

Pharos
Marine



Automatic
Power Inc

**PHALCON 2000
Installation Guide**

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Use this table to keep a record of the Phalcon 2000 details.

| | |
|------------------------------------|--|
| Phalcon 2000 Serial Number: | |
| General Order (GO) Number: | |
| Morse Code Character: | |
| Sensitivity: | |
| Duty Cycle | |

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Contents

| | | |
|-----------|------------------------------------|---|
| Chapter 1 | Installation and Maintenance | 1 |
| 1.1 | Job Set Up Information..... | 1 |
| 1.2 | Maintenance Requirements..... | 1 |
| 1.3 | Test Equipment | 1 |
| 1.4 | Installation | 2 |
| 1.4.1 | Mounting | 4 |
| 1.4.2 | Power Requirements | 4 |
| 1.4.3 | Junction Box..... | 7 |
| 1.5 | Commissioning..... | 9 |

SAFETY

The safe installation, operation and maintenance of the equipment described in this document requires a high standard of training in safety and first aid skills. AB Pharos Marine Ltd. draw the attention of the user to the following particular skills and training that may be needed:

Electrical Safety

Electric Shock

Chemical Burns

Battery Safety

Treatment for Shock

Recovery Position

Emergency First Aid

Burns

Resuscitation

Non-ionising Radiation Hazard

It is recommended that personnel are at least 1 metre away from the Phalcon 2000 during its operation.

DISCLAIMER

1. It is necessary to point out that the Company, or any of its associates, cannot accept responsibility for any form of personal injury, however caused, to anyone other than its employees; therefore every care should be taken to observe all the normal rules of safety.
2. The information contained within this document is correct and complete to our best knowledge and belief. The company cannot accept responsibility for the consequences of any errors or omissions howsoever caused.
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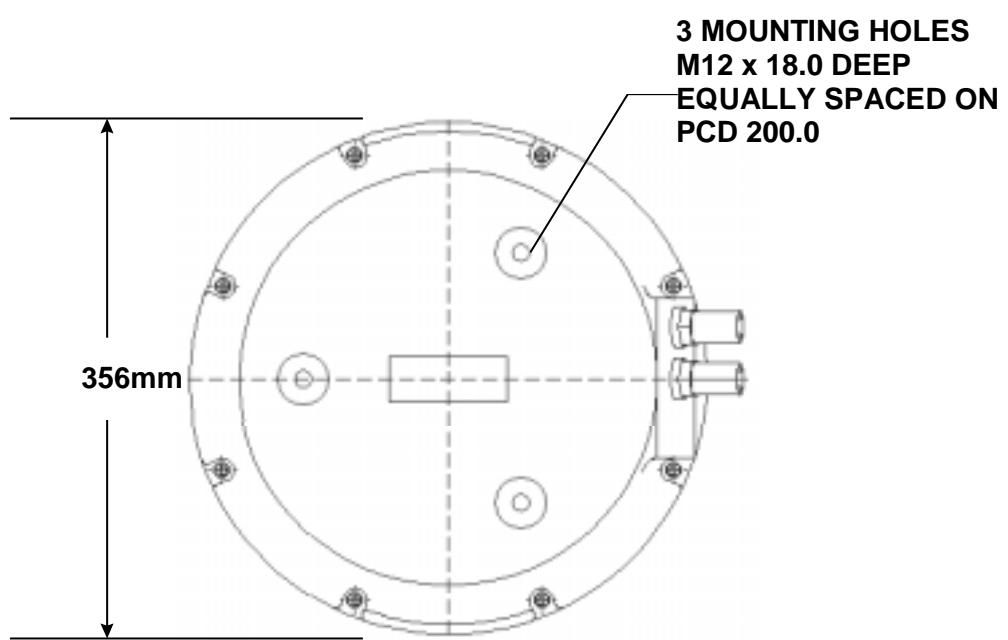
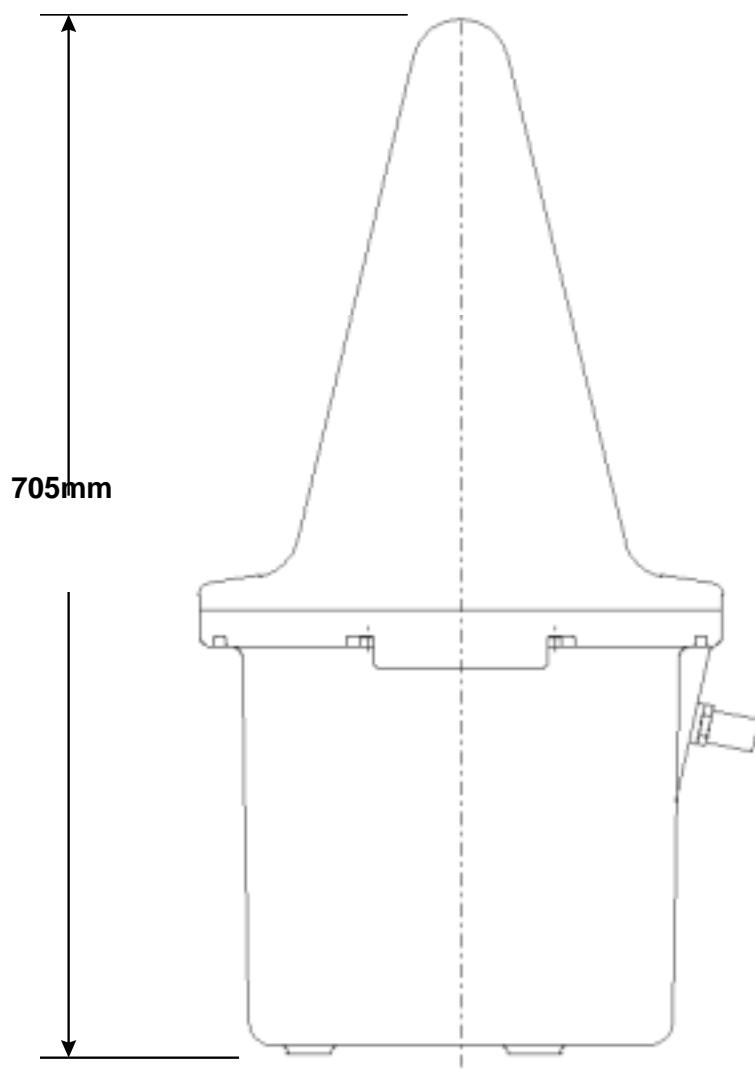
Summary

A RAdar beaCON (RACON) – Phalcon 2000 – is a radar transponder that is triggered by signals transmitted by a marine radar, in either X or S frequency bands (3 cm or 10 cm wavelengths). It responds to this interrogation by transmitting a coded signal that is shown as a definable ‘paint’ on the interrogating radar display. The length of this code is scaled to the length of the received pulse, so the paint length on the radar screen remains similar for different range scales.

The Phalcon 2000 (Figure 1) can be mounted on lighthouses, buoys, bridges, offshore platforms, breakwaters and other structures that need to be identified as an aid to navigation.

This handbook covers Installation and Commissioning of the Phalcon 2000. Operation and Maintenance are covered in a companion manual - *Phalcon 2000 Handbook*.

Figure 1 Mechanical mounting details



Chapter 1 Installation and Maintenance

1.1 Job Set Up Information

Table 1 Tools and Equipment

| Part No / Type | Description | Remarks |
|----------------|----------------------|------------------------------|
| N/A | Torque Wrench | 50-60 Nm (37-44 lbf) |
| Fluke 75 | Multimeter | Current consumption test |
| N/A | Laptop PC or palmtop | RS232 plus terminal emulator |

Table 2 Consumable Materials

| Material No. | Description | Remarks |
|--------------|-------------|------------------|
| | Sealant | Seal connectors |
| | Grease | Bolt lubrication |

WARNING: BE CAREFUL WHEN YOU USE THE CONSUMABLE MATERIALS. OBEY THE MANUFACTURE'S HEALTH AND SAFETY INSTRUCTIONS.

1.2 Maintenance Requirements

Following proper installation and commissioning, little maintenance should be necessary.

To ensure trouble-free performance, it is recommended that Phalcon 2000 be inspected and cleaned, as detailed in the Phalcon 2000 Handbook (Ref: HB-09300/01 Issue 1).

1.3 Test Equipment

For all diagnostics and most repair work on the Phalcon 2000, you will need a multimeter and a serial terminal, e.g. laptop computer that has an RS 232 interface connection and terminal emulation program.

1.4 Installation

WARNING: BE CAREFUL WHEN YOU REMOVE OR INSTALL THE PHALCON 2000. THE PHALCON 2000 WEIGHS APPROXIMATELY 19 KG (42 LB).

The Phalcon 2000 is despatched in a protective carton. Where further handling is necessary, unpacking the carton should be left until arrival at the installation site.

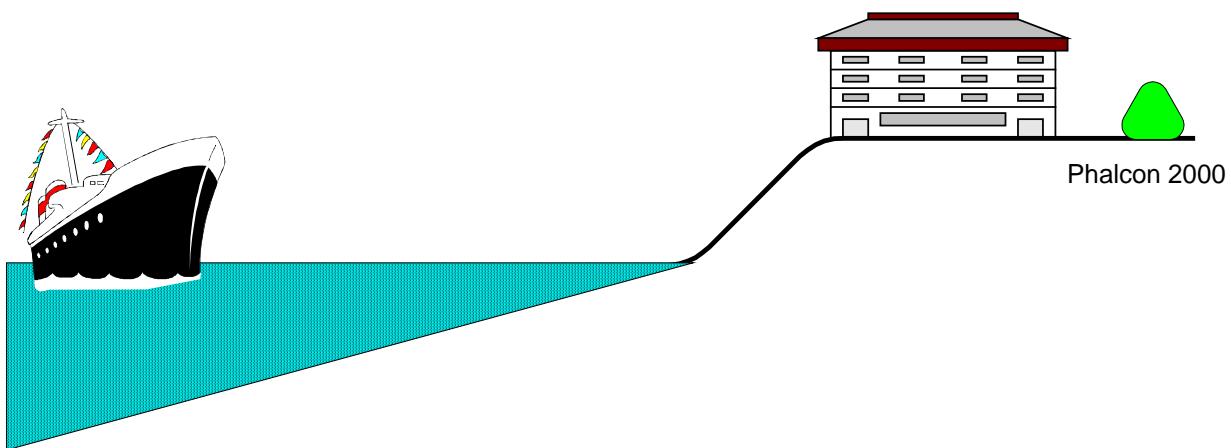
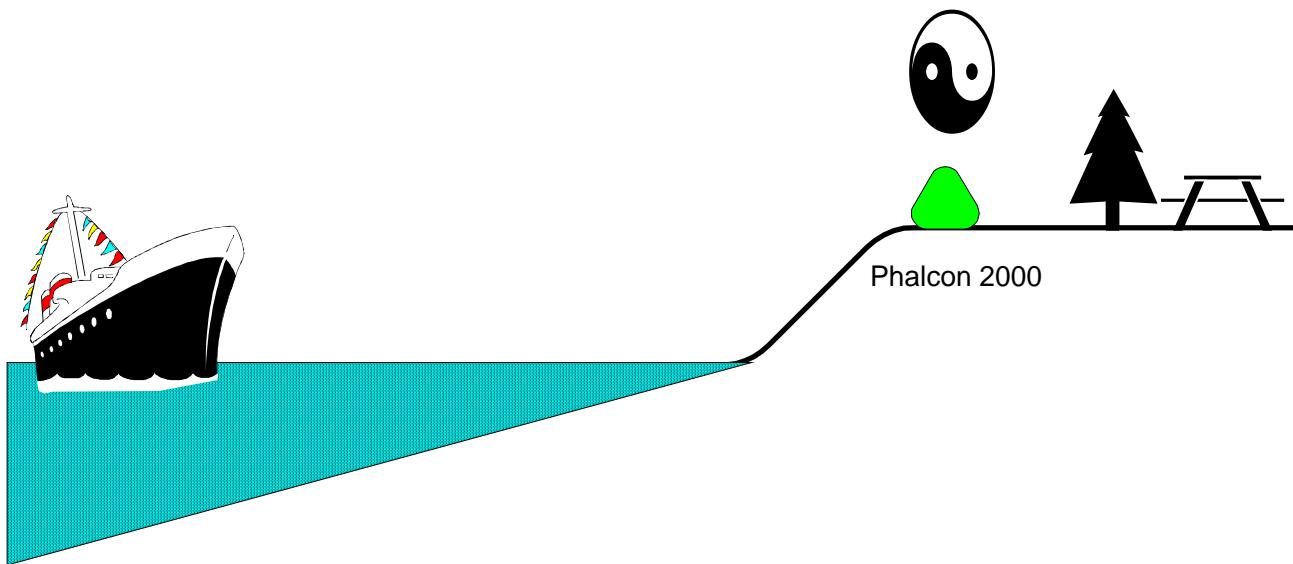
When unpacking, the unit must be examined for signs of transit damage and, where damage exists, the cause must be investigated and the carrier and supplier notified immediately. Failure to observe these instructions could invalidate subsequent claims. Check all items carefully, taking care not to discard smaller items that might be packed separately.

Table 3 Installation Kit

| Part No. | Description | Remarks |
|-----------|----------------|---------|
| | Cable assembly | |
| PH-030001 | Fixing kit | |

Caution: The Phalcon 2000 (Figure 2) requires a clear field of view over the intended operational area, any obstruction will severely restrict operating range.

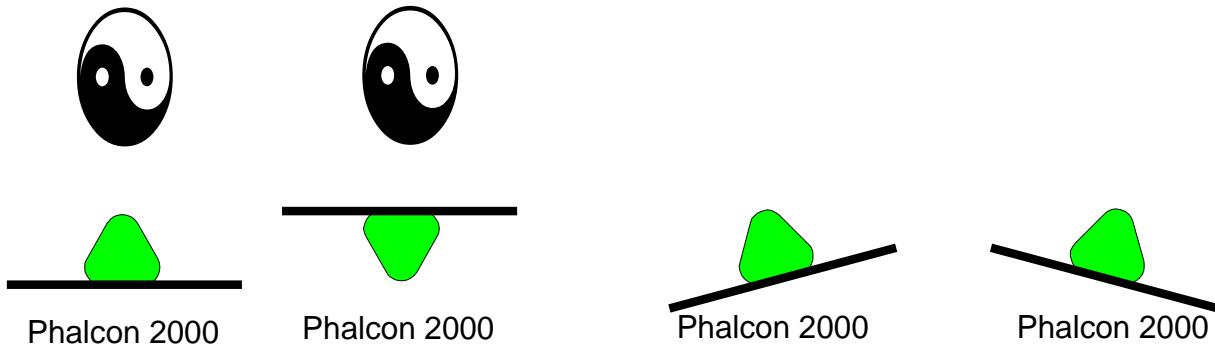
Figure 2 Positioning the Phalcon 2000



1.4.1 Mounting

Ensure that the Phalcon 2000 is mounted with its base horizontal.

Figure 3 Mounting the Phalcon 2000



The Phalcon 2000 is provided with three M12 tapped holes. These holes are equispaced on a 200 mm diameter circle, on the underside of the Phalcon 2000.

Ensure that any mounting plate / fixture and screws used for mounting the Phalcon 2000 are of a material and finish compatible with the stainless steel screw inserts in the moulding – stainless steel screws are preferred.

Use plain and spring washers beneath each screw and apply a light application of grease to assist later removal.

Tighten the screws to between 37 – 44 lbf (50 – 60 Nm).

1.4.2 Grounding for Lightning Protection

The internal electron housing is electrically connected to the metal baseplate mounted in the bottom of the racon housing. One or more of the external mounting bolts should be connected to an appropriate earth grounding structure. If buoy mounted, an insulated copper braid should be connected from the racon base and immersed at least two feet in the water with the insulating removed from the immersed section of the braid.

1.4.3 Power Requirements

A DC power source of 9 V to 36 V can be used for the Phalcon 2000. In most installations, power will be supplied from a 12 V battery recharged by solar panels.

The power supply connector is on the side of the base moulding, as shown in Figure 4. Note that pin 6 (the green wire in the supplied cable assembly) is a reference common for the Suppress Input and Alarm lines and must NOT be connected to the battery lines.

Although the Phalcon 2000 power consumption is very low, the power cables installed must have a current capacity of 3 Amps, and be suitable for external exposure.

Remove the protective cover from the connector body on the unit.

Connect the cable connector onto the Phalcon 2000 socket and tighten the retaining ring. Ensure the cable is held firmly in place.

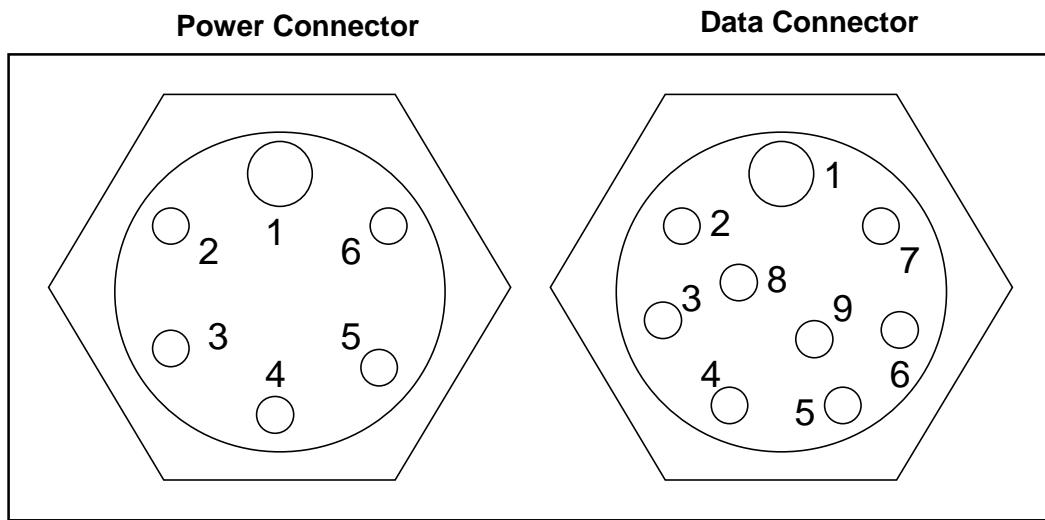
WARNING: BE CAREFUL WHEN YOU USE THE CONSUMABLE MATERIALS. OBEY THE MANUFACTURE'S HEALTH AND SAFETY INSTRUCTIONS.

Apply a waterproof grease or sealant to the connectors.

A two meter cable assembly is supplied to connect the Phalcon 2000 to the Junction Box and power supply. You will need to manufacture the interconnection cables to match your system. Refer to Figure 4.

Note: The power supply inputs are floating relative to ground.

Figure 4 Power and Data Connectors



| Pin | Function | Wire Colour |
|-----|-------------------------------------------------------------|-------------|
| 1 | Vin -ve | Black |
| 2 | Alarm – normally open to pin 4 Closed indicates failure | Brown |
| 3 | Alarm – normally closed to pin 4 Open indicates failure | Blue |
| 4 | Common - for Alarm, pins 2 & 3 & for Blanking, pin 6 | Green |
| 5 | Vin +ve | Red |
| 6 | Blanking input 0V O/P suppressed +5V or open O/P enabled | White |

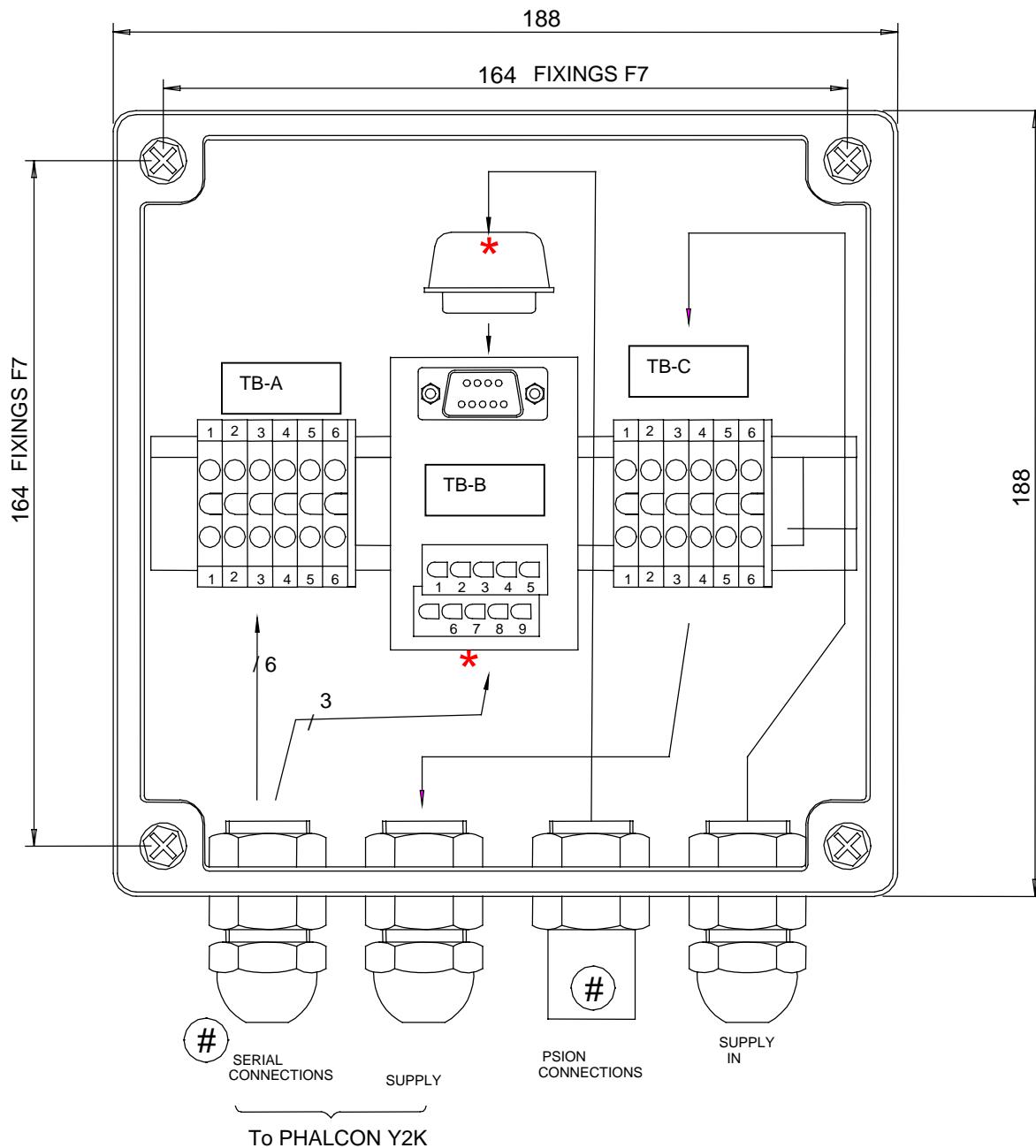
| Pin | Function | Wire Colour |
|-----|---------------------|-------------|
| 1 | Interrogate O/P + | Brown |
| 2 | Interrogate O/P - | Yellow |
| 3 | RS485 A * | Orange |
| 4 | RS485 B * | Purple |
| 5 | RS 485 Ground, 0V | Pink |
| 6 | RS232 In | Green |
| 7 | +5V | Blue |
| 8 | RS232 Out | Black |
| 9 | RS232 Signal Ground | White |

* Optional

1.4.4 Junction Box

The Junction Box (Figure 5) contains an RS 232 serial connector which allows you to connect a laptop PC or palmtop into the system. You can use the laptop PC to get additional information about the operational status of the Phalcon 2000.

Figure 5 Junction Box



Power Connector

| Terminal Block Connection Number | Wire Colour |
|----------------------------------|-------------|
| TB-C 1 | Black |
| TB-C 2 | Brown |
| TB-C 3 | Blue |
| TB-C 4 | Green |
| TB-C 5 | Red |
| TB-C6 | White |

Data Connector

| Terminal Block Connection Number | Wire Colour | Serial Connector Pins |
|----------------------------------|-------------|-----------------------|
| TB-A 1 | Brown | |
| TB-A 2 | Yellow | |
| TB-A 3 | Orange | |
| TB-A 4 | Purple | |
| TB-A 5 | Pink | |
| | Green | TB-B 3 |
| TB-A 6 | Blue | |
| | Black | TB-B 2 |
| | White | TB-B 5 |

1.5 Commissioning

For approximately 30 seconds after first switch on the Phalcon 2000 will carry out set up, self-test and calibration.

An internal sounder gives an indication of correct operation. The unit will go through a set up procedure and perform a self-calibration routine for about 30 seconds after power is first applied. As calibration is completed for each band the sounder will emit a series of bleeps to indicate either pass or fail.

A pass is indicated by a Morse letter U “ DIT DIT DAH “ and a fail indicated by a letter D “ DAH DIT DIT “. The calibration sequence is S-Band followed by X-Band.

Each calibration takes approximately 10 seconds to complete. For 10 minutes after switch-on the Phalcon 2000 will emit a bleep each time it receives an interrogating radar pulse. The sounder is only activated when the Phalcon 2000 is alert or active.

Two Morse letters U, followed by random bleeping as the Phalcon 2000 is interrogated during its alert periods indicate correct operation of the unit.

The Phalcon 2000 response code and duty period are set at the factory.

Caution: Each module is set and tested for optimum performance at the factory. Whilst Phalcon 2000 modules are easy to replace, we do not recommend the interchanging of modules between Phalcon 2000 units.

When the Phalcon 2000 has been fitted to its mounting and connected to a suitable power supply, its response code and service period can be confirmed using the Settings command as described in Phalcon 2000 Handbook. A convenient ship or harbour radar can be used to check for the correct operation of the Phalcon 2000.

If a serial data terminal is available then additional information as to the operational status of the Phalcon 2000 will be available. Refer to the Phalcon 2000 Handbook for more information.

If the unit does not go through these sequences as indicated, please contact Pharos Marine Immediately.