DURHAM, NEW HAMPSHIRE -- "EDALHAB", a 21 ton student constructed experimental underwater habitat was lowered into 50 feet of water in Lake Winnepesaukee Friday, April 26, 1968.

The EDALHAB (coined from Engineering Design and Analysis Laboratory Habitat) was brought from its construction site at the University of New Hampshite to Alton Bay on a house-moving trailer. The habitat plus trailer turned out to be just two inches too high for the first underpass encountered. The ensuing grinding resulted in major damage to the top escape hatch. The extent of the damage was not known until arrival at Alton Bay. Inspection there showed the hatch to be cracked and the handwheel sheared off. Luckily no damage to the seat was found. A second, duplicate hatch was located in Woods Hole, Massachusetts, and flown up in a few hours with the launch director Dan Clark. Between the two, an operable escape hatch was re-installed and the habitat launched.

Launch was accomplished by backing the trailer down the small-boat ramp at Alton Bay. It was towed to the dive site after air, telephone, power and television cables were connected. The habitat carried its own three ton anchors to the site where they were lowered to the bottom. After anchoring, the ballast tanks were flooded and tension taken on the anchor cables. At this point, adjustment of the fixed (scrap iron) ballast was made in order to attain the desired one ton net positive buoyancy. After proper buoyancy was achieved, the habitat was cranked down to the 25 foot rest depth where it was allowed to remain unattended overnight.

On Saturday, April 27, divers entered the habitat to make final checks and adjustments of power, air and television monitoring equipment. The dive crew then entered for the saturation test.

Continuous monitoring of the crew's condition was done from shore by means of a television system and a telephone link. Watches were established for both the shore party and the dive crew, and the operation settled down to routine.

Each shore watch consisted of two scuba divers suited up and ready to go, and a third man to monitor the television, check and bleed (water from) the air system, replace air filters and keep a deck log. Meals were prepared ashore (hot) and taken to the habitat by the divers on watch along with film, flashbulbs, forgotten eyeglasses etc.

The dive crew alternated two men on watch and two men asleep in the bunks provided. The dive crew left the habitat several times to make inspection of anchors, winches, ballast tanks etc. Replacement diving air tanks were brought down as required by the surface diving watch. The crew's tanks were kept outside the habitat both to reduce crowding inside and enable rapid exit. In addition, four 10 minute "bailout bottles" were racked up next to the trunk (inside) for any emergency.

At midnight Sunday, April 28, after 36 hours at the dive depth the habitat was raised to the 15 foot level to begin decompression. It remained at this depth overnight.

On Monday morning, April 29, after a light breakfast, the dive crew prepared to leave the habitat for the surface. They surfaced at 11:06 E.S.T. giving a total of 48 hours 6 minutes for the complete dive.

The habitat was now winched back to the surface where ballast tanks were blown and the variable (scrap iron) ballast was jettisoned. Due to the difficulties expected in getting the habitat up the ramp, the anchors were cut loose and buoyed off for later recovery. The habitat was then towed to the

ramp (approximately 500 yards) and hauled out on rollers.

Description of Habitat -- The habitat, essentially a cylinder 8 feet in diameter and 12 feet long is fitted with two Navy style pipe bunks, desk, chairs and cabinet space for incidentals. An emergency 600 cubic foot air supply is also available to carry over during any prolonged stoppage of shore-supplied air. This emergency system was partly used during the last hour of the dive solely to check auxiliary systems.

Access to the habitat is by means of a 25 x 44 inch bottom trunk fitted with a hatch (for towing only) and ladder. On top is a 19 inch diameter hand wheel-operated escape hatch is provided for exit in the event of bottoming and blockage of the main access trunk.

Air is provided from a compressor ashore through 500 feet of hose. The compressor is a rotory construction-type unit, gasoline driven. Prior tests of the air delivered showed [illegible]nt, no carbon monixide, 39 parts per million carbon dioxide, and oil content at an acceptably low level. In view of this, charcoal filters were provided at the shore manifold to assure clean air. The initial flow rate was set at 50 C.F.M. but later (Saturday afternoon) reduced to 35 C.F.M. The air blows through the EDALHAB and out the bottom trunk.

Heaters, both convective and forced air, provide temperatures of 78 - 81°F. in the habitat with water temperatures of 41°F. The heat loss is mainly due to the air flow as the entire hull is covered internally with two inches of polyurethane foam insulation. Humidity is held to a maximum of 60%. Excursions from 35% to 55% were encountered depending on the number of wet divers aboard.

Power is provided from shore in a conventional 3-wire 240 volts AC system with floating neutral. The power system is protected by a ground fault

interrupter set to trip at 5 milliamperes of unbalanced current. A battery powered emergency lighting system is provided which comes on automatically in case of shore power interruption.

Communications is by means of a local battery-magneto telephone link in the umbilical. The telephones are military type EE-8A's. Additionally a television monitor broadcasting locally (50-100 yards) on television channel 3 enables continuous monitoring of the habitat by conventional television receivers.

Meals are brought to the diving crew in a modified 12 quart pressure cooker. This minimizes internal air contamination and frees the crew of the cooking chore. Coffee is continuously prepared aboard.

An automatic alarm system is installed which is actuated by a three inch water pressure change. This actuates a local (internal) alarm as well as a horn and flashing light on a float at the surface.

Students in the dive crew were: Chester Johnson, 13 Spring Street, New-Market, New Hampshire; David A. Rodrigues, 2A Rita Street, Somersworth, New Hampshire; Frederick Butterworth, Center Street, Wolfeboro, New Hampshire; and Gary N. Sniffin, 13 Elmcrest Drive, Danbury, Connecticut. Other members of the team who worked on the project and provided surface support include Roger Lachance, 54 Pine Street, Rochester, New Hampshire, Ernest Gault, Barlett Avenue, Somersworth, New Hampshire; and Frederick R. Hess, Waquoit, Massachusetts.