Tritech International Limited

# SeaKing/SeaPrince Serial Comms Option

# Operators Manual

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# COPYRIGHT

## Handling of Electrostatic-Sensitive Devices

**Attention**

Observe Precautions for handling Electrostatic Devices

### Caution

### Handling of Electrostatic-Sensitive Devices

Certain semiconductor devices used in the equipment are liable to damage due to static voltages.

Observe the following precautions when handling these devices in their unterminated state, or sub-units containing these devices:

- Persons removing sub-units from any equipment using electrostatic sensitive devices must be earthed by a wrist strap via a 1MΩ resistor to a suitable discharge reference point within the equipment.
- Soldering irons used during any repairs must be low voltage types with earthed tips and isolated from the Mains voltage by a double insulated transformer. Care should be taken soldering any point that may have a charge stored.
- Outer clothing worn must be unable to generate static charges.
- Printed Circuit Boards (PCBs) fitted with electrostatic sensitive devices must be stored and transported in appropriate anti-static bags/containers.

F110.0

# Warranty Statement

**Tritech International Limited** herein after referred to as **TIL**

TIL 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.

The unit/system warranty commences immediately from the date of customer acceptance and runs for a period of 365 days. Customer acceptance will always be deemed to have occurred within 72 hours of delivery.

**Note:** Any customer acceptance testing (if applicable) must be performed at either TIL premises or at one of their approved distributors unless mutually agreed in writing prior to despatch.

**Conditions:**

**These include, but are not limited to, the following:**

1 The warranty is only deemed to be valid if the equipment was sold through TIL or one of its approved distributors.

2 The equipment must have been installed and commissioned in strict accordance with approved technical standards and specifications and for the purpose that the system was designed.

3 The warranty is not transferable, except or as applies to Purchaser first then to client.

4 TIL must be notified immediately (in writing) of any suspected defect and if advised by TIL, the equipment subject to the defect shall be returned by the customer to TIL, via a suitable mode of transportation and shall be freight paid.

5 The warranty does not apply to defects that have been caused by failure to follow the recommended installation or maintenance procedures. Or defects resulting from normal wear & tear, incorrect operation, fire, water ingress, lightning damage or fluctuations in vehicles supply voltages, or from any other circumstances that may arise after delivery that is outwith the control of TIL.
(**Note:** The warranty does not apply in the event where a defect has been caused by isolation incompatibilities.)

6 The warranty does not cover the transportation of personnel and per diem allowances relating to any repair or replacement.

7 The warranty does not cover any direct, indirect, punitive, special consequential damages or any damages whatsoever arising out of or connected with misuse of this product.

8 Any equipment or parts returned under warranty provisions will be returned to the customer freight prepaid by TIL

9 The warranty shall become invalid if the customer attempts to repair or modify the equipment without appropriate written authority being first received from TIL.

10 TIL retains the sole right to accept or reject any warranty claim.

11 Each product is carefully examined and checked before it is shipped. It should therefore be visually and operationally checked as soon as it is received. If it is damaged in anyway, a claim should be filed with the courier and TIL notified of the damage.

**Note: TIL reserve the right to change specifications at any time without notice and without any obligation to incorporate new features in instruments previously sold.**

**Note: If the instrument is not covered by warranty, or if it is determined that the fault is caused by misuse, repair will be billed to the customer, and an estimate submitted for customer approval before the commencement of repairs.**

F167.1

## Safety Statements


Throughout the manual certain safety or operational related comments and requirements will be highlighted to the operator by indications identified by the adjacent symbol and text.

## Technical Support

**Contact your local agent or Tritech International Ltd**


| | | |
|---|---|---|
|  | Mail | ***Tritech International Ltd.***<br>Peregrine Road,<br>Westhill Business Park,<br>Westhill, Aberdeen,<br>AB32 6JL, UK |
|  | Telephone | ++44 (0)1224 744111 |
| | Fax | ++44 (0)1224 741771 |
|  | Email | support@tritech.co.uk |
| | Web | www.tritech.co.uk |


**An out-of-hours emergency number is available by calling the above telephone number**

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 )
- Fault Description
- Any remedial action implemented

Due to the expansion of equipment capabilities and the fact that new sub-modules are continually being introduced, this manual cannot detail every aspect of the operation.

# INTRODUCTION

SeaKing systems communicate using an ARCNET LAN protocol @ 156.2kbit/s standard. RS232 is an available alternative to ARCNET and can be used with SINGLE head sensor systems. This RS232 is not multi-drop and therefore cannot be used for SeaKing systems comprising multiple heads.

Only later releases of the 'SONV3' SeaKing software have the inclusion of RS232 control for the full suite of SeaKing Sensors:


**SOFTWARE COMPATIBILITY**

**'SONV3' V1.26 -> 1.40**
RS232 software control is only available for Imaging or Sidescan Sonars (Node 2) and NOT Profiler (Node 20/21) or Bathy (Node 40).

**'SONV3' V1.47 ->**
RS232 software control is available for Imaging Sonar, Sidescan Sonar, Single Head Profiler and Bathy.

***Note:*** *V1.41 -> V1.46 were special releases.*

If the system is currently configured for ARCNET communications, changes must be made at software and hardware level to enable the RS232 communications option. Software changes are made in the 'V3SETUP' utility program to both AIF card (Node 255) and Sensor head. Hardware changes involve jumper re-configuration on the COMxVx pcb fitted in the SeaKing Sensor head (see sub-section 4 if the Sensor is a SeaPrince Sonar/Profiler model and not SeaKing).

The following sections will step the user through configuring a SeaKing system from ARCNET to RS232 and vice-versa. If the special split comms option (serial 9600 downlink / 57600 uplink) is to be used, consult the later section of this manual which gives details of software setup for this.

# 1. CONFIGURING A SEAKING SCU AND SENSOR HEAD FROM ARCNET TO RS232

The SeaKing Sensor head will use the ASYNC 0 (LAN) serial channel for RS232 communications.

A short test lead (ARCNET configuration) should be made up to connect between the SeaKing Sensor head and the SCU 15-way 'D' Type connector to enable any head re-programming during the conversion to RS232. The standard Tritech 6-way connector should be connected to the "MAIN" port on the SeaKing Sensor head. Test lead wiring is as follows;

| **Tritech 6-pin connector** | | **SCU 15-way "D" type** | |
|---|---|---|---|
| 1 | ---------- | 8 | [ ArcNet LAN A ] |
| 2 | ---------- | 15 | [ ArcNet LAN B ] |
| 3 | ---------- | 24vdc Supply | |
| 4 | ---------- | 0v Supply | |

**Caution!**

***A termination resistor, of value between 39ohms - 100 ohms, must be connected across pins 8 and 15 in the SCU 15-way "D" type connector.***

## CONFIGURING THE SEAKING SENSOR HEAD AND TOPSIDE SCU

Start the system. Close the standard program and run the V3Setup utility from Windows.

You will see a table showing the different devices connected to the network. The first column is the network node number;

Node 255: This represents the topside AIF communications card

SENSOR HEADS
Node 2: Imaging Sonar head
Node 20: Master Profiler head
Node 21: Slave Profiler head
Node 40: Bathy Sensor

Highlight the Sensor Head's row and then click on the 'Program User Data' button. Accept the warning message.
Click on the 'Baud Rates' button and in the 'Async 0 (LAN)' section, set the Right 'Baud' column to the desired comms rate; 115,200 baud should be default, 38,400 baud or above is necessary if operating an Imaging or Sidescan Sonar as any lower comms rates will slow down the scan update rate (57,600 or above is recommended).

***Note:*** *dip switch 1 located on 'SW1' - on the outer rim of the Sonar Head's CPU pcb - is used to switch between 2 pre-set Baud rates; set in the Left and Right 'Baud' columns:*
*dip switch 1 'Off' = Right 'Baud' column (user setting)*
*dip switch 1 'On' = Left 'Baud' column (factory setting : 9600)*

*It is therefore possible to pre-set 2 Baud rates in the 'Async 0 (LAN)' section and use the SW1 dip switch 1 to select between these. It is recommended to retain the left baud setting at 9600 for emergency recovery purposes.*

Exit (twice) and click on 'Yes' to 'ReProgram Node xx' when prompted.

Now repeat the exercise for the AIF card.
Two AIF versions have been used, version V3 and version V4.
Highlight the AIF card row (255)
If the check sum in column 3 is 0 the card is version V4, otherwise the card is version V3.
Now click on the 'Program User Data' button
Accept the warning messages. The next panel will depend on software version number.
Check the 'Serial Lan' check box **OR** select Serial SLU0 from the pull down menu if present. Version 1.50 onwards requires no setting at this point and will select automatically. Next click on the Baud Rates button and proceed as for the sonar.

***Note:*** *dip switch 2 located on 'SW5' on the SCU's AIF V3 communications card has the same functionality as dip switch 1 ('SW1') on the Sensor head's CPU pcb (see page 32 of 'System' manual).*
V4 AIF cards have a check box in the 'Program User Data' panel marked "Aif Hi Speed", this performs the same function.

The AIF card and Sensor head are now ready to communicate as RS232 but need the correct jumper connections to be made inside the Sensor head.

To access the Sensor head internals, undo the locking ring at the connector end and pull out the electronics block (be careful if Bathy as there is an internal wiring connection). Carefully remove the two nuts and screw pillars securing the board stack and remove the top 3 boards (or 2 for Bathy) leaving the comms board only attached to the endplate (...take care not to lose the spacers!).

Several types of comms board have been used in SeaKing Sonar heads; COMCV3 which can only be used in Imaging Sonar heads (these do not have the pin 5 sync used in the profilers or an RS485 channel for a bathy altimeter). All other boards can be used in any Sensor head. The jumper arrangements are different as detailed in the pages to follow.

The standard Tritech 6-way connector should be connected to the "MAIN" port on the SeaKing Sensor head. The Sensor head will use pin 1 for Tx, pin 2 for Rx and pin 5 for Signal Ground.

Cable wiring for RS232 communications is as follows;

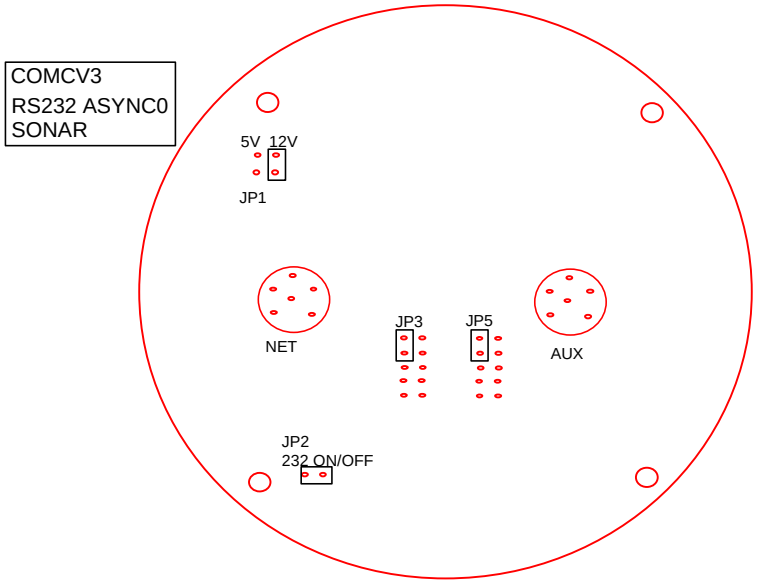
| **Tritech 6-pin connector** | | **SCU 15-way "D" type** | |
|---|---|---|---|
| 1 | ---------- | 13 | [ RS232 UP ] |
| 2 | ---------- | 6 | [ RS232 DOWN ] |
| 5 | ---------- | 2 | [ RS232 GND ] |
| 3 | ---------- | 24vdc Supply | |
| 4 | ---------- | 0v Supply | |

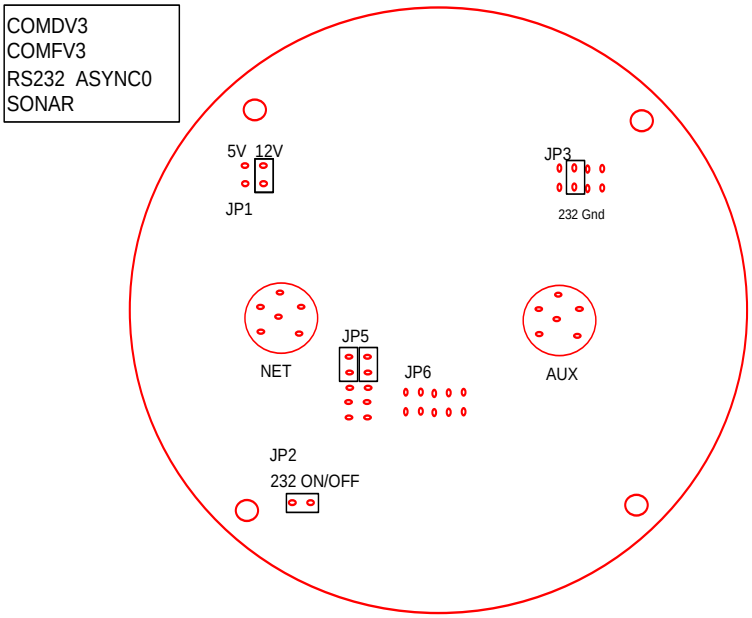
The following diagrams show the standard arrangement for RS232 on the Async 0 (LAN) channel for both types of SeaKing***** comms boards.

***** *Consult section 4 for details of SeaPrince comms board jumper settings.*

After these configurations have been made, the system is ready to operate over RS232 communications.

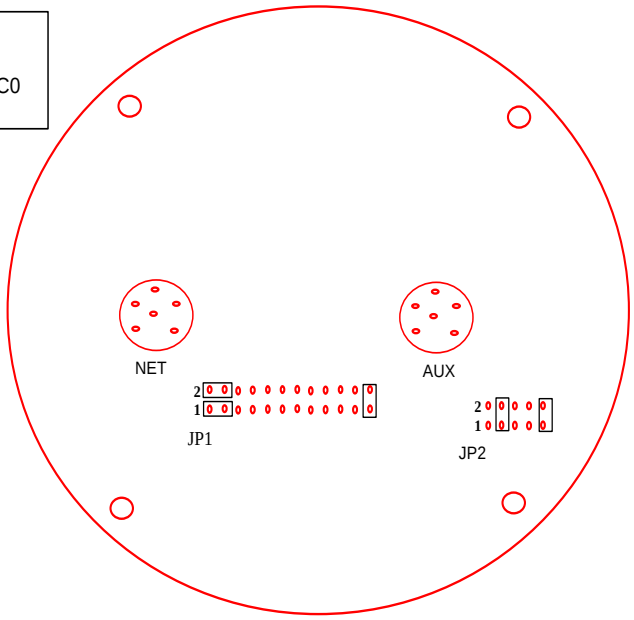
## RS232 Jumper Links for DFS head operation



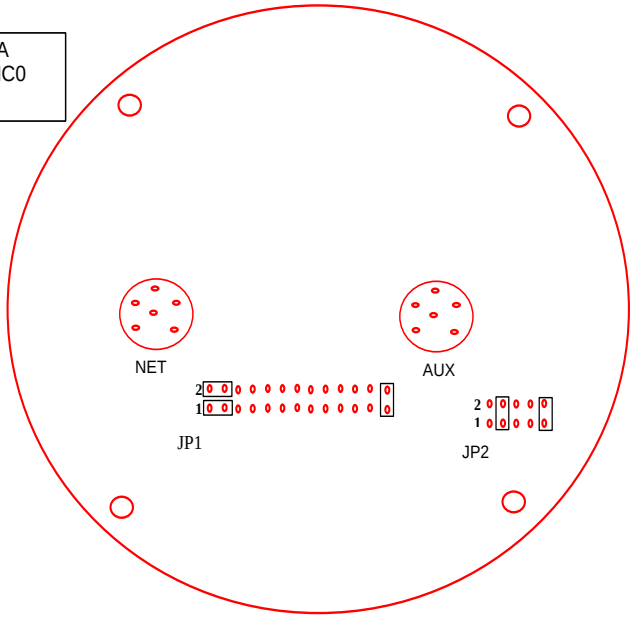



## RS232 Jumper Links for DFS head operation (cont.)

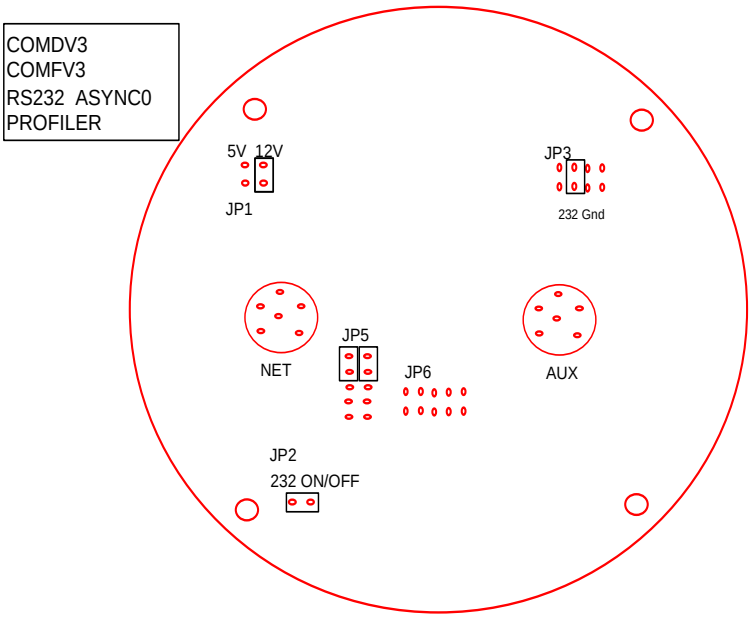
COMGV3
COMV5
RS232 ASYNC0
SONAR

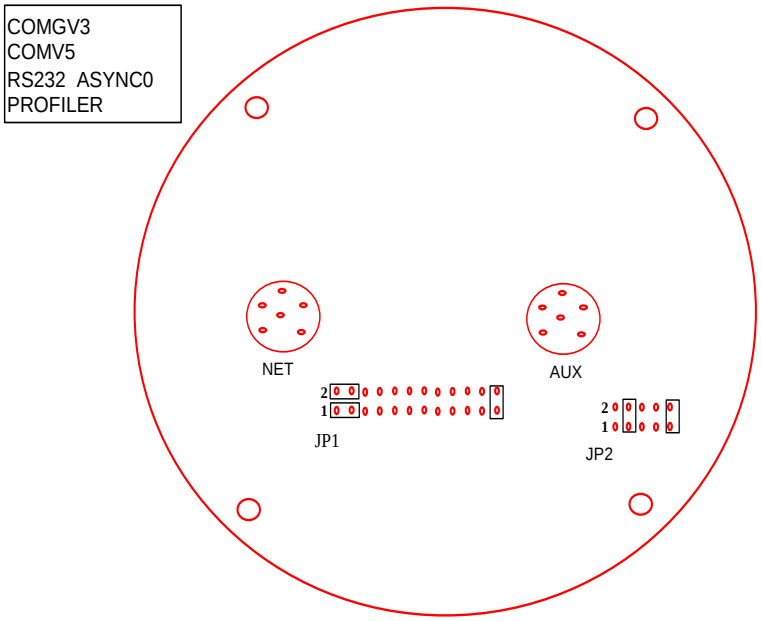



COMV5 Mod A
RS232 ASYNC0
SONAR



## RS232 Jumper Links for Single head DFP operation

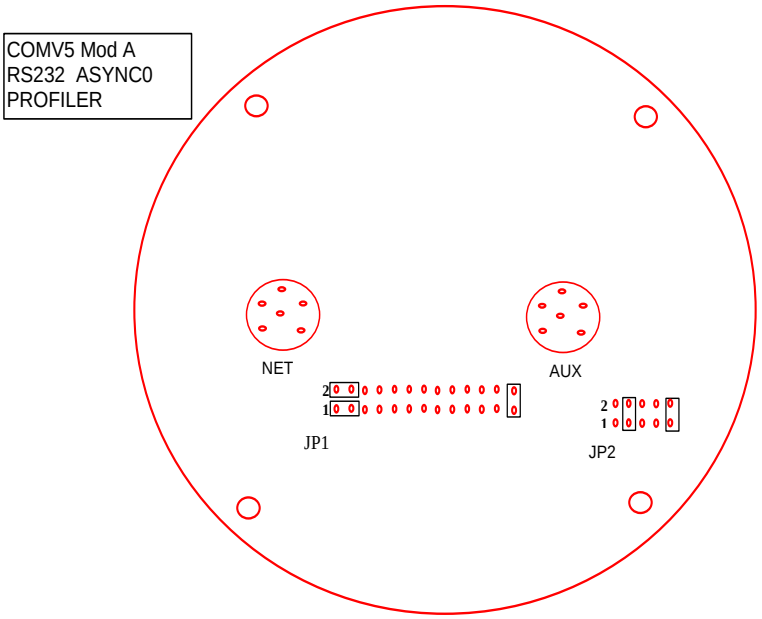


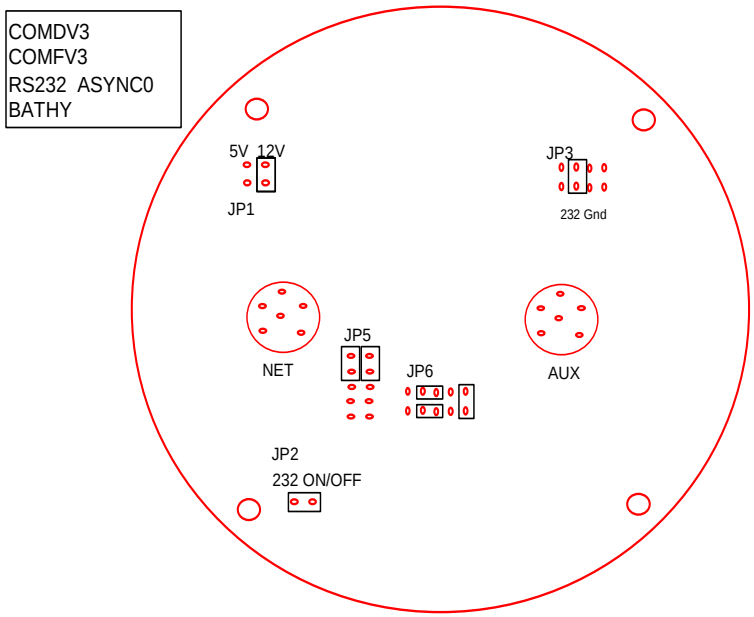

**Caution!**

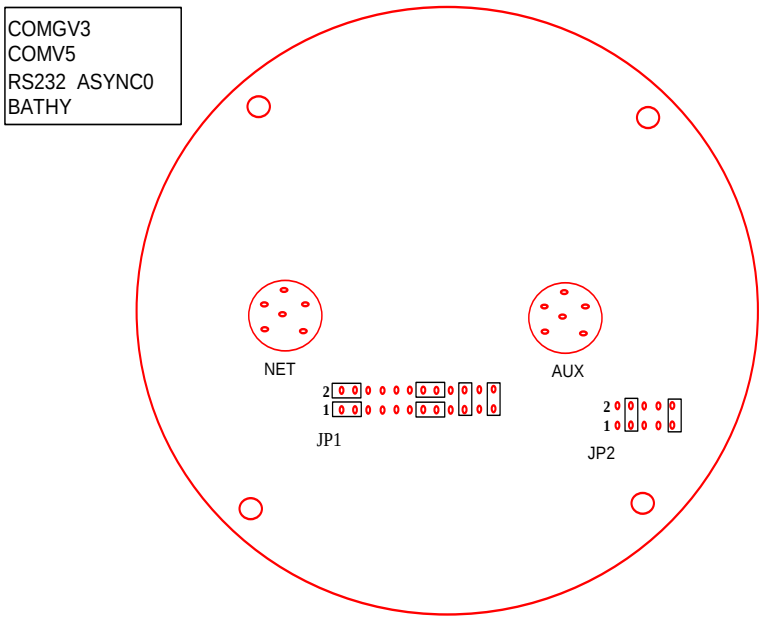
**The COMGV3 and COMV5 PCB marked "profiler" may be modified with U10 removed and pads 3 & 6 linked.**
**For single head RS232 operation the pads of U10 pins 2 & 7 must also be linked together**

## RS232 Jumper Links for Single head DFP operation (cont.)

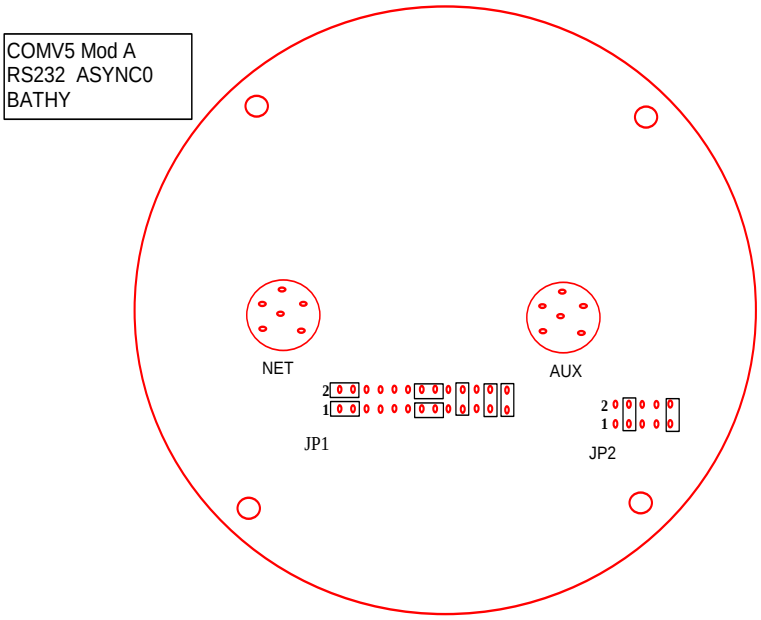


## RS232 Jumper Links for Bathy head operation.



## RS232 Jumper Links for Bathy head operation (cont.)



## ALTERING RS-232 TELEMETRY SETTINGS FROM DEFAULT

The RS-232 communications rate between SeaKing Sensor Head and Surface Control Unit (i.e. internal AIF card) can be altered if necessary *(factory setting = 115,200)*.
There are options for adjustment between 9,600 and 115,200 bit/s, but it is advisable that only **57,600** or **115,200** bit/s be selected if operating an Imaging or Sidescan Sonar over the direct RS-232 option.

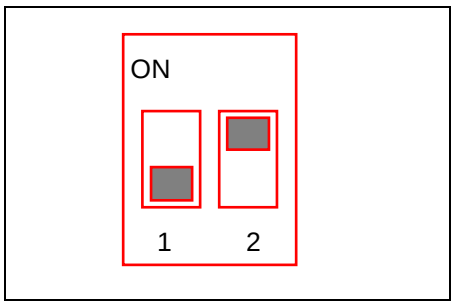
***N.B.*** *Lower rates than 57,600 will not provide adequate bandwidth for imaging applications. Rates as low as 9,600 bit/s should only be considered for profiling or bathymetry, where transmitted data is considerably less in quantity.*

### Step 1: Changing Sensor Head Baud Rate

There is a hardware switch ("**SW1**") inside the Sensor Head, located on the CPU ("**CPUCV3 or CPUV5"**) PCB.

"**SW1**" is used to select between the 2 pre-set communications rates for RS-232.

**SeaKing Sensor CPU Switch - SW1**




The switch settings are as follows…

| | | |
|---|---|---|
| **Switch 1** *(RS-232)* | On = 9,600 # | Off = 115,200 |
| **Switch 2** | On = Normal * | Off = Boot |

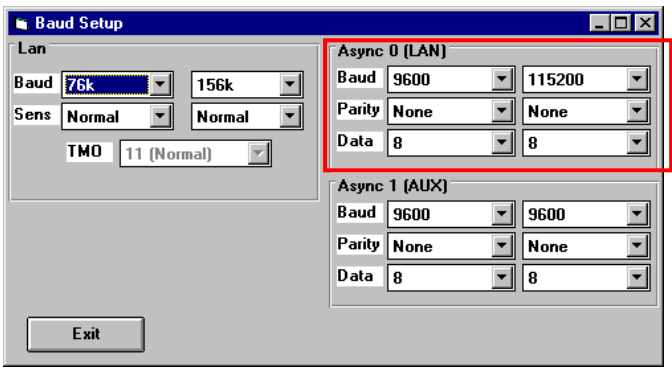
** Switch 2 = On is factory setting, do not touch.*
*# Recommend do not change. Use for Recovery.*

**Switch 1** RS-232 rates of **115,200** and **9,600 bit/s** are the factory settings and these can be altered if necessary using the **V3SETUP** program…

***i)*** In V3SETUP table, highlight the row of the **Sensor Node** *(i.e. Sonar = Node 2).*

***ii)*** Press '**Program User Data**' button and then click on the '**Baud Rates**' button.

**iii)** The following panel will appear…




These are the settings for the RS-232 telemetry link to the surface control unit (SCU).

**iv)** The **Async 0 (LAN)** panel includes the settings for the RS-232 telemetry link to the SCU. *These panels have 2 columns that are associated with the RS-232 settings for the 2 switch positions on **"SW1"**…*

| |
|---|
| LEFT column = Switch 1 'ON'<br>RIGHT column = Switch 1 'OFF' |

**v)** Change the RIGHT column speed to the required comms baud rate.

**vi)** After changes have been made, press the '**Exit**' button and **ReProgram Node** when prompted.

**vii)** Press the '**Rebuild**' button. Only the surface AIF card (Node 255) will appear in the list and this will confirm that telemetry with the Sensor Node has been lost. Do not worry as this is because both Nodes are operating at different baud rates at this stage.

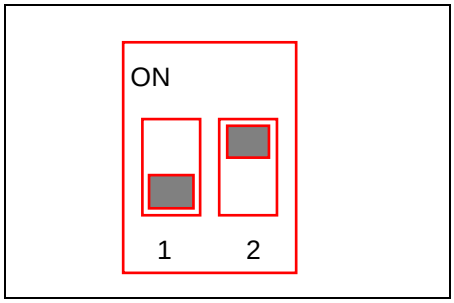
***Now proceed with Step 2 and set the surface AIF card (Node 255) telemetry to the same baud rate that has just been set for the Sensor Head.***

## Step 2a: Changing Baud Rate - AIFV3 Card

There is a hardware switch ("**SW5**") fitted on AIF V3 revision Cards.

"**SW5**" is used to select between the 2 pre-set communications rates for RS-232.

**Surface AIF Card Switch - SW5**




The switch settings are as follows…

| | | |
|---|---|---|
| **Switch 2** *(RS-232)* | On = 9,600 # | Off = 115,200 |
| **Switch 1** | On = Normal * | Off = Boot |

* *Switch 2 = On is factory setting, do not touch.*
# *Recommend do not change. Use for Recovery.*

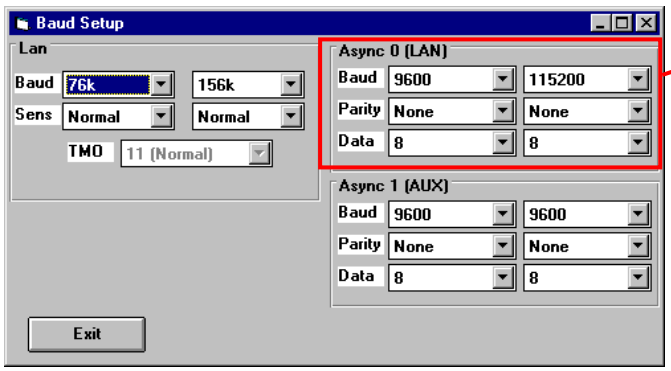
***Note:*** *The orientation of these switches is different from the Sensor heads.*

Configuring the surface **AIF interface card** with the desired RS-232 Baud rate. The V3SETUP program is again used for this…

**i)** In V3SETUP table, highlight the row of **Node 255**.

**ii)** Press '**Program User Data**' button and then click on the '**Baud Rates**' button.

**iii)** The following panel will appear…




These are the settings for the RS-232 telemetry link to the Sensor Head.

***Ensure 'Lan' and 'Async 1 (AUX)' settings appears as indicated left.***

**iv)** The **Async 0 (LAN)** panel includes the settings for the RS-232 telemetry link to the Sensor Head.

**v)** After any changes have been made, press the '**Exit**' button and **ReProgram Node 255** when prompted.

**vi)** If the V3SETUP Node list does not update after 10 seconds, press the '**Rebuild**' button. The Sensor Head Node should now re-appear confirming that the surface AIF card (Node 255) is communicating with it over the new telemetry baud rate.

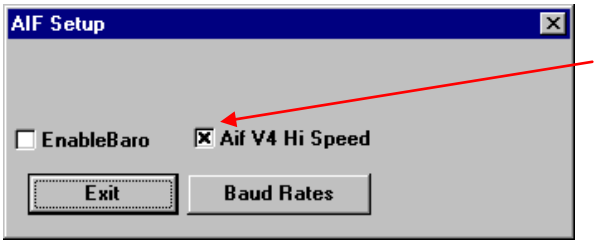
## Step 2b: Changing Baud Rate - AIFV4 Card

On the V4 AIF card the pre-set comm rates for RS232 are software switched.

**i)** Run V3SETUP table, highlight the row of **Node 255**.

**ii)** Press '**Program User Data**' button

The following panel will appear.
The '**Aif V4 Hi Speed**' check-box is used to select between the 2 pre-set communications rates for RS-232.




Aif V4 High Speed (RS232)

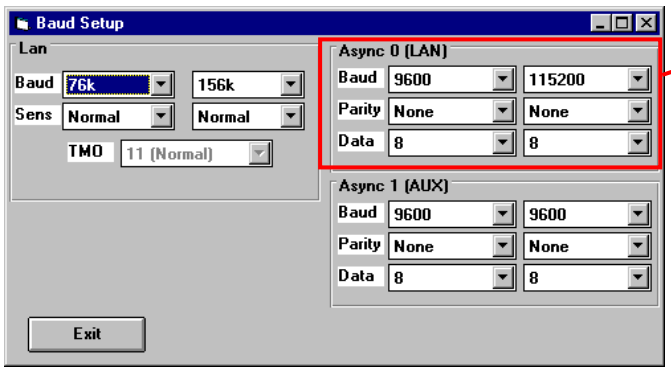
Box checked = 115,200
Box unchecked = 9600 *

# *Recommend do not change. Use for Recovery.*

To configuring the surface **AIF interface card** with the desired RS-232 Baud rate, proceed as follows:

**iii)** Click on the '**Baud Rates**' button on the AIF Setup panel.

**iv)** The following panel will appear…




These are the settings for the RS-232 telemetry link to the Sensor Head.

***Ensure 'Lan' and 'Async 1 (AUX)' settings appears as indicated left.***

**v)** The **Async 0 (LAN)** panel includes the settings for the RS-232 telemetry link to the Sensor Head.

**vi)** After any changes have been made, press the '**Exit**' button and **ReProgram Node 255** when prompted.

**vii)** Close down and restart V3SETUP before any changes made will take effect.

**viii)** The Sensor Head Node should now re-appear confirming that the surface AIF card (Node 255) is communicating with it over the new telemetry baud rate.

## 2. CONFIGURING A SEAKING SCU AND SENSOR HEAD FROM RS232 TO ARCNET

Start the system. Close the standard program and run the V3Setup utility from Windows.

You will see a table showing the different devices connected to the network. The first column is the network node number.

Node 255: This represents the topside AIF communications card

SENSOR HEADS
Node 2: Imaging Sonar head
Node 20: Master Profiler head
Node 21: Slave Profiler head
Node 40: Bathy Sensor

Highlight the Sensor head's row and then click on the 'Program User Data' button. Accept the warning message.

Click on the Baud Rates button and ensure/confirm that the 'Lan' section has Baud (Left column) set to 76k and Baud (Right column) set to 156k. .
Exit (twice) and click on 'Yes' to 'ReProgram Node xx' only if changes have been made, else click 'No'.

Now repeat the exercise for the AIF card. Highlight the AIF card row (Node 255) and then click on the 'Program User Data' button.

Accept the warning messages and un-check the 'serial Lan' check box **OR** select LAN in the pull down if present. Software version 1.50 requires no setting and will select automatically. Then click on the Baud Rates button and proceed as for the sensor head.

The AIF card and Sensor head are now ready to communicate as ARCNET but need the correct connections made.

The connections for ARCNET on the AIF D connector are

Pin 8 (ARCNET LAN-A)
Pin 15 (ARCNET LAN-B)

The Sensor Head will use pin 1 for LAN-A and pin 2 for LAN-B but needs jumper settings made inside.

To access the sensor head internals, undo the lock ring at the connector end and pull out the electronics. Carefully remove the two nuts and screw pillars securing the board stack and remove the top 3 boards leaving the comms board only attached to the endplate (...take care not to lose the spacers!)

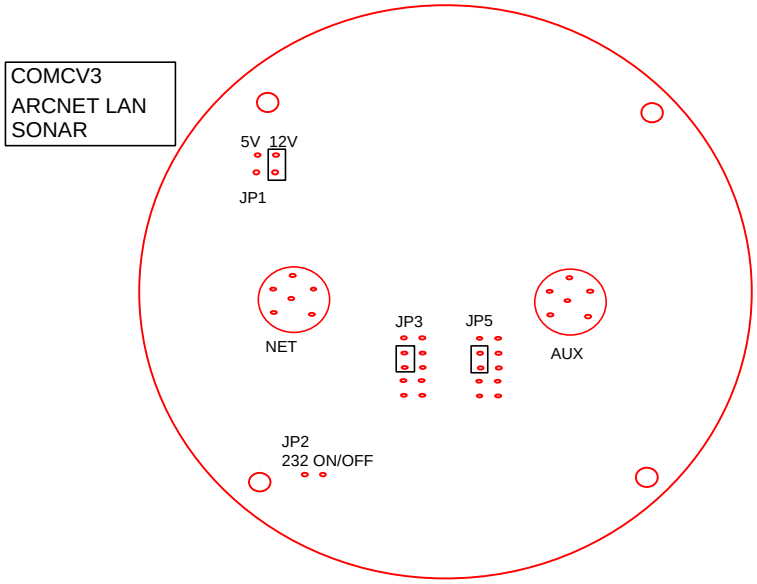
Several types of comms board have been used in SeaKing Sensor heads; COMCV3 which can only be used in sonar heads (they do not have the pin 5 sync used in the profilers or an RS485 channel for a bathy altimeter). All other boards can be used in any head. The jumper arrangements are different as shown in the pages to follow.

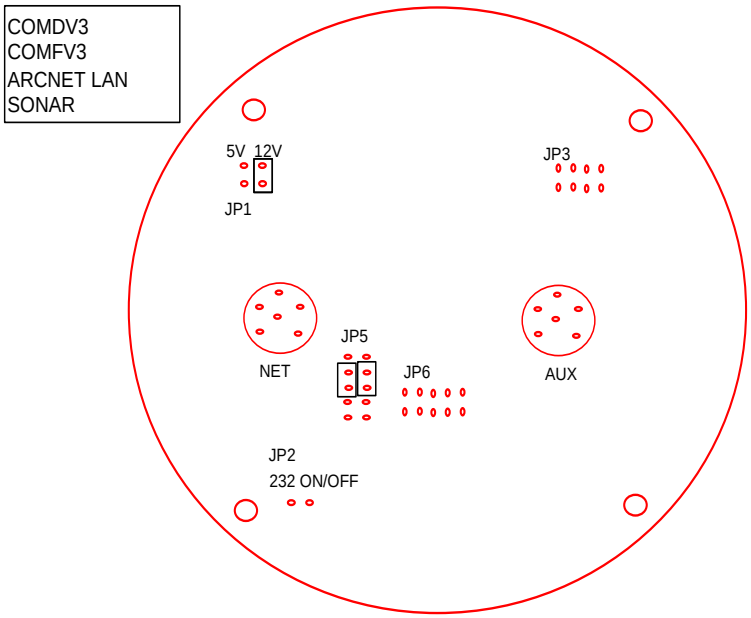
The diagrams show the standard ARCNET arrangement for both types of SeaKing***** comms board.

***** *Consult section 4 for details of SeaPrince Comms board jumper settings.*

After these configurations have been made, the system is ready to operate using ARCNET communications.

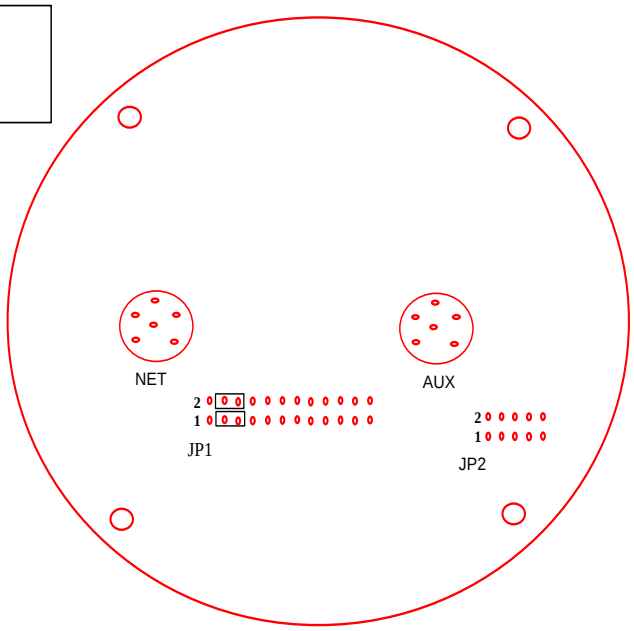
## ARCNET Jumper Links for DFS head operation



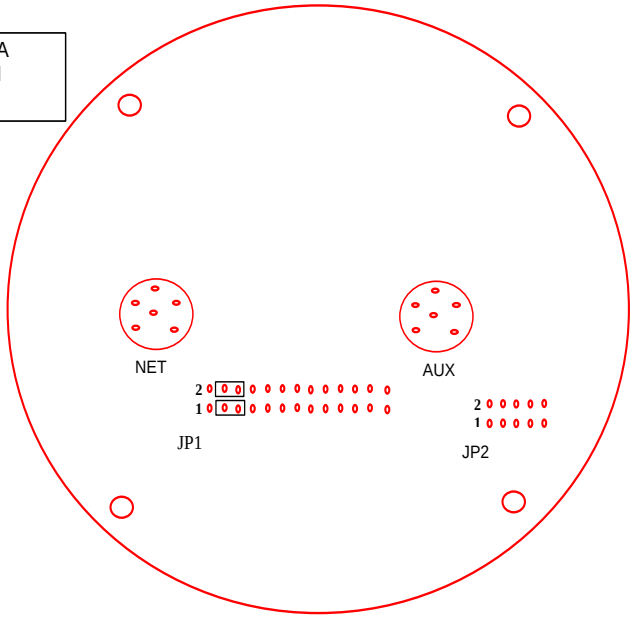



## ARCNET Jumper Links for DFS head operation (cont.)

COMGV3
COMV5
ARCNET LAN
SONAR

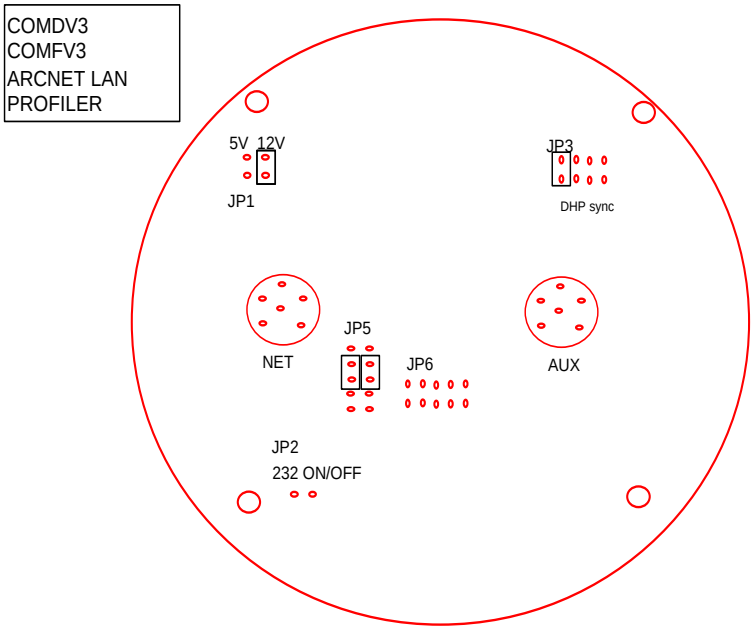


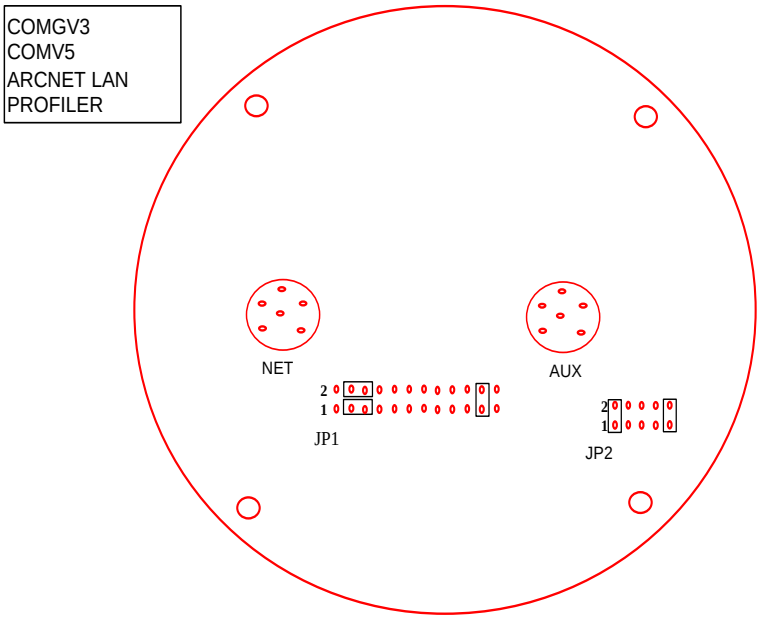

COMV5 Mod A
ARCNET LAN
SONAR




Note : Arcnet can use two different settings **on JP1 (3&5 4&6)** Or **(5&7 6&8) with GV3, V5 and V5 Mod A pcbs**

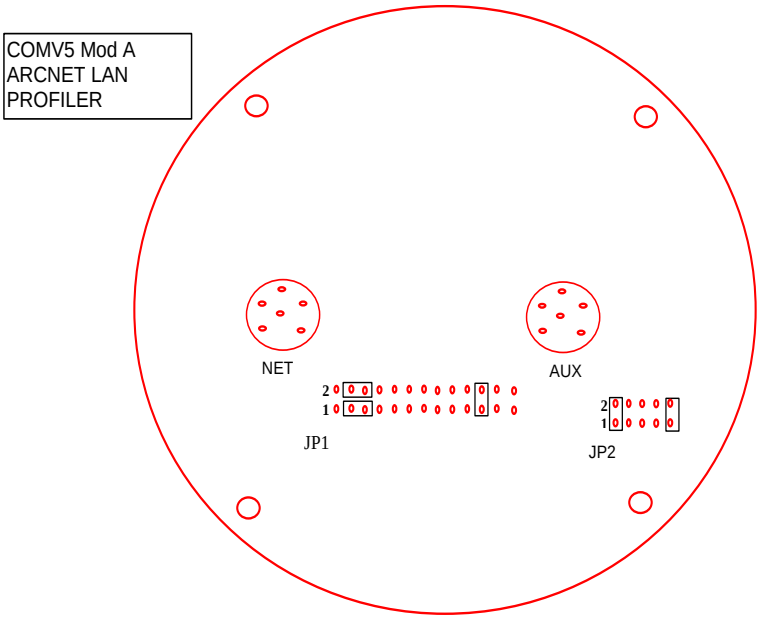
## ARCNET Jumper Links for DFP head operation



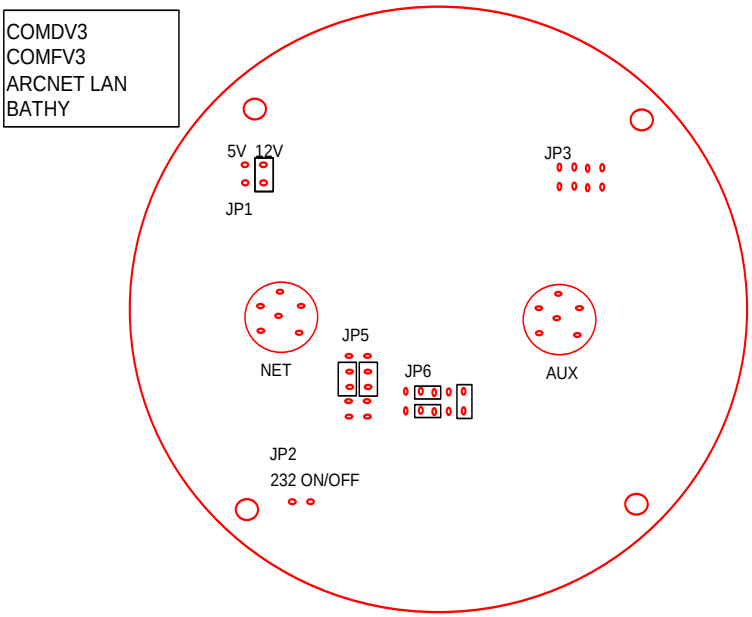

Note : Arcnet can use two different settings **on JP1 (3&5 4&6)** Or **(5&7 6&8) with GV3, V5 and V5 Mod A pcbs**

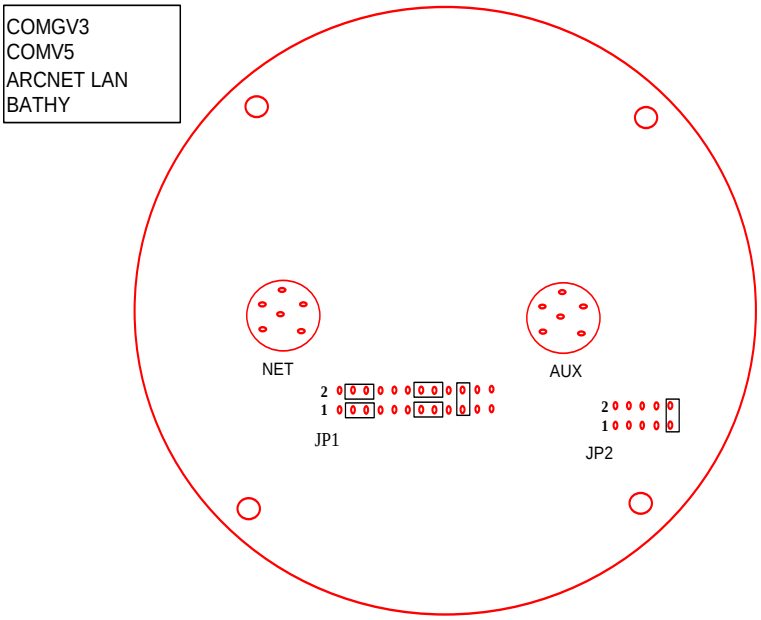
## ARCNET Jumper Links for DFP head operation (cont.)




Note : Arcnet can use two different settings **on JP1 (3&5 4&6)** Or **(5&7 6&8) with GV3, V5 and V5 Mod A pcbs**

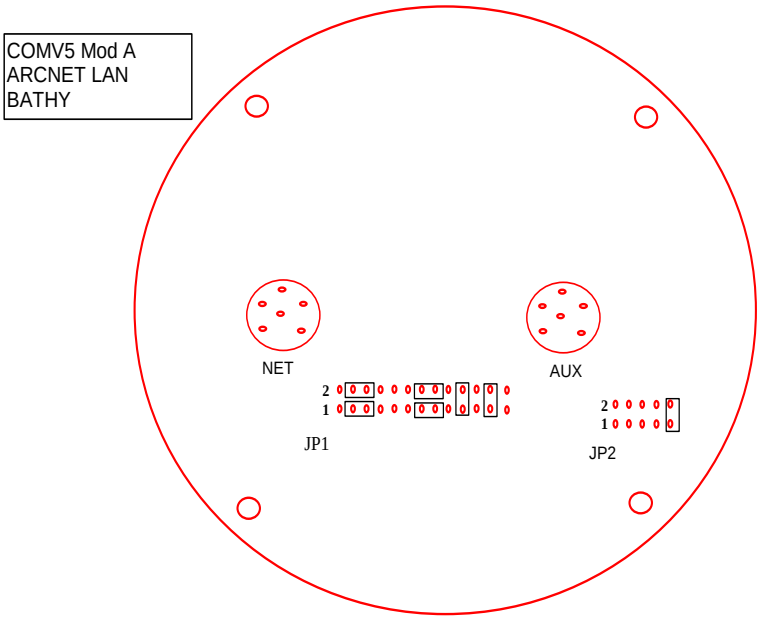
## ARCNET Jumper Links for Bathy head operation.




Note : Arcnet can use two different settings **on JP1 (3&5 4&6)** Or **(5&7 6&8) with GV3, V5 and V5 Mod A pcbs**

## ARCNET Jumper Links for Bathy head operation (cont.)




Note : Arcnet can use two different settings **on JP1 (3&5 4&6)** Or **(5&7 6&8) with GV3, V5 and V5 Mod A pcbs**

## 3. RS232 SPECIAL CONFIGURATION: 9600 DOWNLINK / 57600 UPLINK

The 'V3SETUP' utility should be used to change the Serial LAN settings for the split down/up link baud rate configuration. Procedure for re-configuring a Sonar (Node 2) now given;

a) Highlight the Node 2 (Sonar) row and press the 'Program User Data button (select 'Yes' to continue at the warning message).

b) Press 'Baud Rates'. A table of Baud rate setting will now appear. On the left is the ARCNET LAN table. On the right is ASYNC 0 (LAN) and ASYNC 1 (LAN); these are the Serial LAN tables for serial transfer through the Main (ASYNC 0) and Aux (ASYNC 1) ports on the sonar head.

The ASYNC 0 channel (on the sonar head's Main port) will be used for the head's serial RS232 communications. RS232 wiring details for the 'Main' port are given in an earlier section of this manual.

c) The ASYNC 0 (LAN) has 2 columns for the 'Baud' row. Set the left and right Baud columns to 'TX57/RX96'.

The Sonar Head's CPU pcb has a DIL switch for selecting between NORMAL and HALF BAUD options; the left Baud column is the NORMAL BAUD setting and the right is the HALF BAUD setting. Further details of the DIL switch settings are in the Appendix of the 'SYSTEM' section of the operator's manual.

d) After Baud changes have been made, Press 'EXIT', 'EXIT', and 'Yes' (to ReProgram Node 2 ?).

e) Highlight the Node 255 (AIF card) row and press the 'Program User Data' button (select 'Yes' to continue at the warning message).

f) Press 'Baud Rates' and set 'TX96/RX57' in the left and right columns of the 'Baud' row in the ASYNC 0 (LAN) table.

g) After Baud changes have been made, Press 'EXIT' and then enable (check) the 'Serial Lan' box. Press 'Exit' and 'Yes' (to Reprogram Node 255 ?).

Software settings are now complete. No additional RS232 hardware settings require to be made to the AIF card and sonar for the split comms option.

## 4. SEAPRINCE SENSOR HEAD: HARDWARE JUMPER SETTINGS (RS232/RS485)

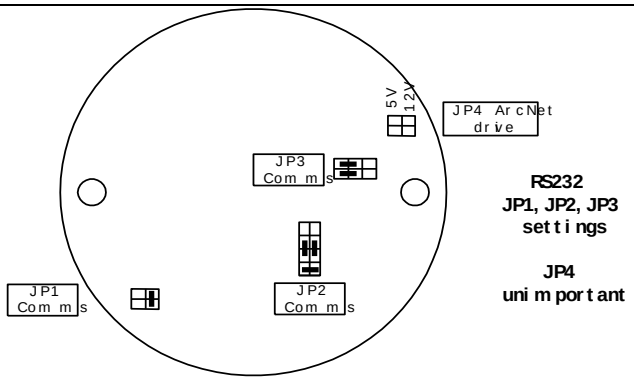
The SeaPrince head will use the ASYNC 0 (LAN) serial channel (as per SeaKing head) for RS232/RS485 communications. Software setup for this is in the 'Program User Data' section of the 'V3SETUP' utility program.

**IMPORTANT:** The SeaKing AIF card has ARCNET / RS232 comms options (NOT RS485). The SeaPrince RS485 comms option is a special configuration and is to be used with earlier SCU-3 systems only; fitted with WINSON AIF cards and running WINSON software. The SeaPrince head will require special emulation software to be loaded in order to do this. It is recommended that (if used) this conversion be carried out by Tritech and not in the field. Contact Tritech for more details.

To access the head PCBs remove the body-tube retaining cord and then remove the body-tube. Remove the two locking nuts securing the board stack and remove the top PCB leaving the S2COM pcb on the top of the stack.

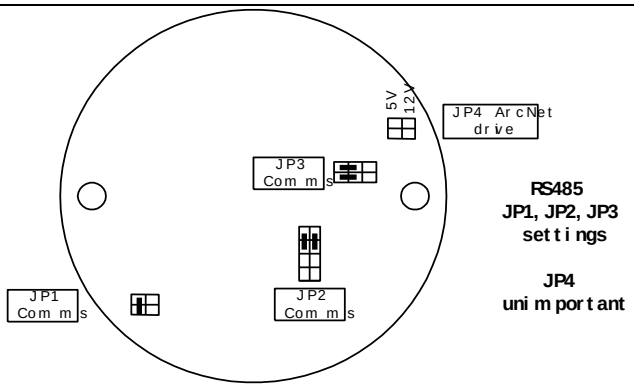
The following S2COM PCB jumpers can be reconfigured for ARCNET LAN / RS232 communications:

**RS232**
JP1: Link pins 3 & 4
JP2 : Link pins 3 & 5, 4 & 6, 1 & 2
JP3 : Link pins 1 & 3, 2 & 4

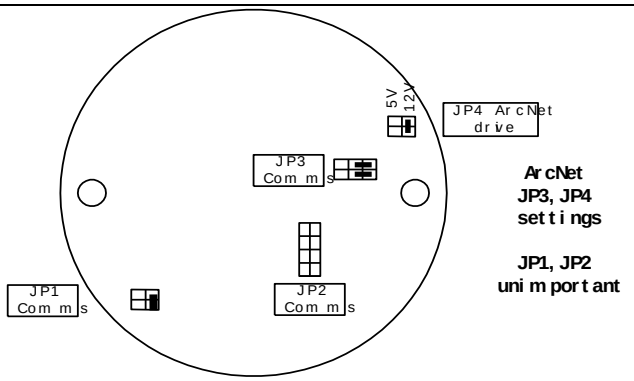



**RS485**
JP1: Link pins 1 & 2
JP2: Link pins 5 & 7, 6 & 8
JP3 :Link pins 1 & 3, 2 & 4

RS485 can only be used with SCU-3 WINSON systems. The head requires special software and WINSON a special set-up. Contact Tritech for more details.




**ARCNET LAN**
JP1: Link pins 3 & 4
JP3: Link pins 3 & 5, 4 & 6
JP4: Link pins for 12V (as shown)



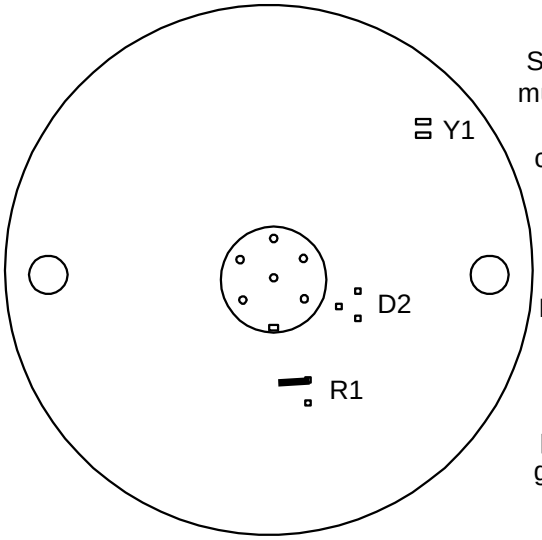
Cable wiring for RS232 communications is as follows;

| **Tritech 6 pin connector** | | **SCU 15-way "D" type** | |
|---|---|---|---|
| 1 | ---------- | 13 | [ RS232 UP ] |
| 2 | ---------- | 6 | [ RS232 DOWN ] |
| 5 | ---------- | 2 | [ RS232 GND ] |
| 3 | ---------- | 24vdc Supply | |
| 4 | ---------- | 0v Supply | |

***NOTE:*** *When running RS232, ensure the following setup on connector board S2CONB PCB S2CONB is the top PCB in the board stack*

- *'Y1' solderbridge is removed*
- *components R1, D2 are not fitted*
- *ground link to R1 pad is in place*

*When running RS485, a 220Ω termination resistor may be included by remaking solder bridge Y1*




Solder bridge Y1 must be open for RS232 & closed for 220 Ohm.

R1 & D2 removed for sonar. Top pad of R1 linked to ground plane for RS232-ground on pin 5