OPERATOR MANUAL

WMB-160F

Multi-Beam Sonar System

Document Revision History

Revision Date	Reason for Change	Version
Up to 26 October 2005	Previous versions V1.0 to V1.8 written in MS Word	V1.0 to V1.8
30 March 2006	New layout in Adobe InDesign. Changes to document to reflect corrections from the service department. Added changes to reflect ENL complete system. Started version number from V1.0 to reflect new document format and layout.	V1.0
31 October 2006	Updated with new software changes and TCP/IP.	V1.1
24 October 2007	Updated with new software changes and addition of Snapshot button to GUI.	V1.2
4 February 2008	Updated patch test	V1.3
12 February 2009	Updated incorporating changes introduced with version 104.048 software	V1.4
19 June 2009	New version incorporating 104.049 software enhancements	V.1.5
7 July 2009	Updated following release of V.49 and additional FAQ's.	V.1.51
30 November 2009	Updated following release of V.50	V.1.6

Related Documents

Document P/Number	Title
IM_WMB160F_SYS	WASSP System Installation Manual

General Notices

ENL reserves the right to change the contents of this manual and any system specifications without notice.

Contact ENL regarding copying or reproducing this manual.

WASSP is not designed to comply with hydrographical mapping standards and therefore must not be used as a navigational mapping tool.

Warnings, Cautions, and Notes

Warnings, cautions, and notes are indicated by the following icons throughout this manual:

A WARNING indicates that if the instruction is not heeded, the action may result in loss of life or serious injury.

A CAUTION indicates that if the instruction is not heeded, the action may result in equipment damage or software malfunction.

A Note indicates a tip or additional information that could be helpful while performing a procedure.

Safety Notices

The installer of the equipment is solely responsible for the correct installation of the equipment. ENL assumes no responsibility for any damage associated with incorrect installation.

Electrical Safety

► Fire, electrical shock, or equipment damage may occur if the transceiver becomes wet.

► The equipment is rated for operation at:

  • Transceiver: 24 V DC.

  • ENL supplied Shuttle Computer: 230 V AC.

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Purpose of this Manual

This operator manual describes how to operate the WMB-160F Multi-beam Sonar System program through its graphical user interface.

Introducing the WMB-160F Multi-beam Sonar System

The WMB-160F is a multi-beam Sonar system that uses wide-angle sonar transducer to profile the water column and seafloor to very high resolution. It is this unique combination of multi-beam sonar and computer processing power which provides you with unparalleled information about the fishing environment. It gives you a wide 120° port-starboard swath of the water column and seafloor, allowing you to find and position reefs and wrecks, fish schools, seafloor hardness changes, and foreign objects in the water column or on the seafloor. From the 120° swath, the system processes 112 dynamic beams, with each beam containing detections from the water column and seafloor.

The information is presented in a user-friendly, mouse controlled, Windows-based operating system. The system can output data to plotting software packages. For optimal performance, roll, heave, pitch, heading and position inputs are all required.

Mapping an area of the seafloor requires motion compensation to compensate for the motion of the vessel. The efficiency of motion compensation strongly depends on the quality of the motion data. Accurate ship measurements must be taken and the dockside and sea trial commissioning procedures carried out thoroughly during installation. Even with good sensors, mapping performance in rough seas will be less accurate than in calm water.

The WMB-160F can be applied to a variety of fishing methods, as well as search and rescue, customs, and police applications.

Main Features

The WMB-160F has the following main features:

► **Improved performance**.
The use of separate transmit and receive arrays has enabled WASSP to optimise both transmit performance and receive sensitivity, giving improved performance over traditional sonar and sounders.

► **High detail picture of marine environment**.
The transmit beam spreads over a 120° port-starboard swath and covers 4° fore-aft while the receive beam covers 10° fore-aft, displaying a highly detailed picture of the marine environment.

► **Beam stabilisation**.
Beam stabilisation compensates for the movement of the vessel, providing accurate seafloor profiles and fish school locations.

► **Variable beam width**.
Unique to the WMB-160F, the single beam view can not only be stabilised, but the beam width can be varied from 5° to 40°.

► **Triple beam view**.
With variable width and angle, the port, centre, and starboard beams display together to help build your understanding of the sea environment.

► **Bottom lock**.
Bottom lock provides a traditional bottom lock mode where the changes in bottom depth are ignored and the bottom is drawn flat. Fish and other echoes are shown relative to the flat bottom image, enabling better discrimination between bottom fish and the seafloor.

► **Computer based profile storage**.
A computer-based system means the WMB-160F can generate and store very detailed seafloor profiles.

► **Digital signal processing (DSP)**.
Using DSP technology, the WMB-160F can provide an indication of changes in seafloor hardness, ideal for scalloping, crayfishing, and trawling where you want to understand and locate small changes on the seafloor.

► **160 kHz operating frequency**.
Operating at a frequency of 160 kHz provides high seafloor definition at depths down to 200m.

► **2-D and 3-D zoom**.
2-D zooming from 250 m out to 3 km. 3-D zooming from 10 m out to 1 km.

► **Depth and seafloor coverage**.
Seafloor coverage is determined by the beamwidth in use: For a 90 degree beamwidth, the seafloor coverage will be approximately twice the water depth. For example, 100 m depth gives 200 m seafloor coverage with 112 beams - every ping. For a 120 degree beamwidth, the seafloor coverage is 3.4 x depth. For example 200m depth gives approximately 680m seafloor coverage.

► **Unique power management system (14 power levels)**.
14 power levels provide optimal performance over a wide range of seafloor types and water depths.

► **More accurate 3-D**.
Profiles 90 times faster than conventional single beam echo sounders, leading to reduced costs and improved accuracy.

► **Future proof technology**.
The computer based operating system and transceiver firmware are both upgradeable as new software features are developed.

System Configuration

Figure 1 – Overview of a Fully Functional WMB-160F Sonar System
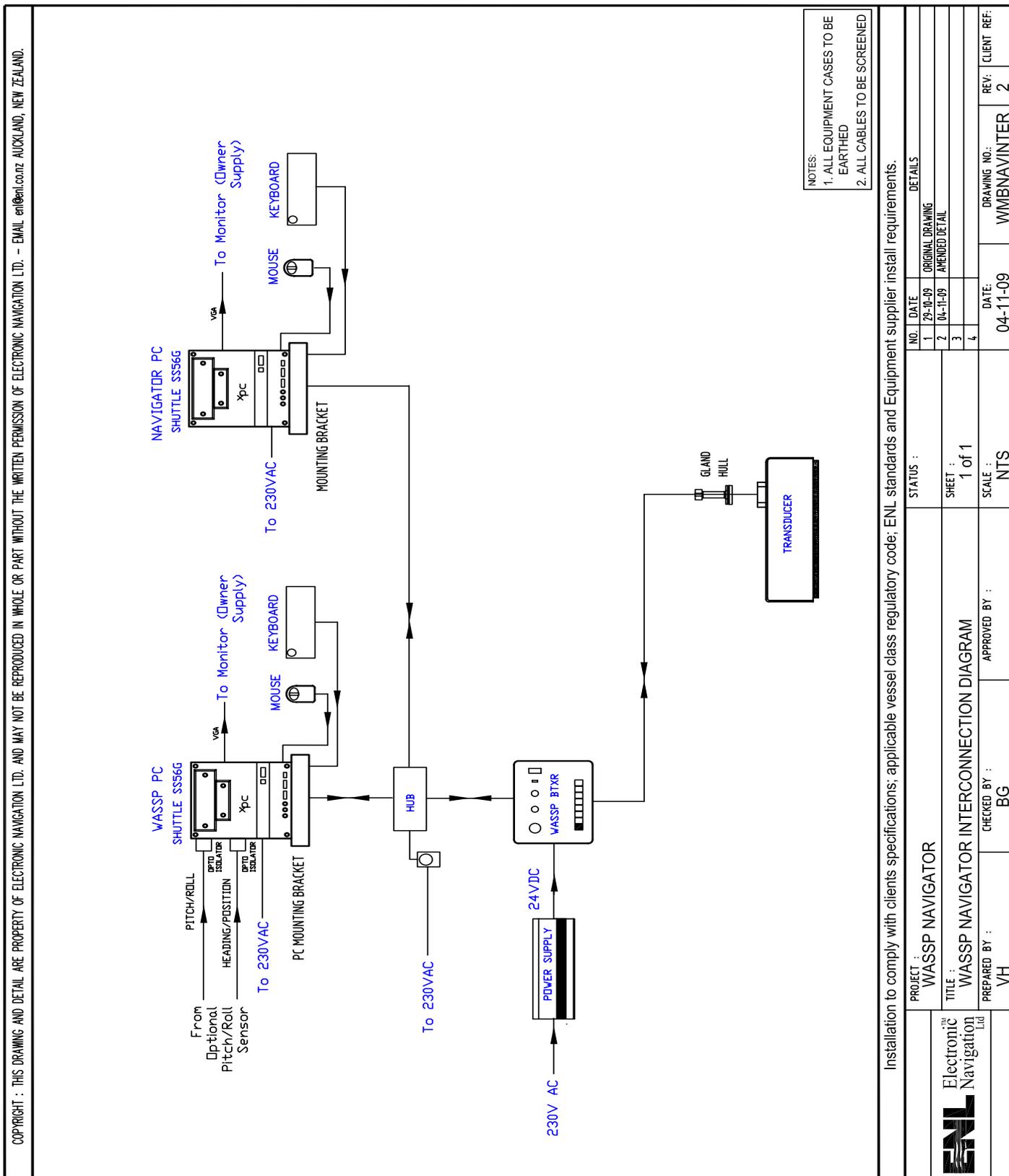
Figure 2 – Overview of a Fully Functional WMB-160F Navigator System

POWER SUPPLY OPTIONS

WMB-DC

INVERTER 230 V AC UPS 24 V DC POWER SUPPLY

WMB-AC

Power Input

230 V AC UPS 24 V DC POWER SUPPLY
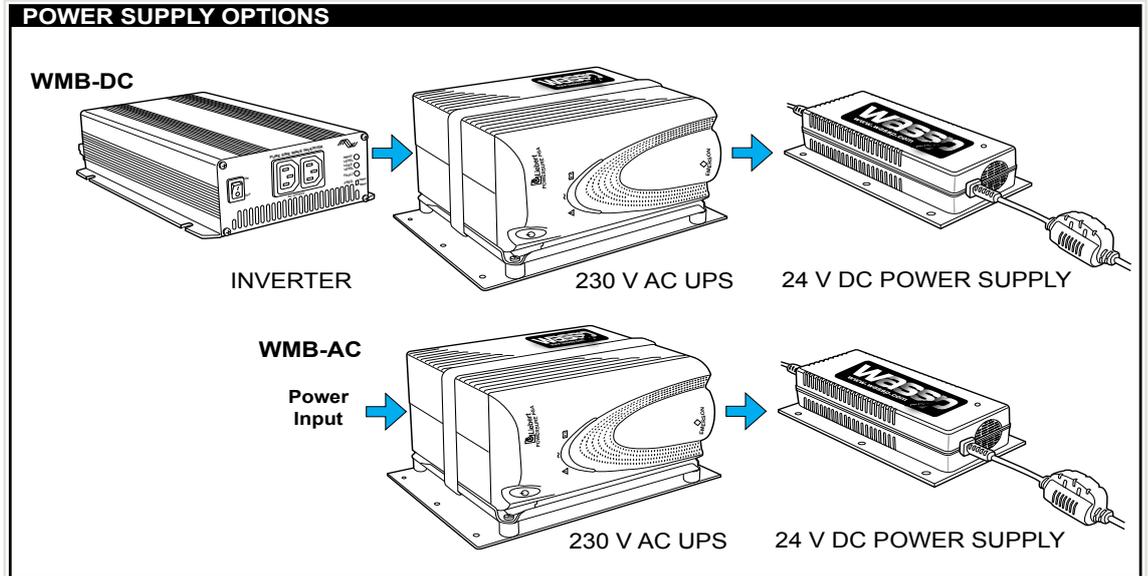
Controls and Indicators

Transceiver The controls and indicators for the WMB-160F transceiver (also known as the BTxR) are located on the transceiver faceplate. See Figure 2.

12 V DC or 230 V AC INPUT

Isolation & Conversion

Transducer Cable PC Input CAT5 Cable Analog Roll Sensor 24 V DC STATUS Lamp

POWER Switch

TRANSMITTER PC SENSOR 24V STATUS POWER

Earthing Strap Connector

Grey Blue Green Yellow Orange Red Black

7 RJ-45 type connectors to transducer cable
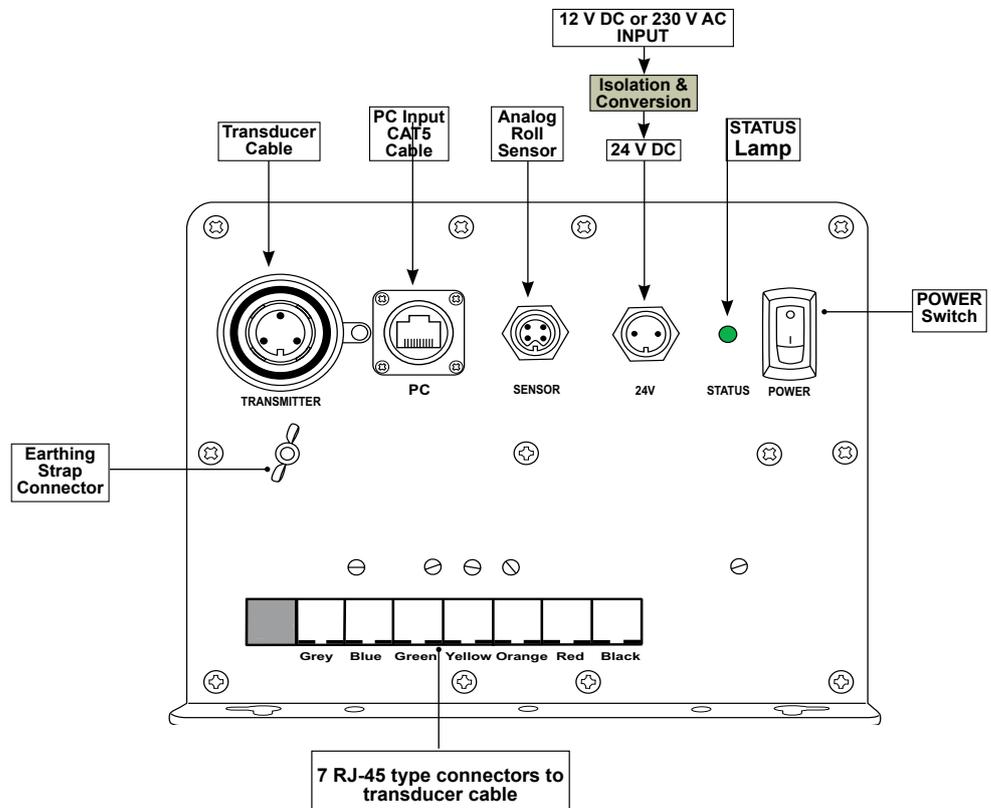
Figure 3 – Transceiver Controls and Indicators

User Interface   When the WMB-160F program starts up, a Navigation Warning screen similar screen to the one shown in Figure 3 is displayed.

Click on OK to accept the navigation warning message.
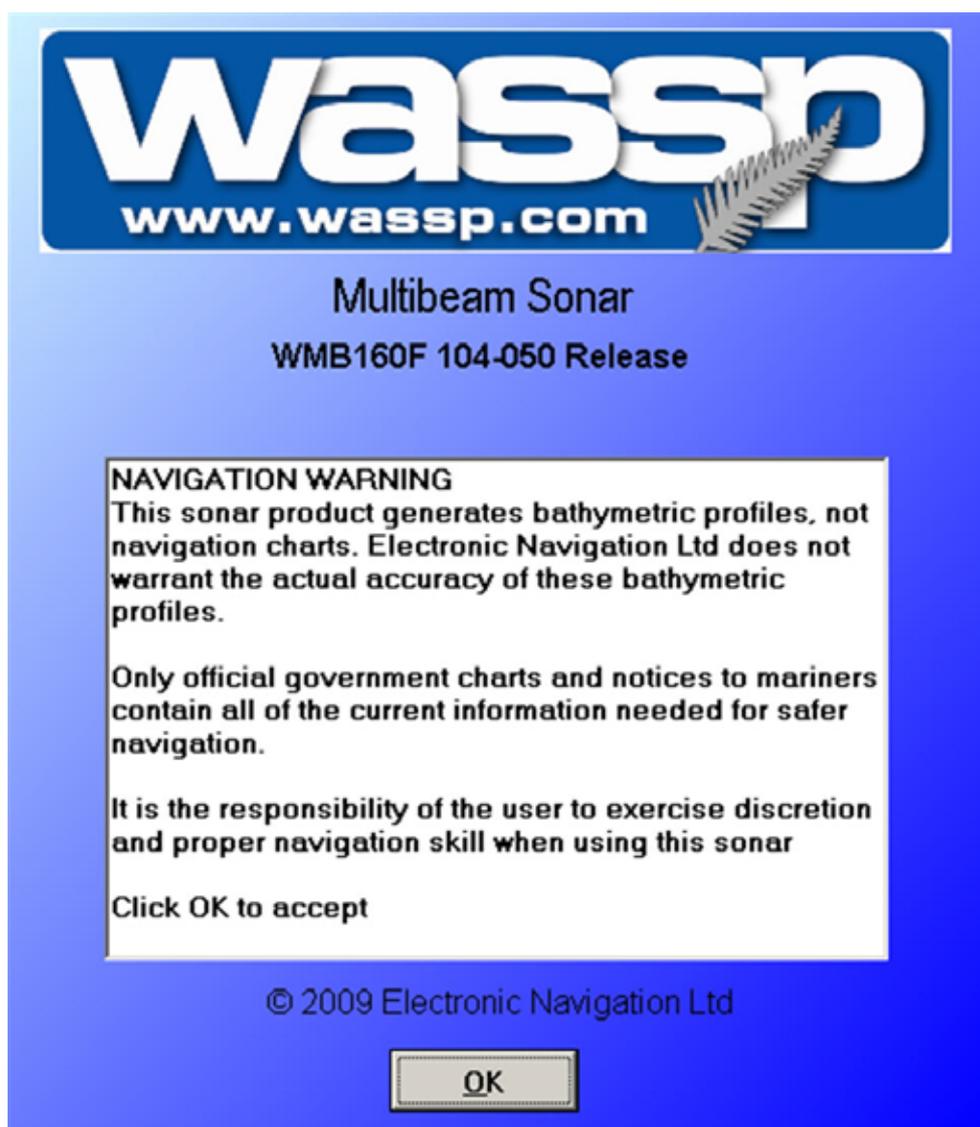
Figure 4 –   WMB-160F Multi-beam Sonar System Navigation Warning

User Interface After accepting the Navigation Warning, when the WMB-160F program starts up, a screen similar to the one shown in Figure 4 is displayed.

Figure 4 shows the user interface in a 4-screen configuration. The menu task bar is displayed vertically on the right hand side of the screen.
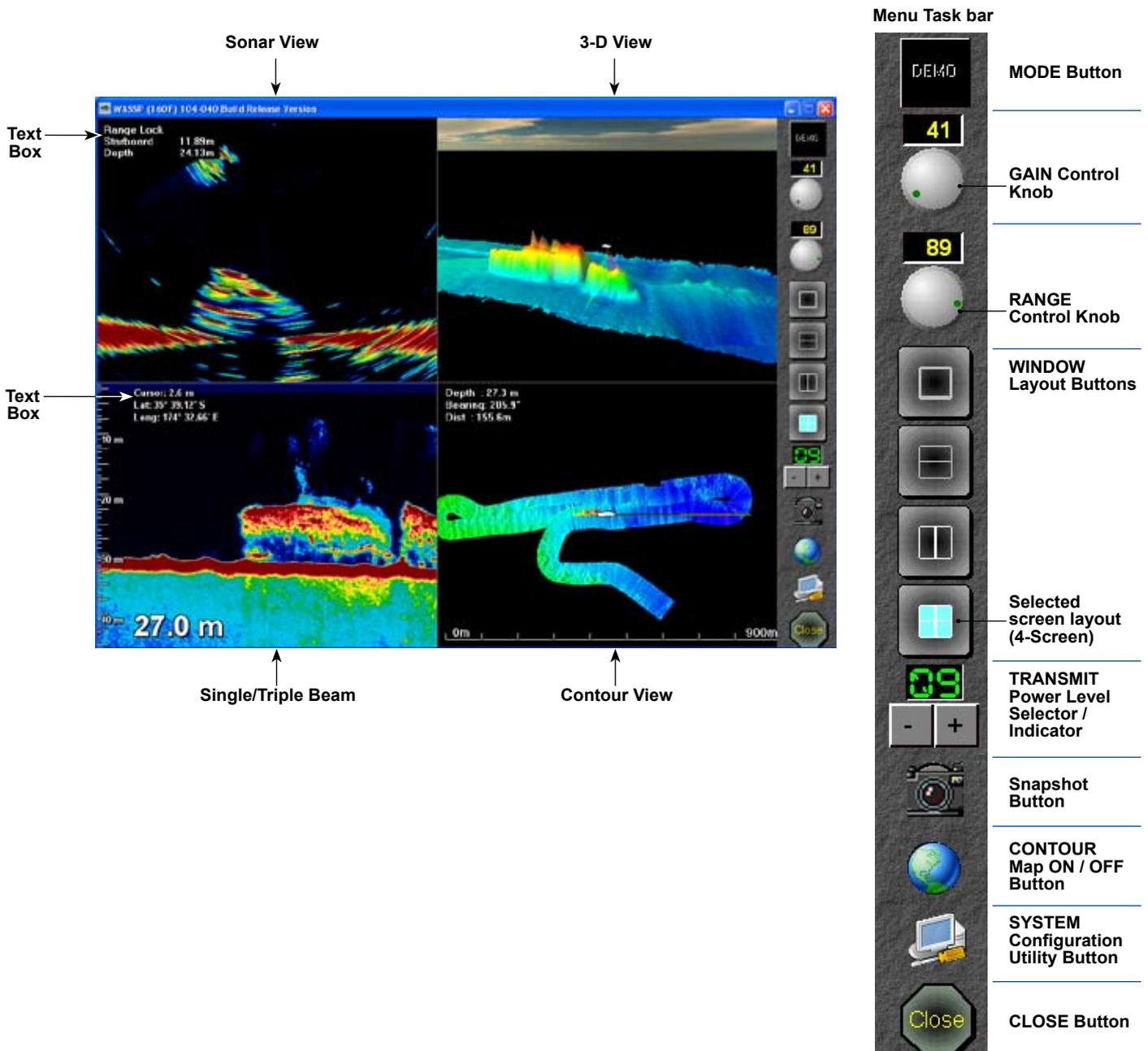
Figure 5 – WMB-160F Multi-beam Sonar System User Interface

Menu Task bar

STBY

DEMO

Cal ▶ Cal ▶ Cal

Start up | **Transition (Self Calibration)** | **After 3 sec**
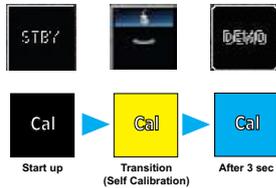
👍 **Double-click on the depth range window to switch between manual and automaic modes..**

👍 **Double-click on the transmit power level window to switch between manual and automaic modes..**

| Name	Function	Remarks
MODE Button	This button has three modes: • Standby mode. • Transmit Mode. • Demonstration Mode.	While in the STANDBY mode, click to change to TRANSMIT mode and vice versa. During start up the system goes through a calibration procedure, indicated by the button changing from BLACK to YELLOW to BLUE.
GAIN Control Knob	Adjusts the gain of the receiver. The digital display above the knob shows the gain setting.	Adjust using the mouse pointer on the gain knob.
RANGE Control Knob	Adjusts the depth range of the receiver between 5 and 300 metres. The digital display above the knob shows the range setting in metres.	**Manual Mode**: Display YELLOW. Adjust using the mouse pointer on the gain knob. **Automatic Mode**: Display GREEN
WINDOW Layout Buttons	The four window layout buttons allow you to change the presentation of the seafloor profile on the screen using a: • Single Screen Layout. • Vertical Split Screen Layout (Layout Two). • Horizontal Split Screen Layout (Layout Three). • 4-Screen Layout.	The single screen layout button (top button) allows toggling through five choices on a single window. The choices are Sonar, Single/Triple Beam, Contour, 3-D, and Sidescan. The double screen layout buttons (two middle buttons) allow toggling through 4 pre-selected combinations of layouts in either a horizontal or vertical layout. These can be altered via the System Configuration Utility. The 4-screen layout button (bottom button) allows toggling through five choices on a 4-window display.
TRANSMIT Power Level Selector / Indicator	The digital display shows the transmit power level. Increment and decrement buttons increase or decrease the transmit power level.	Initially use auto power mode until familiar with the operation of the unit. Generally use auto power (indicated when the digital display is GREEN).
Snapshot Button	Creates a snapshot of ≈1000 pings of scan time of a selected area.	Snapshot data is shown in the single / triple beam view, sidescan view, and contour view.
CONTOUR Map ON / OFF Button	ON allows writing of contour maps. OFF stops writing of contour maps.	Normally set to ON. You may prefer to turn OFF if there are already good images for the current location and the present conditions are not ideal for good bottom images. Turn OFF if there are faults with electronic compass heading data or GPS latitude and longitude data.
SYSTEM Configuration Utility Button	Accesses sub-menus that are not frequently required such as day / night settings, tides, and configuration options.	

Name	Function	Remarks
CLOSE Button	Quits the WMB-160F program.	

MODE Button

When the WMB-160F software application starts up, the MODE button should change from BLACK to YELLOW to BLUE as it goes through its start up and self calibration routine.

Button	Mode	Description
STBY	**Standby Mode** (Click to change mode to Transmit)	The button is BLACK during start up. The button turns YELLOW for about 3 seconds while the transceiver self-calibrates and then turns BLUE, indicating the transceiver has just calibrated and is ready to go. A RED counting button indicates a communications failure. This means that a ping was requested but no data was received. A new ping is sent at least every 5 seconds. A communications failure can happen if the transceiver power is interrupted. Cal — Start up ▶ Cal — Transition (Self Calibration) ▶ Cal — After 3 sec
	Transmit Mode (Click to change mode to Standby)	During transmission, the button animates, showing a pulse for each transceiver pulse being transmitted.
DEMO	**Demonstration Mode**	A BLACK button with DEMO displayed indicates the system started with no dongle. In this mode only replay files can be viewed.
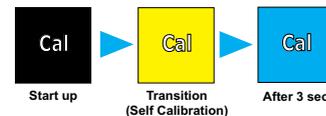
Gain Control Knob

Button	Description
15	Adjusts the gain of the received information. Manually adjust by either clicking and then using the scroll wheel on the mouse, or by using the mouse pointer to drag the knob clockwise to increase and counter clockwise to decrease.

Range Control Knob

Button	Description
60	Adjusts the depth range of the receiver between 5 and 300 metres. The numeric display is YELLOW for manual and GREEN for automatic adjustment. Default is green (automatic mode). Manually adjust by either clicking and then using the scroll wheel on the mouse or by using the mouse to drag the knob clockwise to increase and counter clockwise to decrease. Double clicking on the number causes the control to switch from manual to automatic and vice versa. Set the range to adjust automatically until familiar with the operation of the unit.

## Screen Layout Buttons

Button	Description
	There are four screen layout display options to choose from. A button on the task bar represents each screen layout option. Click the button for the layout option you require. The four screen layout options are: • Top Button - Single Screen Layout (shown selected). • Second Button – Horizontal Split Screen Layout (Layout 2). • Third Button – Vertical Split Screen Layout (Layout 3). • Bottom Button – 4-Screen Layout. For each screen layout, there are five viewing modes available. Each viewing mode displays a different way of viewing the information from the seafloor and water column. The viewing modes are (See Figure 5): • Sonar View. • Single / Triple Beam View. • Contour View. • 3-D View. • Sidescan View.

Sonar View **Single / Triple Beam View**

3-D View **Contour View**

Sidescan View
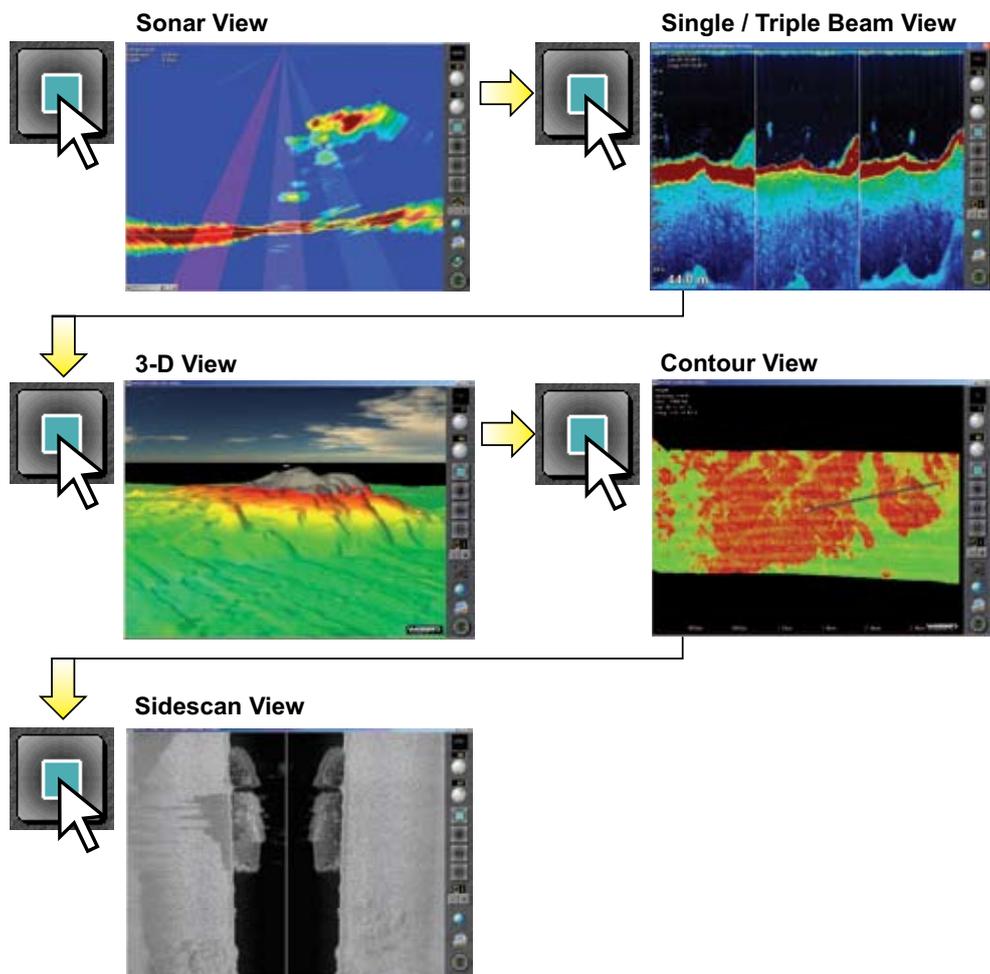
Figure 6 – Selectable Viewing Modes

Top Button – Single Screen Layout

Button	Description
	This is a single screen layout that allows you to toggle through five viewing modes.
	Figure 6 shows the layout of the screen when the top button is selected. The screen is displaying the sonar view. All five viewing modes are available, but with only one being displayed at a time.
	Right-click and **independent zooming** options are available for each viewing mode.

Note, the five viewing modes are available in each of the four screen layout configurations provided you set up all screens in the Layout Two and Layout Three windows of the System Configuration Utility. Click the single screen layout button to toggle between them.
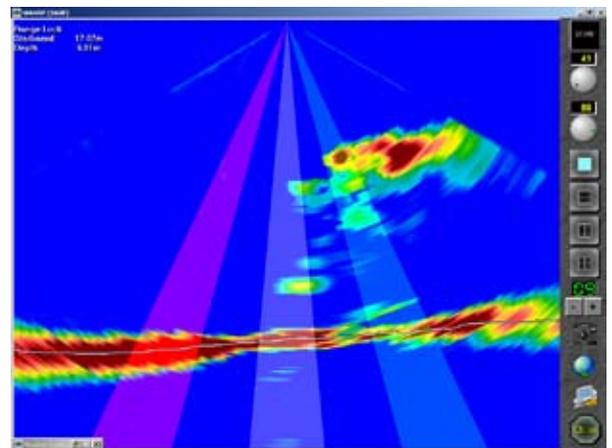

Figure 7 – Single Screen Layout showing the Sonar View

Second Button – Horizontal Split Screen Layout (Layout Two)

Button	Description
	This is a split screen layout that allows you to toggle through four pre-selected toggle combinations of the five viewing modes in a one above, one below configuration. The four pre-selected toggle combinations can be altered via the System Configuration Utility under the Layout Two button.
	Figure 7 shows the layout of the screen when the second button is selected. The screen is horizontally split, displaying the sonar view on top and the contour view with fish overlay below.
	All five viewing modes are available, with any two being displayed at one time.
	Right-click and **independent zooming** options are available for each viewing mode.

Note, the five viewing modes are available in each of the four screen layout configurations provided you set up all screens in the Layout Two and Layout Three windows of the System Configuration Utility. Click the horizontal split screen layout button to toggle between them.
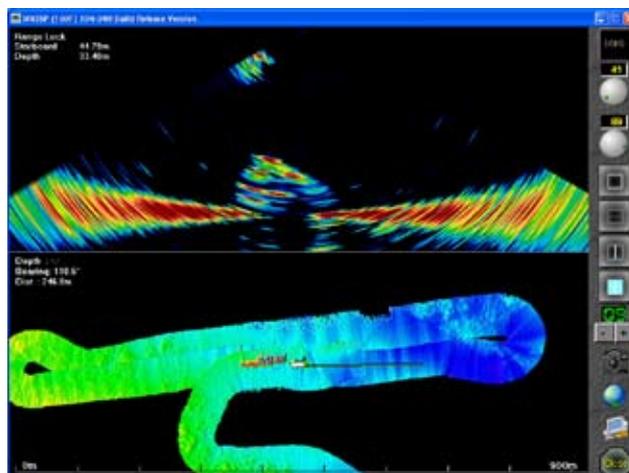
Figure 8 – Horizontal Split Screen Layout (Layout Two)

Third Button – Vertical Split Screen Layout (Layout Three)

Button	Description
	This is a vertically split screen layout that allows you to toggle through four pre-selected toggle combinations of the five viewing modes in a side by side configuration. The five viewing modes can be altered via the System Configuration Utility under the Layout Three button. Figure 8 shows the layout of the screen when the third button is selected. The screen is vertically split, displaying the single beam view to the left side and the sonar view to the right side. The five viewing modes are available, with any two being displayed at one time. **Right-click** and **independent zooming** options are available for each viewing mode.

Note, the five viewing modes are available in each of the four screen layout configurations provided you set up all screens in the Layout Two and Layout Three windows of the System Configuration Utility. Click the vertical split screen layout button to toggle between them.
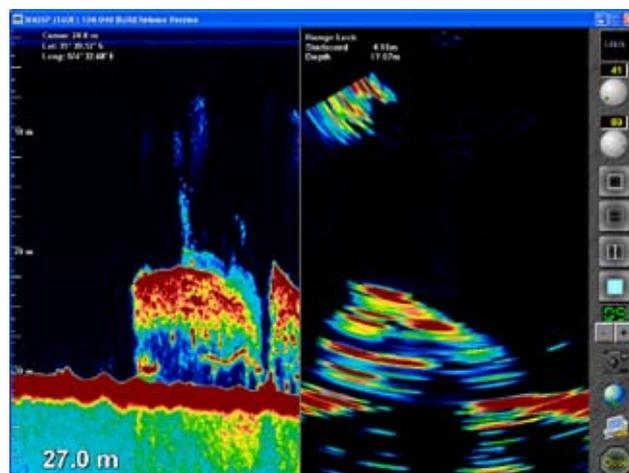
Figure 9 – Vertical Split Screen Layout (Layout Three)

Bottom Button – 4-Screen Screen Layout

Button	Description
	This is a 4-screen layout that allows you to toggle through five viewing choices with four of them on display. Figure 9 shows the layout of the screen when the bottom button is selected. The screen is divided into four, displaying the sonar view on top left, the 3-D view on top right, the single beam view on bottom left, and the contour view on bottom right. **Right-click** and **independent zooming** options are available for each viewing mode.

Note, the five viewing modes are available in each of the four screen layout configurations provided you set up all screens in the Layout Two and Layout Three windows of the System Configuration Utility. Click the 4-screen layout button to toggle between them.
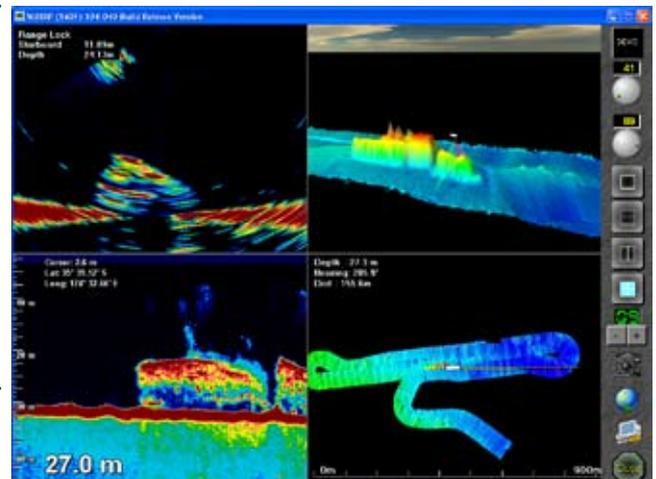

Figure 10 – 4-Screen Layout

Transmit Power Level Selector / Indicator

Button	Description
	The transmit power level selector / indicator operates in the manual and auto modes. Initially use auto power or ~9 power level in the manual mode until you are familiar with the operation of the unit.
	Manual Mode There are 14 transmit power levels that can be selected. Click the increment (+) or decrement (–) buttons to adjust between 01 to 14.
	Auto Mode Double-clicking the LED indicator selects the auto mode, indicated by the LEDs changing to GREEN.

Snapshot Button

Button	Description
	Clicking this button creates a snapshot of ≈1000 pings of a selected area.
	See Snapshots Button on Page 62 for detailed procedures on how to play snapshot files.

Contour Map ON / OFF Button

Button	Description
	Contour Map Button ON
	Contour files are only generated when this icon is ON. Contour map files are always read in if available. The default setting is ON.
	Contour Map Button OFF
	Turning OFF prevents over writing data already stored for contour maps. You may prefer to turn OFF if there are already good images for the current location and the present conditions are not ideal for good bottom images.
	Turn OFF if there are faults with the electronic compass heading data, or GPS latitude and longitude data.
	Contour mapping is OFF when the button has a large RED X.

System Configuration Utility Button

Button	Description
	This button accesses sub-menus that are not frequently required, such as day / night settings, tides, and configuration options.
	These sub-menus are discussed in further detail under the headings **System Configuration Utility** and **Advanced Options**.

Close Button

| Button	Description
	Clicking this button quits the WMB-160F program.
	After clicking **Close**, you must then click **OK** for the program to shut down fully. See Operating Procedures on Page 37 for detailed procedures.

Viewing Modes

Sonar View

The sonar view shows the water column and seafloor profile below the transducer. This represents a sonar view of the water column and seafloor as seen from behind the vessel. See Figure 10.

A 120° wide by 4° long swath or footprint is covered. The system generates 112 beams over the 120° footprint to provide a very high-resolution sonar view. The centre 90° of the swath or footprint is used to develop seafloor profiles and gives a seafloor coverage of twice the depth (e.g. 100 m depth gives 200 m seafloor coverage).

The following methods are used to control the **sonar** view screen:

▶ Right-click Options.
▶ Independent Zooming.

▶▶ TIPS

If there is a secondary sonar or sounder operating on the vessel, you may see pulses of interference from this device on the sonar, triple beam, and sidescan displays. To reduce this interference select the interference filter in the Advanced Options box. See **Advanced Options** for details.
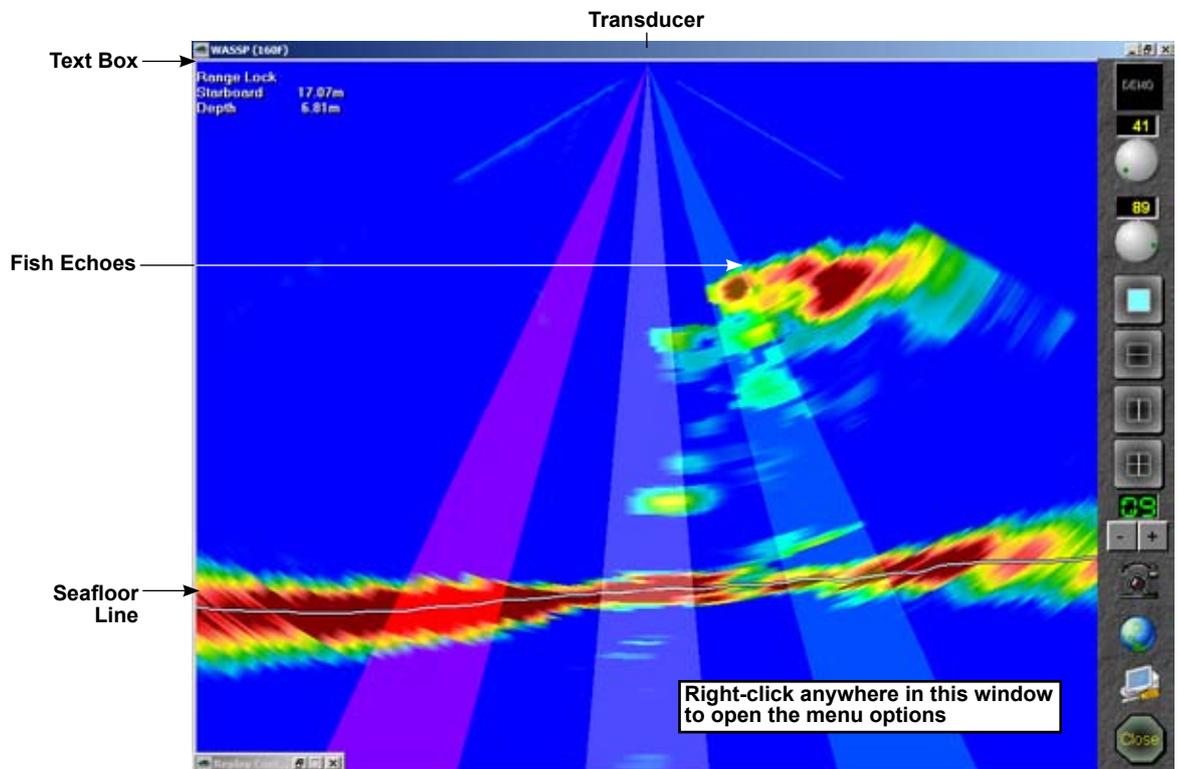
**Figure 11 – Single Screen Layout showing the Sonar View**

Right-Click Options

Using the right mouse button, right-click in the **sonar** view screen to display the following menu options. Click Grid or Text Box to display sub-menus:

Grid	Overlays a grid over the sonar view to enable you to quickly judge distances to targets.
	Click to display Grid options
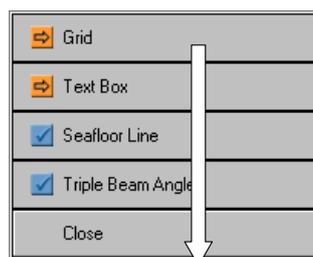
Text Box	Provides the option of a text box to appear in the top left-hand corner of the **sonar** view window. The text box provides x and y axis information on the location of the cursor within the window. You can then place the cursor on a target and know the x y distances to the target.
	Click to display Text Box options.
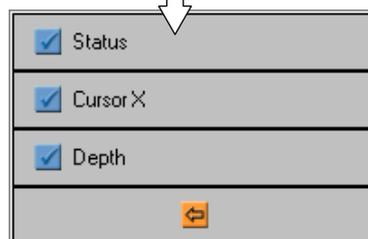
Seafloor Line	Is the software-generated line of the estimated profile of the seafloor.
	Click to apply (tick), click to clear (X).
Triple Beam Angle	Overlays the triple beam swath image with a mask showing the width and position of each of the beams. A RED mask for the port beam, a white mask for the centre beam, and a GREEN mask for the starboard beam.
	Click to apply (tick), click to clear (X).

Independent Zooming

The sonar view can be zoomed in or out independently of other screens. Click in the sonar view screen and roll the scroll wheel to zoom in or out. To return to default zoom, double-click in the sonar view screen.

Advantages

ᴖ Shows an instant snapshot of the area inside the 120° x 4° swath.

ᴖ Shows seafloor profile and fish distribution under the vessel at the same time.

ᴖ The best tool for judging power level and side lobe suppression levels.

ᴖ Shows full resolution of sonar data collected and could allow an operator to pick up seafloor features too small to appear on the 3-D and contour displays.

Disadvantages

ᴗ No history. Information from previous snapshots is not shown.

Single / Triple Beam View

This feature displays information that is similar to the traditional fish-finder display of the water column and seafloor with history along the vessel's track. In the triple beam view it shows the port, middle (below the transducer), and starboard beams See Figure 11.

The following methods are used to control the single / triple beam screen:

► Right-click Options.

► Independent Zooming.

► Shifting.

Horizontal Layout

Port Beam

Middle Beam

Starboard Beam

Full Screen Button

53.2 m

Port Beam   Middle Beam   Starboard Beam

Text Box

Right-click anywhere in these windows to open the menu options

46.6 m

Vertical Layout

Figure 12 – Single / Triple Beam View

Right-Click Options

Right-click in the **single / triple beam** view screen to display the following menu options:

Single / Triple Beam Box

Click Grid, Options, Text Box, or Advance Rate to display sub-menus.

| Grid | Overlays parallel range lines onto the single / triple beam display so that you can quickly estimate ranges to targets. With Bottom Lock **disabled**, this grid is calibrated as depth (from vessel to target). With Bottom Lock **enabled**, this grid is calibrated as distance from the seafloor (from seafloor to target). These are similar to the Grid options of the sonar view. |

Options   Click to display further options:

- **Bottom Lock** – this enables a traditional bottom lock mode where the changes in bottom depth are ignored and the bottom is drawn flat. Fish and other echoes are shown relative to this flat bottom image enabling better discrimination between bottom fish and the sea floor.

- **Triple Beam** – when ticked, Triple Beam displays the view below the vessel from the port, middle, and starboard beams. When not ticked, the middle beam only displays the view below the vessel. The **port beam** is on the left or top (depending on status of the **Horizontally** check box). The **starboard beam** is on the right or bottom.

- **Seafloor Line** – is the software-generated line of the estimated profile of the seafloor.
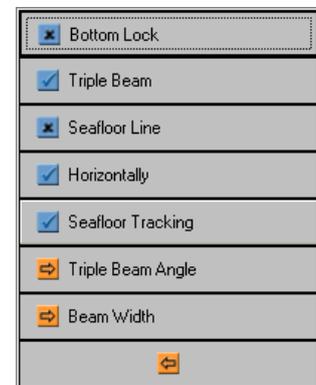

Options Sub-menu
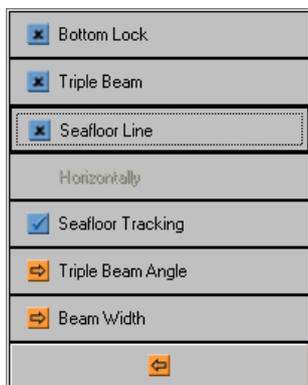
- **Horizontally** – when checked, the **triple beam** windows are drawn horizontally, one on top of the other. The Port beam is at the top of the screen and the Starboard beam at the bottom of the screen.

  When not checked, the triple beam windows are drawn vertically, with the Port beam on the left and the Starboard beam on the right of the screen. See Figure 11.

- **Seafloor Tracking** – is the method used by the program to constantly display the seafloor during scanning operations regardless of the changes in seafloor depth. This is indicated by the word **(Tracking)** being tagged to the end of the words **Manual Zoom** in the Text Box. Seafloor Tracking must be selected in the sub-menu and the Range Control Knob set to automatic (GREEN). If Seafloor Tracking is deselected in the sub-menu, the word (Tracking) disappears from the Text Box. If the Range Control setting is in manual mode (YELLOW) and the seafloor then drops below the range setting, the seafloor will stop being tracked (and lost from the screen).

- **Triple Beam Angle** – represents the angle between the centres of the three beams and can be set to 5, 10, 15, 20, 30, or 40° settings.

- **Beam Width** – represents the width of the individual beams and can also be set to 5, 10, 15, 20, 30, or 40° settings. Selecting a 10° beam width with a 20° **triple beam** angle will therefore give a 50° swath for the **triple beam** view. See Figure 12.

> **▶▶TIPS**
>
> A broader beam provides better coverage and less chance of missing fish marks, but with less definition.
>
> A narrower beam width means higher definition to the information, providing a better idea of the fish density and the shape of the bottom.

Figure 12 shows the differences between beam angle and beam width.

Note, these settings are set up in the single / triple beam view, but also affect the beam angle and beam width of the sonar view. They are shown here in the sonar view for descriptive purposes only.
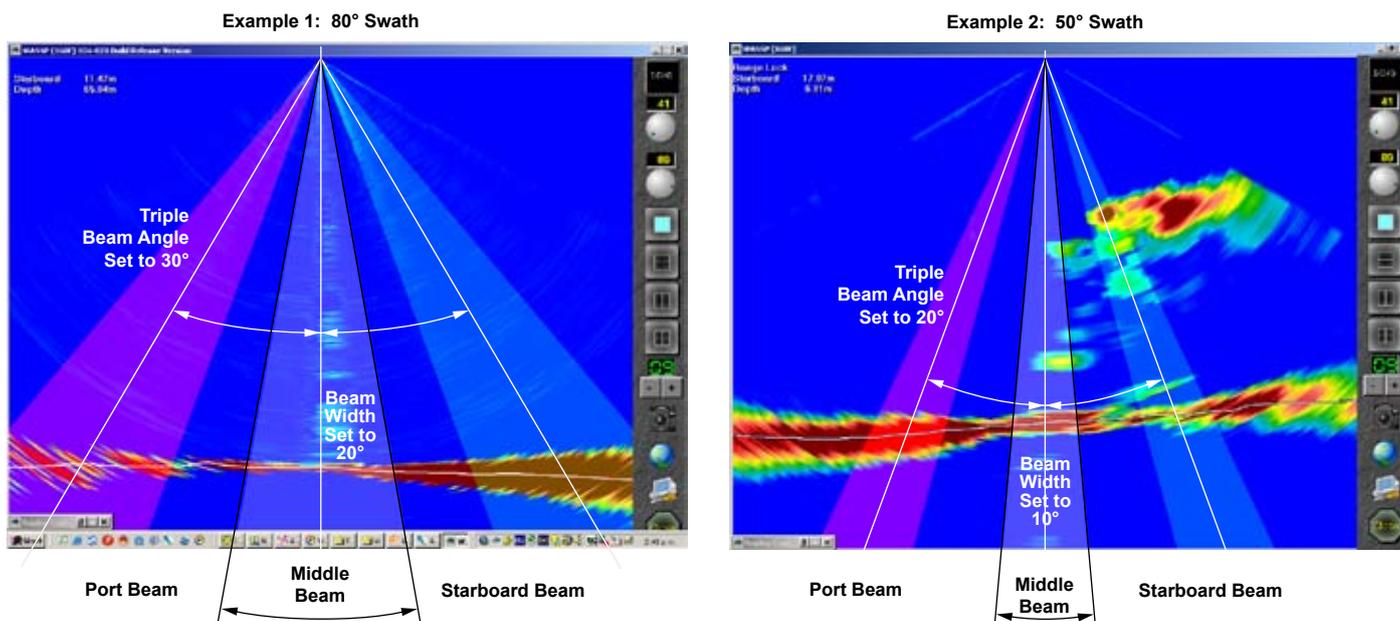
Figure 13 – Triple Beam Angle and Beam Width

Text Box   A text box can be displayed in
the left hand corner of the single
beam or triple beam views. Click
Text Box to display options.
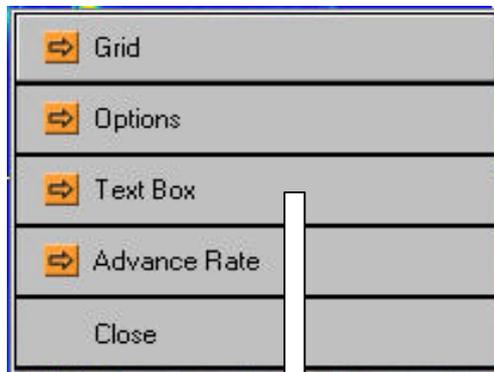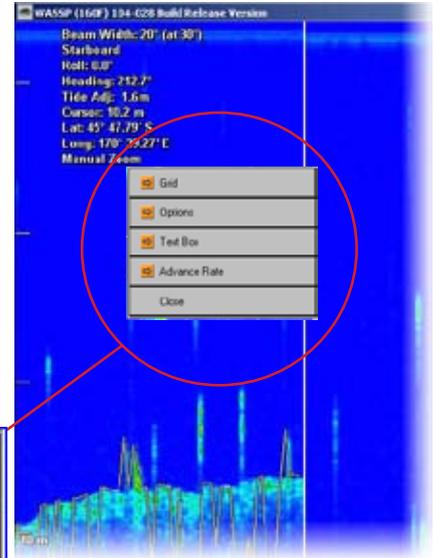
**Placing a tick in the box associ-
ated with each option will cause
the data to be displayed in the
left corner of the single beam or
triple beam screen display.**

Advance Rate
Changes the pixel width and consequently the rate (from 1 to 5) at which the
single / triple beam view scrolls across the display. Click to display options and
select rate.

Independent Zooming

The single / triple beam view can be zoomed in or out independently of other screens. Click in the **single / triple beam view** screen and roll the scroll wheel to zoom in or out. To return to full window view, double-click in the **single / triple beam view** window.

Display Offset (Shifting)

With the Bottom Lock mode **not** selected, the Display Offset function allows you to shift the focus of the display to a depth range below 0 metres, while remaining at the same zoom level.

For example, to shift from say the 0 to 50 metres range to the 50 to 100 metres range, click and hold the left mouse button while rolling the scroll wheel until you reach approximately the 50 to 100 metre depth range. A display box appears on the screen to inform the operator of the offset depth value. Release the left mouse button and you can zoom in or out again, but now zoom occurs from 50 metres.

Advantages

- Shows past information.
- Width and colours of seafloor return can be used to help determine bottom types.
- Adjustable beam width allows optimisation for full coverage or high resolution to see small detail changes.
- Display redraws dynamically when range, gain, or zoom change.

Disadvantages

- Harder to relate the location of features seen to the vessel's position.
- Does not show all information seen by the sonar view.

Contour View This represents a profile contour view of the seafloor where depth is depicted by colour. Detailed seafloor profiles can be quickly built up and stored on the WMB-160F computer.

Figure 13 is an example of a contour view showing how a detailed seafloor profile of an area can be created.

The following methods are used to control the contour screen:

▶ Right-click Options.
▶ Independent Zooming.
▶ Contour Fish Overlay Options.
▶ Backscatter Overlay Options.

Text Box
Displaying:
- Depth of the seafloor below the vessel.
- Bearing from vessel icon to cursor.
- Distance from vessel icon to cursor.

Vessel Track

Right-click anywhere in this window to open the menu options

Ship Icon
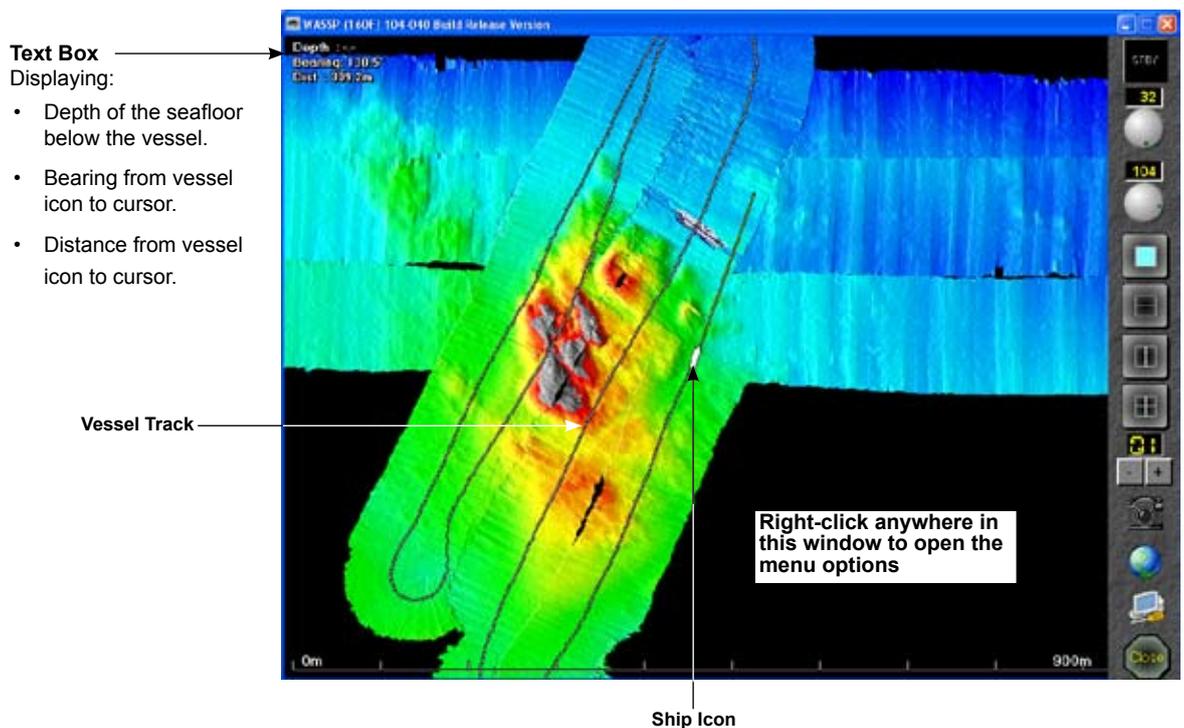
Figure 14 – Contour View

Right-Click Options

Right-click in the **Contour View** screen to display the following menu options:

Goto Page 28 -

Fish Threshold   Clicking this button displays the **Fish Options** dialog box. See **Contour Fish Overlay** on Page 27.

Colours   Clicking the **Colours** button displays the **Depth Colours** dialog box that enables you to change the colours indicating depths on the **contour** and **3-D** views.
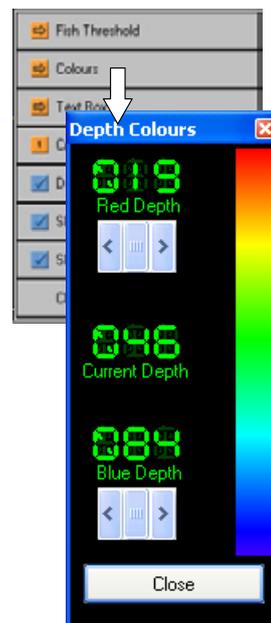
👍 **Note: With Show Fish selected, the Contour and 3-D views display the seafloor as grey scale with full colour fish overlay.**

With Show Fish not selected, the Contour and 3-D views display the seafloor as full colour.

Text Box   The Text Box provides depth, bearing, displacement cursor information and position while in the **contour** view. The depth is the depth at the position highlighted. The bearing and distance are those to the point from the vessel.

Event Marker   This sets a marker at the current vessel position. The mark can be removed by double-clicking it once highlighted.

Cursor Event Marker   Right clicking with the mouse will place an event marker at the cursor position. The mark can be removed by double-clicking it once highlighted.

Draw Vessel Track   The **contour** view shows the vessel track as an overlay while this feature is activated.

Show Fish   This enables the contour fish overlay mode. See **Contour Fish Overlay Options** on the following page.

Show BackScatter   Shows backscatter information on **contour** view. This function is useful for showing the changes in seafloor types over an area. See next page for backscatter set-up screen.
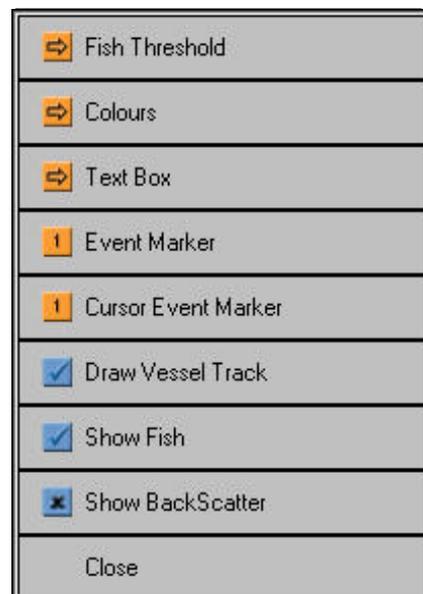
Click Fish Threshold, Colours, or Text Box to display sub-menus.

Backscatter

Ticking the **Show BackScatter** box while in **contour** view will bring up the backscatter settings window. Correct setting of the backscatter gain controls will greatly help display seafloor changes.

To change the Backscatter Gain, two modes are available: Auto and Manual. In auto mode, the backscatter gain will be set automatically, based on the backscatter energy.

In manual mode, to change the gain values for Soft/Steep bottom or Hard/Flat bottom, hold the mouse cursor over the arrow symbol and drag the arrow indicator up or down to vary the gain.

Backscatter gain threshold limit

Auto/Manual Backscatter Gain Select

Fig 15A - BackScatter Black & White gain controls   Fig 15B - BackScatter Colour gain controls
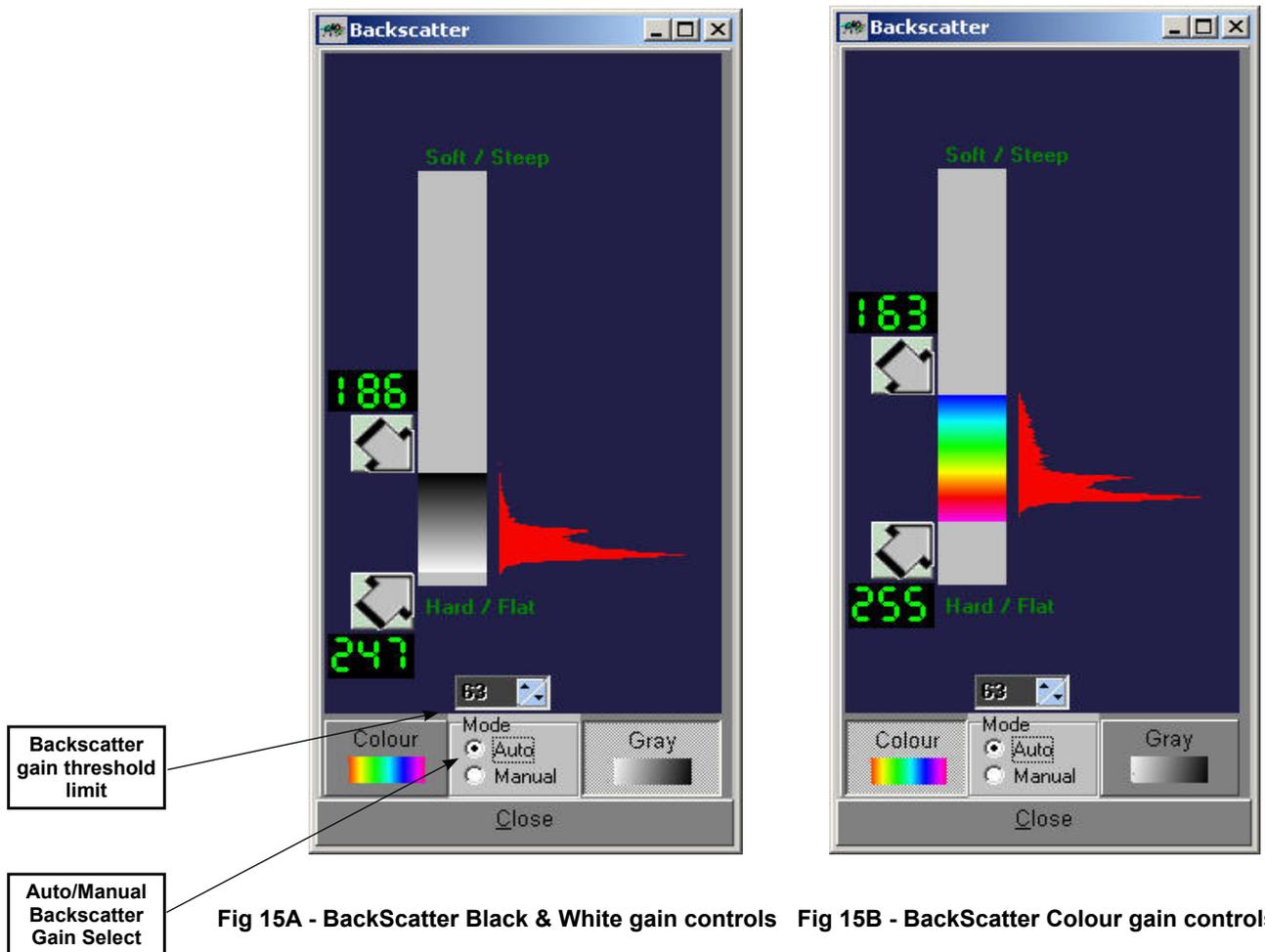
The backscatter spectrum plot shown alongside the gain controls allows you to choose a greater or lesser part of the backscatter energy spectrum in the backscatter display. Refer to the WASSP Installation Manual for more information.

Independent Zooming

The contour view can be zoomed in or out independently of other screens. Click in the **contour** view screen and roll the scroll wheel to zoom in or out. To return to the default zoom level, double-click in the **contour** view window.

Contour Fish Overlay Options

This represents a profile contour view of the seafloor where gradients along the seafloor are depicted by shades of grey. **Fish marks** that are within specified ranges are displayed over the top in colour, giving an accurate position reference of where the fish are in relation to the vessel and features on the seafloor. See Figure 14.

The **fish overlay** parameters are set up by right-clicking the screen and clicking the **Show Fish** button. This opens the **Fish Options** box which lets you edit the fish overlay parameters. See Figure 15.

> **Note: Both the fish and backscatter contour overlay data is collected and stored along with the contour depth information.**
>
> **New data collected, over writes old data for an area. To stop over writing, click the CONTOUR MAP ON / OFF button on the menu task bar.**


Vessel Bearing

Ship Icon
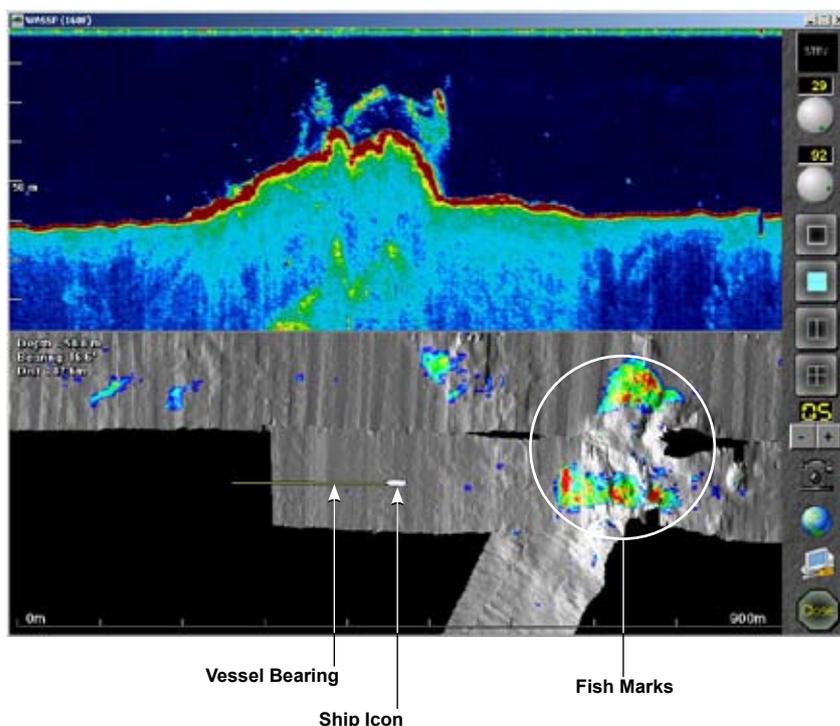
Fish Marks

Figure 16 – Single Beam and Contour View Showing Fish Marks

Selecting **Show Fish** from the **contour** right-click options displays a Fish Marks overlay on the **single beam** view. Once **Show Fish** has been selected on the contour display, the **Fish Options** box appears. See Figure 15.

Select how you want to see the fish in the contour view:

► **Between Depths**. Allows you to select to see fish between specified depths set up in the **Fish Options** box.

► **Depth From**. Allows you to select a depth from the bottom in the **Fish Options** box in which to see fish displayed.

Note: If displaying single beam view, the indicators show the depth range you have selected for the fish overlay.

Note: When showing fish overlay, colours for depth (seafloor) revert to greyscale.

Depth From Marker showing top position of 30 metres from bottom (seafloor)

Between Depths Marker showing Start depth of 11 metres

Between Depths Marker showing End depth of 31 metres
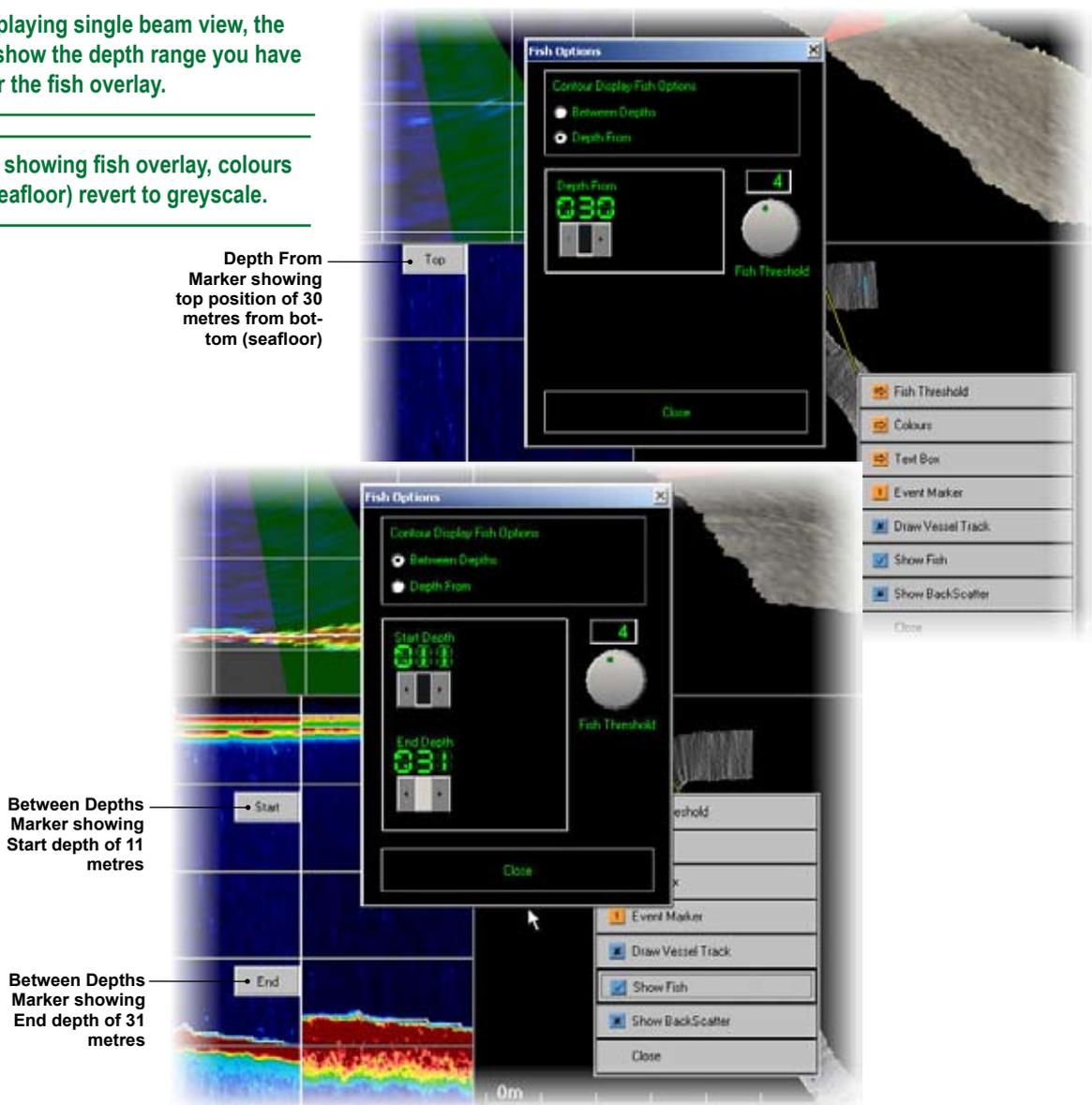
**Figure 17 – Fish Options Box with Between Depths or Depth From selected**

► The **Fish Threshold** control allows you to tune the "Fish Detection" for your vessel. The control has a range of 0 to 20. Initially set to zero, a higher number will ignore small echo signals and thus prevent noise showing up as fish targets. Reducing the Fish Threshold number will increase the sensitivity but will result in echo returns due to noise showing up as fish targets. Try varying the Fish Threshold setting up and down until you get one which is optimum for your vessel's installation.

Backscatter Overlay Options

Selecting **Show Backscatter** in the right-click options applies backscatter to the contour view of the seafloor along the profiled area. The colour scale is BLACK to WHITE (unless colour backscatter is ticked) with:

- BLACK = NO return (weak echoes).
- WHITE = HIGH return (strong echoes).

The lighter the colour on the screen, the stronger the return.

Using this display you can determine areas of hard / rocky ground (light areas) and areas of soft, sandy, or kelp covered ground (dark areas).

Right-clicking in the sidescan view opens the right-click options box. Click **Gain** to open the **Backscatter Gain** box, allowing you to adjust the gain factor (BLACK and WHITE) for both the sidescan and contour backscatter views.

Figure 16 shows Gain being selected in the right-click options box

See **Sidescan View** for more details on interpreting backscatter information.

Note: Recommended Gain Threshold Settings for the 160kHz WASSP system is between 60 and 65. This is set at time of installation and should NOT be changed.
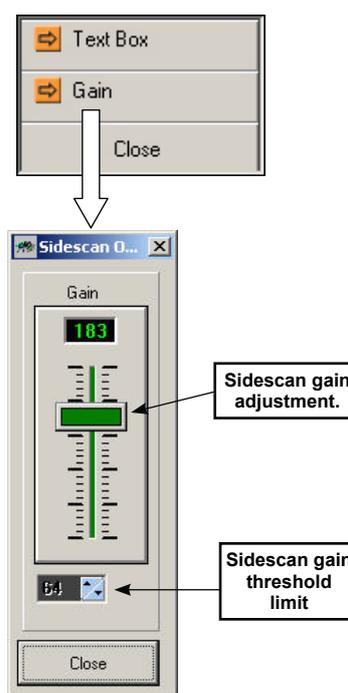

Figure 18 – Sidescan Options Box

The gain controls for both backscatter and sidescan modes are in the same options box (see figure 16). This box is automatically shown whenever the backscatter mode is selected from the contour map view. The options box can also be selected by right-clicking in the sidescan view screen.

Colour Backscatter

If the "Colour Backscatter box is checked, the backscatter information will be displayed in colour. Varying the backscatter gain will now change the colour of the backscatter display from blue (minimum backscatter) to red (maximum).

Colour backscatter helps display seafloor changes even more clearly than the black and white display mode.

Setting the Gain Threshold Limit:

The **Gain Threshold Limit** sets a reference value for the maximum level of backscatter that will be scaled into white colours. The limit is typically between 60 and 65, and is set at time of commissioning the system. Once set the limit rarely needs adjustment. To set the limit, sail over an area of seafloor that is known to have a high backscatter return (for example rocks). Adjust the Backscatter Gain Threshold value up or down until the map is very dark except for small white areas where the highest backscatter is received. The Backscatter Brightness can then be adjusted to give the desired picture. The brightness control can be varied at any time without affecting the saved backscatter maps, but changes to the Threshold Limit will alter the reference point for all backscatter values saved after the change.

N.B. - The Gain Threshold Limit can only be changed by a technician. Requires a Technician Dongle.

Warning - changing these at a later date will cause earlier recorded seafloor backscatter data to be displayed incorrectly.

Advantages

- Shows the vessel location and heading relative to the seafloor features, fish marks, and backscatter information.
- When showing fish overlay, colours for depth (seafloor) revert to greyscale.
- Mark option.
- History is saved and the data can be seen when visiting an area days or years after collection.
- Backscatter overlay shows changes in seafloor type clearly. Good for navigating a trawl path for fish only found in specific areas.

Disadvantages

- In shallow depths <45 metres, resolution of the contour view is less than the sonar view.
- The contour view picture relies on software algorithms to trace the seafloor correctly. Wrecks may trace as fish and vice versa.

3-D View   The **3-D view** screen displays a three-dimensional view of the seafloor from information generated by the WMB-160F. The WMB-160F sonar calculates seafloor profiles every pulse. These profiles are automatically stored on the computer.

As the vessel covers an area, a detailed seafloor profile is generated. This profile can be viewed in either the **3-D** or **contour** screen.

Figure 17 is an example of a 3-D view showing a three-dimensional image of a seafloor area that has been profiled using the WMB-160F. Right-click in the 3-D view screen to open a menu of options for this screen.

The following methods are used to control the 3-D view screen:

► Right-click Options.
► Independent Zooming.
► Changing View Angle.

Figure 19A — 3-D View

Ship Icon
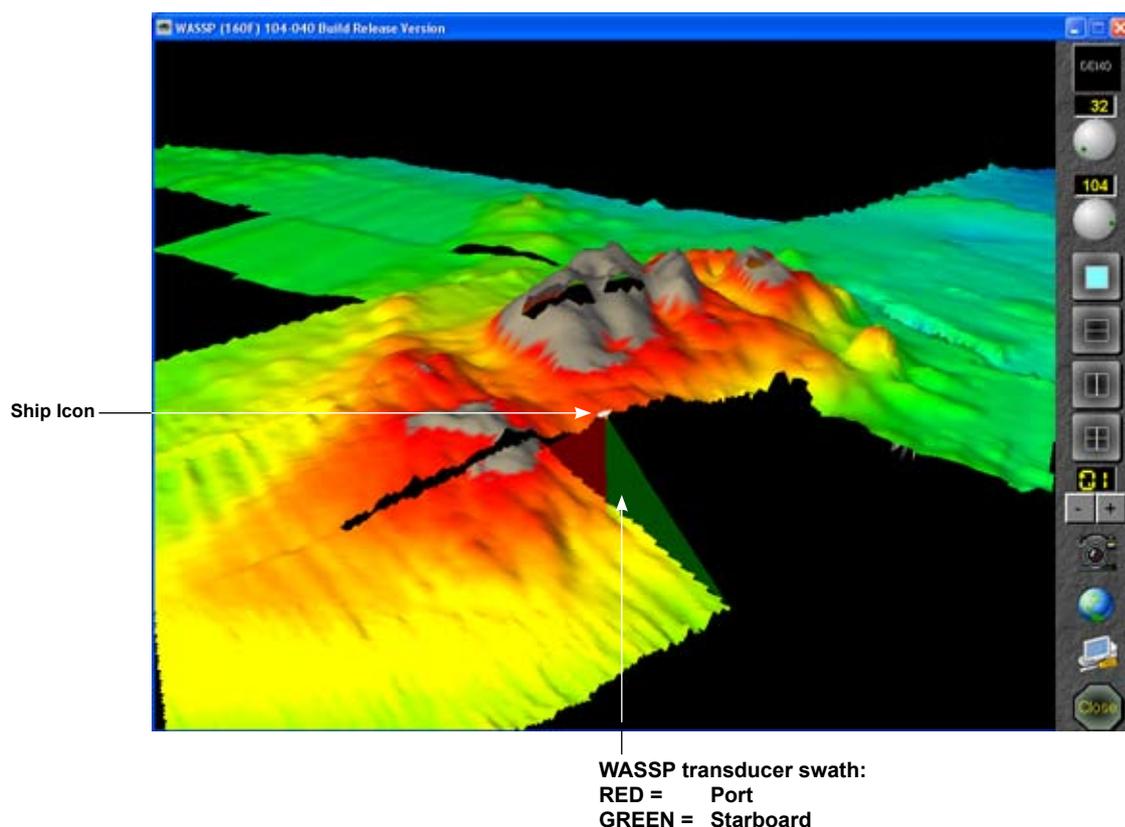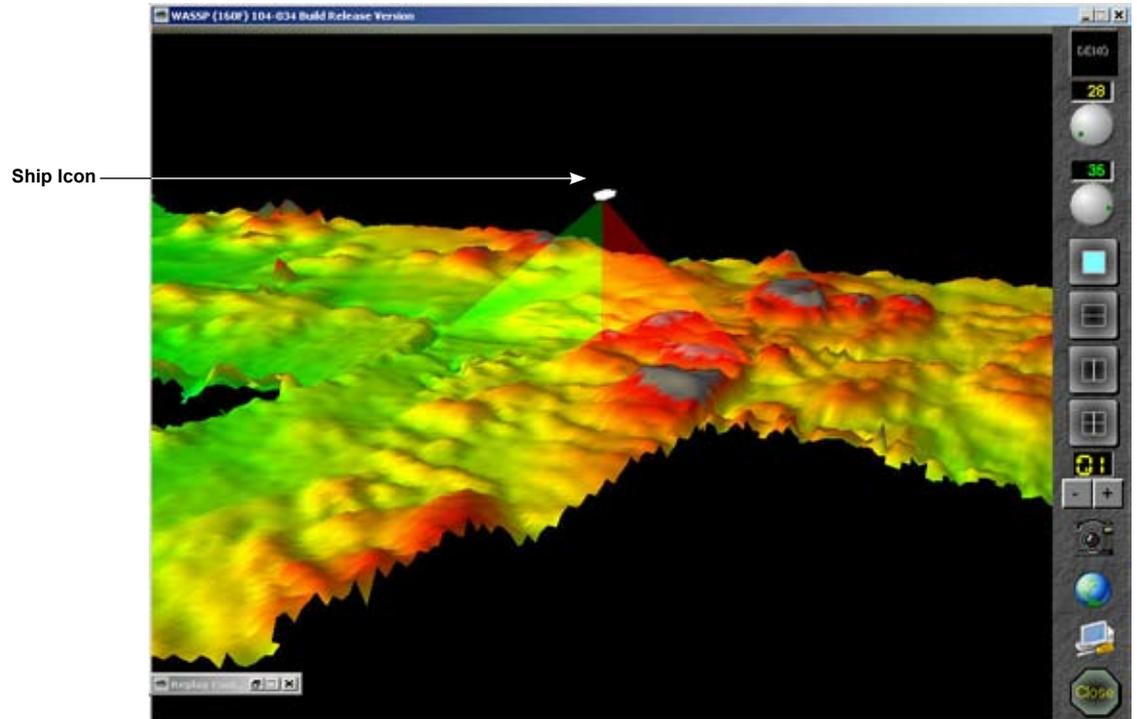
Figure 19B — 3-D View

Right-Click Options

Right-click in the **3-D** view screen to display the following menu options:

Show Swath	Clicking the **Show Swath** button selects or deselects the Show Swath option. The swath shown is an approximate representation of the sonar 120° beam.
Show BackScatter	Shows backscatter information on **contour** view. This function is useful for showing the changes in seafloor types over an area. **Black** = weak echoes. **White** = strong echoes.
Colours	Clicking the **Colours** button opens a **Colours** dialog box that allows you to alter the colour settings for depth. Changing the depth colour settings in this box also changes them in the **Contour** view mode.

View Clicking the **View** button opens a dialog box with the following view options available:

► **North Up** – means the 3-D view is always shown in a North-up mode, like the contour view, as per normal plotter functions.

► **Free Rotate** – means the 3-D view can be rotated freely by the mouse to view and highlight any particular area of interest.

► **Course Up** – means the 3-D view is always shown from just behind the vessel rotating as it turns.

► **Behind Vessel** – As with Course Up but the view is 100 to 300 metres behind the vessel.
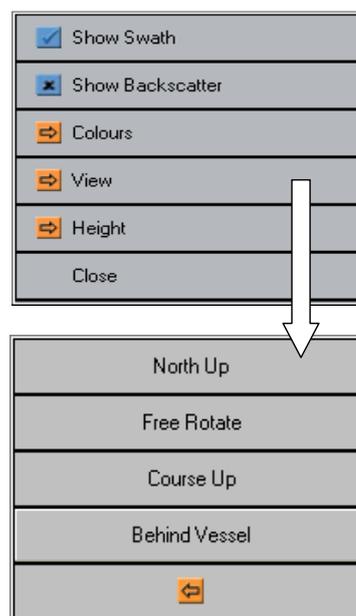
Height Clicking the **Height** button opens a **Height** dialog box that allows you to alter the height of the 3-D image. The options are 1:1, 2:1 and 3:1. Changing the height ratio from the default value of 1:1 causes a vertical exaggeration of the height of the 3-D image.

This allows sea bed objects to be accentuated, and may assist in determining of the nature of the sea bed or objects lying on the seafloor.
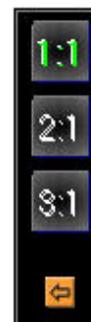
Note: WASSP systems with earlier versions of software had the height set to a fixed ratio of 2:1.

Independent Zooming

The **3-D view** can be zoomed in or out independently of the other windows. Click in the 3-D screen and roll the scroll wheel to zoom in or out. To return to the full screen view, double-click in the 3-D screen.

Changing View Angle

The angle that the 3-D image can be viewed at can be changed. Click anywhere in the 3-D view screen and then hold down the left mouse button. The 3-D view can then be angled around the vessel position to optimise the view by moving the mouse. Rotation of the view is performed in the same way, but requires Free Rotate to be selected in the right-click View options

Advantages

↻ Shows seafloor features in 3-D allowing an operator to gain a more complete picture of the seafloor.
↻ Rotation allows an operator to better distinguish patterns, trends, and objects..

Disadvantages

↻ Smaller viewing area than the contour view.
↻ No fish or hardness indications.
↻ In shallow depths <40 metres, resolution of the contour view is less than the sonar view.
↻ The contour view picture relies on software algorithms to trace the seafloor correctly. Wrecks may trace as fish and vice versa.

Sidescan View The sidescan view is a sidescan picture generated from the sonar data received by the system. The display is drawn on the screen as a waterfall – the newest information appears at the top of the screen, while the oldest falls off the bottom of the screen. This is similar to the way sounder displays operate, except that in their case the new data appears on the right and the old data disappears off the left of the screen.

The left side of the sidescan view shows the signals received from the port side while the right shows signals received from the starboard side. By default, the sidescan view starts at the centre of the vessel and works its way out to port and starboard.

As the sidescan image moves further out along the seafloor, the picture shows features on the seafloor. Objects, such as rocks, appear as bright white marks followed by a shadow. Harder ground gives strong returns (lighter on the grey scale), while a patch of mud or kelp causes a dark patch/shadow to appear. See Figure 18.

The primary advantage of the sidescan view over the other views is in locating and identifying objects on the seafloor off to each side of the

vessel. Some structures such as a shipwreck may appear like a large fish school on the sonar view and thus not appear as an object on the contour or 3-D views.

In Figure 18, the sidescan view allows you to interpret the sonar information from a different view point, showing a wreck just above the seafloor as a clearly shaped structure.

Due to the nature of the origin of the data, any signals of significant strength register as a faint mirror on the opposite side of the display. Standard sidescan systems generally rely on a towed transducer that is held deeper in the water, having the advantage of a lower aspect ratio.
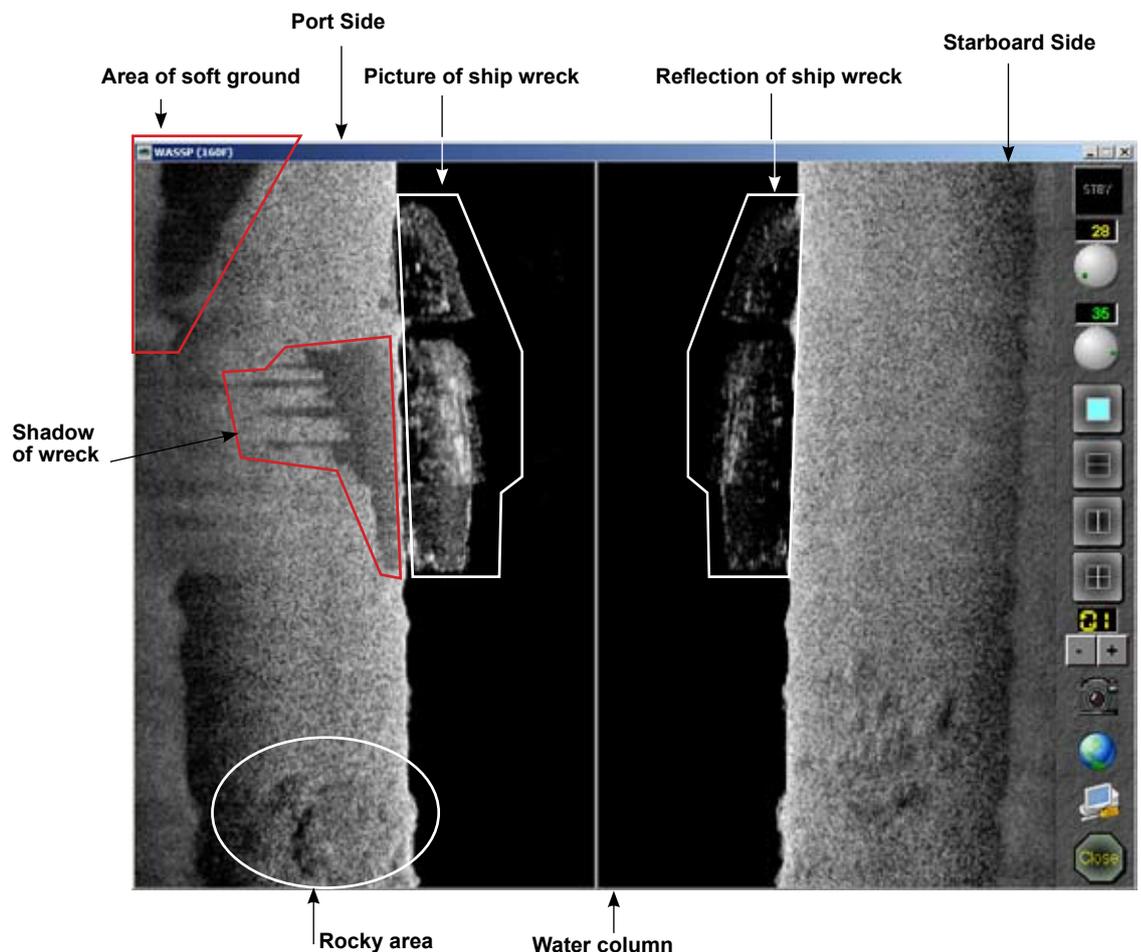
Figure 20 – Sidescan View

The following methods are used to control the sidescan view window:

► Right-click Options.
► Independent Zooming.

Right-Click Options

Right-click in the **sidescan** screen to display the following menu options:

Text Box
Provides the option of a text box to appear in the top left hand corner of the **sidescan** screen. The text box provides x and y axis information on the location of the cursor within the window. You can then place the cursor on a target and know the x y distances to the target.
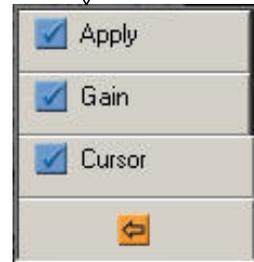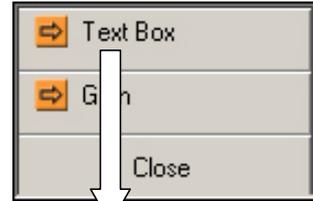
Gain
When you click the **Gain** button the **Sidescan Options** box appears and enables you to adjust the gain factor for the sidescan view.
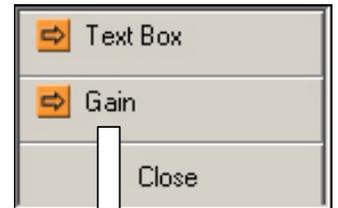
The right-hand slider allows you to increase or decrease the amount of WHITE in the picture.

Sidescan brightness adjustment.

Sidescan gain threshold limit
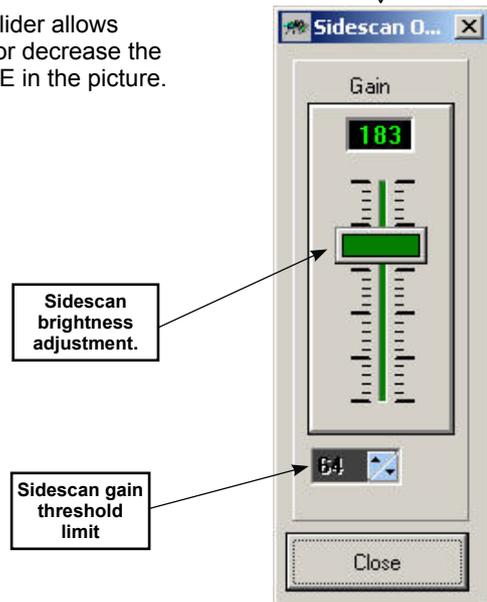
Independent Zooming

The **sidescan** view can be zoomed in or out independently of the other windows. Click in the **sidescan** screen and roll the scroll wheel to zoom in or out. To return to the full screen view, double-click in the **sidescan** screen.

Advantages

- Shows a detailed picture of the seafloor, allowing you to locate and identify objects on the seafloor off to each side of the vessel.
- Can detect small objects or changes in the seafloor texture or density.

Disadvantages

- Harder to tie features down to an exact location relative to the vessel than on the contour view.
- Doesn't compensate for slope of the seafloor.

Operating Procedures

STEP	PROCEDURE	SCREEN

1 **Turn on the power**:

a. Press the POWER button on the transceiver.

The transceiver starts up and the STATUS lamp glows GREEN. **This can take up to 30 seconds.**

b. Turn on the computer.

In standard installations, the WMB-160F program self loads.

The program then performs a self-calibration (STBY button turns YELLOW). When the button turns BLUE it is ready to go.

If no dongle is found, a **Dongle Error.** box appears on the screen.

Ensure a dongle has been plugged into the computer's USB port and click **Retry**. If this doesn't work, remove the dongle and try plugging in again.

STATUS   POWER
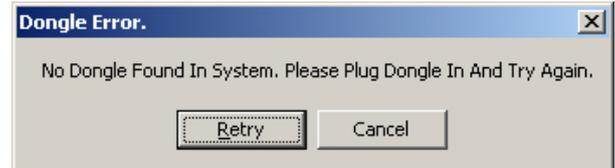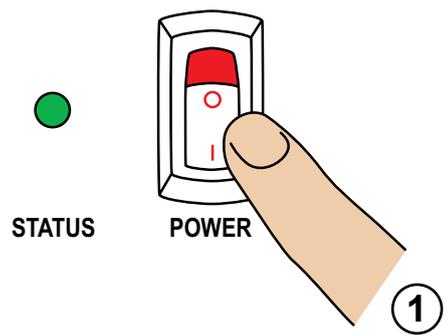
You can click **Cancel** and run a demo file from the System Configuration Utility.

2 **Transmit, receive**:

a. Click the MODE button to switch from STBY (standby) to the transmit mode.

When transmitting, the transmit button animates showing a pulse being transmitted from the vessel.

Note: The MODE button is disabled while playing back a demo file. While in the transmit mode a demo file cannot be played back.
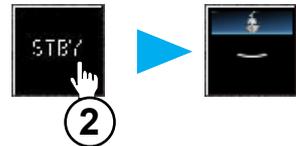
A RED counting transmit button means that a ping was requested but no data was received. A new ping is sent every 5 seconds. This happens if the transceiver power is interrupted.

STEP	PROCEDURE	SCREEN

3   **Choose a display mode**:

a. Click the window layout button representing the screen layout you require:

    Single.
    2-Horizontal Split Screen.
    2-Vertical Split Screen.
    4-Screen.

b. Keep clicking the layout button you have chosen until the display mode or modes you require displays.

    The 2-Horizontal and 2-Vertical screens can be reconfigured in the **System Configuration Utility**.

SINGLE   2-HORIZONTAL

③

2-VERTICAL   4-SCREEN
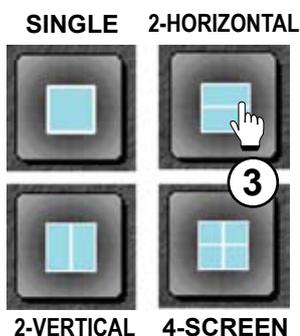
Note: It is usually easier to select the display modes after you have started transmitting as the displays are blank beforehand.

4   **Set up the selected screen layout**:

a. Right-click anywhere in the selected screen layout window.

    A set of options appears.

b. Click the options you require.

Example of right-click options

➡ Text Box
➡ Gain
Close
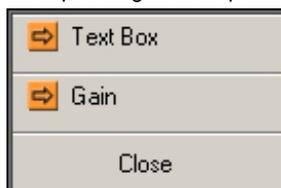
5   **Perform the profiling operations you require**:

6   **Quit the WMB-160F program**:

When you have completed your profiling operations:

a. Click the **MODE** button to set the transceiver to standby.

b. Click **Close** on the task bar.

    The **Exit System** box appears.

c. Click **OK**.

    All files opened by the system are closed automatically and the program shuts down.

d. Shut down the computer following standard Windows procedure.

e. Turn the transceiver OFF using the POWER button on the faceplate.

    The WMB-160F system is now shut down.

STBY

⑥A

Close

⑥B

Exit System

Ok   Cancel

⑥C

STATUS   POWER

⑥E

Doc. P/N: OM_WMB160F_SYS
Version: V1.6
Issue Date: 30 Nov 2009

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ENL Electronic Navigation Ltd
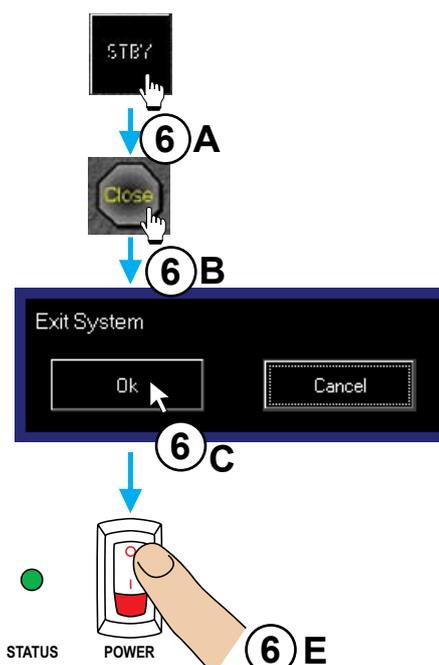
Troubleshooting

If the WMB-160F program provides no data when you transmit, check the following:

► Ensure that all cables and connections have been installed correctly. For example, TCP/IP cables, GPS, NMEA sensor, and so on.

► Software installation and settings. See **Checking Software Installation** procedures below.

► NMEA data sentences. See Step 5 of the **Checking Software Installation** procedures below.

Checking Software Installation   To check the software installation, proceed as follows:

STEP	PROCEDURE	SCREEN / COMMENTS	
1	Confirm the **Transfer Task** symbol is present in the Windows Task Bar. If not in the Task Bar, run the Serial Transfer Task. In the Task Bar, click Startup > Programs > Startup.	EN 10:46 a.m. ① **Transfer Task Symbol**	
2	Right-click the **Transfer Task** symbol.	EN 10:46 a.m.	Note: If the Serial Transfer Task icon is not available on the Task Bar, click Start > Programs > WASSP> WMB160F> Serial Transfer Task.
3	Click **Setup**. The WASSP Serial Transfer Task box appears.	② Setup Exit EN ③ 10:46 a.m.	
4	Make sure the following are connected: • BTxR Comms Port. • BTxR Data Port. If not connected, check that power to the transceiver is ON and the ethernet cable is connected between the transceiver and the computer.	**WASSP Serial Transfer Task V1.73 TCP © Electronic Navigation Ltd 2006** NMEA Settings **WASSP Settings** Network Status: WASSP TCP Port: 17000 WASSP TCP Status: WASSP Client Connected... Sonar Client Connected... NMEA Client Connected BTxR Com Port Setting BTxR TCP Host: 192.168.65.220 BTxR Comms Port: 17070 Status: Connected. BTxR Data Port: 17080 Status: Connected. ④ BTxR Component Closed! Attempting to connect to BTxR comms port.	
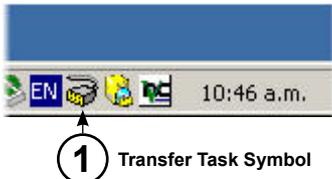
STEP	PROCEDURE	SCREEN / COMMENTS

5 Click the **NMEA Settings** tab.

If NMEA data is being received, make sure the NMEA settings **Activity** lamps are glowing / flashing GREEN for each connected Com port.

If any of the Activity lamps are RED, configure the port settings correctly.

For example see opposite: Port 1 is flashing activity, Port 2 is in error and needs configured, Port 3 is not flashing yet, and Port 4 has just flashed.
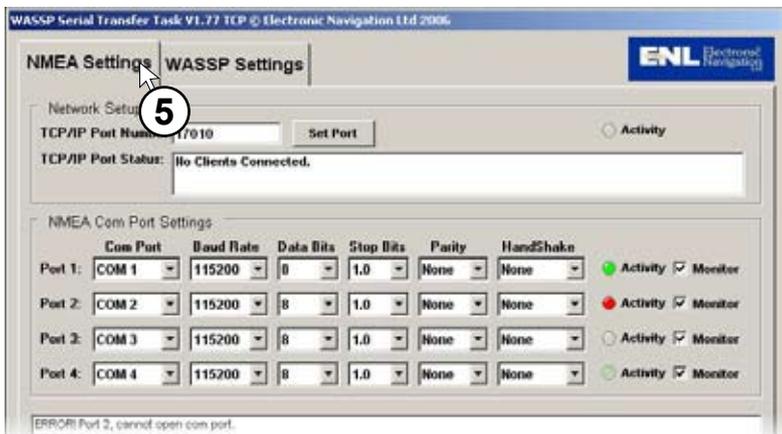
6 Open the WMB160F program.

If the system is correctly configured and the transceiver is ON, the button turns YELLOW almost immediately while performing a self calibration, and approximately 3 seconds later turns BLUE.
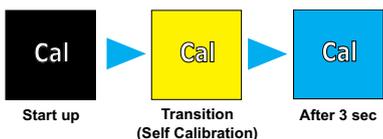
If the system is not configured the button remains BLACK.

7 Wait and confirm that the **Contour View** loads and confirms GPS position.

Check that the correct NMEA data is being received and sent by NMEA devices.

The screen remains BLACK and displays a changing message until the contour view displays.
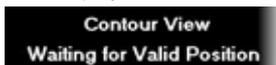
Contour View starts with this message ...

... and goes through all the segments until the contour view displays

8 Open the **WASSP Network Status** box and confirm that NMEA information is received.

Click the System Configuration Utility icon > Technician > Network.

STEP	PROCEDURE	SCREEN / COMMENTS
9	Click the MODE button to start pinging.	
10	Confirm ping. The MODE button should animate showing a ping from the vessel.	
11	Adjust the range until the picture can be seen on the sonar view. (Double click on the digital display to switch to auto-ranging).	**Use mouse pointer to adjust range setting**
12	Confirm the contour view draws seafloor swath at right angles to the heading of the vessel. Check CONTOUR MAP button is not deselected.	**CONTOUR MAP button selected** Depth : -.- Bearing: 21.6° Dist : 331.3m **Swath at right-angles to vessel heading** 0m 900m
13	Double-click the **Transmit Power Level** indicator until it turns GREEN (Auto Power).	
14	Click each view and confirm that all views display and draw.	
15	If the seafloor profile is being drawn but with significant errors, change the Minimisation, Clutter and Power Level settings until the level appears correct on the sonar. Display the sea-floor line to confirm the state of the seafloor detection algorithm.	**> Advanced Options** **Advanced Options** Minimisation **3505** Clutter **1978** **Adjust Clutter** 0 5000 10000 15000 0 7500 15000 **Adjust Minimisation** norm Interference Filter **TRANSMIT Power Level Selector** (15) **Adjust Power Level**
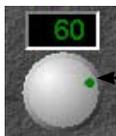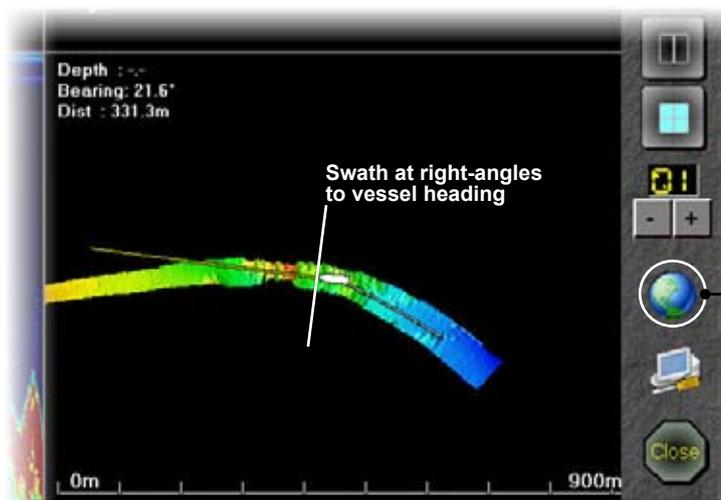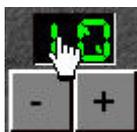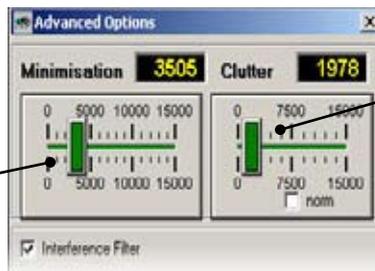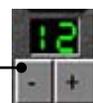
STEP	PROCEDURE	SCREEN / COMMENTS
16	If contour maps don't reload old data when going over previous tracks confirm the contour map directory is correct.	Click the System Configuration Utility icon > Technician > Ship Setup > General. Confirm the selected directory exists.
17	If the contour / single / sidescan views don't work, check 32-bit colour depth in Windows.	In the Control Panel, double-click Display Properties > Settings and in the Colours list make sure True Colour (32 bit) is selected.
18	The system requires GPS position and ships true heading to create the sea profile displays. Known as sentences, this information is provided by NMEA (the National Marine Electronics Association). NMEA sentences accepted by WASSP are: HDT, HDG, VTG, RMC, RCD, GGA, GGL, ZDA, PSXN, PFEC-GPatt, PFEC-GPhve. These sentences then need to be converted from current loop, to the RS-232 that is used by the computer. If the data providers do not have the capability to do this themselves, a data converter must be used. Data cables should be run from existing sensors on the vessel to the two of the three serial ports at the rear of the computer (COM 1, COM 3, and COM 4) using 9-pin female D connectors, terminated as shown in the wiring diagram opposite.	

GPS — **NMEA** — **Opto Coupler** — **RS-232** — **COMPUTER (DTE) COM1 (3)***

Heading Sensor — **NMEA** — **Opto Coupler** — **RS-232** — **COM3 (4)***
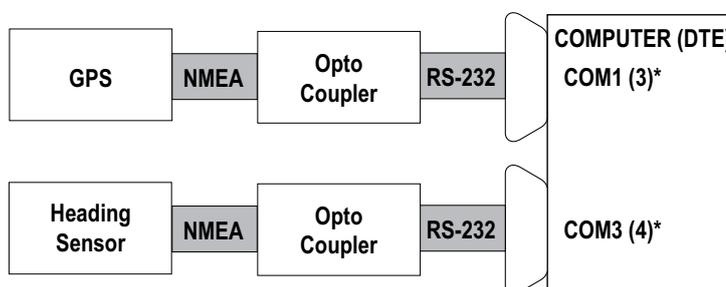
* Later supply computers only have COM3 and COM4 serial ports.

9-pin D Type Female Connector

Tx- — GREEN — GND

NMEA Cable

Tx+ — YELLOW or WHITE — Data from sensor

Note: the supplied cable may have yellow or white conductor for the Tx+ data connection
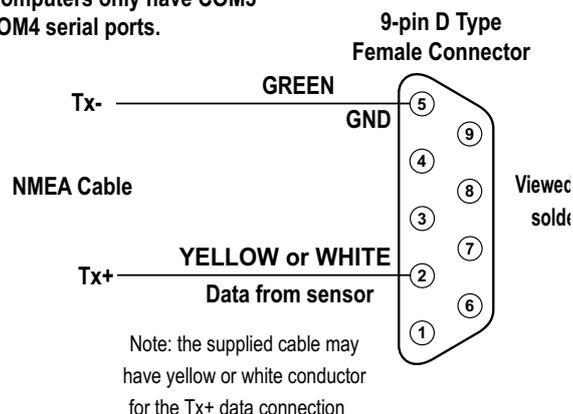
System Configuration Utility

The System Configuration Utility window provides access to options that are required on a less frequent basis than those on the main screen.

See Figure 19 below.
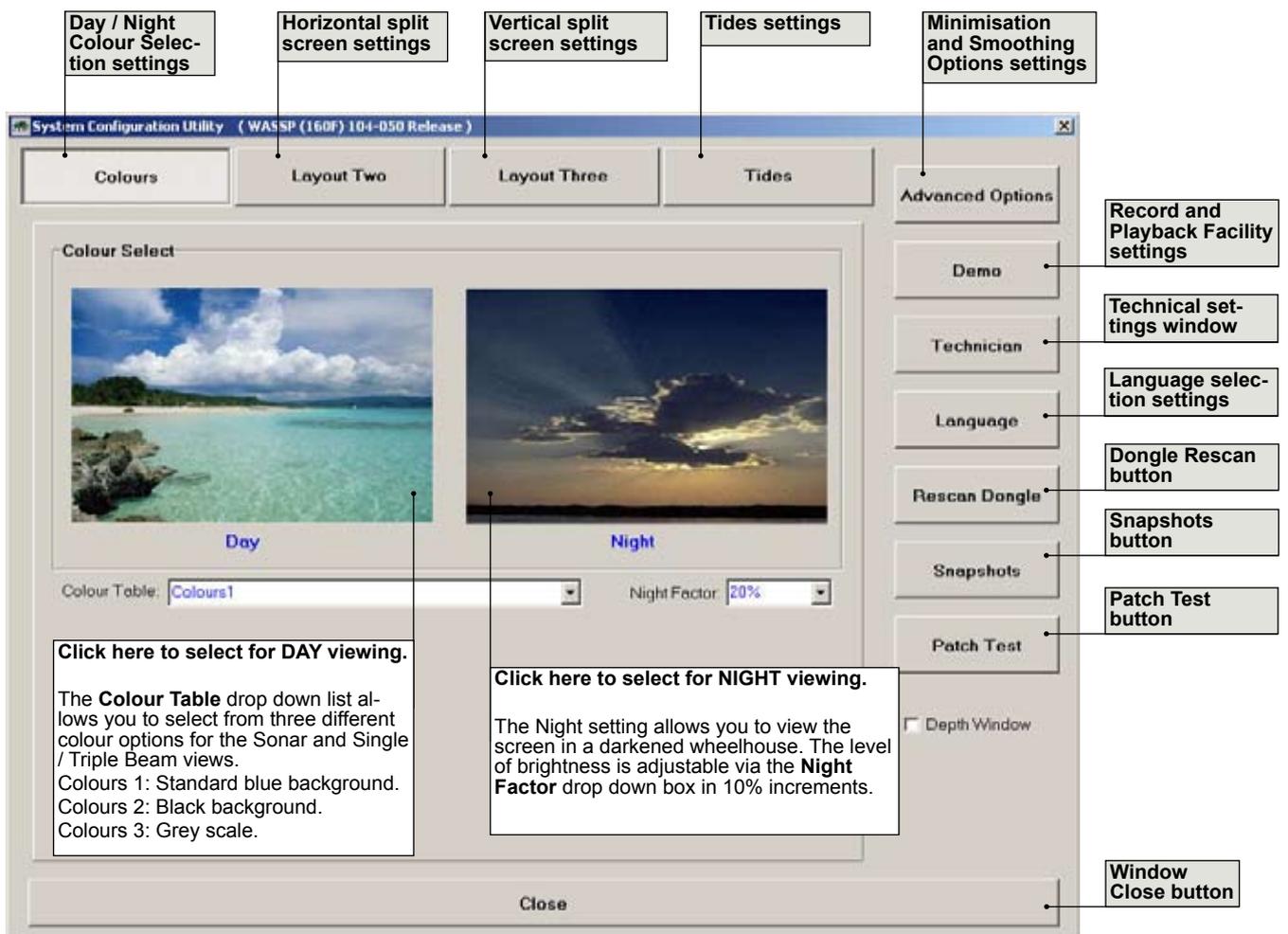
Figure 21 – System Configuration Utility – Displaying Colours Window

Colours Window In the Colours window, shown in Figure 19, click the **Day** graphic for bright ambient light conditions, or the **Night** graphic for reduced lighting conditions, such as wheelhouse night conditions.

Adjusting the display brightness on the monitor can also be used to reduce / increase the screen brightness.

Layout Two Window (Horizontal Split Screen)

The **Layout Two** window allows you to customise the Horizontal Split Screen display option using four toggle combination settings. The toggle combinations can be stepped through in the main user interface screen by clicking the **horizontal split screen** button on the menu task bar until your display choice appears.

Note: While in the Horizontal Split Screen mode only one instance of each view can be shown at any time, i.e. you cannot have two views of, for example, the sidescan view.

You can change the display choices for each toggle combination individually while in the Layout Two window. Select the toggle combination you want to change and then click the required display choice button next to the top or bottom screen. New combinations take effect when you return to the main user interface screen and click the Layout Two Window button to toggle the views. See Figure 20.
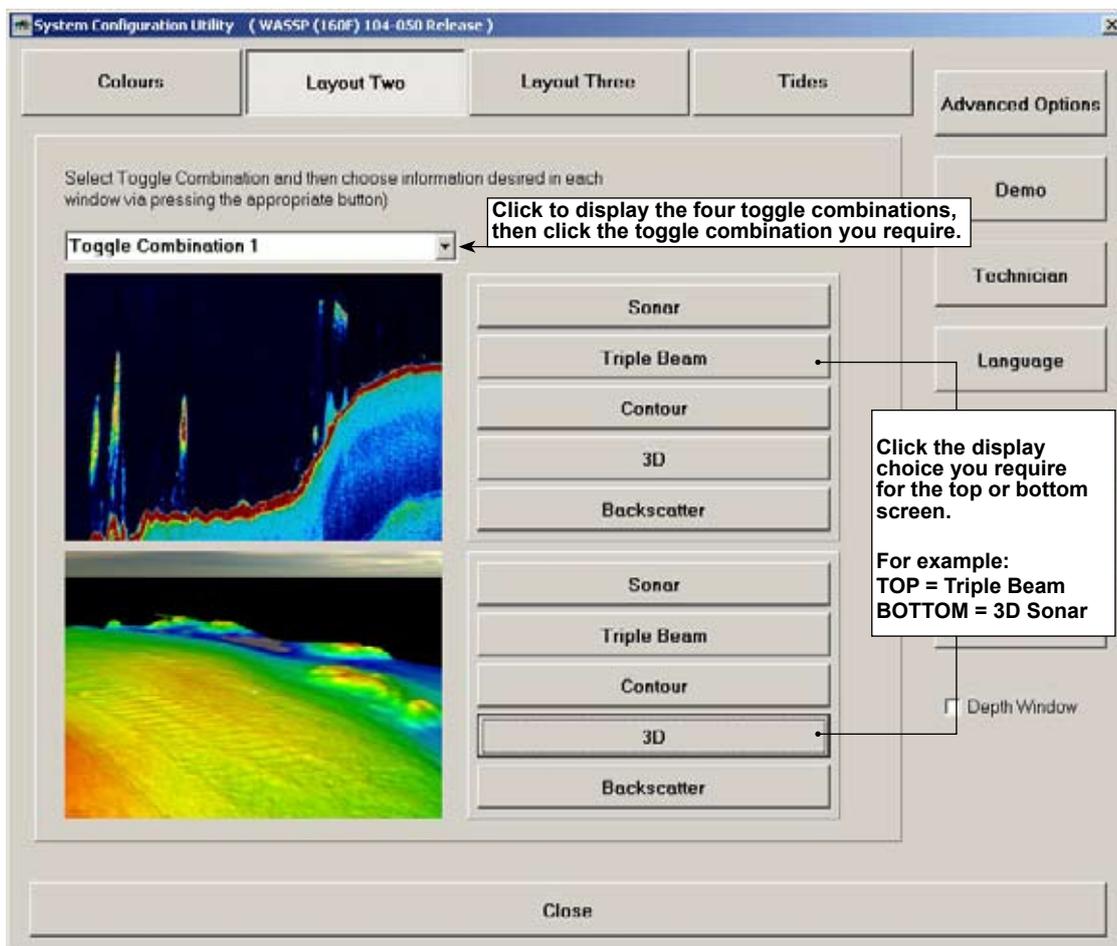
Figure 22 – System Configuration Utility – Displaying Layout Two (Horizontal Split Screen Window)

Layout Three Window (Vertical Split Screen)

The **Layout Three** window allows you to customise the Vertical Split Screen display option using four toggle combination settings. The toggle combinations can be stepped through in the main user interface screen by clicking the **vertical split screen** button on the menu task bar until your display choice appears.

You can change the display choices for each toggle combination individually while in the Layout Three window. Select the toggle combination you want to change and then click the required display choice button next to the left or right screen. New combinations take effect when you return to the main user interface screen and click the Layout Three button again.

See Figure 21.
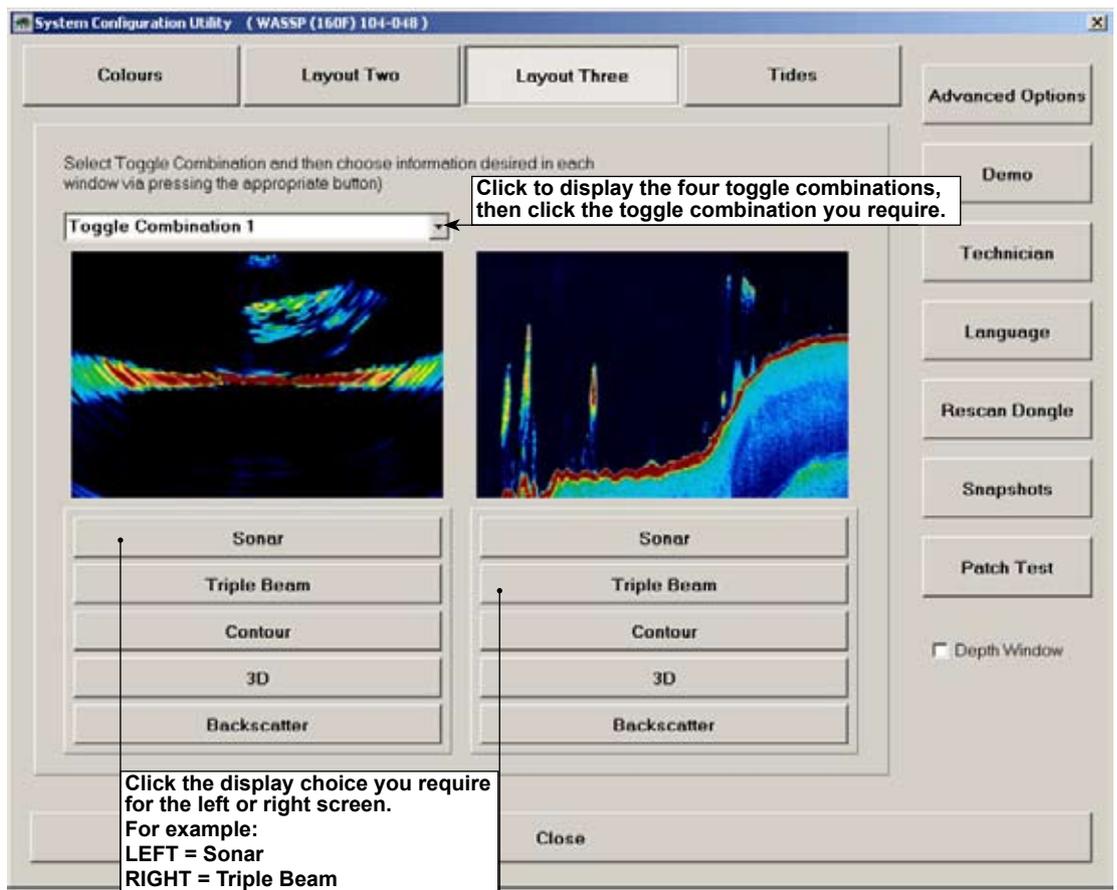
Figure 23 – System Configuration Utility – Displaying Layout Three (Vertical Split Screen Window)

Tides Window

The **Tides** window allows you to change the way WMB-160F uses tide information. Assuming the **Disable Tides** check box is cleared, WMB-160F uses the GPS positioning information coming through the computer communications port to automatically select the closest tide station. The WMB-160F then calculates a tide offset value and adjusts the seafloor profile data using the tide offset value.

Selecting the **Disable Tides** check box can cause the seafloor depth to vary as the tide waxes and wanes, resulting in inconsistencies in seafloor mapping.

The **Local Time Difference** box shows the difference in hours between coordinated universal time (UTC) and the local time. For example, if you are in New Zealand waters during the period that includes daylight saving, the Local Time Difference setting should be set to 13, the number of hours New Zealand is ahead of UTC with daylight saving. So if UTC is 10.00 am and local time is indicated as 13 hours (as shown in Figure 21), then the local time would actually be 11.00 pm.

▶▶ **TIPS**

•The Tides button displays tide information for the operator.

With the **Disable Tides** box cleared, the settings are constantly updated.

Disable tides when operating on a lake.

•The **Database** tab allows selection of either the default tide data file or the European tide database.

Vessels operating in Northern Hemisphere waters may get better performance from the tide information by selecting the European tide data.
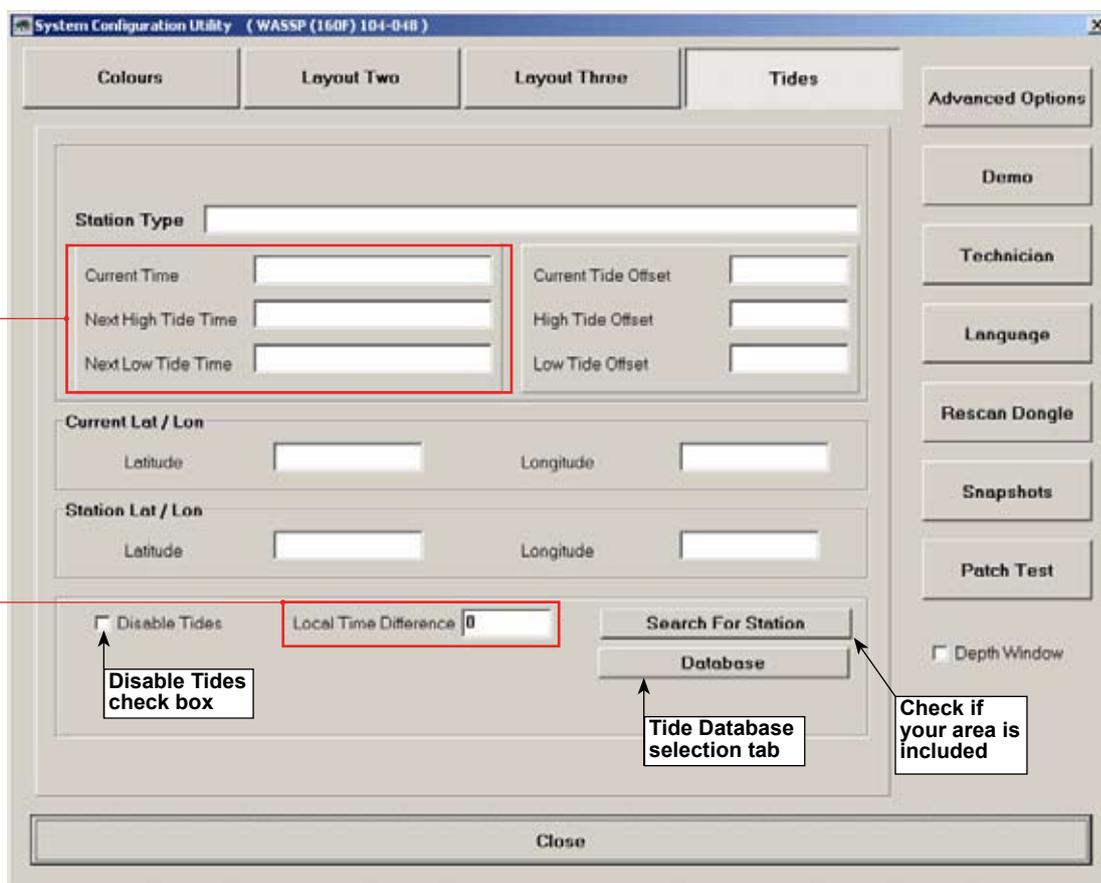
Figure 24 – System Configuration Utility – Displaying Tides Window

Advanced Options

The following seven buttons fall under the advanced options category. See below:

► Advanced Options button.
► Demo button.
► Technician button.
► Language button.
► Rescan Dongle button.
► Snapshots button.
► Patch Test button
► Depth Window
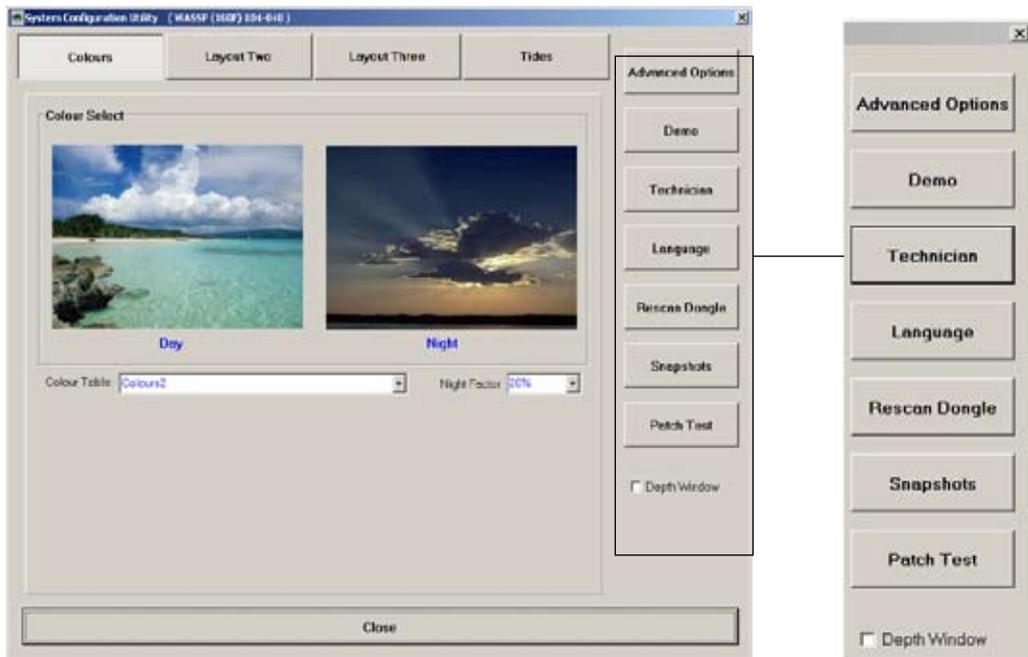
Figure 25 – System Configuration Utility – Advanced Options

Advanced Options Button Clicking the **Advanced Options** button opens the **Advanced Options** box. This box allows modification of the degree of smoothing on the Triple Beam Display and the Polar (Sonar) Display.
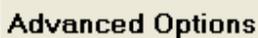
Configure the Interference Filter and Minimisation Function to best suit your requirements. See Figure 26.

The default values for the Advanced Options are:

► Interference Filter: **Enabled**.
► Minimisation: **3000**.
► Clutter: **0**
► Smoothing: **2**.

Interference Filter

The Interference Filter enables a reduction in interference caused by other ultrasonic sub-sea acoustic devices such as sounders. It also provides some noise filtering. It is recommended that the interference filter be left selected (ON) if you have another sounder or sonar on your vessel that operates at the same time as the WMB-160F. Best results are achieved if all other sounders are turned off.

Set the Interference Filter Level to High when encountering strong interference, and Low when interference is weak.

Smoothing

Smoothing only affects the single beam view. It allows averaging of the individual seafloor samples in the longitudinal (fore-aft) direction to eliminate the quantised or pixelated effect that would otherwise be visible on the single beam view. Generally, the best value for smoothing is **2**.
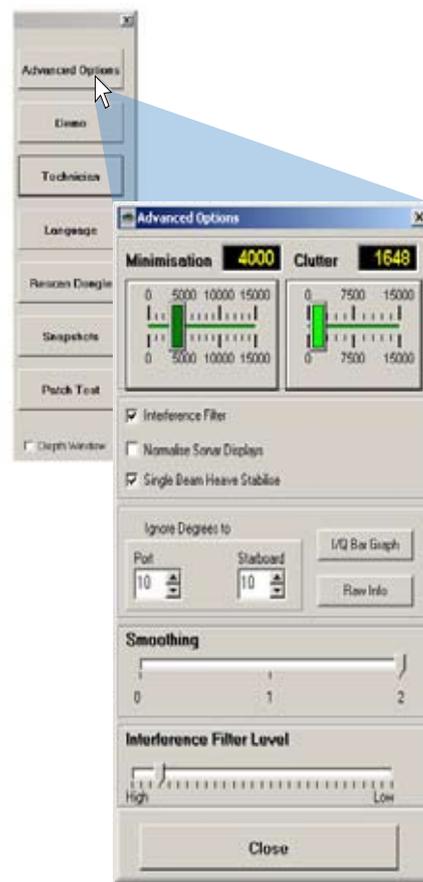
Figure 26 – Advanced Options Box

Minimisation

Minimisation describes the filtering process used to remove sidelobe signals. Sidelobe generated signals show up as a ring on the sonar view where the transmission pulse first strikes the seafloor, or as a mirror of features on either port or starboard.

Sidelobe generated features can confuse the sonar picture making it hard to interpret. However, too much minimisation can also distort the sonar image. Refer to the Installation Manual IM_WMB160F_SYS, for more information on selecting correct minimisation settings for your installation.

Clutter

Clutter describes the filtering process used to remove low level (noise) signals. The control sets the threshold for the minimum signal level that will be displayed.

Normalise Sonar Displays

Ticking the Normalise Sonar Displays check box boosts the overall system gain to compensate for the weaker signal returns when working in deeper water.

Ignore Degrees

Ignore Degrees to sets how far apart sea floor detection points are calculated. Port = 0 and Starboard = 0 means detections are processed for 120º of the 120º swath. Port = 10 and Starboard = 10 means detections are processed for 100º of the 120º swath.

The default value for Ignore Degrees to is 0.

The **I/Q Bar Graph** and **Raw Data** information can be used to see the raw data from the transducer. This information is only used for fault finding. Refer to the WASSP Installation Manual for more information.

Demo Button

Clicking the **Demo** button opens the **Replay Controls** control panel. This allows raw data from the transceiver to be recorded and replayed.

Demo

👍 Note: When replaying a demo file, the MODE button must be on STBY. If left in the TRANSMIT mode, the SELECT FILE TO PLAY button on the Replay Controls box is not active.
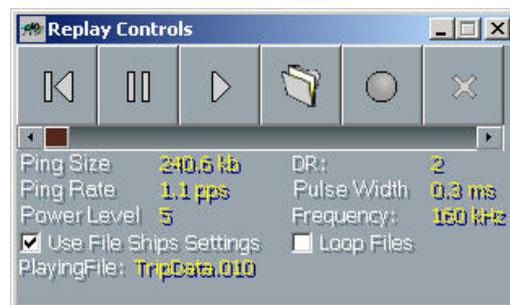
Figure 27 – Replay Controls Box

Use File Ships Settings Check Box

Selecting this check box applies the original ship's settings to the file being replayed. Not selecting this check box applies the current settings of the program running on your computer to the replay file. Note, once the check box is selected, files opened after the check box is selected use the new settings.

Loop Files Check Box

Selecting this check box allows single files in a selected folder to loop, or all the data files in a folder to run continuously one after the other in a loop.

The functions of the buttons shown in Figure 27 from left to right are as follows:

⏮	Rewind to Start of the File.	📁	Select File to Play.
⏸	Pause Playback of Current File.	⏺	Record (Displays a Save As dialog box).
▷	Play Current File.	✕	Close Replay Controls.

The slider bar below the buttons allows for quickly jumping through a replay file to a particular point. The lower section of the replay controls shows information about the last ping and displays this information whether replaying a file, recording acquired data, or acquiring data without recording.

The size of raw data files is very large and recording raw data files is not recommended for inexperienced operators. Recording data files allows you to look at acquired soundings data at any time. Contour map files are saved regardless of whether the raw data is being recorded or not.

Technician Button

Clicking the **Technician** button opens the **Technician Utility** box. The Technician Utility box holds four buttons:

► Ship Setup.
► Network.
► BTXR Options.
► Options.

These buttons allow access to a range of advanced setup and diagnostic tools. The system should normally be set up during installation. Any further set up can be done by the operator using the tools under the **Ship Setup** and **Network** buttons. These are available with a user dongle connected.

The **BTXR Options** and **Options** buttons allow access to diagnostic tools and are not normally accessed by the operator and are only available with a technician dongle connected.
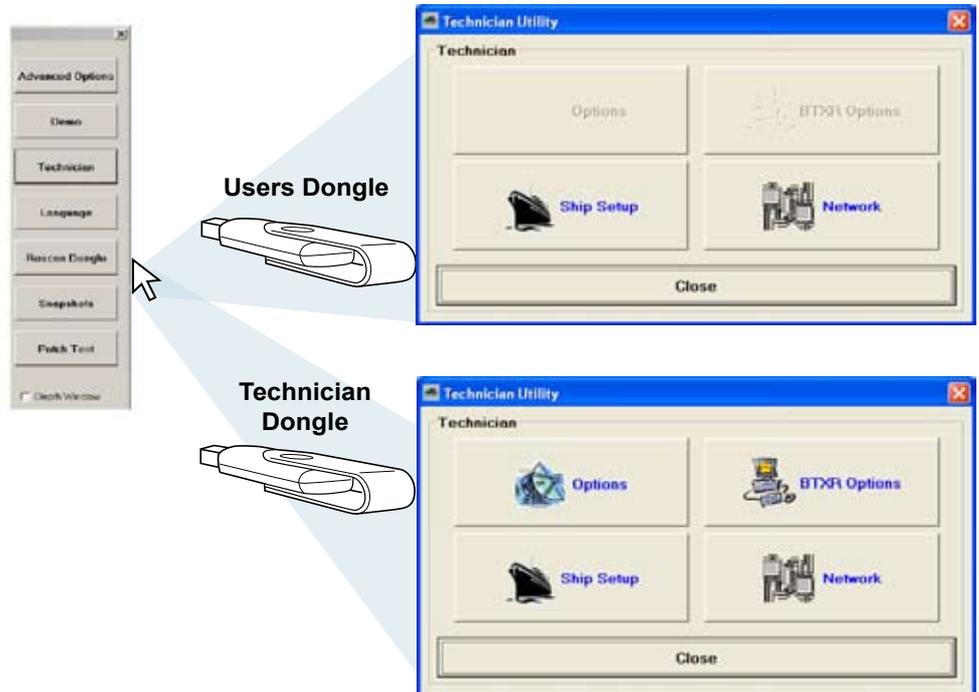
Figure 28 – Technician Utility Box – Showing Buttons Available With Users and Technicians Dongle

User Dongle

With a user's dongle connected to a USB port on the computer, only the **Ship Setup** and **Network** buttons are available for further setup of the WMB-160F system. Provided the system has been installed correctly and all commissioning procedures performed successfully, these buttons provide access to the settings that may need to be changed to improve the operation of the WMB-160F system.
N.B. - Some configuration panels are able to be viewed but not changed. If you can't change them, a Technician Dongle is required.

Technician Dongle

With a technician's dongle connected to a USB port on the computer, all four buttons are available for further setup and diagnostics of the WMB-160F system. The settings provided by the **Options** and **BTXR Options** buttons do not help the system operator to use the system. Changes made to the settings under these buttons are more likely to hinder operation. They are mainly available to allow advanced diagnosis of the system and any problems it may have.

⚠ **CAUTION**

These functions can adversely affect the performance of the WMB-160F system. Read this section carefully as any changes you make may not be recoverable.

Ship Setup Button

In the **Technician Utility** box, click **Ship Setup** to open the **Ship Setup Options** box. See Figure 27. Six page tabs provide access to the following ship setup settings:

► General.
► Offset Corrections.
► Sound Speed.
► Sensor Values.
► System Setup.
► Power.
► Navigation

Most of the Ship Setup Options should only need to be configured once in the lifetime of the WMB-160F installation. These are normally set during installation and commissioning of the system.

The Ship Setup options that may need to change during operation are:

► Device Settings (under General) – if changes are made to the vessel's sensors.
► Sound Speed.
► Power – set power levels to suit changes in seafloor depth.

See Installation Manual for commissioning tests using Ship Setup options.

General Tab

General settings provide:

► **Transducer Depth**. Provides the ability to compensate for the depth the transducer is mounted below the water line.

► **Pitch / Roll Sensor Offsets**. If using an external sensor connected to the transceiver, these settings allow you to enter the specific zero angle voltage and sensitivity voltage characteristics of the roll sensor you are using. If a motion sensor is not installed, it is recommended that you disable roll compensation.

► **Heading Offset**. Provides a **heading offset** dial so that compensation for errors in the ships heading can be corrected. The most common reason for a heading offset is when magnetic heading information is being given instead of true heading. If true heading is being given, the heading offset is usually 0. Otherwise a heading offset should be entered as appropriate. Heading offset can also be used to compensate for transducer misalignment, causing a heading error.

If the vessel is travelling in a straight line in the direction it is facing, you can adjust the **heading offset** quite accurately by eye. Look at the vessel track on the **contour** display and the bearing line and adjust the heading offset until they are parallel (the bearing line should point away from the track made on the contour display behind the vessel). If the vessel's heading changes erratically, make sure that there are not multiple conflicting heading sentences being fed into the WMB-160F's serial ports.

► **Vessel Information.** Vessel's name, country and home port may optionally be entered here.

Note, roll sensor settings shown are the default values.
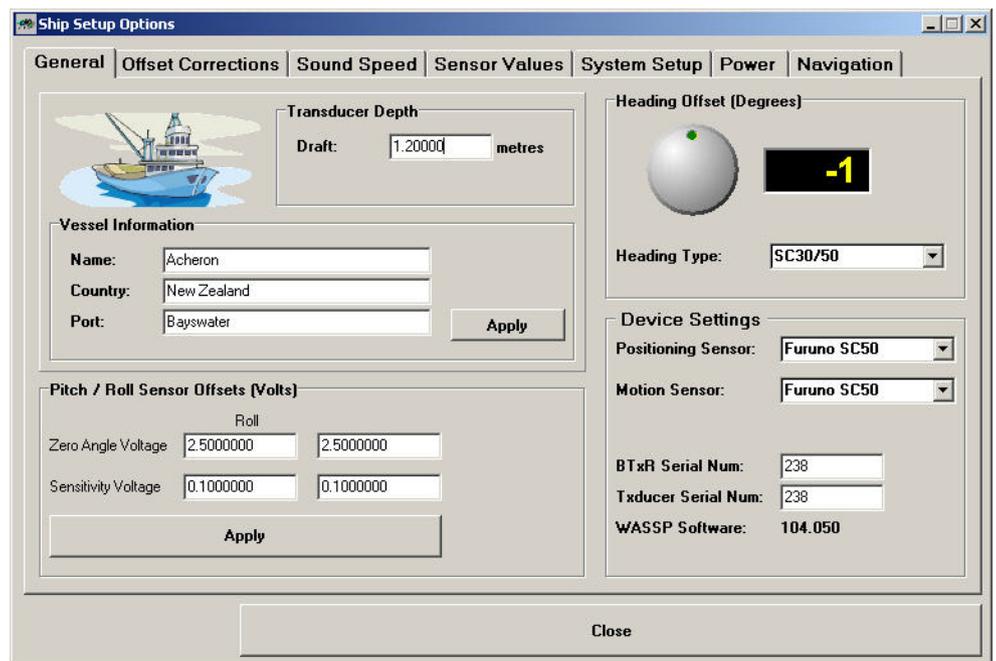
Figure 29 – Ship Setup Options Box – Showing General Tab

▶ **Device Settings**. Provides a Positioning Sensor and Motion Sensor drop down list to select the appropriate installed sensor for both device settings. The advantages being that you can compensate for pitch (and possibly heave) as well. To make corrections using the SC30's Pitch, Roll and Heave values, select the appropriate check boxes..

▶ The BTxR Serial Number and Transducer Serial Number are filled in at time of installation.

Offset Corrections Tab

The Transducer Heave Compensation check box should be selected if the x, y, and z offsets have been recorded. This enables the system to compensate for heave generated by the vessel pitching and rolling.

See Figure 28.

Note, offset values shown are examples only. The actual values for your vessel must be used
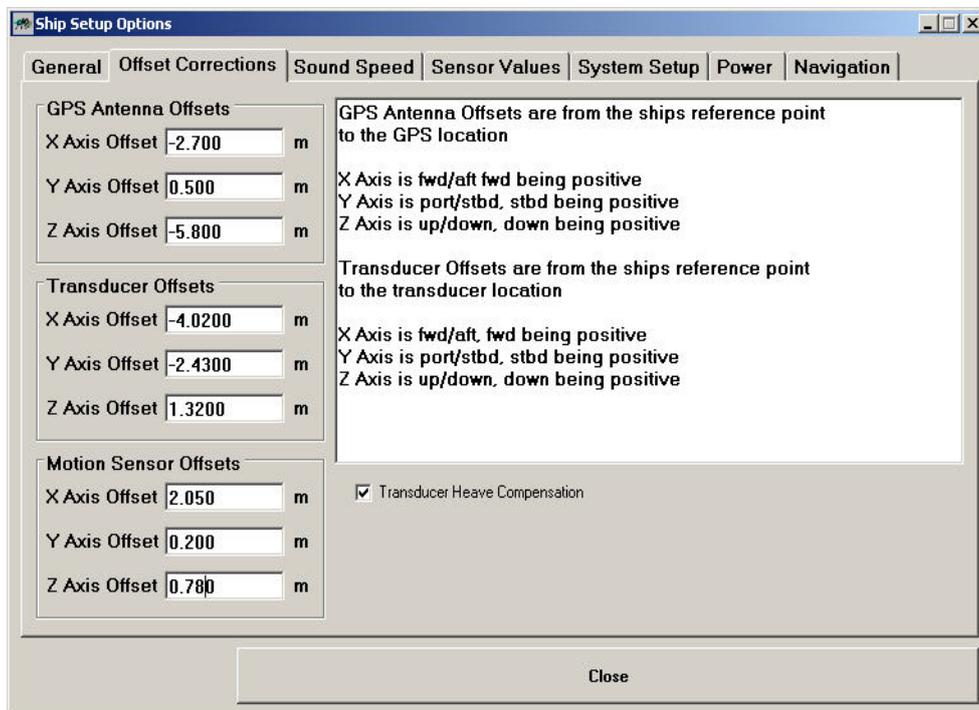
Figure 30 – Ship Setup Options Box – Offset Corrections Tab

Sound Speed Tab

The **Sound Speed** tab allows you to set surface speed correction settings for fresh and sea water. Valid values for both sea and fresh water range between 1000 and 2000 m/s. See Figure 29.

It is recommended that sound speed sensors are used for obtaining an accurate sound speed value. A general rule of thumb for sound speed setting over a flat seafloor would be:
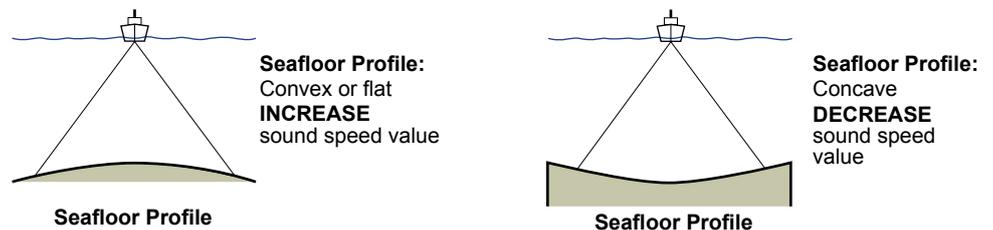
Seafloor Profile: Convex or flat **INCREASE** sound speed value

Seafloor Profile: Concave **DECREASE** sound speed value

Seafloor Profile

Seafloor Profile
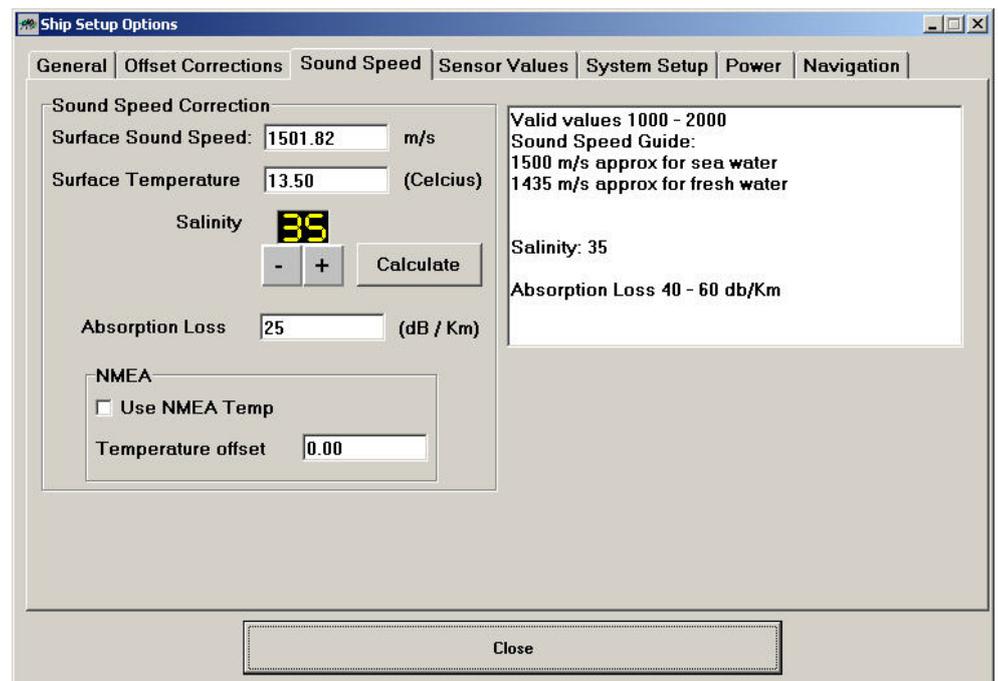
Figure 31 – Ship Setup Options Box – Sound Speed Tab

NMEA Temperature

If the **Use NMEA Temperature** check box is ticked, the WASSP application software will use NMEA temperature data from an external temperature sensor and is displayed in the "Surface Temperature" window. The "Temperature offset" box may be used to input an offset to correct for any error in the external temperature sensor.

Salinity

The default value for the salinity of sea water is 35. This value should not be changed unless the actual salinity of the surrounding water is known. If fishing in fresh water, the value should be set to 1.

Clicking on the **Calculate** button will re-calculate the Surface Sound Speed value based on the Salinity and Surface Temperature values.

Absorption Loss

As sound travels through water, some of the energy contained is absorbed by the water, resulting in attenuation of the signal. The chosen value of absorption loss is used when calculating and displaying backscatter information. For an 160kHz WASSP system, a default value of 25dB/Km is used. This is set at time of installation and affects the appearance of the backscatter display. This value should not be changed. See Installation Manual, Commissioning Procedures, Sea Trials for more information.

Sensor Values Tab

The **Sensor Values** tab provides a roll corrections slider to compensate for any offset between the WMB-160F transducer mounting and the water line. If the transducer and motion sensor are not mounted on the same angle this will also require compensation. A Pitch Offset box allows you to set a pitch offset setting in degrees.
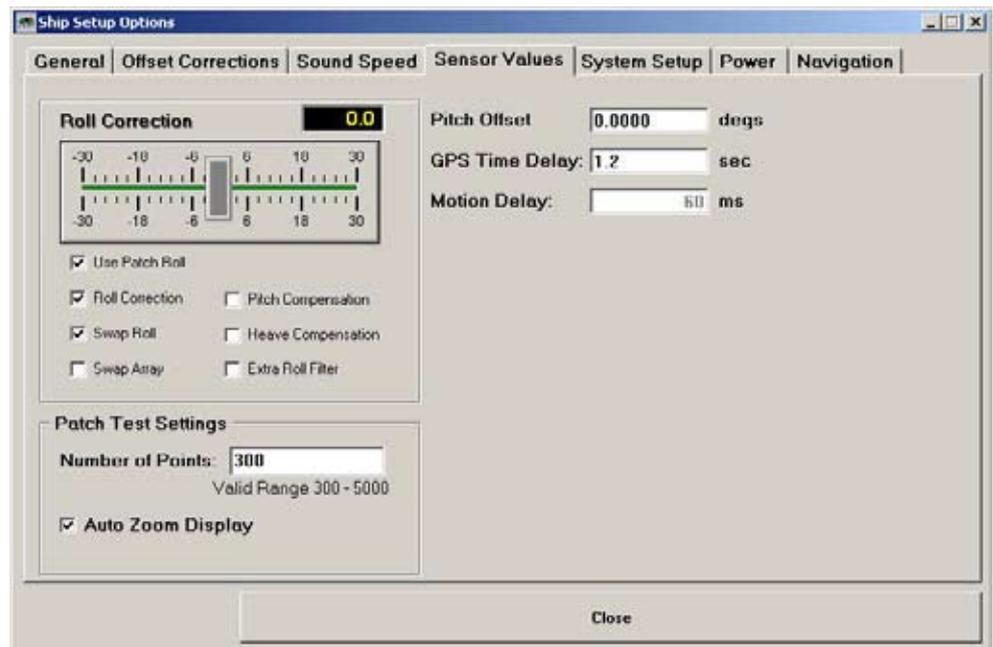
Figure 32 – Ship Setup Options Box – Sensor Values Tab

Inaccuracies with roll correction make it harder for the system to compensate for any changes in roll. If roll correction is enabled (on the **Sensor Values** tab) and the vessel is rolling less than 25°, the sonar picture should remain in almost the same place from ping to ping. If the sonar picture moves with the vessel then the roll compensation setting is likely to be wrong. The **Swap Roll** selection check box allows toggling to reverse the polarity of the roll sensor. If correct, the display does not move. If not correct, the display could roll 2x what the vessel is actually rolling.

If the roll sensor and or the transducer are not mounted entirely flush you may have to move the **Roll Correction** slider to compensate. The calculation of the Roll Correction value is now an automatic function of the software and is set at time of installation when the Sea Trial Commissioning Patch Test (Roll Correction) is performed. Provided the " Use Patch Roll" box is checked, the WASSP application will use the calculated value.

The **Swap Array** check box is used to account for wiring differences between different versions of the WMB-160F. If you find that the shallow part of the harbour, or a significant landmark, is appearing on the wrong side of the **Contour / 3-D** display, then there is a chance you have this option selected when it should not be, or vice versa. Engage the Extra Roll Filter when the vessel is rolling greater than 5º and the roll compensation is not fully compensating for the roll motion.

⚠ **CAUTION**

Do not engage the Extra Roll Filter in calm conditions.

Pitch Offset

A Pitch Offset box allows you to set a pitch offset setting in degrees to correct for transducer and motion sensor mis-alignment. See Figure 30.

GPS Time Delay

All GPS positioning systems have some delay from receipt of the satellite signal to outputting the correction data. When a Furuno SC-30 is used as the source of position data, this delay is 1.2 seconds. and equates to an error of about 10m in the location of an object on the seafloor. This value should only be changed if the type of position sensor is changed.

Motion Delay

The motion delay value is displayed for information only and cannot be changed. The value is determined by selecting the type of motion sensor in the Ship Setup Options General Tab - See Figure 29.

For more detail on how to set the values on the Sensor Values tab, refer to the WASSP Installation Manual, Commissioning Procedures, Sea Trials.

System Setup Tab

The **System Setup** tab allows you to configure the following system wide settings:

► **Contour Path**. Indicates the directory where the contour map profiles are stored (History of seafloor profile in areas the vessel has been mapping).

► **Snapshot Path**. This is the location where Snapshot data is stored.

► **Depth Units**. Allows you to select the unit of measurement for depth throughout the system in metres, feet, or fathoms. Changes take effect immediately.

► **Screen Resolution**. Allows you to select the screen resolution (1024 x 768 minimum recommended) and screen appearance (Windowed, No Title Bar, Full Screen). The Apply button must be clicked and the WMB160F program restarted before the changes take effect.

► **OpenGL Buffer.** Normally set to "Double" but some computer graphics chips (e.g. Intel), require "Single". Change to "Single" if Polar/3-D displays are not drawing correctly when the WASSP application is running.

► **Smoothing Options**. The setting chosen for smoothing depends on how much bottom detail is required. For flat bottom and good meshing of bottom swath, choose high. Where bottom detail is important, e.g. rocks or wreck outline, choose a lower setting. Lower settings may result in a more uneven appearance of the ocean floor between adjacent mapping swaths. The chosen setting is a compromise between bottom detail and uniformity of the ocean bottom map. The Default value sets smoothing to Medium.

Select Screen Resolution

Windowed:
Standard Windows layout with Title Bar and Task Bar.

No Title Bar:
Standard Windows layout but with no Title Bar or Task Bar.

Full Screen:
No Title Bar and Task Bar at full screen resolution (normally 1024 x 768).

Apply Button:
Click the Apply button and then restart the WMB160F program for Screen Resolution settings to take effect.
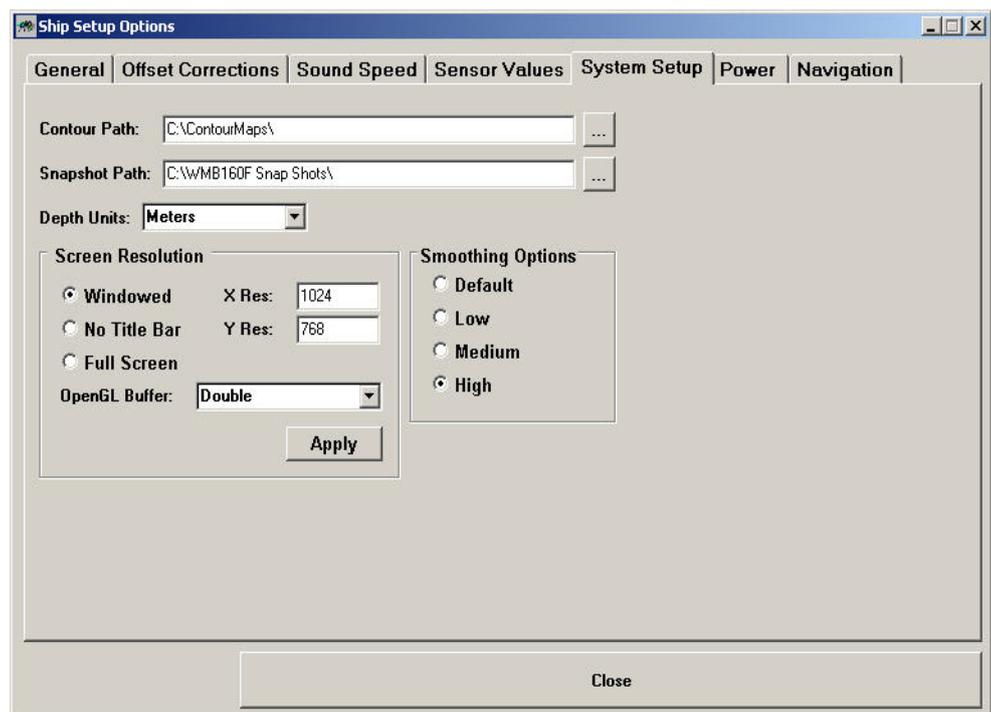
Figure 33 – Systems Setup – System Setup Tab

Power Tab

The **Power** tab displays 14 power levels, seven in the low range and seven in the high range, that can have each level individually set from fourteen drop down boxes. A **Defaults** button sets all fourteen power levels to a default setting. When setting power level depth settings individually, click the **Apply** button when you have completed the settings.

If a power level is set out of sequence, for example level 5 is set to 14 m, level 6 is 50 m and level 7 is 40 m, then a WASSP information box appears and informs you that a specific power level is invalid (level 6 in our example). Level 6 can then be set individually to a level below that of level 7 and above level 5. See Figure 32.
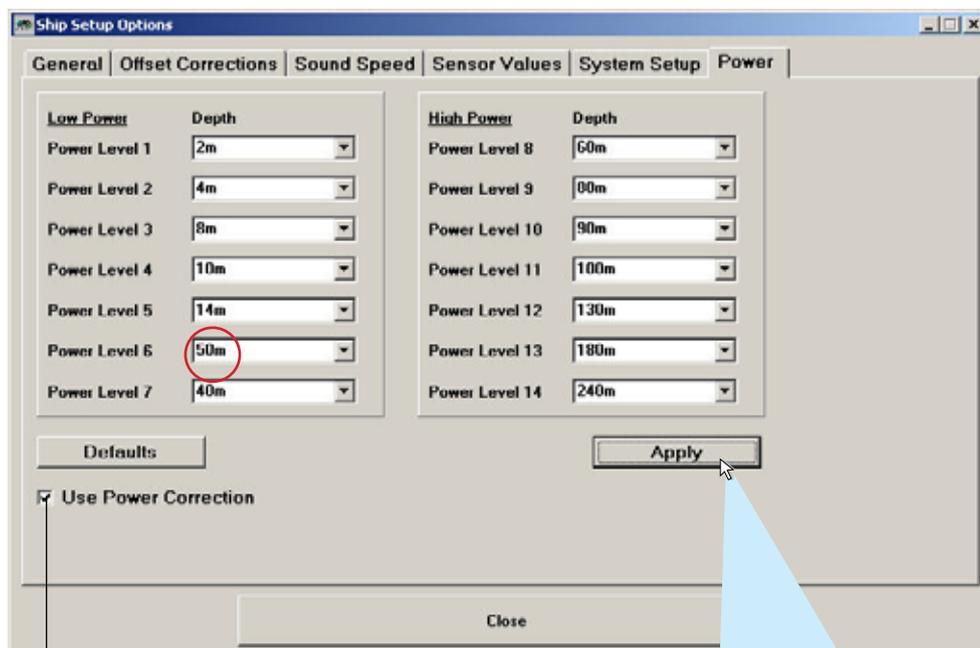
The "Use Power Correction" check box is normally ticked. This corrects for changes in power levels in SideScan and Backscatter modes.

Click OK and reset Power Level 6 to a level between Power Levels 5 and 7.
If no other power levels have been changed, clicking "Defaults" will reset the power level.

Figure 34 – Systems Setup Box – Power Tab

Navigation Tab

The **Navigation** tab window provides a visual indication of pitch and roll and is for information only.
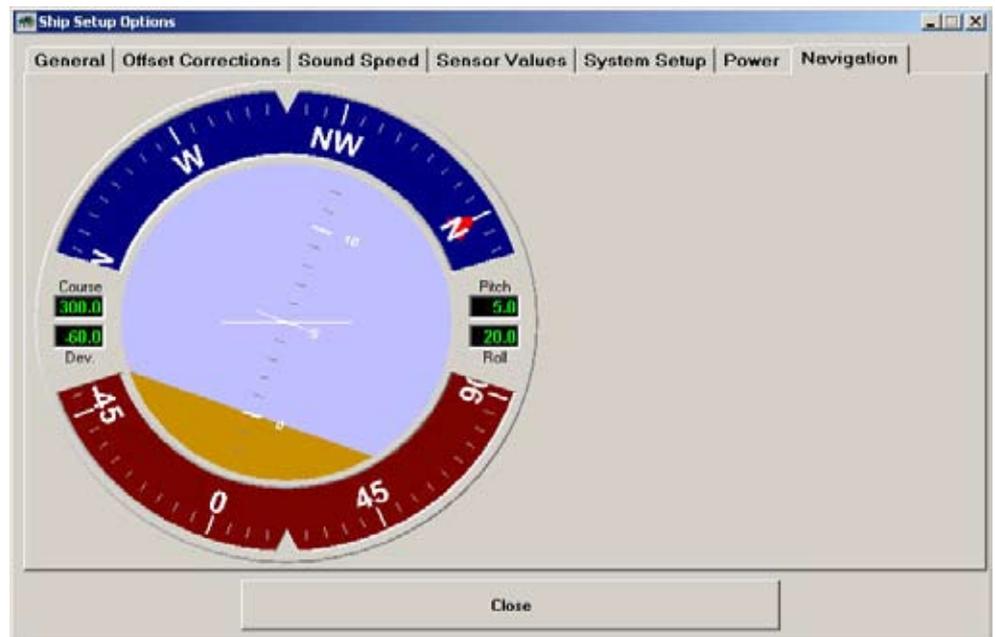
Figure 35 – Systems Setup – Navigation Tab

Network Button

Clicking the Network button on the **Technician Utility** box displays the **WASSP Network Status** box showing an overview of the data input into the WMB160F system. There are three transfer task TCP port network connections that need to be made for the WMB160F system to work, these are:

► WASSP TCP Status.

► Sonar TCP Status.

► NMEA TCP Status.

While in the Demo mode, the system does not need network connections to operate correctly as data files are played back through the program.
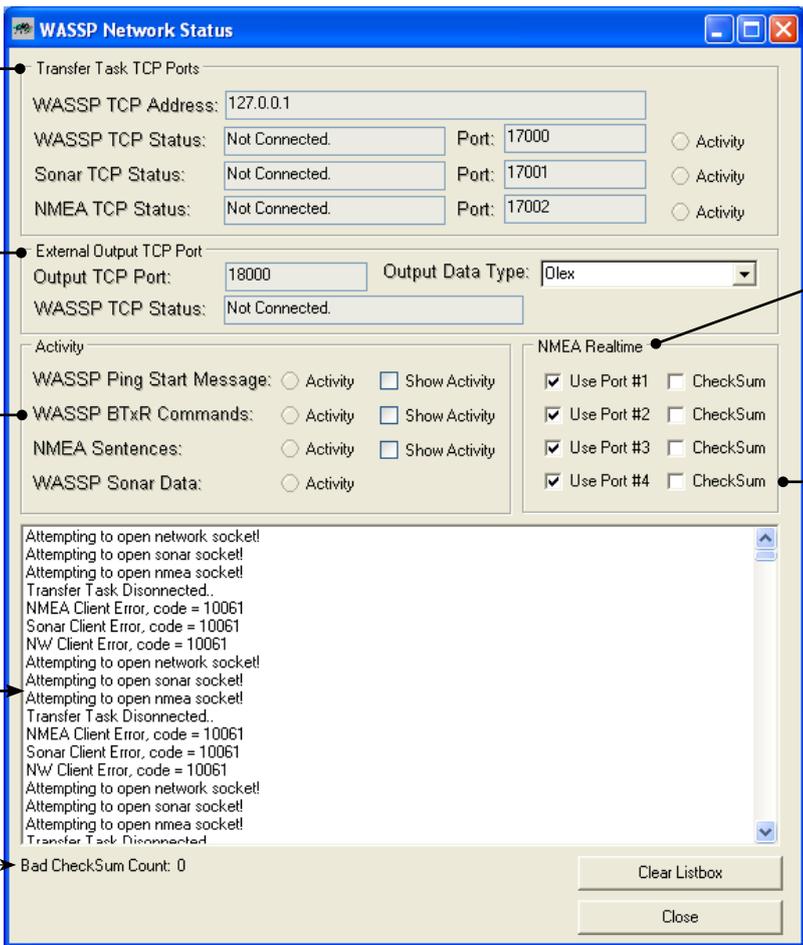
Transfer Task TCP Ports:
Shows the status of the connections to the transfer task program.

External Output TCP Port:
Shows the external output connection status to another program using the WMB160F data.
For example, Olex.

Activity Lamps:
The Activity lamps glow GREEN when there is activity on a port.

Diagnostics Window:
Allows an operator to view NMEA data received by the WMB160F system.

Bad CheckSum Count:
Uses the supplied checksum value on NMEA to check for errors.
If errors occur, the Bad CheckSum Count increases.

NMEA Realtime:
Enables data on port to be used by WASSP. If deselected data will only be logged to file if recording.

CheckSum:
Allows rejection of corrupted NMEA data if ticked.

Figure 36 – WASSP Network Status Box

Buttons Only Available with a Technician Dongle

The controls under these buttons are used by a technician during installation and system diagnostic checks.

See Installation Manual IM_WMB160F_SYS for further details.

BTXR Options Button

Clicking the BTXR Options button displays the BTXR Options box. The controls under this box allow diagnostics of the transceiver.

Options Button

Clicking the Options button displays the Options box. The controls in this box allow you to set the beam forming and data decimation settings. These are normally set during installation and commissioning of the system.

Language Button

Clicking the **Language** button opens the **Language Selection** box. The **Language Selection** box allows you to select the language you wish to use for general operation of your WMB-160F system.

Language

Select the language you desire from the **Language Selection** box and then click the **Load Language** button. The captions of the controls change instantly.

If the language you have selected is not being displayed correctly, you may want to change the language Windows uses for non-Unicode programs to be the same as the language you wish to view the WMB-160F in.

Figure 37 – Language Selection Box

You'll find the Windows language selection under the **Regional Options** icon in the **Control Panel**. Click the **Advanced** tab and use the combo box to select the most appropriate language selection. Languages that use right to left scripting and East Asian languages, that are supported or become supported in the future by the WMB160F system, will require the installation of the appropriate supplemental language support in the Windows Operating System.

To select a language:

STEP	PROCEDURE	SCREEN
1	Click **Start** > **Control Panel**. The Control Panel appears.	
2	In the Control Panel, double-click **Regional and Language Options**. The Regional and Language Options box appears.	

STEP	PROCEDURE	SCREEN
3	In the **Regional and Language Options** box, click the **Advanced** tab. The Advanced tab appears.	
4	Select the language setting you require.	
5	Click **OK**. The language settings are applied.	
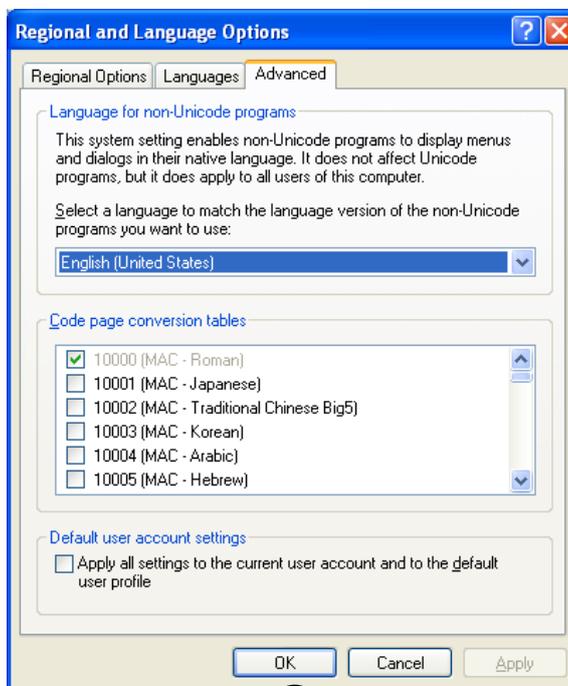
Snapshots Button

The Snapshot mode allows you to take a snapshot of approximately 1000 pings duration of the current seafloor and water column scanning session or demo file. The snapshot is stored in the computer and can then be renamed and displayed in the single / triple beam, 3-D, Contour, and Sidescan views at a later time in the Snap Shots box in the System Configuration Utility.

Note - Sonar data is not saved and the Polar view will be blank when viewing a snapshot.

The snapshot does not replay like a demo file. When selected and loaded into the program it remains static. All

Snapshot Button

right-click options are still available and each view can still be independently zoomed in or out.

A cross-hair is displayed in the centre of the contour view. The position of the cross-hair can be changed using the centre button on the pointing device. The contour view adjusts to the new position with the cross-hair re-centred on the screen. This allows you to view the full extent of the saved snapshot area in the contour and 3-D views.
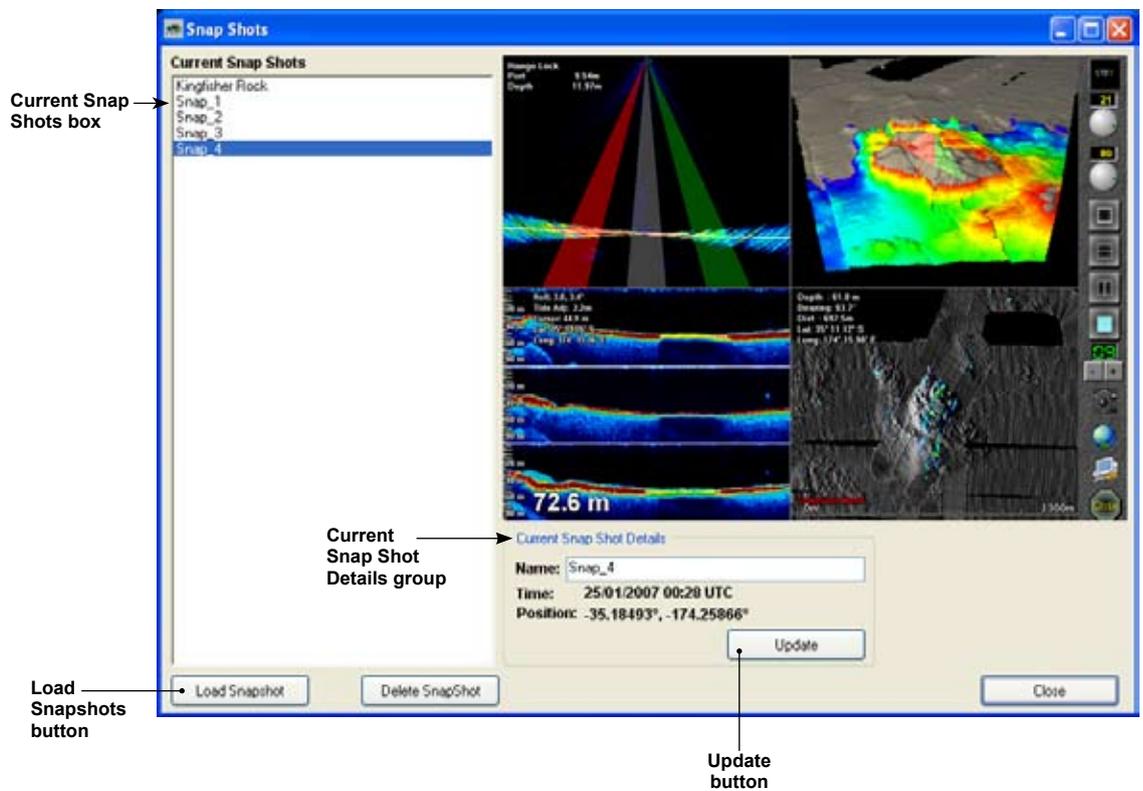

Figure 38 – Snap Shots Box

Load Snapshot Button

Clicking the **Load Snapshot** button loads the selected snapshot file and displays it on the WMB-160F user interface.

Delete Snapshot Button

If a snapshot is no longer required, or is out-of-date, it can be deleted by highlighting it and then clicking the **Delete Snapshot** button.

Update Button

The **Update** button saves any changes made to the name of a snapshot. Click the snapshot name you want to change in the **Current Snap Shots** box, edit it in the **Current Snap Shot Details**, **Name** box and then click **Update**.

Rename a Snapshot

To rename a snapshot file:
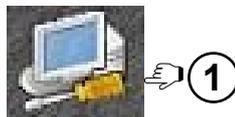
| STEP	PROCEDURE	SCREEN / COMMENTS
1	Click the **System Configuration Utility** button on the user interface. The System Configuration Utility box appears.	
2	Click the **Snapshots** button. The Snap Shots box appears.	
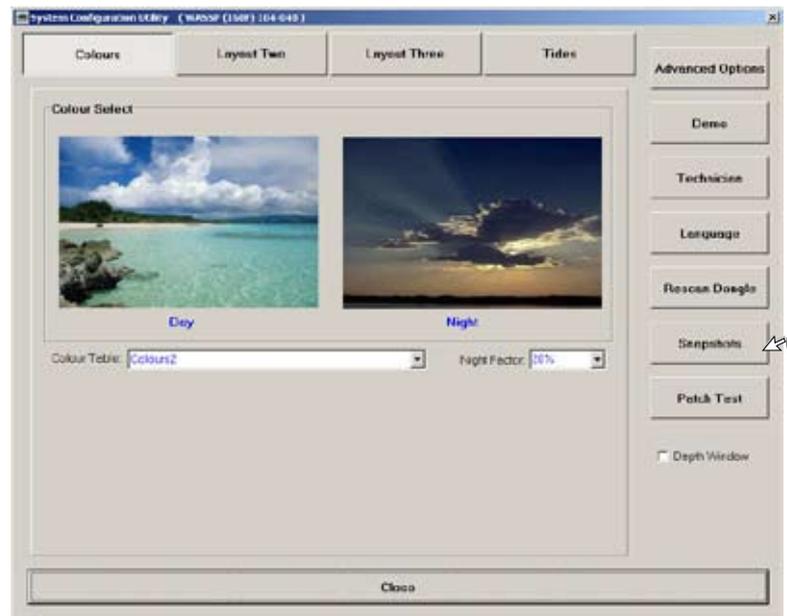
STEP	PROCEDURE	SCREEN / COMMENTS
3	Select the snapshot file you want to rename from the **Current Snap Shots** list. **Snap_5** in our example screen.	
4	In the **Current Snap Shot Details** group highlight the file name in the **Name** box and type a new file name to suit. **Kingfisher Rock 1** in our example.	
5	Click **Update**.	
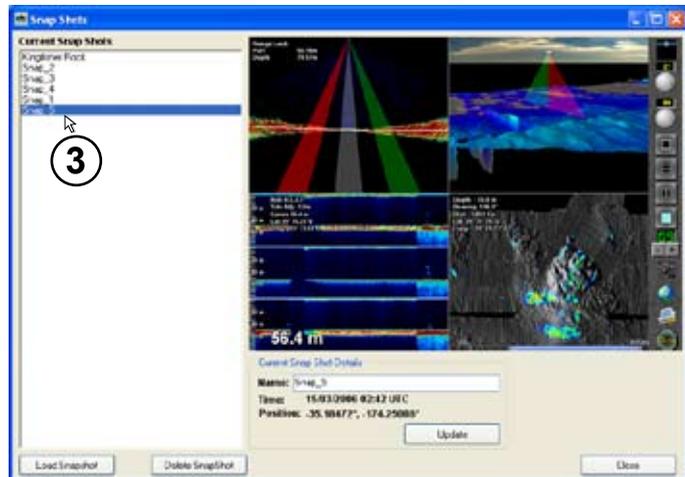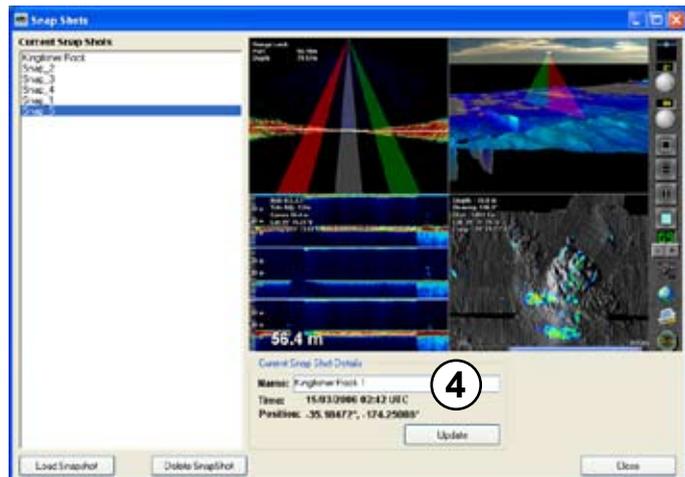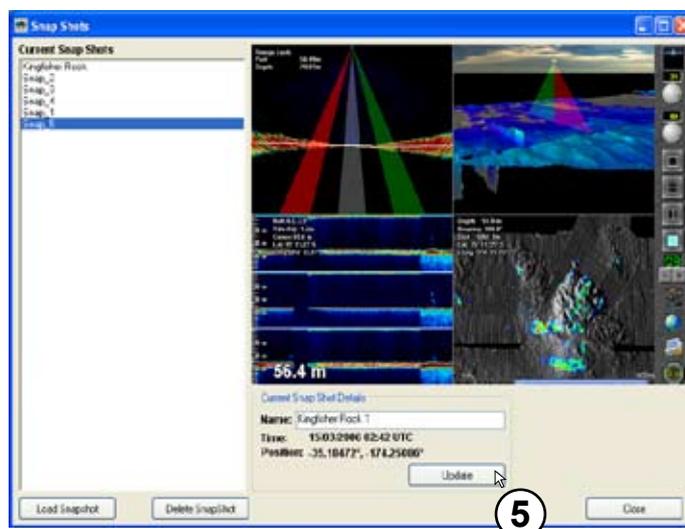
| STEP	PROCEDURE	SCREEN / COMMENTS
	The new name, Kingfisher Rock 1, is displayed in the **Current Snap Shots** list.	
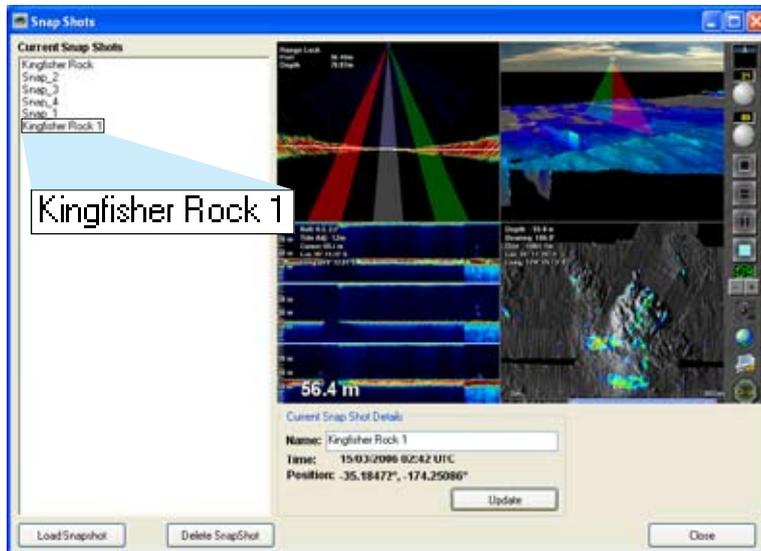
Retrieve and Display a Snapshot

To retrieve and display a snapshot file:
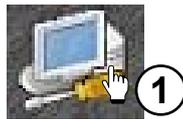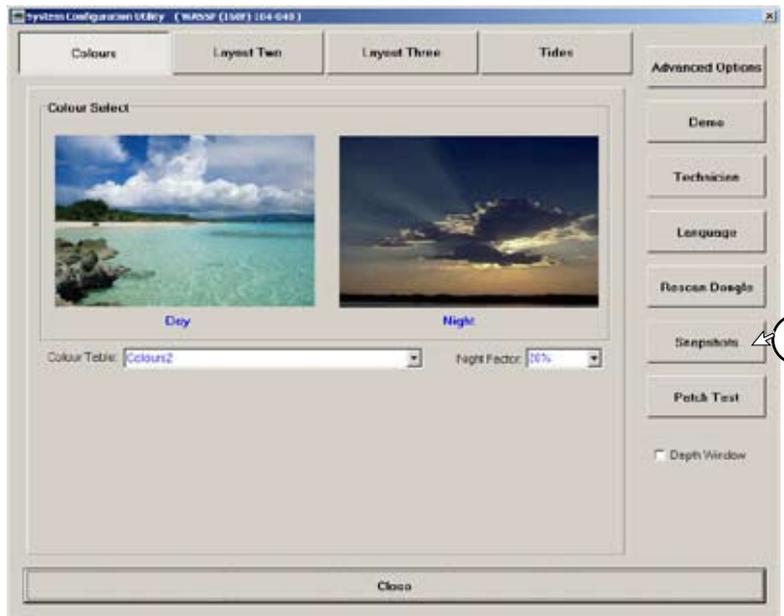
| STEP	PROCEDURE	SCREEN / COMMENTS
1	Click the **System Configuration Utility** button on the user interface. The System Configuration Utility box appears.	
2	Click the **Snapshots** button.	
	The Snap Shots box appears, displaying the top listed snapshot file.	
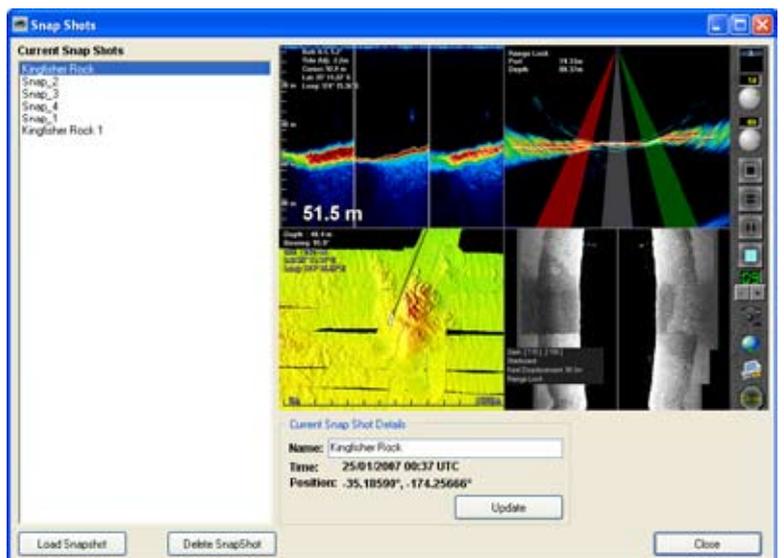
STEP	PROCEDURE	SCREEN / COMMENTS

3 Select the snapshot file you want to display from the **Current Snap Shots** list.

Kingfisher Rock 1 in our example.
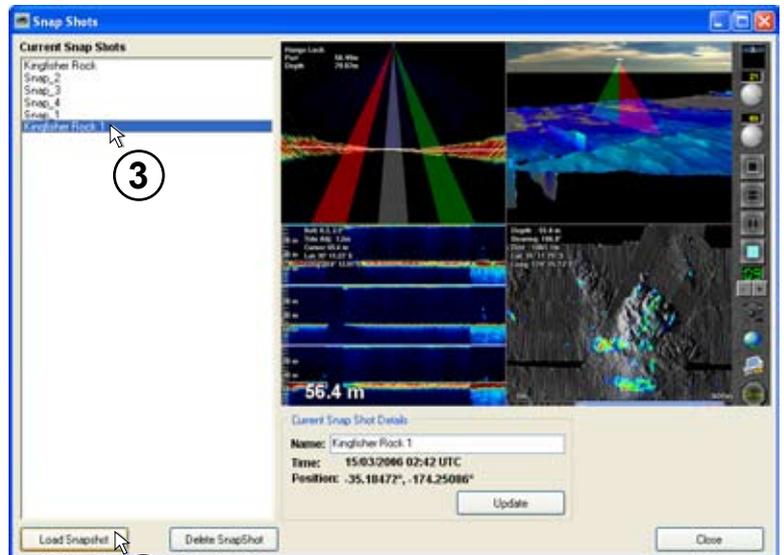
4 Click **Load Snapshots**.

The selected snapshot file is loaded onto the user interface.

5 To display and view other parts of the snapshot area not visible on the contour view, position the mouse pointer at approximately where you would like the cross-hair to be centred.
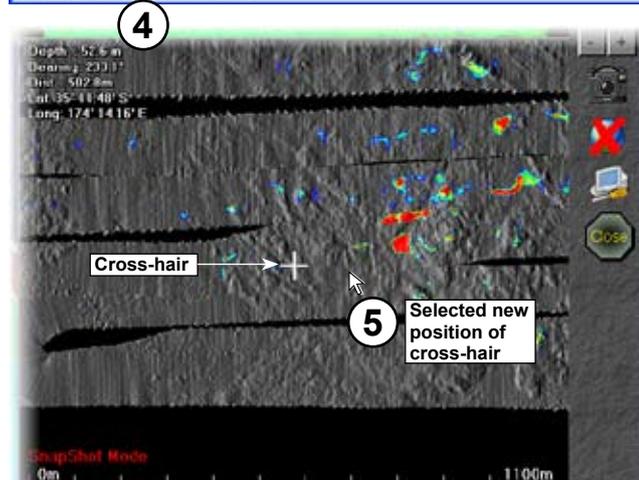
Click the centre button on the mouse.

The display scrolls across to the new position with the cross-hair displayed in the centre of the screen.

This also re-centers the 3-D view allowing views in 3-D of any part of the contour display.
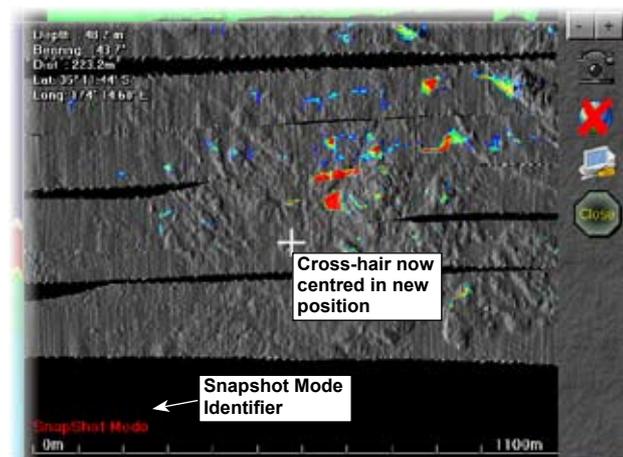
You know you are displaying a snapshot file as the words: **Snapshot Mode** are displayed in RED at the bottom left of the contour view window in the user interface.

Rescan Dongle Button The Rescan Dongle button allows you to change the dongle and menu without shutting down the program.

If you want to change the dongle while the program is running, remove the dongle and insert a new one, then click the **Rescan Dongle** button. The program rescans the dongle and should read the new one you have inserted. See Figure 23, Page 47.

Patch Test Button The Patch Test button is used during installation and commissioning to measure and calculate the value of roll correction.

Refer to the WASSP System Installation Manual (IM_WMB160F_SYS) for more information on this function.

Depth Window The Depth Window check box (click on box with cursor to enable) will place a depth display on top of the WASSP display screen. The depth display window can be moved to any convenient location on the screen by clicking and dragging using the mouse. To close the depth window, click on the "X" close box.

'X' Close Box
Click on this to close the depth window. Click anywhere on depth window to drag and place on screen.
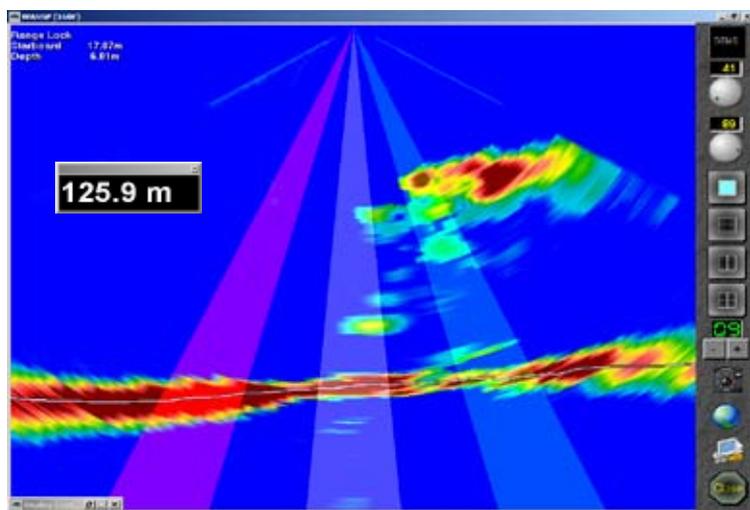
Fig. 39 - Sonar View screen showing Depth Window in place.

Frequently Asked Questions (FAQs)

Following is a list of frequently asked questions (FAQs) covering common problems encountered when operating the WMB-160F system. Note the Trouble Shooting section of this manual covers most of the typical operational problems, and this section should be consulted olny after reading the Trouble Shooting section. Each FAQ question is numbered and answered in the following pages.

1) The WMB-160F system is transmitting too slowly, how can I speed it up?

2) Why does the range not change on the display when I move the Range Dial?

3) Why is no seafloor profile generated in the 3-D or contour views after the system initially starts transmitting?

4) Why do gaps appear between the swath footprints in the contour and 3-D views?

5) The WMB-160F system has stopped transmitting without operator intervention. Why?

6) When I click the MODE button, or run a replay (demo) file I get no picture on the display. Why?

7) When I press the STBY button the button goes red and a number on it counts up, but there is no activity on the WASSP display. How do I fix this?

8) What does the error message that appears when I run WASSP mean? Is my WASSP system faulty?

9) Why is there a ring displayed just above the seafloor? What causes there "ring" marks? How can I get rid of them?

10) What is the constant signal on the sonar/fish fuinder display?

11) Why is my WASSP system not tracking the seafloor?

12) Why doesn't the seafloor line up when I go over it again?

13) Why does the seaflloor move if my WASSP system is motion compensated?

14) The mode button animates as if pinging but nothing happens. What is wrong?

Question 1 **The WMB-160F System is transmitting too slowly, how can I speed it up?**

Remember that the WMB-160F system must acquire twice the depth of standard sounders to enable the full seafloor profile across 120°. If the entire profile is to be captured, the ping rate will need to be at least half that of a standard single beam sounder.

Manually adjusting the range down will increase the ping rate significantly but will result in the loss of seafloor information, including break up of the 3-D display after a point. If you are only interested in the centre beam of the triple beam display, the range control can be reduced to just over half the current depth in metres. The optimal range is twice the current depth in metres. The range control should normally be set to automatic (green digital display).

Other programs running at the same time as the WMB-160F program consume processing power and take processing time away from the WMB-160F system, slowing down the rate of transmission. For optimal performance, ensure the WMB-160F program is the only application running.

Question 2 **Why does the range not change on the display when I move the Range Dial?**

Double-click each viewing mode (sonar, single / triple beam, 3-D, contour, and sidescan) to reset the view so that automatic range control is re-enabled. The range continues to track the range dial while in this mode. If any zooming is done with the wheel mouse then automatic range control will be disabled again until you once again double-click on the appropriate view.

Question 3 **Why is no sea floor profile generated on the 3-D or contour views after the system initially starts transmitting?**

Check that the NMEA data input is being received and that the communications ports are configured correctly. If the range for data collection is too small, the system cannot acquire the seafloor and cannot track the range automatically. Enter the manual range mode and set the range deep enough to acquire the seafloor before returning to the automatic range mode. Also check that the Contour Map button is ON. See Page 11.

Question 4 Why do gaps appear between the swath footprints on the contour and 3-D views?

There are multiple possibilities here:

▶ The vessel may be travelling too fast to map the seafloor in this depth of water.

▶ The range setting could be set much larger than necessary and as a result the system is transmitting slower than is optimal.

▶ The computer is giving processing power to another operation (other than the WMB-160F program) causing processing of sounding information to take longer as a result lowering the transmission rate of the WMB-160F system.

▶ The GPS data has come in at irregular intervals.

▶ The WMB-160F system has stopped. See Question 5.

▶ The GPS data source may have dropped out completely preventing the system from mapping the seafloor data to its appropriate location. Ensure an isolation device is being used to convert the current loop NMEA to RS-232.

▶ The seafloor detection may have briefly failed due to aeration or excess noise.

Question 5 The WMB-160F system has stopped transmitting without operator intervention?

If time is taken from the system by another application for long enough, the WMB-160F system may restart transmission in a number of seconds. If the system does not restart, try stopping and then starting the system using the MODE button on the tool bar. If this does not work, try to restart the WMB-160F program and the transceiver. The most likely cause of this is a sudden power supply spike or drop.

Question 6 **When I click the MODE button, or run a replay (demo) file I get no picture on the display. Why?**

The WMB-160F is designed to run in 32-bit colour, with a minimum 1024x768 resolution. Check your display settings and change if required.

STEP	PROCEDURE	SCREEN
1	Make sure your display options are correctly configured. Right-click on the desktop and click **Properties**. Or, click **Start** > **Settings** > **Control Panel**.	
2	In the **Control Panel**, double-click **Display**.	

STEP	PROCEDURE	SCREEN

3 In the **Display Properties** box, click the **Settings** tab.

4 In the **Colour quality** box, set the colour quality to 32-bit.

5 On the **Screen resolution** area slider bar, set the resolution to 1024 by 768 pixels.

6 Click **OK**.
The new screen settings are applied.

Note: Steps 5 and 6 are optional.
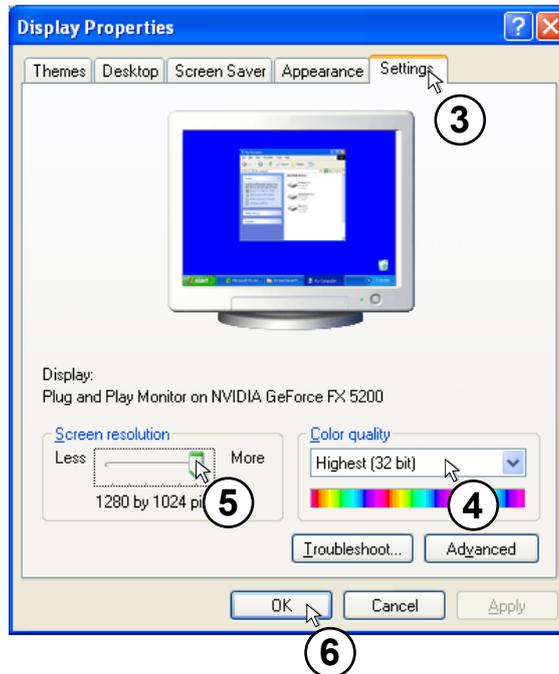
7 Return to the WMB-160F program.

Question 7 **When I press the Stby button, the button goes red and a number on it counts up, but there is no activity on the WASSP display. How do I fix this?**

First make the following checks of your WASSP installation:
- Check that the Transceiver power is ON and the green LED light on the front panel flashes every few seconds.
- Make sure the CAT5 network cable is connected at both the Transceiver and the PC ends (unplug and re-plug to make sure).
- Check that the Transfer Task application is running (look for the icon on the Start Bar at the bottom of your PC screen) and was running when you started WASSP. If not, restart WASSP after running the Transfer Task application.

Transfer Task icon

Question 8 **What does the error message that appears when I run WASSP mean? Is my WASSP system faulty?**

Consult the list below for the cause/course of action if an error message is displayed in WASSP.

- **Cannot Find Tide TCD File:**
  Use the tide function to search for a valid database file.
  Check file is present in directory. Reinstall if not present.

- **Error Loading TVG File**:
  Check in the Windows Control Panel under Regional and Language Options, Regional Options, Customize, Numbers Tab, that the "Decimal Symbol" setting is set to a ' . ' rather than a ' , ' (comma)
  Check file is present in directory. Reinstall if unable to locate.

- **"Too Many Files With This Name. Aborted."**
  This occurs when storing raw data using the data recorder if there are more than 1000 files of the same initial name in a directory. Change the name or directory if you wish to continue to save raw data files. NOTE unless you require the raw data for some purpose it is not recommended to record raw data files – these files are very large ($\approx$ 2Gb/hour) and will require careful management in order to prevent the Hard disk drive of your computer from becoming full. A computer with a full disk drive becomes unusable. Try to have at least 10 Gb of free drive space at all times to allow sufficient room for system file management.

- **Cannot set power levels. Power Level x invalid**:
  This occurs when setting the power level settings when the depth values do not increase as the power levels increase. Check that every depth selection for each sequential power level is greater than the previous.

- **No Dongle Found In System. Please Plug Dongle In And Try Again.**
  This error can occur if the USB device has not been detected by windows or the Dongle is not connected to the system. Remove the dongle if it is already in place and then reconnect it to the computer after a few seconds. Press the retry button. The system will operate in replay mode without a WASSPDONGLE but will not work in real time.

- **No License File Found On Dongle.**
  The most likely cause of this error is that the WASSP dongle has been modified or the contents have become corrupted.
  If the license file has been removed from the dongle the system will not operate.
  Contact your dealer to source a new WASSPDONGLE – you will need to return your current faulty Dongle.

- **License File Is Corrupted.**
  The licence file on the WASSPDONGLE has been modified in some way and is no longer valid. Contact your dealer to source a new WASSPDONGLE – you will need to return your current faulty Dongle.

No Attitude: No Pitch:
The system is configured to compensate for Pitch and there has been a gap of multiple pings where there was no Pitch data received. Check the Motion Sensor configuration in WASSP. Also check the Serial Port configuration in the WASSP Transfer Task and finally that the sensor itself is on and operating correctly.

• **No Attitude: No Heave:**
The system is configured to compensate for Heave and there has been a gap of multiple pings where there was no Heave data received. Check the Motion Sensor configuration in WASSP. Also check the Serial Port configuration in the WASSP Transfer Task and finally that the sensor itself is on and operating correctly.

• **No Attitude: No Roll:**
The system is configured to compensate for Roll and there has been a gap of multiple pings where there was no Roll data received. Check the Motion Sensor configuration in WASSP. Also check the Serial Port configuration in the WASSP Transfer Task and finally that the sensor itself is on and operating correctly.

• **LINK ERROR:**
This error message indicates that there has been a data corruption internally in the Transceiver between the Receiver and the DSP. The WASSP system will not function at this point. Reset the power to the Transceiver – if the message continues to be shown return the system to your dealer for service.

• **TX PWR ERROR:** This warning informs the operator that the Transmitter did not reach full voltage during the system start up sequence - the most common cause for this is a low 24V power supply voltage/current. If the system appears to operate correctly after you see this message then this is not an issue. If the system does not appear to function then the error implies that the Transceiver Transmitter unit has failed - Contact your Dealer for further assistance.

• **CARRIER REF ERROR:** This error message indicates that there has been a failure in the synchronised internal timing chain of the Transceiver. If restarting the power to the Transceiver does not clear this error return the Transceiver to your dealer for service.

• **SERIAL FAILURE:** This error message indicates that an internal DSP board communications failure has occurred. The WASSP system will not function correctly at this point. Turn the power off/on at the Transceiver – if the message continues to be shown return the system to your dealer for service.

• **System Initialisation Failure:** This error implies that the system was not fully operational when the WASSP GUI was run. Shut down the shuttle P.C. and the Transceiver and do a complete re-start. If the error message continues to be shown, refer to the troubleshooting section on Page 41, or contact your your dealer for further assistance.

Question 9 **Why is there a ring displayed just above the seafloor? What causes these 'ring' marks? How can I get rid of them?**
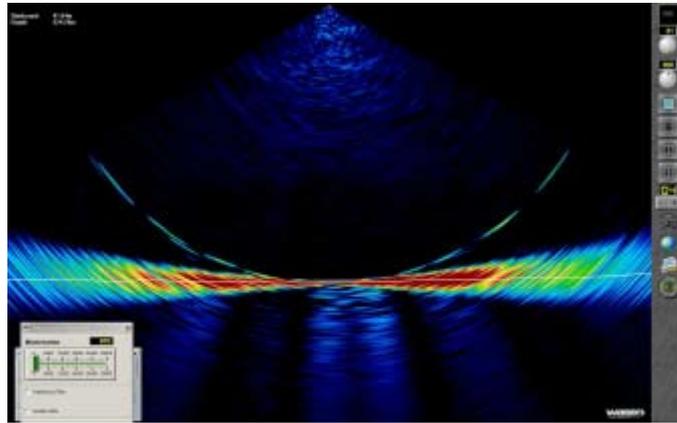
This ring is a by-product of the multi-beam technology of your WASSP system. It is supposed to be there but in practice we want to make it as difficult to see as possible. To avoid these rings confusing the sea floor tracking algorithms or being confused as fish marks the Minimisation feature allows these rings to be suppressed on the Sonar display.

The ring is caused by mathematical limits – when a very strong signal arrives at the receiver it creates a shadow like effect that creates a ring of much weaker echoes. Unfortunately the signal return from the sea floor is many orders of magnitude stronger than a fish echo and thus the shadow of weaker echoes are comparable to fish targets.

How do I know if I have a problem then? – From experience in the field a minimisation level around 3000 is normal. Some systems may have as low as 1500 others up to 5000, often as a result of newer or older technology. If the minimisation required to remove traces of these rings is much higher then there could be a problem. If you have a minimisation level of lower than 6000 and can't see any rings then your WASSP system is probably operating correctly.

If you have the system working with no sign of these rings and then they start to appear and you have not changed the Minimisation settings then something has changed for the worse – keep reading.

There are a number of ways to optimise the performance of your WASSP system and to reduce these rings:

a) Too much power – This is the most common cause of problems. When there is too much acoustic energy in signals returned from the sea floor they may distort. Distortion of the signals will cause ambiguity in resolving the position and thus create rings of very high amplitude.

b) Shading of Receiver – Any difference across the receiver caused by marine growth or any other irregularity across the face of the receiver will contribute to a reduction in the discrimination of the WASSP system. This will lead to higher intensity rings.

c) Reconnection Fault – If the cable from the Transceiver to the Transducer was disconnected and has been reconnected recently it is possible the receiver is connected incorrectly. Check the colour codes of Ethernet connections are in the correct order.

d) Calibration – It is possible that the system calibration was disrupted by another sounder, close the WASSP GUI and re-run to allow the system to recalibrate.

e) Electronics Failure – If one or more channels fail in the electronics this will increase the intensity of the ring.

f) Configuration – Changes made in the Technician configuration could significantly change the system performance. Check Windowing, Power and Pre-processing options. If possible reverse any changes made if the system configuration deteriorates. If the changes are unknown make a note of all ship setup information, backup the WASSPPRO.INI file and then delete the original to run the WASSP system with default configuration settings.

Question 10   **What is this constant signal on the sonar/fish finder display?**

There are many sources of noise, interference and general acoustic reflections which can make these bathymetric displays difficult to use. A description of the different types of noise and ways in which you might be able to determine and eliminate them follows.

Sonar/Sounder – Other Sound producing devices will produce constant blips on the WASSP sonar display which will vary in intensity and size depending on the transmission power and angle of the system. If you wish to continue using your other sounders you can suppress this noise using the Interference Filter option.

Aeration – Air in the water around the transducer can cause transmitted signals to be absorbed or reflected prematurely resulting in false signal reports from the transducer.

Biomass – Large bodies of photo plankton can float through the sea covering very large areas. This may be the source of large areas of constant faint signal return through a region of the water column.

Own Transmission – WASSP shows all received signals starting from half way through the transmission pulse. Thus you should see a red or yellow ring at the top of the Sonar display. As power level and pulse width increase this signal return will be stronger and larger.

Keel Reflection – If the WASSP system is mounted in such a way that transmitted signals can reflect off the ships hull you may find that there is a constant strong return shown on the sonar display. This may happen even if the hull is just outside the 120degree transmission swath. If a strong signal follows the boat and is within the dimensions of the ship then this signal is probably a reflection off your own ship. This will make it hard to detect fish at this depth but otherwise shouldn't affect the performance of your WASSP system.

Electrical – There are an almost infinite number of ways in which Electrical Noise can influence system performance. The first priority is that the system be well grounded – this means a large and preferably short grounding wire connects the Transceiver to the Power supply ground. WASSP is relatively protected by noise on Power supply sources but a very noisy supply could cause trouble. More likely causes of electrical interference are if noisy, high power machinery or wiring is run beside the transducer cable. Electrical noise is either constant, regular or transmit power dependant.

Water Temperature Layers – A thin faint horizontal line that is present ping after ping in the same place could be a temperature layer. The Sea is often layered with various temperature layers due to pressure and surface mixing. Often a reflection can be created at the depth where a significant change in water temperature occurs – causing an acoustic return.

Prop Noise – If the turbulent water flow off the props is directed onto the transducer face this could create aeration noise. Especially relevant for lower frequency models – it may be possible to pick up the prop noise as an acoustic source. For this reason it pays to mount the transducer some distance from the ships props. Prop acoustic noise will appear on the side of the Sonar display close to the prop and will look like a regular pulse or solid signal depending on the rotation speed.

Vibration – Shudders of vibration and vibrating mounting structures can induce significant noise. Additionally a vibration in mounting can cause motion compensation of the system to fail. Sharp jolts and vibrations will generate rings of high signal.

Question 11   **Why is my WASSP System not tracking the Seafloor?**

Any source of Noise mentioned in the answer to Question 9 above can cause the seafloor detectection to fail if it is bad enough. In some cases bad noise can cause the tracking to fail and it could take a number of pings for the WASSP system to reacquire the seafloor. In some instances noted below and in bad cases of noise it may not be possible to automatically resume seafloor tracking.

Power – If too much power is being used for the depth of water you are operating in, the seafloor tracking signal could be noisy especially if there is enough power to cause signal distortion as the tracking algorithm may track the rings produced by this. Conversley, too low a power level may result in the signal levels from the sea floor being below the noise floor of the system and thus they will be ignored as noise. This will tend to cause the surface noise to be considered as a bottom detection candidate.

Depth – The WASSP system can acquire a sea floor profile swath 3.7 times the nadir depth but this requires the acquisition depth to be at least twice that of the maximum depth on that swath. WASSP takes this into account and when the Depth Dial reads 100m the system acquires to 210m. If the acquisition depth is in manual mode or the system fails to track down with the seafloor then you may need to manually increase the system range to allow it to reacquire the seafloor.

Fish – Occasionally a very large dense school of fish can be detected as a mountain on the seafloor. This should be easy to determine with a second pass over the area at a later time. This function also allows wrecks to show on the contour display as these are often similar in density to fish schools.

GPS Position – If there is no position the WASSP system will not output depth data and will cease to write contour maps.

Minimisation – The seafloor tracking is affected by the Minimisation level; ensure this is set appropriately as described in the Installation Manual on Page 50.

Question 12   **Why doesn't the seafloor line up when I go over it again?**

There are several factors which can cause this to show on your WASSP display however remember that if the vessel is operating in a high sea state, your motion sensor may not be able to fully compensate for the vessel's movement:

GPS Time Lag – The standard Furuno SC-50 and SC-30 Heading sensors have a 1.2 second delay on GPS data. Ensure that any GPS delay is entered into the Ship Setup Configuration as this will cause large errors in depth.

Motion Compensation – To make good use of motion compensation we must ensure that the WASSP transducer and any Motion sensors are securely mounted and do not move at all. The dynamic and static accuracy of the motion sensor effectively determines the differences you can expect when you pass over the same area again.

Sea State – Motion Compensation is a complex process and makes some assumptions – the bigger the sea state and the smaller the boat the less reliable the seafloor data will be as there is more reliance on the accuracy of measurements and the input from the motion sensors.

Cornering – Motion compensation is costly to do to the nth degree. Most low end Motion sensors have poor performance on corners due to the centripetal acceleration forces caused by a turn affecting the delicate balance of the sensor. Thus sea floor detections collected while the boat is turning are likely to be of lesser quality than those collected in a straight line.

Water Temperature – The water temperature and salinity affect the sound speed and thus the angle at which the sound moves through the water column. This causes the sea floor to curve up or down as noted in the operator manual. If the seafloor exhibits a curve up or down on the edges, adjust the sound speed. Note: The surface water temperature will probably change during the course of a day.

Tide Correction – Tide is essential for matching up overlapping swaths. If you have disabled the Tide correction the swaths will rarely line up on your WASSP displays. Ensure that the ZDA sentence is being collected and sent to the WASSP computer so it can determine the UTC time and use the correct tide correction value.

Transducer Offsets – The transducer, GPS and draft offsets need to be input into the WASSP ship setup configuration so that the motion induced errors in the seafloor can be correctly compensated for.

Roll Offset – If there is a fixed offset in the mounting of the transducer or Motion Sensor you will need to conduct a patch test to determine this error. Without this the roll correction will not work correctly.

Question 13   **Why does the Seafloor Move if the system is Motion Compensated?**

The Contour and 3D display are fully motion compensated. The other displays are only compensated for Roll to save on processing time and to avoid creating artefacts in the data. If the Sonar display is rotating then the Roll correction is not working. Remember too that if the vessel is operating in a high sea state, your motion sensor may not be able to fully compensate for the vessel's movement

Check Roll Information is being received (Open the Raw Information Form and check the Roll Graph displays roll waveforms). You should see a red line on this display if the Roll information is being processed.
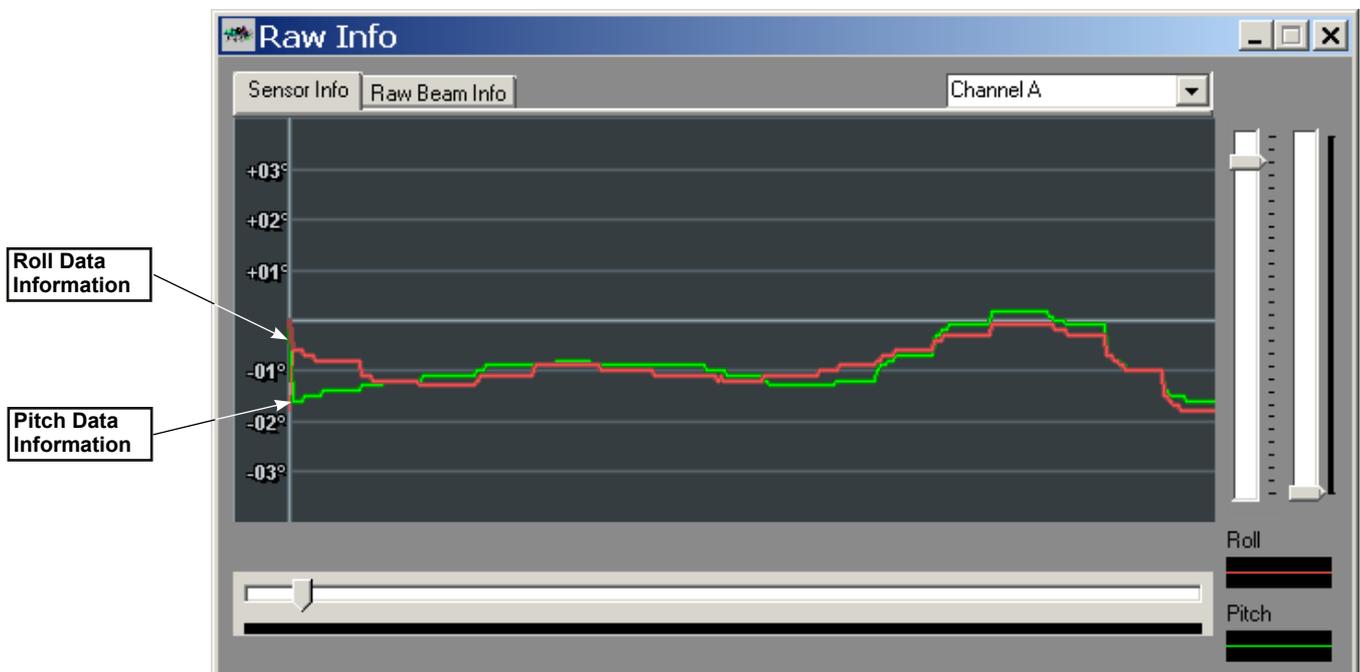
- Check that the device that you receive roll information from is on and that all your serial cables are still connected to your WASSP Computer.

- Check that the correct sensors are selected in the Ship Setup Form, this configuration could have been inadvertently changed.

• Check that the Roll Configuration settings have not been changed. If the transducer array has been re-installed, the Swap Array setting could have changed in which case you will need to invert the Roll Configuration. When in doubt, use the values that were recorded in the Installation Manual at time of commissioning. If the roll offset is incorrect a slight roll of the display will occur. If the roll polarity is incorrect you will see a doubling of the actual vessel roll (i.e. complared with having the roll compensation disabled).

• Use the WASSP Network Status screen to check that you have not disabled the Serial port. Check that the serial port with the attitude data is being used.
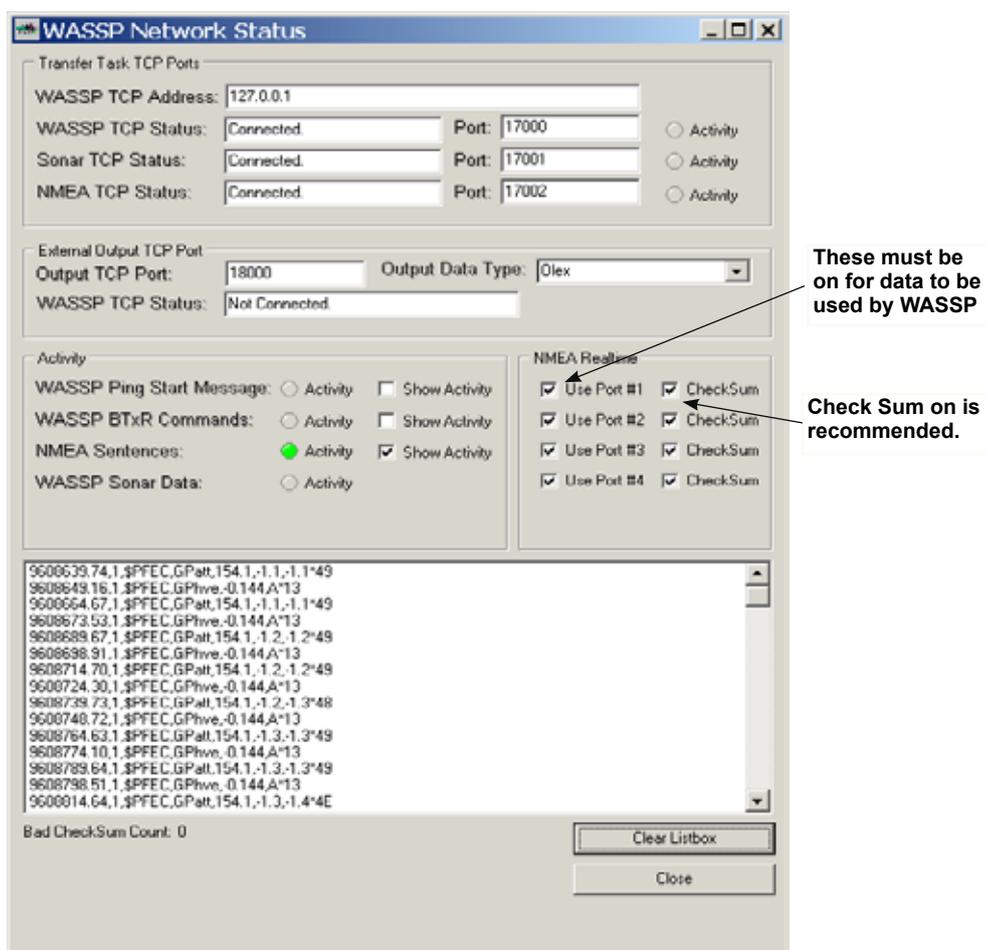
Finally if the sea floor is not uniformly flat you could see rapid changes in the sonar display with each ping as the ship moves across the sea floor. As there is no heave or pitch compensation on this display it will often move up and down and if the sea floor changes angle it will also appear to roll a bit. If you are unsure check that the seafloor remains flat on a flat piece of seafloor and remember that a vertical shift is expected if there is vessel roll, pitch and or heave. These artefacts should be mostly removed when you look at the WASSP Contour display which is corrected for the measured attitude elements.

Question 14 **The mode button animates as if pinging but nothing happens. What is wrong?**

If you are looking at the Contour or 3D displays these will not update without GPS information, sea floor profile information and mapping is enabled. Check your GPS is on. This can be validated by checking the network input screen or transfer task diagnostic displays. If the seafloor line is not being traced on the Sonar display or the Mapping has been disabled then new data will not be added to the Contour Maps.

Increase the gain, and range. Can you see noise on the Sonar Display? If not reset the power to the Transceiver, and reset the PC and retry. If this problem persists and there are no error messages, contact your dealer. If you are getting an error message or messages, look at the relevant information for the error message in that section of the FAQ.

Ensure that the Transducer has not been disconnected from the Transceiver, both the receiver cables and the transmit cables need to be connected in order for the WASSP system to operate. If problems persist after a full system shutdown and power up then contact your dealer.

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Technical Specifications

Dimensions

Transceiver:	Height: 180 mm. Width: 221.5 mm. Length: 535 mm.	**Sea Chest Type Transducer**:	Height: 77 mm. Width: 367 mm. Length: 435 mm.	**Fairing Type Transducer**:	Height: 88 mm. Width: 183 mm. Length: 672 mm.

Computer Requirements

CPU:	Minimum 2.5 GHz 32-bit processor.
Memory:	1 GB RAM.
HDD:	40 GB (recommended minimum 160 MB).
Graphics:	NVIDIA GeForce 4 Graphics 64 MB (or faster DirectX8 and OpenGL compatible graphics card).
CD-ROM Drive:	Required for software installation.
Serial Ports:	At least 2.
USB Ports:	At least 2.
Power:	230 V AC (ENL supplied Shuttle PC).

Display

Display unit:	Owner supplied.
Resolution:	1024x768 or better.
Display range:	
Range	5 to 300 m.
Shift	5 to 200 m.
Zoom range	2-D zooming from 250 m to 3 km, 3-D zooming from 10 m to 1 km.
Display modes:	Sonar view. Single / Triple beam view. 3-D sonar view. Contour view. Backscatter view.
Display windows:	Single screen. Vertical split screen. Horizontal split screen. 4-screen.
Advance speed:	Slow – fast (5 speeds).
Record:	Raw data, capture maps.

Transceiver

Output power:	14 power settings from 40 W to 1.5 kW.
TX rate:	Automatic ping rate, determined by depth.
Frequency:	
Beam width:	160 kHz.
Maximum depth:	112 beams at 1.07º over 120º port/starboard swath, Transmit 4º fore/aft, Receive 10º fore/aft.

Stabilisation

Roll:	±30º depending on sensor.

Interface

Inputs:	NMEA sentences: HDT, HDG, VTG, RMC, GGA, GGL, ZDA, PFEC-Gpatt, PFEC-Gphve.

Power Supply

Transceiver:	24 V DC, 70 W.
Computer:	230 V AC, 50 to 60 Hz (inverted from 24 V DC ships supply).

Environmental

Temperature:	0 to 40 ºC.
Relative humidity:	5 to 95% non condensing.
Vibration:	IEC 60945, protected equipment.

Weight

Transceiver:	5 kg.
Transducer:	
Sea Chest type:	18 kg.
Fairing type:	14 kg.

Equipment List

Standard:

Transducer:	WMB-160F-FT (fairing type for wood and FRP hulls) or WMB-160-SCT (sea chest type for steel and alloy hulls).
Transceiver:	WMB-BTxR.
Computer:	WMB PC.
Gland:	WMB-AG (alloy), WMB-SG (steel), WMB-PL (plastic).
Inverter:	WMB-INVERTER.

Options:

Satellite compass:	For beam roll stabilisation.

Disclaimers:

The WMB-160F is not designed to comply with hydrographical mapping standards and therefore must not be used as a Navigational Mapping Tool.

ENL reserves the right to change this manual without notice.

Specifications subject to change without notice.