

Seafarer 5

SEAFARER RANGE

# SEAFARER 5

## ECHO SOUNDER

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### Installation and Operating Instructions

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Cables: **Seatronics**, Poole

# SEAFARER 5

## ECHO SOUNDER



### CONGRATULATIONS

You have become the owner of a Seafarer 5 Echo Sounder. If you follow the installation instructions carefully and carry out routine maintenance as recommended, then this quality product will give you many years of trouble free service.

# INSTALLATION AND OPERATING INSTRUCTIONS

## INTRODUCTION

The Seafarer 5 echo sounder operates by measuring the time interval between transmission and reception of ultra-sonic pulses from the sea bed via a piezo electric transducer fitted in the hull of the boat.

The depth is displayed on a circular dial by a brilliant yellow Light Emitting Diode (LED) on two range scales. Ranges are 0-20m and 0-120m on metric model or 0-66ft and 0-10 fathoms on Feet/Fathoms model. In addition, the instrument is fitted with a depth alarm (audible and visual) which operates up to 30 metres (16 fathoms).

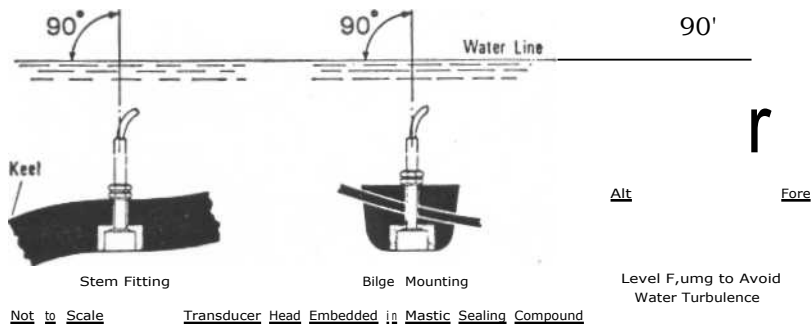
## TRANSDUCER INSTALLATION

**WARNING:** The co-axial cable is sealed into the stem of the transducer and if damaged in any way cannot be reconnected. The transducer lead has a nominal length of 24 feet (7.3 metres) and should not be extended or cut without the advice of a service engineer. Any excess cable should be coiled away from excessive heat or sources of electrical interference. Transducers with longer cable can be supplied to special order. For full depth performance the transducer stem should be mounted as near vertical as possible. Install the transducer in a part of the hull which is as clear as possible from aerated or

turbulent water and where accidental damage is unlikely to occur. Normally a position slightly aft of amidships is preferable. For fin-keel sailing boats it may be preferable to fully recess the transducer into the stem so that the face is completely flush. It should be remembered that the beam angle of the transducer is  $\pm 22\frac{1}{2}$  and care should be taken that a false echo is not created by the keel. If a single transducer is installed on the centre line of the boat depth readings will be obtained up to an heel angle of  $22\frac{1}{2}$ . If two transducers are required, to avoid fin-keels for instance, then each should be fitted in opposite bilges facing outward at an angle of approximately  $15^\circ$ . By using an automatic change-over switch (optional extra) available from all good chandlers, a twin transducer installation will enable the Seafarer 5 and 700 to give accurate depth readings to an heel angle of  $37\frac{1}{2}$ .

The following illustration indicates typical transducer installations using a wooden fairing block outside the hull. The fairing block has been carefully bored, carved and sanded to a streamlined shape avoiding the creation of turbulent water which may reduce or even prevent depth indication when the boat is travelling at a speed. In one of the examples shown, an internal fairing block has been used for strength and sealing and to allow for hull curvature. The installation should be carefully rendered watertight by using a sealing compound between all mating surfaces. Do not over-tighten the nuts on the transducer stem.

Fig. 1



## TRANSDUCER INSTALLATION DIAGRAM

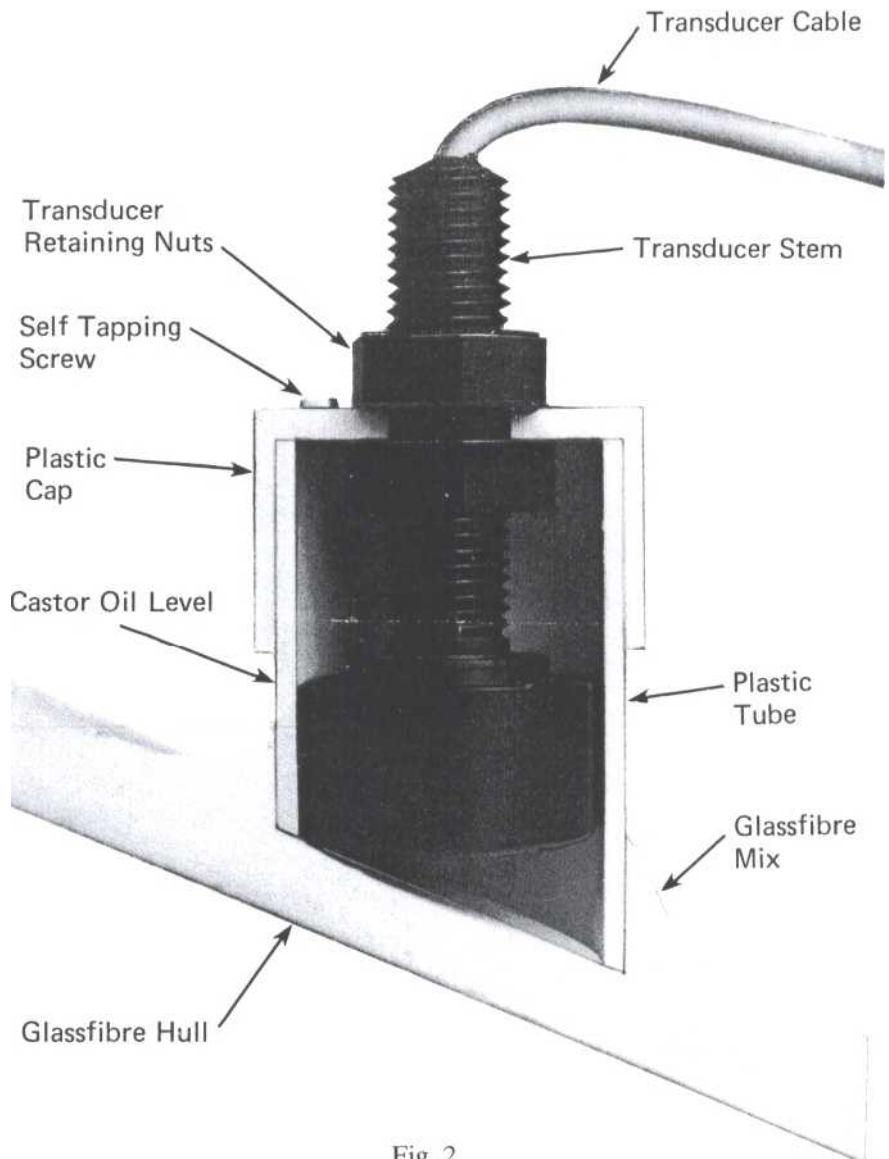


Fig. 2  
In-Hull Transducer

## TRANSDUCER ANTI-FOULING

Following installation the water exposed face of the transducer may be painted with one thin coat of hard Antifouling, carefully applied so that the paint does not form or trap air bubbles. Care should be taken not to damage the transducer face or the piezo electric crystal that it protects. Accidental damage to this scaled unit cannot be repaired.

## WITHIN HULL (GRP) TRANSDUCER INSTALLATION (Optional)

As an alternative to mounting the transducer through the hull with the face in direct contact with the [water](#), it may be positioned inside a glass-fibre hull by means of an In Hull Transducer Kit as shown in Fig. 2. The In Hull Transducer Kit is available from most Chandlers and Boatyards, as an optional extra. The end cap of the In Hull Transducer Kit is provided with a push-out insert making it suitable for the stem diameter of both the Seafarer 5 and 700 transducers. This method of installation has the dual advantage that no hole is made in the vessel's 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 upon the thickness and quality of the glass-fibre. We do not recommend this method of installation if the thickness of the glass-fibre exceeds three-quarters of an inch. Neither do we recommend its use in hulls of wood, steel or aluminium, although this method of installation has been found acceptable with these materials in some cases. Full installation details are supplied with the In Hull Transducer Kit and copies are available on request to Seafarer Navigation International Limited.

## INSTRUMENT INSTALLATION

**WARNING:** The location of the instrument should be at least 2 feet (61 cms) from a magnetic compass. Repeat meter 1 foot (30 cms).

With the bracket provided the instrument may be mounted in any position, as the bracket can be rotated through 360°. (The bracket is designed to be slightly undersized to ensure a good grip on the case). This means that it can be facing down from a cabin roof, or on top of an instrument panel or console, or side mounted by the chart table. If the instrument is mounted outside or in a cockpit, a sheltered position should be chosen, since although the instrument is water resistant it is not fully waterproof. For this reason it is advisable to provide a cover or some additional protection against extreme climatic conditions.

## FLUSH MOUNTING

An alternative method of mounting is to fully recess the instrument into a panel or bulkhead using a flush mounting flange. The template provided with the operating booklet may be used for making the appropriate cutout in the bulkhead. Remove the two plastic side mounting knobs and cut the projecting screw threads back to the metal flange on each side of the instrument case. Fit the plastic mounting bezel to the instrument by slacking the four fixing screws at the rear of the case sufficient to allow the bezel (which is in two halves) to be slipped in between the front panel and the case. Re-tighten the four screws trapping the bezel in position. The instrument can now be pushed into the cutout in the bulkhead from the front and secured with eight countersunk screws in the bezel. The outline dimensions of the Seafarer 5 for mounting purposes are shown in Fig. 3.

## POWER SUPPLY

The instrument may be powered by either an internal battery or ship's supply of nominal 12/24 or 32 volts D.C. without adjustment. The rear battery compartment cover must be removed to allow access to the connections. If the instrument is to be powered from the ship's supply, attention is drawn to the fact that the internal battery terminals **MUST** remain stowed in their stowage position. The unit will not operate on an external supply unless the battery terminals are in the stowage position.

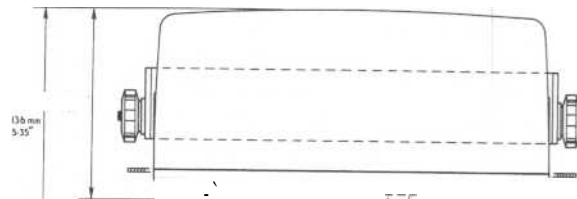
**Internal Batteries.** The recommended battery is the Ever Ready PP9 or Vidor VT9 or its international equivalent:

Beret PP9	Diamon 339
Ever Ready 276	Petrix 439
Mazda RO 617	Superpila 995
	Tudor 911

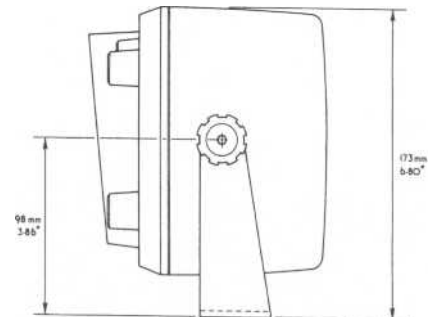
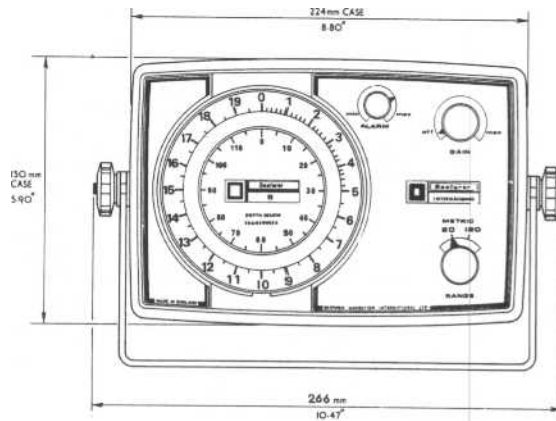
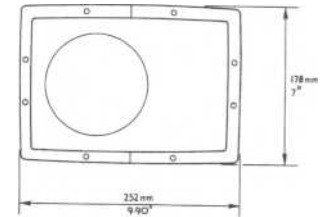
Remove the battery clips (red and black leads) from their stowage position and clip them on to the battery in the correct polarity. Red to positive (+VE) and black to negative (-V E).

As an alternative two 4.5 volt flat flashlight batteries of the type with two brass contact strips at the top may be used with an appropriate adaptor. During the Season, periodically check the battery or batteries for signs of corrosion and always remove them at the end of the Season. Should the instrument ever need servicing, remove the battery before posting.

**Ships Supply.** The instrument will accept any nominal ships supply of 12, 24 or 32 volts D.C. without adjustment. Damage, however, will be sustained if a higher voltage is connected or if the ships supply produces "peaks" in excess of 35 volts. To connect the instrument, remove the battery compartment cover and make a small hole in the sealing grommet marked "external supply" in the back cover. Thread the power supply cables through

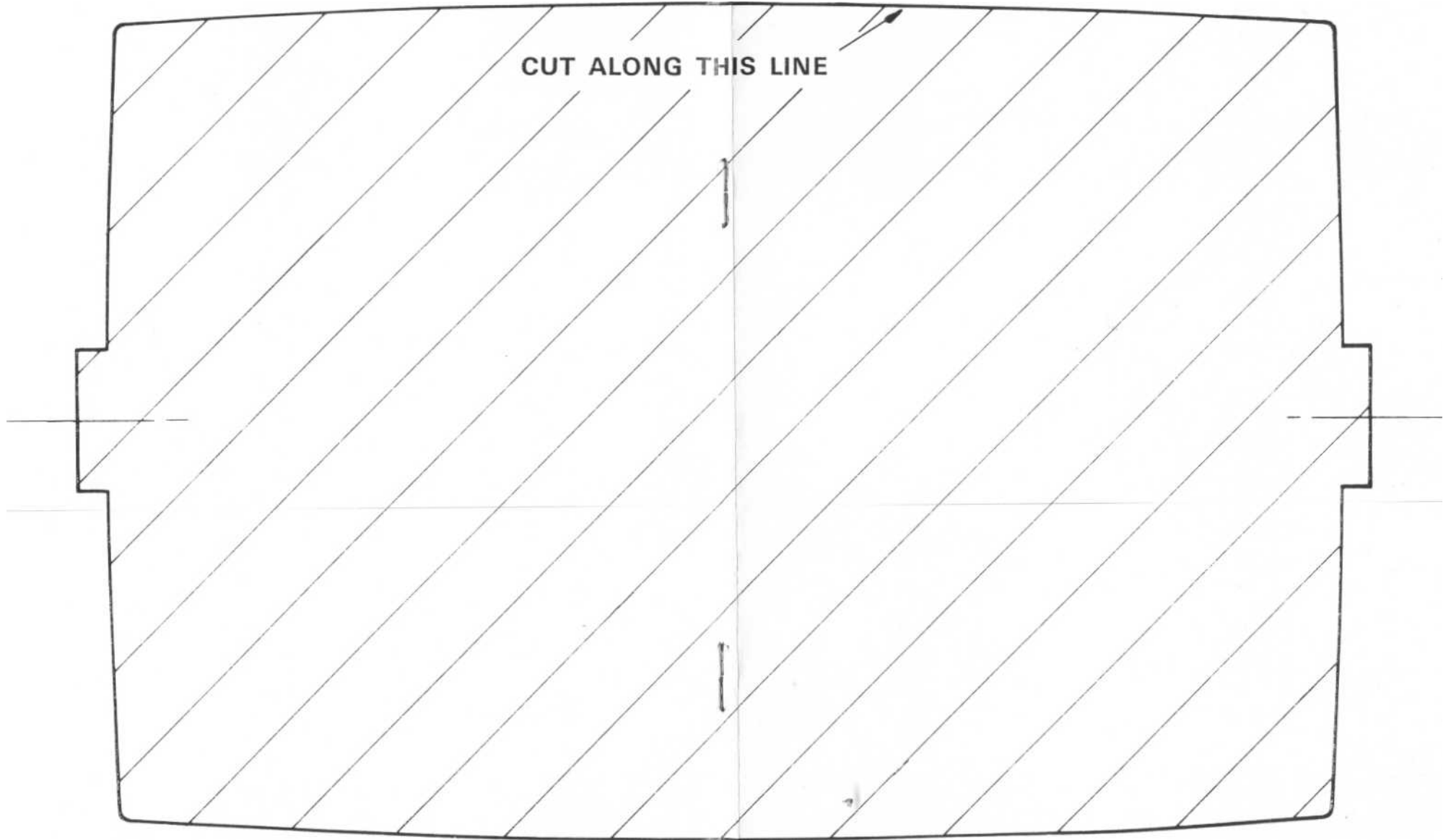


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OUTLINE DIMENSIONS FOR SEAFARER 5

# SEAFARER 5 AND 700

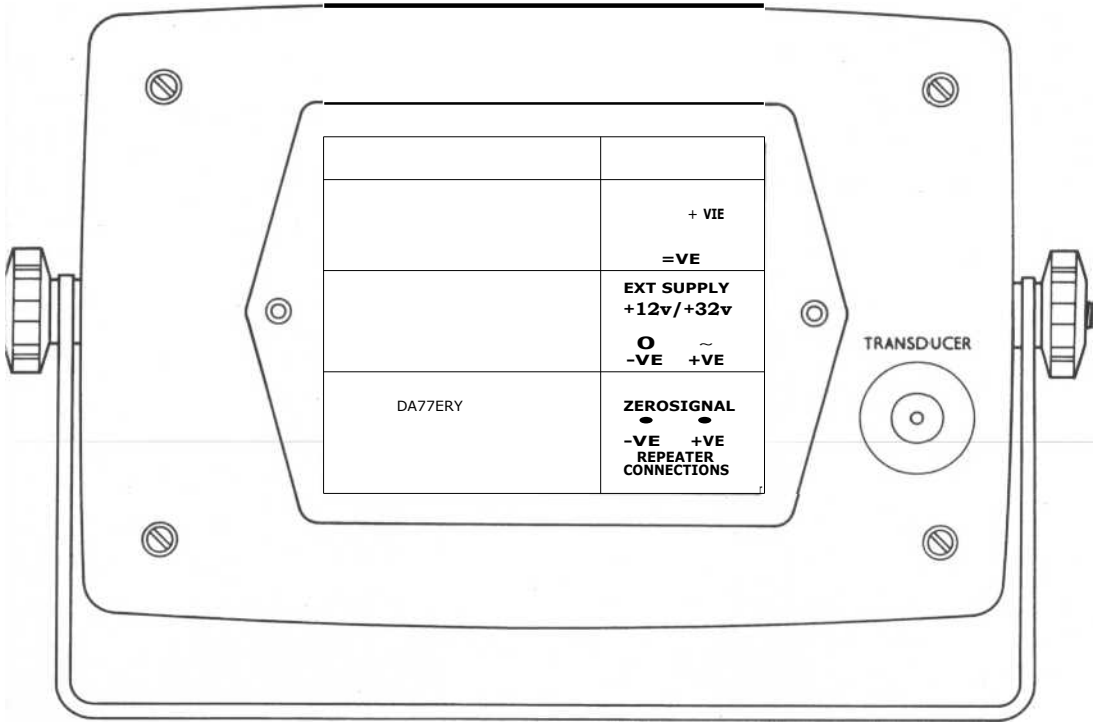


**"Cutout" Template for Bulkhead Mounting**

the grommet and connect the negative supply to the screw terminal on the instrument marked -VE and the positive supply to the screw terminal marked +V . The internal battery terminals MUST remain clipped in their stowage position when the ships

supply is connected. If the polarity is inadvertently reversed no damage will be sustained, but the instrument will not work until the correct polarity is connected. Check the correct operation of the instrument before re-fitting the rear cover -

Fig. 4



REAR VIEW WITH COVER REMOVED

**SEAFARER 7009 5**



## GENERAL OPERATION

With the power supply connected to the instrument, turn the "gain" control to the "ON" position. Yellow LED will flash at "0" on the dial. Select shallow water range and turn "gain" control in a clockwise direction until a second (echo) indication appears on the dial. This indicates the depth of water beneath the face of the transducer. If the "gain" control is advanced more than is necessary, multiple echoes of the true depth will appear. This setting is too high and should be reduced until only the first echo is visible. This will improve clarity of reading and conserve battery power.

The efficient performance of all echo sounders depends on the nature of the sea bed. For instance, a hard, rocky or firm sand sea bed will reflect back ultra-sonic sound waves extremely well. The return echo from a sea bed of this type will be shown as a firm flash on the dial at the appropriate depth. On the other hand, deep mud or large amounts of kelp will give a weaker reflection and produce a wider, more indeterminate flash. With practice it is therefore possible to ascertain not only the actual depth, but also the type of sea bed. To locate fish, advance the "gain" beyond the normal setting for depth indication only. Fish will then be indicated by random flashes at their appropriate depth. It should be noted that an echo return from fish depends on the size of the air sac and varies greatly with different types of fish.

## DEPTH ALARM OPERATION

The Seafarer 5 is fitted with an audio alarm which will give a warning when the depth of water below the transducer falls below a pre-set level. This is adjusted by the "ALARM" control and is variable from 0.8 metres (2.7ft) to a nominal maximum of 30 metres (16 fathoms). When the alarm facility is not required, the control should be set to the "MIN" position. To set the depth at which the alarm is to operate, turn the "ALARM" control in a clockwise direction. A yellow flashing LED will appear on the dial face. Continue to rotate the "ALARM" control until the forward edge of this LED indicator is aligned with the required depth calibration on the dial.

If the depth of water below the transducer falls beyond the alarm setting, then the alarm will sound. This can then only be silenced by sailing into deeper water or, by turning the "ALARM" control in an anti-clockwise direction.

**CAUTION**-If the transducer is mounted in a vessel which has projections below the transducer (keel or twin bilge keels etc) then the alarm setting must take into account this additional depth, if grounding is to be avoided.

## DIGITAL REPEAT METER

### (Optional Extra)

A digital repeat meter is available as an optional extra. This instrument is suitable for use with Seafarer 5 or Seafarer 7(X) echo sounders. The meters are single range and can be supplied calibrated to read in feet or metres. The "metric" model reads from 0.8 metres to 119.9 metres and the "feet" model from 2.7 feet to 359.9 feet. The calibration of the repeat meter is independent of the echo sounder and it will continue to read in its factory set units, whichever echo sounder model (foot/fathom or metric) it is used with. Depth is indicated on a four digit liquid crystal display which is fitted with red, LED edge lighting for night use.

## INSTALLATION

The repeat meter may be flush mounted in the cockpit or other suitable position for use by the Helmsman or Navigator. It requires only a single hole fixing of 87mm (3.4in) diameter. Whilst the front face of the meter is weather-proofed, a suitable sealing compound should be used to ensure a watertight seal between the bulkhead and the meter flange.

Inter-connection between the repeat meter and the echo sounder is via a 4-core screened cable of 6m length. If required, this may be extended by using a terminal block and extra cable of the same (or very similar) type. The screen must be disconnected and separated from the wire and solder tag to which it is connected. The screen and four wires are then connected via the terminal block to the extension cable. The end of the extension cable to be connected to the echo sounder must be made up with the screen and wire connected together at the solder tag. However, care must be taken to ensure that the joint is fully protected against ingress of water. The cable is an integral part of the repeat meter and is supplied with it. To connect to the instrument, remove the battery compartment cover and make a hole in the repeat meter cable entry grommet. Thread the cable through the grommet and connect each lead to the appropriate terminal following the diagram supplied. Finally, replace battery compartment cover. If display illumination is required, then a 12 volt D.C. (ships supply) should be connected to the terminals at the rear of the meter. For 24 volt systems, connect a resistor (180 ohm 1 watt) in series with the supply. To provide a variable level of illumination, a potentiometer (1 Kohm) should be fitted in series with the supply. In which case the 180 ohm resistor should be omitted.

## REPEAT METER OPERATION

The repeat meter will start to operate as soon as the Echo Sounder is switched on. However, if the "olain" control is set too low, colon in the middle of the

display will flash. This "missing echo" indication will continue until a satisfactory echo has been obtained from the sounder. The minimum reading on the repeat meter is 0.8 metres (or 2.7 feet) and has *been* set by a bubble suppression circuit. This is to prevent false readings which could be caused by aeration at the interface between boat and water.

## GUARANTEE AND SERVICE

The Seafarer 5 and 700 are fully guaranteed under the conditions as stated on the guarantee card supplied with the instrument. After the guarantee expires, or if problems arise which are not covered by the terms of the guarantee, your instrument will be repaired in the United Kingdom by the manufacturers or by one of their officially authorised main distributors. Unauthorised or inexperienced persons should not attempt to service the instrument since this is not only likely to worsen whatever fault has arisen, but will immediately nullify the Guarantee. Should it ever be necessary to return the instrument for service it is essential that the internal battery be removed and that the instrument be carefully packed and insured for transit. A brief note (giving your name and address) and the symptoms of ailure is of great assistance to service engineers in locating a fault.

### Routine Maintenance

The transducer should be examined periodically and if fitted outside the hull a thin coat of hard anti-fouling paint should be applied to the face of the transducer with a soft brush, care being taken not to

trap air bubbles under the paint. A build-up of barnacles and other marine encrustation on the face of the transducer will cause progressive deterioration of the instrument maximum depth capability. Barnacles should be removed by crushing between a pair of pliers and not tugged off as the transducer face may become irreparably damaged. Particles of imbedded shell can be dissolved by applying a 20% solution of dilute hydrochloric acid, and be rinsed off with fresh water. If an internal battery is fitted, this should be examined periodically for acid leakage and replaced as necessary. The battery should be removed if the instrument is not used for an extended period.

The transducer co-axial plug and socket connections should be kept clean and protected against sea water. The transducer cable should be examined periodically for damage, particularly where the cable emerges from the plastic transducer stem.

The instrument should be carefully protected at all times from salt water and the seals examined to ensure that water is not allowed to penetrate the instrument.

### Accessories and Spares

Additional or spare transducers as well as automatic change-over, switches, repeat meters, mounting brackets and visors are always readily available from Yacht Chandlers, Dealers or Boatyards.

If you encounter a supply problem, please contact Seafarer Navigation International Limited directly.

# SEAFARER 5

## TECHNICAL DATA

### Depth Scales:

	Foot/Fathom Model	Metric model
Shallow Range	4-60 feet	0.20 metres
Deep Range	460 fathoms	4-120 metres

### Analogue Presentation:

Brilliant Yellow Light Emitting Diode (LED) Flash on Clock Face Dial with up to 35° viewing angle.

### Accuracy:

Better than ±2% of depth readinn within operating temperature range-10°C to +50 C.

### Power Supply:

9 volt, PP9 Battery (or equivalent) not supplied, or, External supply 10.8v to 32v D.C. (reverse polarity protected).

### Power Consumption:

On internal battery, nominally 105 mA on shallow range and 75 mA on deep range. On ship's supply, maximum of 120 mA on all ranges.

### Power Output:

Typically 100 watts peak to peak pulse power on both ranges.

### Compass Safe Distance:

Not less than 2ft (61cms).

### Transducer:

Short stem with Lead Zirconate Titanatc piezo electric disc. Supplied with 24ft (7.3m) cable. Nominal frequency 150KHz.

### Shallow Water Alarm

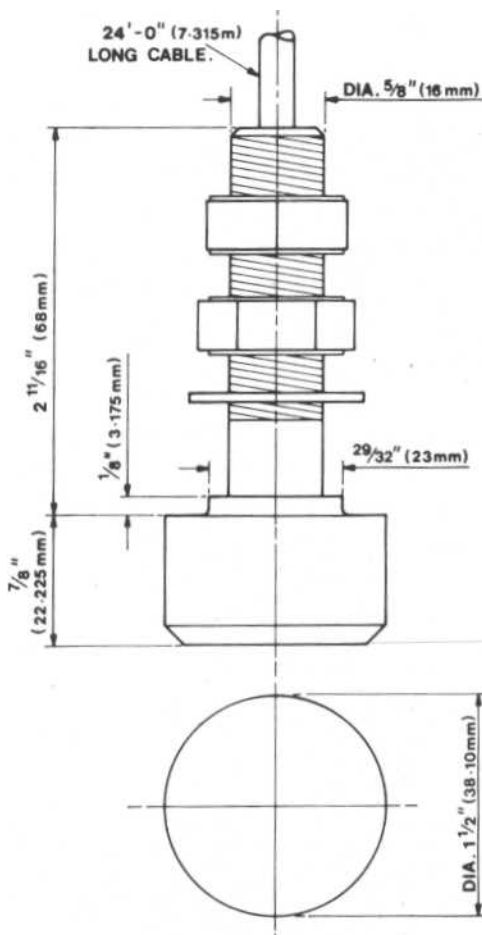
Can he set at any depth between 0.8m to 30m (nominal) (2.7ft to 16 fathoms).

### Dimensions:

instrument Only	224x 150x 136mm
With Mounting Bracket Fitted	266x 173X 136mm

### Weight:

1.3kg (excluding battery and transducer).



## TRANSDUCER DIMENSIONS

**DIGITAL REPEAT METER  
TECHNICAL DATA**

**Depth reading:**

Feet Model 2.7ft to 359.9 (single range)  
Metres Model 0.8m to 119.9 (single range)

**Display:**

4 digit Liquid Crystal with provision for edge lighting.

**Power Supply:**

5 volts D.C- from main instrument.

**Power Consumption:**

Less than 1mA.

**Working Temperature Range:**

-15° C to +65CC.

**Accuracy:**

±0.5°c.±1 LSD.

**Case Style:**

Circular, flush mounted, supplied with 6 metres of cable.

**Weight:**

0.52kg unpacked. 0.62kg packed.

**Case Dimensions:**

Flange Diameter: 116mm.  
Body Diameter: 85mm  
Body Depth: 55mm (minimum).

**Display Edge Lighting:**

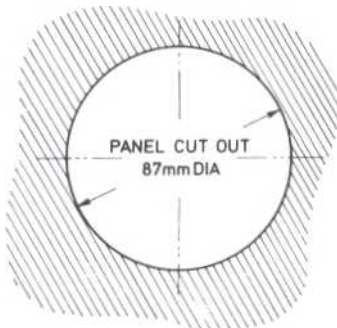
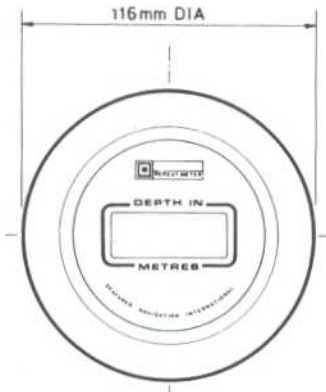
From external supply of between 10s to 16v D.C.

For 24v D.C. systems. lit a 1811 ohm 1 watt series resistor, or 1 Kohm potentiometer, if dimming is required.

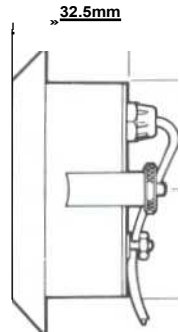
Typical current consumption: 60mA at 12v.

**Missing Echo Indication**

If Echo is lost for any reason (e.g. gain too low) colon in centre of display will flash; last good reading remains displayed.



**13mm**      **55mm MIN I**



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OUTLINE DIMENSIONS OF REPEATER METERS FOR SEAFARER 5 AND 700



ray — r  
L1C1ct

## The Seafarer product range also includes

Commercial and Small Craft Radars. Speed Logs, Electro-Magnetic and Trailing. VHF Radio Telephones. Portable Distress Radio Telephone. Radio Direction Finders. Automatic Pilots. Echo Sounders.

*If you would like further details of any of these items,  
please contact us at the address below*

SEAFARER NAVIGATION INTERNATIONAL LTD  
Fleets Lane, Poole, Dorset

Tel: (Poole) 0202 674641 Tlx: 41169

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The Seafarer Navigation International Limited policy is one of continuous development, and consequently this product may vary in detail from the description and specification in this booklet.

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