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.

Thank you for choosing this Icom product. This product is designed and built with Icom's state of the art technology and craftsmanship. With proper care this product should provide you with years of trouble-free operation.

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 CLASS B AIS TRANSPONDER.

◇ *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.

EXPLICIT DEFINITIONS

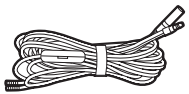
WORD	DEFINITION
⚠**WARNING!**	Personal injury, fire hazard or electric shock may occur.
CAUTION	Equipment damage may occur.
NOTE	If disregarded, inconvenience only. No risk of personal injury, fire or electric shock.

CLEAN THE TRANSPONDER THOROUGHLY WITH FRESH WATER after exposure to saltwater, and dry it before operating. Otherwise, the transponder's keys, switches and controllers may become unusable, due to salt crystallization.

NOTE: If the transponder's waterproof protection appears defective, carefully clean it with a soft, wet (fresh water) cloth, then, dry it before operating.
The transponder may lose its waterproof protection if the case or connector is cracked or broken, or the transponder has been dropped.

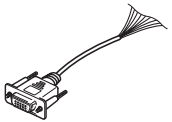
SUPPLIED ACCESSORIES

DC power cable (OPC-2059)

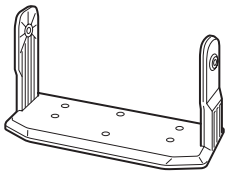


NMEA connector cable (OPC-2014)

• The OPC-2014 has 15 leads, numbered 1 to 15.



Mounting bracket



For the mounting bracket

Knob bolts

Flat washers (M5)

Screws (5×20)

Spring washers (M5)

MXG-5000S GPS RECEIVER is sold as a set with the MA-500TR.

MXG-5000S

MXG-5000S (Referred to as Internal GPS)

Cable length: Approx. 10 m (32.8 ft)

• An instruction sheet comes with the MXG-5000S. Please read it before installing and operating the MXG-5000S.

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 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.

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.

INSTALLATION NOTE

Installation:
The installation of this equipment should be made in such a manner as to respect the EC recommended electromagnetic field exposure limits. (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 the installation height should be at least 0.4 meters above any accessible position. 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 a distance of 0.4 meters of the antenna, nor operated at all if any person is touching the antenna.

It is recommended that antenna of a maximum gain of 3 dB are used. If higher gain antenna are required then please contact your Icom distributor for revised installation recommendations.

Operation:
The exposure to RF electromagnetic field is only applicable when this device is transmitting. This exposure is naturally reduced due to the nature of alternating periods of receiving and transmitting. Keep your transmissions to the minimum necessary.

FCC INFORMATION

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Icom is not responsible for the destruction, damage to, or performance of any Icom or non-Icom equipment, if the malfunction is because of:
- Force majeure, including, but not limited to, fires, earthquakes, storms, floods, lightning, other natural disasters, disturbances, riots, war, or radioactive contamination.
- The use of Icom transceivers with any equipment that is not manufactured or approved by Icom.

ABOUT CE AND DOC

Hereby, Icom Inc. declares that the versions of MA-500TR which have the “CE” symbol on the product, comply with the essential requirements of the Radio Equipment Directive, 2014/53/EU, and the restriction of the use of certain hazardous substances in electrical and electronic equipment Directive, 2011/65/EU. The full text of the EU declaration of conformity is available at the following internet address:
http://www.icom.co.jp/world/support

DISPOSAL

The crossed-out wheeled-bin symbol on your product, literature, or packaging reminds you that in the European Union, all electrical and electronic products, batteries, and accumulators (rechargeable batteries) must be taken to designated collection locations at the end of their working life. Do not dispose of these products as unsorted municipal waste.
Dispose of them according to the laws in your area.

COUNTRY CODE LIST

• ISO 3166-1

	Country	Codes		Country	Codes
1	Austria	AT	18	Liechtenstein	LI
2	Belgium	BE	19	Lithuania	LT
3	Bulgaria	BG	20	Luxembourg	LU
4	Croatia	HR	21	Malta	MT
5	Czech Republic	CZ	22	Netherlands	NL
6	Cyprus	CY	23	Norway	NO
7	Denmark	DK	24	Poland	PL
8	Estonia	EE	25	Portugal	PT
9	Finland	FI	26	Romania	RO
10	France	FR	27	Slovakia	SK
11	Germany	DE	28	Slovenia	SI
12	Greece	GR	29	Spain	ES
13	Hungary	HU	30	Sweden	SE
14	Iceland	IS	31	Switzerland	CH
15	Ireland	IE	32	Turkey	TR
16	Italy	IT	33	United Kingdom	GB
17	Latvia	LV			

PRECAUTIONS

⚠**WARNING! NEVER** connect the transponder to an AC outlet. This may pose a fire hazard or result in an electric shock.

⚠**WARNING! NEVER** connect the transponder to a power source of more than 16 V DC such as a 24 V DC. This could cause a fire or damage the transponder.

⚠**WARNING! NEVER** reverse the DC power cable polarity when connecting to a power source. This could damage the transponder.

⚠**WARNING! 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.

⚠**WARNING! NEVER** operate the transponder during a lightning storm. It may result in an electric shock, cause a fire or damage the transponder. Always disconnect the power source and antenna before a storm.

CAUTION: NEVER place the transponder where normal operation of the vessel may be hindered or where it could cause bodily injury.

KEEP the transponder at least 1 m (3.3 ft) away from the vessel's magnetic navigation compass.

DO NOT operate 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 to clean the transponder, as they will damage the transponder surfaces. If the transponder becomes dusty or dirty, wipe it clean with a soft, dry cloth.

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.

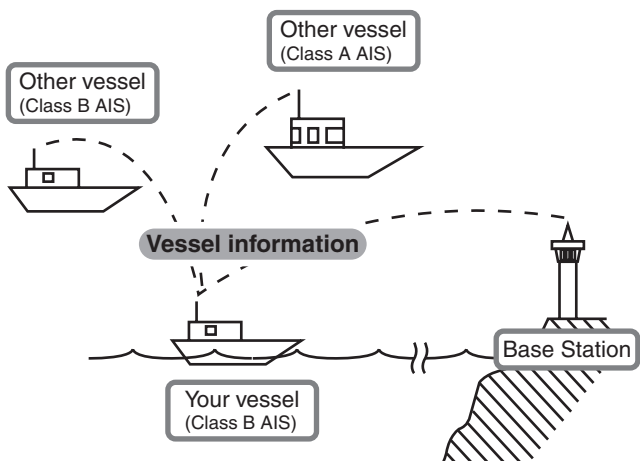
BE CAREFUL! The transponder meets IPX7* requirements for waterproof protection. However, once the transponder has been dropped, waterproof protection cannot be guaranteed because of possible damage to the transponder's case or the waterproof seal.
* Except for the DC power and cloning cable connectors.

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.

TABLE OF CONTENTS

◇ ABOUT AIS

AIS is an acronym for “Automatic Identification System.”
An AIS transponder is a short range data radio unit, used primarily for collision-risk management and navigation safety. It automatically transmits and receives vessel information such as the vessel name, MMSI code, vessel type, position data, speed, course, destination and more. Information is exchanged among the vessels and/or base stations on the VHF maritime mobile band. The information helps to identify other nearby vessels or stations by displaying the received data on a plotter or a radar screen.



◇ AIS Classes

There are seven types of AIS stations; vessels, base stations, Aids to Navigation (AtoN), Search and Rescue (SAR), Search and Rescue Transmitter (AIS-SART), MOB (Man OverBoard) and EPIRB (Emergency Position Indicating Radio Beacon)-AIS.

There are two classes of AIS units, which are installed on vessels; Class A and Class B.

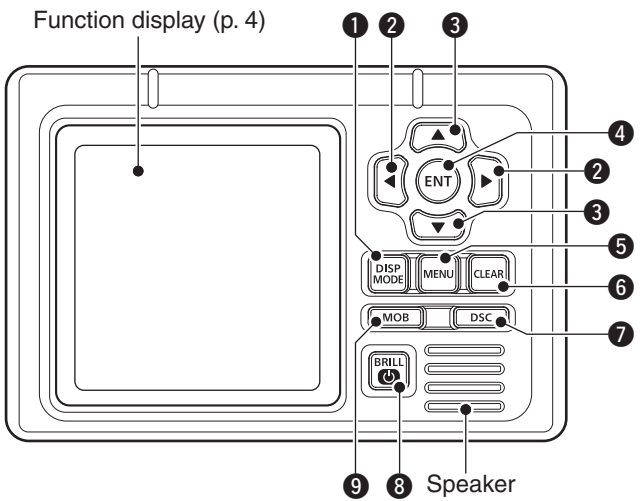
Under the Safety Of Life At Sea (SOLAS) convention, all SOLAS vessels, as described below, are required to install a Class A AIS transponder:

- Upwards of 300 gross tonnage engaged on international voyages.
- Passenger vessels, irrespective of size, engaged on international voyages.
- Upwards of 500 gross tonnage not engaged on international voyages.

A Class B AIS transponder is designed to be interoperability with Class A units, but not to impact the Class A network.
Many commercial vessels, and some leisure craft, not classified as requiring a Class A unit, choose to install a Class B unit to avoid accidents at sea.

2 PANEL DESCRIPTION

■ Front panel



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 the target list display operation.
- ***<In the danger list display>*** shows the danger list display operation.

❶ DISPLAY MODE KEY [DISP MODE]

<Common>

➥ Push to switch the display mode between the plotter, target list and danger list. (pp. 4–6)

➥ While in the Menu mode, push to exit it, and return to the plotter, target list or danger list display which was selected before you entered the Menu mode.

❷ LEFT AND RIGHT KEYS [◀]/[▶]

<Common>

While in the Menu item setting mode, push to select a menu option. (pp. 31, 35)

<In the plotter display>

➥ Push **[◀]** to sequentially select each AIS target icon farthest from your vessel (or waypoint, if it is set; see page 26 for setting detail). (p. 15)

➥ Push **[▶]** to sequentially select each AIS target icon closest to your vessel (or waypoint, if it is set; see page 26 for setting detail). (p. 15)

- A target box will appear around the selected target or waypoint icon.

<In the danger list display>

➥ Push **[◀]** to sort the AIS target data by CPA (Closest Point of Approach). (p. 17)

➥ Push **[▶]** to sort the AIS target data by TCPA (Time to CPA). (p. 17)

❸ UP AND DOWN KEYS [▲]/[▼]

<Common>

➥ While in the Menu mode, push to select a menu item. (pp. 9, 30)

➥ Push to select a voice channel in the voice channel selection screen. (p. 24)

<In the plotter display>

Push to select the display range. (p. 15)

<In the target or danger list display>

Push to select an AIS target in the target or danger list display. (pp. 16, 17)

❹ ENTER KEY [ENT]

<Common>

➥ Push to display the detail screen of the selected AIS target. (pp. 15–17)

➥ Push to save the input data. (pp. 8, 10, 15)

➥ Push to enter the Menu item setting mode. (pp. 9, 30)

➥ While in the Menu item setting mode, push to select a menu option. (pp. 11, 12, 16, 31, 34–36)

➥ While searching for a GPS satellite, push **[ENT]** to display the GPS information screen. (p. 14, 33)

❺ MENU KEY [MENU]

<Common>

➥ Push to enter the Menu mode. (pp. 9, 30)

➥ While in the Menu mode, push to exit it, and return to the plotter, target list or danger list display which was selected before you entered the Menu mode.

❻ CLEAR KEY [CLEAR]

<Common>

➥ Push to cancel the entered function, or return to the previous screen. (pp. 10, 13, 25)

➥ While in the Menu mode, push to exit it, and return to the previous screen. (pp. 9, 30)

➥ Push to stop an alarm. (pp. 15–17)

❼ DSC KEY [DSC]

<Common>

➥ When the AIS target is selected, or the detail screen is displayed, push to display the voice channel selection screen. (p. 24)

➥ After selecting the voice channel, push to transmit an Individual DSC call to the selected AIS target. (p. 24)

This function is available only when a transceiver is connected to the transponder. (p. 41)

❽ POWER/BRILL KEY [POWER•BRILL]

<Common>

➥ Hold down for 1 second to turn the power ON or OFF. (p. 14)

• After turning ON the power, the opening screen will appear.

➥ Push to show the display backlight and contrast adjusting screen. (p. 15)

❾ MAN OVERBOAT KEY [MOB]

<Common>

Hold down for 1 second to set the waypoint. (p. 27)

• The MOB alarm sounds, and a flag icon appears on your current position.

Count on us!

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