

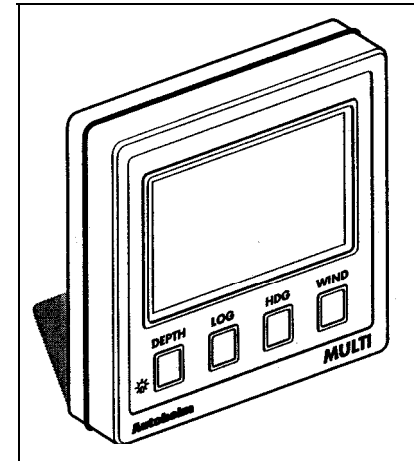
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Autohelm[®]

**ST 50
PLUS**

MULTI
Operation and
Installation



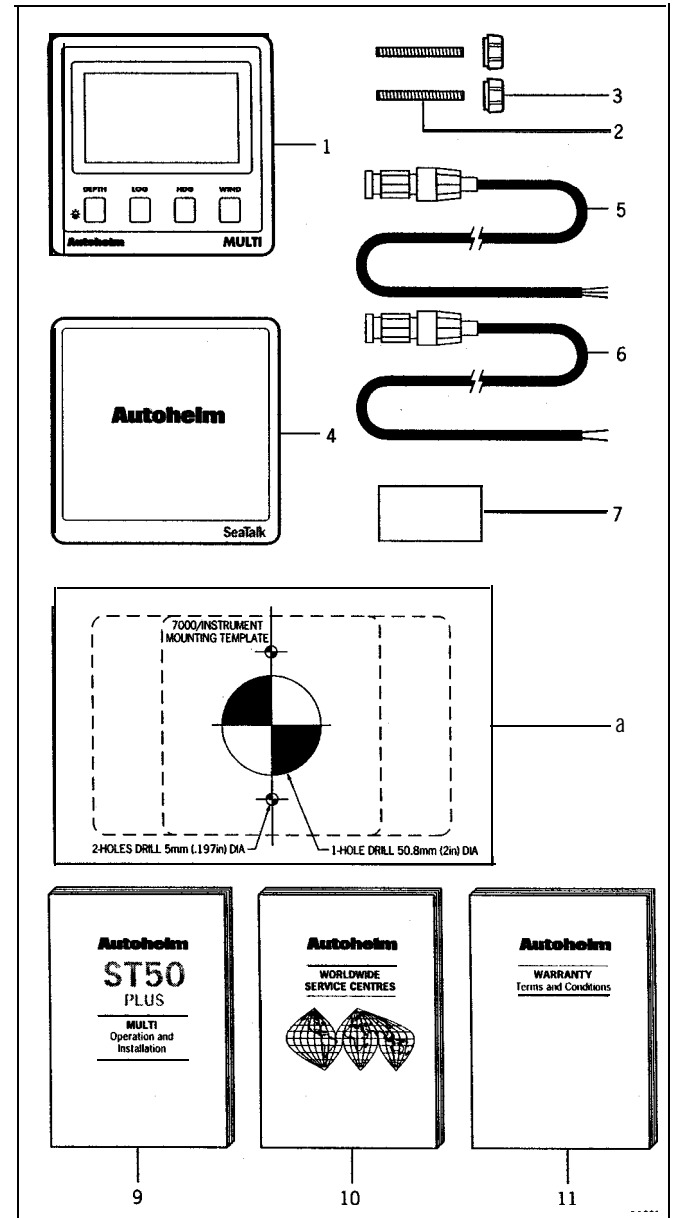
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Package Contents

The following items are included in the ST50 Plus Multi package:

1. ST50 Plus Multi control head
2. Fixing studs (2 off)
3. Thumb nuts (2 off)
4. Control head cover
5. Power cable
6. NMEA cable
7. Securii sticker
8. Fiing template
9. Operation and installation handbook
10. Worldwide Service Centre handbook
11. Warranty document



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Introduction

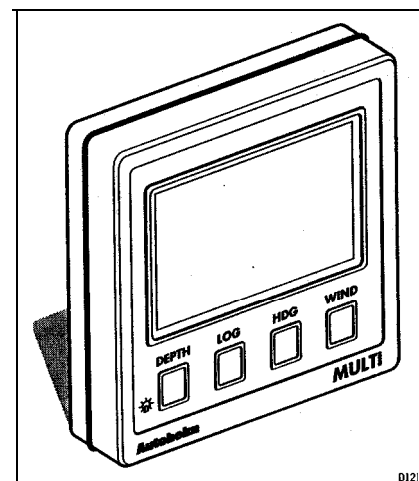
The ST50 Plus Multi is a powerful multifunction repeater that allows you to display many parameters transmitted onto the **SeaTalk** bus by other instruments. As well as repeating 'live' information, the Multi is able to provide computed functions **derived** from data supplied by other **SeaTalk** instruments.

The following computed functions are available with a full **SeaTalk** system:

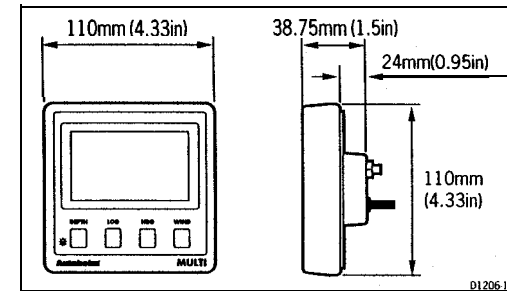
VMG, True **Wind** Direction, True **Wind** Speed, Tack Course, Distance Made Good and Course Made Good.

The ST50 Plus Multi also incorporates a security feature to protect instruments mounted in vulnerable areas such as the cockpit, helm or mast.

Thank you for purchasing an **Autohelm** product. May we take this opportunity to wish you years of trouble free operation.



Chapter 1: Control Head Installation



1.1 Sing

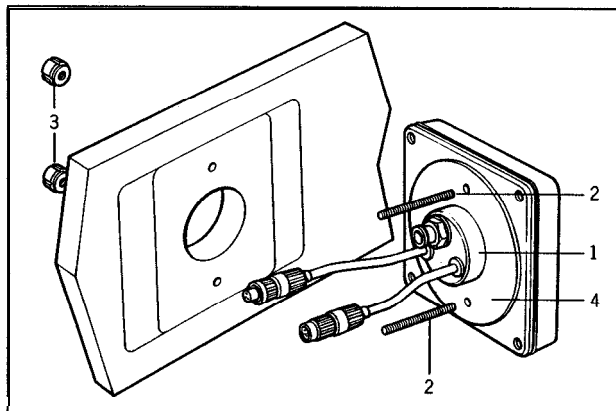
The ST50 Plus Multi is designed for above or below deck installation where it is:

- Easily read by the helmsman
- Protected against physical damage
- At least 230mm (9in) from a compass
- At least 500mm (20in) from radio receiving equipment
- Accessible from behind for ease of installation and cable running

Cation:

To prevent moisture **forming** on the display window, **the ST50 Plus Multi 'breathes' through a small vent in the cable boss. Therefore, the control head must be sited where the rear case is protected from contact with water.**

The rear case is **fitted** with a foam gasket to form a water-tight seal between the instrument and the selected installation face.



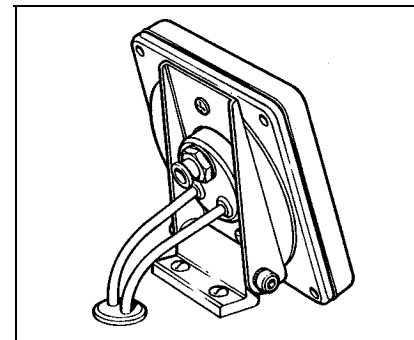
1 Cable boss 2 Fixing studs 3 Thumb nuts 4 Gasket

1.2 Mounting Procedure

1. Make sure that the selected location is clean, smooth and flat.
2. Apply the self-adhesive template (supplied) to the selected location and mark the centres for the fixing studs (2) and the cable boss (1).
3. Drill two 4mm (5/32in) clearance holes for the fixing studs (2) through the bulkhead. Remove the template.
4. Cut the clearance hole for the cable boss (1) using a 50mm (2in) diameter cutter.
5. Screw the two fixing studs (2) into the control head.
6. Pass the SeaTalk cable and transducer tails through the cableboss (1) clearance hole.
7. Assemble the control head to the bulkhead and secure from behind using the thumb nuts (3).

Bracket Mounting

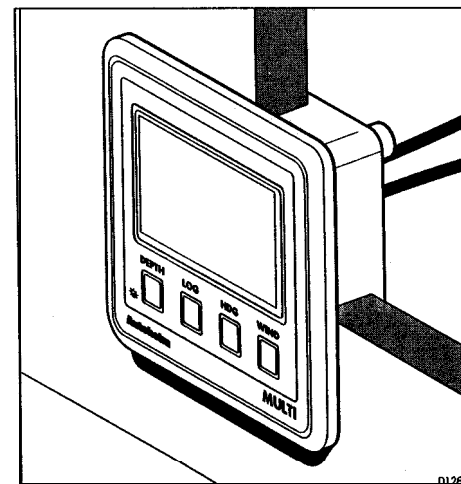
The ST50 Plus Multi can, as an alternative, be bracket mounted using the Autohelm Mounting Kii (Cat. No. D130).



Note: Because the instrument breathes through the vent in the rear case, this bracket is for interior use only.

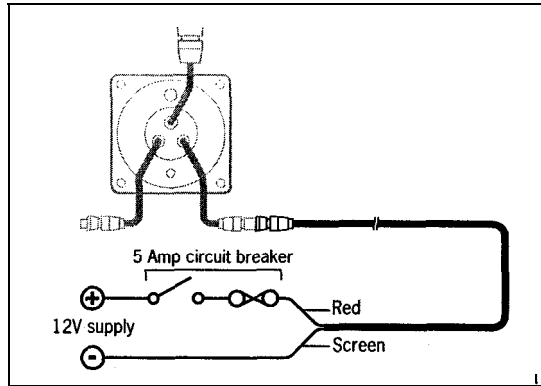
Flush Mounting

A flush mounting kit is available for installations where a flush mount is required or more desirable. Full installation instructions are provided with the kit (Cat. No. D187).



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1.3 Power Supply (stand-alone operation)

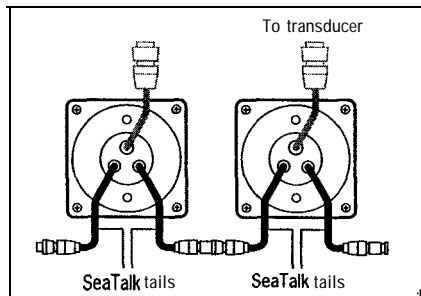


1. Connect the 2m (6ft.) power supply directly to the distribution panel.
2. Cut the cable to length and connect the red wire to the + 12V terminal and screen to the 0V terminal.
3. Cut back and insulate the yellow wire.
4. Protect the circuit with a 5A circuit breaker.

Note: Longer runs to the power supply can be made using one of the SeaTalk Extension Cables.

1.4 Power Supply (SeaTalk operation)

All instruments in a SeaTalk system receive power and information from the SeaTalk bus. Each instrument has two SeaTalk connectors (3 pin) on 150mm (6in) tails. To supply power and information to the instrument simply plug the tails from adjacent instruments into the ST50 Multi tails.

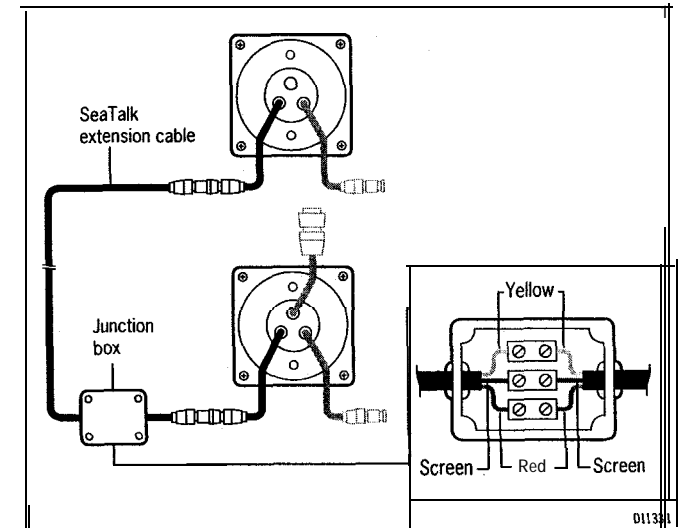


1.5 Connection of Separated Instruments

Separated instruments can be connected using one of the range of SeaTalk Extension Cables. These cables are supplied with a SeaTalk connector fitted to each end. A junction box can be used to join the cable if it is cut for easier routing or shortening.

If preferred, any 2 core, screened cable conforming to the following specification may be used instead of the SeaTalk cable.

- 22 AWG, 2 core screened cable with a minimum copper area of 0.5mm².



1.6 Ring Connection

Installations with a large number of instruments on a **SeaTalk** bus may require a second **ring-main** connection to the power supply breaker to prevent excessive voltage drops. Whether a second ring main is required can be determined from the following:

Cable run upto 10m (33ft)

Single connection: 13 instruments maximum

Second connection: 26 instruments maximum

Cable run upto 20m (66ft)

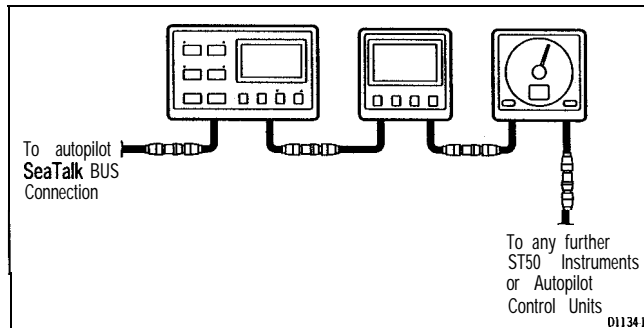
Single connection: 7 instruments maximum

Second connection: 13 instruments maximum

The second ring-main should be connected to the spare lead on the last instrument in the chain and directed back to the circuit breaker.

1.7 Connection to SeaTalk Compatible Autopilots

If the installation includes a **SeaTalk** compatible Autopilot the ST50 Plus instruments may be connected to the **SeaTalk** bus at any point. No independent connection to the **12V** power supply is necessary as the instruments receive power from the Autopilot course computer.



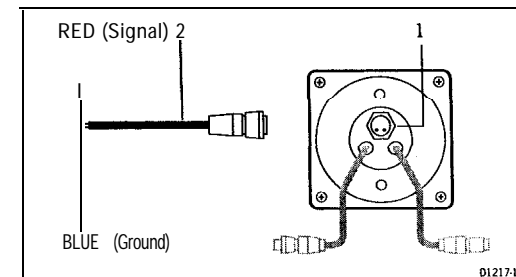
1.8 Connection to other Marine Equipment

The ST50 Plus Multi has an NMEA 0183 data output connector (1). Providing it is available on the **SeaTalk** bus, the following information will be transmitted every 1 to 2 seconds:

Sentence	Content	Instrument required on SeaTalk Bus
VWR	Apparent Wind Speed (knots) and Direction	Wind
DBT	Depth of water below transducer (feet)	Depth or Tridata
HDM	Magnetic Compass Heading	Steering Compass or SeaTalk Autopilot
HSC	Locked Magnetic Compass Heading	SeaTalk Autopilot (operating in Auto mode)
VHW	Water Speed (knots) Magnetic and True Compass Heading	Speed or Tridata Compass or SeaTalk Autopilot
GLL	Longitude and Latitude	GPS or Navdata
VTG	Course Over Ground Speed Over Ground	GPS or Navdata
BWC	Bearing and Distance to Waypoint	GPS, Navdata or Navcenter
MTW	Water Temperature (deg.C)	Speed or Tridata

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A 1m (3ft) NMEA Interface cable (2) is supplied with the Multi. The red wire should be connected to the signal input and the blue wire to the signal ground (0V) of the other marine equipment. Up to two NMEA 0183 receivers may be connected to each Multi.



Chapter 2: Fault Finding and Maintenance

2.1 Fault Finding

All **Autohelm** products are, prior to packing and shipping, subjected to comprehensive test and quality assurance programmes. However, if a **fault** arises **with** the ST50 Plus **Multi**, the following table will help to identify the probable cause and provide the most likely cure.

Fault	Cause	Action
Instrument display blank.	No supply.	Check supply. Check cabling and security of SeaTalk connectors. Check fuse/breaker. Return unit for repair.
Instrument displays 'CODELOCK set', ENTER CODE	The 'Code Lock' feature has been set.	Enter correct code number.
No exchange of information between SeaTalk instruments.	SeaTalk cabling problem.	Check security of SeaTalk connectors. Disconnect instruments one by one to isolate faulty unit.
Failure of a group of instruments in SeaTalk chain.	SeaTalk cabling/connector problem.	Check security of SeaTalk connectors and non-functioning units.

2.2 Maintenance

Instrument

Certain atmospheric conditions may cause condensation to form on **the control** head window. This will not harm the instrument and can be cleared by increasing the illumination setting to Level 3.

Chemical and abrasive materials must not be used to clean the ST50 Plus **Multi** instrument; if it is dirty, clean with a soft, damp **cloth**.

Cabling

Examine all cables for chafing or damage to the outer **shield** and, where necessary, replace and resecure.

Advice

For advice, or further information regarding the installation of this product, please contact the **Autohelm** product Support **Department** or your own **National** Distributor.

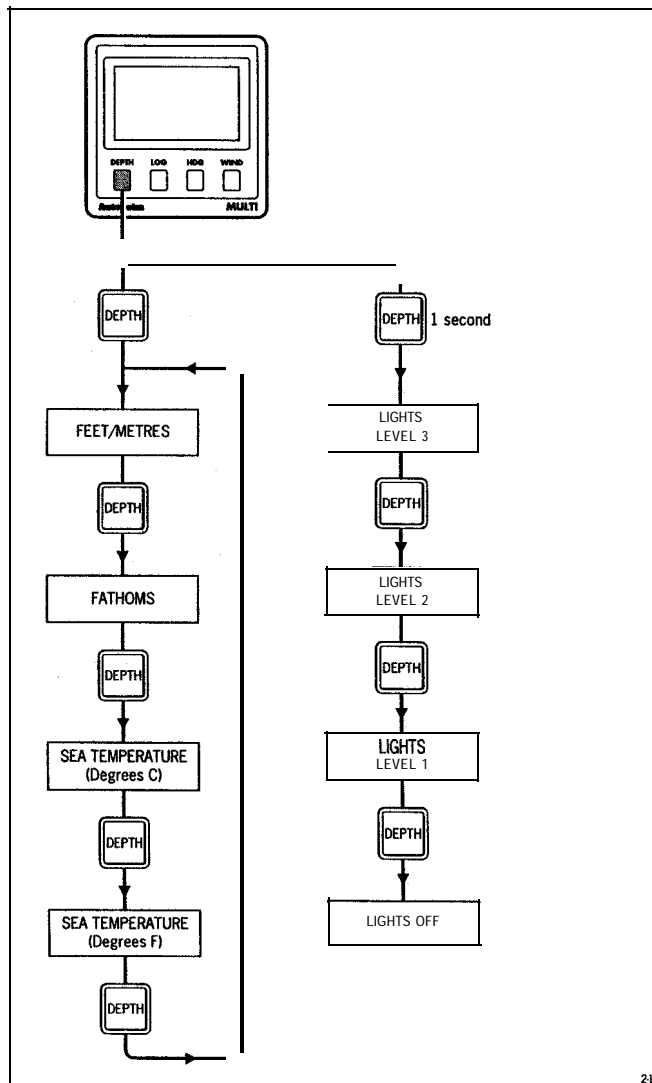
Chapter 3: Operation

The ST50 Plus Multi can be connected to other ST50 instruments to provide a fully integrated system that can be linked to any of the **SeaTalk** compatible autopilots. The Multi also provides NMEA 0183 data for navigation receivers, chart plotters or other navigational equipment.

Note: The operational flow charts on **the** following pages show the information available **with** a full **SeaTalk** system.

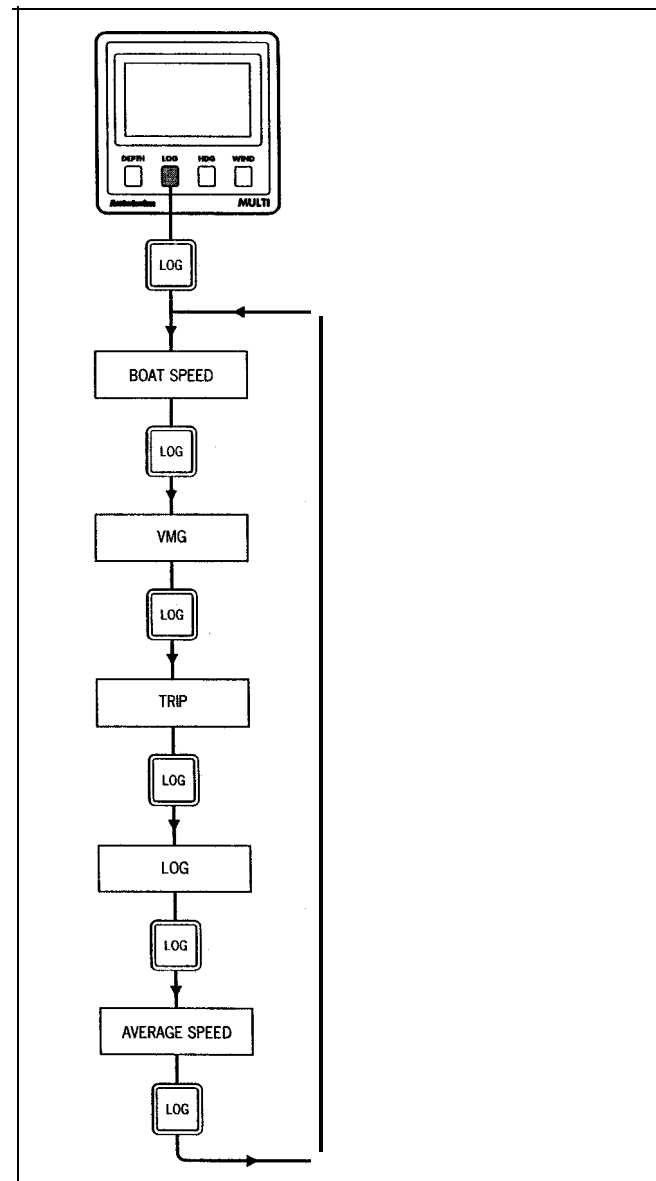
Units of measure follow those of the main instrument,

3.1 Depth Key

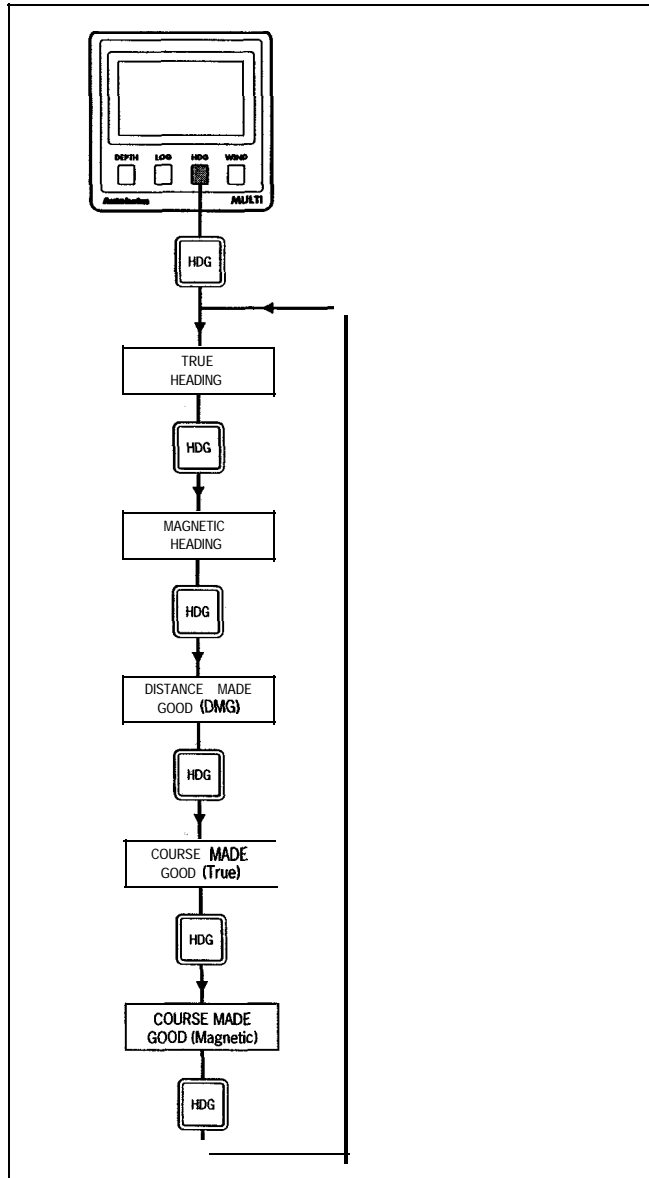


Note: Depth alarms can be silenced by pressing any key. Also, the Fathoms display is only available when feet is transmitted on the SeaTalk bus

3.2 Log Key



3.3 HDG Key



HDG Key Notes

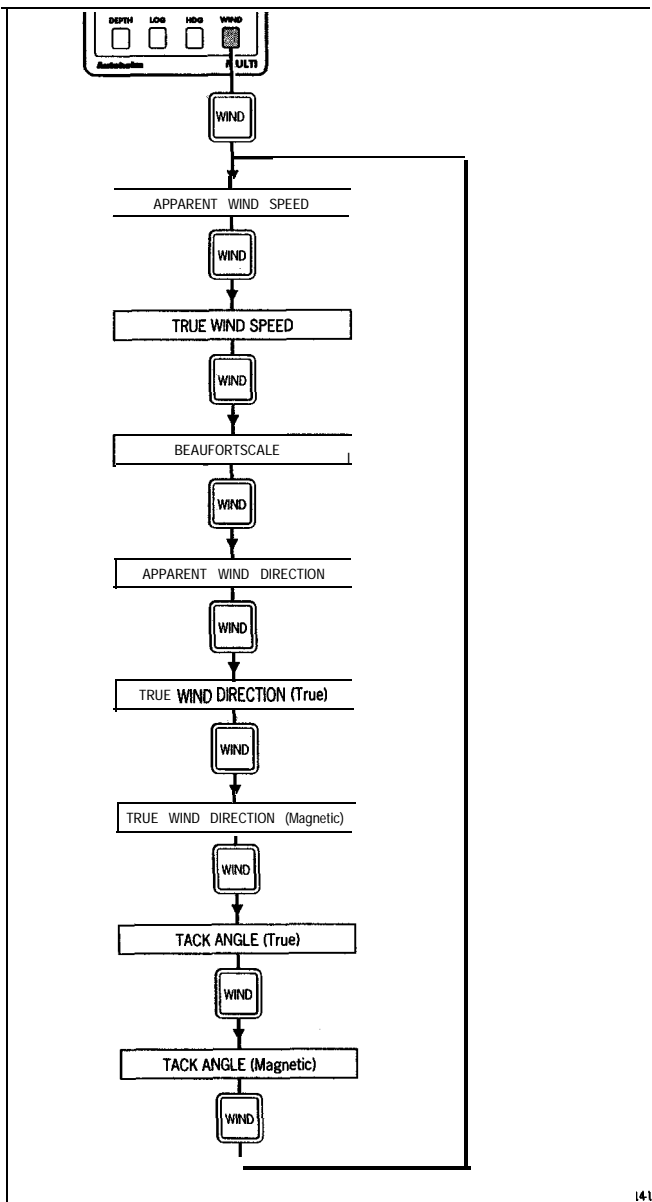
True Heading

True headings are displayed only if variation is present on the SeaTalk bus or set in calibration on the Multi instrument.

Distance Made Good and Course Made Good

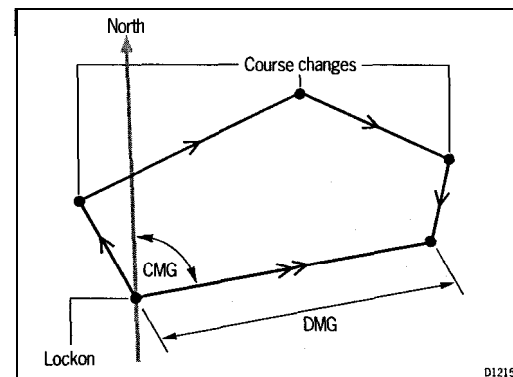
The Distance Made Good and Course Made Good displays can be reset by pressing and holding **HDG** for 4 seconds.

3.4 Wind Key



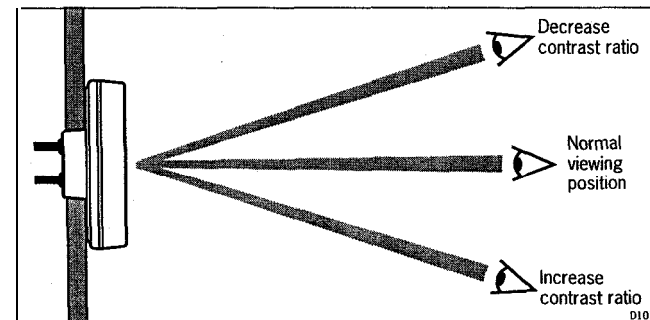
3.5 Dead Reckoned Functions

Distance Made Good (**DMG**) and Course Made Good (**CMG**) are dead reckoned functions with no correction for tidal set or drier.



3.6 Display Contrast

The contrast can be adjusted to achieve optimum legibility at any angle.



1. Momentarily press **DEPTH** and **LOG** together.
2. Press **HDG** or **WIND** to increase or decrease the contrast setting (the range being between 1 and 15).
3. Press **DEPTH** and **LOG** together momentarily to store the contrast setting.

Note: A high setting will suit installations where the control head will be viewed from above.

Chapter 4: CODE Lock Security

The ST50 Plus range incorporates an anti-theft feature called 'CODE Lock'. Designed to protect individual instruments or complete systems in vulnerable areas, 'CODE Lock is a four digit number that you programme into the permanent memory of a selected 'master' instrument.

Note: A 'master' instrument is a digital unit on which the code number can be entered, and then, if part of an integrated system, transmitted to other ST50 Plus instruments.

This **facility** means that, should a CODE Locked instrument be removed from the vessel without your permission, it cannot be operated without the four digit security number.

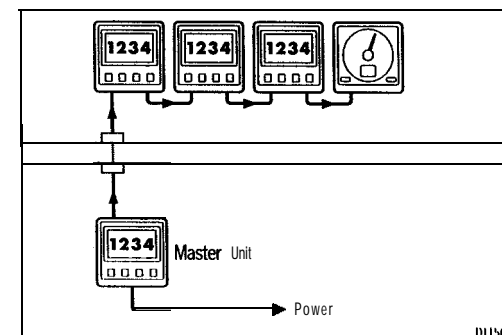
'CODE Lock can be used in one of three modes:

Mode 1: Off

As it leaves the factory 'CODE Lock' is set to off. In this mode the instrument will operate normally when it is switched on, however, the unit will not be protected by the anti-theft feature.

Mode 2: 'CODE Lock' Once-Only Entry (page 23)

This mode is designed for systems with a digital ST50 Plus instrument in a safe, belowdecks location. This instrument can then be used as a 'master' to enter the four digit code number and, when the power is switched on, automatically transmit the code to all the instruments in the system. The advantage of this mode is that, with the master safely below deck, code entry via the keypad is a **once-only** operation on installation.

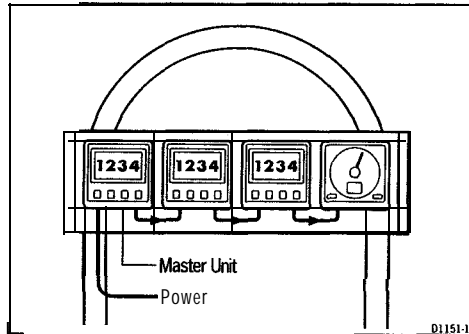


Once 'CODE Lock' is set the system operates normally as soon as the power is switched on. In other words, the 'CODE Lock security is invisible.

Mode 3: 'CODE Lock' input at Power-On (page 24)

In the 'Power-On mode', the ST50 Plus is configured so that you have to enter the four digit number on a 'master' digital instrument every time the system is switched on. **Until this number is entered the instrument(s) will not operate.**

This mode is particularly useful when you are unable to position a 'master' instrument below decks and, therefore, all the vessels valuable instrumentation is left in a vulnerable area.



Should a CODE Locked instrument be removed from the system, it will not operate until the correct four digit security number is entered or received.

If your selected master instrument fails for any reason, the security code number can be entered via another ST50 Plus instrument in the system. However, until another instrument is set as a master or the existing master is replaced, the security code will have to be entered every time the system is switched on.

Note; A warning sticker is provided with each instrument. If you have set 'CODE Lock, position this warning sticker in a prominent location to deter potential thieves.

Setting Up the Security Code

When the ST50 Plus Multi is switched on for the first time the security feature is set to off. To turn the 'CODE Lock' feature on, proceed as follows:

Once Only Entry

	Action	Display Shows
1	Press and DEPTH and LOG together for 4 seconds	CAL after 2 seconds and Z098VXX after 4 sec.
2	Press DEPTH once	CODELOCK Cal. Off
3	4 seconds after 'CODELOCK Cal. Off	ENTER CODE
4	Press LOG	' _ _ _
5	Press HDG or WIND to select first number	1 _ _ _
6	Press LOG to accent number	1' _ _
7	Press HDG or WIND to select second number	1 2 _ _
8	Press LOG to accept number	1 2' _ _
9	Press HDG or WIND to select third number	1 2 3 _
10	Press LOG to accept third number	1 2 3' _
11	Press HDG or WIND to select fourth number	1 2 3 4
12	Press LOG to accept code	' 1 2 3 4'
13	Press LOG	PWR ON?
14	Leave PWR ON? flashing for 10 seconds	CODELOCK Cal. set
15	To exit CODELOCK, press DEPTH and LOG together for 2 seconds	Normal operation

If you do not exit 'CODELOCK Cal. set' within 10 seconds the display will change to CANCEL CODE. You now have the option of cancelling the code, by pressing **LOG** to return to the _ _ _ _ display, or exit as described in action 15 above.

Your Code Number

For future reference, enter your chosen code number into the box below.

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For obvious reasons, please store this handbook in a safe place.

Operation

Once only 'CODE Lock' entry is invisible once it has been set.

On Power-Up

	Action	Display Shows
1	Press DEPTH and LOG together for 4 seconds	CAL after 2 seconds and Z098VXX after 4 sec.
2	Press DEPTH once	CODELOCK Cal. Off
3	4 seconds after 'CODELOCK Cal. Off	ENTER CODE
4	Press LOG	' _ _ _
5	Press HDG or WIND to select first number	1 _ _
6	Press LOG to accept number	1 ' _ _
7	Press HDG or WIND to select second number	1 2 _ _
8	Press LOG to accept number	1 2 ' _
9	Press HDG or WIND to select third number	1 2 3 _
10	Press LOG to accept third number	1 2 3 ' _
11	Press HDG or WIND to select fourth number	1 2 3 4
12	Press LOG to accept code	' 1 2 3 4
13	Press LOG	PWR ON?
14	Press LOG within 10 seconds	CODELOCK Cal. set
15	To exit CODELOCK, press DEPTH and LOG together for 2 seconds	Normal operation

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If you do not exit 'CODELOCK Cal. set' within 10 seconds the display will change to CANCEL CODE. You now have the option of cancelling the code, by pressing LOG to return to the _ _ _ display, or exit as described in action 15 above.

Your Code **Number**

For future reference, enter your chosen code number into the box below.

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For obvious reasons, please store this handbook in a safe place.

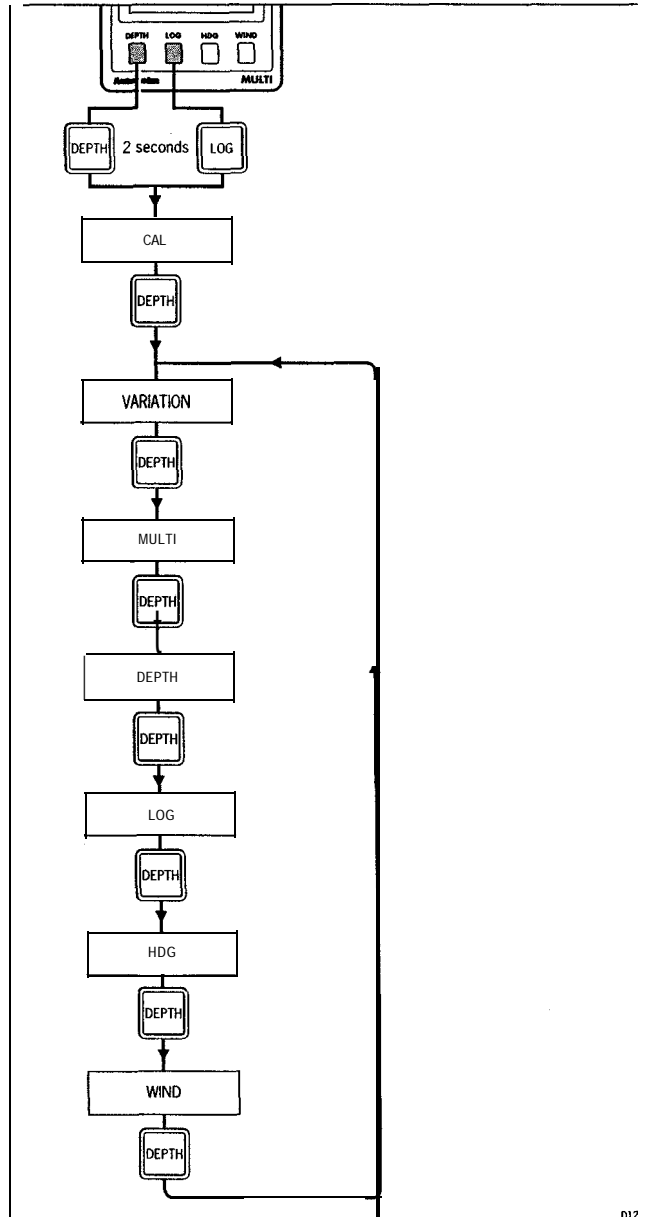
Operation

When the unit is powered on you are prompted to enter the code number. To enter the number, carry out actions 4 to 12 above and press **LOG**.

Chapter 5: Calibration

The ST50 Plus Multi can be adjusted to suit your particular requirements using the initial, intermediate and extended calibration menus described in this section.

5.1 Initial Calibration



Initial Calibration Notes

Variation

Heading information is transmitted onto the SeaTalk bus by the instrument reading the fluxgate compass. This can be the Autopilot or ST50 Steering compass which, in either case, should be set to display magnetic headings.

Magnetic Only

If you want to display just magnetic headings on the multi, set the Autopilot or ST50 Steering Compass to read magnetic and set variation on the Multi to zero (this is the factory default).

True and Magnetic

To display both true and magnetic headings, set the Autopilot or ST50 Steering Compass to read magnetic. If available in the Autopilot calibration menu, Variation should be set on the Autopilot. Otherwise set variation on the Multi using **WIND** to increase and **HDG** decrease the displayed value.

Note; When set to display true headings, significant changes in local variation will alter the true display as the fluxgate compass measures the magnetic heading. If you want the Steering Compass or Autopilot to display true heading, please contact your local distributor or the Autohelm Product Support Department for advice.

Storing Variation

To store variation, press and hold **DEPTH** and **LOG** for 2 seconds.

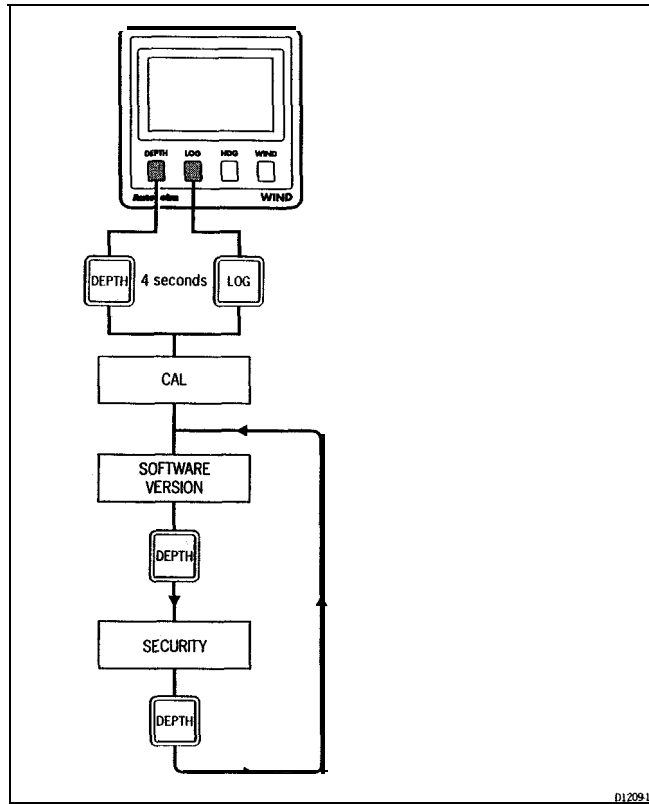
Multi, Depth, Log, HDG and Wind

These functions are for use with the Multi Remote Control. Full details are given in the handbook supplied with remote control.

Exit Initial Calibration

Press and hold **DEPTH** and **LOG** for 2 seconds to exit initial calibration.

5.2 Intermediate Calibration



Intermediate Calibration Notes

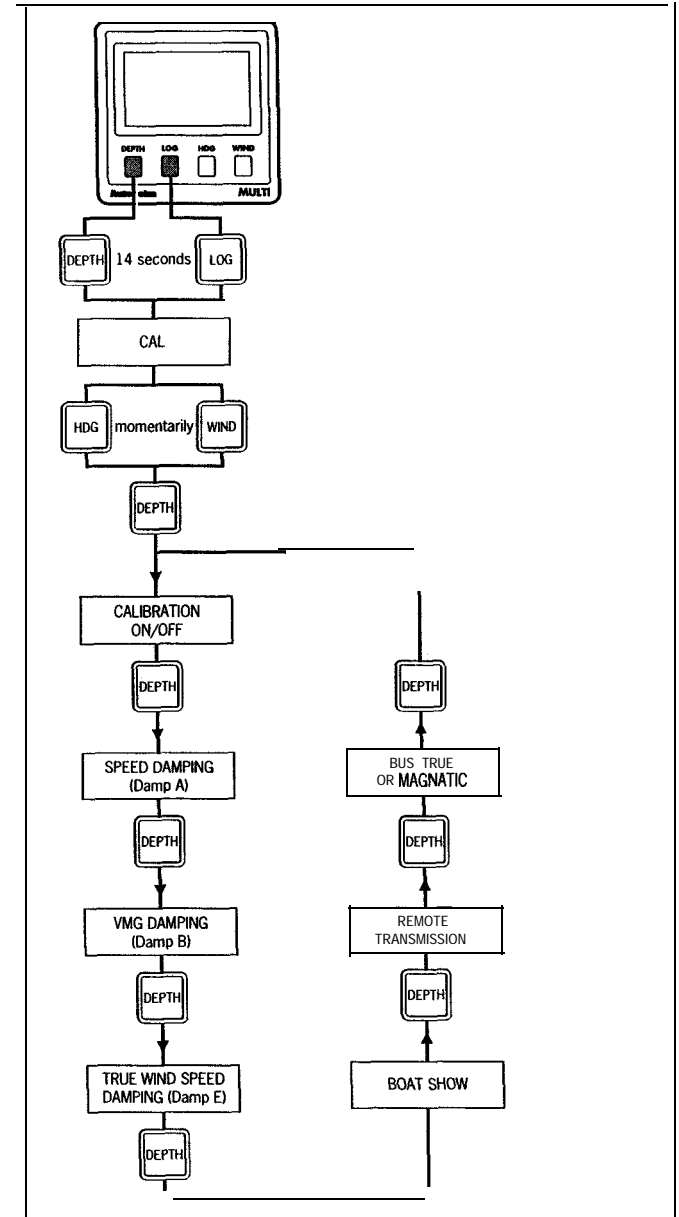
Refer to Chapter 4 for full details on the **security** feature.

To exit intermediate calibration, press and hold DEPTH and **LOG** together for 2 seconds.

Exit Intermediate Calibration

Press and hold DEPTH and **LOG** for 2 seconds to exit intermediate calibration.

5.3 Extended Calibration



Extended Calibration Notes

With the exception of the damping menus, which are adjusted using HDG and/or WIND, the following options are **modified** using the WIND key.

Calibration On/Off

Calibration allows you to protect your selected settings. When calibration is enabled the initial and intermediate calibration cannot be **modified**.

CAL 0 = Calibration locked, i.e. no access

CAL 1 = Calibration unlocked, i.e. normal access

Once locked calibration can be unlocked by entering extended calibration and selecting 1, calibration unlocked (the factory default is 1).

Damping (Speed, VMG and True Wind)

Damping adjusts the averaging applied to the displayed data. The default setting is 4, however, the range is between 1 and 15.

Boat Show

Boat Show mode is a dealer demonstration program only. Under no circumstances must this program be engaged when this unit is installed on-board your vessel. The display must, therefore, be left set to 'BSHOW 0'.

Remote Transmission

The 'MULTI' option is for future use only and should be set to 1.

Bus (True or Magnetic)

This option is set to true or magnetic, depending on whether the information on the SeaTalk bus is true or magnetic (the factory default is magnetic).

Exit Extended Calibration

Press and hold DEPTH and LOG for 2 seconds to exit extended calibration.

Chapter 6: General Specification

Dimensions:	110 x 110mm (4.33 x 4.33in)
Power supply:	10 to 16V
Power consumption:	30ma (normal) 100ma (illumination on)
Temperature range:	0 to 70 deg.C
Illumination:	3 levels plus off