

# Undine Mk 3

A redesign and build by Fran Oakey



Undine is a submarine originally designed by Hal Harrison and published as a free plan in the October 2001 issue of Marine Modelling International. The plan was for a model that was inexpensive and easy to build requiring only three channels, rudder, front planes and propulsion. The model was 30" long, made from 2mm liteply, designed as a simple dynamic diving submarine with fixed rear planes and controlled by the front planes for depth.

I have built two models of the Undine, one a third larger than the original plan at 40 inches long and one at 50% larger 45 inches long. The 40 inch long model was the first to be built and had both the bow and stern planes controllable from the radio. The reason for building it larger was in order to include a servo for the rear planes and an auto levelling device.

Following the great success of the 40 inch model a second model, the mark 3 was built 45 inches long to allow for the inclusion of another feature, a floodable chamber. The model's construction is more or less as the plan except that all the dimensions have been multiplied by 1.5. Because the model is that much bigger it has been made from 3mm liteply and skinned with a single layer of fibre glass (GRP) to add more strength and provide a good water proof skin. The weight of the fixed lead ballast had to be calculated and cast before the model was skinned so that it could be fitted under the GRP.

The vented floodable chamber was built into the hull at the centre of the boat so that the boat would have about ½ an inch of freeboard when the chamber is empty, thus giving the boat a more realistic appearance when on the surface. The chamber holds 18ozs of water when full and takes the boat to decks awash, at which point the buoyancy was adjusted to be about 2ozs. Filling and discharging the water from the chamber is done whilst the boat is on the surface with a car windscreen washer pump powered from the 7.2volts propulsion battery.

The water tight compartment covers have silicone rubber seals made from bathroom silicone sealer and model aircraft wing covering nylon. Access to the electronics for switching on and charging the battery is through a 1 ½ inch BSP access hole with a greased "O" ring seal. Robbe rubber bellows are used to seal the planes control rod entry to the water tight compartment

An auto levelling device is fitted to the model which modulates the signal to the stern planes servo to keep the boat level when submerged. The stern planes are not used to submerge the boat but they can be adjusted from the transmitter, to trim the boat. The sensitivity of the auto leveller, which is a modified helicopter gyro, can also be adjusted from the transmitter.

The transmitter is a JR 388 in PCM mode used in conjunction with a JR NER-649S receiver so that the fail safe feature of this radio equipment could be used, because there is a very limited space to add boxes of electronics to provide a stand alone fail safe system. The receiver aerial exit is sealed with a short length of silicone rubber and a tie wrap and its end sealed with "blue tack" which is also used to secure the aerial to the side of the model.