

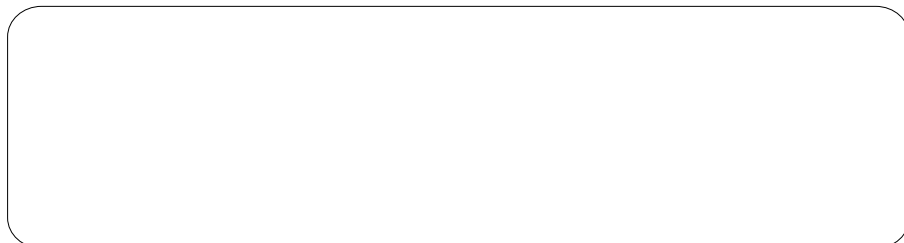
# **DST SeaSprite Sonar**

## **Installation and Operator's manual**



New Digital Sonar Technology with  
CHIRP for ultimate resolution

Supplied by



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### WARRANTY

Tritech International Limited herein after referred to as T.I.

T.I. warrants that at the time of shipment all products shall be free from defects in material and workmanship and suitable for the purpose specified in the product literature.

1. The system warranty commences at the date of customer acceptance and runs for a period of 180 days.

The Customer Acceptance Test must be performed either at Tritech International or at one of their approved distributors unless otherwise specified in writing. The warranty does not apply unless the recommended maintenance instructions have been followed and does not apply to defects resulting from normal wear and tear, incorrect operation, fire, water or lightning damage or damage caused by variations in a ships voltage, or from any other circumstances which arise after delivery and beyond the control of T.I.

2. Warranty service is performed at the discretion of T.I. either by repair or replacement of the equipment in question.

3. The warranty does not cover personnel transportation and per diem allowances related to repair or replacement.

4. The warranty is subject to the following conditions:-

a) The system must have been sold by T.I. or one of their authorised representatives.

b) The system must have been installed and commissioned in accordance with approved technical standards and specifications and for the purpose for which the system was designed.

c) Any claim must be notified in writing to T.I. without delay upon discovery of a defect.

d) Defective parts have to be forwarded to T.I. adequately packaged and by suitable means of transport, freight paid and with a report stating the defect. The replacement parts or equipment covered by the warranty will be returned to the customer, carriage paid by T.I.

5. The warranty shall become invalid if the customer repairs or modifies the equipment and components without written authority from T.I.

6. The warranty is not transferable, except as or applies to Purchaser first then to customer.

7. All further claims on any grounds whatsoever, are excluded.

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IBM and AT are registered trademarks of International Business Computers.

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## TECHNICAL SUPPORT AND SOFTWARE UPGRADES

**Tritech International Ltd**  
**Technical Support**

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**Westhill Business Park**  
**Westhill**  
**Aberdeen AB32 6JL. UK**

**Telephone : ++ 44 1224 744 111**  
**Fax : ++ 44 1224 741 771**  
**Email : [workshop@tritech.co.uk](mailto:workshop@tritech.co.uk)**

If you have cause to use our Technical Support service, please ensure that you have the following details at hand **prior** to calling:

- System Serial Number (if applicable)
- Serial Numbers of all scanning / profiling heads
- Software Revision Number
- Fault Description
- Any remedial action implemented

The name of the organisation which purchased this system is held on record at *Tritech International Ltd*. Details of new software and hardware packages will be announced at regular intervals. Depending on the module, free upgrades will be offered in keeping with our policy of maintaining the highest levels of customer support.

## PART 1. SOFTWARE INSTALLATION (WIN98/2000/XP)

### PC Hardware Requirements (Minimum):

- Pentium PC
- 32MB RAM (Win98), 128MB (Win2000/XP)
- 10MB Hard Disk Space (Installation)
- Available COM Port (115.2kBaud capable)
- 16-Bit Colour Graphics Card at 800x600 Resolution

- 1) Insert the 'SeaSprite Sonar' Installation CD into drive and run SETUP.EXE.
- 2) The Installation will place 2 shortcuts on the Desktop; i) SeaSprite Setup ii) SeaSprite Sonar.
- 3) The SeaSprite Sonar software is pre-configured to communicate with the Sonar via **the COM1 Port @ 115,200 Baud, 8 Data, No Parity, 1 Stop**.
- 4) Consult the SeaSprite Sonar software manual for operating instructions and details on how to re-configure COM Port assignment and telemetry settings.

## PART 2. HARDWARE INSTALLATION

### Power

The Sonar head should be powered from a clean DC Supply or Battery pack capable of supplying **9-50Vdc @ 2.2VA**.

*To reduce damage to the sonar head in the event of over voltage it is recommended that an appropriate fuse is included in the power supply connection.*

### Handling



The SeaSprite Sonar head is an oil-filled product and under NO circumstance should it be opened up or tampered with in any way. There are no user-serviceable parts or internal switches, which would necessitate disassembly.



The 'Seal Screw' should never be unscrewed as this may result in oil loss. The blue/yellow diaphragm on the top of the Sonar head is to allow for volume changes in the oil at different operating temperatures. This diaphragm should never be poked or stabbed with sharp instruments.



The Sonar may be lowered to depths of **NO MORE** than 750 metres.



The connector socket is not usable "open face" and should always be sealed with either a plug or the blanking-plug provided.



The 'AUX' Port should be blanked off at all times when not in use.

*Please also refer to the point listed under the "Further Information" section, when handling or operating.*

## Communication protocol

The SeaSprite Sonar is supplied with two communication ports labelled "Main" and "Aux". All communication to the control PC on the surface should be via the "Main" port, while the "Aux" port is used for daisy chained communication links to other Trittech sensors.

The communication configuration of the "Main" and "Aux" ports are **FACTORY SET**. These are Software selectable comms (RS232, RS485) and should not be changed without first contacting Trittech.

The 4 option variants A-D are available

A=Main-485, Aux-485,  
B=Main-232, Aux=485,  
C=Main-485, Aux-232,  
D=Main-232, Aux-232



In this example, the label shows that configuration A has been selected

- The RS232 telemetry is Bi-directional, 3-wire (Tx, Rx and Gnd) between the Sonar head and the PC / Laptop RS232 COM Port. This may be via an RS232 Modem or Multiplexer.
- The RS485 telemetry is Half-duplex, 2-wire (RS485+ & RS485-) between the Sonar head and surface RS485 connection. Typically, the surface RS485 connection can be an RS485 serial COM Port installed in the PC or it can be an "RS485 to RS232" signal converter that is attached to the PC / Laptop's standard RS232 COM Port.  
The RS485 circuit inside the head has a factory supplied 150 ohm termination fitted, a matching 150 ohms may be fitted to the surface if the twisted pair length dictates.

By the above methods, the Sonar Head should be connected through to an available Serial COM Port on the PC / Laptop installed with the SeaSprite Sonar software.

## Third Party Communication Devices

### RS485 to RS232 converter

If a SeaSprite system is supplied configured RS485 it may be necessary to use an RS232 to RS485 converter to allow interface with a standard PC com port, as stated above.

- The converter must be capable of Half-duplex operation and able to support speeds of at least 115,200 baud.
- It is not recommended to use a unit, which is powered from the PC com port as this can reduce the maximum length of twisted pair, which the system will operate through.
- It is advised that the RS485 circuitry on the converter is optically isolated to protect both the PC and the converter from high voltages, which may become present in a fault condition on an ROV umbilical.

### NOTES WHEN USING "ADAM 4520" RS232 TO RS485 CONVERTER

Trittech International recommends the use of the above converter. This device can be purchased from Trittech International Ltd if required. Contact Trittech Technical Support for details.

The Device is externally powered with an input range of 10-30VDC, we recommend the use of 24 volts. Internal switches are used to set baud rate, their function is detailed on the external case of the unit. ***It is imperative that the internal switch is set to match the system baud rate between the head and the PC.***

### Electrical connection

Whilst wiring up and connecting the converter, adhere to the following;

- RS485+ connects to Pin 1 of the SeaSprite Sonar head.
- RS485- connects to Pin 2 of the SeaSprite Sonar head.

### NOTES WHEN USING "B&B ELECTRONICS 485OT9L OR 485OTLED" RS232 TO RS485 CONVERTER

This is a commonly used RS232 to RS485 interface that provides optical-isolation between the ports. The Device is externally powered with an input range of 10-30VDC, we recommend the use of 24 volts.

The internal switches and jumpers are used to select the baud rate and communications mode.

***It is imperative that the internal switches are set to match the system baud rate between the head and the PC. Consult the interface documentation on the switch settings.***

#### ***JP1 should be set to "SD" for the Half-Duplex control method***

For half duplex, RS485 operation at 115.2KBaud, we recommend the following set-up;

- Switches 1 to 4 off,
- Switches 5 to 8 on
- JP1 set to "SD"
- R21 fitted as 4.7K $\Omega$ .

### Electrical connection

Whilst wiring up and connecting the converter, adhere to the following;

- TB1 Pin 2 (Labelled "TDB+") is RS485+ and connects to Pin 1 of the SeaSprite Sonar head.
- TB1 Pin 1 (Labelled "TDA-") is RS485- and connects to Pin 2 of the SeaSprite Sonar head.

### NOTES WHEN USING USB TO RS232 COM PORT ADAPTERS

It is common for new laptops to be supplied without standard COM port hardware.

In this instance a USB to Serial adapter may be used to obtain a "virtual" COM port on such machines.

There are many different types of this adapter available on the market, however ***note the following prior to purchase...***

Because of the requirement to support half duplex operation, the timeout on the data link is critical.

This means that no delays can be introduced between the PC and the Head, and the strings sent must arrive complete.

Certain USB adapters buffer the data, which means the SeaSprite Sonar strings get broken up when passing through such adapters. When this is the case the following symptoms are common...

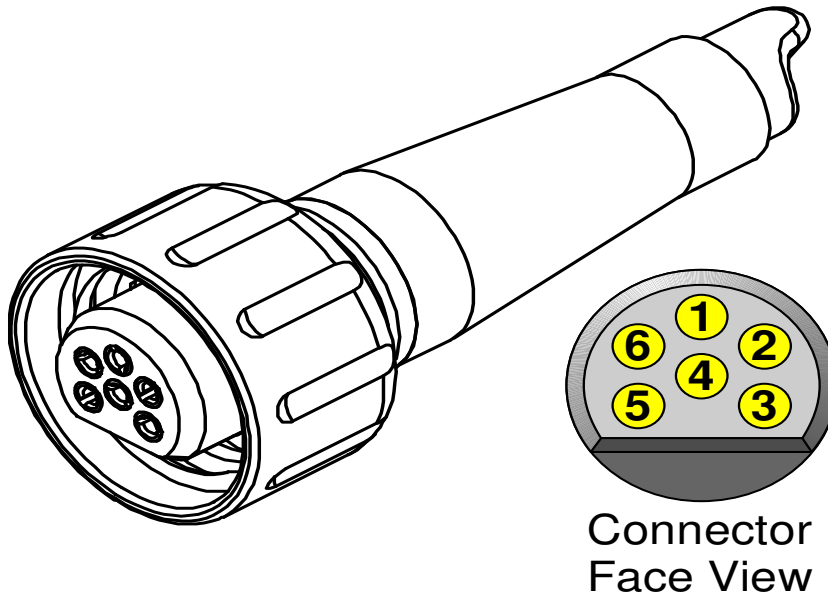
The Sonar head (Node2) can be detected in the "SeaSprite Setup" program, but when running the "SeaSprite Sonar" program the Sonar head is intermittent or does not scan.

If problems are experienced with the USB adapters, try first to load the system on a PC with a normal COM port to confirm that the Sonar head (and, if applicable, RS485 converter) are operational.

A proven USB serial adapter device can be purchased from Tritech International Ltd if required, contact Tritech Technical Support for details.

### System Interconnect Cabling

The Standard Underwater Connector supplied is a Trittech 6-way connector, the wiring code is shown below including pin-outs for RS232/RS485 and power connections.



Pin Number	Cable Whip Colour	Wire Function
1	Yellow	RS485 Comms A or RS232 Comms TX
2	Blue	RS485 Comms B or RS232 Comms RX
3	Red	Supply Positive Voltage
4	Black	Supply Ground
5	Green	RS232 Comms Ground or Analogue Output (where applicable)
6	Drain Wire with Black 'Heat-shrink' Insulation	Earth



**Please Note:** Connectors should only be applied to the Sonar when the power supply is turned off. Before turning on the power supply, ensure the EARTH line is not connected to a positive potential (re Pin 4), as erosion damage to the housing may occur.



**Please Note:** The SeaSprite series connector is NOT wet-mateable, and although limited electrical protection circuitry is provided within the SeaSprite units, direct exposure to water, when the unit is powered may cause erosion damage to the connector pins, or internal fuses to blow that may only be replaced by the factory.

When either port is not in use, the blanking cap **MUST** be fitted!



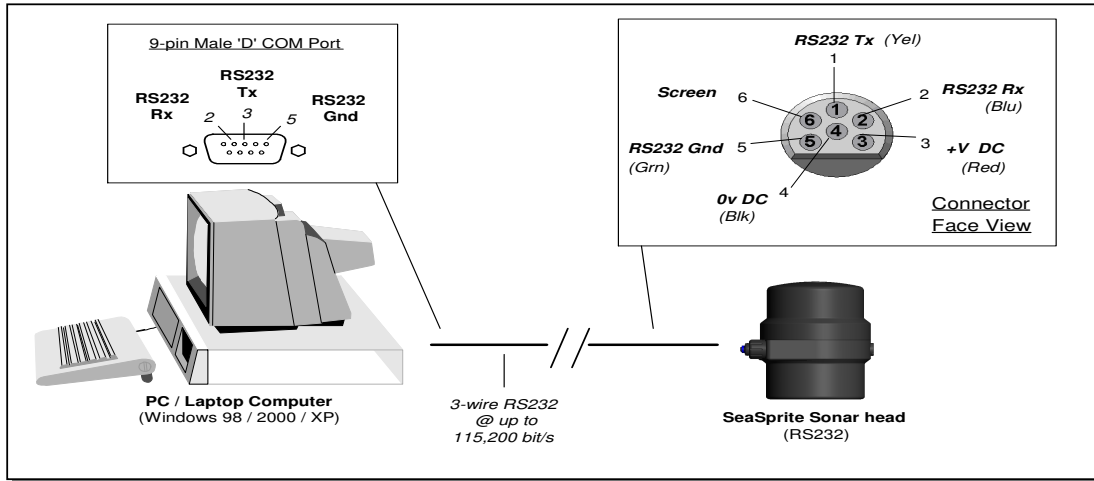
**Please Note:** The connector wiring information can be applied to both the "Main" or "Aux" communication ports. However, the function of pins 1, 2 and 5 depends on the capabilities, configuration and port of the device connected to.



**Please Note:** The sonar head is protected against voltage surges on the power and comms. Lines using internal suppressers. Sustained over voltage will damage the head. To reduce risk it is strongly recommended that 100mA fuses be used in the comms. Lines and an appropriate fuse used in the power supply (e.g. [1A@12V](#) or 500mA@24V)

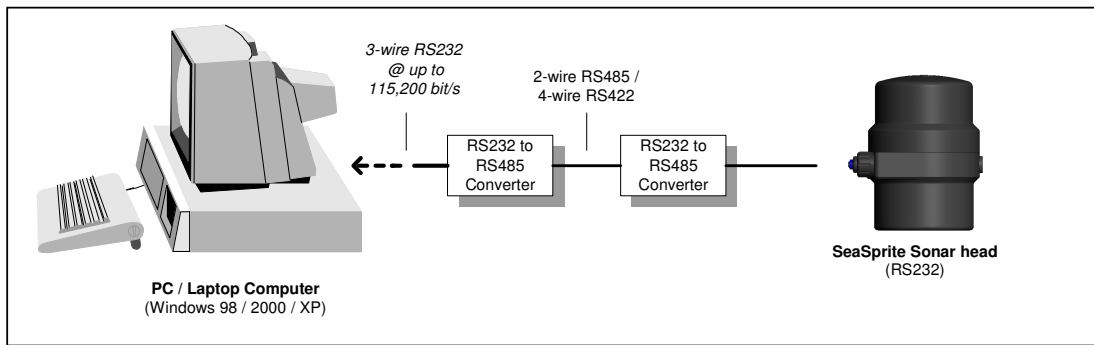
### A. RS232 SeaSprite Sonar ("Main" Port):

Communications between the SeaSprite Sonar "Main" port and the PC serial port is 3-wire RS232. Configuration is as follows;

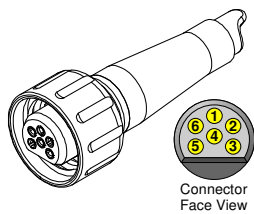


Depending on the type of conductors used, the RS232 may only drive up to 20 metres of copper cabling. For longer cable lengths it is necessary to run through a repeater or converter, or switch to optical fibre with an RS232 telemetry option.

A method to operate the (RS232) SeaSprite Sonar head over longer cable lengths would require a pair of RS232 to RS485 converters installed surface and subsea;



**NB: Select converters with an optically isolated RS485 interface, to protect the PC serial port.**

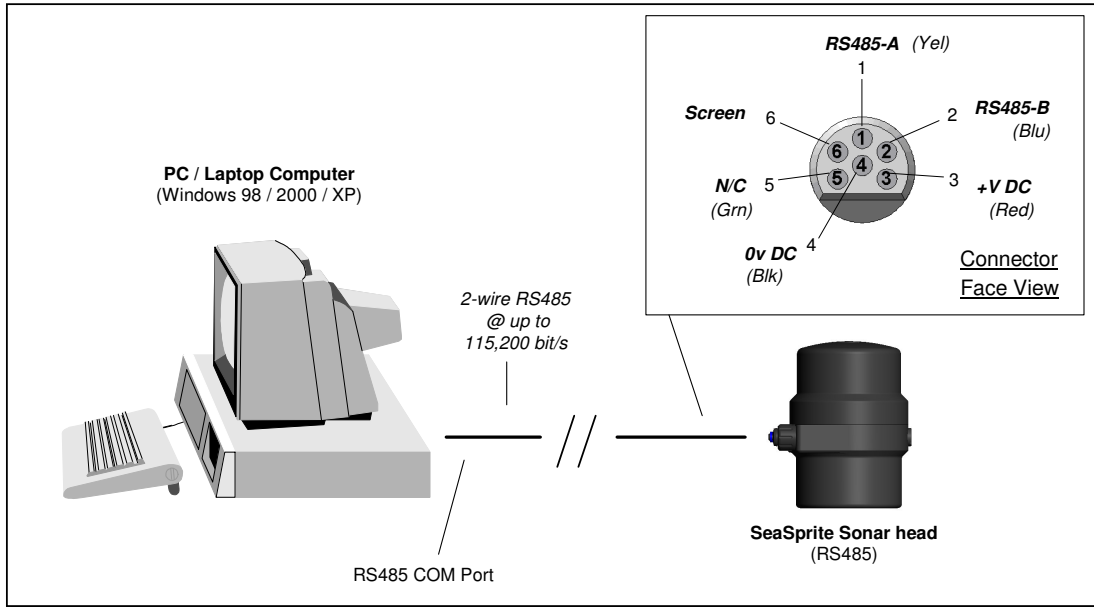


#### SUMMARY

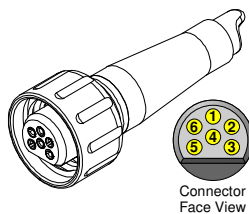
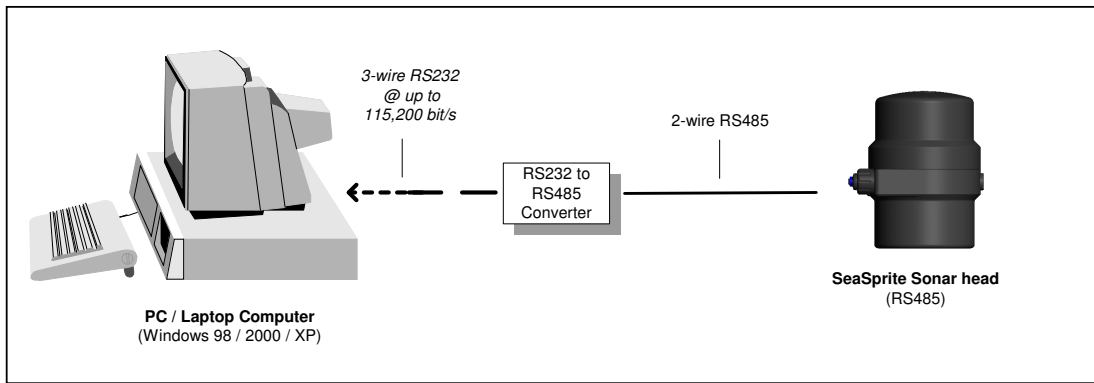
- **Pin 1** on the Sonar 6-pin "Main" connector port is the RS232 Tx that should be connected to the RS232 Rx on the PC serial port.
- **Pin 2** on the Sonar 6-pin "Main" connector port is the RS232 Rx that should be connected to the RS232 Tx on the PC serial port.
- **Pin 5** on the Sonar 6-pin "Main" connector port is the RS232 Gnd. This should be connected to the RS232 Common Gnd on the PC serial port.

**B. RS485 SeaSprite Sonar ("Main" Port):**

For the RS485 telemetry option, this can run directly over a twisted pair cable of typical length up to as much as 1km. The first option would be to run the telemetry straight into the PC but for this an RS485 Serial Comms card would need to be fitted inside the PC;



Alternatively, the RS485 SeaSprite Sonar can be connected to the PC RS232 Port via an RS485 to RS232 external converter;



**SUMMARY**

- **Pin 1** on the Sonar 6-pin "Main" connector port is the RS485 + that should be connected to the RS485 + on the PC RS485 serial port or signal converter box.
- **Pin 2** on the Sonar 6-pin "Main" connector port is the RS485 - that should be connected to the RS485 - on the PC RS485 serial port or signal converter box.

## Further Information

### General

- The SeaSprite Sonar head is an oil-filled product and under NO circumstance should it be opened up or tampered with in any way. There are no user-serviceable parts or internal switches that would necessitate disassembly.
- The 'Seal Screw' should never be unscrewed as this may result in oil loss. The yellow diaphragm on the top of the Sonar head is to allow for volume changes in the oil at different operating temperatures. This diaphragm should never be poked or stabbed with sharp instruments.
- The Sonar may be lowered to depths of NO MORE than 750 metres.

### Connector

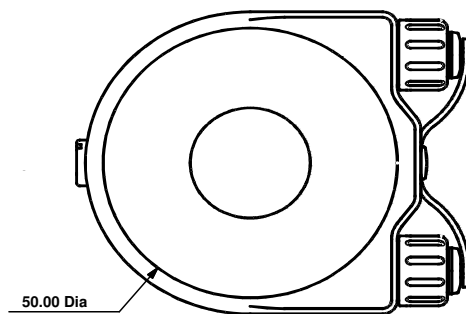
- The connector socket is not usable "open face" and should always be sealed with either a plug or the blanking-plug provided.
- The 'AUX' Port should be blanked off at all times when not in use.
- Care should be taken when mating the connector, with either a plug or a blanking-plug, to ensure both mating ends are clean and dry.
- Special attention should be given to checking the O'ring for dirt. The O'ring is located under the lock-ring on both the plug and the blanking plug.
- When mating the connector, first locate the plug on its 'D' profile, push together as far as possible and then tighten the lock-ring. The action of tightening the lock-ring draws the two mating ends fully together.
- The connector lock-ring needs only to be finger tight. The use of any tools to tighten the lock-ring further is not necessary and could result in damage to the connector.

### Telemetry

- The SeaSprite Sonar head should be programmed to communicate at a default Baud Rate of 115,200 @ 8 Data, No Parity, 1 Stop. This can be re-configured through the Setup program (*consult Appendix A*).
- It is recommended that a Baud Rate of 57,600 or above be maintained wherever possible to provide enough system bandwidth to operate the Sonar at its maximum resolution.
- For the RS232 telemetry option, if a direct RS232 cable is to be used then this will have a limit of typically 10 to 15 metres in length. Otherwise, a modem with fibre optic interface should be used to increase telemetry distances.
- To prevent damage to the PC / Laptop it is best to use an RS232 / RS485 Serial Port (or Signal Converter) that has optically isolated inputs for protection.

### Mechanical Mounting

The SeaSprite may be gently gripped by a 50mm diameter clamping mechanism around the bottom part of its housing.



Dimensions are in millimetres.

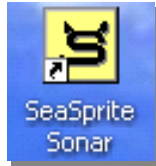


**Specification**

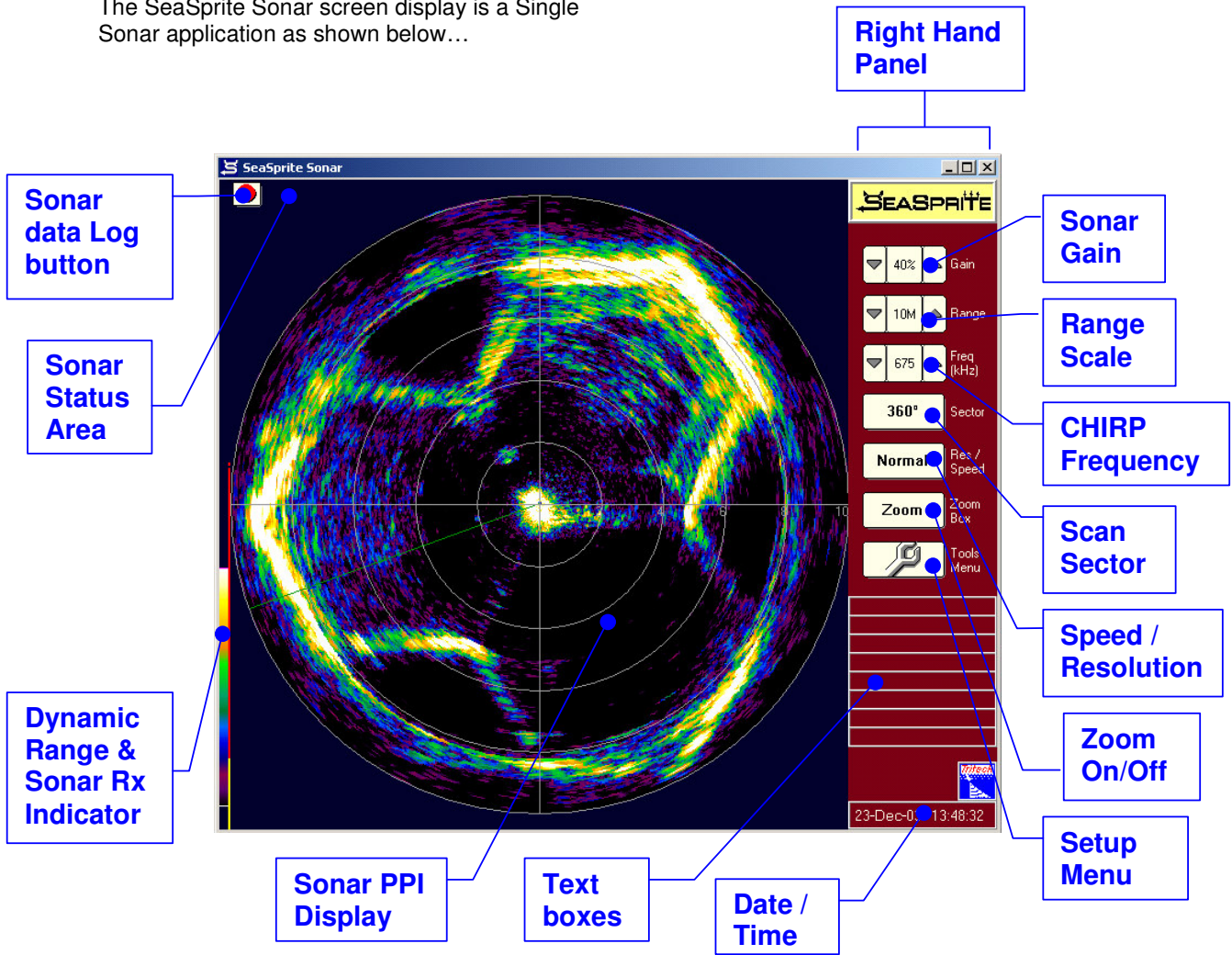
<b>Operating Frequency</b>	Chirp: Centre frequency of 700 KHz
<b>Beam width, vertical</b>	30°
<b>Beam width, horizontal</b>	3°
<b>Range Settings</b>	From 5m (6.5ft) to 100m (320ft)
<b>Scan Sectors</b>	User selectable up to 360° continuous
<b>Step Speed</b>	Hi-Res, Normal and Highspeed
<b>True Acoustic Zoom</b>	Yes
<b>Instant Reversal</b>	Yes
<b>Image Measurement</b>	Yes
<b>Inverted Head Operation</b>	Yes
<b>Power Requirements</b>	9V - 50V @ 2.2VA DC
<b>Data Communication</b>	RS485 (twisted pair), RS232 (via modem up to 115Kbps)
<b>Communication Requirements</b>	Maximum cable length 1000 meters (using RS485)
<b>Topside Control</b>	Customer supplied PC or Laptop using standard serial comms port. Windows 98, 2000 or XP operating system.
<b>Software</b>	Tritech SeaNet(OEM) display
<b>Maximum diameter</b>	56mm (2.20 inches)
<b>Maximum height</b>	74.5mm (2.93 inches)
<b>Weight in air</b>	290g (0.64 ounces)
<b>Weight in water</b>	145g (0.92 ounces)
<b>Operational Depth</b>	Deep rated 3000m (9,840ft): 750m (2,460ft) standard
<b>Operating Temperature</b>	-10 °C to +35 °C
<b>Storage Temperature</b>	-20 °C to +50 °C

### SEASPRITE SONAR APPLICATION

The **SeaSprite Sonar** application can be run from the 'Programs' group in the Windows 'Start' menu or from the desktop by double clicking on the shortcut icon as shown below...



The SeaSprite Sonar screen display is a Single Sonar application as shown below...



### MAIN FUNCTION BUTTONS

There are 7 buttons / controls on the right hand panel of the screen display. These are used to configure the Sonar and to set-up the screen layout;

#### **‘Setup Menu’ button**

When this button is clicked a Popup menu will appear where the Sonar and display settings can be configured via a number of menu items. These will be explained later.

#### **‘Sonar Gain’ button**

This sets the sonar receive gain (0 – 100%) as required – typically this is around 20% but is varied according to water and target conditions and user preference.

#### **‘Range Scale’ button**

This sets the maximum range (5m – 100m) the sonar will scan. Long ranges are scanned more slowly than short ranges due to the limit imposed by the velocity of sound in water.

#### **‘Transmit Frequency’ button**

This is set at the CHIRP Sonar transmit pulse frequency of 700KHz

#### **‘Scan Sector’ button**

This sets the width of the scanned sector. Typically this will be adjusted according to the required seabed coverage. There are several sector settings including 360°, 180°, 135° and 90°.

#### **‘Speed / Resolution’ button**

This button will toggle through 3 preset settings, which will vary the Sonar scan speed and image detail. Use the ‘Normal’ settings in most cases, which will produce the best resolution. However, toggle to ‘Fast’ or ‘Very Fast’ settings if a higher scan speed is required. In normal operations, select ‘Normal’ for detailed examination of static targets where a slower scan update will not pose a problem. Select ‘Fast’ if a fast scan update is required at the cost of a little image detail. The ‘Very Fast’ setting will produce the lowest resolution and image quality but will produce the fastest scanning.

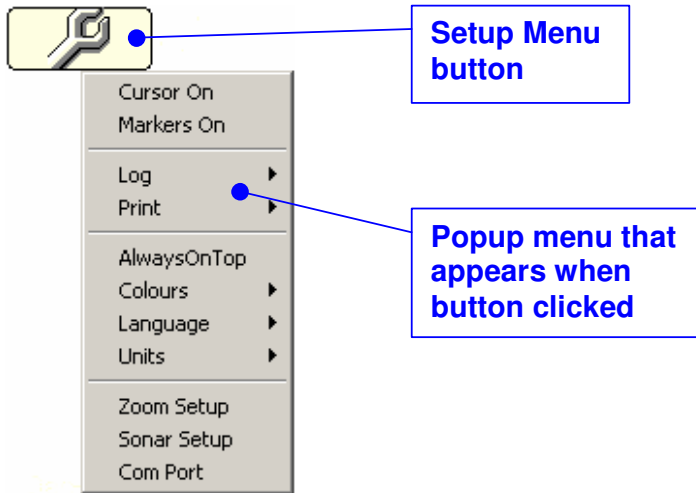
#### **‘Zoom On/Off’ button**

Toggles a zoom box on the display, which can then be positioned by the cursor. This is a true acoustic zoom magnifier that will give more image detail in the area surrounded by the zoom box. The Zoom window size and magnification can be adjusted in the ‘Setup Menu’.

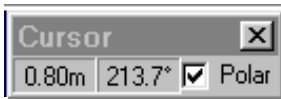
#### **‘Dynamic Range’ / Contrast slider**

This is on the left hand side of the Sonar display and sets the contrast between hard and soft targets. Usually set to user preference, it can help find small features in generally featureless situation or exclude clutter from a heavily featured seabed. More details concerning the usage of this control can be found in later pages of this manual.

**SETUP MENU**

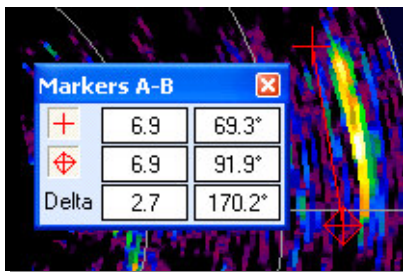


**Cursor On** – Adds the cursor position panel to the sonar display.



**'Polar'** – Check on to display co-ordinates in Polar or off to display co-ordinates in Cartesian format.

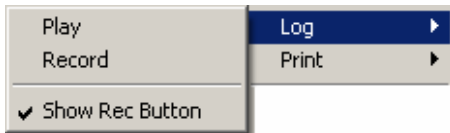
**Markers On** – Adds A (+) and B (⊕) markers under left button control. The range and bearing to each marker & separation and relative bearing are shown.



Select A or B marker icon on the 'Markers A-B' panel and that Marker will be dropped at the Origin (0,0) on the Sonar display. Then, pick up the Marker using the Left mouse button and drag it over the Sonar display.


When both Markers are dropped on the Sonar display, a line will be drawn which connects them.

**Log...**

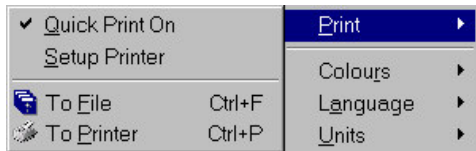


... **Play** – Use to play back recorded log data.  
Follow the on screen display.

... **Record** – Use to record Sonar data.  
Follow the on screen display.

... **Show Rec Button** – Display the Log button (  ) on Sonar display top-left.

**Print...**



... **Quick Print On** – This has 2 effects;

When printing 'To File' then a bitmap will be saved to the Log directory with bitmap name having time format.

When printing 'To Printer' then Print Setup dialog box will not appear and default printer and it's settings are chosen.

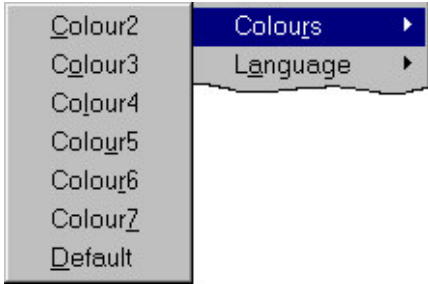
... **Setup Printer** – Select and set-up the Windows Printer.

... **To File** – Print screen to a bitmap file. When 'Quick Print On' = Off, a dialog box will appear allowing the user to select file path (Log directory) and bitmap name.

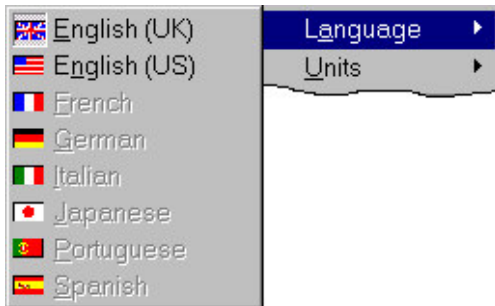
... **To Printer** – Print to Windows Printer. When 'Quick Print On' = Off, a set-up dialog will appear allowing the user to select printer and set it's options before printing.

**AlwaysOnTop** – Select this function to bring the SeaSprite display to the front of the Windows desktop. This will place the Sonar display On Top of other open applications.

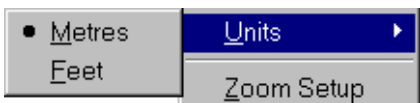
**Colours** – Use to select from several preset colour schemes for the Sonar display.



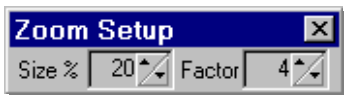
**Language** – Select from several international languages. Currently only UK and US English are available.



**Units** – Select the units for the Sonar Range labelling and cursor co-ordinates. Metres and Feet are the available options.



**Zoom Setup** – Sets the size and magnification factor of zoom box.

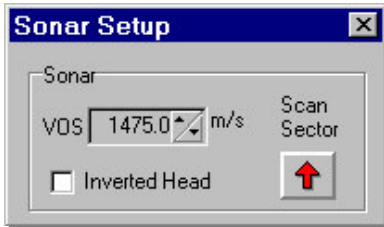


The **Size** shows the normal display screen zoomed area as a percentage of the zoom display window.

The **Factor** shows the number of zoomed range bins\* for each normal range bin.

\*A 'Bin' is a binary range sample taken over the current Sonar scan-line. The more 'Bins' that are sampled over the scan-line then the better the Sonar Range Resolution. In the Zoom box, the Factor will set a multiplier for the number of Bins in the Zoomed area that is above the number sampled in the main Sonar display area. For instance if there were 10 Bins taken over 1m (Bin sampling period = 0.1m) in the main Sonar display area, then a Factor of 4 would set 40 Bins to be sampled per 1m in the Zoom area. The result is an increase in Range Resolution by a factor of 4 within the Zoom area.

**Sonar Setup** – Sets various head options.



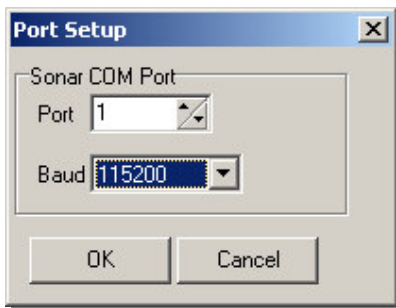
**'VOS'** – used to enter a **V**elocity **O**f **S**ound value that will be applied in the Sonar display.

**'Inverted Head'** - swaps the display from left to right. Enable if mounted boot up.

**'Scan Sector'** – Use this control to select the scanning sector

when the display is in a 180 degree sector view. There are 4 sectors indicated by the arrow position; Up = forward, Right = Starboard, Left = Port, Down = Aft.

**Com Port** – Select and configure the COM port that the SeaSprite Sonar will be connected to on the PC/Laptop.



**'Port'** – select the COM Port number that the Sonar head is connected to.

**'Baud'** – Set the COM Port baud rate to match the setting of the SeaSprite Sonar head. The default factory setting for Sonar is 115,200 baud.

**OTHER CONTROLS :-**

**Sonar Log Button**

This has 3-states;



**Grey:** The button is disabled whenever the Sonar is not connected, or telemetry with the Sonar has not yet been established, or during Log playback.



**Red:** The Sonar is active and scanning. The button is now active and can be de-pressed to Log the Sonar data.

**Flashing Red/Grey:** The Sonar data is currently being logged. Click on the Log button to stop the logging.

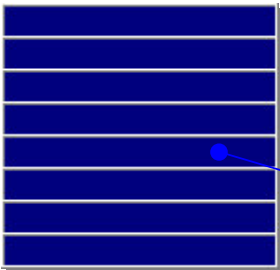
**Instant Scan Reversal**

Double click on the icon at the top of the Right-hand panel to instantly reverse the scan direction of the Sonar. The default icon is the SeaSprite logo...



Double-click to switch the Sonar scan direction

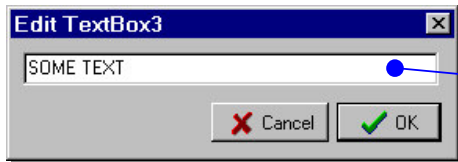
**Text Entry Boxes**



There are 8 Text Entry boxes which each can display 17 text characters (includes spaces). These can be used for displaying job information or company contact details.

Double-click to enter text

To write some text into the boxes, double-click on a box to open the Textbox Editor and then type some text using a keyboard.



TextBox Editor

**Date / Time display**



Displays the PC System Clock Date and Time. This can be adjusted in Windows.

**Right-Hand Panel Minimise**

Double click on the Right-Hand Panel background to minimise the panel and bring the Sonar display up to full screen.

When minimised, the panel will appear as an 'ellipsis' button (⋮) on the bottom right of the screen. Click on this button to maximise the panel once more in order to review and change Sonar settings.

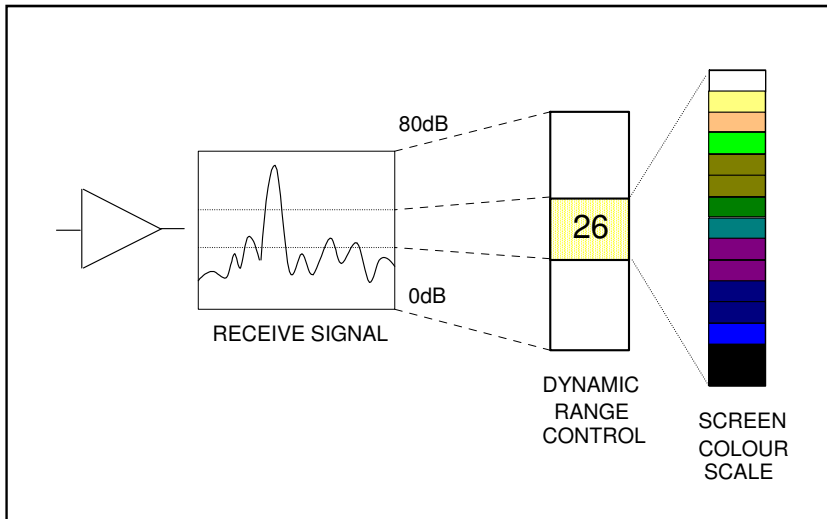
### Dynamic Range and Sonar Rx Indicator

The dynamic range bar is the A/D sample window (with 64-colour mapping) for the Sonar receive signal (which extends from 0 to 80dB). To the right of the dynamic range bar is the Sonar receive signal strength indicator (Yellow = Average amplitude over scan-line, Red = Maximum amplitude echo for scan-line).

Normally the sampling window should not need to be adjusted from its default position (as shown on the left). However, if used properly, adjusting the sample window can produce better quality imaging.

The dynamic range bar can be adjusted to change Sonar display contrast and sensitivity. Adjustment is made using the left and right mouse buttons.

- 1) **Contrast** adjustment – **Right-click** on the bar and whilst **holding** down the right button, move the mouse up/down to increase/decrease the size of the bar. The sampling window can be any size between a range of 9 - 25dB. Decrease the size of the sampling window to increase the sonar display contrast. Ideally the control should be set somewhere in the centre of the allowed range (16 - 18 dB) to give the best results under most conditions. Select a high value to reduce the contrast of the sonar display.
- 2) **Sensitivity** adjustment – **Left-click** on the bar and whilst **holding** down the left button, move the mouse up/down to decrease/increase the Sensitivity of the Sonar receiver. Increasing the Sensitivity (move bar down) will produce a more saturated display with greater weak-return content. Decreasing the Sensitivity (move bar up) will omit background noise and low level returns seen at the receiver



The sonar receiver will accept a return signal in the region of 0 - 80dB. The dynamic range controls are used to adjust the position of a sampling window within the 0-80dB dynamic range band of the receive signal.

*- Idealised representation of A/D Sample window*

### CHIRP TECHNOLOGY

In monotonic (single frequency burst) sonars, the range resolution is determined by the length of the transmitted pulse. The smaller the pulse is, the greater the resolution achievable and vice-versa.

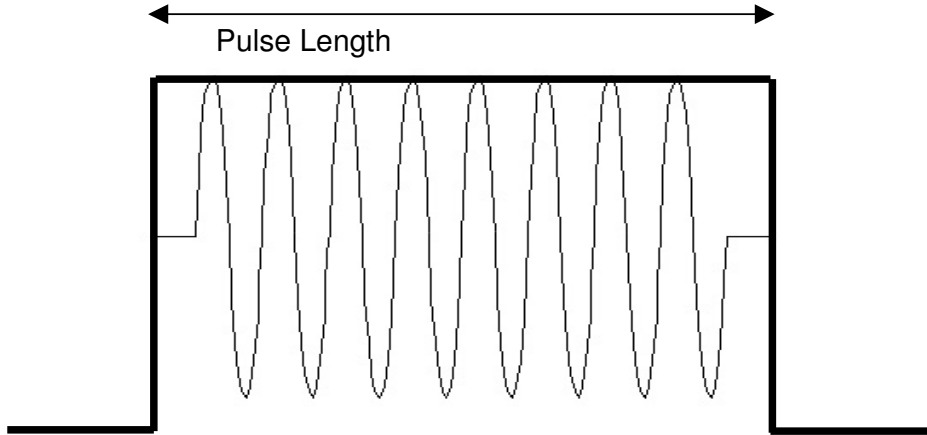


Figure 1

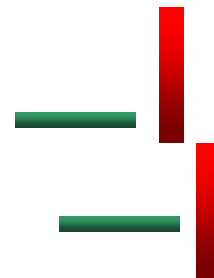
#### Example 1 Monotonic Sonar

Single frequency acoustic pulse



Tx Pulse →

Two simulated targets



← Rx Pulse's

Net effect.....



In this example the two targets are interpreted as a single large target by the sonar.

By introducing CHIRP technology the range resolution can be improved by ‘sweeping’ the pulse using a start and stop frequency. Now the range resolution of the system is proportional to the bandwidth (difference between the start and stop frequencies). Using this technique creates a unique pulse signature that dramatically improves range resolution. Theoretically an improvement by a factor of 5 over typical monotonic systems is possible, more noticeable at shorter ranges.

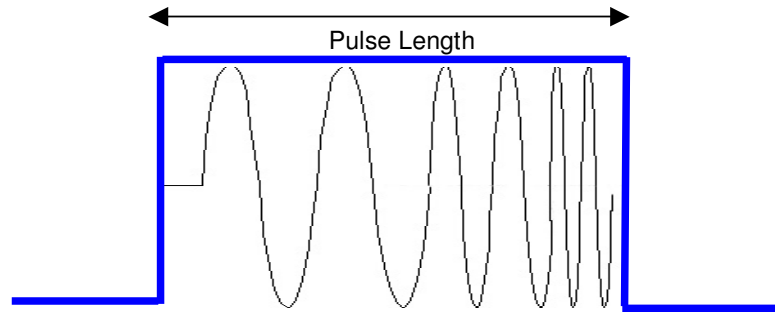


Figure 2

F1 (Start frequency)

F2 (Stop frequency)

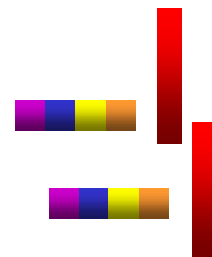
### Example 2 CHIRP DST Sonar

The CHIRP pulse is represented pictorially by 4 colours to demonstrate the concept; in reality, there are an infinite number of frequencies available.

CHIRP pulse



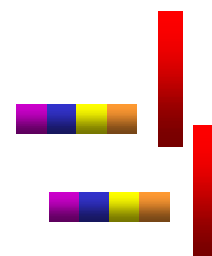
Two simulated targets



Tx Pulse →

← Rx Pulse's target's

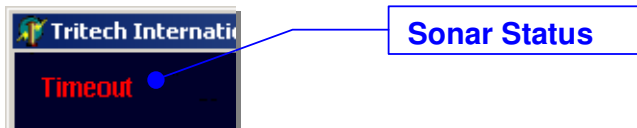
Net effect.....



In this example the unique signature of the CHIRP pulse signature allows two separate targets to be interpreted by the sonar

## Sonar Status

Various error codes are reported in the Sonar Status Area. These help the user determine any faults with equipment or cabling, as a guide to making any corrections or replacements.



Status Codes are as follows...

'Centre'	:	The transducer is not passing through the Ahead position at the correct sequence point. Physical damage internal to the Boot is the most likely cause of this.
'Timeout' /	:	There is no communication with the Sonar head. Check that the cable wiring is okay, that the Sonar is powered and the correct COM Port and baud rate are configured in the Tools Menu.
'Log xxx k'	:	This is displayed when the log record facility is ON and shows the current size of log file.
'Play xxx'	:	This is displayed when the log play facility is ON and shows the current record number within the log file for reference.

## Customising the Icons

The icons are displayed on the top and bottom of the Right-hand Panel display and can be edited to include customer's own logo or other icons. The default icons are...



There is a choice of replacing either of the 2 default icons, which have been stored in the SeaSprite software's working/install directory.

The working/install directory will have been selected during the software installation and as default will be **C:\Program Files\SeaSprite\**.

The 2 default icons are named; '**ICON1.JPG**' (SeaSprite Logo) and '**ICON2.ICO**' (Tritech Logo).

It is possible to replace the **ICON1.JPG** with a single Jpeg or Bitmap image. To do this, first delete the existing **ICON1.JPG** and place in the directory either a Jpeg (**ICON1.JPG**) or Bitmap (**ICON1.BMP**) image. There is no limit to the number of colours used in these images but the maximum size must be kept within **128x50** pixels.

Also, the **ICON2.ICO** file can be replaced by creating a **32x32 icon** of the same name and replacing the default copy that is in the working/install directory.

Additionally, any of the 2 icons can be deleted from the directory, which will exclude them from the display.

*Note: if, within the working/install directory, there are 2 images of name "Icon1.Bmp" and "Icon1.Jpg" then (with priority) only one will be loaded onto the desktop; Jpeg is first and then Bitmap.*

### MAINTENANCE

#### Head maintenance

Wash down with fresh water each time a unit is recovered from the water, paying particular attention to the boot and connector areas.

Although units are designed for a wide temperature range it is best to avoid temperature extremes for long periods and protect units from bright sunlight.

Repairs are by major unit change out which may involve reprogramming a head. In these cases instructions will be supplied.

It is recommended that usage logs are maintained and that the heads are returned to vendor at 4000-hour intervals for routine inspection/replacement of slip rings, compensation oil and O-ring seals

Underwater cables are not normally within the scope of supply, but will also require regular inspection.

#### Cables

The cables are high quality with low halogen jackets, which should provide long service life without problems. Care should be taken to ensure that they are properly sited during installation to avoid movement and fatigue, but otherwise no maintenance is required.

#### Computer

The PC / Laptop computer should be loaded with a standard version of Windows 98 / 2000 or XP. If for any reason it is necessary to reload the Sonar system this should be done using the CD supplied. Follow the set-up dialog during installation.

*The Sonar software can be reloaded as follows...*

- 1) Insert the Sonar CD into the CD ROM drive.
- 2) Browse the CD ROM drive and run Setup.exe from the root. Follow the on screen directions. This will automatically install the Sonar software to the Program Files directory on the C:\ drive.
- 3) The Registry retains any user-configured changes. When Setup.exe is run the registry will be set back to a factory default setting.
- 4) Shortcut(s) will automatically be created on the Windows Desktop to run the Sonar software and any utility programs that may have been supplied.

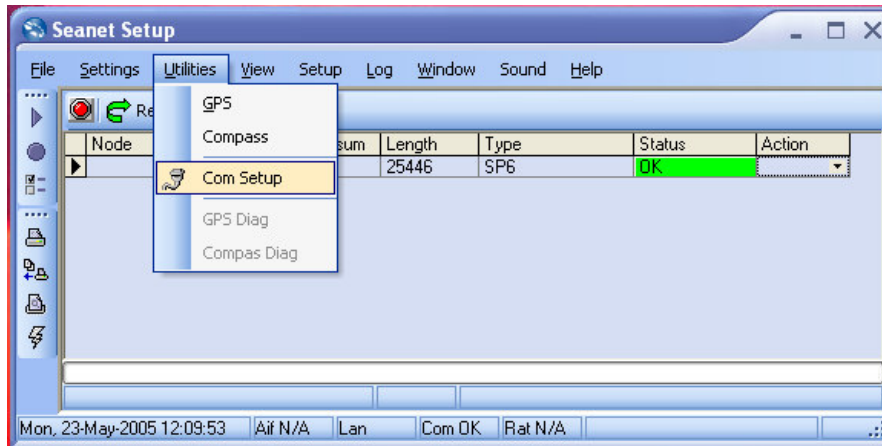
*To Remove the Sonar software, use "Settings\ControlPanel" from the Windows Start Menu...*

- 1) Run Add/Remove Programs and select SeaNet.
- 2) Follow the on screen directions and choose Uninstall from the options.
- 3) On completion all the above installation will be removed, including the Registry settings and Desktop Shortcuts
- 4) The Screen resolution should be set to maximum 1024x768 at either 16-bit or 32-bit colours. A resolution of 800 x 600 is optimal for display purposes.

## APPENDIX A : SEASPRITE SETUP PROGRAM

**Important:** The Setup program forms part of the SeaNet software suite, which includes control and display of other, multiple devices such as Sidescan, Profiler and Bathy. This Setup utility therefore includes options such as Sound, GPS, TCM-2 that are only available with other displays in the SeaNet suite and not intended for SeaSprite OEM software which is a Sonar only program.

### CHANGING SEASPRITE SONAR BAUD RATE



The system has been factory set and should not need to be altered in most circumstances. However, there may be times when the Baud rate may need to be changed to satisfy field requirements. These changes can be made from the **SeaSprite Setup** Program;

There are only 2 areas within the Setup program that will need to be entered for SeaSprite Sonar operation...

1. The '**Utilities**' – '**Com Setup**' menu item (shown above) is used to change the Settings of the Surface computer COM Port. This needs to be configured correctly to initially communicate with the SeaSprite Sonar so that new Baud Rate settings can then be downloaded to the Sonar head.
2. Clicking on '**Setup**' – '**Aif Card**' will open the 'Aif Setup' pop-up panel with settings for the Aif (Acoustic interface) card. In the case of the SeaSprite system, the Acoustic interface is via a COM port. Always ensure that the 'Enabled' check-box is checked / ticked to enable the COM port. This is only applicable for communicating with the SeaSprite Sonar through the Setup program and does not affect the main SeaSprite display program.

## Configuring New Baud Rates

This should only ever be necessary to communicate over a longer RS232 serial cable (>10metres), installed between the PC and the SeaSprite Sonar head (or signal converter) or over a modem system that can only handle lower rates. In this event, the Baud Rate should be kept as high as possible to give enough system bandwidth for the Sonar head to operate at full speed and resolution.

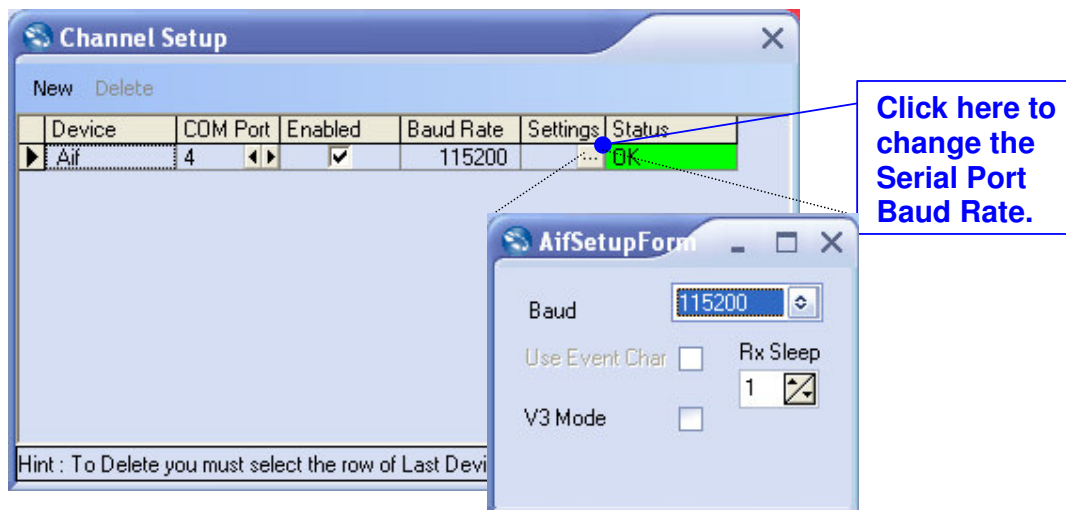
The first step is to communicate with the SeaSprite Sonar head, which involves setting the COM Port settings within the Setup program to match the SeaSprite head's Baud rate and COM port connection.

It may be necessary to use a short serial cable to first communicate with and re-program the SeaSprite Sonar head before it is then installed on the longer cable or modem system.

### First change the COM Port Baud Rate to match current Sonar settings...

**N.B.** The Setup program default will be COM1 @ 115.2K which matches the SeaSprite display software defaults.

- Click on the **Utilities** menu item and select **Com Setup** from the drop-down list.
- The **Channel Setup** panel will appear as follows. Click on the '**Settings**' ellipsis ('...') to open the **AifSetupForm** to change the **Baud** setting.



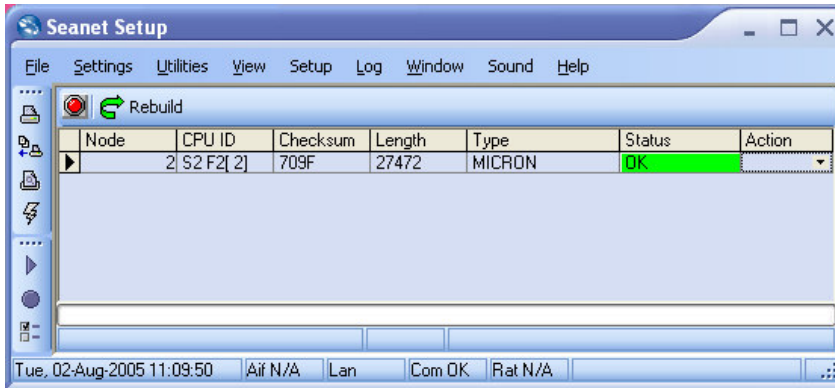
- Ensure that 'V3 Mode' is disabled, 'Use Event Char' is greyed out and disabled and 'Rx Sleep' = 1.
- Close the Form via the 'X' button for settings to be applied.

### Then, if necessary, change the PC's Serial COM Port

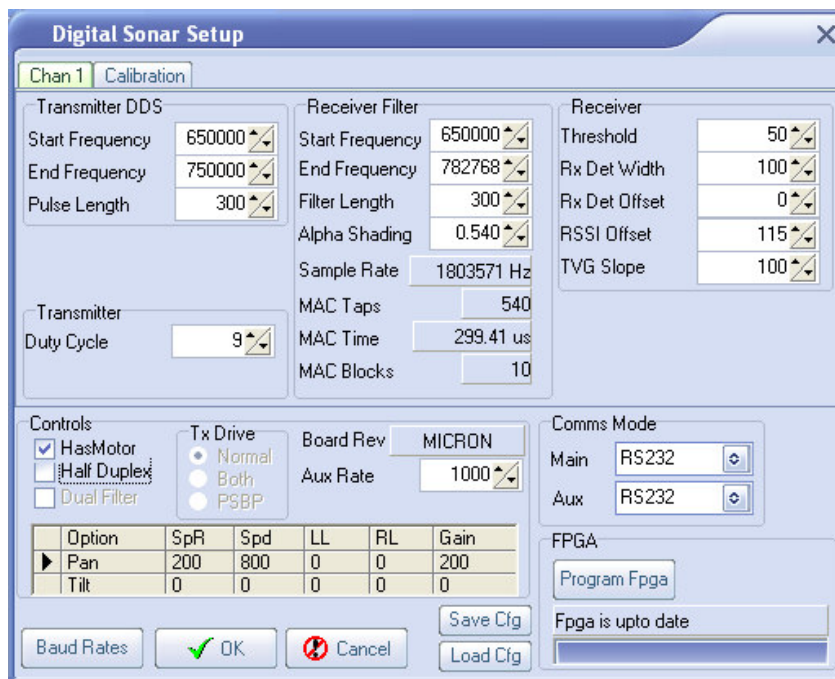
- In the **Channel Setup** panel (shown above), change the '**COM Port**' to match the SeaSprite port connection. Also ensure that the '**Enabled**' check-box is checked / ticked.
- Close down the Channel Setup by clicking on the 'X' button on the top-right. New settings will be saved and applied.

**To Program the new Serial Baud Rate into Sonar...**

- a) First ensure that the SeaSprite Sonar head (Node 2) is detected and displayed in the Setup program table...

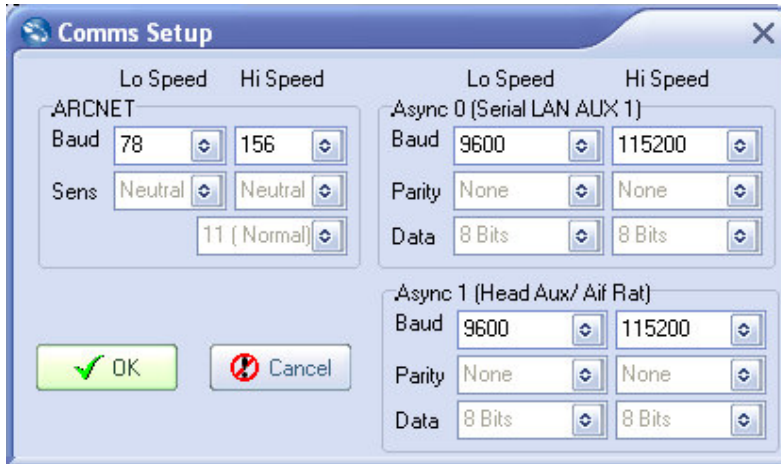


- b) Click on the **Action** column for Node 2 and then select **Setup**, as shown...



**NB: The settings for the Chirp Sonar are factory set and cannot be changed by the user. The Comms Mode is also factory set and should not be changed.**

- c) Then Click on the **Baud Rates** button in the next panel to open the **Comms Setup** panel...



- d) The **Async 0 (Serial LAN) -> Hi-Speed** column is the setting that needs to be altered. It will be at the factory default 115200 Baud setting. Change this to the desired Baud Rate then click **OK**.
- e) Then, **OK** the next panel and the new Baud Rate will be programmed into the SeaSprite Sonar. This will only take several seconds.
- f) Close the Setup Program and re-open the **Micron display software**. Change the Baud rate of the PC COM Port to match the new Micron sonar settings. This is performed in **Tools Menu – Com Port**.

**Additional Sonar Setup information.**

This screen displays the computed ADC calibration value along with a quality factor. This is factory set and this page is read only.

