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"Seabiskit"

Lake George Cruise Report

Cruise Dates: Oct 16 to Oct 22, 1976

Location: Lake George, New York

Scientific Party: Richard J. Wold - Chief Scientist
Yngvar W. Isachsen - Co-Chief Scientist, New York State Geol. Survey
Frank Jennings - Seismic Technician
Ken Parolski - Seismic Technician
Rick Major - Navigation Support, New York State Geol. Survey
Bob Dineen - Navigation Support, New York State Geol. Survey
Boat Operator: New York State Dept. of Environmental Conservation

Cruise Objectives:

This cruise was conducted on southern Lake George which is located on the southeastern side of the Adirondack dome. The Adirondack dome is currently rising at the rate of 3.7 mm/yr near the center of the dome. The cruise was planned, to study the unconsolidated sediments for evidence of recent faulting as a result of this rapid domical uplift. It was hoped to locate these recent faults and determine the amount of movement

Instrumentation:

- 1) Uniboom System - Single channel uniboom data were collected using the EG&G transducer and a DeNorte Streamer with 21 hydrophone transducers in a single active element of 22 foot length. A Krohnrite filter and a USGS designed amplifier were also used. Recording was made on a EPC Model 4100 graphic recorder.
- 2) 7 KHz Echosounder - A Raytheon PTR-106C sonar transceiver with a TC-7 transducer was used. Recording was on a EPC Model 4100 graphic recorder.
- 3) 200 KHz Fathometer - A Raytheon Fathometer Model DE-719BRTT was used which contains a recorder. The transducer was operated at 200 KHz.
- 4) Varian Magnetometer - A Varian Model V-75 proton precession magnetometer was used.
- 5) Motorola MiniRanger Navigation System - A Motorola Mini Ranger III was leased along with two shore based reference stations.
- 6) Vessel - The SEABISKIT was a surplus aluminum Army bridge pontoon, approximately 30' long and powered by a 115 HP outboard. It had a 6 foot beam with 2 1/2 feet of freeboard. A short deck and a gangway extended 6 feet

over the bow of the boat was permanently attached to the hull. The facilities at the Green Island base of the New York Dept. of Environmental Conservation included:

- a. Ability to back truck up to boat.
- b. Overhead hoist over boat slip
- c. Fuel available at the dock
- d. A locked boat house, which allowed overnight, in the water, storage of the boat providing both weather protection and security of the equipment.

Operational Considerations

1) Boat - Since the boat was open, it was necessary to construct a wooden frame using C-clamps to fasten it to the hull. The frame was covered by a canvas and on the last day, plastic film was added to protect the equipment from rain. Figure 1 illustrates the layout of the equipment on the boat. The uniboom catamaran was secured tight against the starboard side and was never brought aboard. A Norwegian buoy was attached to the magnetometer head to keep it at a depth of about 3'. The uniboom and magnetometer were deployed off the starboard side and the hydrophone was boomed off the port. The 7 kHz and 200 kHz transducers were secured on either side of the catwalk extending forward of the bow at a depth of 3' for the 7kHz and 18" for the 200 kHz transducer.

2) Navigation - The Motorola Mini-Roger is a pulse radar type system operated in the Range-Range mode. It has a probable range error of 3 meters at 36 km. It can utilize up to 4 shore-based reference stations. This survey used 2 reference stations which resulted in excessive delays while reference stations were being repositioned. Range readings to the 2 shore-based stations were printed in meters along with a sequential number at a rate of about 8 readings/minute. In order to place the shore-based reference stations, the New York State Dept. of Environmental Conservation provided a fast power boat for this work. The New York State Geological Survey representatives carried out this job. Transponders were always positioned along one shoreline (not opposite sides of the lake). The navigation operators would also see that transponders were always pointed at the survey boat so that the boat was always operating in the maximum signal strength area.

In general, this technique worked well. Problems resulted from not having any radio communication between the boats and when the survey boat was operating close to a shore station, its signal tended to interfere with that of the more distant station, particularly when the boat was on the base line connecting the reference stations.

3) General - Time readings were recorded on all records every five minutes and at course changes. Since the navigation readings did not have the readings but only a sequential number, this number was marked and also written on the uniboom record.

The deployment of gear did not provide any problems. The seismic streamer was put out first and then the uniboom, followed by the magnetometer.

Equipment grounding was a problem until everything was tied together and to the hull. Marking four records simultaneously was also a problem. In the future, time readings should be printed on the navigation records and time marks should be automatically put on all records.

Chronological Log

On 16 October, Frank Jennings and Ken Parolski drove to Lake George with the equipment in a U-Haul truck. On 17 October, the equipment was mounted on the boat in about 8 hours and test cruise was run. On 18 October final adjustments were made and the navigation system was installed and tested. At about 1300 the first part of the survey was carried out in the north end of the lake. The uniboom and streamer were towed 20' behind the boat and the magnetometer 70' behind the boat. The wind was blowing and white caps were visible. The temperature was about 40°F. After some minor problems 16.8 km of good data were obtained. Operations were stopped at about 1530.

On 19 October, the central and southeastern part of the lake were surveyed. Operations were started about 0830. The uniboom and streamer were towed about 30' behind with about 30' separation and the magnetometer was towed 100' behind the boat. The day was overcast but there was no wind. The temperature was about 38° F and later dropped to near freezing. At about 1330, the boat ran out of fuel. At 1500 the survey was restarted. Due to communication problems the shore reference stations were not moved and it was necessary to use dead reckoning for navigation in the southeastern corner of the lake. Despite these problems, 42.5 km of good data were obtained. Operations were stopped at about 1730.

On 20 October, the southwestern part of the lake was surveyed. Operations were started about 0900. The day was overcast with some light rain falling. Navigation reference stations were not well located and as a result part of the day required dead reckoning for positions. Another 51.6 km of data were obtained and all planned track lines were completed at about 1530.

On 21 October, Frank Jennings and Ken Parolski packed the equipment into the truck and returned to Woods Hole.

Data Collected

<u>Type Data</u>	<u>Kilometers</u>
Uniboom	110
7 kHz	110
200 kHz	110
Magnetics	110

Figure 2 illustrates the track lines covered over Lake George.

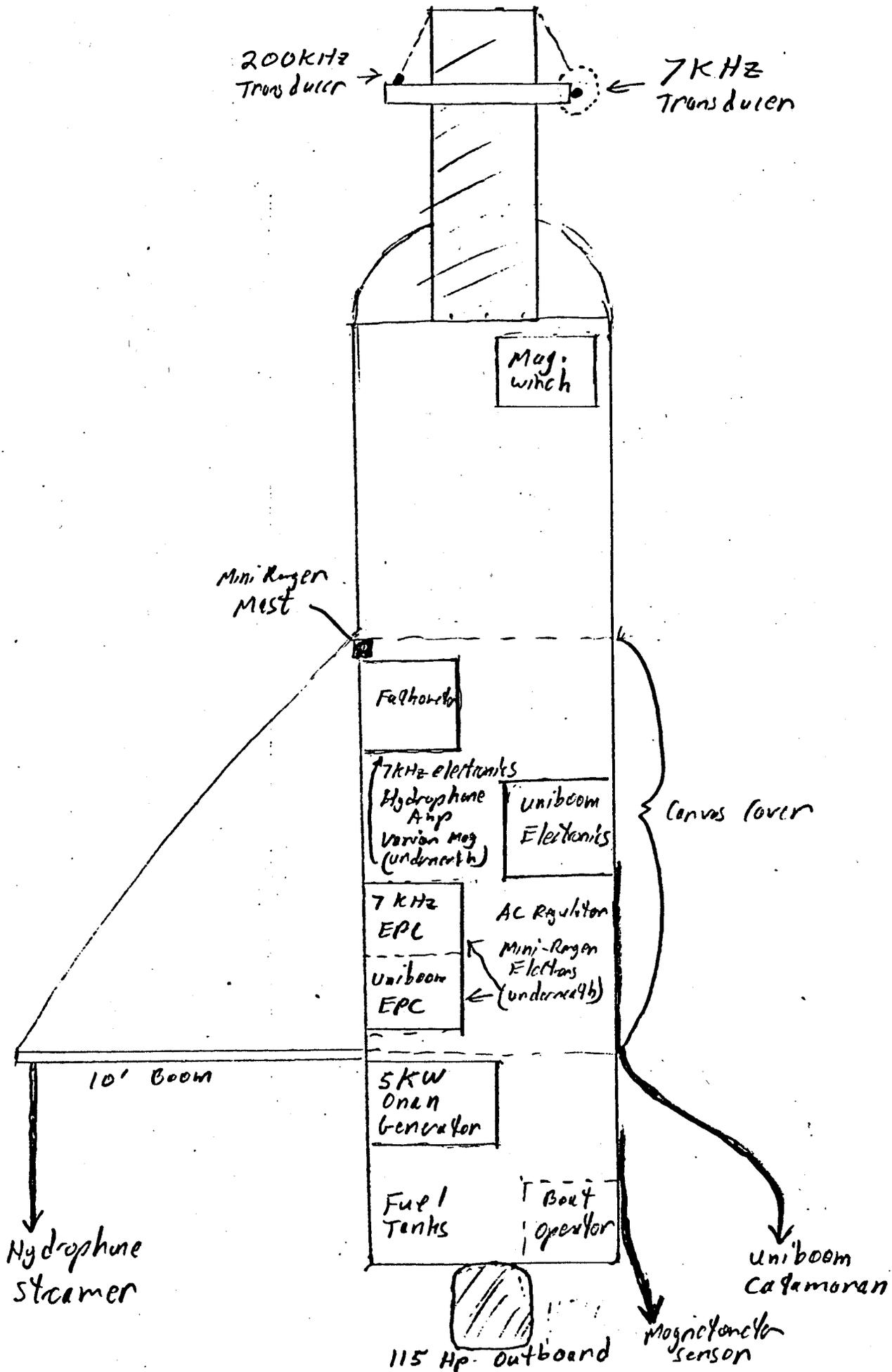


Figure 1

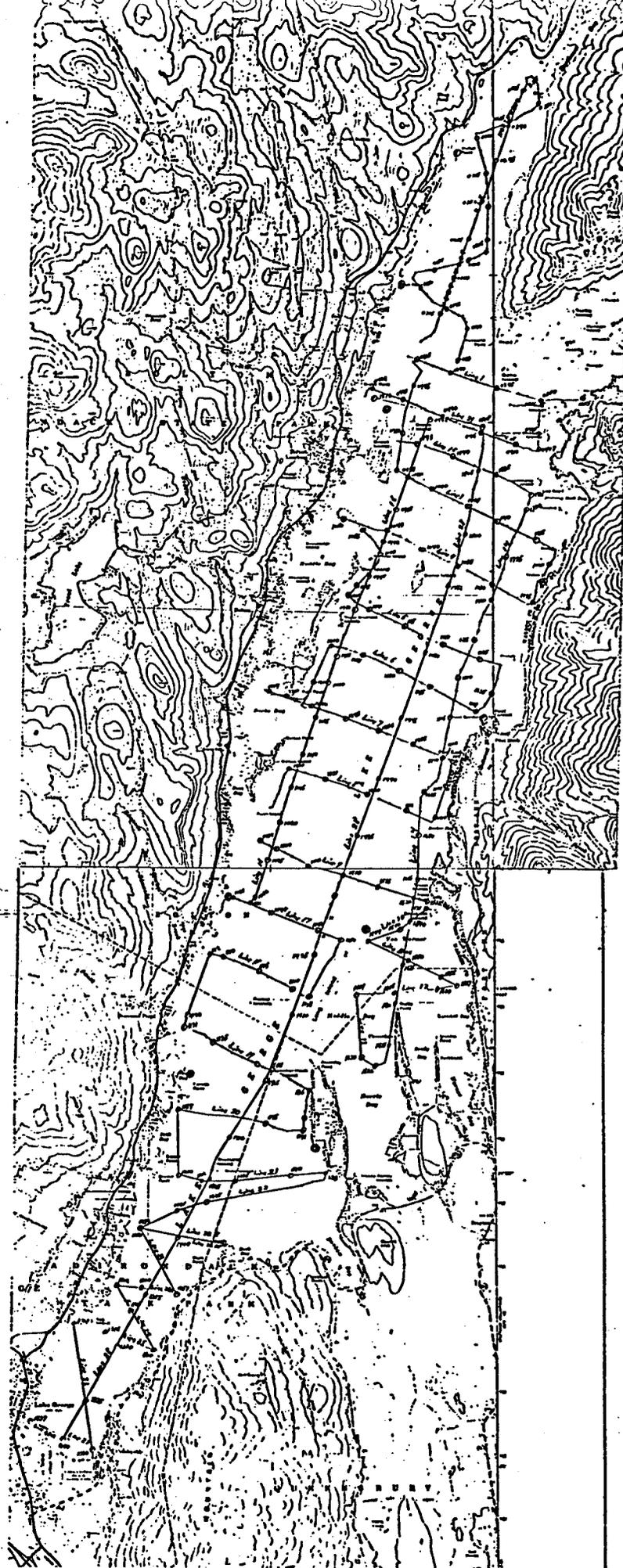


Figure 2