

# **TARGET 2 RANGE**

**ECHO  
SOUNDER  
SPEED AND  
DISTANCE LOG**

**NASA**  
MARINE INSTRUMENTS

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## INTRODUCTION

The Target speed and distance log is supplied complete with display unit, paddle wheel assembly, skin fitting and blanking cap. The Target depth sounder is supplied complete with display unit, transducer and alarm buzzer. Both units are intended for 12V ships supply operation though, because of their low power consumption, can be run from an external dry battery.

## INSTALLING THE DISPLAY

Select a convenient position for the display on a panel or bulk head. The site must be flat and the cavity behind the panel must remain dry at all times. (The cable entry boss is not sealed to allow free passage of air to and from the unit. This prevents misting of the display.) The positions for the fixing holes can be marked on the panel using the drill template which is an integral part of the packing carton. Before drilling check that there is sufficient space behind the panel to route the cables and to allow access to tighten up the wing fixing nuts.

Drill the five holes and check that the unit fits. It may be wise to connect the cables before finally fixing the unit in position. Connect the black wire to negative and the red to positive. It is wise to use a fuse to provide protection should a fault occur. The current consumption is very small, a 1/4 AMP fuse is more than adequate.

## (TARGET SOUNDER ONLY)

The red wire of the alarm is also connected to the positive supply whilst the black wire connects to the green wire from the display unit. The alarm is not watertight and must be mounted in a protected position.

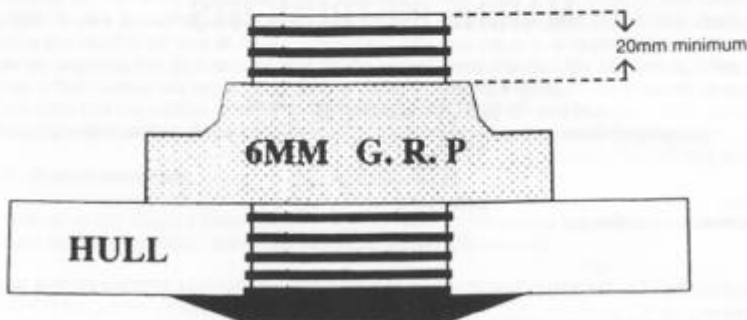
A sponge rubber seal is provided which should be fitted into the slot in the back of the instrument. Fit the instrument into the panel and tighten the four wing nuts finger tight only. It is important that the sponge rubber seal makes good contact with the panel or water may get behind the unit and enter the cavity behind the panel. It is always good practice to take the cables vertically down from the unit. This prevents water running along the cables and into the unit.

## TARGET LOG PADDLE WHEEL INSTALLATION

The paddle wheel should be installed at a point in the hull where:-

- 1) It is immersed at all attitudes under power or sail.
- 2) The blades of the paddle wheel are presented with a Smooth flow of water corresponding to the vessels speed through the water. On displacement hulls this is usually about amidships, but on planing hulls it should be as far aft as possible.
- 3) It should be easily accessible in the bilges for cleaning and laying up. A blanking cap is provided to seal the skin fitting when the paddle wheel is removed.
- 4) It is not vulnerable to damage from unforgiving surfaces such as trailers and lifting slings.

Drill a hole of 42mm diameter to take the skin fitting and use conventional methods for sealing. It is advisable to avoid the use of mastic materials - use a form of proprietary silicon sealant. The securing nut has a groove on its underside which should also be filled with sealing compound. Finger tighten this nut only. After the sealing compound has set wipe off the excess and encapsulate the whole assembly in G.R.P. as shown in the diagram. Take care to ensure that a minimum of 20mm of thread is left uncovered. The paddle wheel unit can now be slid into the housing, with the arrow pointing along the centre line of the vessel. It is recommended that a little silicon grease be smeared over the rubber "O" ring to keep the unit free. Plug the transmitter cable into the display unit socket and for added protection it is again recommended the plug be lightly covered with silicon grease.



## TARGET LOG OPERATION

When switched on the display will momentarily display the total distance and then revert to reading speed. The speed is shown in nautical miles per hour and is reliable up to 25.0 knots. (At higher speeds cavitation around the paddlewheel may reduce accuracy.)

A short press of the SPEED key will turn the backlight on and off.

A short press of TRIP key will display the Trip distance. To reset the trip to zero first select trip by pressing the TRIP key. When the trip distance is shown press and hold the TRIP key until the display shows ' F '. The trip is then reset to zero. The trip distance is shown in tenths of nautical miles up to 99.9nm and in single miles up to 999nm thereafter.

A short press of the TOTAL key will display the total distance. The unit will display the total distance travelled to 999nautical miles. This counter cannot be reset.

A long press of the SPEED key will return to the Speed display

## CALIBRATION

The calibration is preset in the factory. The type of hull and the position of the paddlewheel may affect the performance of the unit. If the log under or over reads then the calibration factor can be adjusted to compensate.

Enter the Engineering mode by first turning off the power supply to the instrument. Press and hold the SPEED key whilst the power supply is turned back on. The word ENG will appear on the display. Press either the TRIP or TOTAL keys to display the calibration setting. This is normally 100 (%) when it leaves the factory. Press TRIP to increase or TOTAL to decrease the number. Each press will increment or decrement the number by 1%. When the desired calibration factor is attained a long press of the SPEED key will return the unit to normal operation. Both speed and distance are calibrated simultaneously. The calibration factor is stored in non-volatile memory and is retained when power is off.

## TARGET SOUNDER TRANSDUCER INSTALLATION

The transducer can be mounted in one of three ways:

- The transducer face can be bonded directly to the inside of the hull. (Some energy is lost to the hull but the loss in performance is, for most G.R.P. hulls, hardly noticeable).
- A transom mount is available from your dealer.
- The transducer can be positioned inside a GRP hull by means of an In Hull Transducer kit.

This method of installation has the dual advantage that no hole is made in the vessels hull and that the echo sounder and transducer can easily be removed for examination or installation elsewhere. It should be mentioned however, that although the accuracy will in no way be affected by installing the transducer inside the hull, the maximum range sensitivity may be reduced, depending on the thickness and quality of the glass fibre. The In Hull Kit is available direct from NASA Marine or your local chandler. Whichever is selected the best location still has to be found.

Select a position below the water level where the transducer will point substantially towards the sea bed and where the transducer and cable are kept well clear of interference generating equipment. This position should be well clear of large masses of bubbles or cavitation which would disrupt the signal.

To test the suitability of the location, press a little sticky chewing gum on the surface of the transducer and stick it down to the inside of the hull (remove dirt and oily residue first). The unit can then be tested. If the location is satisfactory the chewing gum can be removed and the transducer mounted using one of the methods described previously. (Note: Do NOT shorten the transducer cable).

It is important that the face of the transducer is thoroughly bonded down to the hull. A single air bubble will cause a considerable loss in performance.

The transducer and the place of mounting must be kept entirely free of any antifouling compound as this can also effect the performance of the unit.

## NOTES ON ELECTRICAL INTERFERENCE

External electrical interference is characterised by persistent, random numbers on the display which obscure the true depth reading on the depth sounder.

This is caused by large amplitude voltage "spikes" generally associated with the engine's alternator and/or ignition system which has not been properly suppressed. These "spikes" may find their way into the sensitive amplifier section of the depth sounder in two ways:

- (a) Through the craft's common power supply or
- (b) Through direct radiation from the source of interference.

To reduce the possibility of induced interference from the engine's generator and/or ignition system choose a position as far away from the engine as possible and run the cable from the transducer as far as practicable from the engine. Do NOT cut the transducer cable, but stow excess away from any possible source of electrical interference.

#### **TARGET SOUNDER OPERATION**

Various operational parameters need to be set into the memory prior to use to get the best from your Target depth sounder. Once set, these parameters are permanent and not likely to require adjustment.

Most sounders measure the depth below the transducer. It is often more convenient to display the depth below the keel. A facility has been included where the vertical distance between the transducer face and the bottom of the keel (the keel offset) can be programmed into the unit. The unit then reads the true depth below the keel. (On delivery the keel offset is zero so the unit will read the depth below transducer).

#### **BACK LIGHT:**

A quick press of the SET key will turn on the back light. A further quick press of the SET key will turn the back light off.

#### **TO SET THE KEEL OFFSET**

Put the unit into engineering mode. (This is achieved by turning off the power supply to the unit and turning the power back on whilst the SET key is depressed). The word 'ENG' will appear until the SET key is released. Now use the ALARM UP and ALARM DOWN keys to set the required keel offset. A long press on the SET key will return to normal echo sounder operation.

#### **SELECTING THE OPERATING UNITS (FEET or METRES)**

Put the unit into engineering mode (see above). A short press on the SET key will swap the units from feet to metres. A long press on the SET key will return to normal echo sounder operation.

#### **SETTING THE SENSITIVITY THRESHOLD**

Echoes received from near objects will clearly be larger than from more distant objects. Echoes from keels or turbulence under the boat may be substantially greater than echoes from the sea-bed and may cause the sounder to alternate between the sea-bed and something more local. To overcome this problem, the Target sounder is fitted with variable swept gain. This reduces the sensitivity for local objects, progressively increasing the sensitivity as depth increases. The point at which the gain starts to rise is called the sensitivity threshold. The sensitivity of the unit at depths below the sensitivity threshold will be considerably reduced whilst above the sensitivity threshold the unit rapidly becomes more sensitive with increasing depth.

The sensitivity threshold is factory set to 0.0 metres. To view the sensitivity threshold press SET. The value can be altered by using the ALARM UP and ALARM DOWN keys. The value is then fixed in memory by pressing SET.

#### **USING THE ALARMS**

The alarm will sound if an echo is received which is shallower than the upper alarm setting or deeper than the lower alarm setting. To view the setting of the upper (Shallow) alarm, press the ALARM UP key. Return to sounder by pressing SET. To view the setting of the lower (Deep) alarm, press the ALARM DOWN key. The setting can be altered by using the ALARM UP and ALARM DOWN keys. The new value is entered and the unit returned to the echo sounder by pressing the SET key. To enable the alarm, press the ALARM UP and ALARM DOWN keys simultaneously. A 'bell' symbol will appear to show the alarm is activated. When an alarm condition is apparent the bell symbol will flash and the audible alarm will sound. Pressing ALARM UP and ALARM DOWN again will disable the alarm. All parameters set into the unit are held in memory even when the power is removed.

#### **IMPORTANT - Supply transients**

As a safety feature on the Target 2 Echo Sounder any transient on the supply will activate a automatic shutdown feature. To reset from this condition, turn the power supply off for 30 seconds.

**NOTE: THESE INSTRUMENTS ARE SIMPLY AIDS TO NAVIGATION AND SHOULD NOT BE CONSIDERED AS A SUBSTITUTE FOR GOOD SEAMANSHIP.**