

Angling Technics Limited

FULCRUM NAVIGATOR

Instructions

Thank you very much for purchasing the Fulcrum Navigator. Please spare a few minutes to familiarise yourself with this system before you use it.

Overview

The Fulcrum Navigator is a satellite navigation system designed for baitboats of any manufacture. As well as a number of other functions, it replaces physical marker buoys with an invisible electronic version. It can store and retrieve up to seventy five electronic markers which can then be used to guide your baitboat to a spot with high precision and ease – time and again, day and night on any water in the world. The system comprises two parts, a boat transponder which contains the satellite receiver and a shore based handset mounted LCD display. The boat transponder is usually powered directly by the boat and the display by internal rechargeable NiMH batteries.



The boat transponder uses satellites to find its location on earth and sends this information to the shore based unit. **The shore unit** then calculates where the boat is, relative to the 'marker', and provides simple distance and direction indications as to how to get to the marker. In addition to this, the display indicates the voltage of the boat battery together with an ability to warn you when the boat battery is getting low. Another very useful feature on the display is an arrow indicating which direction the boat is heading – obvious at fifty yards but not quite so easy at two hundred in poor light.



Fitting

The transponder is designed to fit straight onto the Angling Technics standard baitboat or the Microcat which provide its power supply via the gold connector (centre positive). The **Safety Link** fitted to the transponder must be attached to somewhere on the boat. If you have another type of boat then you can use the transponder power pack (available separately)



The shore unit has been designed to fit most of the current radio transmitters from Futaba, Acoms and Hitec. Simply remove the backing from the two **Velcro** pads and place them where the Z brackets align on the back of the transmitter as shown here. Ensure that the rubber patch on the rear lower edge of the metal housing of the shore unit lies against the transmitter body. The shore unit can then simply be attached or removed as required.

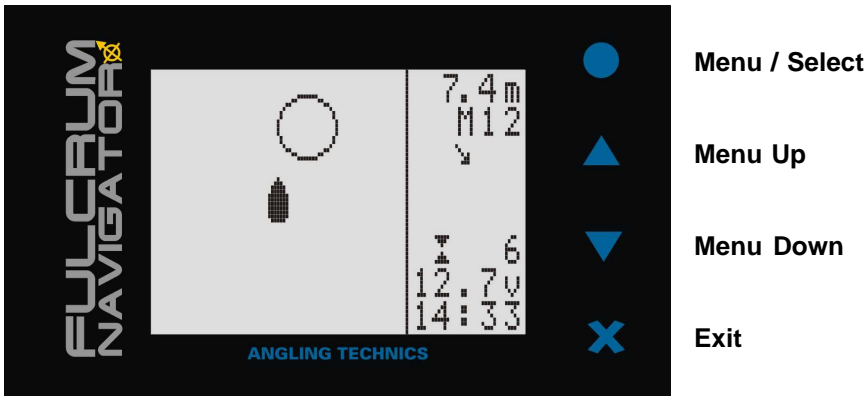


Attach the shore unit to your transmitter in this way:

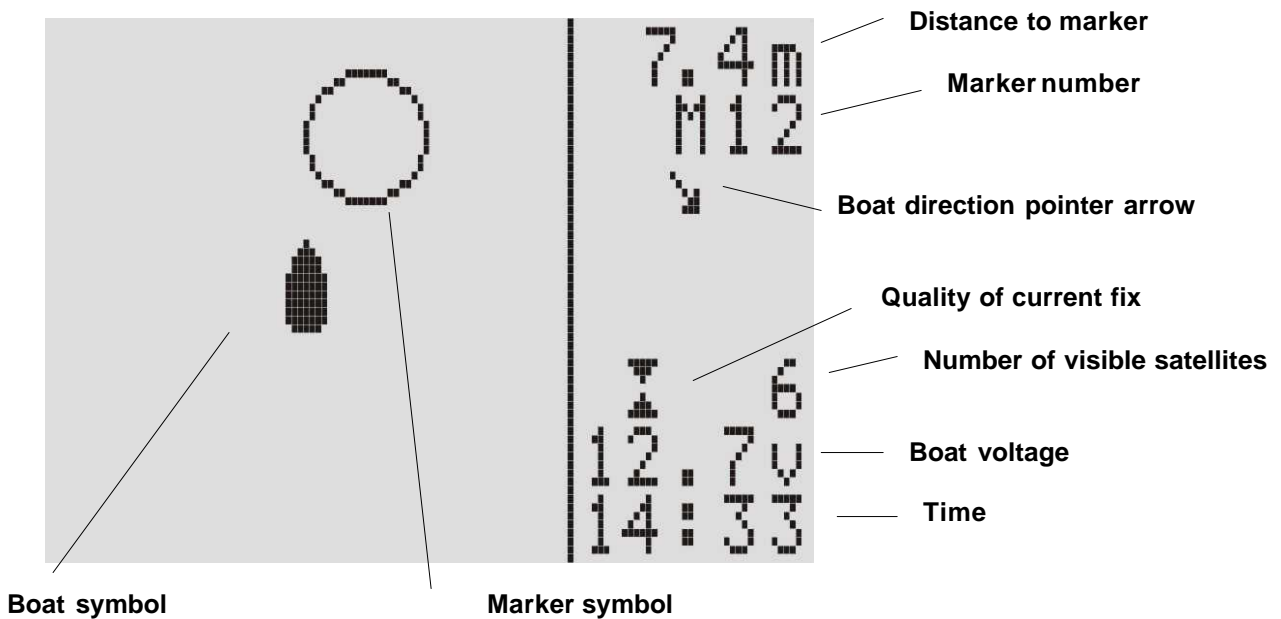


The receiver is turned on and off using the switch on the left hand side of the unit.

Controls

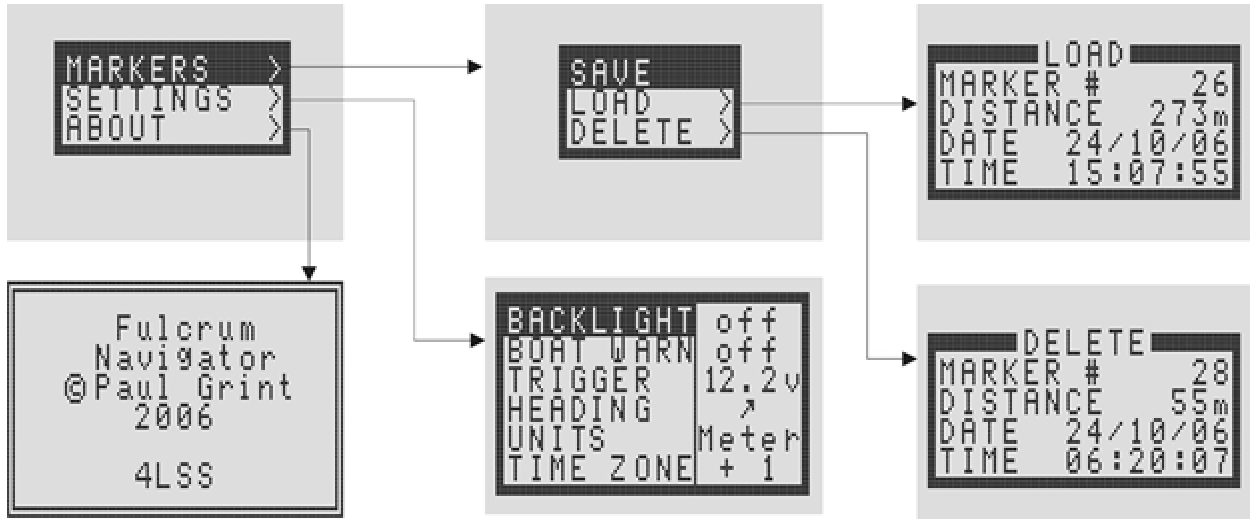


Display



Menus

Here is the menu structure that can be accessed and navigated through using the four control buttons located on the right side of the shore unit. Where a title is highlighted this is where the next press of the select (top) button will take you.



Markers menu

Save – saves the current baitboat location together with the date and time using the next available unused marker number. This number becomes the current number once you return to the main screen.

Load – brings up a screen entitled load, where you can navigate through the saved markers using the up/down controls (▲ ▼) until you find the marker you require. The distance from this stored marker to the current location of the boat is displayed to assist you. If no distance is shown then the distance is beyond 1000 meters. You can exit this menu by either selecting a stored marker using the select button (●) or exiting the menu using the exit button (x).

Delete – brings up a screen entitled delete, where you can navigate through the saved markers using the up/down controls (▲ ▼) until you find a marker you wish to delete. Once deleted, the next stored marker is displayed. The distance from this stored marker to the current location of the boat is displayed to assist you. If no distance is shown then the distance is beyond 1000 metres. Pressing the exit button (x) will take you back to the main screen.

Settings menu

In this menu any highlighted title will have its value changed by pressing the select button (●)

Backlight – with this control set to **on**, the backlight will be on as long as the unit is on. If this is set to **off**, the backlight will only come on whilst you are within the menu system.

Boat warn – This setting enables the unit to warn you if the boats voltage drops below a value set by the trigger (adjusted in the trigger setting).

Trigger – this value is the boat voltage, below which the unit will beep and display a warning – allowing you enough time to return your boat safely to shore. (Adjustable from 5.0v to 14.0v in 0.1v increments)

Heading – this adjusts the direction pointer (relative to you) the boat is traveling. If you wish to make use of this facility you will need to send your boat into a straight line before you access the menus. Once the boat is running in a straight line, press the select button (●) whilst the HEADING is highlighted until the arrow points in the general direction of the boat. If you overrun, simply keep pressing the select button (●) until it is correct. The pointer arrow has eight points so will give an indication of boat direction but not precise angle.

Units – this enables you to change the setting between feet and metres.

Time Zone – this adjusts the time from UTC (GMT) to your local time.

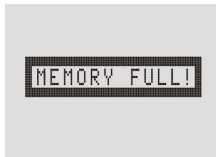
All settings are stored in memory so that any changes you make will apply immediately and the next time you turn the unit on.

Messages

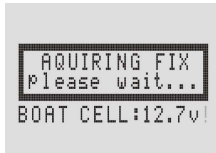
A number of messages accompanied by beeps may be displayed. Their meanings are as follows:



There are no stored markers in memory and you are accessing the load marker menu.



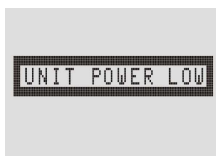
All 75 marker locations are full – use marker delete to make more space.



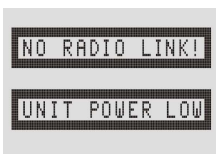
The boat transponder is attempting to gain a position fix. It also shows the voltage of the boat battery and includes an "!" after the voltage if the voltage is below the trigger value.



The transponder on the boat is not connected or has gone out of radio range or is receiving interference from nearby



The battery supply inside the shore unit is low. You will need to recharge the unit for 14 hours to achieve a full battery. Do not leave on charge for more than 24 hours. There is no need to discharge the unit before recharge as the batteries are NMH technology and have no 'memory' effect.



A Combination of no transponder signal and shore unit low power.

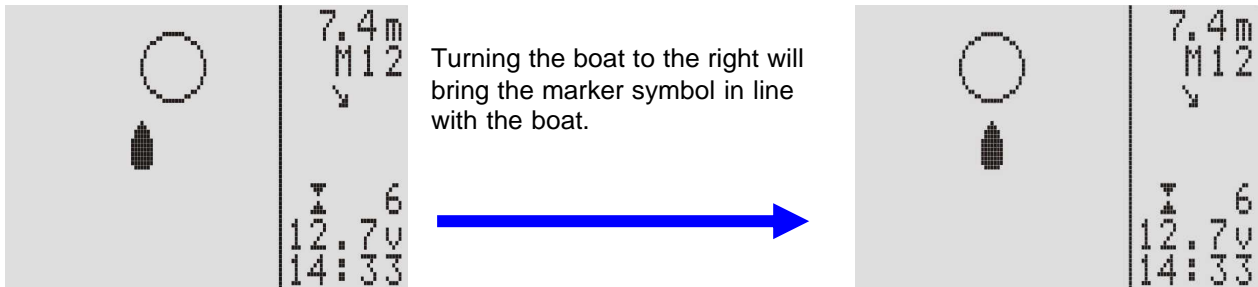


The transponder had a position fix but has lost it either because of obstruction of the transponder antenna or power was interrupted.

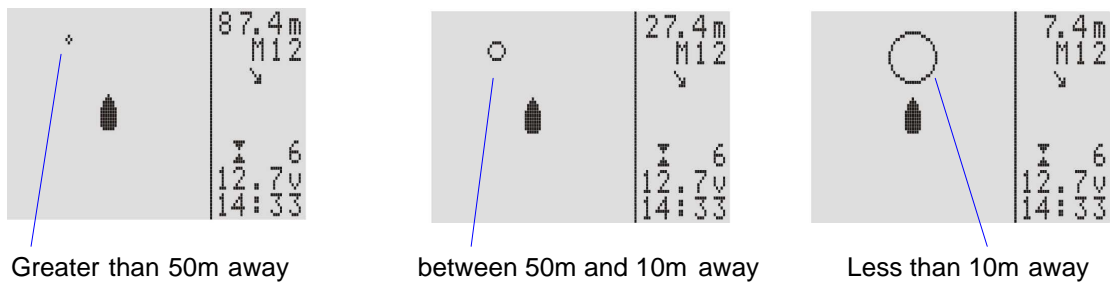
Operation

When the transponder is initially connected to the baitboat it will usually take about 40 seconds to obtain a fix. It can take longer under certain poor signal circumstances and locations.

To store a marker in memory you simply press the select button (●) three times in succession and go through the menu system - **MENU > MARKERS > SAVE** when your boat is over your selected spot. To navigate to the current marker you use the boat symbol to represent yourself driving the boat. If the marker appears to the right of the boat then the boat needs to be steered right until the marker symbol is directly in front of the boat symbol and vice-versa:



The marker symbol has three shapes/sizes depending on how far away the boat is from the marker. If initially, there are only three visible satellites, no symbol will appear until four or more are detected.



Greater than 50m away

between 50m and 10m away

Less than 10m away

Once the boat is central and within the large marker symbol you are within a few metres of the stored marker. Once you are within one metre of the marker the unit will issue a triple beep. You can use this sound to trigger the dropping of bait and/or line on this spot.

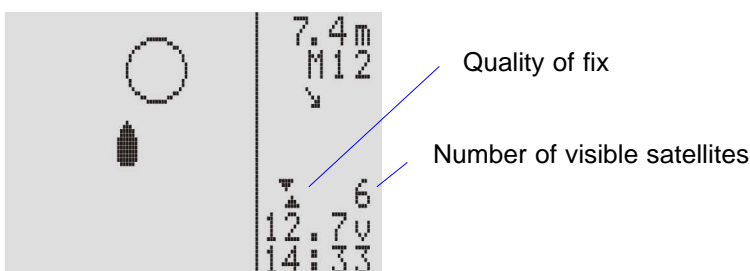
Please note that your boat must have been more than ten metres from the marker for this triple beep to be re-armed. This is to avoid repeated beeping just after you have stored a marker.

As you get closer to a marker the distance shown in the top right of the display will decrease as well as the symbol getting closer to the boat symbol (as shown in the pictures above)

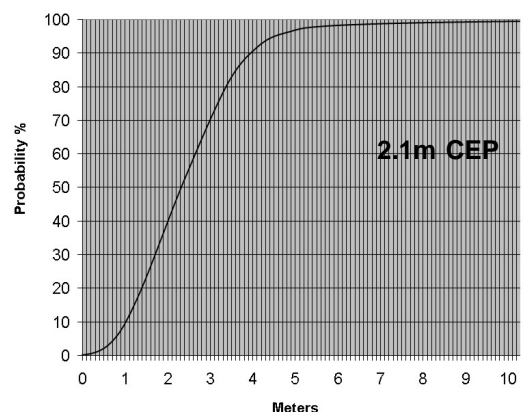
It is important to note that when the boat is not moving, no directional information can be obtained from it i.e. the direction arrow will be invalid and the marker symbol will change angle around the boat symbol (but not distance)

Notes on accuracy

When relying on a satellite positional fix it is important to understand that because a number of things influence the overall accuracy of a fix, the quality of the fix and number of satellites visible is provided to aid you. The quality is shown as two opposing needles. The higher the quality of the fix, the closer these needles will be to being exactly in line. Similarly the number of visible satellites will also tell you how good the fix is. Any number above 6 would be good and 12 would be excellent. Caution should be used with numbers under 6. The graph shows a typical profile of the accuracy of a GPS receiver.



GPS accuracy



Monitoring of boat battery

If you have the **BOAT WARN** enabled then the main display will flash the word 'low' over the boat battery voltage if the voltage goes below the trigger value. By default the unit is set to 11.7v for the Angling Technics standard baitboat or Microcat. If triggered it indicates that you have approximately ten minutes before the boat battery becomes exhausted. For other boats you will need to ask the manufacturer for a battery discharge profile or adjust it from experience e.g. a boat with a higher current usage than a Microcat will need this value set higher and vice-versa. **Please disconnect the transponder from your boat when not required as it will continue to draw current even when the boat is switched off.**

Charging

When the shore unit's battery is exhausted, plug in the supplied charger into the socket on the rear of the unit and charge for 14 hours, but no longer than 24 hours. There is no need to discharge the unit before recharge as the batteries are NMH technology and have no 'memory' effect – i.e you may charge it at any time.

Specification

Resolution : 0.1m

Accuracy: 2.1m CEP

Radio system: EN300 220-2 V2.1.1

EN301 489-03 V1.4.1

Radio range: 200m +

Transponder weight: 200g

Transponder power usage: 6v – 18v @ 175mA maximum (100mA average)

Receiver battery life: 11 hours without backlight, 5 ½ hrs with backlight.

Troubleshooting

Problem	Possible cause	Solution
No satellite fix	<ol style="list-style-type: none">1) View of sky obstructed by trees, hills, buildings etc.2) Transponder battery supply low3) Power supply interference	<ol style="list-style-type: none">1) Wait for several minutes until satellites have moved in the sky and try again.2) Replace/recharge battery3) Try with no motors running – if this solves the problem seek manufacturer's guidance on interference suppression.
Radio link failure	<ol style="list-style-type: none">1) Transponder battery supply low or not connected.2) Radio interference	<ol style="list-style-type: none">1) Recharge or check battery supply.2) Try in another location
Marker symbol jumps around the screen and the distance to marker figures are erratic.	Poor satellite fix	Wait until a better fix is obtained. A small amount of jumping will occur depending on the quality of the fix but excessive amounts indicate a poor fix.
Delay after exiting the menu system.	Can be up to one second delay due to signal synchronising	The system will appear to 'hang' waiting for the next transmission of data from the transponder and is normal.
Battery life of shore unit is poor	<ol style="list-style-type: none">1) Backlight may be being used unnecessarily2) Low capacity batteries being used.	<ol style="list-style-type: none">1) Turn off backlight using settings menu.2) Obtain higher capacity batteries.