REPRINTED FROM

Tropicals

The Aquarist Magazine for Hobbyists & Dealers

Cohu Electronics, Inc., 2000 Series TV Camera Being Demonstrated

New Equipment Anti Lobs For Stutlying Morine Life

by John L. Russell, Jr., Box 1141, Coral Gables, Fla.

Controlled Studies of Tropical Fish

In order t.o make realistic and meaningful studies of tropical fish in action in the lab it is necessary to have the artificial conditions in the lab approximate as closely as possible the actual conditions of the ocean.

Whenever scientific studies are made on marine life it is important to have as many factors possible remain relatively constant while changing one or more variables.

The conditions of the environment for tropical fish and all other fish and marine life as well vary in many respects. For example oxygen content and acidity, carbon dioxide levels, saltiness, temperature and cloudiness of the water will differ from spot to spot in the ocean. Tidal flow must also be taken into account in a tank or aquarium if scientists are to make meaningful study of fish life and marine life.

In order to study the habits of fish migration one must be able to ascertain what cues or clues the fish is using as a guide or incentive to migrate. It might be amount of sunlight, temperature of the water, or even odors.

One might undertake a study to determine fish food preferences or preferences for various types of baits. If the question is put to the scientist: How well do sharks hear, or what colors can they see? the variables must be controlled so that the problems can be attached on a scientific basis to eliminate speculation and guesswork in so far is feasible.

The need of special facilities and special highly refined equipment to do highly scientific experimental work on tropical fish and marine life has been felt for decades now. However, at long last one of the first labs in the world to provide such facilities is now under construction in Miami, Fla., on the Rickenbacker Causeway, at the University of Miami Institute of Marine Sciences. Dr. Warren J. Wisby is supervisor of the new facility which is costing somewhere in the neighborhood of

REPRINTED BY

COHU

EL-EC::TRc::>NIC::S;INC:

i#i§Fi§5o•v•s•c:>N

5725 Kearny Villa Rd., San Diego, Calif. 92112 277-6700 (Area Code 714)

half a million dollars, much of it furnished by the National Science Foundation, of course.

Up to the time of the new development scientists had to rely on studies made on water from the bay, and as the marine specialists were so well aware, the water in the tanks always varied with the water of the bay and they had no way to really control the environment of their experimental subjects. Now the new building will have controls to adjust oxygen, acidity, carbon dioxide levels, saltiness, temperature, cloudiness of the water and tidal flow in a wide range of aquariums and tanks of all sizes. The building is three floors high with labs on the top two. The ground floor has garage doors. Huge settling tanks on the roof collect unwanted debris from the bay water before it is pumped to the labs. This undesirable plant life, ground-up shells and refuse is what on land we might call dust.

With the completion of this new marine lab facility, the first of its kind in the world, a whole new world of marine study will open up and studies already under way can be expanded and enlarged.

One of the most fascinating problems scientists are eager to attack which one normally does not often associate with tropical fish is that one faced by our future astronauts — weightlessness. Actually the fish is the only three-dimensional animal that has no top nor bottom to his life.

Soon we will know just why, when, and under what conditions a shark will attack a man even when not provoked. We will begin to untangle some of the remarkable instinctive behavior of some of our most exotic tropical fish. A whole new vista, a panorama of untapped knowledge is at hand, and this new facility may help to blaze the trail so that more scientific institutions will follow suit and build their own controlled conditions marine labs where "Instant Oceans" can be formulated to perform almost any experiment or study desired.

Oscilloscope Photography In Marine Service

The value of the modern laboratory oscilloscope as a measuring instrument is well known and much appreciated by most engineers, physicists, technicians, and scientists. The oscilloscope is, of course, an electronic measuring device with a small screen like a portable TV receiver. It uses a cathode ray tube like a TV but measures wave patterns and shows them visually.

The oscilloscope has been used to study sound wave patterns to help make better sound equipment. It is used as a device in troubleshooting electronic equipment. Physicians use the oscilloscope in heart surgery to get a visual image of heartbeat. Watch engineers use the oscilloscope in analyzing fine mechanical movements of watches. The oscilloscope is used as a diagnostic and inspection tool as an analytieal device.

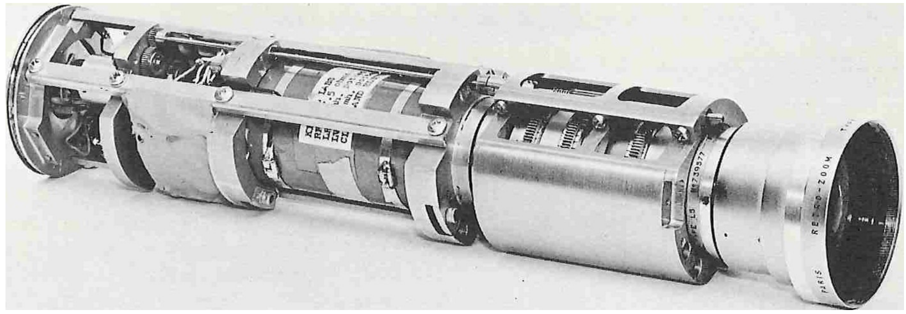
More recently the oscilloscope has been brought into the play in mapping the ocean floor, in marine labs to study the sounds of fish. Any sound that can be picked up and applied to the oscilloscope electronically can be presented on the screen visually. Furthermore any sound that can be represented on the screen can be greatly magnified visually and the component parts of any visual representation can be photographed. Taking pictures of sound waves is very simple because any type of signal that can be displayed on the oscilloscope can also be photographed if the appropriate camen1 and film combination is used.

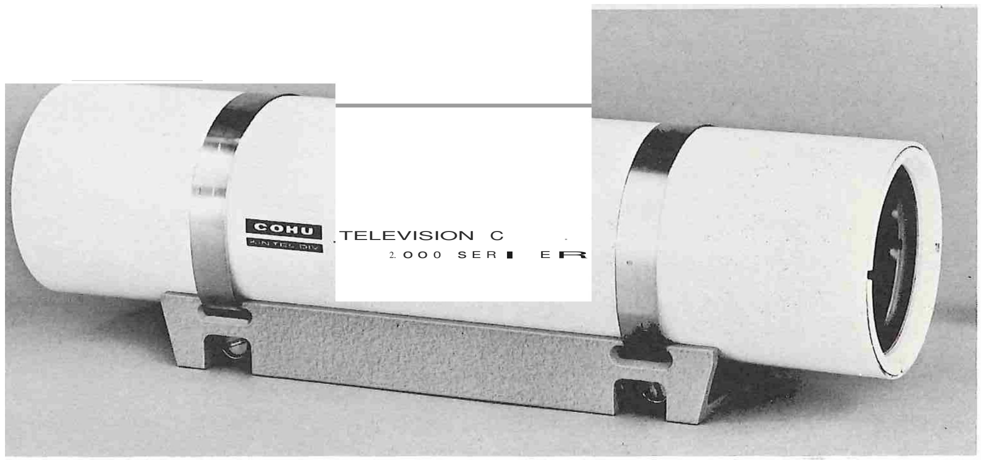
Conventional cameras can be used to photograph oscilloscope traces if the right lens and shutter combination is used and if some kind of light-tight enclosure is provided. But the film must be developed before the results are known which is a time consuming process and one is never certain of the results until the negative or print is available for inspection. Consequently the Polaroid Land back cameras are quite useful to scientists.

Cameras employing Polaroid backs offer many adval\tages. The finished print is available for immediate inspection in seconds which means that shots can be retaken immediately if necessary. Finished prints can be made on paper or transparencies for projection or they can be blown up for enlargements.

Now certain applications require photographing transient signals that occur at random or unpredictable intervals like in attempting to study the sounds made by porpoise. Since you never know when a fish will make a sound a high-speed camera employing 35 mm strip film can be very useful. This is not a movie camera, but rather a condition where the film is simply passed in front of the lens at a constant rate of speed which can be changed to suit the requirements. This film is taken out and developed and often a great length of film may have to be viewed before the points of interest are discovered.

The use of the oscilloscope and oscilloscope photography is just another illustration of how modern electronics is play-





Close- up of Outer and Inter parts of Cohu new 2000 Series TV C<.mera. Cohu Electronics, Inc., is located at Box 623, San Diego 12, Calif.

ing an increasingly important role in solving some of the riddles offered by the sea and its contents.

Underwater Closed Circuit Television

One of the most remarkable electronic devices to help scientists study marine life is underwater closed circuit television. Using this type of equipment one person alone may submerge carrying along with him a small, compact, light, watertight camera connected to a long length of cable, and the underwater scenes are transmitted over the cable back to dry land or on the deck of a ship on the surface on the face of a TV receiver or monitor.

In cases where great depths are to be explored only the equipment may be sent down so that no human lives are put in danger from excessive pressures.

When a camera is dispatched underwater a number of students or scientists can continually watch underwater life without even getting their feet wet.

For those who are not familiar with closed circuit TV equipment, a basic unit generally consists of a closed circuit TV camera, a length of coaxial cable, a control unit, and a receiver or monitor. The pictures taken by the camera are transmitted over the cable and appear on the screen. The effect is precisely the same as the one you receive at home on your regular TV only, of course, closed circuit makes it a private and specialized affair seen and viewed only by a selected few. It is not broadcast TV in any sense when applied in this manner.

Underwater use of closed circuit TV is not new. In fact, it has been utilized by the government, the armed services, and certain organizations for years.

For example, the Bureau of Ships of the United States Navy has been very active in exploring the uses of TV for work below water and special equipment has been developed for that purpose. Underwater TV equipment was combined with motion-picture recording in 1951 to probe a strange object located by sonar.

Fleeting glimpses of the bottom of the ocean and pictures of a submerged object were obtained by this means in the vicinity of Block Island New York. During the search maneuvers of the USS Roberts or DD-823 as she cruised back and forth over the site of a previously detected sonar object, the sunken hulk of a U-boat dis-

Another photo of the Cohu Electronics, Inc., Series 2000 TV Camera in Action

patched to a watery grave during the last 7 days of World War II was spotted.

By the use of special waterproof, pressure resistant housings to protect the camera, CCTV was employed by the British Navy to locate and rescue personnel from a disabled submarine in 280 feet of water off the Isle of Wight. Captain Jacques Yves Cousteau of the French Navy used it in salvaging an ancient Greek merchant vessel in the Mediterranean. This highly versatile device was also instrumental in locating the wreckage of the Comet aircraft which crashed in the Aegean Sea in 1954.

More recently underwater CCTV has been used in the study of marine life by the U. S. Fish and Wildlife Service. Some Universities have conducted underwater observations for whole classes of students by this media. Its advantages are being readily realized by those who wish to make scientific studies of marine life which is so very difficult to get at directly.

The equipment now available for underwater use has become much more refined and versatile. The type of camera used by a diver in a shallow water dive to examine the hull of a moth ball ship docked at Green Cove Springs, Fla., was quite large. The equipment made by Pye Limited used for underwater work was a three-unit system: the camera enclosed in a hand-held sphere of 12 inches in diameter, connected to its control unit and a monitor by a 250 foot cable.

Cohu Electronics, a Division of Kin Tel, in California, has developed a remarkable underwater closed circuit TV camera that is no larger or heavier than a king-sized flashlight. An underwater diver holds it in the hand just as one would a flashlight and swimming along or walking in a diving suit simply points it in any direction where pictures are desired. The cable tl'ails along after the diver and up above in a boat or on shore observers get a remarkably clear picture of fish, marine plant life, underwater topography, sunken objects, or anything that is desirous of being observed.

With the development of very simple, light, rugged, and compact equipment like this all kinds of underwater studies can be made much more readily with far better results by many more groups of interested people. No doubt scubba and skin divers and many underwater swimmers as well will put this type of equipment to fascinating use to study marine life.

●●●