144/430 MHz Dual Band High Performance Gain Vertical Base Station Antenna Series

X510MH

Operation Instructions

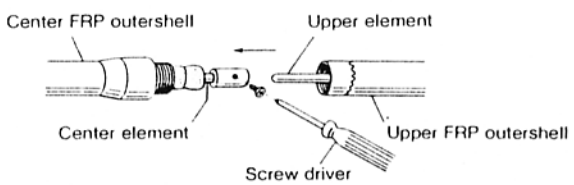
● Description

Newly developed Linear Phase Shift technology and Direct Joint structure by three-piece FRP outershell enable to achieve the following performance.

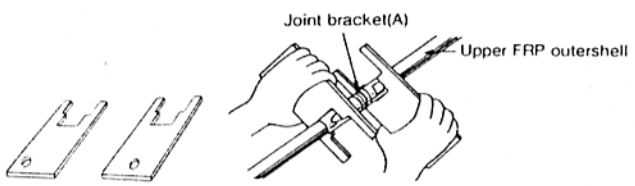
1) 144MHz 5/8 wave three-element C-Load and 430MHz 5/8 wave eight-element structure.
2) High performance and high maximum power rating 144MHz and 430MHz bands.
3) Lower VSWR and broader coverage at 144MHz and 430MHz.
4) Overlapping three-piece FRP outershell structure is strong enough to compete with one piece structure.
5) Ring gasket provides perfect waterproof.
6) Assemble or disassemble if necessary by simply fastening or loosening of few connecting sections.
7) DC ground structure of the antenna protects transceiver from high voltage caused by thunder lightning.
8) With optional 144/430MHz duplexer, two bands can be transmitted simultaneously, or one band can be transmitted simultaneously while receiving the other band. In any case, use DIAMOND's genuine duplexer.

● Assembly

1. Connect upper and center elements. To pull out element joint bracket at the top of center element, make upper part of the element down and shake lightly.



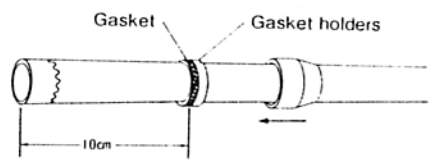
Note: Be sure to assemble the antenna from upper element. If the antenna is being assembled from lower element, the element can not be pulled out from outershell and fasten properly.



2. After connecting these elements with a screw, push back center element downward in advance to connect upper and center outershells. Then connect upper and center outershells at upper joint bracket section.
3. Fasten upper part of the joint bracket (A) with a special wrench attached by holding lower part of the joint bracket (A) firmly with the wrench. Use narrow gap section of the wrench to fasten and hold each part of the bracket. For perfect waterproof, fasten the bracket until there is no gap between each part.

Note: Be sure to fasten the bracket firmly, otherwise it may invite water leakage problem.

Note: Adhesive NOTE seal is attached on the joint bracket. Remove the seal before installing the antenna. Gasket and gasket holders have to be fixed at 10cm from the edge of FRP outershell.



4. Connect center and lower elements.

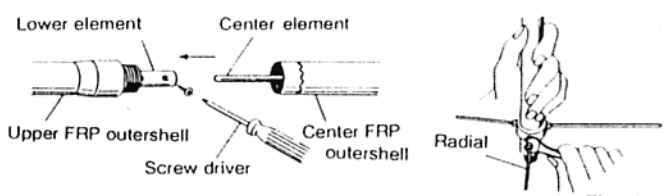
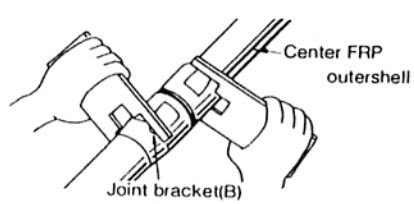


Fig. 1

Note: Do not pull out lower element.

5. Fasten lower part of joint bracket (B) just as the same way as the joint bracket (A) with a special wrench attached. Use wide gap section of the wrench to fasten and hold each part of the bracket. For perfect waterproof, fasten the bracket until there is no gap between each part.



Note: Be sure to fasten the bracket firmly, otherwise it may invite water leakage problem.

6. Attach three radial elements as shown in Fig. 1.
7. Attach two mast brackets on support pipe and fix them. Then connect a coaxial cable, with a UHF connector.

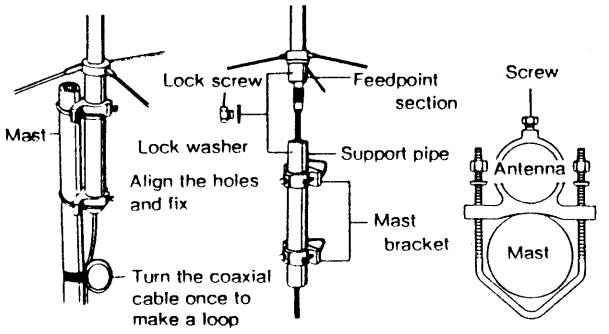


Fig. 2

8. Fix support pipe and feedpoint section of the antenna with lock screw by aligning the holes at the bottom of the section and upper part of the pipe.
9. Attach assembled antenna on a mast by taking whole balance into account as shown in Fig. 2. Turn the coaxial cable once to make a loop at right below the antenna to escape excess load from the cable.

Note: Though acceptable mast diameter is from 30mm (1.18"), it is recommended to use larger diameter mast as possible because the antenna is relatively large.

Note

Though all these antennas employ DC ground structure, circuit across center conductor section and ground section of the connector is open (not conducted) if it is measured by a voltohm meter. If it is closed (conducted), check to see coaxial cable and/or connector thoroughly. Be sure to install the antenna vertically. Full performance of the antenna can not be guaranteed if the antenna is not installed vertically.

It is recommended to practice test transmission for adjustment as short and least power as possible.

Warning

Do not touch or come close to the antenna during transmission.

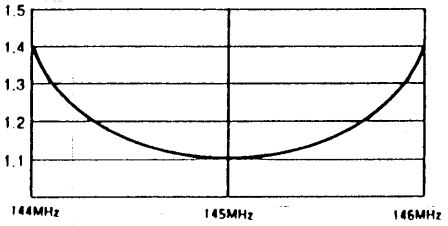
Do not install the antenna where is easily reachable by the children.

● Adjustment

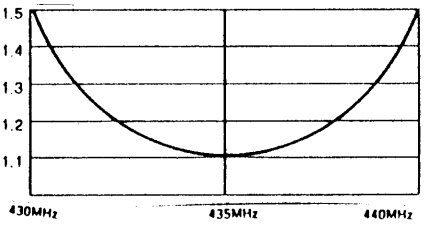
The **X510MH** antenna is completely adjustment free. If vswr of the antenna is extraordinary high, most likely, it is due to coaxial cable and connector contact, or connector soldering problem. And be sure to use 50Ω coaxial cable to feed the antenna.

● VSWR

144MHz



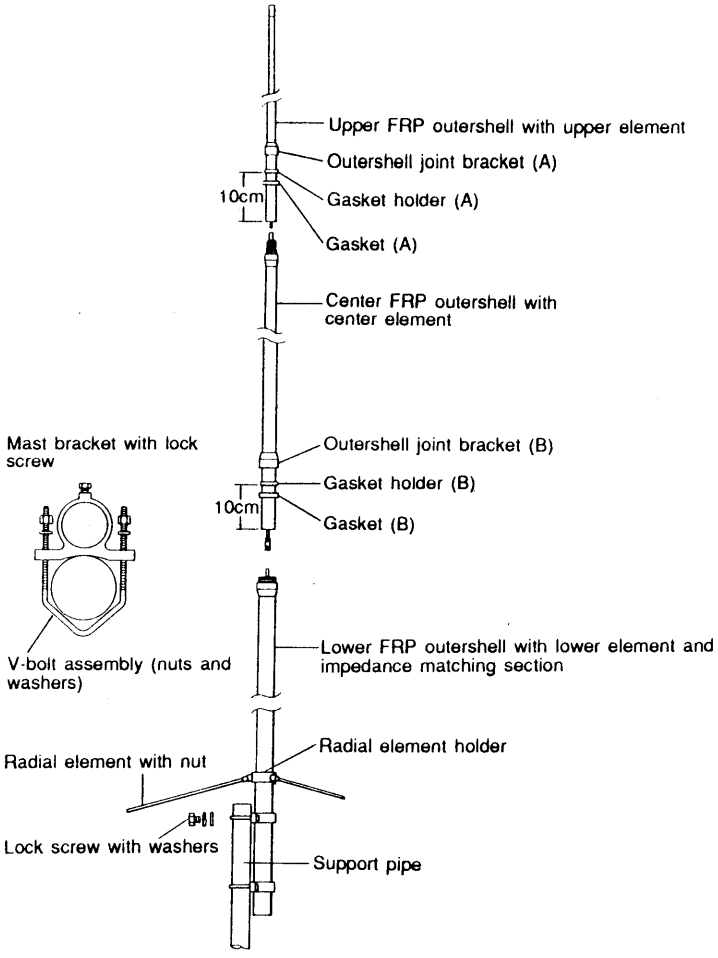
430MHz



● Specifications

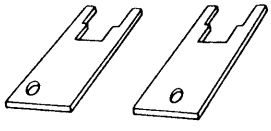
Frequency: 144~146MHz, 430~440MHz
Gain: 8.3dB(144MHz), 11.7dB(430MHz)
Impedance: 50 ohms
VSWR: Less than 1.5:1 (see charts)
Max. power rating: **350 W**
Rated wind velocity: 40m/sec. (90MPH)
Mast diameter accepted: 30–62mm (1-1/5" to 2-2/5")
Length: 5.2m (204.7")
Weight: 2.0kg (4.4 lbs.)
Radial length: approx. 52cm (20.5")
Connector: UHF
Type: Three 5/8-wavelength C-Load phased-vertical (144MHz)
Eight 5/8-wavelength C-Load phased vertical (430MHz)

● Part name

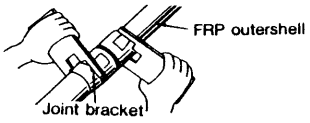


To fasten FRP outershell joint brackets with special wrenches included in the package.

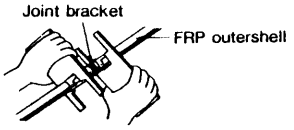
1. There are wrenches in the package.



2. Use wide section of the wrenches to fasten thick diameter FRP outershells.



3. Use narrow section of the wrenches to fasten thin diameter FRP outershell.



Be sure to fasten joint brackets firmly since they are used to maintain waterproof of the antenna.

FOR YOUR SAFETY

Read the following safety precautions before start assembling the antenna.

- Assemble the antenna on the ground or wide and flat place such as on balcony before installation.
- Do not assemble or install the antenna on a place where you can not have enough distance from any electric power lines.
- Do not install the antenna on a rainy or windy day.
- Do not attempt to install the antenna only by yourself. Installing the antenna alone on the roof may lead you dangerous accident. Always ask your friends for help installing the antenna.
- Do not use iron or aluminum ladder at a reachable distance from any electric power lines.
- Do not install the antenna on a mast which is not grounded properly.
- Do not have your family members or friends touch or come close to the antenna, unless they have realized its potential danger.

TO AVOID FATAL ACCIDENT

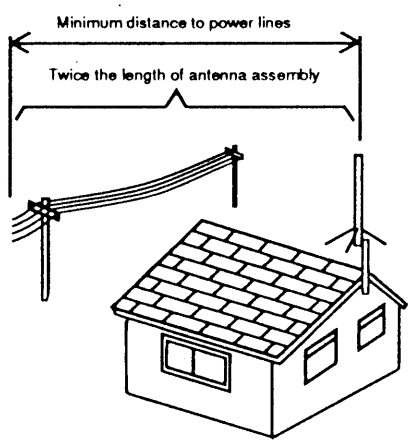
- Do not attempt to sustain the antenna, or any part of support structure if it begins to fall down. Let it fall by itself.
- Do not attempt to remove or restore the antenna or any part of support structure if it touches a electric power line by chance. Let it be as it is, do not touch it, and call your local electric power company immediately.

IN CASE OF AN ACCIDENT

- Do not touch a person or an animal who is or seems to be in contact with the antenna or any support structure which is fallen on a live eletric power line. Touching one may lead you to be electrocuted.
- Do not attempt to separate a person or an animal who is or seems to be in contact with the antenna or any support structure which is fallen on a live electric power line by yourself. Call or have someone call a police officer, ambulance, doctor immediately.

ANTENNA INSTALLATION PRECAUTIONS

To determine antenna installation location, there are several factors to be taken into account. First thing is antenna propagation direction to specific target stations. As to whether there is any obstacles such as tall buildings on the line of sight. Next is specific installation location. As to whether specific location is adequate in terms of antenna support and surrounding safety.



- Do not attempt to install the antenna by yourself if you do not have any experience in installing base station antenna. Ask your experienced friends or professional for help.
- Do not attempt to install the antenna at a location where does not have enough distance from nearby electric power lines. It is advised to install the antenna at least twice of total antenna height from nearby electric power lines.
- Do not install the antenna on any type of tower, pole or telescopic mast which exceeds 30 feet high, if you do not have enough experience in installing the antenna on that kind of location. Ask your experienced friends or professional for help.
- Do not use more than 1/10' section if you install the antenna on iron plumber's pipe. Attach guy wire if multiple pipes are used to install the antenna.

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