion	Type of Onset	Observable on Short Period NS	EW	Z	Long Period NS	EW	Z	Remarks
JANUARY									
1	23:48:10.2	i	N	W	D	-	-	-	
5	13:56:15.5	i	-	-	D	-	-	-	
6	06:25:19.5	e	-	-	U	-	-	-	
11	12:25:51.5	i	S	-	D	-	-	-	
12	03:47:27.8	i	N	E	U	-	-	-	
26	15:57:18.0	i	N	E	D	-	-	-	Quarry blast
26	20:19:14.2	i	N	W	-	-	-	-	Quarry blast
27	11:56:14.6	e	-	E	U	-	-	-	
28	13:10:18.0	i	S	W	D	-	-	D	
29	09:33:03.5	i	S	W	U	*	-	*	
29	20:33:48.5	i	S	W	D	*	*	*	
30	04:49:24.0	i	N	E	D	-	-	-	
30	10:13:12.0	e	S	W	D	S	E	D	
31	05:18:20.5	i	-	-	D	-	-	-	
FEBRUARY									
5	20:15:12.0	i	-	-	-	-	-	U	
5	21:01:16	e	-	-	-	-	W	-	
6	02:15:00	i	S	-	U	-	-	-	
13	09:04:22.5	e	RF	*	*	S	W	U	
14	07:23:39.2	i	S	RF	U	N	E	RF	
14	12:19:08.2	i	S	RF	U	N	E	RF	
14	22:26:52.2	i	-	RF	U	-	-	-	
16	03:14:31.0	e	S	W	-	-	-	-	
16	11:49:07.0	i	-	-	D	-	-	-	
18	18:28:58.8	i	N	W	D	-	-	-	Quarry blast
22	16:45:28.0	i	N	W	D	-	-	-	Quarry blast
22	21:19:11.2	i	S	W	D	-	-	-	
24	13:40:02.3	i	N	E	U	N	-	U	
25	08:18:27	e	N	W	D	-	-	-	
26	20:32:38.4	i	N	-	D	N	W	U	
27	04:49:06.0	i	S	E	D	-	W	D	

Date	GMT of 1st motion	Type of Onset	Observable on Short Period NS	EW	Z	Long Period NS	EW	Z	Remarks
MARCH									
3	17:32:39.1	i	N	-	U	-	-	-	
4	07:50:24.8	i	-	-	D	-	-	-	
4	15:22:07.3	i	-	-	U	-	-	-	
4	15:51:13.6	i	-	-	D	-	-	-	
4	18:31:39.2	i	N	W	D	-	-	-	Quarry blast
5	07:13:17.4	e	-	-	D	-	-	-	
7	12:28:57.3	e	-	-	D	-	-	D	
8	17:02:53.0	i	N	W	D	-	-	-	Quarry blast
10	01:49:55.6	i	S	E	U	-	-	-	
10	11:02:58.0	e	-	-	U	-	-	-	
11	07:39:14.0	i	N	E	D	-	-	U	
13	10:44:31.0	i	N	W	D	-	-	-	
16	08:57:03.5	i	S	W	U	S	W	U	
24	02:26:48.1	i	S	E	U	-	-	U	
24	12:57:02	e	-	-	D	-	-	-	
25	09:43:05	e	N	W	U	-	-	-	
25	20:36:40.5	i	N	E	U	-	-	-	
25	23:05:39.5	i	N	-	D	-	-	-	
26	10:03:12.5	i	-	W	D	-	W	U	
26	13:43:40	e	-	-	U	-	-	-	
26	21:48:14.5	i	-	-	U	-	-	U	
29	00:23:29.5	i	S	E	U	S	E	U	
30	17:04:34.4	i	S	E	U	-	-	-	
31	04:54:32.0	i	N	-	U	-	-	-	
31	06:00:03.2	i	-	-	U	-	-	-	
31	07:26:34.0	i	-	-	D	-	-	-	
APRIL									
1	04:41:07.0	i	S	-	U	-	-	-	
2	11:55:20.2	i	-	-	U	-	-	-	
6	11:27:47.2	i	RF	E	U	-	-	-	
7	22:55:30.8	i	-	E	U	-	-	U	
8	14:44:38.5	i	-	W	D	-	-	-	

Date	GMT of 1st motion	Type of Onset	Observable on Short Period NS	EW	Z	Long Period NS	EW	Z	Remarks
APRIL (continued)									
13	02:29:16.9	i	S	E	D	S	-	D	
16	01:48:40.0	i	N	W	U	-	-	-	
19	08:01:15	e	-	-	-	-	W	-	
25	08:33:31.0	i	*	*	D	*	*	*	
29	20:41:22.0	i	N	E	U	-	-	U	
29	21:55:05.4	i	S	W	D	-	-	-	
30	01:17:36.6	i	N	W	D	-	-	-	
MAY									
4	06:06:27.8	i	S	W	U	*	*	*	
4	16:25:21.1	i	S	-	U	*	*	*	
4	20:03:54.3	i	N	W	D	*	*	*	
5	15:27:43.4	i	S	E	U	*	*	*	
6	08:58:09.5	i	S	W	U	*	*	*	
7	16:33:28.8	i	S	W	D	*	*	*	
8	09:00:24.9	i	S	W	D	*	*	*	
10	22:30:41	e	N	E	U	N	-	U	
12	20:17:28.4	i	N	W	D	-	-	-	
12	20:48:26.0	i	S	-	U	*	*	*	
13	12:49:58.2	i	S	W	D	*	*	*	
17	04:19:04.0	i	S	-	U	-	-	-	
18	05:44:39.3	i	N	RF	U	*	*	*	
18	12:40:06.0	i	N	RF	D	*	*	*	
18	13:23:06.9	i	-	RF	D	*	*	*	
19	01:15:45.8	i	S	E	U	*	*	*	
19	21:42:10.0	i	-	E	D	-	-	D	
22	14:08:49.2	i	N	E	U	-	-	U	
22	16:05:08.4	i	*	*	U	*	*	*	
22	16:35:24.6	i	*	*	U	*	*	*	
22	22:12:36.4	i	-	E	U	-	-	-	
23	07:49:12.8	e	-	-	U	-	-	U	
25	08:53:54.9	i	S	E	U	*	*	*	
26	23:18:16.7	i	N	W	D	-	-	-	

Date	GMT of 1st motion	Type of Onset	Observable on Short Period NS	EW	Z	Long Period NS	EW	Z	Remarks
MAY (continued)									
27	04:10:08.0	i	N	W	D	-	-	-	
29	22:57:27.5	i	-	-	D	-	-	-	
30	07:16:58	e	N	-	D	-	-	-	
JUNE									
1	21:31:08.7	i	S	E	D	*	*	*	
2	22:27:57.0	i	N	-	D	-	-	-	
3	11:38:50	e	N	W	D	-	-	-	
4	21:24:01.7	i	S	-	U	*	*	*	
10	04:36:16.2	i	-	-	D	-	-	-	
10	06:58:43.8	i	-	-	D	-	-	-	
10	10:58:40.3	i	N	-	D	-	-	-	
12	04:24:30.1	i	S	W	D	-	-	-	
12	13:17:04.0	i	N	W	U	-	-	-	
15	15:42:39	e	S	-	D	-	-	-	
17	18:50:10.9	i	N	RF	U	-	-	-	
17	23:21:30.8	i	S	RF	D	-	-	-	
19	09:28:07	e	S	RF	D	*	*	*	
26	23:49:24.0	i	N	E	U	*	*	*	
27	01:48:23.1	i	N	W	U	*	*	*	
27	13:15:56.8	i	-	-	D	*	*	*	
28	02:48:31.1	i	S	E	U	-	-	U	
28	22:07:55.6	i	S	E	U	S	E	U	
28	23:09:21.0	i	S	-	D	*	*	*	
29	18:08:04.4	i	S	E	D	*	*	*	
30	07:04:45.2	i	S	E	U	*	*	*	
30	22:17:09.7	i	S	E	U	-	-	-	
JULY									
1	20:00:01.4	i	N	E	U	*	*	*	
2	00:37:36.1	i	S	W	U	*	*	*	
3	19:49:39.1	i	S	W	U	*	*	*	
3	20:04:58.0	i	S	*	U	*	*	*	
5	05:57:19.9	i	N	E	U	*	*	*	

Date	GMT of 1st motion	Type of Onset	Observable on Short Period NS	EW	Z	Long Period NS	EW	Z	Remarks
JULY (continued)									
7	19:26:13.7	i	S	*	U	*	*	*	
8	14:19:49.8	i	N	*	U	-	-	-	
8	18:14:16.1	i	RF	W	-	-	-	-	
9	09:31:06.6	i	*	*	RF	N	-	U	
10	05:35:17.6	i	S	W	RF	S	*	U	
12	06:57:35.2	i	-	E	U	*	*	*	
12	14:10:02.7	i	S	W	D	-	-	-	
14	05:48:20.4	i	S	E	D	S	E	D	
16	18:39:27.4	i	S	W	U	*	*	U	
18	00:11:10.1	i	N	E	U	*	*	*	
19	05:55:41.8	i	N	E	U	*	*	*	
20	00:28:14.4	e	N	E	U	-	-	-	
20	06:55:49.1	i	N	E	U	*	*	*	
22	17:39:39.4	i	N	W	D	-	-	-	
25	07:10:55.3	i	N	W	U	*	*	*	
26	04:28:26.8	i	N	E	D	*	*	*	
26	15:05:31.3	i	N	E	D	*	*	*	
26	23:57:18.6	i	-	-	D	*	*	*	
27	06:08:35.7	i	N	W	U	*	*	*	
28	08:15:07.5	i	*	*	D	*	*	*	
28	19:03:53.1	i	N	-	U	*	*	*	
29	20:33:33	e	-	-	-	-	-	U	
30	07:04:06.4	i	N	E	U	-	-	-	
30	14:09:09	e	-	W	U	-	-	-	
31	15:03:14.5	i	N	-	D	*	*	*	
31	17:58:50	e	*	*	*	*	*	*	
AUGUST									
1	10:56:19.8	i	S	-	U	*	*	*	
1	20:02:09.9	i	S	W	U	*	*	*	
2	18:34:28.8	i	S	W	U	*	*	*	
2	21:06:45.9	i	-	E	U	*	*	*	
3	00:40:03.0	i	N	E	U	*	*	*	

Date	GMT of 1st motion	Type of Onset	Observable on Short Period NS	EW	Z	Long Period NS	EW	Z	Remarks
AUGUST (continued)									
3	10:30:30.0	i	S	E	D	S	E	D	
3	16:39:00	e	S	E	D	*	*	*	
4	02:19:13.4	i	N	W	D	*	*	*	
4	07:28:18.7	i	N	W	D	*	*	*	
5	18:56:42.1	i	S	W	D	*	*	*	
5	19:52:08	e	N	W	-	*	*	*	
6	09:40:24.4	i	S	E	D	*	*	*	
6	09:53:51.4	i	S	E	D	*	*	*	
6	13:43:08.4	i	-	E	D	U	-	-	
7	04:45:47.0	i	-	E	U	*	*	*	
7	07:26:12.4	i	N	W	U	*	*	*	
7	09:41:13.9	i	S	W	U	*	*	*	
7	18:42:44.7	i	N	E	U	-	-	U	
8	02:26:02.1	i	S	W	D	*	*	*	
8	11:10:23.2	i	-	-	D	N	E	*	
9	14:53:41.4	i	*	*	U	-	-	U	
9	16:48:04.9	i	S	W	D	*	*	*	
9	23:15:20	e	*	W	D	*	*	*	
10	15:13:40.5	i	N	E	U	-	-	-	
10	16:06:13.5	i	N	W	D	-	-	-	
10	18:54:20	e	-	-	-	-	-	U	
10	19:23:30	e	S	W	U	-	-	-	
11	03:42:20	e	-	-	-	-	-	U	
11	10:15:01.6	i	S	W	U	-	-	-	
12	01:16:56.2	i	N	E	U	*	*	*	
12	18:55:54.6	i	S	-	D	*	*	*	
12	20:46:08.1	i	S	-	D	-	-	-	
13	03:35:50.3	i	N	W	D	-	-	-	
13	05:12:22.7	i	N	-	D	-	-	-	
13	17:04:49.2	i	-	W	U	*	*	*	
15	06:24:45.9	i	S	E	U	S	E	U	
15	15:01:53.2	i	N	E	D	*	*	*	

Date	GMT of 1st motion	Type of Onset	Observable on Short Period NS	EW	Z	Long Period NS	EW	Z	Remarks
AUGUST (continued)									
15	17:30:02.7	i	N	W	D	*	*	*	
17	11:39:51.0	i	S	E	U	-	-	-	
18	18:53:54.3	i	N	W	D	N	W	D	
19	21:24:08	e	N	E	U	*	*	*	
20	07:13:04.8	i	-	-	U	*	*	*	
20	16:01:09.7	i	-	-	U	-	-	-	
21	03:45:02.9	i	N	W	U	N	W	U	
21	10:36:21.8	i	N	E	U	*	*	*	
22	04:06:38.4	i	N	E	D	*	*	*	
22	09:34:09.2	i	N	E	U	N	E	U	
23	13:21:07.7	i	S	E	D	*	*	-	
23	20:09:51.5	i	S	E	D	*	*	*	
24	01:03:04.8	i	N	W	U	*	*	*	
25	12:31:41.7	e	N	W	U	-	-	U	
25	16:26:58.2	i	S	E	D	*	*	*	
26	06:02:17.3	i	S	W	D	*	*	*	
26	08:57:10.9	i	S	-	U	*	*	*	
26	16:31:04.8	i	N	E	U	*	*	*	
26	22:57:50	e	-	-	D	*	*	*	
27	03:36:09.7	i	-	-	D	N	E	-	
27	21:16:33.9	i	S	E	D	*	*	*	
28	00:18:10.3	i	S	W	D	*	*	*	
29	09:07:13.3	i	N	E	U	-	-	-	
29	15:40:08.2	i	S	W	D	-	-	D	
30	00:36:19.6	i	S	E	U	*	*	*	
31	15:15:30.6	i	N	E	U	*	*	*	
31	17:39:29.9	i	S	W	U	*	*	*	
31	18:41:35.9	i	S	E	U	*	*	*	
31	20:04:52.5	i	-	-	U	*	*	*	

Date	GMT of 1st motion	Type of Onset	Observable on Short Period NS	EW	Z	Long Period NS	EW	Z	Remarks
SEPTEMBER									
1	02:28:52.1	i	-	-	U	*	*	*	
1	11:18:07.5	i	N	E	U	*	*	*	
1	17:18:06.4	i	N	E	U	*	*	*	
1	23:03:35.0	i	S	-	D	*	*	*	
2	02:33:32.0	i	-	E	U	-	-	-	
2	04:19:44.9	i	S	-	D	-	-	-	
2	14:16:54	e	S	E	U	-	-	-	
2	18:33:42	e	-	E	U	-	-	-	
2	21:30:12.7	i	S	-	U	-	-	-	
2	23:57:27.5	i	-	-	D	-	-	-	
3	09:20:48	e	N	W	U	*	*	*	
3	23:55:03.6	i	S	-	U	*	*	*	
4	00:45:22	e	*	*	D	*	*	*	
4	05:17:09.6	i	N	E	D	-	-	D	
4	09:38:37	e	-	-	-	*	*	*	
4	15:41:43	e	-	-	U	-	-	-	
4	16:57:31.8	i	N	E	U	*	*	*	
4	19:12:53	e	-	-	U	*	*	*	
4	21:33:58	e	N	E	U	-	-	-	
4	21:47:06	e	N	-	U	-	-	-	
5	10:00:14.5	i	S	W	D	-	-	-	
5	22:41:45.9	i	-	W	D	*	*	*	
6	01:52:26.6	i	N	E	D	-	-	-	
6	06:11:22	e	-	E	U	-	-	U	
6	12:24:41	e	-	-	U	*	*	*	
6	21:06:48.6	i	N	E	U	-	-	U	
7	02:17:30.5	i	N	E	U	*	*	*	
7	03:00:39	e	-	E	U	*	*	*	
7	09:02:52.6	i	-	-	U	N	E	U	
7	12:55:21.3	i	N	E	U	*	*	*	
8	01:13:10	e	*	*	*	-	-	-	
8	09:18:18.4	i	N	E	U	-	-	-	

Date	GMT of 1st motion	Type of Onset	Observable on Short Period NS	EW	Z	Long Period NS	EW	Z	Remarks
SEPTEMBER (continued)									
8	20:08:06.6	i	S	-	D	*	*	*	
9	03:04:38.3	i	N	E	D	-	-	-	
9	18:17:44.4	i	N	W	U	*	*	*	
9	19:43:46.6	i	S	E	U	*	*	*	
10	17:10:29.0	i	S	-	D	*	*	*	
10	19:52:52.8	e	N	W	U	*	*	*	
11	02:22:19.7	e	S	E	D	-	-	-	
13	17:15:40.2	e	N	E	U	-	-	U	
15	01:01:33.2	e	N	E	D	-	-	-	
16	15:58:28.0	i	N	E	U	-	-	-	
16	20:45:05.3	i	N	E	D	-	-	-	
16	23:05:34.7	i	N	W	U	-	-	-	
17	06:03:31.8	i	S	W	D	-	-	-	
17	19:35:12	e	-	-	-	-	-	D	
18	17:09:53.7	i	S	E	D	-	-	-	
23	17:13:18.7	i	-	W	U	-	-	-	
24	16:39:12.8	i	N	E	U	-	-	U	
24	20:25:41.2	i	N	W	D	-	-	-	
26	03:34:26.4	i	N	-	D	-	-	-	
26	04:29:12.0	i	-	-	D	-	-	-	
26	05:38:44.6	i	N	E	D	-	-	-	
27	10:16:19	e	N	-	U	-	-	U	
27	12:37:57.4	i	N	E	U	-	-	-	
29	22:27:55.5	i	S	W	U	-	-	-	
29	22:50:00.0	i	S	-	D	*	*	*	
OCTOBER									
3	15:23:40.8	i	-	-	U	-	-	-	
3	21:41:44.5	i	N	E	U	-	-	U	
4	13:48:35.0	i	-	-	U	-	-	-	
5	16:51:51.0	i	N	E	D	-	-	-	
5	21:36:31	e	-	E	-	*	*	*	

Date	GMT of 1st motion	Type of Onset	Direction of First Motion			Remarks
OCTOBER (continued)						
6	17:27:03.6	i	N	-	D	
6	21:04:03	e	-	E	U	
7	04:06:02.5	i	S	-	D	
7	12:53:07.4	i	S	-	U	
7	19:19:58.2	i	S	E	U	
8	12:34:04.5	i	-	-	D	
8	13:27:09.1	i	S	E	U	
9	16:07:20	e	S	E	U	
9	18:38:08.6	e	S	E	U	
9	21:17:52.8	i	N	E	D	
9	21:28:05.9	i	S	E	U	
9	23:01:32	e	-	-	D	
12	11:39:30.6	i	S	E	U	
13	05:30:26.0	i	*	*	*	
13	16:12:19.5	i	S	E	U	
13	18:26:16.1	i	S	-	U	
13	19:40:00.5	i	-	-	U	
13	22:07:25.6	i	-	-	D	
14	00:04:53.5	i	-	-	U	
14	04:18:23.1	i	-	-	U	
14	13:34:06.1	i	S	E	D	
15	07:47:05.1	i	N	E	U	
15	09:14:31.9	i	N	E	U	
15	09:44:22.9	i	N	E	U	
15	10:07:14.7	i	N	E	U	
15	10:59:45.1	i	N	E	U	
16	15:32:25.4	i	N	E	U	
16	22:32:06.6	i	N	W	D	
19	02:30:50.2	i	N	-	U	
19	03:46:34.5	i	N	-	U	
19	03:59:23.5	i	N	-	U	
20	01:05:41.5	i	N	E	U	

Date	GMT of 1st motion	Type of Onset	Direction of First Motion			Remarks
OCTOBER (continued)						
20	06:22:50.9	i	N	E	U	
20	09:23:16.3	i	N	E	U	
20	13:11:05.9	i	N	E	U	
21	15:50:50.5	i	S	W	U	
21	17:45:34.2	i	S	-	U	
21	19:37:32.1	i	-	-	U	
22	12:33:53.3	i	N	E	D	
23	10:00:04.2	i	S	E	D	
24	07:45:54.5	i	N	E	D	
25	06:12:59.5	i	N	E	U	
26	19:46:25.8	i	-	E	D	
30	22:29:53	e	N	E	U	
30	22:40:11	e	N	E	U	
NOVEMBER						
1	20:34:48.6	i	N	-	U	
1	22:53:52.9	i	N	E	D	
3	03:18:19.0	i	S	E	U	
4	01:36:20	e				
5	17:55:50	e	N	E	U	
5	19:29:28	e	N	E	U	
6	16:59:32.9	i	N	W	U	
6	19:05:13.4	i	N	W	U	
6	21:49:30.5	i	N	E	U	
9	21:23:31.0	i	S	W	D	
10	01:08:40.3	i	S	W	D	
11	20:25:50.2		-	-	D	
12	07:18:29.9		-	-	U	
12	20:54:24.6	i				
12	21:49:09.0	i				
14	20:36:26.7	i	N	E	D	
15	21:19:07.5	i	-	-	D	
16	06:58:37.0	i				

Date	GMT of 1st motion	Type of Onset	Direction of First Motion			Remarks
NOVEMBER (continued)						
17	00:56:46.7		-	E	D	
17	22:08:01	e	N	W	D	
18	14:43:50	e	S	E	D	
18	16:18:46	e	S	E	U	
18	20:55:43	e	-	-	U	
18	22:17:16	e	N	-	D	
19	08:39:23	e	N	-	D	
19	11:13:29	e	N	-	D	
21	17:02:19.1	i				
21	21:13:23.5	i				
22	14:58:26.2	i				
26	18:25:43.2	i				
26	20:21:18.5	i				
27	02:29:23.2	i				
27	22:28:10.1	i	N	E	U	
28	15:24:09.6	i	N	W	U	
28	20:52:07	e	N	-	U	
DECEMBER						
2	21:04:34.5	i	-	-	D	
2	22:44:36.6	i	S	W	D	
3	00:02:58.4	i	-	W	U	
3	23:14:11.0	i	N	W	U	
6	18:55:06.8	i	-	E	U	
11	20:27:45.4	i	N	E	U	
11	20:34:08.8	i	N	E	U	
14	07:59:24.6	i	N	W	D	
15	20:08:09.8	i	N	E	D	
16	02:11:03.9	i				
21	17:30:09.4	i	N	E	U	
21	18:03:02.2	i	N	E	U	
22	23:20:43.5	i	N	E	U	
23	17:42:34.0	i	N	E	U	

Date	GMT of 1st motion	Type of Onset	Direction of First Motion			Remarks
DECEMBER (continued)						
23	18:45:09.5	i	N	-	D	
23	18:55:57.0	i	N	W	D	
26	16:25:38.8	i	N	E	-	
26	21:16:39.3	i	N	E	U	
26	23:20:04.3	i	N	E	U	
29	17:25:31.7	i	N	W	U	
30	13:41:52.1	i	N	-	U	
30	18:11:05.7	i	N	E	D	
31	17:56:10	e	N	-	U	
31	20:30:11	e	N	-	-	

We acknowledge with thanks receipt of the following bulletins and other publications between 12 January 1963 and 4 March 1964:

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