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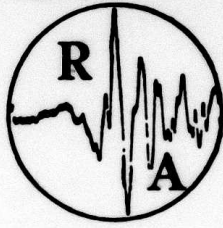
No.1,

1 OCT ~~1979-10~~ 30 SEP ~~1980~~

6 SEISMIC DISCRIMINATION AT REGIONAL DISTANCES.

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RONDOUT ASSOCIATES, INCORPORATED

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## Introduction

This report deals with research carried out under Contract F49620-80-C-0021 between the Air Force Office of Scientific Research and Rondout Associates, Incorporated. The title of this work is "Seismic Discrimination at Regional Distances". The work statement of the contract is as follows:

- "a. Operate a regional seismic network (tripartite-three components) in the eastern United States to collect seismic events.
- b. Determine the regional characteristics for earthquakes occurring in the eastern United States and Canada.

The operations (sic.) of network and the analysis of data is a joint program with the University of Nevada."

Under this program, the University of Nevada has provided the sensing elements, the site electronics and the data recording system. Rondout built the vaults at the remote sites, constructed power and telephone data transmission facilities and routinely operates the data recording system located at the RAI corporate office at 1 Stilba Lane in Stone Ridge, New York.

Data from the array are recorded continuously on digital magnetic tapes with a sampling rate of 25 samples per channel. The original data are saved for a period of approximately one (1) week. Data for a particular event of interest are mailed to the University of Nevada for analog play out and subsequent analyses.

## Current Stations

Although the initial installation of the recording equipment was significantly delayed because of late delivery by the manufacturer, the full array has been operational since November 7, 1980. Two three component stations were operational as of September 6, 1980.

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A. D. BLOSE  
Technical Information Officer

A location map for the stations is presented in Figure 1. Narrative description of the station locations will be provided in a later section. Geographic coordinates of the locations, taken from USGS topographic maps, are listed in Table I together with approximate station elevations.

Data from the remote sites are transmitted digitally via telephone lines to the recording facility at 1 Stilba Lane in Stone Ridge, New York.

### Data

During the network operational period, the following events have occurred.

#### Earthquakes Catskill Seismic Network

Date	Origin Time	Lat.	Long.	Mag.		Depth	Location
				$m_b$	$M_S$		
9/7/80	04:36:38.3	38.033N	118.578W	4.9	5.0	15	California-Nevada border
9/21/80	04:08	45.62N	74.39W	3.2	-	-	SE Canada
9/26/80	13:18:41.5	35.249N	119.383W	4.4	-	6	Central California
9/26/80	18:06	--	--	3.0	-	-	New York
9/27/80	03:41	--	--	3.2	-	-	Burlington Canada
9/27/80	18:01	--	--	3.0	-	-	Burlington Canada
9/27/80	19:16:24.9	37.62N	118.903W	3.9	-	5	California-Nevada border
10/10/80	12:25:23.7	36.143N	1.413E	6.3, 7.2	7.3	10	Algeria
10/24/80	14:59	17.85N	98.12W	6.8	-	-	Mexico
10/24/80	17:27	41°16'N	72°49'W	3.2	-	-	New Haven, Connecticut
10/25/80	00:41	41°16'N	72°49'W	3.0	-	-	New Haven, Connecticut
11/8/80	10:27:33	41.14N	124.30W	7.0	-	-	Northern Connecticut

Accepted for	NTIS	NTIS	NTIS	NTIS	NTIS
By	Dist	Dist	Dist	Dist	Dist
Dist	Dist	Dist	Dist	Dist	Dist

Explosions  
Catskill Seismic Network

Date	Origin Time	Lat.	Long.	Mag.		Depth	Location
				$m_b$	$M_S$		
9/14/80	02:42:39.3	49.979N	78.883E	6.2	4.2	0	E. Kazakh SSR

Two explosions in Nevada and five additional USSR explosions have been recorded by the Network.

The recorded data for these events have been forwarded to the University of Nevada for processing. A typical play out for the Mono Lake earthquake is presented in Figure 2.

#### Data Analyses

Since the array became fully operational only on November 7, 1980, there has been little opportunity to carry out analyses of the data. Principal efforts to date have been in the areas of:

1. The determination of the threshold detection level of the array for events in the eastern and central portions of the United States and Canada and
2. The determination of the characteristics of the seismic noise at the sites.

These analyses are underway at the present time and results will be presented in subsequent progress reports.

#### Site Description

All of the remote stations are located in or near the unincorporated hamlet of Stone Ridge, New York.

1. Station 0. This station is located at the Pomeroy residence on Route 213.

The site can be reached as follows:

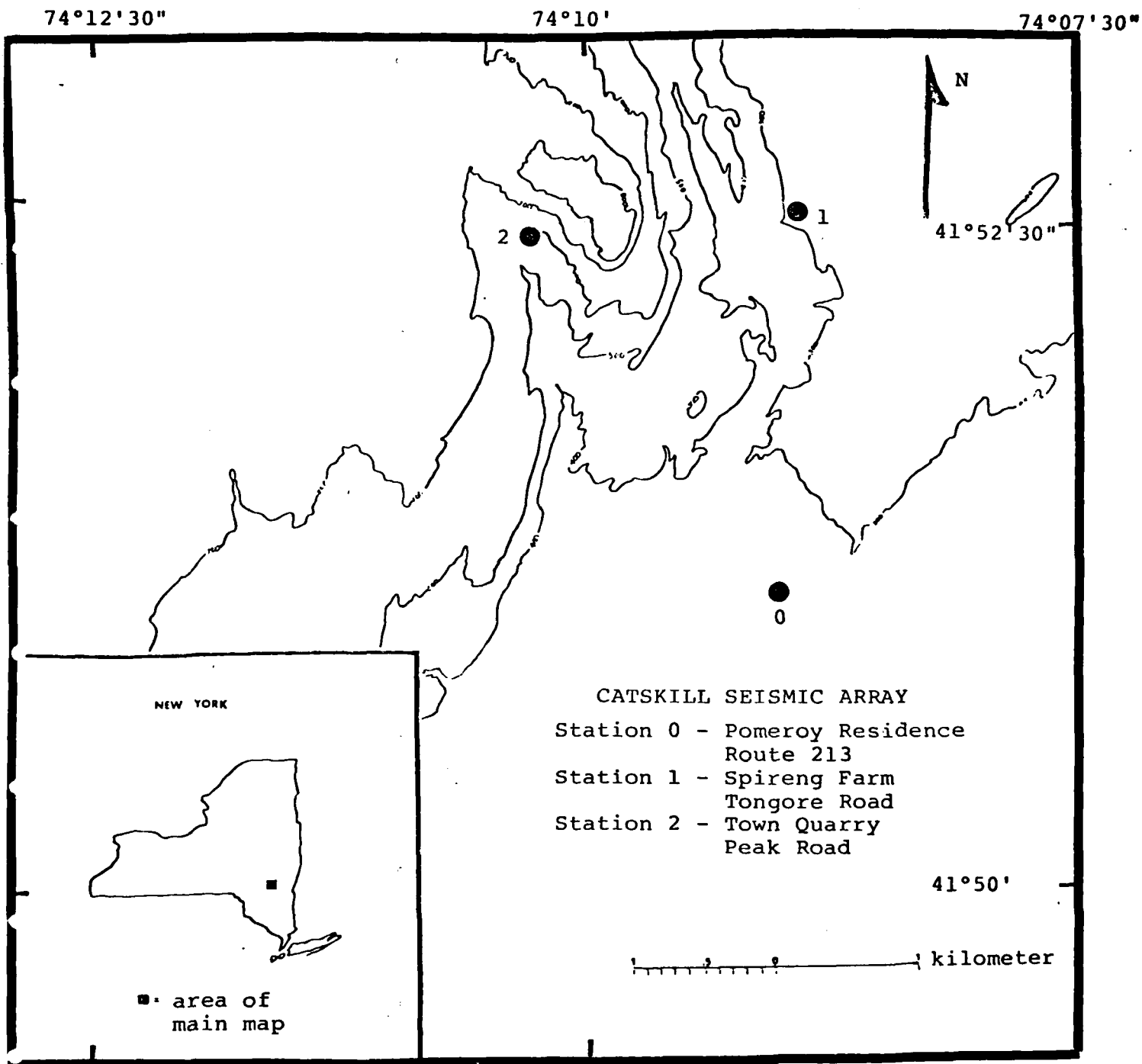


Figure 1. Location Map of Catskill Seismic Array.

## Table I

CATSKILL SEISMIC ARRAY  
STONE RIDGE, NEW YORK

STATION 0 - ROUTE 213 (COOPER STREET) - POMEROY RESIDENCE

COORDINATES: 41°51'06"N LAT. ELEV. 345 FEET  
74°09'00"W LONG.

STATION 1 - OFF TONGORE ROAD - SPIRENG RESIDENCE

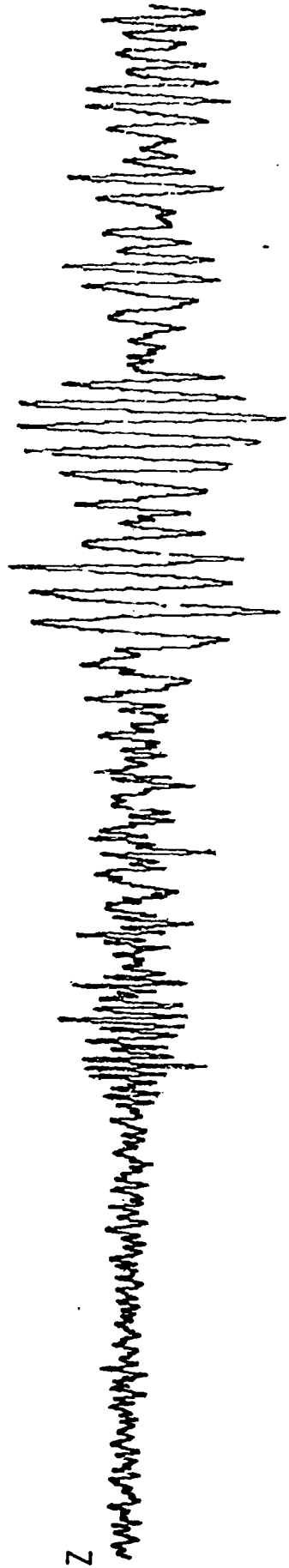
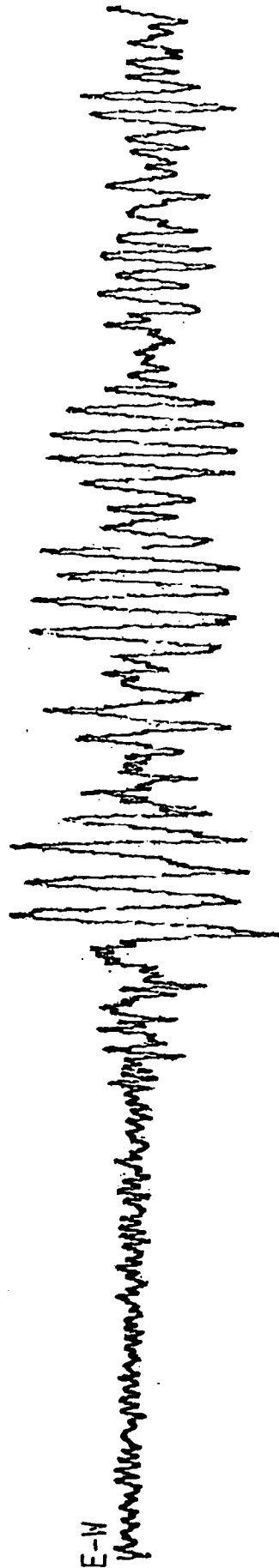
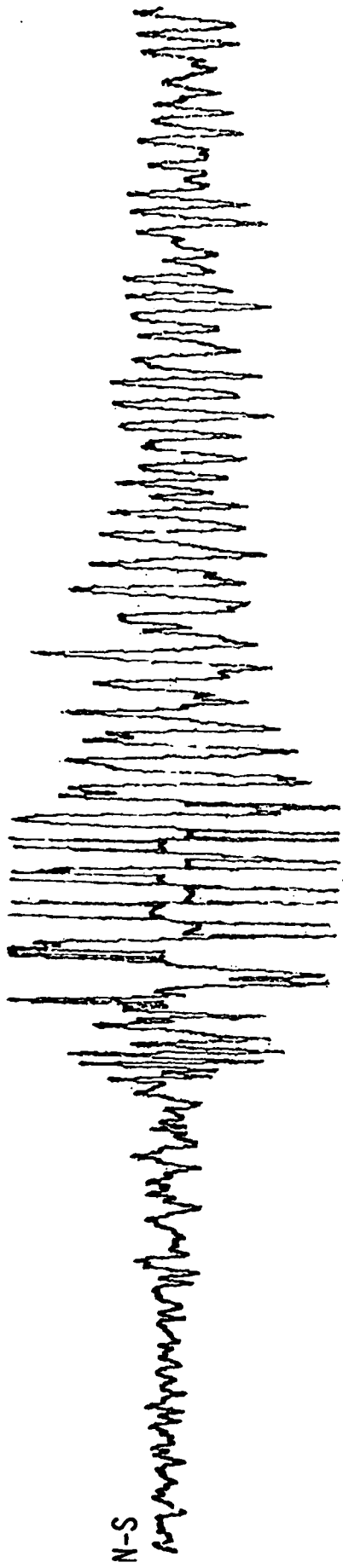
COORDINATES: 41°52'32"N LAT. ELEV. 280 FEET  
74°08'57"W LONG.

STATION 2 - OFF PEAK ROAD - TOWN QUARRY

COORDINATES: 41°52'27"N LAT. ELEV. 580 FEET  
74°10'17"W LONG.

## DISTANCES

0 - 1	2.64 km
0 - 2	3.04 km
1 - 2	1.84 km



00:51:00 .....  
Figure 2. Three component Catskill Seismic Array recordings of the California-Nevada border region earthquake of September 7, 1980. O=04:36:38.32, Coordinates 38.033°N 118.578°W  $m_b=4.9$

From the intersection of Route 209 and Route 213 West, proceed west on Route 213 approximately .45 mile. After passing Hendrick's Lane on the left, a white house with blue shutters and a large fir tree in front can be seen on the left. On this property, approximately 100 meters from Route 213 and 20 meters from the rear of the detached garage, the instrument vault is located. A picture of the vault is shown in Figure 3.

2. Station 1. This station is located on the Spireng Farm on Tongore Road.

The site can be reached as follows:

From the intersection of Route 209 and Tongore Road in Stone Ridge, proceed along Tongore Road 1.45 miles. Passing large corn fields on the left, a farm with several out buildings will be seen on the ridge on the left side. A dirt farm road leads (.15 miles) to the main farmhouse and behind the farmhouse, a more primitive road leads further into the woods to the site. Power and telephone poles and lines lead to the seismic vault. A picture of the vault area is presented in Figures 4

3. Station 2. This station is located in the Town Quarry on Peak Road in Stone Ridge.

The site can be reached as follows:

From the intersection of Route 209 and Route 213 West, proceed west on Route 213 approximately 1.0 miles passing the location of Station 0 on the left. At this point where Route 213 takes a 90° turn to the right, proceed straight ahead on Peak Road. At 1.50 miles from this intersection of Route 213 and Peak Road, a large shale quarry will be seen on the right side. Telephone and power lines lead from Peak Road directly to the seismic vault area. A picture of the vault area is presented in Figures 5 and 6.

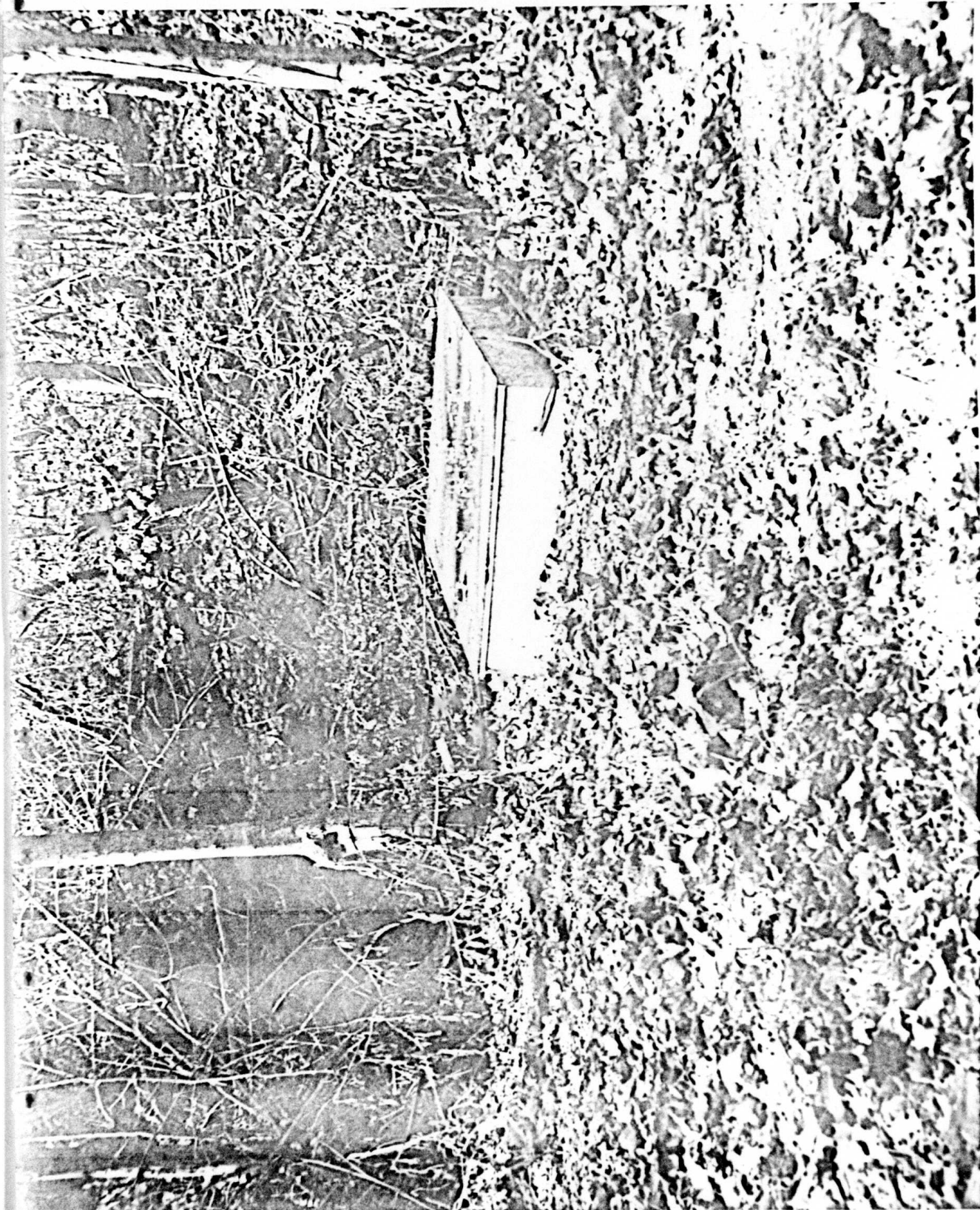
The interior of the vault is shown in Figures 7, 8 and 9.

4. Recording Facilities. The recording facilities of the Catskill Seismic Array are located in the corporated office facility of Rondout Associates, Incorporated at 1 Stilba Lane in Stone Ridge.



To reach the RAI office, proceed as follows:

From the intersection of Route 209 and Route 213 West in Stone Ridge, proceed west on Route 213 0.5 miles, passing Hendrick's Lane and Station 0 on the left. Turn left on Pine Bush Road just before the Marbletown School. Stilba Lane is the first left off Pine Bush Road. #1 is the raised ranch on the corner of Stilba Lane and Pine Bush Road. The unit has a brick front on the lower part, black shutters and a red door. Parking is available in the driveway off Pine Bush Road. The RAI offices are right across the street from the Marbletown School Playground less than .1 mile from the intersection of Pine Bush Road and Route 213.



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Figure 3. A view of the exterior of the seismic vault at Station 0 of the Catskill Seismic Array.

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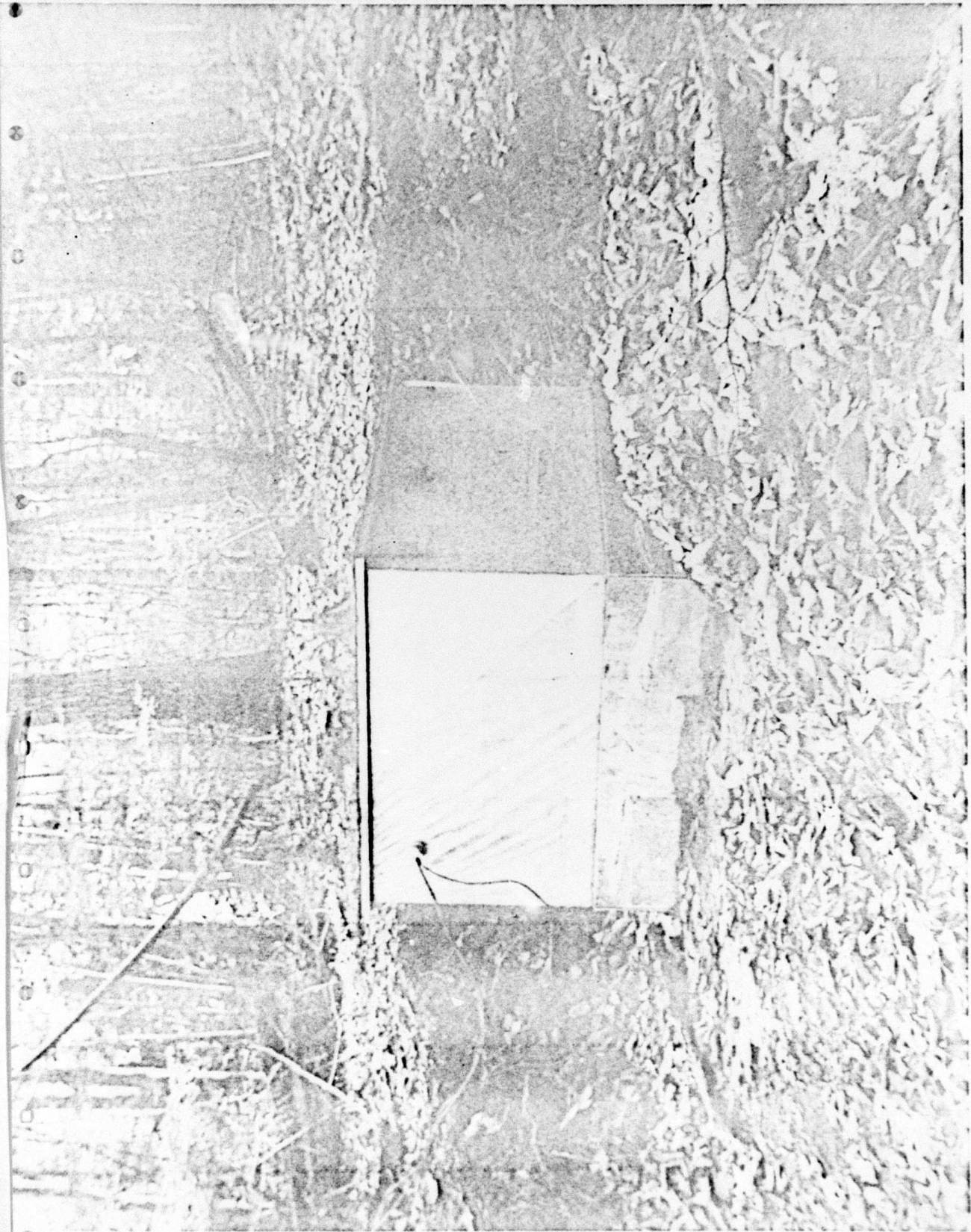


Figure 4. A view of the exterior of the seismic vault at Station 1 of the Catskill Seismic Array. At the time the photograph was taken, the vault had not been buried.

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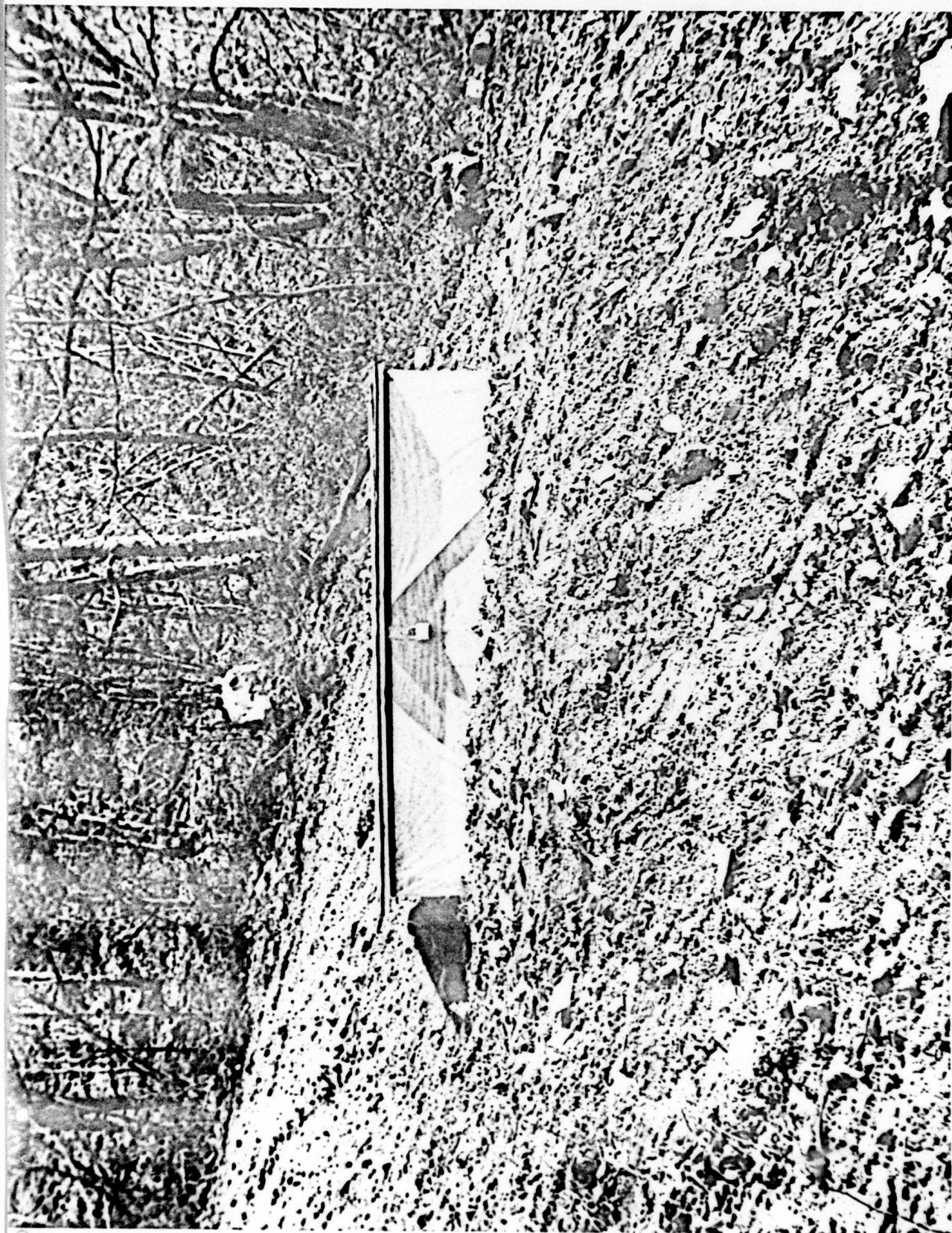


Figure 5. A view to the west of the exterior of the seismic vault at Station 2 of the Catskill Seismic Array. Following construction, the vault was buried to provide thermal insulation.

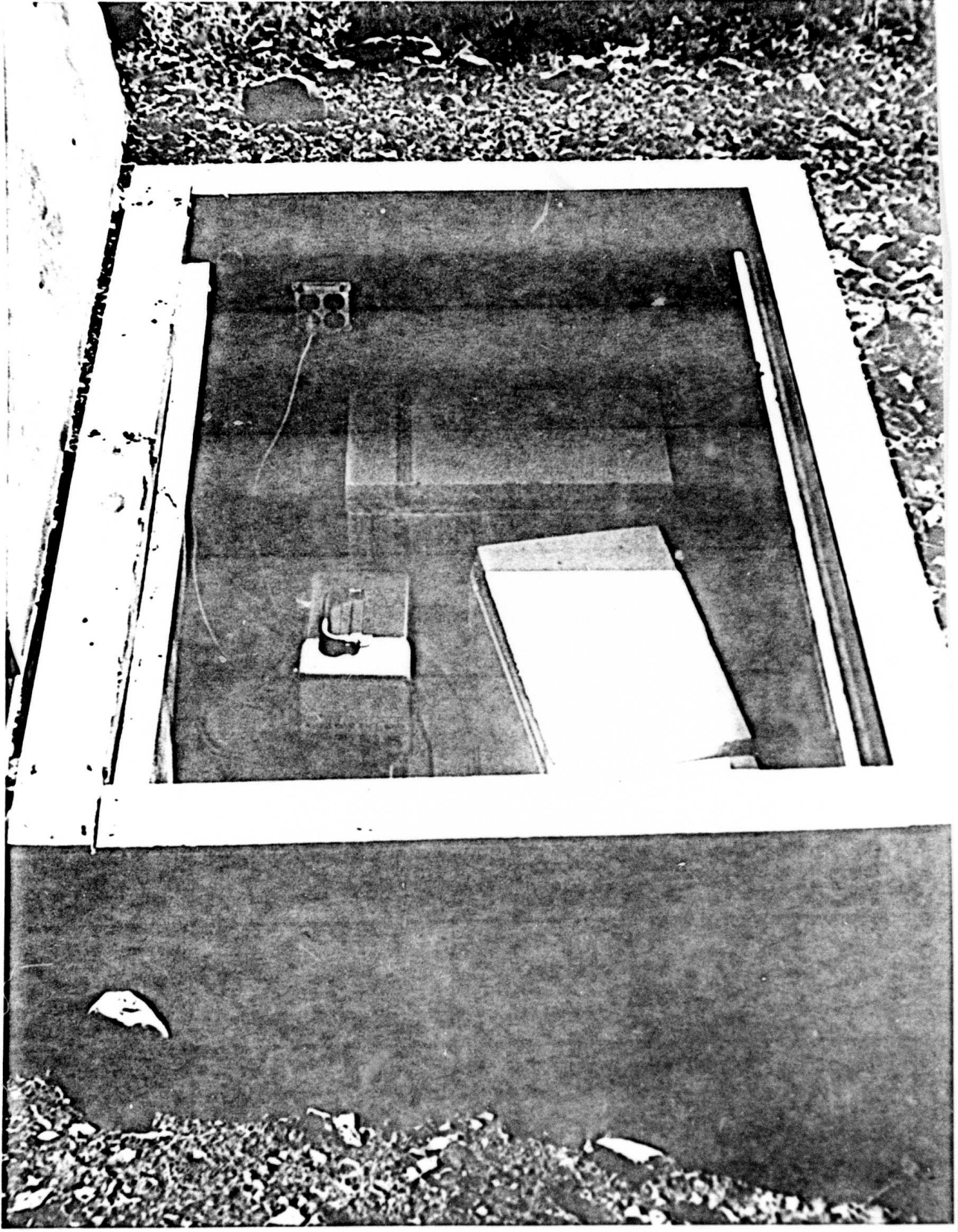
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Figure 6. A view to the north of the exterior of the seismic vault at Station 2 of the Catskill Seismic Array.

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Figure 7. A view of the interior of the seismic vault at Station 2. Note the styrofoam seismometer boxes. Station electronics including A to D conversion are located in the small gray metallic box at the lower right.



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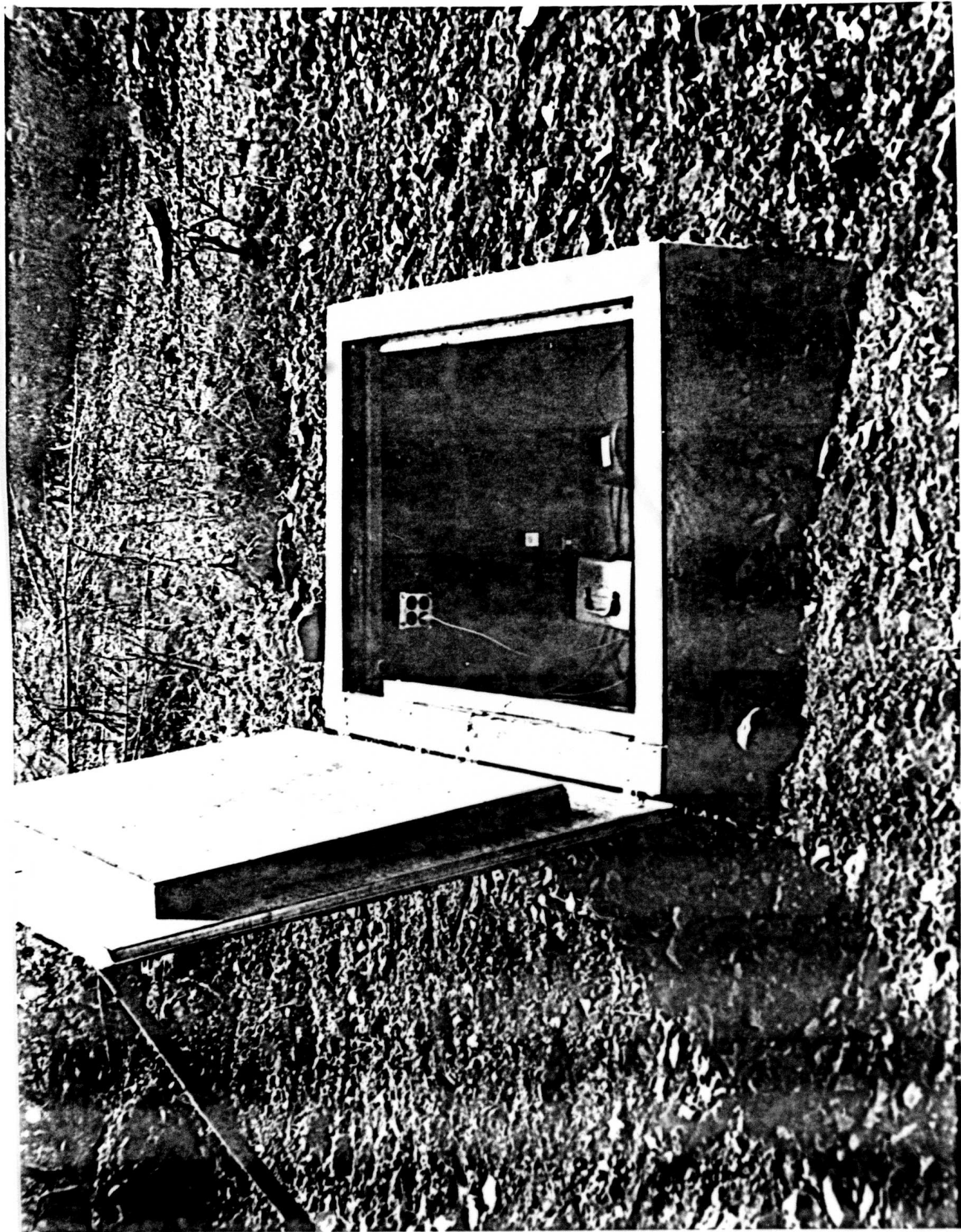


Figure 8. A view of the interior of the seismic vault at Station 2 with styrofoam covers removed from seismometers.

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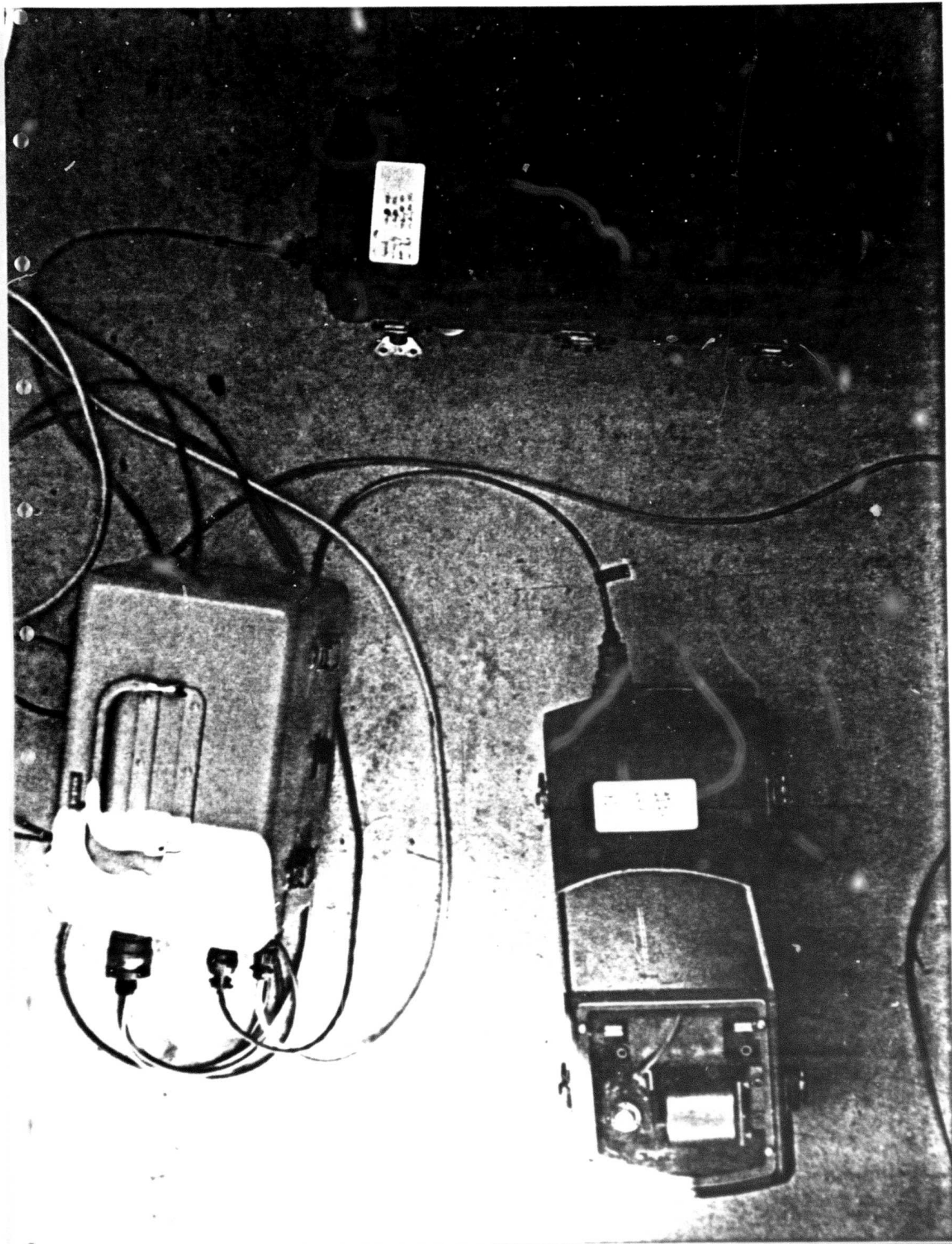


Figure 9. A close-up view of two of the seismometers and the electronics package at Station 2.