



# Your PDF Guides

You can read the recommendations in the user guide, the technical guide or the installation guide for ICOM MA-500TR. You'll find the answers to all your questions on the ICOM MA-500TR in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual ICOM MA-500TR  
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INSTRUCTION MANUAL

CLASS B AIS TRANSPONDER  
**MA-500TR**

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

Icom Inc.



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**Manual abstract:**

" Many hours of research and development went into the design of your MA-500TR. IMPORTANT READ ALL INSTRUCTIONS carefully and completely before using the transponder. SAVE THIS INSTRUCTION MANUAL -- This instruction manual contains important operating instructions for the MA-500TR. EXPLICIT DEFINITIONS WORD WARNING! CAUTION NOTE DEFINITION Personal injury, fire hazard or electric shock may occur. Equipment damage may occur. If disregarded, inconvenience only. No risk of personal injury, fire or electric shock. D FEATURES Full dot-matrix display visually shows real-time vessel traffic information IPX7 waterproof protection 3 lines of NMEA0183 Input/Output GPS receiver comes with the MA-500TR Collision-risk management functions Integration with Icom VHF transceivers\* \* See the leaflet that comes with the transponder for details of the corresponding transceiver. CLEAN THE TRANSPONDER THOROUGHLY WITH FRESH WATER after exposure to saltwater, otherwise, the keys and switch may become inoperable due to salt crystallization. i FCC INFORMATION · FOR CLASS B UNINTENTIONAL RADIATORS This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. @@@@ -ncrease the separation between the equipment and I receiver. @@ · onslutthedealeroranexperiencedradio/TVtechnician C for help. SUPPLIED ACCESSORIES DC power cable (OPC-2059) NMEA connector cable (OPC-2014) · he OPC-2014 has 15 T leads, numbered 1 to 15. Mounting bracket For the mounting bracket Knob bolts Flat washers (M5) Screws (5×20) Spring washers (M5) MXG-5000 gps receiver is included with MA-500TR.

MXG-5000 (Referred to as Internal GPS) Cable length: Approx. 10 m (32.8 ft) · ninstructionsheetcomeswiththeMXGA 5000. Please read it before installing and operating the MXG-5000. ii RADIO OPERATOR WARNING Icom requires the radio operator to meet the FCC Requirements for Radio Frequency Exposure.

An omnidirectional antenna with gain not greater than 9 dBi must be mounted a minimum W ARN ING of 5 meters (measured from the lowest point of the antenna) vertically above the main deck and all possible personnel. This is the minimum safe separation distance estimated to meet all RF exposure compliance requirements. This 5 meter distance is based on the FCC Safe Maximum Permissible Exposure (MPE) distance of 3 meters added to the height of an adult (2 meters) and is appropriate for all vessels. For watercraft without suitable structures, the antenna must be mounted so as to maintain a minimum of 1 meter vertically between the antenna, (measured from the lowest point of the antenna), to the heads of all persons AND all persons must stay outside of the 3 meter MPE radius. Do not transmit with radio and antenna when persons are within the MPE radius of the antenna, unless such persons (such as driver or radio operator) are shielded from antenna field by a grounded metallic barrier. The MPE Radius is the minimum distance from the antenna axis that person should maintain in order to avoid RF exposure higher than the allowable MPE level set by FCC. iii FAILURE TO OBSERVE THESE LIMITS MAY ALLOW

THOSE WITHIN THE MPE RADIUS TO EXPERIENCE RF RADIATION ABSORPTION WHICH EXCEEDS THE FCC MAXIMUM PERMISSIBLE EXPOSURE (MPE) LIMIT. IT IS THE RESPONSIBILITY OF THE RADIO OPERATOR TO ENSURE THAT THE MAXIMUM PERMISSIBLE EXPOSURE LIMITS ARE OBSERVED AT ALL TIMES DURING RADIO TRANSMISSION. THE RADIO OPERATOR IS TO ENSURE THAT NO BYSTANDERS COME WITHIN THE RADIUS OF THE MAXIMUM PERMISSIBLE EXPOSURE LIMITS. Determining MPE Radius THE MAXIMUM PERMISSIBLE EXPOSURE (MPE) RADIUS HAS BEEN ESTIMATED TO BE A RADIUS OF ABOUT 3M PER OET BULLETIN 65 OF THE FCC.

THIS ESTIMATE IS MADE ASSUMING THE MAXIMUM POWER OF THE RADIO AND ANTENNAS WITH A MAXIMUM GAIN OF 9dBi ARE USED FOR A VESSEL MOUNTED SYSTEM. ABOUT CE · INSTALLATION NOTES The installation of this equipment should be made in such a manner as to respect the EC recommended electromagnetic fieldexposurelimits(1999/519/EC). The maximum RF power available from this device is 2 watts. The antenna should be installed as high as possible for maximum efficiency and that this installation height should be at least 5 meters above ground (or accessible) level. In the case where an antenna cannot be installed at a reasonable height, then the transmitter should neither be continuously operated for long periods if any person is within 5 meters of the antenna, nor operated at all if any person is touching the antenna. In all cases any possible risk depends on the transmitter being activated for long periods. (actual recommendation limits are specified as an average of 6 minutes) Normally the transmitter is not active for long periods of time. Some radio licenses will require that a timer circuit automatically cuts the transmitter after 1 to 2 minutes etc. Similarly some types of transmitter, SSB, CW, AM, etc. have a lower 'average' output power and the perceived risk is even lower.

CE versions of the MA-500TR which display the "CE" symbol on the serial number label, comply with the essential requirements of the European Radio and Telecommunication Terminal Directive 1999/5/EC. This warning symbol indicates that this equipment operates in non-harmonised frequency bandsand/or may be subject to licensing conditions in the country of use. Be sure to check that you have the correct version of this radio or the correct programming of this radio, to comply with national licensing requirement. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 iv ABOUT CE DECLARATION OF CONFORMITY We Icom Inc. Japan 1-1-32, Kamiminami, Hirano-ku Osaka 547-0003, Japan · List of Country codes (ISO 3166-1) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 Country Austria Belgium Bulgaria Croatia Czech Republic Cyprus Denmark Estonia Finland France Germany Greece Hungary Iceland Ireland Italy Latvia Codes AT BE BG HR CZ CY DK EE FI FR DE GR HU IS IE IT LV 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 Country Liechtenstein Lithuania Luxembourg Malta Netherlands Norway Poland Portugal Romania Slovakia Slovenia Spain Sweden Switzerland Turkey United Kingdom Codes LI LT LU MT NL NO PL PT RO SK SI ES SE CH TR GB 0560 Bad Soden 2nd Dec.

2010 Place and date of issue Declare on our sole responsibility that this equipment complies with the essential requirements of the Radio and Telecommunications Terminal Equipment Directive, 1999/5/EC, and that any applicable Essential Test Suite measurements have been performed. Kind of equipment: Type-designation: CLASS B AIS TRANSPONDER Icom (Europe) GmbH ma- 500tr Communication Equipment Auf der Krautweide 24, 65812 Bad Soden am Taunus, Germany Authorized representative name Version (where applicable): This compliance is based on conformity with the following harmonised standards, specifications or documents: i) IEC 62287-1 Ed.



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I ii) ITU-R M.1371-3 iii) ITU-R M.825-3 iv) IEC 60945 2002 v) EN 60950-1 2006 A11 2009 vi) vii) viii) Y.

*Furukawa General Manager Signature v PRECAUTIONS RWARNING! NEVER connect the transponder to an AC outlet. This may pose a fire hazard or result in an electric shock. RWARNING! NEVER connect the transponder to a powersourceofmorethan16VDCoruserreversepolarity. This could cause a fire or damage the transponder. RWARNING! NEVER cut the DC power cable between the DC plug at the back of the transponder and fuse holder. If an incorrect connection is made after cutting, the transponder may be damaged. CAUTION: NEVER place the transponder where normal operation of the vessel may be hindered or where it could cause bodily injury. BE CAREFUL! The transponder rear panel will become hot when operating continuously for long periods of time. Place the transponder in a secure place to avoid inadvertent use by children. BE CAREFUL! The transponder meets IPX7\* requirements for waterproof protection.*

*However, once the transponder has been dropped, waterproof protection cannot be guaranteed because of possible damage to the transponder's case or the waterproof seal. \* Except for the DC power and cloning cable connectors. For U.S.A. only CAUTION: Changes or modifications to this device, not expressly approved by Icom Inc., could void your authority to operate this device under FCC regulations. Approved Icom optional equipment is designed for optimal performance when used with an Icom transponder. Icom is not responsible for the destruction or damage to an Icom transponder in the event Icom*

*transponder is used with equipment that is not manufactured or approved by Icom. Icom, Icom Inc.*

*and the Icom logo are registered trademarks of Icom Incorporated (Japan) in Japan, the United States, the United Kingdom, Germany, France, Spain, Russia and/or other countries. Marine Commander is a trademark of Icom Incorporated. All other products or brands are registered trademarks or trademarks of their respective holders. KEEP the transponder at least 1 m (3.3 ft) away from the vessel's magnetic navigation compass.*

*DO NOT use or place the transponder in areas with temperatures below 20°C (4°F) or above +60°C (+140°F) or, in areas subject to direct sunlight, such as the dashboard. DO NOT use harsh solvents such as benzine or alcohol when cleaning, as they will damage the transponder surfaces. If the transponder becomes dusty or dirty, wipe it clean with a soft, dry cloth. vi TABLE OF CONTENTS FOREWORD ..*

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..... each AIS target icon closest to your vessel (or waypoint, if it is set; see page 24 for setting detail). (p. 15) · target box will appear around the selected target or waypoint A icon. o i Speaker The angle brackets show common or special display operations, as described below: ·<Common> shows the common operation. · In the plotter display> shows the plotter display operation.

· In the target list display> shows message icon stays on the plotter display as long as the T unread message is stored in the RX log memory. D Plotter display After the transponder is turned ON, the plotter display automatically appears, if the GPS receiver is connected and it receives signals from a satellite. It shows the display range and the icons of the AIS targets. w q e r t y 4 i u PANEL DESCRIPTION 2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 t TARGET BOX Shows the selected AIS target (or waypoint, if it is set; see pages 24-26 for setting detail). · hen a target box appears, push [ENT] to display the detail W screen of the selected AIS target or waypoint. · Description of the icons Icon Description AIStar: Vessel The tip of the target triangle automatically points in the direction it's heading. The icon blinks when the AIS target is closer than your CPA and TCPA settings. (Dangerous target) AIS target: Lost target\* The target triangle is marked with a diagonal line. AIS target: Base Station AIS target: Search and Rescue (SAR) AIS target: Aids to Navigation (AtoN) Waypoint \*A vessel is regarded as a "Lost target" after a specified period of time has passed since the vessel last transmitted data. (p.

27) The "Lost target" icon disappears from the plotter display 6 minutes and 40 seconds after the vessel was regarded as a "Lost target." Ask your dealer for details. y YOUR VESSEL ICON Your vessel icon is displayed in the center of the display. · hen "N-UP" is displayed, the vessel icon automatically points W in the direction you are heading, in 45 degree steps. · hen "AC-UP" is displayed, the vessel icon constantly points to W the top of the plotter display. · hen your vessel moves less than 2 knots, the icon is displayed W as " . " u KEY ENTRY GUIDE Shows the key entry guide. Push [ ] or [ ] to select each AIS target icon (or waypoint), in sequence. (p. 15) · A target box will appear around the selected target icon.

Push [ENT] to display the detail screen of the selected AIS target or waypoint. (pp. 15-17) i DISPLAY RANGE Shows the selected display range. · .125, 0.25, 0.5, 0.75, 1.5, 3, 6, 12, 24 nm (nautical miles) are 0 selectable. 5 2 PANEL DESCRIPTION Function display (Continued) D Target list display D Danger list display In the plotter display, push [DISP MODE] to switch to the target list display, which shows all AIS targets being detected by the transponder.

In the target list display, push [DISP MODE] to switch to the danger list display, which helps you to find any dangerous target whose CPA is within 6 nm (nautical miles) and TCPA is within 60 minutes of your vessel. q q e e w w q THE NUMBER OF TARGETS Shows the number of AIS targets which are being

detected by the transponder. w KEY ENTRY GUIDE Shows the key entry guide. Push [ ] or [ ] to select an AIS target. (p. 16) Push [ENT] to display the detail screen of the selected AIS target. (pp. 16, 17) e TARGET INFORMATION Shows the following AIS target information: ·MMSIcodeorname, if the name is programmed. ·Range(RNG)fromyourvesseltothetarget(unit:nauticalmile) ·Bearing(BRG)fromyourvesseltothetarget(unit:degree) q THE NUMBER OF DANGEROUS TARGETS Shows the number of AIS targets which are being detected by the transponder.



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w KEY ENTRY GUIDE Shows the key entry guide.

Push [ ] or [ ] to sort the danger target data. (p. 17) Push [ENT] to display the detail screen of the selected AIS target. (p. 17) e DANGER TARGET INFORMATION Shows the following dangerous target information: ·MMSIcodeorname, if the name is programmed.

·CPA :ClosestPointofApproach(unit:nauticalmile) ·TCPA:TimetoCPA(unit:minute) 6 PREPARATION MMSI code setting The 9-digit MMSI (Maritime Mobile Service Identity: DSC self ID) code can be set at power ON. If the MMSI code has already been set, the following steps are not needed. Go to page 9. This initial code setting can be performed only once. After being set, it can be changed by only your dealer or distributor.

q Hold down [POWER-BRILL] for 1 second to turn ON the power. ·A long beep sounds, and the opening screen appears. 3 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 e After the opening test is completed, "No MMSI" appears when no MMSI code is set. f the MMSI code has already been set, the MMSI code appears. 1 Go to page 9. ·ush[CLEAR] to skip the setting, and go to the plotter display. P In this case, the transponder operates as just an AIS receiver. [POWER-BRILL] w The opening screen displays the results of the opening test (ROM, RAM and backup data test); "OK" or "NG" (No Good). f "NG" is displayed, hold down [POWER-BRILL] for 1 second to turn I OFF the power, then ON again to reset the transponder. If there is no change, contact your dealer or service center.

Continued on the next page. 7 3 PREPARATION MMSI code setting (Continued) r Push [ENT] to enter the MMSI code setting mode. t Push [ ] or [ ] to input the specific 9-digit MMSI code. ·ush[ ] to move the cursor forward. P ·ush[ ] to move the cursor backward. P ·ush [CLEAR] to cancel, and go to the plotter display. In this P case, the transponder operates as just an AIS receiver. [ ], [ ], [ ], [ ] [ENT] [CLEAR] y After inputting the 9-digit code, push [ENT].

·TheMMSIconfirmationsscreenappears. NOTE: The coast station ID or the group ID cannot be entered as your MMSI code.

·GroupID :Thefirstonedigitis"0." ·CoaststationID:Thefirsttwodigitsare"0." If you enter a code that starts with "0" or "00," an error beep sounds after pushing [ENT] in step y. u Input the same MMSI code which was entered in steps t and y for the confirmation. Then, push [ENT] to save.

i After the MMSI code has been saved, the transponder automatically enters the Initial setting mode. See pages 9 to 13 for setting details. The Initial setting mode can also be entered from the Menu mode. (p. 9) 8 PREPARATION 3 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 Initial setting mode The Initial setting mode allows you to set the vessel's information that is exchanged among the vessels and/or base stations.

And,youcansettheseldom-changedNMEAInput/ Output settings. NOTE: After the MMSI code programming, the transponder automatically enters the Initial setting mode. In this case, skip steps q and w. q Push [MENU] to enter the Menu mode. w Push [ ] or [ ] to select "Initial Setting," then push [ENT]. e Push [ ] or [ ] to select the desired item, then push [ENT]. r Enter the characters or select the desired option. The procedures are described on pages 10 to 13. t Repeat steps e and r to set other items. y Push [CLEAR] to exit the Initial setting mode, and return to the Menu mode.

u Push [CLEAR] to exit the Menu mode. [ ] [ENT] [ ] [CLEAR] [MENU] D MMSI code Enter the vessel's MMSI code. See page 7 for setting details.

·IftheMMSIcodehasalreadybeenset,youcannotchangethis. D Name Enter the vessel's name of up to 20 characters. See page 13 for setting details. D Call Sign Enter the Call Sign of up to 7 characters. The Call Sign is a unique designation ID for a station. See page 13 for setting details. 9 3 PREPARATION Initial setting mode (Continued) D Internal/External GPS Antenna Position Setthesemeasurementstoindicateinternaland/orexternal GPS antenna position on the vessel.

·InternalGPSantenna : he GPS antenna which is connected to T the [GPS] connector. ·ExternalGPSantenna: he GPS antenna which is connected to one T of the NMEA lines. (p. 37) D Type of Ship Select your vessel type. Push [ ] or [ ] to select your vessel type from the list, then push [ENT] to save and return to the Initial setting mode.

[ ] [ENT] [ ] q Push [ ] or [ ] to select "A," "B," "C" or "D." ·A : Bow to Antenna ·B : Stern to Antenna ·C : Port side to Antenna ·D : Starboard side to Antenna ·Push[CLEAR] to cancel and return to the previous screen. w Push [ ] or [ ] to input the value into that item. A and B : Between 0 and 511 meters (0 and 1676.5 feet) C and D : Between 0 and 63 meters (0 and 206.

6 feet) e Repeat steps q and w to input other values. r Push [ENT] to save and return to the Initial setting mode. [ ], [ ], [ ], [ ] [ENT] [CLEAR] ·Type of Ship List 30 Fishing 31 Towing 32 Towing & two < 200m 33 Engaged in Dredging 34 Engaged in Diving 35 Engaged in Military 36 Sailing 52 Tugs 53 Port tender 54 Vesselswithantipollution 55 LawenforcementsVessel 58 Medical Transports 59 Ships RR Resolution NO18 60 Passenger Ship 70 Cargo Ship 80 Tanker This screen shows the internal GPS antenna set screen. 37 Pleasure Craft 50 Pilot 51 Search&RescueVessel 10 To show the external GPS antenna set screen, select "Set EXT GPS POS" in the "Initial Setting" mode. (p. 9) PREPARATION 3 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 D NMEA Input/Output ports ·NMEA1/NMEA2/NMEA3 data speed The data communication speed (baud rate) can be set for eachInput/Outputport;NMEA1andNMEA3. NOTE: The data communication speed of NMEA2 is fixed to38400bps.NMEA2isused for communication between the transponder and the Icom MarineCommanderTM system or a GPS receiver. q Push [ ] or [ ] to select "NMEA1" or "NMEA3." ·NMEA1 : Used for communication between the transponder and atransceiveroraGPSreceiver.

(Default:4800bps) ·NMEA3 : Used for communication between the transponder and a navigational equipment or a GPS receiver. (Default:4800bps)

·Youcannotselect"NMEA2." ·GPS Input1/GPS Input2/GPS Input3 Set the NMEA1, NMEA2 and NMEA3 Input ports' capability. q Push [ ] or [ ] to select "GPS Input1," "GPS Input2" or "GPS Input3." ·GPS Input1" is for the NMEA1, "GPS Input2" is for the NMEA2 " and "GPS Input3" is for the NMEA3 ports setting. ·ou can also turn the function ON by pushing [ ], or OFF by Y pushing [ ]. w Push [ENT] to toggle this function ON or OFF. w Push [ENT] to select the data communication speed between4800bpsand38400bpsintothatitem.



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You can also select the option by pushing [ ] or [ ]. e Repeat steps q and w to set another port.

r Push [CLEAR] to save and return to the Initial setting mode. [ ], [ ], [ ], [ ] [ENT] [CLEAR] : The GPS information that is received from the external GPS receiver of the selected port is sent to the transponder. (Default for "GPS Input2" and "GPS Input3") OFF : The GPS information that is received from the external GPS receiver of the selected port is not sent to the transponder. (Default for "GPS Input1") e Repeat steps q and w to set other ports' capability. r Push [CLEAR] to save and return to the Initial setting mode.

[ ], [ ], [ ], [ ] [ENT] [CLEAR] ON 11 3 PREPARATION Initial setting mode DNMEA Input/Output ports (Continued) - AIS Output Set the NMEA2 output port's capability. This function should normally be set to "AIS." q Push [ ] or [ ] to select "AIS Output." w Push [ENT] to select either "AIS" or "AIS+GPS."

You can also select the option by pushing [ ] or [ ].

· Remote ID Set a Remote ID number between 80 and 89. The Remote ID is included in the sentence of the format for the Icom own NMEA. q Push [ ] or [ ] to select "Remote ID." w Push [ ] or [ ] to set a Remote ID number between 80 and 89. e Push [CLEAR] to save and return to the Initial setting mode. [ ], [ ], [ ], [ ] [CLEAR] : The NMEA2 output port sends only the AIS information to the connected device. (Default) AIS+GPS : The NMEA2 output port sends both the AIS T and GPS information to the connected device. This setting is recommended for use in an area where there are few vessels. In areas crowded with AIS equipped vessels, a large amount of information is received. The output of GPS information has priority, so the NMEA2 output port may not send some AIS information correctly.

However, the transponder displays the AIS information on its LCD correctly. e Push [CLEAR] to save and return to the Initial setting mode. [ ], [ ], [ ], [ ] [ENT] [CLEAR] AIS 12 PREPARATION 3 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 D Name and Call Sign settings q Push [ ] or [ ] to select the "Set Name" or "Set Call Sign" that you want to program, then push [ENT] to enter the setting mode. [ ] [ENT] [ ] e Repeat step w to input all characters. r Push [ ], [ ], [ ] or [ ] to select "FINISH," then push [ENT] to save and return to the Initial setting mode. [ ], [ ], [ ], [ ] [ENT] w Push [ ], [ ], [ ] or [ ] to select the desired character in the table, then push [ENT] to input it. · Select", " then push [ENT] to move the cursor forward. @@ · Select "SPACE," then push [ENT] to input a space.

· Select "DELETE," then push [ENT] to delete a character. · Push [CLEAR] to cancel and return to the previous screen.

[ ], [ ], [ ], [ ] [ENT] [CLEAR] 13 4 BASIC OPERATION Turning power ON IMPORTANT: BE SURE to connect the GPS receiver to the transponder before turning the power ON. (p. 35) q Hold down [POWER-BRILL] for 1 second to turn ON the power. · long beep sounds, and the opening screen appears. A e

After the opening test is completed, the MMSI code appears, if the code has already been set.

· "NoMMSI" appears when no MMSI code is set. (p. 7) [POWER-BRILL] r The GPS search display appears while searching for a GPS satellite. · hile searching, the GPS information screen can be displayed W by pushing [ENT], or you can enter the Menu mode by pushing [MENU]. (pp.

28, 31) w The opening screen displays the results of the ROM, RAM and backup data test, "OK" or "NG" (No Good). f "NG" is displayed, hold down [POWER-BRILL] for 1 second to turn I OFF the power, then ON again to reset the transponder. If there is no change, contact your dealer or service center.

14 t When the GPS receiver receives signals from a satellite, the transponder automatically displays the position data on the plotter display. (p. 15) BASIC OPERATION 4 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 Display backlight and contrast settings You can adjust the display backlight and contrast settings. The display backlight lights the function display and keys, and is convenient for nighttime operation. Also, you can adjust the display contrast between objects and the background. q ush [POWER-BRILL] to display the popup screen to adP just the display backlight and contrast level. @ @ @ @ @ q ush [DISP MODE] several times to select the plotter display.

@ @ @ @ @ @ @ @ @ @ (p. @ @ w Push [ ] or [ ] to select "Northup/COG up," then push [ENT]. @ @ @ @ @ @ @ @ @ w Push [ ] or [ ] to select the desired AIS target. e

Push [ENT] to display its detail screen. (p. @ @ @ @ r Push [CLEAR] to save and return to the Menu mode. @ @ @ @ @ @ @ @ @ The contents differ, depending on the AIS class. @ @ @ @ e Push [ENT] to display its detail screen. @ @ @ @ @ @ [ ] [DSC] See pages 39 and 40 for connecting instructions. @ @ (p.

@ @ (pp. @ @ @ @ @ @ @ @ @ @ @ @ @ @ y After receiving the acknowledgement from the AIS target, use the transceiver to communicate. See the transceiver's manual for details. 22 OTHER FUNCTIONS Message D Receiving a message A safety-related message of up to 161 characters can be received from an AIS equipped vessel in the area. When a message is received, a beep sounds three times, and the message icon appears on the plotter display.

(The message icon does not appear on the target list or danger list display.) The contents of the message can be checked in the receive message log, as described to the right. The message icon stays on the plotter display as long as the unread message is stored in the RX log memory. NOTE: The transponder automatically stores the received messages in the RX log memory. (See to the right) 5 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 D Message logs The transponder automatically stores the last 20 received messages in the log memory.

The oldest message is automatically deleted when a new message is received. q Push [MENU] to enter the Menu mode. w Push [ ] or [ ] to select "Message," then push [ENT]. e Push [ ] or [ ] to select "RX Log," then push [ENT]. r Push [ ] or [ ] to select the message that you want to read, then push [ENT].

· The contents of these selected messages are displayed. t Push [CLEAR] to return to the previous screen. y Push [CLEAR] three times to exit the Menu mode.

Appears Plotter display 23 5 OTHER FUNCTIONS Waypoint D Display a waypoint list Up to 100 waypoints can be stored in the waypoint list. q Push [MENU] to enter the Menu mode.

w Push [ ] or [ ] to select "Waypoint," then push [ENT]. e Push [ ] or [ ] to select "List," then push [ENT]. r Push [ ] or [ ] to select the desired waypoint. · Push [ ] to sort the waypoint data by Name. · Push [ ] to sort the waypoint data by Range. D Add a waypoint The position information that you want to memorize can be added as a waypoint.



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q Push [MENU] to enter the Menu mode. w Push [ ] or [ ] to select "Waypoint," then push [ENT]. e Push [ ] or [ ] to select "Add," then push [ENT].  
 ·Yourcurrentpositioninformationisdisplayed.

t Push [ENT] to display the detail screen of the selected waypoint. r Push [ ] or [ ] to select "Name," then push [ENT]. t Push [ ], [ ], [ ] or [ ] to select the desired character in the table, then push [ENT] to input it. ·Select" ," then push [ENT] to move the cursor forward. @@·Select"SPACE," then push [ENT] to input a space.

·Select"DELETE," then push [ENT] to delete a character. ·Push[CLEAR] to cancel and return to the previous screen. [ ], [ ], [ ], [ ] [ENT] [CLEAR] y Push [CLEAR] to return to the previous screen. u Push [CLEAR] three times to exit the Menu mode. 24 y Repeat step t to input a waypoint name of up to 10 characters.

u Push [ ], [ ], [ ] or [ ] to select "FINISH," then push [ENT] to set and return to the previous screen. OTHER FUNCTIONS 5 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 i Push [ ] or [ ] to select "LAT:," then push [ENT]. o Push [ ], [ ], [ ] or [ ] to set the desired latitude data in the table, then push [ENT] to input it. ·Select" ," then push [ENT] to move the cursor forward. @@·Select"N," then push [ENT] to input N; North latitude. @@·"W" and "E" cannot be input. ·Push[CLEAR] to cancel and return to the previous screen. @@@@!! Push [ ] or [ ] to select "LON:," then push [ENT]. @@@@!! "N" and "S" cannot be input. @@Convenient! Each time you hold down of [MOB] also adds a waypoint.

See page 26 to edit the waypoint data. @@q Push [MENU] to enter the Menu mode. w Push [ ] or [ ] to select "Waypoint," then push [ENT]. @@·Push [ ] to sort the waypoint data by Name. ·Push [ ] to sort the waypoint data by Range. u Enter a waypoint name, latitude data and longitude data, as described in steps t to !3 of "D Add a Waypoint" on pages24and25. i Push [ ] or [ ] to select "SAVE," then push [ENT] to save the edited data and return to the "EDIT WAYPOINT" list screen. ·Push[CLEAR] to cancel and return to the previous screen. [ ] [ENT] [ ] [CLEAR] r Push [ ] or [ ] to select the desired waypoint. t Push [ENT] to enter the edit item selection screen.

o Push [CLEAR] three times to exit the Menu mode. y Push [ ] or [ ] to select the top item (waypoint name), then push [ENT]. 26 OTHER FUNCTIONS 5 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 D Delete a waypoint Lost target A vessel is regarded as a "Lost target" after a specified period of time has passed since the vessel last transmitted data, as described below. The "Lost target" icon disappears from the plotter display 6minutesand40secondsafterthevesselwasregardedasa "Lost target." Ask your dealer for details.

The criteria to become a Lost target: Vesseltype Except Class B Class B A waypoint can be deleted from the waypoint list. q Push [MENU] to enter the Menu mode. w Push [ ] or [ ] to select "Waypoint," then push [ENT]. e Push [ ] or [ ] to select "Delete," then push [ENT]. ·The "DELETE WAYPOINT" list is displayed.

·Push [ ] to sort the waypoint data by Name. ·Push [ ] to sort the waypoint data by Range. r Push [ ] or [ ] to select the desired waypoint. t Push [ENT] to display the detail screen of the selected waypoint. y Push [ENT] to display the confirmation screen. u Push [ ] or [ ] to select "OK," then push [ENT] to delete the selected waypoint data and return to the "DELETE WAYPOINT" list screen. ·Select"Cancel"tocanceldeleting. [ENT] [ ] [ ] Except Class B : Vessel is at anchor, moored and moving less than 3 knots 18 min. 18 min. 1 ClassB : essel is moving less than V 2 knots 2 Vessel is at anchor, moored and moving 1 min. more than 3 knots N/A 3 min. N/A 90 sec. N/A 30 sec. N/A Vessel is moving between 0 and 14 knots 3 (ExceptClassB),orbetween2and14knots 1 min. (Class B) 4 Vessel is moving between 0 and 14 knots 1 min. while changing course 5 Vesselismovingbetween14and23knots 36 sec. Vesselismovingbetween14and23knots 6 36 sec. while changing course i Push [CLEAR] three times to exit the Menu mode. 7 Vesselismovingmorethan23knots 8 12 sec. Vesselismovingmorethan23knotswhile 12 sec.

changing course 27 6 MENU MODE OPERATION Menu mode items The Menu mode contains the following items. Item North up/COG up\* CPA/TCPA ·Alarm ·SlowWarn ·CPA,TCPA Message [ ] [ENT] [ ] [CLEAR] [MENU] ·RXLog\* Waypoint ·List\* ·Add\* ·Edit\* ·Delete\* Own Static Own Dynamic GPS Information Alarm Status User Setting ·KeyBeep ·AlarmBuzzer p. 32 p. 33 p.24 p. 24 p. 26 p. 27 p. 30 p. 31 p.

31 p. 32 p. 23 p. 29 p. 29 p. 30 Ref. p. 16 Item User Setting ·RCVMSGBUZZ ·InternalGPS ·SBAS Function ·SBAS Search ·SBAS Satellite Initial Setting ·SetMMSI\* ·SetName\* ·SetCallSign\* ·SetINTGPSPOS\* ·Set EXT GPS POS\* ·SetTypeofShip\* ·SetInput/Output\* Channel Information Diagnostics ·MonitorTest\* ·TransponderTest\* ·VersionInformation\* p.44 p.45 p.

45 pp. 7, 9 pp. 9, 13 pp. 9, 13 p. 10 p. 10 p. 11 p.34 p. 33 p.

33 p.34 p.34 p.34 Ref. General q Push [MENU] to enter the Menu mode.

w Push [ ] or [ ] to select the desired item, then push [ENT]. e Select the desired option or check the screen contents.

Theproceduresaredescribedonpages29to34. ·omeitemsare not described in this section. See the list to the S right for the specified pages.

r Repeat steps w and e to select or check other items. t Push [CLEAR] to exit the Menu mode. \*These items are not described in this section. See the specified page. 28 MENU MODE OPERATION D CPA/TCPA 6 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 ·Alarm You can turn the collision alarm function ON or OFF. q Push [ ] or [ ] to select "Alarm." w Push [ENT] to toggle this function ON or OFF. ·ou can also turn ON the function by pushing [ ], or OFF by Y pushing [ ]. ON : "COLLISION ALARM" appears on the display, and the alarm buzzer sounds\* repeatedly when an AIS target is closer than your CPA and TCPA settings, as explained to page 30. (default) \*The alarm buzzer sounds only when the alarm buzzer function is turned ON.

(p. 33) ·Slow Warn The GPS receiver calculated COG data of a vessel that is at anchor or drifting is unreliable, and therefore the CPA and TCPA data may not be calculated correctly. If a vessel is anchored in your alarm zone, the unreliable data can cause the collision alarm to sound many times, even if there is no real danger. To prevent this, when the anchored vessel's SOG is less than this set value, the Slow Warn function assumes that vessel's COG is fixed towards your vessel and an alarm will sound.



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q Push [ ] or [ ] to select "Slow Warn." w Push [ ] or [ ] to input the value between 0.1 and 4.9 kt (in 0.1 kt steps), or select OFF. (default: 1.0 kt) e Push [CLEAR] to save and return to the Menu mode. [ ], [ ], [ ], [ ] [CLEAR] OFF : The collision alarm function is OFF. e Push [CLEAR] to save and return to the Menu mode. [ ], [ ], [ ], [ ] [ENT] [CLEAR] NOTE: If other vessels at anchor or drifting come into your alarm zone, the Slow Warn alarm will sound again. Only if the previous vessel disappears from the Dangerous List (pp. 6, 17), and then re-enters the list, can a new Slow Warn or regular alarm sound, depending on the vessels SOG, or CPA and TCPA. The Slow Warn function operates in the same way if your vessel is at anchor and other vessels enter your alarm zone area. 29 6 MENU MODE OPERATION Menu mode items DCPA/TCPA(Continued) · CPA, TCPA Enter CPA (Closest Point of Approach) and TCPA (Time to CPA) values. These settings help you find a dangerous target to avoid a collision. The icon blinks on the plotter display and/or the alarm buzzer sounds, when the AIS target is closer than your CPA and TCPA settings.

q Push [ ] or [ ] to select either "CPA" or "TCPA." w Push [ ] or [ ] to input the value into that item. · CPA : between 0.1 and 6.0 nm (in 0.1 nm steps) B (default: 1.5 nm) · TCPA: between 1 and 60 minutes (in 1 minute steps) B (default: 20 min) e Repeat steps q and w to input the value into the other item. r Push [CLEAR] to save and return to the Menu mode. [ ], [ ], [ ], [ ] [ENT] [CLEAR] D Own Static This screen shows your static vessel information such as MMSI code, Vessel Name, Call Sign, Internal/External GPS antenna position and Type of Ship. q When the Own Static screen is displayed, push [ ] to select the next page, or push [ ] to select the previous page.

w Push [CLEAR] to return to the Menu mode. 30 MENU MODE OPERATION 6 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 D Own Dynamic This screen shows your dynamic vessel information such as Latitude and Longitude data, SOG, COG, GPS receiver type, UTC date and time, PA, RAIM (Receiver Autonomous Integrity Monitoring) function availability and Latitude and Longitude error data. · n internal GPS has no RAIM function. When the internal GPS is A used, "RAIM," "LAT ERROR" and "LON ERROR" are not displayed. · n external GPS requires a RAIM function. When the external GPS A is used, "RAIM," "LAT ERROR" and "LON ERROR" are displayed. D GPS Information The GPS Information screen shows the viewable GPS satellite's information, when the internal or external\* GPS receiver is connected. \*Only when the transponder receives the sentence format "GSA" or "GSV" from the external GPS receiver. q When the GPS Information screen is displayed, push [ ] to select the next page, or push [ ] to select the previous page. · The icons of the satellites being used, blink. The GPS antenna of your vessel is located in the center of the North, South, East and West screen, and the visible GPS satellite icons are displayed. q When the Own Dynamic screen is displayed, push [ ] to select the next page, or push [ ] to select the previous page. w Push [CLEAR] to return to the Menu mode. When a non-differential GPS receiver is connected, PA is normally 'L.' However, if the values of "LAT ERROR" and "LON ERROR" are less than 5.0 meters (16.4 feet), PA changes to 'H.' When a differential GPS receiver is connected, PA is normally 'H.' However, if the values of "LAT ERROR" and "LON ERROR" are more than 15.0 meters (49.2 feet), PA changes to 'L.' SAT : Satellite number LEVEL : Signal strength level w Push [CLEAR] to return to the Menu mode. 31 6 MENU MODE OPERATION Menu mode items (Continued) D Alarm Status The Alarm Status screen shows the type, date and time of the last 25 malfunctions that were detected. Even if the alarm buzzer function is turned OFF, the alarm status is displayed here. (p. 33) q When the Alarm Status screen is displayed, push [ ] or [ ] to scroll the screen. w Push [CLEAR] to return to the Menu mode. [ ] [ ] [CLEAR] Time Date Alarm type D User Setting The User setting mode allows you to set the seldom-changed settings, and you can "customize" the transponder operation to suit your preferences and operating style. q Push [MENU] to enter the Menu mode. w Push [ ] or [ ] to select "User Setting," then push [ENT].

e Push [ ] or [ ] to select the desired item, then push [ENT]. r Select the desired option, shown in the Menu below. The procedures are described to the right and continued on the next page. t Repeat steps e and r to select other items. y Push [CLEAR] to save and return to the Menu mode. u Push [CLEAR] to exit the Menu mode. [ ] [ENT] [ ] · Description of the Alarm type Alarm type GPS RX CH A CH B TX ANT Description Appears when "GPS Malfunction" is detected. Appears when "RX Malfunction" is detected. Appears when "CH A Noise Level Malfunction" is detected. Appears when "CH B Noise Level Malfunction" is detected. Appears when "TX Malfunction" is detected. Appears when "Antenna Open or Short Malfunction" or "Antenna High VSWR Malfunction" is detected. [CLEAR] [MENU] <SETTING ITEMS> · Key Beep You can select the silent operation, or you can have confirmation beeps sound when you push a key. Push [ENT] to toggle this function ON or OFF. \* ON : A beep sounds when pushing a key. (default) OFF : The key beep is OFF. (Silent operation) 32 MENU MODE OPERATION 6 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 · Alarm Buzzer Turn the alarm buzzer function ON or OFF. Push [ENT] to toggle this function ON or OFF. \* ON : The alarm buzzer sounds when a malfunction occurs or an AIS target is closer than your CPA and TCPA settings\*. (default) \*The alarm buzzer sounds only when the collision alarm function is turned ON. (p. 29) · Internal GPS The Internal GPS setting mode allows you to set the internal GPS settings. q Push [MENU] to enter the Menu mode. w Push [ ] or [ ] to select "User Setting," then push [ENT]. e Push [ ] or [ ] to select "Internal GPS," then push [ENT]. r Push [ ] or [ ] to select the desired item, then push [ENT]. t Select the desired option, shown in the Menu below. The procedures are described to the right and continued on the next page. y Repeat steps r and t to select other items. u Push [CLEAR] to save and return to the User Setting mode.

i Push [CLEAR] twice to exit the Menu mode. [ ] [ENT] [ ] [CLEAR] OFF : The alarm buzzer is OFF. · Received Message Buzzer (RCV MSG BUZZ) Turn the received message buzzer function ON or OFF. Push [ENT] to toggle this function ON or OFF. \* ON : The buzzer sounds three times when a message is received. (default) OFF : The received message buzzer is OFF. \*You can also turn ON the function by pushing [ ], or OFF by pushing [ ].



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[MENU] 33 6 MENU MODE OPERATION Menu mode items D User Setting (Continued) <SETTING ITEMS> - SBAS (Satellite Based Augmentation System) Function The SBAS transmits signals to correct errors and improve accuracy and reliability in data received from regular GPS satellites. When this function is ON, the transponder uses the corrected data. Push [ENT] to toggle this function ON or OFF.

You can also turn ON the function by pushing [Y], or OFF by Y pushing [Y]. - SBAS Satellite When "Manual" option is selected in the SBAS Search item, you should manually select the SBAS Satellite which covers the zone your vessel is monitoring. Push [Y] or [Y] to select an SBAS Satellite number between 120 and 138. (default: 120) ON : The SBAS function is ON. (default) OFF : The SBAS function is OFF.

- SBAS Search Set the SBAS search function to "Manual" or "Auto." This function should normally be set to "Auto." Push [ENT] to select either "Manual" or "Auto." You can also select the option by pushing [Y] or [Y].

D Channel information The channel information screen shows the channels 2087 and 2088 information in which safety-related messages are transmitted to, and received from, the AIS targets.

The channel to be used is automatically set according to the message received from an AIS Base Station. Push [CLEAR] to return to the Menu mode. Manual : You have to manually select the SBAS satellite. This option can be useful when your vessel is in an area where 2 satellite zones overlap. Auto : The transponder automatically searches for the SBAS satellite that is determined according to the position of your vessel. (default) [CLEAR] 34 INSTALLATION AND CONNECTIONS Connections About the installation distance from the compass: KEEP the transponder at least 1 m (3.3 ft) away from the vessel's magnetic navigation compass. 7 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 e DC POWER CONNECTOR Connects the supplied DC power cable between this connector and a 12V power source. r HIGH-DENSITY D-SUB 15 PIN (NMEA IN/OUT) Connects an Icom Marine Commander™ system, navigation equipment, external GPS receiver, etc. using the supplied OPC-2014 nmea connector cable.

See page 37 for the pin assignment. w q e r y t q CLONING CABLE CONNECTOR Connects the cloning cable from this connector to a PC. Ask your dealer for details. w INTERNAL GPS RECEIVER CONNECTOR Connects to the MXG-5000 to receive position data and transmit it with other AIS information.

NOTE: Important notes and how to install the MXG5000 are described on the instruction sheet that comes with it. Be sure to read them before installing and operating the MXG-5000. Requirements of the external GPS: The datum of the external GPS receiver must be T "WGS-84".

BS sentence can be input using the RAIM function. G The external GPS antenna must be installed within 26 m (85.3 ft) of the internal GPS antenna.

CAUTION: After connecting the DC power cable and NMEA connector cable leads, cover the cable and leads with a rubber vulcanizing tape, to prevent water seeping into the transponder. Rubber vulcanizing tape 35 7 INSTALLATION AND CONNECTIONS Connections (Continued) t GROUND TERMINAL Connects to a vessel ground to prevent electrical shocks and interference from other equipment occurring. Use a self-tapping screw (3 × 8 mm). y ANTENNA CONNECTOR connects to a marine VHF antenna with a PL-259 connector for AIS signal transmission and reception. (p.

38) CAUTION: Transmitting without an antenna may damage the transponder. D High-density D-sub 15 pin assignment trewq !0 o i u y !5 !4 !3 !2 !1 Rear panel view NOTE: The OPC-2014 nmea connector cable has 15 leads, numbered 1 to 15. 36 INSTALLATION AND CONNECTIONS 7 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 PIN No. 1 2 3 4 5 6 11 7 8 9 10 12 13 14 15 When PIN No. GND SPECIFICATIONS -- SENTENCE FORMAT -- DESCRIPTION Connects to ground.

NMEA1 OUT ( ) · Output level : V/40mA max. 5 ( S-422 balanced type) R NMEA1 OUT (+) NMEA1 IN ( ) NMEA1 IN (+) ALERT1 ALERT2 NMEA2 OUT ( ) NMEA2 OUT (+) NMEA2 IN ( ) NMEA2 IN (+) NMEA3 OUT ( ) NMEA3 OUT (+) NMEA3 IN ( ) NMEA3 IN (+) · Input level : Less than 2 mA (at 2V applied)

· Load rating : DC 24V/500mA max. DSC, RMC, GGA, VTG, GSA, Connects to the NMEA input/output connector of GSV, GBS, DTM, DSE, GNS, a transceiver to transmit an Individual DSC call, GLL or to connect to a GPS receiver. (p. 39) The data communication speed (baud rate) can RMC, GGA, VTG, GSA, GSV, be selected between 4800bps (IEC61162-1) and , DTM, GNS, GLL GBS 38400 bps (IEC61162-2) for each Input/Output port. (Default: 4800bps) -- A short occurs between pins 6 and 11 when the alarm buzzer sounds if a malfunction occurs, or an AIS target is closer than your CPA and TCPA settings. Same as pins 2 and 3 Same as pins 4 and 5 VDM, VDO, ALR, ACA, ACS, TXT, Connects to the Icom Marine Commander™ sysRMC\*, GGA\*, GNS\*, GLL\*, VTG\*, tem or to a GPS receiver. GSA\*, GSV\*, GBS\*, DTM\* The data communication speed (baud rate) is RMC, GGA, VTG, GSA, GSV, fixed to 38400bps (IEC61162-2) for each Input/Output port. GBS, DTM, GNS, GLL RMC, GGA, VTG, GSA, GSV, Connects to a piece of navigation equipment or GBS, DTM, GNS, GLL to a GPS receiver. The data communication speed (baud rate) can RMC, GGA, VTG, GSA, GSV, be selected between 4800bps (IEC61162-1) and 38400bps (IEC61162-2) for each Input/Output GBS, DTM, GNS, GLL port.

(Default: 4800bps) Same as pins 2 and 3 Same as pins 4 and 5 a received GPS signal includes no GBS sentence, the transponder will not receive the signal from the external GPS receiver. \*Sent only when the "AIS+GPS" option is set in "AIS Output." (p. 12) 37 7 INSTALLATION AND CONNECTIONS Fuse replacement One fuse is installed in the DC power cable. If the fuse blows, track down the source of the problem, have it repaired, and replace the damaged fuse with a new one of the proper rating. About the VHF antenna A key element in the performance of any communication system is the antenna. The VHF AIS/radio antenna should be mounted in a location that has a clear, unobstructed view in all directions and as far away from interference as possible, for the best reception and transmission. When selecting a mounting location, follow the guidelines below. - Mount the VHF AIS/radio antennas at least 3 m (9.85 ft).

) M away from each other. - Mount the VHF AIS/radio antennas as high as possible. - Be sure the location is out of the radar beam. - Be sure the location will not be shaded by a random antenna or mast. VHF AIS antenna VHF radio antenna Fuse rating: 3 A At least 3 m (9.85 ft.) 38 INSTALLATION AND CONNECTIONS 7 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 Transceiver connection · Antenna connector The antenna uses a PL-259 connector. 30 mm Coupling ring 10 mm (tin here) 10 mm tin q Slide the coupling ring down. Strip the cable jacket and tin the shield. w Strip the cable as shown at left.



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Tin the center conductor. e Slide the connector body on and solder it. r Screw the coupling ring onto the connector body. Connect the transponder and a transceiver using the OPC-2014 nmea connector cable. After connecting, an Individual DSC call can be made to the AIS target using the transponder without entering the target's MMSI code. (p. 22) See the leaflet that comes with the transponder for details of the transceivers which can operate with this function. In this section, the connecting instructions of the IC-M504\*1, IC-M505\*1, IC-M603\*2 and IC-M604\*2 are described as an example. See the instruction manual of each for transceiver's connecting instructions. \*1 Requires the first two digits of the serial number to be "21" or higher.

\*2 Requires the first two digits of the serial number to be "31" or higher. 12 mm solder solder 30 mm (13/16 in) 10 mm (13/32 in) 12 mm (1/32 3/32 in) Continued on the next page. NOTE: There are many publications covering antennas and their proper installation. Check with your local dealer for more information and recommendations. 39 7 INSTALLATION AND CONNECTIONS Transceiver connection (Continued) D IC-M504/M505 NMEA IN LEAD (Red) NMEA OUT LEAD (White) D IC-M603/M604 GPS receiver/External speaker connector Transceiver's rear panel · GPS receiver/External speaker connector Transceiver's rear panel · NMEA IN LEAD (Red) Outer conductor: NMEA IN (-) Connects to lead 2 of OPC-2014. Inner conductor: NMEA IN (+) Connects to lead 3 of OPC-2014. · NMEA OUT LEAD (White) Outer conductor: NMEA OUT (-) Connects to lead 4 of OPC-2014. Inner conductor: NMEA OUT (+) Connects to lead 5 of OPC-2014. r NMEA OUT (+) e NMEA OUT (-) q NMEA IN (-) Connects to lead 2 of OPC-2014. w NMEA IN (+) Connects to lead 3 of OPC-2014.

e NMEA OUT (-) Connects to lead 4 of OPC-2014. r NMEA OUT (+) Connects to lead 5 of OPC-2014. SP (+) SP (-) w NMEA IN (+) 40 INSTALLATION AND CONNECTIONS 7 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 Mounting the transponder D Using the mounting bracket The universal mounting bracket supplied with your transponder allows overhead or dashboard mounting. q Mount the bracket securely with the 4 supplied screws M (5 × 20 mm) to a surface which is more than 10 mm (13/32 in) thick and can support more than 3 kg (6 lb 61 oz). w Attach the transponder to the bracket so that the face of the transponder is at 90° to your line of sight when operating it.

About the installation distance from the compass: KEEP the transponder at least 1 m (3.3 ft) away from the vessel's magnetic navigation compass. · MOUNTING ON THE BOARD · OVERHEAD MOUNTING NOTE: Check the installation angle; the function display may not be easy to read at some angles. These bolts show a mounting example only. Not supplied with accessories.

41 7 INSTALLATION AND CONNECTIONS MB-75 installation An optional MB-75 flush mount kit is available for mounting the transponder to a flat surface, such as an instrument panel. KEEP the transponder at least 1 m (3.3 ft) away from your vessel's magnetic navigation compass. @ @ @ @ @ @ @ @ PROBLEM POSSIBLE CAUSE 8 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 If you are unable to locate the cause of a problem or solve it through the use of this chart, contact your nearest Icom Dealer or Service Center. SOLUTION REF. The transponder does not · Bad connection at the power source. turn ON. Cannot transmit. · Check the connection to the transponder. p. 35 C der.

-- minute has not passed from turning · Wait for 1 minute from turning ON the 1 W ON the transponder power. transponder power. The plotter display does not · The results of the opening test is "NG" · old down [POWER-BRILL] for 1 sec · pp. 7, T H appear. (No Good). @ @ @ @ GPS satellites. @ @ 35 T C not disappear. the transponder. sponder. · elect the desired AIS target or display pp.

15, S An error beep sounds after · An AIS target is not selected. 16, 17 the detail screen of the AIS target. pushing [DSC]. @ @ 39 A der. transponder. The collision alarm does not · The collision alarm function is OFF. T sound. · The alarm buzzer function is OFF. T · Turn ON the collision alarm function. T · Turn ON the alarm buzzer function.

T p. 29 p. 33 43 8 MAINTENANCE Error message Error message is displayed when a malfunction occurs that has an error message programmed for it. Message contents Description GPS MALFUNCTION Appears when no GPS data is received. NO GPS DATA RX MALFUNCTION Appears when the transponder receive circuit NORCV circuit has failed. Appears when excessively strong atmospheric RX MALFUNCTION spheric noise, or noise signals from other CHANNOISELEVEL navigation equipment, are received on Channel A. Appears when excessively strong atmospheric RX MALFUNCTION spheric noise, or noise signals from other CHBNOISELEVEL navigation equipment, are received on Channel B. TX MALFUNCTION Appears when no RF power is output, or NO TX POWER the transmit circuit has failed. Appears when the protective circuit cuts off TX MALFUNCTION the AIS signal after 1 second of continuous CONTINUOUS TX transmission. ANT MALFUNCTION Appears when the antenna is open or OPEN OR SHORT shorted.

Appears when the high VSWR\* is detected ANT MALFUNCTION (the antenna is mismatched). HIGH VSWR \*Voltage Standing Wave Ratio Diagnostics There are two types of diagnostic tests performed -- Monitor test, Transponder test and Version information. · Monitor Test You can check whether all LCD segments turn ON and OFF properly. q Push [MENU] to enter the Menu mode. w Push [ ] or [ ] to select "Diagnostics," then push [ENT]. e Push [ ] or [ ] to select "Monitor Test," then push [ENT]. r Push [ ] or [ ] to select "All ON 2 Sec" or "All OFF 2 Sec," then push [ENT]. · All ON 2 Sec : All LCD segments turn ON for 2 seconds. · All OFF 2 Sec : All LCD segments turn OFF for 2 seconds. t Push [CLEAR] to return to the "DIAGNOSTICS" screen.

y Push [CLEAR] twice to exit the Menu mode. [ ] [ENT] [ ] [CLEAR] [MENU] 44 MAINTENANCE 8 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 · Transponder Test You can check whether the transponder units work properly. q Push [MENU] to enter the Menu mode. w Push [ ] or [ ] to select "Diagnostics," then push [ENT]. e Push [ ] or [ ] to select "Transponder Test," then push [ENT].

r The screen shows the result of the ROM, RAM, RX/TX T unit, antenna and GPS receiver tests; "OK" or "NG" (No Good). t Push [CLEAR] to return to the "DIAGNOSTICS" screen. y Push [CLEAR] twice to exit the Menu mode. [ ] [ENT] [ ] [CLEAR] [MENU] · Version Information You can check the version information of SW (Software), FI (Function Image) and the Internal GPS receiver. q Push [MENU] to enter the Menu mode. w Push [ ] or [ ] to select "Diagnostics," then push [ENT]. e Push [ ] or [ ] to select "Version Information," then push [ENT].



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r The screen shows the version information of each item. t Push [CLEAR] to return to the "DIAGNOSTICS" screen. y Push [CLEAR] twice to exit the Menu mode. [] [ENT] [] [CLEAR] [MENU] 45 9 D General SPECIFICATIONS AND OPTION Specifications D Dimensions 145 (5 23/32) D Transmitter · utputpower O :2W ·Modulationsystem :GMSK ·Conducted Spurious emissions : Less than 36 dBm 165 (6 1/2) 31.4 (1 1/4) 77 (3 1/32) Unit: mm (inch) D Receiver ·Sensitivity(20% Packet Error Rate) : 110 dBm ·Intermodulationrejectionratio :Morethan65dB ·Spurious response rejection ratio : orethan74dB(AIS) M More than 70 dB (DSC) ·Adjacentchannelselectivity :Morethan70dB : Less than 57 dBm (AIS) ·Conducted spurious emission This equipment meets IEC 62287-1 specifications. All stated specifications are subject to change without notice or obligation. Option ·MB-75 flush mount kit Used to mount the transponder to a panel. 46 91.

4 (3 19/32) 110 (4 11/32) : 61.975,162.025MHz(default) 1 156.025162.025 MHz ·Typeofemission :16K0GXW (GMSK) ·Currentdrain(at12Vnominal) :TX:1.5A,RX:0.7A ·Powersupplyrequirement :.6to15.6VDC 9 (negative ground) ·Operatingtemperaturerange :20°Cto+60°C;4°Fto+140°F ·Antennaimpedance :50 $\phi$  nominal ·Intermediatefrequency AIS1 : 1st:21.700MHz,2nd:450kHz AIS2 : 1st:30.

875MHz,2nd:450kHz · imensions D :165(W) $\times$  110(H)  $\times$  123(D) mm, (Projections not included) 6 1/2(W)  $\times$ 411/32(H)  $\times$ 427/32(D) in ·Weight :Approximately1.0kg;2lb20oz ·I/Oconnector :High-densityD-sub15pin ·Frequencycoverage 108.4 (4 9/32) 123 (4 27/32) TEMPLATE 165 (6 1/2) 146 (5 3/4) 10 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 R12 (Max.) Cut here Unit: mm (inch) 110 (4 11/32) 92.4 (3 5/8) 47 A to N CODE AND DESCRIPTION The following table shows all the A to N codes which appear on the detail screens of an "A to N."

" (p. 21) Code 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 REFERENCE POINT RACON OFF SHORE STRUCTURE SPARE LIGHT, WITHOUT SECTORS LIGHT, WITH SECTORS LEADING LIGHT FRONT LEADING LIGHT REAR BEACON, CARDINAL N BEACON, CARDINAL E BEACON, CARDINAL S BEACON, CARDINAL W BEACON, PORT HAND BEACON, STARBOARD HAND BEACON, PREFERRED CHANNEL PORT HAND Description DEFAULT, TYPE OF ATON NOT SPECIFIED Code 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 Description 11 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 BEACON, PREFERRED CHANNEL STARBOARD HAND BEACON, ISOLATED DANGER BEACON, SAFE WATER BEACON, SPECIAL MARK CARDINAL MARK N CARDINAL MARK E CARDINAL MARK S CARDINAL MARK W PORT HAND MARK STARBOARD HAND MARK PREFERRED CHANNEL PORT HAND PREFERRED CHANNEL STARBOARD HAND ISOLATED DANGER SAFE WATER SPECIAL MARK LIGHTVESSEL/LANBY 49 MEMO MEMO 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 AT FI IT PL GB RO < Intended Country of Use > BE FR LV PT IS TR CY DE LT SK LI HR CZ GR LU SI NO DK HU MT ES CH EE IE NL SE BG A-6860D-1EX-q Printed in Japan © 2011 Icom Inc. Printed on recycled paper with soy ink. 1-1-32Kamiminami,Hirano-ku,Osaka547-0003,Japan .



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