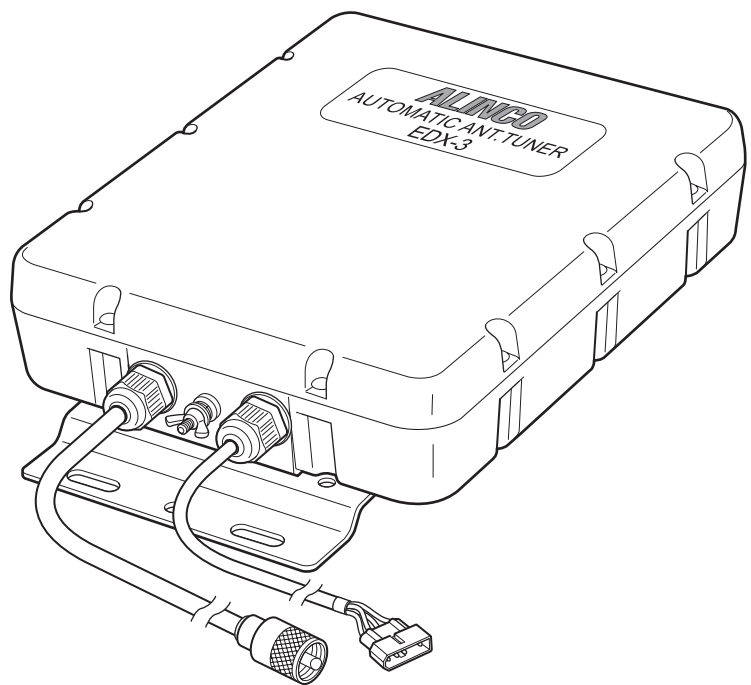


HF AUTOMATIC ANTENNA TUNER

EDX-3**Instruction Manual**

Thank you for purchasing your new Alinco accessory.

This Instruction manual contains important safety and operating instructions.

Please read this manual carefully before using the product and keep it for future reference.

Please be aware that EDX-3 is made especially for Alinco transceivers, and Alinco is not responsible of any inconveniences when used with radios of other manufacturers. Alinco can not provide connection instructions to use EDX-3 with transceivers of other makes.

**ALINCO**
INCORPORATED

IMPORTANT

- As a nature of this product, it generates a very high voltage to the antenna element and other terminals up to several kilovolts.
For this, some countries apply the height restrictions of such devices for installations. At any case install EDX-3 and elements in the way that a person or pets can't access and touch it.
- Modern vehicles/vessels are made of cutting-edge electronics technology. Transmitting RF signals while driving/navigating may cause interferences to those electronics devices risking accidents. Be sure to check the safety of operation before driving/navigating.
Alinco does not reccomend transmission while driving a vehicle, and declines any responsibility for any consequence RF intereference may cause.

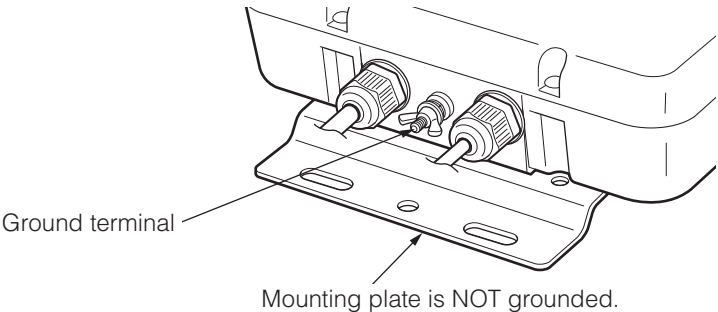
WARNING

To prevent any hazard during operation of Alinco's radio product, in this manual and on the product you may find symbols shown below. Please read and understand the meanings of these symbols before starting to use the product.

Word	Definition
 Danger	Personal injury, fire hazard or electric shock may occur.
CAUTION	Equipment damage may occur.
NOTE	Precautions to avoid inconveniences.

 **DANGER HIGH VOLTAGE! NEVER** touch the antenna terminal, ground terminal, antenna or counterpoise while transmitting. Place the EDX-3, antenna and counterpoise in positions where no one can touch them.

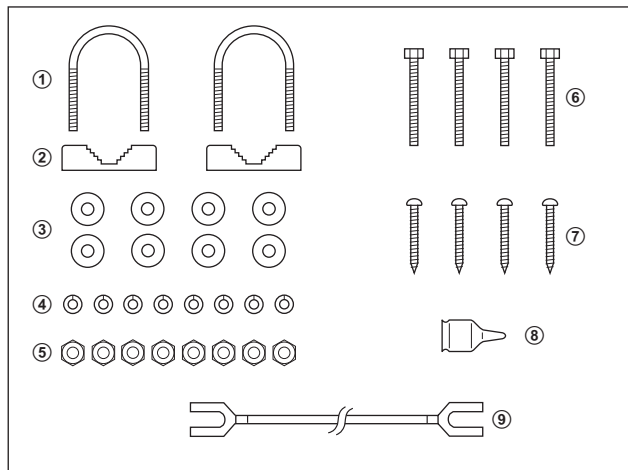
-  **NEVER** use without a ground connection.
-  **NEVER** transmit during internal maintenance. This may cause an electric shock.
-  **USE** the ground terminal for ground connection. The mounting plate is not connected internally.



-  **DO NOT** operate your transceiver when enough current is not available. Be cautious to battery drain (flat-battery) of your car/boat.
-  **AVOID** using the EDX-3 in areas where the temperature is below -20°C (-4°F) or above +60°C (+140°F).

SUPPLIED ACCESSORIES

The following accessories are supplied with the EDX-3.



	Qty.
① U-bolts	2
② U-bolt plates	2
③ Flat washers (M6)	8
④ Spring washers (M6)	8
⑤ Nuts (M6)	8
⑥ Hex head bolts (M6×50)	4
⑦ Self-tapping screws (A0 6×30)	4
⑧ Weatherproof cap	1
⑨ Ground cable	1

- Standard accessory may vary depending on the model you have purchased.
Please consult with your Alinco dealer for the details before purchase.

Optional items necessary to operate EDX-3

The following parts are additionally required for installation, but are not supplied with the EDX-3.

Purchase these parts locally according to your preferences.

- ① AWG 14×4-conductor shielded cable or grounded antenna with base
- ② Fixing hardware such as a metal mast or a car antenna bracket
- ③ Materials like Isolation tape to protect connectors from water and salt
- ④ Tools to be used during the installation
- ⑤ Common mode filtering parts such as ferrite cores and beads

FEATURES

Matches all bands

EDX-3 matches any frequency on every HF band across 1.8-30 MHz.

Full automatic tuning

Just press the [TUNE] key on the transceiver, and EDX-3 adjusts immediately to the minimum SWR of any frequency on any HF band*.

HF operation anywhere

EDX-3 allows you HF operation where antenna element length is restricted due to space.

Weather resistant*

EDX-3 is housed in a durable, weather resistant ASA case with a rubber gasket.

The antenna tuner can be conveniently installed even outdoor.

250 memories for shorter tuning time

To decrease the tune-up time, EDX-3 automatically stores the matching conditions for up to 250 frequencies. Re-tuning for a memorized frequency takes only a second.

Low power tune up

EDX-3 emits low output power during tuning. This feature reduces the possibility of causing interference to other stations.

Tuner through function

The tuner through function is built into EDX-3. This function helps improve receiver gain, depending on the antenna element length used, and operating frequency.

* Please note that some restrictions may apply to antenna length and conditions of use.

Details are contained in this manual.

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ANTENNA SYSTEM

Antenna for ship

Required antenna element length

Required antenna element length to achieve full performance varies according to the lowest frequency:

The lowest frequency	Required antenna element length
1.9 MHz band (1.8MHz)	12m; 39.4 feet or longer
3.5 MHz band	7 m; 9.8 feet or longer

Undesirable antenna element lengths

AVOID multiples of $1/2\lambda$ (half wavelength) for antenna element lengths, since tuning becomes difficult and may cause damages to the tuner.

L : Antenna element length to be avoided [m]

f : Operating frequency [MHz]

n : Natural number (n = 1, 2, 3, ...)

$$L = \frac{300}{f} \times \frac{1}{2} \times n$$

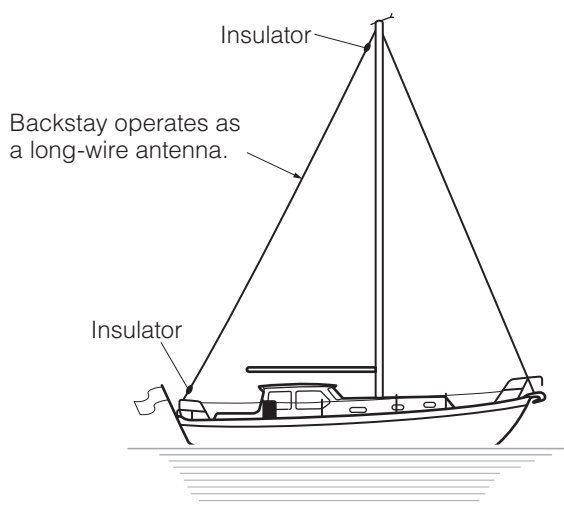
■ [Example]

At an operating frequency of 14 MHz, avoid the following antenna element lengths:

$$L = \frac{300}{14} \times \frac{1}{2} \times n \approx 10.7\text{m}, 21.4\text{m} \dots$$

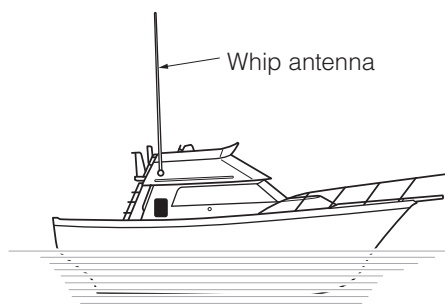
1 m $\approx$ 39 inches

■ [Installation]



WARNING

Pay extra attention to the ship, its equipment, crew and passengers's safety for installation of the system. Cables are easily accessible in smaller vessels.

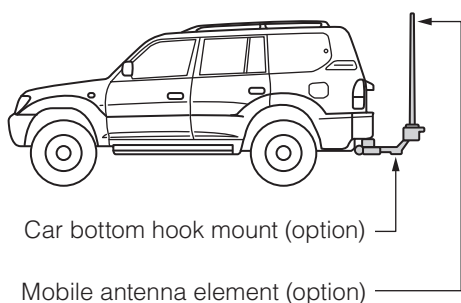
**NOTE**

Keep antennas as far away from other objects as possible, especially metal objects to avoid short-circuiting.

Antenna for land operation

For land mobile operation, an optional grounded whip antenna and an antenna mount are necessary. Please consult your dealer for suitable antenna and a mounting base. Connect a suitable length of antenna cable to the antenna terminal.

To achieve full performance, refer to "Required antenna element length" on P.5. Also refer to the "Ground and counterpoise" chapter in the next page to ground the tuner. A good ground or a counterpoise is essential not only for proper operations but also for your own safety.

**WARNING**

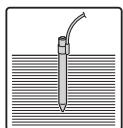
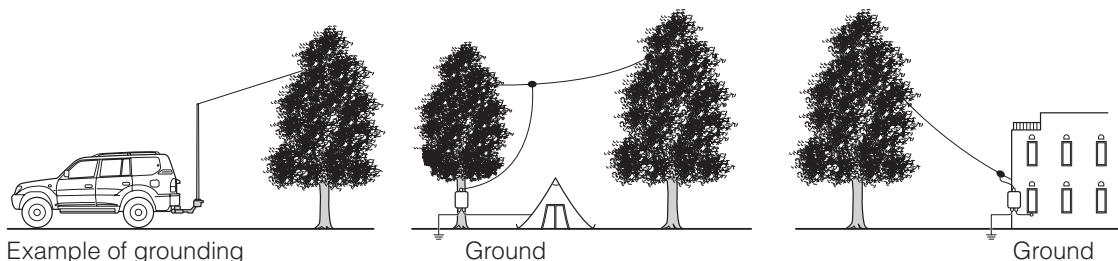
Modern vehicles are made of cutting-edge electronics technologies. Transmitting high RF power may cause interferences to such electronics devices and risks your safety. The manufacturer suggests NOT to use EDX-3 while driving, and not responsible of any consequences such interferences may cause to you and your property.

**NOTE**

The explanation about antenna elements herein are for your reference purposes. The best element for you depends on options such as the diameter and material of the element, bare wire or covered, and conditions of installation. It can't be explained quantitatively and theoretically in practice. You may find information about ATU and its antenna theories on radio magazines and on the internet.

Alinco strongly suggests to refer to such information in general for the efficiency and your safety purposes.

[Examples of mobile and fixed station setup]



NOTE

Insulate the lead-in cable of the EDX-3 antenna terminal and antenna element from other metal objects. While operating outdoor, be sure that no one can access to antenna elements and counterpoise. Touching them may cause serious injury.

Ground and counterpoise

The EDX-3's ground terminal **MUST** be connected to ground. Grounding prevents electric shocks, interference to other equipment and other problems. Grounding also ensures effective signal transmission.

DANGER! NEVER connect the ground terminal to the following points. These connections may cause an explosion or electric shocks:

- Gas or electrical pipe
- Fuel tank or oil-catch pan

IMPORTANT! The mounting plate is **NOT** connected to the EDX-3's internal ground.

Be sure to use designated grounding terminal , not the plate to ground.

Ideal ground points

One of following points is ideal:

- External ground plate
- External copper screen
- External copper foil

Good ground points for ships

If electrically connected to sea water, one of the following points is usable:

- Stainless steel stanchion
- Through mast
- Through hull
- Metal water tank

Undesirable ground points

AVOID the following points. These connections may cause noise or electrolysis:

- Engine block
- Ship's DC battery ground



The explanation about grounds and counterpoise herein are for your reference purposes. The best ground for you depends on options such where and how to ground, or the diameter and material of the radials, bare wire or covered, and conditions of installation.

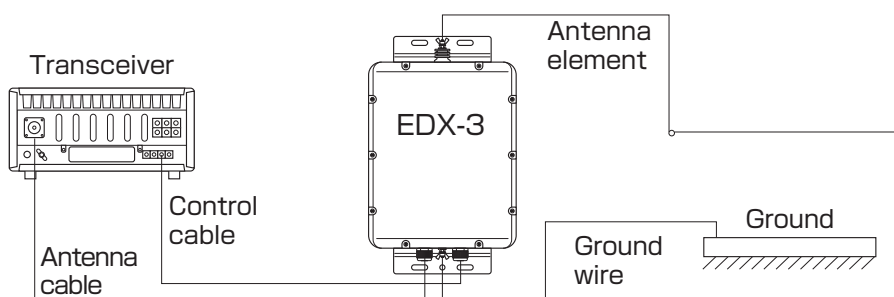
It can't be explained quantitatively and theoretically in practice. You may find information about ATU and its ground theories on radio magazines and on the internet.

Electrolysis

All ground cables from the EDX-3, HF transceiver, etc. on your ship should be connected to only 1 ship's ground.

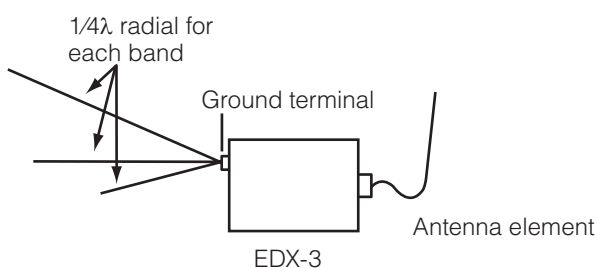
AVOID connection to 2 or more points. Voltage difference between 2 or more ship's grounds may cause electrolysis.

AVOID connection between dissimilar metals where an electric current is present. These connections may cause electrolysis.



Counterpoise

In case a good ground is not available, connect a counterpoise as shown below.



$1/4\lambda$ (quarter wavelength) radial for each band is suitable for a counterpoise. Install the counterpoise directly below the EDX-3's ground terminal. Insulate the ends of each radial from other metal objects. Layout the radial horizontally and as straight as possible.

L : Counterpoise length for the operating frequency [m]

f : Operating frequency [MHz]

$$L = \frac{300}{f} \times \frac{1}{4} \times 0.95 \times \text{odd number (1,3,5...)}$$

Notice: The loaded ratio of 0.95 is indicative. It is affected by your radial cable materials and condition of the installation.

■ [Example]

At an operating frequency of 14 MHz, use a counterpoise with the following length:

$$L = \frac{300}{14} \times \frac{1}{4} \times 0.95 = 5.09\text{m}$$

Ground cable

For best results, use the heaviest gauge wire or metal strap available to you. Make the distance between the tuner and ground as short as possible.

Confirm that the through mast is electrically connected to sea water if it is used as a ground.

WARNING	When grounding to metal hull Use a Zinc anode to protect the hull from electrolysis. Ask your ship dealer, installer or refer to a technical book, etc., for RF ground details.
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INSTALLATIONS

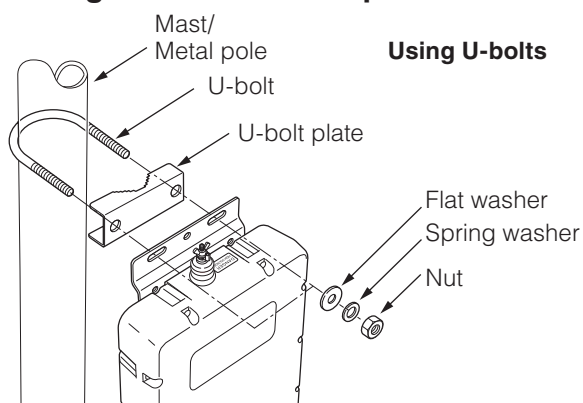
Please read the instruction manuals of Alinco HF transceivers for details. EDX-3 maybe referred to as EDX-2, but connection and operation instructions remain unchanged. EDX-3 supports all ALINCO DX-series HF transceivers that EDX-2 is usable.

Installation outline

- ① Mount the EDX-3 in the desired location.
 - Refer to p. 10 "Mounting."
- ② Connect the control cable and the coaxial between the transceiver and the EDX-3.
 - Refer to your transceiver's manual for details.
- ③ Connect an antenna, ground or counterpoise.
 - Refer to previous chapters for details.

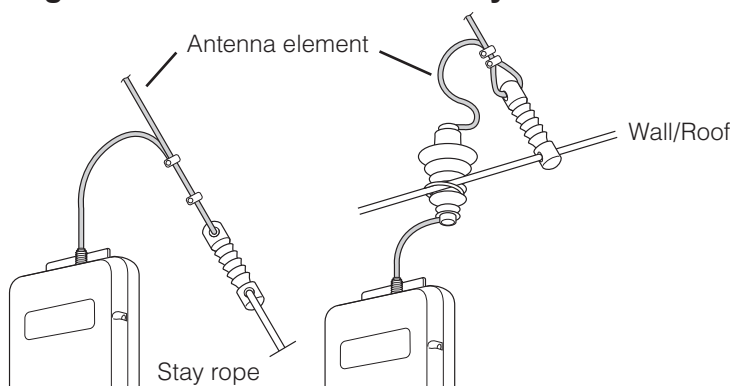
Mounting

■ Mounting on a Mast/Metal pole



WARNING Mount the EDX-3 securely with the supplied nuts and bolts. Otherwise, vibrations and shocks while moving, could loosen the antenna tuner making it fall, causing personal injury.

■ Wiring of Antenna element and stay



Use high-quality insulators, hardware and stay ropes to securely fix element cable.

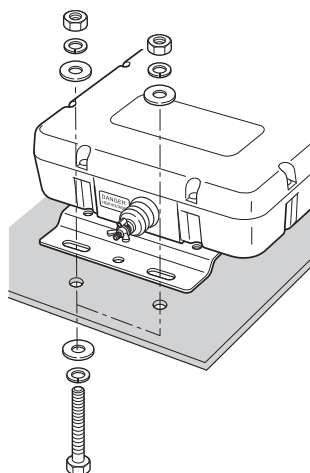


NOTE

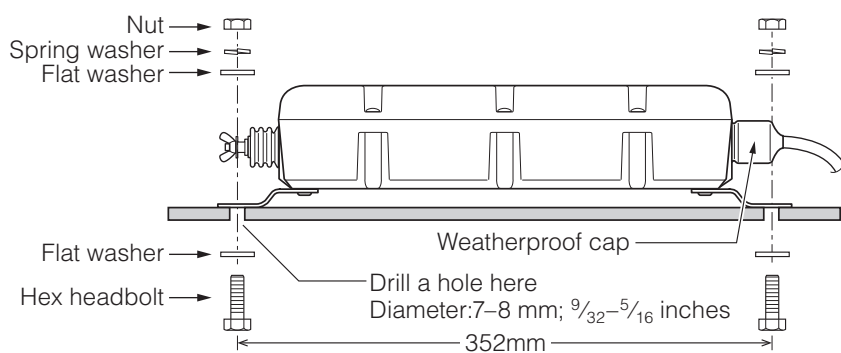
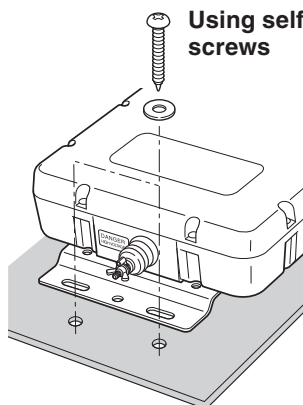
This device generates mechanical noise of relays. This is a nature of this product and not a defect. Please pay extra attention to your neighbors about such noise.

■ Mounting on a flat surface

Using nuts and bolts



Using self-tapping screws



Operation

Please read the instruction manuals of Alinco HF transceivers for the operation.

EDX-3 is a complete replacement of previous EDX-2, and operation is totally the same.

EDX-3 supports all ALINCO DX-series HF transceivers that EDX-2 is usable.

CAUTION EDX-3 is made especially for genuine Alinco HF transceivers. Alinco can't provide any connection information for transceivers of other manufacturers.

To reduce the risk of electric shock and RF noise, please follow the instruction below.

- Separate the transceiver and EDX-3 as far as possible. Roll and store the excessive length of cables and keep away from the transceiver and tuner.
- Other cables and metal devices such as DC cable, CW keyer or microphone and cables etc should also be kept as far away as possible from the cables connected to the tuner.
- NEVER transmit without the element being connected.

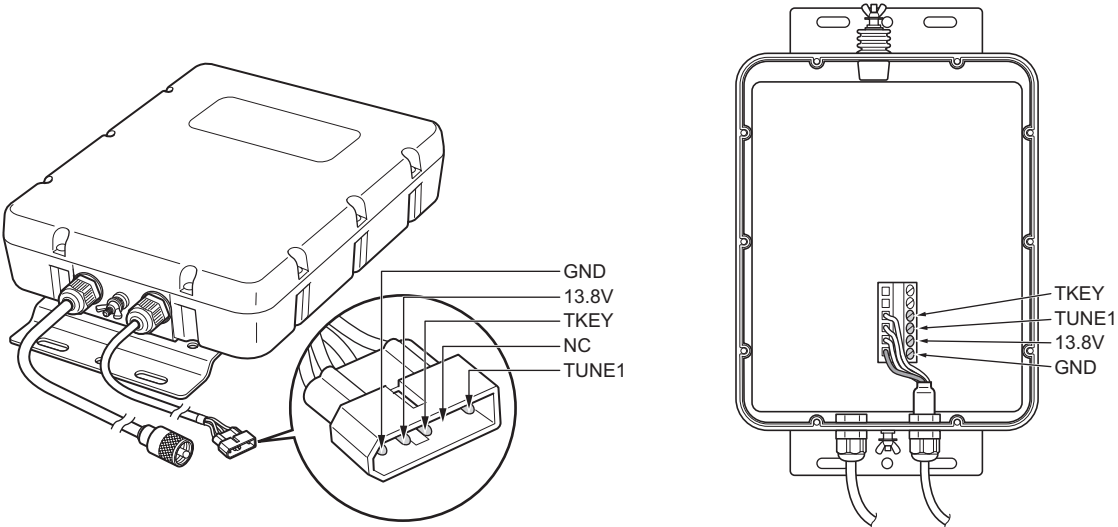
Be sure to take tune every time you change the operating frequency even within the same band.

When "TUNE" icon disappears from the display of the transceiver after tuning, transmit at full-power and make sure the RF meter on the display shows the max indication. If tuning is not complete, the poor SWR protection function limits the output and displays less segments.

CONTROL CABLE SIGNALS

Terminal information

Terminal	Description
TKEY	Key voltage. Grounded during tuning. Max. current drain 100 mA.
TUNE1	Receives start voltage. Max. current drain 1 mA
13.8V	13.8 V DC + input terminal. Max. current drain 2 A
GND	Ground terminal for above signals.



About extending cables length

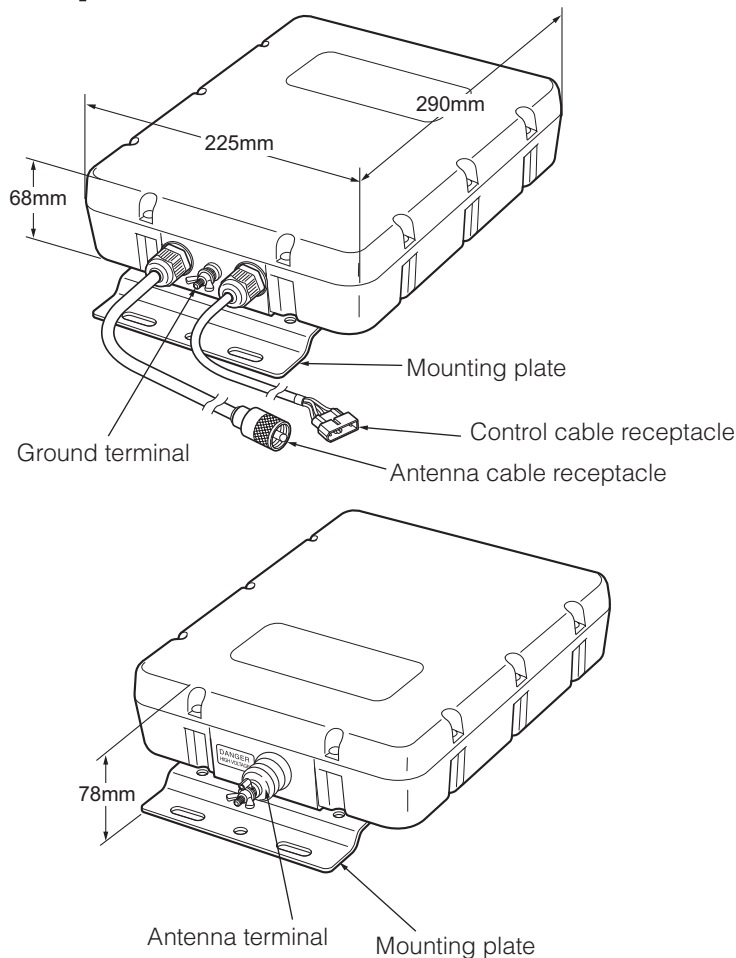
The coax and control cables may be extended at your own responsibilities. Use larger gauge cables when you extend them to minimize the signal loss. Make same connections as the originals, and be sure to use high-quality cables for durability especially in case of outdoor installation.

About common mode and filtering

As a character of automatic tuners, you should take countermeasures against common mode effects. It consists of installing ferrite coils and/or beads to the coax and control cables of EDX-3. This also depends on such factors as the diameter and length of cables. You may search information by using key words like “antenna tuner common mode filter” on the internet. Careless installation and operation will cause poor efficiency, damages to equipment and electric shock. Damages caused by common mode current voids warranty.

UNIT DESCRIPTION AND SPECIFICATIONS

Unit description



Specifications

- | | |
|-------------------------------|--|
| • Frequency coverage | : 1.8–30 MHz (with 12m; 39.4 feet or longer element) |
| • Power supply requirement | : 13.8 V DC (supplied from HF transceiver) |
| • Current drain | : Max. 2 A |
| • Operating temperature range | : –20°C to +60°C (–4°F to +140°F) |
| • Weight | : 2.1 kg; 4.6 lb |
| • Antenna connectors | : SO-239 (50 Ω) inside, PL259 (50Ω) Coax cable |
| • Max. Input power | : 150 W (PEP) 100 W (continuous) |
| • Automatic tuning time | : Approx. 2–3 sec. (general condition) Max. 15 sec. Approx. 1 sec. (re-tuning for a memorized frequency) |
| • Automatic tuning accuracy | : Less than VSWR 2:1 (after tuning, except for multiples of $1/2 \lambda$) |

Manufacturer :

ALINCO,INC.

Head Office: Yodoyabashi-Dai Building 13th Floor
4-9, 4-Chome, Koraihashi, Chuo-ku, Osaka 541-0043, Japan
Phone: +81-6-7636-2362 Fax: +81-6-6208-3802
<http://www.alinco.com/>
E-mail: export@alinco.co.jp

Information and specifications are subject to change without notice.

We will replace the manual if manufacturing/printing may be defective, but can't be responsible of eventual typographical errors and misinterpretations.

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EDX-3 complies with essential requirements of the 89/336/EEC directive for Electro-Magnetic Compatibility.
This compliance is based on conformity with EN61000-6-4 and EN61000-6-2.

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