

## Assessing sounder performance: a guide to gathering objective and meaningful performance data

### Introduction

Although most Raymarine sounder owners and users prefer fully-Automatic operation, and this is one of the Raymarine sounders' great strengths, this mode is not suitable for comparing performance in different conditions or analysing performance-related problems. The procedure below allows the user to gather data that will allow Raymarine-trained Service Dealers and Raymarine technical support to assess system Noise levels (which severely impact performance) and relative signal strengths.

### Preparation

1. Insert a blank Compact Flash (CF) or MicroSD (μSD) card, as appropriate for your MFD model, into the MFD chart slot.
2. Find your sounder model in the Sounder Groups table below and using your MFD's sounder setup, apply the values from the relevant column below:

Sounder groups						
<b>Group A</b>	Dragonfly, CP100, CP200, CP370, CP470, CP570, Lighthouse DownVision MFDs, Axiom MFDs					
<b>Group B</b>	CP300 v3 software, CP450C v1 – v3					
<b>Group C</b>	CP300 v4, CP450C v4					
<b>Group D</b>	DSM25, DSM30, DSM250, DSM300, DSM400, A50D, A57D, A70D, Lighthouse 600W Digital MFDs					

Control name	Manual or Auto	Group A	Group B	Group C	Group D
<b>Power</b>	Manual	100	100	100	100
<b>Gain / Sensitivity</b>	Manual	65	50	50	100
<b>Colour Gain / Contrast / Intensity</b>	Manual	15	15	15	10
<b>TVG / Noise Filter / Surface Filter</b>	Manual	0	100	31	0
<b>Colour Threshold</b>	N/A	100	100	100	100

3. Configure dual-frequency display:

#### Classic and Widescreen MFDs

Go to *Menu > Fishfinder Setup > Configure Preset Frequencies* (choose one Preset mode (e.g. 'P2 Dual') which you will need to take note of and re-use below.)

Exit the menu and press the relevant softkey to go to your dual-frequency **Preset** page configured above, e.g. 'Preset 2 Dual'.

#### Lighthouse MFDs running v9 and earlier software

*Menu > Frequency Settings* and configure dual-frequency display (e.g. 50 & 200kHz for DSMs or Low Chirp & High Chirp for CP450C systems).

#### Lighthouse MFDs running v10 and later software

If required, create a split-screen page layout containing two Fishfinder applications. Select this dual-fishfinder page and then go to *Menu > Channel* and select a different sounder channel (e.g. Low Chirp / High Chirp, 50kHz / 200kHz) for each application. Always use Chirp modes for Chirp-capable sounders (CP450C, CP470, CP570 etc.)

4. Configure Display Mode to show A-Scope Mode 2 on each sounder frequency:

#### **Classic and Widescreen MFDs**

Press the softkey *Adjust [Your chosen Preset name]... > Select View > A-scope > A-scope Mode = 2*

#### **Lighthouse MFDs**

*Menu > Display Mode > A-scope > Mode 2*

5. Configure the display to show **Vessel Position** and **Speed Over Ground (SOG)**

#### **Classic and Widescreen MFDs**

Go to *Menu > Databar Setup > Configure... > Add Data*

#### **Lighthouse MFDs**

*Menu > Presentation > Databoxes Setup*

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## **NOTE: Taking a screenshot**

Screenshots are far superior to digital photos for sounder diagnostics because they are high-resolution, show the whole screen and are always in focus. They are also much easier for you when you're offshore. They will be saved to the MFD's chart card slot.

### **Classic and Widescreen MFD ranges**

Press and hold the **DATA** key for 10s, until the MFD beeps twice with about a 2s gap between

### **Lighthouse MFDs**

1. If your display has two chart card slots, go to *Home > Customise > Display Preferences > Screenshot File* and choose the card slot to which you want to save. *MicroSD1* is the top slot.
2. Press *Power key > Camera icon*

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## **Test process**

1. Motor out into the depth of water at which you have been having problems. It's ok to switch back to Auto settings to do this, as long as you go back to the above Manual settings before continuing.
  2. Range the sounder so that the seabed is shown about two-thirds of the way down the sounder screen. Leave on **Manual Range**.
  3. Adjust the **Colour Gain** control until the bottom return signal is just touching the LHS of the A-scope, as above.
  4. Stop the boat. Put the engines into Neutral
  5. Take several screenshots
  6. Put the engines into gear and re-do Step 5 at idle speed (dead slow).
  7. Accelerate and redo Step 5 at 5 knot intervals until you reach the vessel's maximum speed.
- Raymarine Asia Pty Ltd. Last updated August 2014

8. Send the screenshots to us via our File Transfer Service, <https://transfer.flir.com>, using the destination email address [aus.support@flir.com](mailto:aus.support@flir.com). Please include:
- A description of what you see as the problem with the images in question
  - Noise level measurements (Colour Gain levels) for each frequency tested (*note that unless making a specific noise-level measurement, you should use the exact values described in the table on p1 only and make sure that you use the same values throughout.*)
  - Sounder model (*DSM30, DSM300, DSM400, CP450C etc.*)
  - Sounder software version and display software version (e.g. *CP450C v4.04, e125 v12.26*)
  - Transducer model (e.g. *B744V, R299, B265LM*)
  - Transducer installation location (e.g. *inboard of port engine, transom stbd side*)
  - Boat make and model
  - Testing location (e.g. *20nm of ESE Port Stephens*)
  - Your name and contact details

## Examples

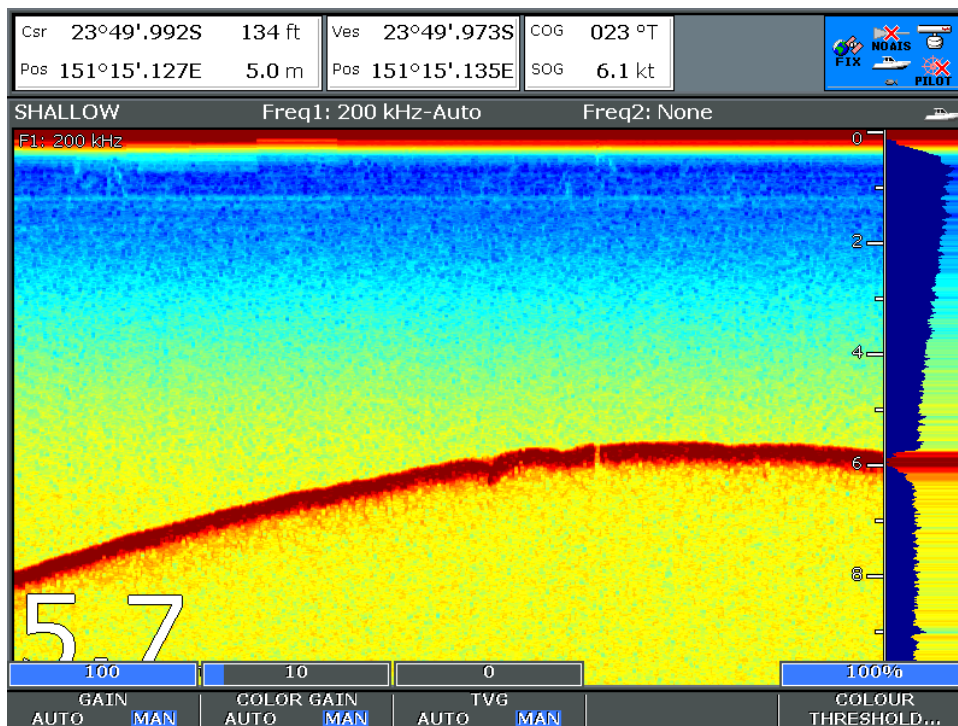


Figure 2: A DSM300 sounder system configured to show useful sounder performance diagnostics, though ideally it should be running dual-frequency split-screen. In this case we have a strong bottom return and low background noise level leading to very good contrast between the bottom return and the noise.

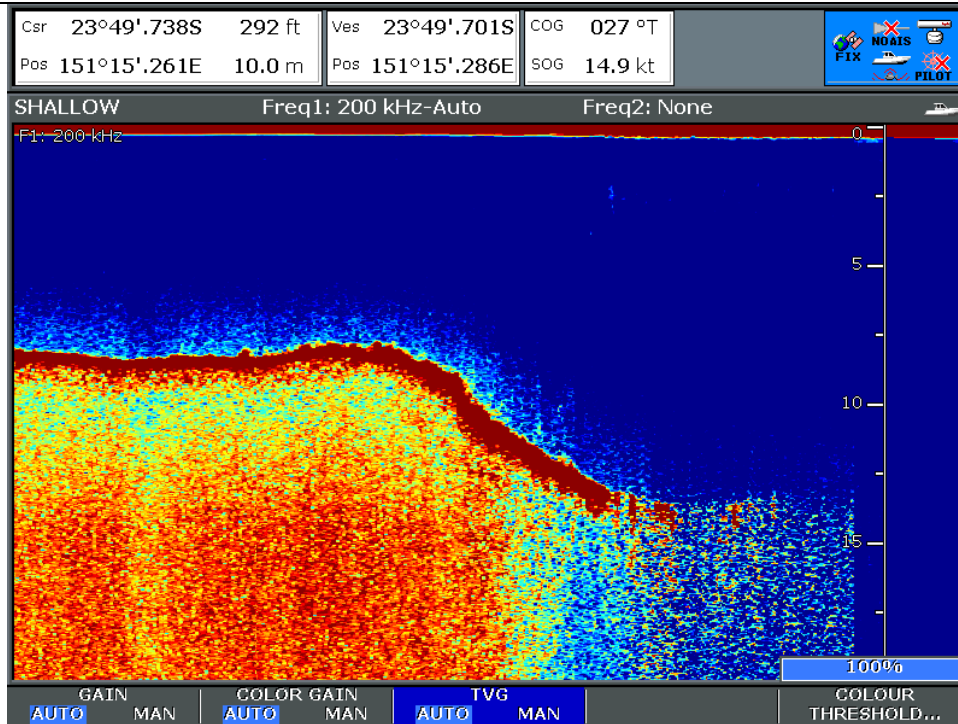


Figure 3: An example of a sounder image which is NOT useful for diagnostics. Running the sounder in Auto Gain means that we cannot tell for sure whether the loss of bottom return was due to a high noise level or low signal level

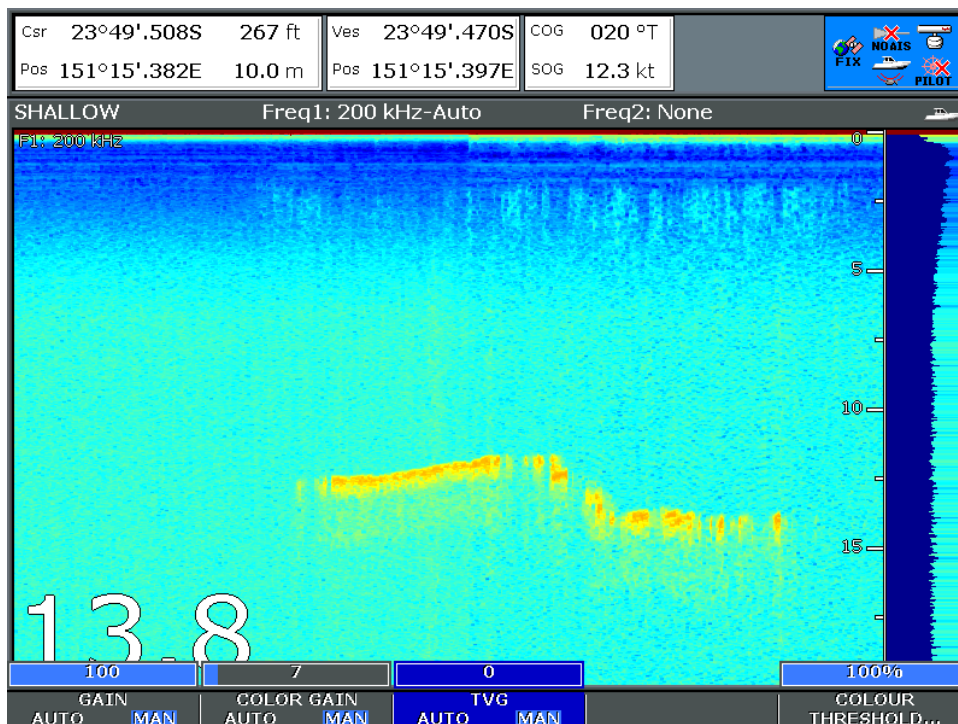


Figure 4: Although the user is running in the wrong Colour Gain level, this screenshot is useful for diagnostics and clearly shows a low Noise level (pale blue-green background) but very broken and intermittent bottom return. This is a classic symptom of aeration under the transducer and usually means that the transducer needs to be moved to a better spot. This is not a sounder fault.

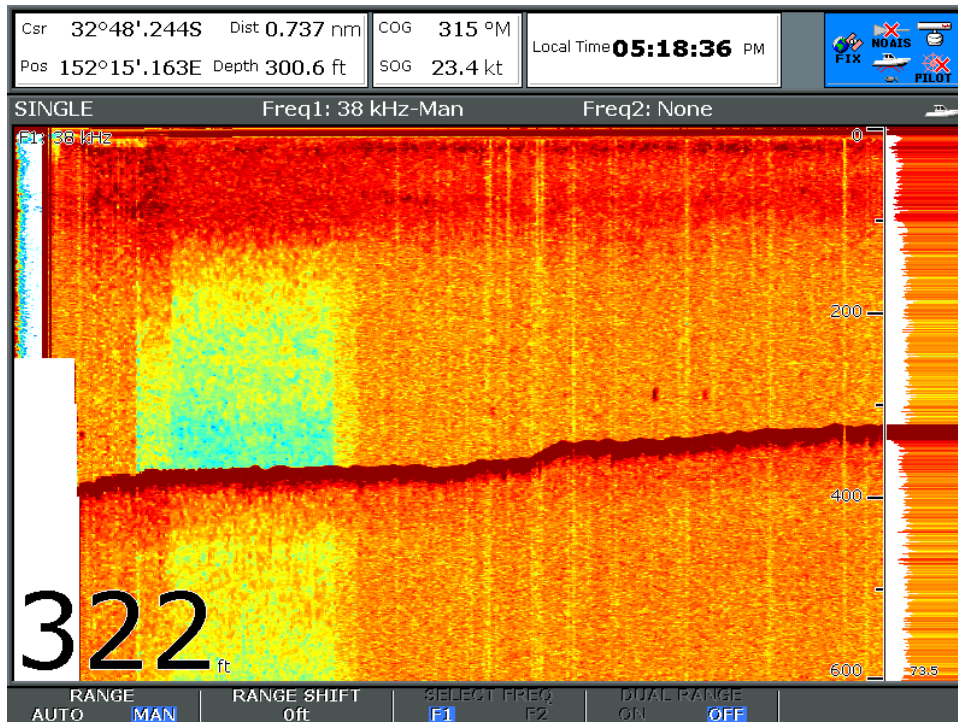


Figure 5: This screenshot is a good example of a boat-speed related Noise signal. You can see that the bottom return remains clear and continuous with no gaps (no air under the transducer) but you can see that in the section of the sounder image above the 'Range Shift' soft-key the background noise level (just above the bottom return) is far lower than in the rest of the sounder return. The boat was running at around 23 knots but for a short period slowed to idle, and this drop in speed was accompanied by a significant drop in background Noise level. The strong, continuous red band across the top of the sounder image is clutter from plankton, not part of the noise signal. The high noise level would have produced a picture, in Auto, which would look very like Figure 3. Neither the noise nor plankton clutter in this image are sounder faults.

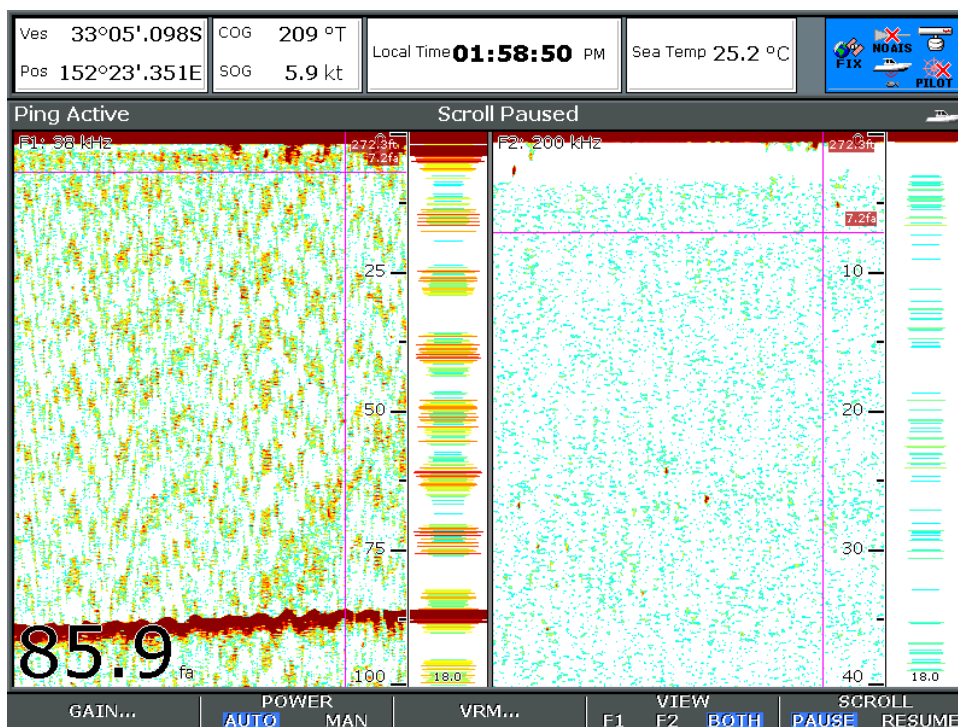
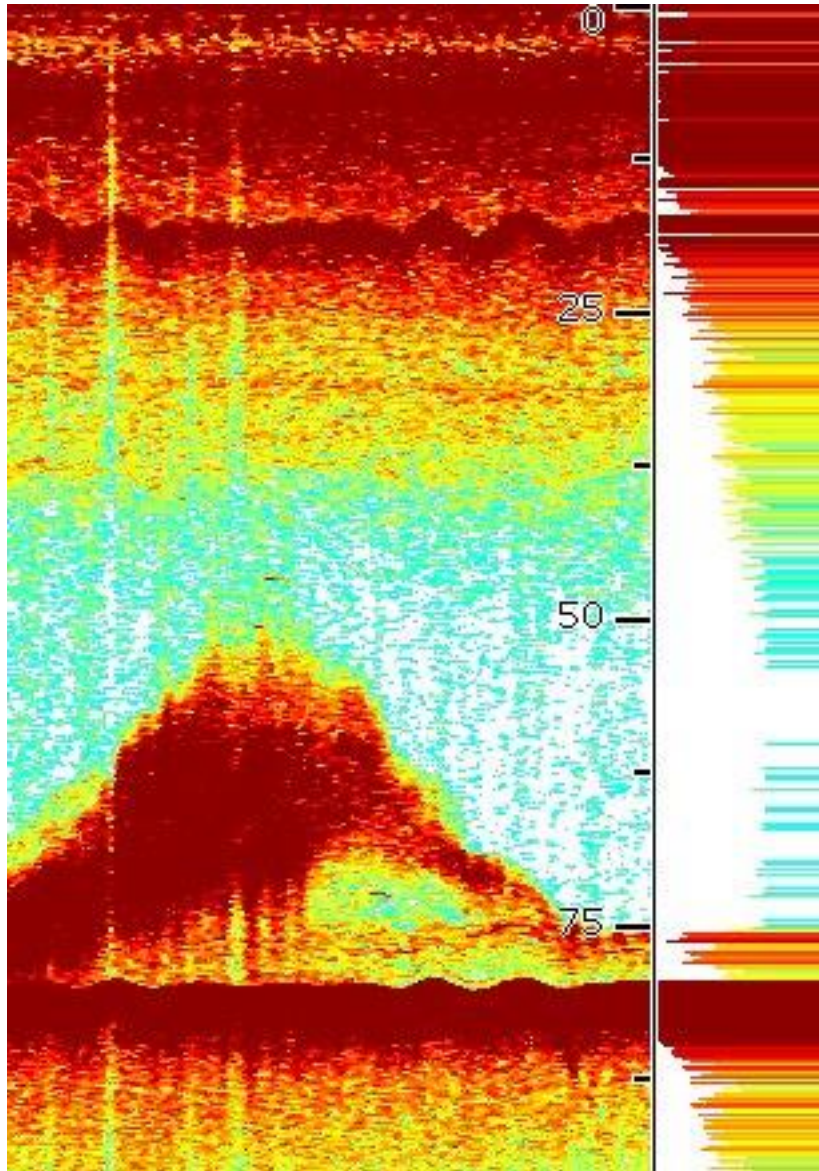


Figure 6: Classic symptoms of noise from machinery or electronics on your own vessel. The herringbone pattern in the 38kHz sounder image and regular, repeating pattern in the A-scope

*view are very characteristic of an unwanted cyclical signal which is interfering with your sounder.  
This is not a sounder fault.*



*Figure 7: a strong return in the upper water layers from a dense zooplankton bloom where offshore current eddies mix with coastal water. Below is a large bait school being attacked by pelagic predators.*