

A+T



MFD

USER & INSTALLATION MANUAL

(Please check the Downloads section of our website for the latest manual)

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General Notes on MFD

The A+T MFD is supplied as a spare/replacement part for existing B&G H3000 and H2000 systems, including WPT2 and WPT3, using the Fastnet bus.

Warranty.

The A+T MFD is warranted against manufacturing defects for two years from date of first use (or three years from shipping from factory, whichever is earlier) on a return to factory basis. Warranty is voided if opened except by A+T. An integral tamper sensor is fitted.

The warranty specifically excludes physical damage, lightning strike to the vessel, overvoltage on supply or signal lines and use outside the normal operating environment of a racing yacht.

Installation

The input voltage range for the DC supply to the MFD is 10-36v. Generally this will be taken from the Fastnet bus. Electrical connections and mounting information is at Appendix C

Notes on Version MFD1

Key functions implemented at this issue include:-

- Display of all data items on the Fastnet bus
- Bluetooth pairing for field upgrades
- Alternating data fields available
- Measuring, display and logging of internal temperature and humidity

At this issue the following planned upgrade functions are not yet implemented:-

- NMEA interfacing
- Calibrations (basic) of speed, depth, wind, heading
- Damping
- Set up of remote displays
- Data capture of Fastnet bus activity and Bluetooth file transfer to send back for analysis

Trademarks

A+T is a registered trademark of A+T Instruments Ltd. B&G, H2000, H3000, WPT, WPT2 & WPT3 are product names or trademarks of Navico UK Ltd whose use here is acknowledged.



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1. General notes on use

The MFD allows the display of any data available from the instrument processor and allows control of some functions and settings of the instrument system.

To protect against accidental changing of the display in use, simultaneously hold down the two lower buttons on the MFD to LOCK the displayed data. It is unlocked by the same hold-down.

The DPTH, WIND and NAV dedicated keys force in each case 3 preset pages of data. These are fixed in the MFD and cannot be changed by the user, apart from temporarily. Use of the ◀▶ keys allows any panel to be selected and MENU/ENTER allows any data item to be shown, but this is only temporary and is lost when any other page is selected or the display is powered off.

The unit is supplied with a single user page accessed with the PAGE (□) key. Up to 7 configurable additional user pages can be added (or deleted) so to a total of 8 user pages. The user pages are cycled around on each press of PAGE. Any data item in any page can be temporarily altered as immediately above. If after it is changed the PAGE Button is held down for 3 seconds or longer, then the changed data is saved on that page.

Up to 10 sets of alternating data can be set up to show in any data area, each of two or three data items with a user chosen cycle rate.

The main menu is accessed with the MENU Key:-

This Display	allows setting for user pages
System	systems settings and diagnostics

An inbuilt humidity sensor will flash a warning on the display every minute when over 90% - return unit immediately to A+T if this happens.



2. Data display

This is all controlled from the **This Display** menu:

Edit Page	Allows editing of current user page on the display (not preset pages)
Add Page	Adds a new user after the currently selected user page
Delete Page	Deletes currently selected user page (if more than one)
Contrast	Allows changing of LCD display contrast
Reverse	Select White on Black , Black on White or Auto selecting with lights on
Lighting Colour	Select from Red and Green
Lighting Level	Select lighting level for keys and LCD for High, Mid, Low levels

The unit default comes with a single user page set-up. This page can be changed and up to 7 further user pages added. Pages can also be deleted until only one remains.

Before selecting **Edit**, **Add** or **Delete**, first select the user page to be edited, deleted or after which a new page is to be added.

i. **Edit** this user page on this display

This is exactly as **Add** below, except that default (layout and data) is set to the existing page. Changes made here are preserved once finished.

ii. **Add** new user page on this display

1. Select from list of layout options , default is two sets of data, all data fields blank
2. Once confirmed, the new user page is displayed, data fields are blank and can be edited into each panel:-
3. Using ◀▶ to select the panel to set-up.
4. Once panel is selected (MENU) then full interactive menu of Data Groups/Items is offered.
5. All such data set-up is saved for the page automatically. It can always be changed later either by using **EDIT this user page on this display** or by changing on the fly and holding the **PAGE** key down for 3 seconds to save.

iii. **DELETE** this user page on this display

CONFIRM No/Yes (Default No) to avoid accidental deletion

Data Groups/Items

Data items are stored in the normal Groups (so **WIND** contains AWA, AWS, TWA, TWS etc) plus any additional Groups/Menus that have come from the processor (in particular WPT).

ALTDATA allows for up to 10 user channels of alternating data to be set up and displayed, so typically Distance to Waypoint and Bearing to Waypoint can be set inside the display to alternate. The alternating channels are set up, if wanted, under the **System** menu.



ALL allows viewing and selecting of all 255 channels of data on the Fastnet bus including seeing their identifiers. This is useful to display data that is not available on some existing B&G displays (as the inbuilt menus do not allow) and is also very useful in troubleshooting WPT user output.

3. System Settings

These are controlled from the **System** menu:-

Alternating Data	Sets up alternating data channels, up to 10, see below
Diagnostics	Allows diagnostic network data to be displayed, contact A+T
Bluetooth	Enables Bluetooth for uploading, see Appendix B
Reset	Quick reset – equivalent of power cycle Factory Defaults – as unit delivered, loses all user pages
Statistics	Displays Serial Number, system configuration, internal temperature and humidity
Simulation	Solely for A+T use, do not access this menu

Alternating data

Up to 10 Alternating data sets may be set up and selected for any display, so

ALT1 5 BSP SOG COG

sets the display variable ALT1 to cycle through the set three values showing each for 5 seconds before moving on. Either 2 or 3 data selections may be used.



APPENDIX A – User Page layout options

Any data (including alternating) can be set into any field in any of the layouts illustrated below.

BSP	22.8	KT
DEPTH	54.7	METRE

BSP	22.8	KT
17.5	305	
TWS KT	TWD M	

SOG KT	21.4	COG M	087
17.5	305		
TWS KT	TWD M		

BSP KT	22.8		
32.4	-85		
AWS KT	AWA		
17.5	305		
TWS KT	TWD M		

22.8	21.4		
BSP KT	SOG KT		
32.4	-85		
AWS KT	AWA		
17.5	305		
TWS KT	TWD M		



APPENDIX B – Bluetooth Firmware Update

There are two processors in the A+T display, Main and LCD, and each can be uploaded independently. However, check release notes for each version, as some versions are not compatible and it is important to install the correct firmware and in the correct order.

We recommend pairing each A+T unit using the Windows 'Add Device' dialog before commencing with the A+T Uploader. Different versions of Windows have subtle differences in the pairing of Bluetooth devices. Please see Microsoft documentation if you are not familiar with this procedure.

Note that PC and unit must be as close as possible before commencing.

Before pairing each unit, select the following on the display:

MAIN MENU | This Display | Bluetooth | Bootload Main CPU

Do not select 'Yes' at this stage.

You will see the serial number and pairing code (usually 1234) displayed on the LCD. Use these to select and pair to the relevant unit.

Having paired the units, you are ready to open the A+T Uploader program.

The Uploader requires three files:

1. A+T Uploader Vx_xx.exe
2. InTheHand.Net.Personal.dll
3. The required update file type .hex

Files 1 and 2 must be in the same folder and can be run from a USB stick

Now follow this procedure in order:

1. Open A+T Uploader
2. On unit to be updated select:

MAIN MENU | This Display | Bluetooth | Bootload (choose required) CPU

3. Click 'Find Unit' on Uploader
If target serial number does not show up in the list before 'NO UNIT FOUND...' or 'SELECT UNIT...' message, then click 'Find Unit' again
4. Select required unit from list
5. Select **Are you Sure? |Yes** on unit
6. Click 'Connect' on Uploader. If unit fails to connect, please click 'Find Unit', then select and click 'Connect' again, but **DO NOT SWITCH OFF OR PRESS ANY BUTTONS** on the display being updated at this stage



7. When prompted, open Firmware file, being careful to only select a file compatible with the unit CPU being updated
8. When prompted, click on 'Upload'
9. After a few seconds, the unit and the uploader should indicate that the firmware is loading. The progress bar should start moving. The upload will take around 5 minutes

Special Bootload Reset functions

If for any reason the bootloading fails, there are some special functions to help recover the display.

If the Main CPU bootloader fails, you can power down and back up again and should be able to upload firmware without any button presses

If the LCD CPU bootloader fails, you must power down and back up again whilst holding the 'Page' (top left) button

If you started the Main CPU bootload in the display, but now find you can't proceed, then power down the display and back up again whilst holding down the 'down' arrow to return to normal operation.

If the firmware is corrupt in the Main CPU and the bootloader is not automatically showing, then you can power up whilst holding the 'Menu' (bottom left) button which will force the unit to bootload

APPENDIX C – Mounting and installation

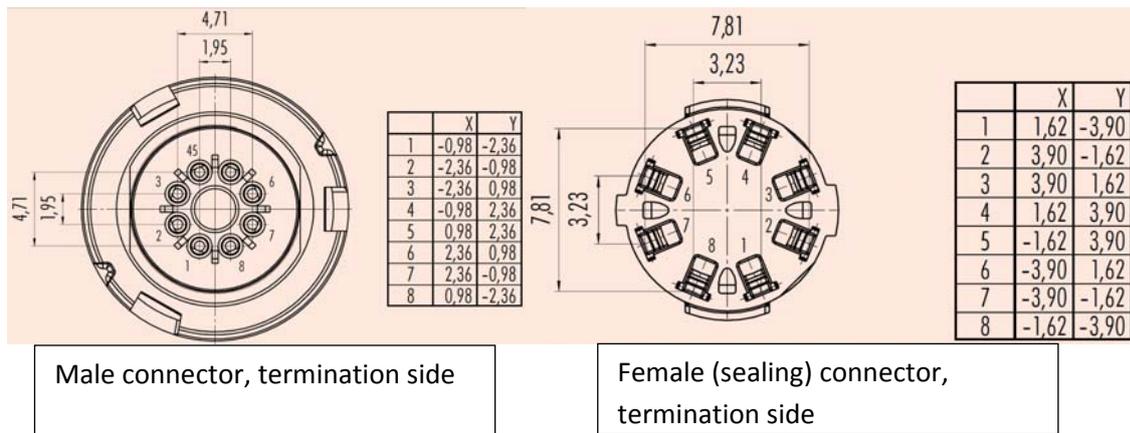
The unit is supplied with a pigtail (or pigtail with in-line connector). The pigtail can be shortened as needed (or the in-line connector cut-off) with-out affecting water-integrity of the unit or warranty.

The colour codes in the cable are:-

Colour	Pin*	Function	Comment
Black	2	0v	**See note below.
Red	7	+v Power	Normally from Fastnet bus, 10v-26v dc
White	3	Fastnet A	Connect to B&G Fastnet White
Green	5	Fastnet B	Connect to B&G Fastnet Green
Brown	1	NMEA 0183 in A	Opto-isolated
Blue	6	NMEA 0183 in B	Opto-isolated
Violet	8	NMEA out A	
Yellow	4	NMEA out B	Do not connect to power 0v

**If the unit is powered from a supply other than the Fastnet power, then the 0v of this power supply should be connected common to the 0v (black wire) of the Fastnet bus.

*The pin numbers are used when an in-line connector is supplied.



Binder Bayonet NCC Series 770. Mated connector is IP 67-rated, Female receptacle remains IP 67-rated in unmated condition

The normal requirements for Fastnet bus apply in that two terminator resistors, each of 100 Ω , at either end of the network. The resistance measured across green and white with the whole system turned off should be 50 Ω .

The drawing for the cut-out, mounting holes and overall display dimensions (including bezel) is shown below and should allow for a 1mm tolerance all around in the cut-out. This also ensures that any strain in the yacht structure cannot be transferred to the MFD display body.

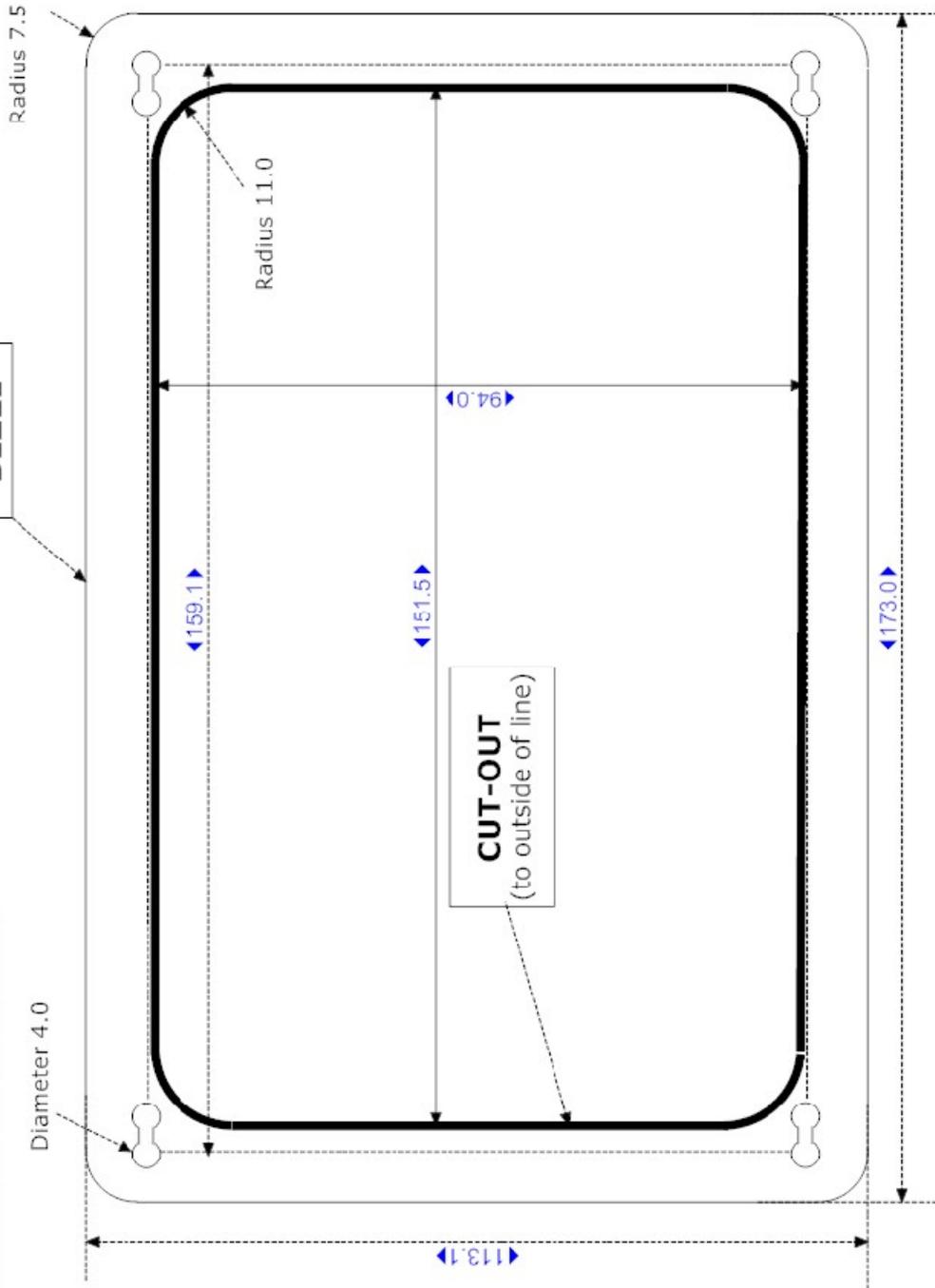


There are no special electrical insulation requirements, even when mounted into carbon, aluminium or steel as the MFD has an all synthetic body.

To achieve the best sealing between the MFD and the bulkhead or other mounting plane(should this be required) then the recommended procedure is:-

- a) Dry fit the MFD
- b) Apply a bead of propriety non-adhesive sealant (so not Sikaflex) and screw/bolt in partly, using small spacers to achieve an even gasket without squeezing all the sealant out of the gap.
- c) Once the sealant has gone off, typically 24 hours, remove any spacers and gently tighten the screws/bolts half a turn or so to take up on the now formed gasket. Clean away any surplus sealant. **DO NOT USE** Acetone or other alcohol based solvent agent which may damage the MFD plastic material.
- d) **TAKE CARE NOT TO OVERTIGHTEN THE FASTENING SCREWS or BOLTS.** Overtightening could lead to distortion of the display body and consequential loss of watertight/airtight integrity. In a worst case this could result in breaking the glass or breaking off the mounting lugs. None of these would be covered by warranty.

CHECK PRINTED DIMENSIONS BEFORE USING AS TEMPLATE



SHEET NO. V1.1

SCALE 1:1

DATE 30/12/2015

DIMENSIONS mm

DRAWN BY HJA

A+T Instruments
MFD Cut-out and Mounting