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NASA TECH BRIEF

Langley Research Center

Miniature Sonar Fish Tag

The problem:

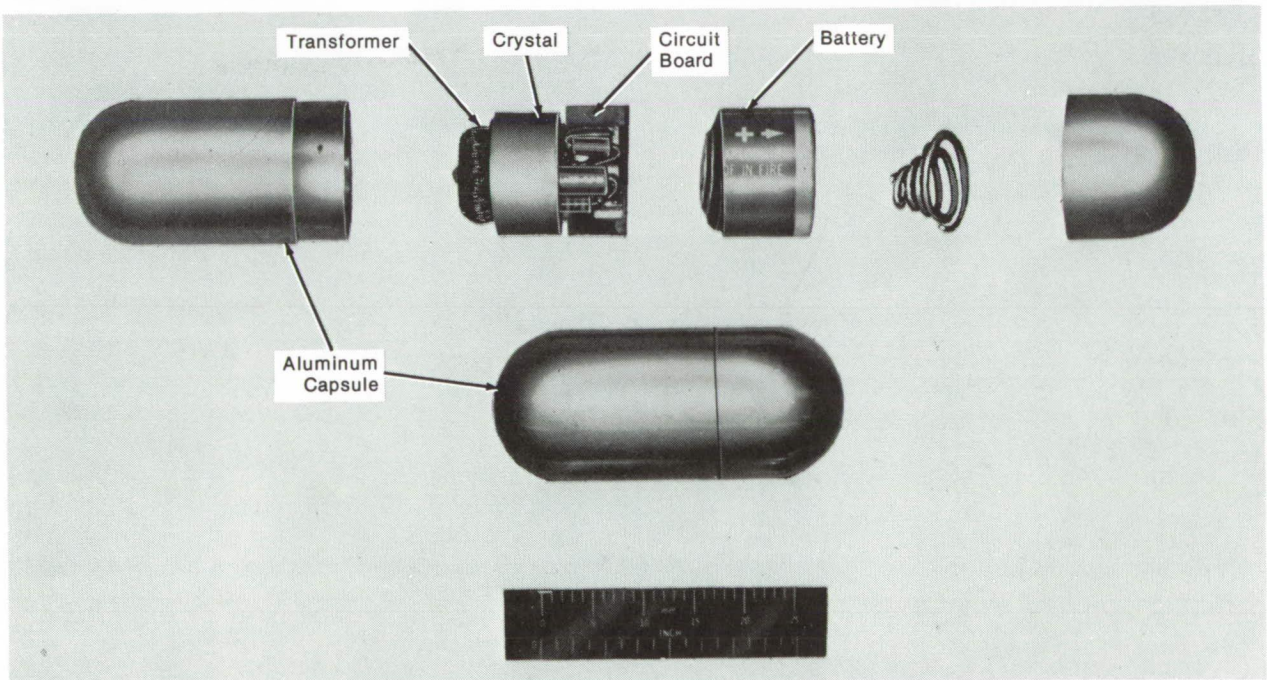
An inexpensive method is needed to track or to determine the exact location of fish during the study of their behavioral characteristics in response to manmade perturbations of their environment. The method must have a useful range and operating life and require low manpower to operate and maintain. It must be applicable to small as well as large adult fish and must operate over a wide temperature range with stability, since fish must often be tracked for several days.

The solution:

A new miniature self-powered sonar device may be implanted in the body of a fish. It transmits a signal that can be detected with portable tracking gear or by an automatic detection-and-tracking system.

How it's done:

The miniature self-powered sonar device is shown in the figure. It is small enough to be implanted in or attached to the body of a fish to be tracked, and it transmits a 38-kHz, pulse-modulated, omnidirectional signal for a period of about 400 hours. The device can be detected and tracked by either portable, shipboard-mounted, or fixed receiving stations at a range in excess of 1 mile (1.6 km). The transmitter is a low-cost expendable instrument which is packaged in an anodized-aluminum capsule 1.5 cm (0.60 in.) in diameter with a length of 3.5 cm (1.40 in.). The device



Exploded View of Self-Powered Sonar Device for Tracking Fish

(continued overleaf)

is completely self-contained and weighs less than 8 g (0.28 oz) in water, including its power supply.

With fresh batteries, an operating life of over 400 hours may be expected, and by replacing the batteries, the device itself may be used almost indefinitely. Furthermore, its size, weight, and range make the capsule adaptable to numerous applications in addition to tracking fish.

Potential applications in other hydrosphere studies are being explored. For example, the transmitter could be used with active seabed or subsurface drifters. These devices are used in determining the normal dispersion of pollutants dumped into the ocean at offshore sites. They are also useful in channel and harbor maintenance when studying bottom-sediment transport mechanisms to determine the causes of shoaling.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
Langley Research Center
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Hampton, Virginia 23665
Reference: B75-10092

Patent status:

NASA has decided not to apply for a patent.

Source: Ray W. Lovelady and Robert L. Ferguson
Langley Research Center
(LAR-11814)

Categories: 02 (Electronics Systems)
03 (Physical Sciences)
05 (Life Sciences)