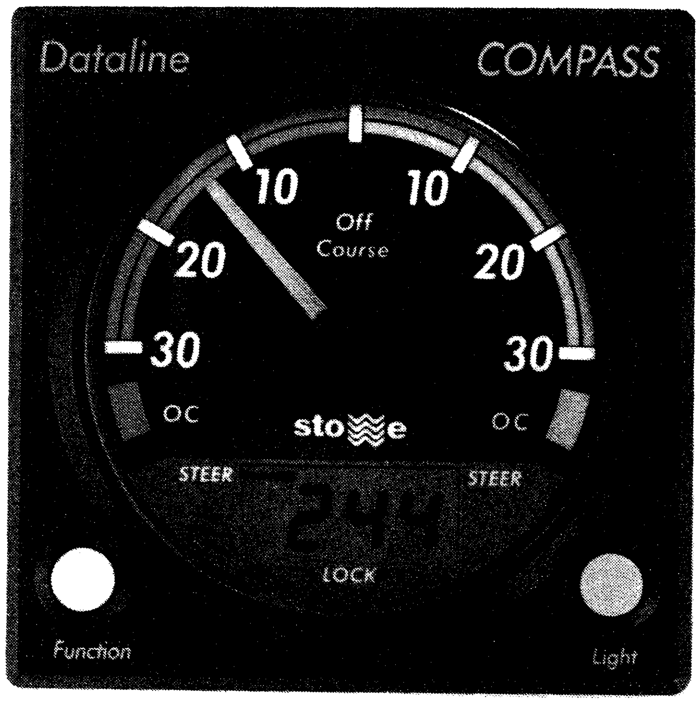
Dataline

INSTRUCTION & INSTALLATION MANUAL
FOR

COMPASS



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1. INTRODUCTION TO DATALINE

DATALINE is a major advance in marine instrumentation.

Conceived by Stowe, a world leader in the manufacture of marine instruments, DATALINE fully utilises all the skill and experience acquired over 8 years manufacturing products such as the internationally acclaimed Navigator and Micro ranges of sail and powerboat instruments.

DATALINE takes all the recognised Stowe hallmarks of quality, ruggedness and reliability and combines them with the technological and visual appeal needed to satisfy the many and varied demands of today's yacht and powerboat owners.

Most significantly, though, DATALINE achieves this in a way that brings unprecedented benefits not only to the end user, but also to the boatbuilder and electronic installation specialist.

This is how it works:

The DATALINE system, as the name implies, is based on a single cable which carries both the power and the data round the boat on a serial Databus using a communication language called NMEA 0183.
This language is the established industry standard and since DATALINE provides both NMEA 0183 inputs and outputs, compatibility is achieved with other navigational aids, such as Satnavs, compasses, plotters and autopilots, which use the same language. By adopting the industry standard the boat's information system is not subject to the 'closed system' constraints of some manufacturers' products so you are free to interface with other compatible navigational aids, irrespective of manufacturer.

The signal is generated from the DATABOX which is installed in a safe, dry environment below deck near the mast, or behind the chart table, or perhaps in the engine compartment of a powerboat. All sensors are wired to the DATABOX.

The DATALINE itself is then THE ONLY WIRE that runs to the instruments, which are simply linked together in a 'daisy chain' in whatever order suits the installation.

The DATALINE system has the capability of linking from one up to 15 instruments and remains as flexible and as viable for any installation, big or small, power or sail.

Since the DATABOX contains the total capability of the system any additional instrument head can be simply connected into the line without any upgrade to the electronics.

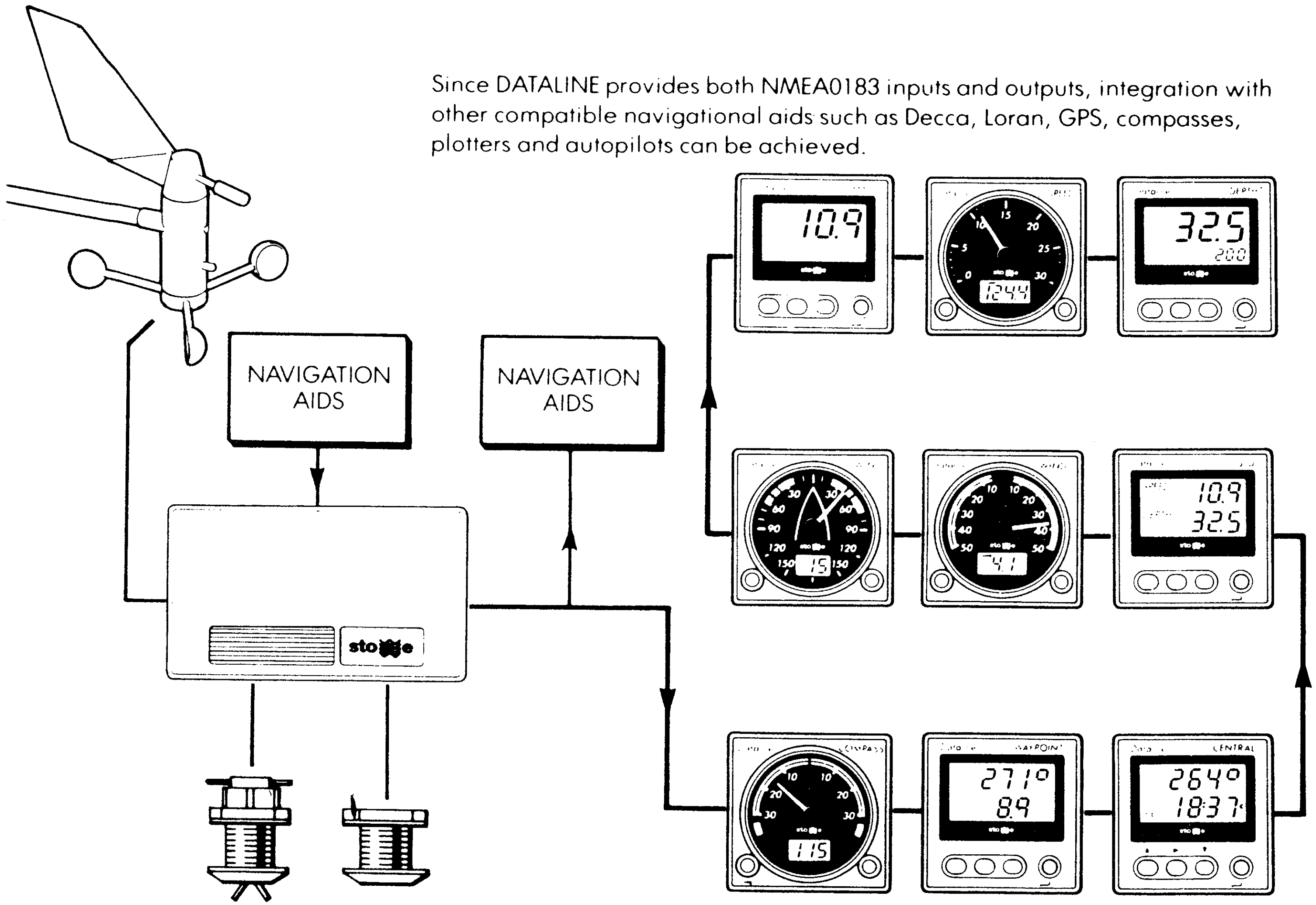
A complete range of analogue and digital instrument heads provides unparalleled flexibility for use in cockpit, flybridge, chart table, or indeed any location on the boat.

In addition to the advances and benefits inherent in the DATALINE system concept, the instrument heads themselves incorporate design features that place DATALINE many years ahead of any comparable instrument system. These include an integral moulded window for water tightness and damage resistance, removable dessicant pack and replaceable clip on cover.

2. DATALINE SYSTEM DIAGRAM

The DATALINE range of yacht instruments includes SPEED multifunction, DEPTH, WIND, WIND PLUS, WAYPOINT Decca/Loran repeater, S/D speed/depth dual display and CENTRAL multifunction instrument.

Since DATALINE provides both NMEA0183 inputs and outputs, integration with other compatible navigational aids such as Decca, Loran, GPS, compasses, plotters and autopilots can be achieved.



3. DATALINE COMPASS

Technical Specification — Instrument

Electronics	4 Bit Micro + 8K ROM
Power	10 — 16V @ 70mA plus 90mA for lighting when required
Temperature Range	−10°C to 70°C
Size	110 × 110 × 17mm (4⅓ × 4⅓ × ⅔ inches)
Depth Overall	38mm (1½ inches)
Weight	225 grams
Mounting Hole Diameter	50mm (2 inches)
Compass Resolution	1°
CTE Resolution	0.1 nautical mile
CTE and Distance To Go requirements	Radio Navigator connected using NMEA 0183B sentences 1. $IIXTE, (Cross Track Error) 2. $IIWDC or $IIWDR (Distance To Go)

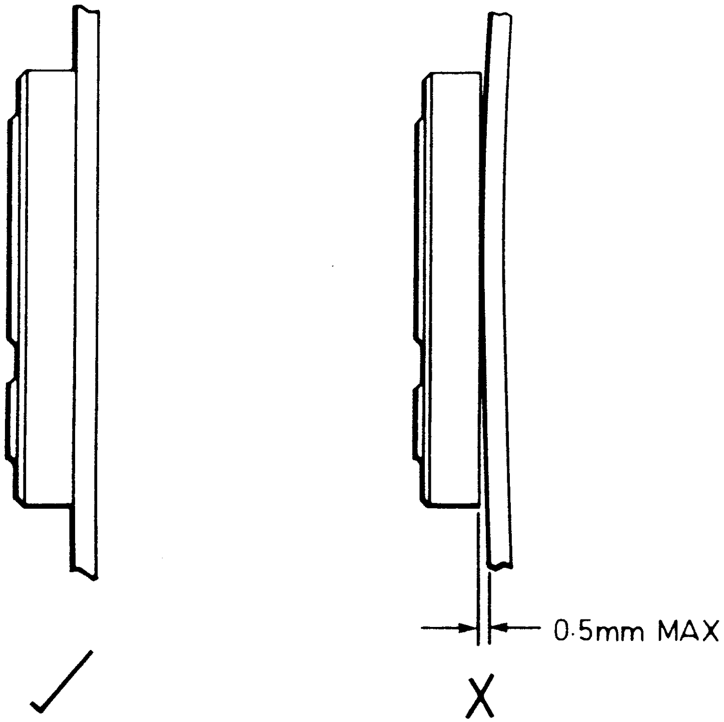
Technical Specification — Sensor

Power	11 — 16V @ 70mA
Size (Overall)	120 × 193 × 83mm
Mounting Centres	130mm
Weight	700 grams
Resolution	1°

4. INSTRUMENT HEAD INSTALLATION

The instrument head is fully waterproof and can therefore be installed on deck or below. The connections should be protected from water penetration and should, if possible, allow rear access to remove the dessicant pack annually.
The position selected should in the first instance meet the requirements of the helmsman or crew. The analogue head should be at least 150mm (6″) away from a magnetic compass.

The selected surface must be flat and even to within 0.5mm.



N.B. DO NOT OVERTIGHTEN FIXING SCREWS

Step 1 Once a suitable position has been found, the installation can begin. For security reasons a note should be made of the unit serial number, and kept in a safe place.

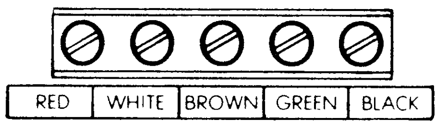
Step 2 Carefully position the self-adhesive template provided on the surface where the instrument is to be mounted.

Step 3 Drill a small pilot hole first and then check the location on the other side of the panel or bulkhead to confirm suitability.

Step 4 Open hole out using a 50mm (2") cutter in a hand held brace or electric drill. Drill the 4 fixing holes using a 2.5mm (3/32") drill.

Step 5 Connect the instrument to the Dataline wire, making sure that the colours are correctly wired to the terminals. The Dataline wire can either be taken from the Databox or from any convenient instrument head. Instrument heads can be connected in any order.

Connection Diagram



Step 6 Before finally fixing the instrument in position, the installation should be checked functionally.

step 7 If it is not possible to gain access to the instrument back when fitted, the terminals at this stage should be covered with a liberal coating of silicone grease, vaseline, WD40 (or similar moisture dispersant). These materials will not harm any other instrument components.

Step 8 Secure the instrument head in place using the 4 No. 6 self tapping screws provided and ensure the sealing gasket is correctly located. DO NOT OVERTIGHTEN as the instrument can be permanently damaged if distorted — tighten screws lightly and evenly.

WARNING: DO NOT use any form of sealing compound on the instrument back. This can damage the instrument and prevent access to the dessicant pack.

Step 9 Finally, the cover of your choice, black or white, can be clipped on over the instrument.

INSTALLATION OF THE COMPASS SENSOR

The sensor should be mounted away from areas of magnetic interference. The optimum location is close to the vessel's centre of pitch and roll. On steel vessels the sensor should be mounted on the mast approximately one to three metres from the main structure.

Minimum mounting distances

The sensor should be a minimum of ONE metre from:—

Radios and loud-speakers
RDF INSTRUMENTS
Other compasses
Engines / electric motors
Large masses of soft iron e.g. keels
Cables carrying more than ½ Amp
Depth sounders, etc.

and should be a minimum of THREE metres from radar magnetrons.

FIXING THE SENSOR

Using a 4mm hexagonal key, remove the fixing bracket from the sensor assembly and fix this vertically to a location that MUST be facing forward. NOTE: Calibration is NOT available to take out heading offsets.
Use brass or stainless steel screws — DO NOT use ordinary steel screws.

Before mounting the sensor on the bracket, release the transit screw. This is found at the base of the sensor towards the back. Unscrew this 10 full turns to allow full movement of the sensor assembly. If the sensor is mounted externally, then the screw should be removed and shortened by 10mm before refitting tightly.

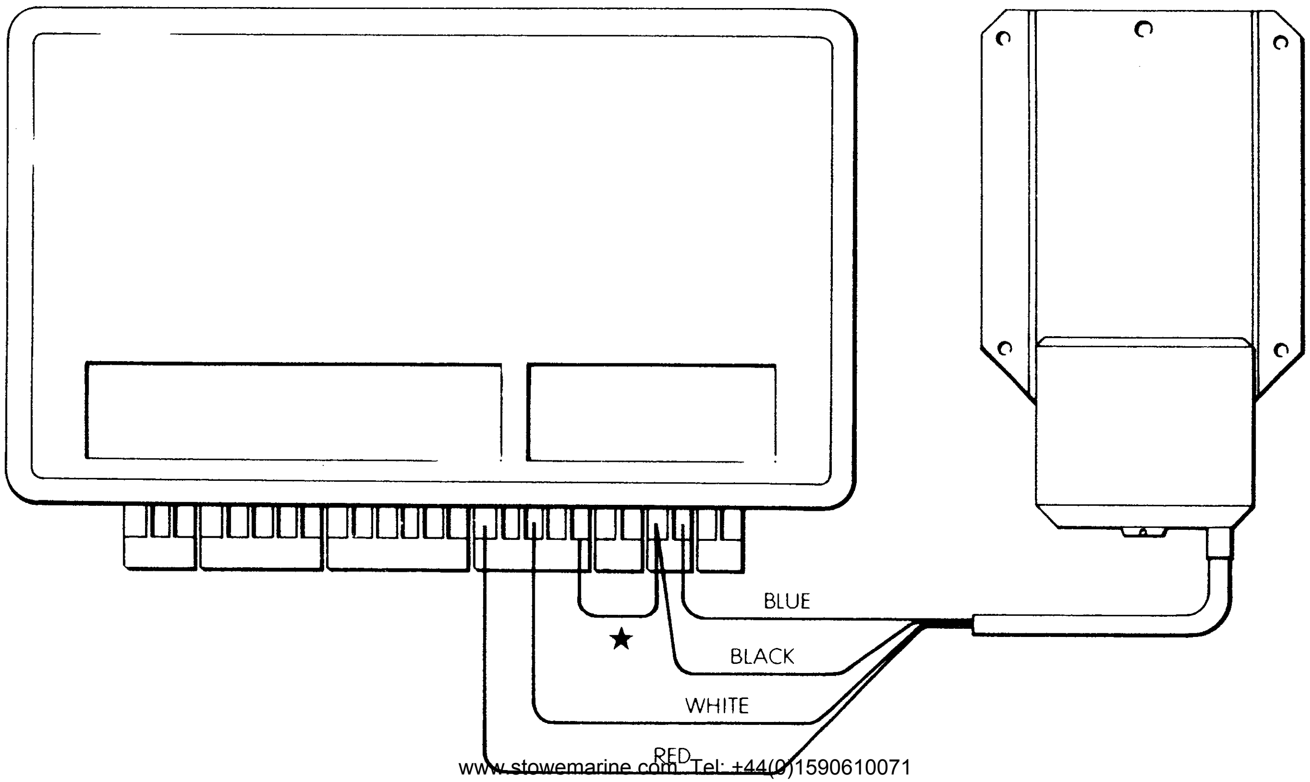
CONNECTING THE SENSOR TO THE DATABOX

NOTE: The GREEN and YELLOW wires from the sensor are not connected, and should be cut back and insulated.

Connections are as follows:—

COMPASS	DATABOX	COMMENTS
RED	DATALINE — RED	12V supply
BLACK	DATALINE — BLACK	0V supply and reference
BLUE	COMPASS — A	Compass data
WHITE	DATALINE — BROWN	Calibration data

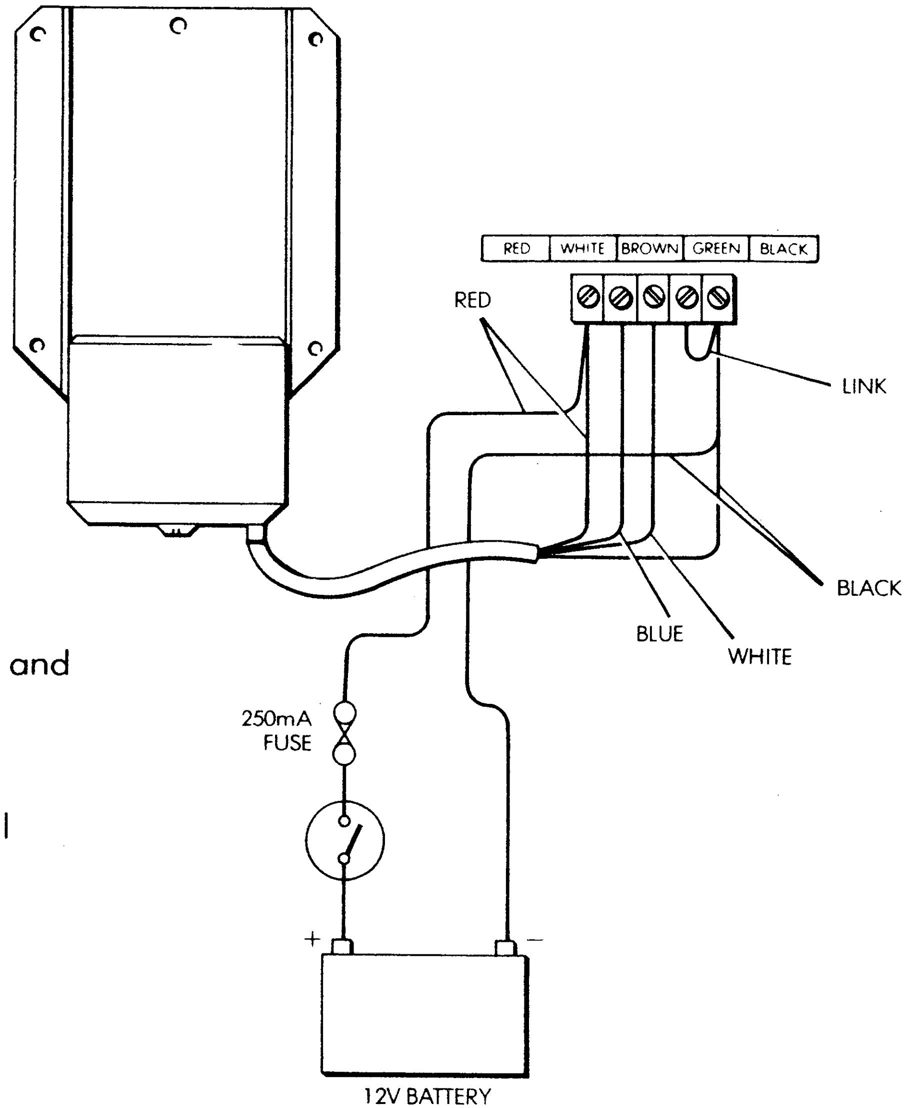
★ NOTE: A link between DATALINE BLACK and COMPASS—B will be required for correct operation.



CONNECTING THE SENSOR TO A STAND ALONE INSTRUMENT

IMPORTANT: IF THE COMPASS IS CONFIGURED AS A STAND ALONE UNIT, THEN CROSS TRACK ERROR AND DISTANCE TO GO INFORMATION WILL NOT BE AVAILABLE.

NOTE: The GREEN and YELLOW wires from the sensor are not connected, and should be cut back and insulated.



Connections are as follows:—

SENSOR	COMPASS DISPLAY	PURPOSE
RED	RED	12V supply
BLACK	BLACK	0V supply and reference
BLUE	WHITE	Compass data
WHITE	BROWN	Calibration data

Power should be connected via a 250mA fuse and a power switch and should be connected to the back of the compass display as per the diagram.

NOTE: A link between COMPASS BLACK and COMPASS GREEN will be required for correct operation.

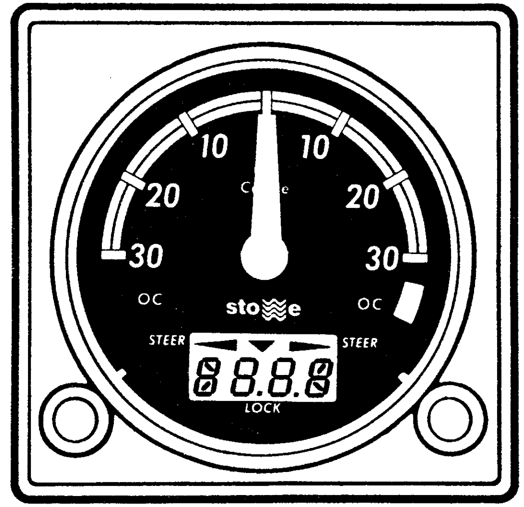
5. DATALINE COMPASS — FUNCTIONS

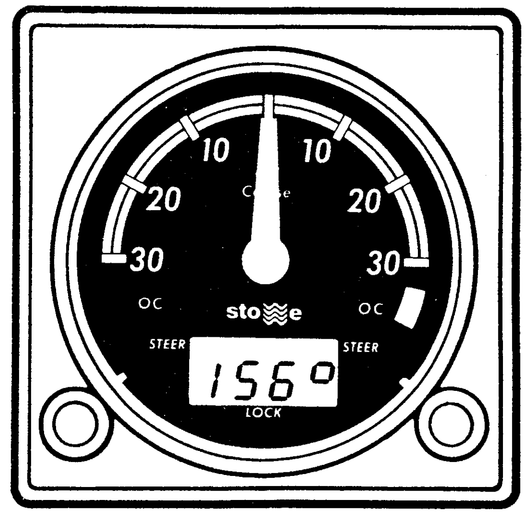
POWERING UP

When switching on the system the LCD display will show all segments for one second and the pointer will point to 0 degrees.

The display will then revert to showing the current magnetic heading.

NOTE: The damping level is set automatically by the system to suit the prevailing sea conditions.

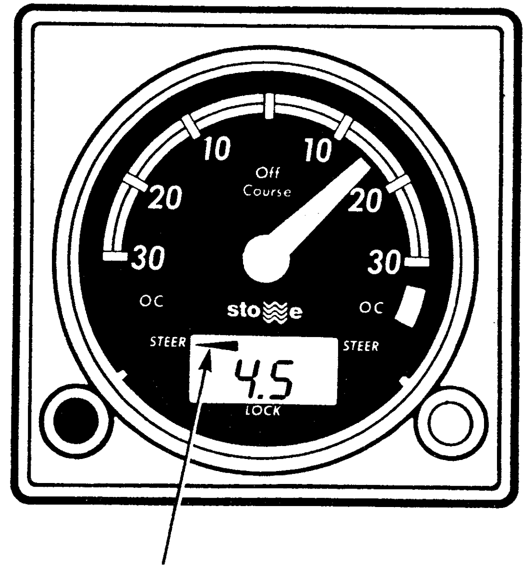




CROSS TRACK ERROR

NOTE: This facility is only available if an appropriate radio navigator is connected to the Databox. (See Technical Specification)

From the CURRENT HEADING MODE press and hold the FUNCTION button for 3 seconds. The pointer will then display the CROSS TRACK ERROR in nautical miles. The steer bars on the digital display will indicate to the helm the direction of corrective steer required.



STEER BAR

The digital display will now show DISTANCE TO GO information if the system has been connected to a radio navigator with the appropriate output. (See the Technical Specification for more information.)

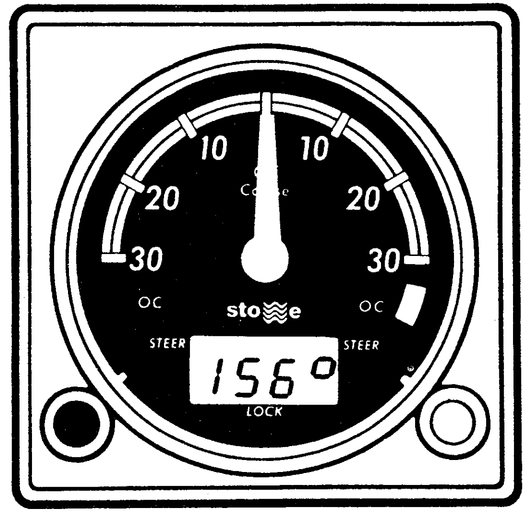
To re-enter the CURRENT HEADING MODE depress both buttons simultaneously.

NOTE: When entering this mode the display will show the LOCKED COURSE MODE display for a couple of seconds.

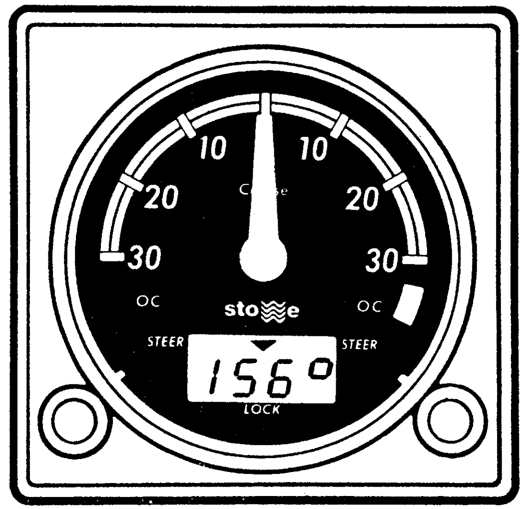
LOCKED COURSE MODE

NOTE: Whilst in this mode the lighting levels cannot be set from this instrument, although if set from any other instrument, the lights will set to that level.

Set the instrument to be in CURRENT COURSE MODE and press the FUNCTION button.



The digital display will now show the LOCKED COURSE which will be the last course displayed before entering the mode. To distinguish this mode from others the centre arrow annunciator will be illuminated. The pointer will indicate 0 degrees, and then proceed to show the heading error from the LOCKED COURSE.



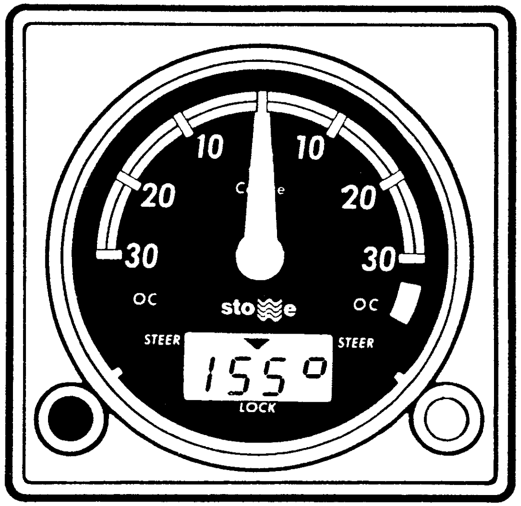
The LOCKED COURSE may be modified by pressing the two buttons thus:—

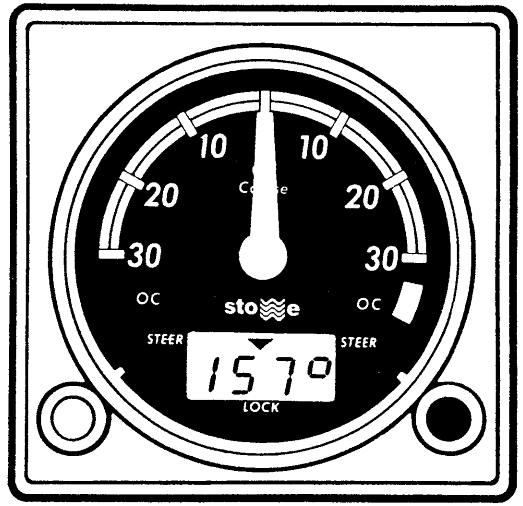
FUNCTION button:—

Subtracts from the set heading.

LIGHT button:—

Adds to the set heading.

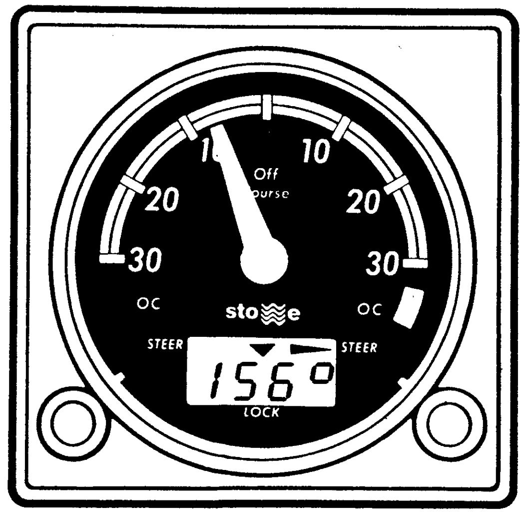




NOTE: A single press will alter the heading by one degree. If a button is held, then the angle will be modified continuously until the button is released. An alternative method for large course changes is to exit the mode and then re-enter when the desired heading has been achieved.

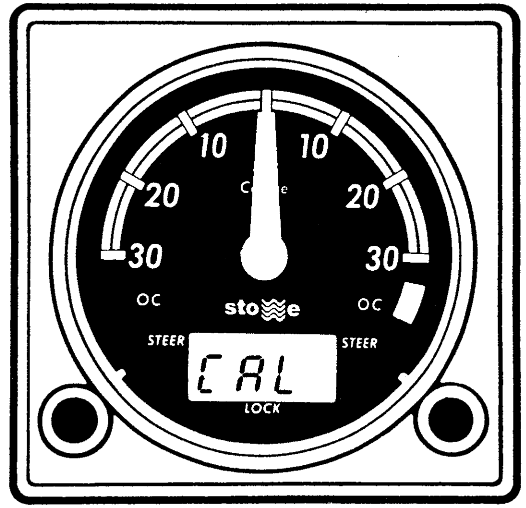
Exit the LOCKED COURSE MODE by depressing both buttons simultaneously.

The steer bars on the LCD will indicate the direction of corrective steer required.



CALIBRATING YOUR COMPASS

NOTE: Due to the structure of the DATALINE system some messages in this calibration mode may take up to 30 seconds to appear.



To enter the CALIBRATION mode, **set the Compass to the CURRENT HEADING mode** and depress both buttons simultaneously for 3 seconds.

The display will then show 'CAL'. Now press the LIGHT button and wait for the response.

If the display changes to 'CALc', then the compass has been previously calibrated. If however the display shows 'CAL0', then the compass is uncalibrated. (See also ERROR MESSAGES.)

In either case calibration may or may not be undertaken. To exit the calibration mode depress both buttons simultaneously.

If calibration is required, then follow the procedure below.

1. Place the vessel in such a position that it may be swung through a full 360 degrees.
2. Align the vessel to approximately 270 degrees. The vessel must not be aligned to less than 180 degrees or more than 359 degrees.
3. Press the LIGHT button and wait for the display to change to 'CALi'. This means that the procedure has been initiated. To stop the procedure press the LIGHT button again.
4. Begin swinging the boat. It may take several rotations to complete the procedure. Swinging may be achieved by hand or by motoring circles. During this procedure the display will change to show 'CALr', meaning calibration running.
5. After a time the display will again change to show 'CALc'. The procedure has now been successfully completed.
6. The CALIBRATION mode may be exited by depressing both buttons simultaneously.

CAL i

CAL r

CAL c

If at any time a number appears after the 'CAL ' message, then an error has occurred. Refer to the list below.

IMPORTANT: IT IS ESSENTIAL THAT ONCE CALIBRATED, THE COMPASS IS CHECKED BY USING KNOWN COMPASS BEARING POINTS.

If a constant heading error is incurred, please consult a service dealer for corrective action.

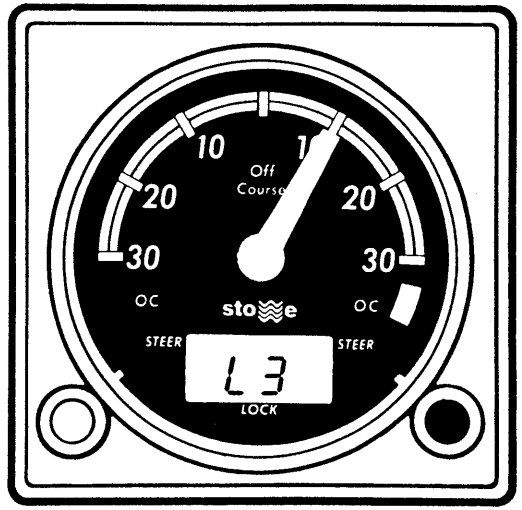
CAL 1 — Upon initiating the procedure the heading was less than 180 degrees. Restart the procedure making sure the heading is approximately 270 degrees.

CAL 2 — The speed of rotation is too slow. Restart the procedure making sure that the speed of rotation is faster.

CAL 4 — Memory error. Contact your local agent or STOWE for further advice.

CAL 6 — Battery voltage is below 11 volts. Check the condition of the battery and charge if necessary.

SETTING THE LIGHTING LEVEL



NOTE: Lights cannot be set from the LOCKED COURSE mode.

To select the required lighting level, hold the LIGHT button for 3 seconds. The current level will be displayed and then will cycle through all the levels. To select the level, release the button at the appropriate time. The level will then set on all other instruments connected to the DATALINE.

L 3	FULL LIGHTING
L 2	MEDIUM LIGHTING
L 1	LOW LIGHTING
L 0	LIGHTS OFF

ERROR MESSAGES

If at any time the message 'Err ' and a number is flashed on the display, then an error that may affect the operation of the compass has been detected.
If an error is OCCURRING then the compass should NOT be used for navigation.

The ERRORS are:—

Err 4 — Memory Error. Switch off the system and then re-apply power after a short while. If the error recurs consult your local agent or STOWE for advice.

Err 6 — Battery voltage is below 11 volts. Check the condition of the battery and charge if necessary.

6. OPERATIONAL CHECKLIST & TROUBLE SHOOTING GUIDE

Stowe instruments are carefully tested and proven before shipment. However, installation conditions and procedures (and very occasionally failures of components within the instruments) can cause difficulties and the following check list will direct the user to the source and remedy.

For additional assistance call your local agent listed at the rear of the manual.

CONDITION	PROBABLE CAUSE	ACTION
All Repeaters have blank LCD displays	• No 12V power supply	Check supply. Check wiring. Check 5A fuse in Databox. Return Databox for service.
All Repeater LCD's show bars	• No information from Databox	Check wiring from Databox to repeaters, particularly Green and White wires. Return Databox for service.
One Repeater has blank display or bars	• Faulty Repeater	Check wiring at rear of Repeater. Return Repeater for service.
Compass data not showing	• Sensor not wired correctly	Check wiring.

CONDITION	PROBABLE CAUSE	ACTION
CTE / Distance To Go shows bars	● System not connected to suitable Radio Navigator	Check if correct data is being transmitted. Connect Radio Navigator if fitted.
Display shows ?'s after confirming calibration or setting lights	● No information to Databox	Check the wiring on the Dataline — particularly the BROWN wire.
	● Information not received by Databox	Try pressing the LIGHT button again or setting the lights from another instrument.

DEMONSTRATION MODE

This function allows the user to learn the instrument whilst being away from the rest of the system. It allows the user to use all the functions of the instrument, using example values produced by the instrument.

To enter the Demonstration Mode, connect the instrument as follows:—

0V to the BLACK terminal

12V to the RED terminal

Before switching on the supply (or connecting to the battery), press the orange 'LIGHT' button, and hold whilst applying power. The instrument will then power up in the DEMO mode.

To leave the DEMO mode, the instrument should be switched off and then back on again in the normal way.

7. CARE AND MAINTENANCE OF INSTRUMENT HEAD

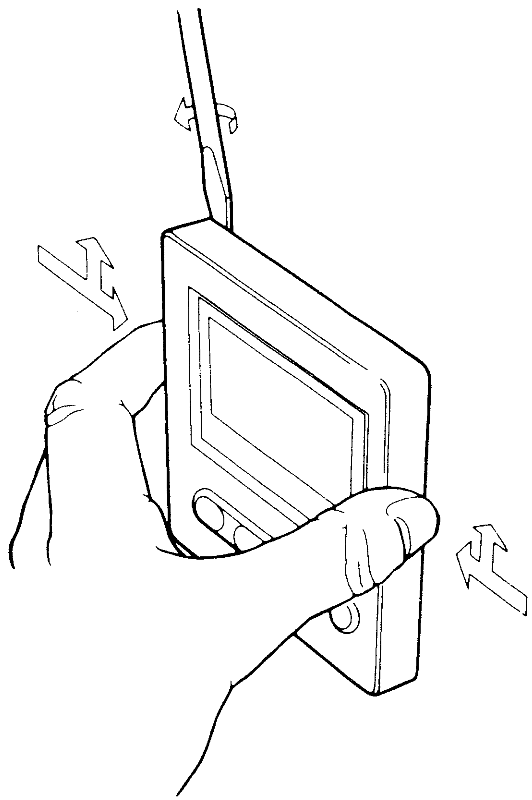
The instrument head will under normal use require little maintenance as the cases are made from high impact material (polycarbonate) to withstand the rigours of an exposed cockpit. It is important to avoid using chemical cleaners and hydrocarbons such as diesel, petrol etc.
If the instrument requires any form of cleaning, use fresh water and a mild soap solution (not a detergent).

It is advisable at the start of each season to check all connections to the instrument head and cover with silicone grease, vaseline or WD40. The dessicant pack at the rear of the instrument above the terminal block should be removed and dried if signs of condensation appear on the instrument glass. This can be achieved by partially removing the M3 screw and pulling on the screw. The pack can then be dried by placing in a warm place for 24 hours. Do not use a gas oven for this purpose.

WARNING — DATALINE ANALOGUE REPEATER

The window in this instrument is virtually unbreakable.
However, impact or heavy pressure on the window will cause it to deflect and seize the pointer.

Return to factory carriage paid for free re-alignment (during warranty period only).



8. REMOVAL OF THE INSTRUMENT

To remove the instrument head, the outer cover must first be removed. This can be done by squeezing the instrument sides between finger and thumb and applying an upward pressure. At the same time place a wide bladed screwdriver between the bulkhead or panel and the cover, and gently rotate.
Then remove the four fixing screws securing the head in place, and very gently lever off the head.

9. SERVICE

Please make absolutely certain that an instrument believed to be faulty does not merely require correct power supply wiring or transducer connections.
Should the unit have to be returned to the factory, adequate packing with 80mm (3") of all round cushioning must be provided. Please quote the serial number (on the rear of the instrument head) in any correspondence.

10. WARRANTY

The instrument is guaranteed for 24 months from the date of purchase. If no proof of purchase is available, then the guarantee period will commence from the date of manufacture.
If purchased in the UK, please return the unit carriage paid, together with a copy of the receipt of purchase, and a clear description of the problem.
If purchased outside the UK, please return the unit to the Stowe official distributor in the country of purchase.

Should you choose to have your instrument repaired in a country outside the country of purchase, the distributor may charge for labour, but not for parts, at the local rate.

N.B. Please consult the section on Service above, to ensure the instrument is correctly packed.

A warranty card may be issued in some countries — please fill this in and return it to the postage paid address.