

74009

REPORT OF UNIBOOM CRUISE TO LAKE CHAMPLAIN
ABOARD THE MIDDLEBURY COLLEGE R/V BRUNO SCHMIDT
11 OCTOBER 1974 - 13 OCTOBER 1974

Compiled by Dennis Edwards

In order to improve the future operation of the uniboom seismic system, this report describes the operational difficulties that were encountered during a cruise aboard the R/V Bruno Schmidt in lower Lake Champlain. The cruise was conducted from Friday, 11 October 1974 through Sunday, 13 October 1974. Participating from Middlebury College were Dave Folger and Ray Linde. Participating from the U.S. Geological Survey in Woods Hole, Massachusetts were Patty Forrestel, Debbie Hutchinson, John Behrendt and Dennis Edwards.

OPERATIONAL NOTES

Catamaran-pinger: We had no operational problems with the catamaran; however, it towed very low in the water, sometimes submerging completely. Our tow point was about four feet above the surface, being the winch block on the R/V Schmidt. The catamaran floats were usually buried, throwing up a sheet of spray. On surges, the entire structure would completely submerge.

Hydrophone array: We towed the hydrophone from an outrigger, lashed to the port gunwale, trying to maintain a thirty foot separation between the hydrophone and the pinger. On the second day, I added an extra five foot length of flotation to the hydrophone cable. I thought that this might get rid of some of the wave noise by making the hydrophone more flush with the surface. Later in the afternoon, I removed the float for good (still leaving two floats on the cable) and found that the signal/noise ratio improved.

EG & G power source: Except for the first day, Friday, we had no problems with the keying signal. On Friday morning, the key signal would stop after five to ten minutes of operation; then start up again after a few minutes rest. I isolated the problem to the power source but had no feeling for it beyond that. At first, we suspected a cooling problem. It seemed possible that a circuit was heating up to some threshold and then shorting out, coming on again after a short cooling period. After the power source worked continuously for the rest of the operation, I feel the trouble may have been due to condensation in a circuit caused by sitting around the warehouse all summer and then being cooled in the sub-freezing temperatures we encountered at Lake Champlain.

Onan generator: The Onan consumed approximately 3/4 gallons of gasoline per hour for a total of fifteen hours of operation. The unloaded voltage was 125 volts A.C. and under load, it maintained a line voltage between 110 and 120 volts A.C.

UNIBOOM CRUISE REPORT (continued)

E.P.C.(Curley) recorder: I was disappointed with some of the records we obtained in 2 1/2 days of profiling. Most of the records have good resolution but a low signal to noise ratio (low contrast). All through the records (Saturday afternoon and Sunday), there are gain surges where the signal to noise ratio decreased momentarily. These gain surges do not show up when the recorder is on the bench, even when we simulated a variable line voltage with a variac.

It was suggested that I print the positive and negative signal coming out of the seismic amplifier. Most of Friday's records are in this mode and are of very poor quality. From Friday afternoon on, I printed only the positive signal and this greatly improved the records.

Maximum acoustic penetration is to about 500 feet. Even when switching to a 0.50 sec. sweep, I was not able to follow the acoustic basement below 500 feet with about 200 feet of sediment cover. I kept the filter setting at 400 - 3800 HZ. for most of the profiling.

Each time I changed a paper roll and at the end of each day, I wiped the two forward rollers clean with 'Contact Re-Nu' and a clean cloth. These rollers pick up grease while running and can increase the printed noise.

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