

ELECTRONIC SURVEILLANCE OF RESERVOIR FOR NETS

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Abstract: With the increase in illegal commercial fishing, there is a need for better and faster means of detecting nets in our reservoirs. With the improvements in Sonar depth finders for fishermen came the idea to use electronics, especially the Graph Recorder in the detection of nets. Its use makes law enforcement personnel more effective.

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Illegal netting in Keystone Reservoir has been a problem for enforcement personnel, especially since the introduction of striped bass in 1966. In 1977, rangers found, pulled out, and destroyed over 10,000 feet of nets from Keystone. The nets were full of fish, most of which were dead. One net in particular was over 7,000 feet long and had over 4,000 pounds of dead fish in it.

In the past rangers used a drag (of various types) attached to a rope and dragged behind a boat to catch the net. This method is very time consuming, slow, and requires at least 2 rangers to be effective. At best 2 rangers could cover only about 2 miles of a lake. Therefore, new methods for detecting nets were needed. I worked on various ideas. Diving planes or down-riggers were used but without any success. Being a former regional biologist for fisheries divisions, I considered heat detection. Fish, being a cold-blooded animal, would have body temperature similar to the water, except when active their temperature may increase. This idea was discarded. Next came the Flasher Fish Locator, which would register a signal of a net, but the signal was so fast it could not be interpreted as a net.

In January 1979, I contacted T. Shockley of Lowrance Electronics in Tulsa about the use of their Graph Recorder to detect nets. Lowrance Electronics was very enthusiastic about the idea. The Graph Recorder gives a print out picture of a cross-section of the Lake from top to bottom. Not only does it give this cross-section but it shows fish, brush, rock, and other things in the water.

After much preliminary work on various units the Graph Recorder Model 1510A was selected to be used. On 15 March 1979, T. Shockley, P. Weidemann, Ranger J. Lowrey and I made the first run with the Graph Recorder. We checked out the Appalachia Bay area on Keystone, an area where illegal netters frequently operate. On this run 3 nets were found, 2 trammel nets and 1 gill net. The weather was overcast, air temperature 50 F and water temperature 42 F.

On 4 April 1979, Ranger Lowrey and I ran more tests with the Graph Recorder on gill nets. The weather was clear, air temperature 55 F, water temperature 45 F. We found that different nets give a different signal. The signals are similar to brush but each has a distinct hook with a long tail at the top. We found during the test that a number of variables affect the signal of Graph Recorder.

The variables are:

1. Water temperature: Colder water conducts the sonar signal better than warmer water, therefore giving a more distinct signal.
2. Lake bottom: a sandy, rock or hard bottom gives a more distinct signal than soft mud bottom.
3. Weather: In our test we received a better signal on overcast days.
4. Type of net: Each type of net gave a different kind of signal with each type of net having its own signal.
5. Type of boat: The longer, wider more stable boats giving a better recording.

The Model 1510A Graph Recorder was mounted on a 17 foot Skeeter Platform Boat for the first tests. All other tests were done with a 13 foot Boston Whaler Boat. The larger more stable boat gave a clearer recording and was not affected by wave action as the smaller boat was. The Graph Recorder was mounted to permit the boat operator and an observer to review the graph. The power cable was run directly to the battery with an on-off toggle switch wired into the positive wire. This eliminates the need to disconnect the power cable from the battery when the Graph Recorder is removed from

the boat. If this is not done electrolysis will ruin the plug in. The Transducer was mounted on the transom in an area where no air bubbles are picked up.

The scale knob should be set on 60 high power or higher according to water depth. This increases the power to produce a signal cone diameter approximately half the depth. Turn the sensitivity knob to about $\frac{3}{4}$ open or the 3 o'clock position or until the graph starts to block out; then back up the knob until you get a clear recording of the bottom. You will pick up some interference in the upper layers of water, but this gives a clearer picture of the bottom and a net. Turn chart speed to $\frac{3}{4}$ speed and gray line on until a thin gray line is obtained. Then a rock or hill is gray lined showing the object is attached to the bottom. The suppression knob should be set at lowest possible setting. These adjustments will require use to obtain; also settings will vary from day to day and between different bodies of water.

The Graph Recorder can be used at speeds up to 20mph increasing the effectiveness of the rangers and area they can patrol.

When a signal of a net or a likely looking object is recorded on the graph a marker should be dropped on the spot. To check the signal make a turn with a radius of approximately 30 feet. If a signal is picked up in the same area you are sure it is a net. To be positive it is a net, complete the circle and if the third signal is received you can be certain it is a net. Also after picking up the 2 signals of a net the boat can be stopped as you start to pick up the third signal.

The Graph Recorder shows a fish as a boomerang type signal; a net has a similar signal but the tail is longer and narrower. Brush is also shown on the graph but it does not have a definite hook and tail.

By using the Graph Recorder law enforcement can make life more difficult for netters. More can be apprehended or their net can be seized immediately.

Other uses of the Graph Recorder that can help the enforcement officer are: locating sunken boats, recovery of drowning victims, automobiles, etc. The Graph Recorder also gives a ranger a more detailed idea of lakes in their areas.

Recently Lowrance Electronics has introduced a new Graph Recorder, Model 1510B. It has 30 foot higher power setting and depth increase to 360 feet. The 1510A has a 60 foot lower power, a 60 high power and a maximum depth of 240 feet. The increase in depth to 360 feet enables the 1510B to be used in all lakes and offshore in Coastal areas.

The Model 1510B can be ordered direct from Lowrance Electronics Inc. It will cost approximately \$420.00. This includes recorder unit, power cable, transducer, transducer cable and brackets.