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Ultrasonic Tracking of Migratory Fishes with an Internal Tag

Ross M. Horrall
University of Wisconsin

H. F. Henderson
University of Wisconsin

A. D. Hasler
University of Wisconsin

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American Fisheries Society Meeting
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Ultrasonic Tracking of Migratory Fishes with an Internal Tag

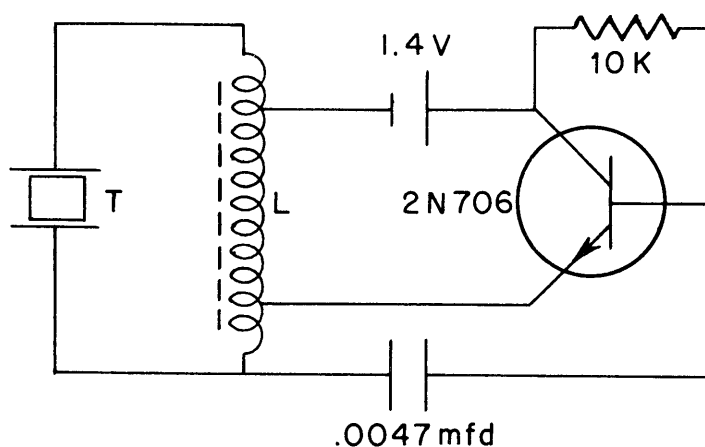
Ross M. Horrall, H.F. Henderson, and A.D. Hasler
The University of Wisconsin

A small ultrasonic tag, 9 mm by 40 mm in size, has been developed by members of the fish orientation group at the University of Wisconsin. The tag emits a continuous signal at approximately 65 kc/sec. The signal is received via a directional hydrophone and a high quality communications receiver. Tracking ranges of up to 1 km have been obtained. The placement of the tag is internal: either into the stomach or into the body cavity of the fish. The tags and tracking equipment have been successfully employed in studies on the open water movements and orientation of white bass during their spawning migration. (Supported by NSF Grant GB-3123; ONR contract Nonr-1202(26); PHS Grant 5T1-WP-2-04; and the Wisconsin Conservation Department)

Techniques for tracking fish:

1. Bobber tracking (Hasler et al. 1958)
2. Balloon method (Horrall 1961)
3. Dye marker method (Hasler and Henderson 1963)
4. Ultrasonic tracking (Trefethen 1956; Trefethen et al. 1957; Johnson 1960; Novotny and Esterberg 1962; Henderson 1963)

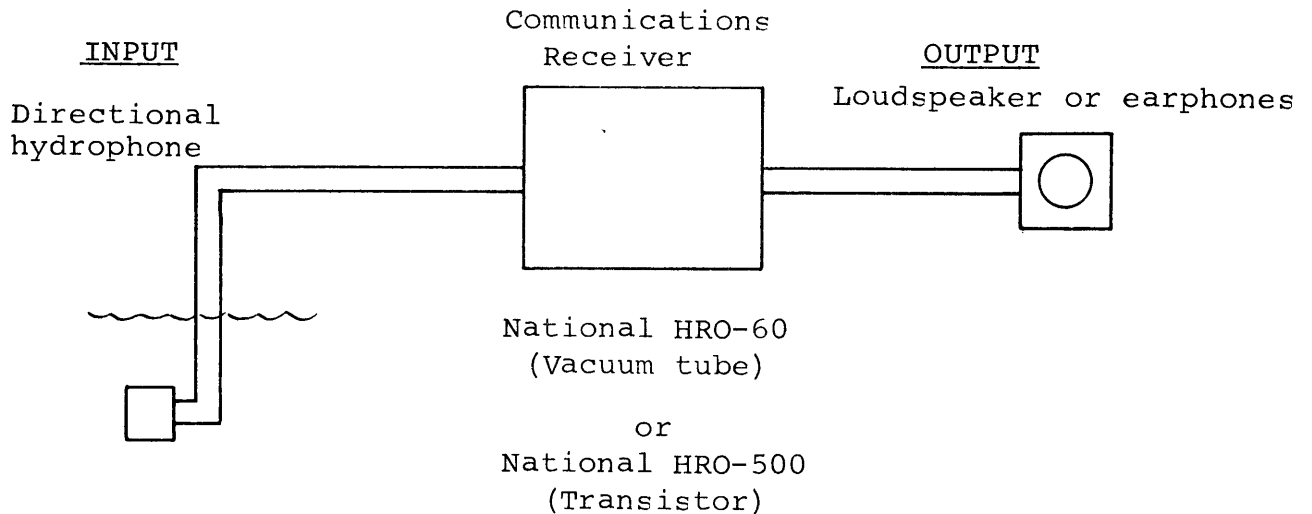
The Wisconsin Ultrasonic Tag:



T cylindrical transducer
of lead zirconium
titanate (P2T)

L coil: 125 turns, #36
enameled wire, tapped
at 25th & 75th turns,
on ferrite core

Receiving equipment:



References:

- Hasler, A.D., and H.F. Henderson. 1963. Instrumentation problems in the study of homing in fish. In: Bio-telemetry. Pergamon Press. New York. 195-201.
- Hasler, A.D., R.M. Horrall, W.J. Wisby, and W. Braemer. 1958. Sun-orientation and homing in fishes. Limnol. Oceanogr. 3(4): 353-361.
- Henderson, H.F. 1963. Orientation of pelagic fishes. (I) Optical problems (II) Sonic tracking. Ph.D. Thesis. Univ. of Wisconsin. 135 pp.
- Horrall, R.M. 1961. A comparative study of two spawning populations of the white bass, Roccus chrysops (Rafinesque), in Lake Mendota, Wisconsin, with special reference to homing behavior. Ph.D. Thesis. Univ. of Wisconsin. 181 pp.
- Johnson, J.H. 1960. Sonic tracking of adult salmon at Bonneville Dam, 1957. U.S. Fish and Wildlife Service, Fishery Bulletin 60: 471-485.
- Novotny, A.J. and G.F. Esterberg. 1962. A 132-kilocycle sonic fish tag. Progressive Fish Culturist 24(3): 139-141.
- Trefethen, P.S. 1956. Sonic equipment for tracking individual fish. U.S. Fish and Wildlife Service. Special Scientific Report--Fisheries 179:1-11.
- Trefethen, P.S., J.W. Dudley, and M.R. Smith. 1957. Ultrasonic tracer follows tagged fish. Electronics 30(4): 156-160.