

HAM TENNA for SATELLITE COMMUNICATION

144 MHz Band (144~146 MHz)
& 430 MHz Band (430~440 MHz)

Impedance

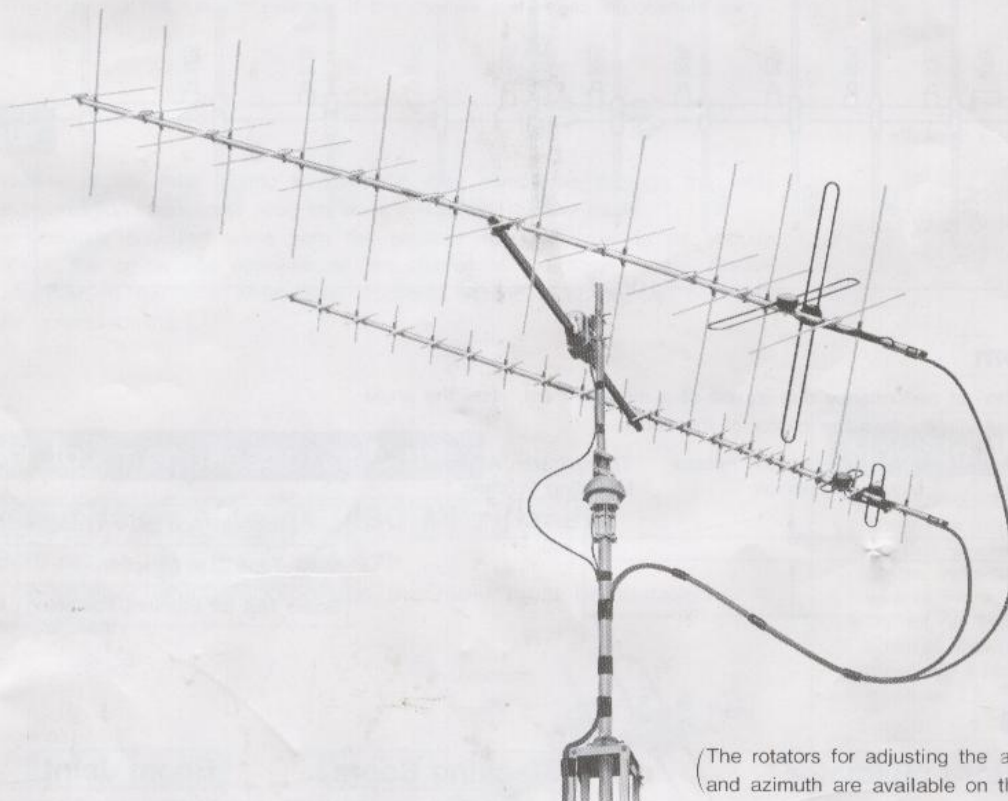
50 Ω

WHS32N

(Circularly Polarized Wave Changeover Type)

Fiberglass Stacking Boom Provided

OSCAR Hunter



(The rotators for adjusting the angles of elevation and azimuth are available on the market.)

Circularly Polarized Wave

This cross type antenna has been specially designed to correspond the circularly polarized wave from the OSCAR 10 Communication Satellite, and achieves far better communication than ordinary linear polarized wave antennas.

Circularly Polarized Wave Changeover Type

Since the right-hand and left-hand circularly polarized wave changeover relay is incorporated, a signal can be transmitted or received in the best condition even if the satellite position is changed.

High Performance

Since the maximum gain of the transmission antenna (430 MHz band) is 13.4 dB and the maximum gain of the reception antenna (144 MHz band) is 12 dB, top quality reception is achieved without the use of a pre-amplifier.

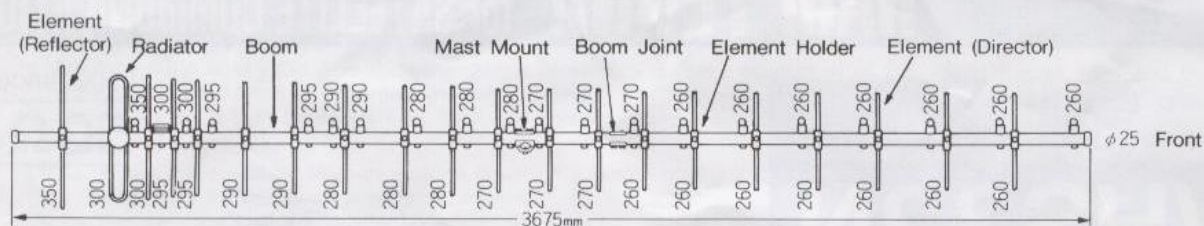
High Quality Materials

High strength corrosion-resistant aluminum alloy is adopted for boom, element and element holder. Bolt and nut are made of stainless steel.

Outview

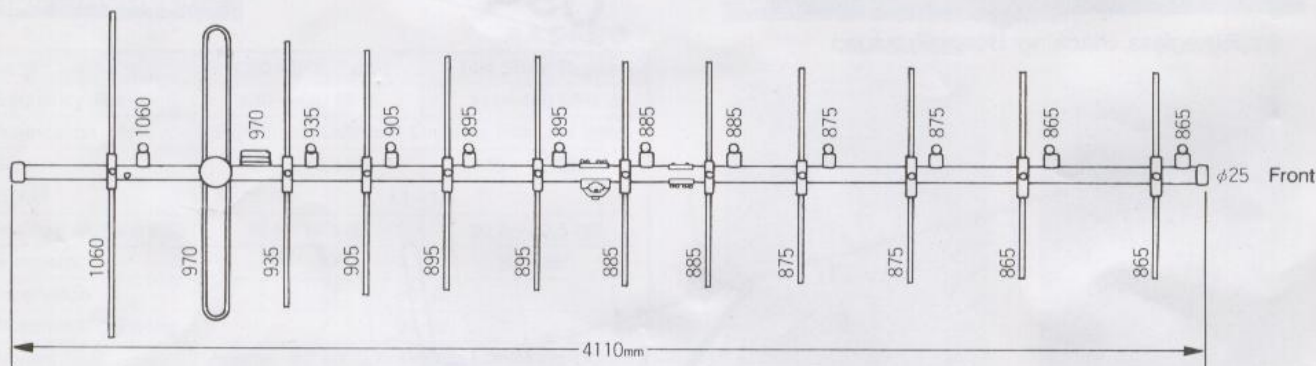
Transmission Antenna (430 MHz Band)

20 Elements



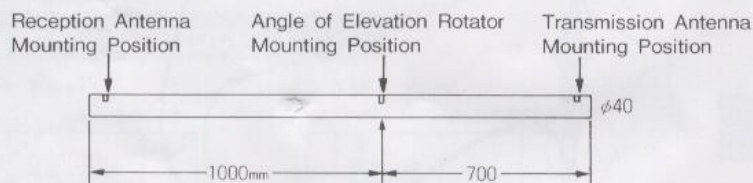
Reception Antenna (144 MHz Band)

12 Elements



Stacking Boom

To prevent deterioration of performance due to use of a metallic mast, slide the angle of elevation rotator out slightly from the center of the boom.

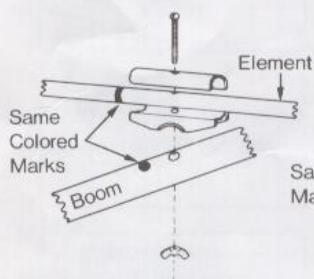


Accessories

| | |
|----------------------------------|--------|
| Self-bonding Tape (50 cm Length) | 3 pcs. |
| Vinyl Tape (5 m Length) | 2 pcs. |
| Spare Nut for Element Fastening | 6 pcs. |

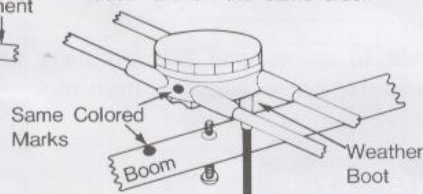
How to Install

Reflector-Director



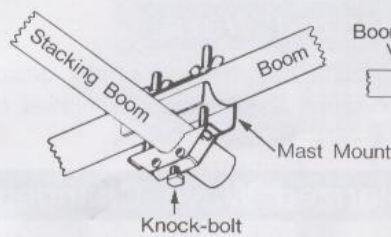
Radiator

Mount the bracket so that the color marks on it and the boom are on the same side.

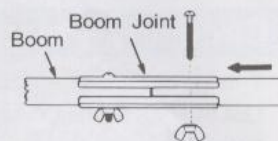


Stacking Boom

Install the antenna on the stacking boom.

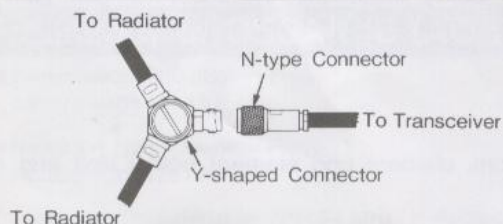


Boom Joint



Fasten the wing nut firmly and screw in the knock-bolt until its tip screws in the boom.

How to Waterproof Y-shaped Connector

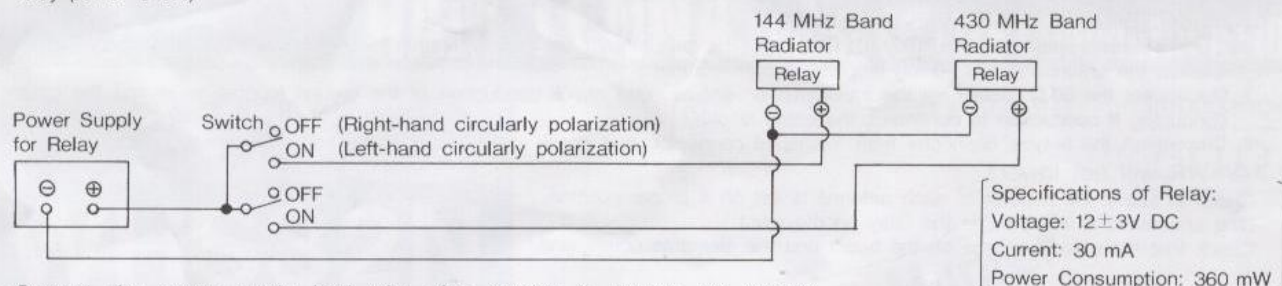


- ① The N-type connector (available on the market) which connects with the Y-shaped connector should be tightened firmly with pliers.
- ② Peel off cloth attached to the back of self-bonding tape. While stretching the tape to about double or triple length, wrap it around the Y-shaped connector and wrap there again with vinyl tape to prevent water from entering.



Wiring Method for a Relay for Polarized Wave Changeover

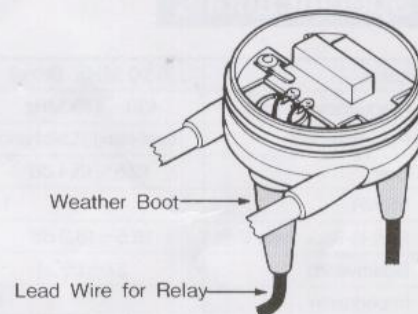
- Use 12 V DC, 20 mA or more for the power source of the relay. (Right-hand circularly polarized wave when the relay power is off.)



- Connect the power supply lead wire after passing it through the weather boot. (Outdoor use cord is available on the market.)
- Connect the lead wire to the terminals properly referring to the positive \oplus and negative \ominus indications on the printed circuit board.
(The relay will not function properly if the positive and negative polarities are reversed.)

Note

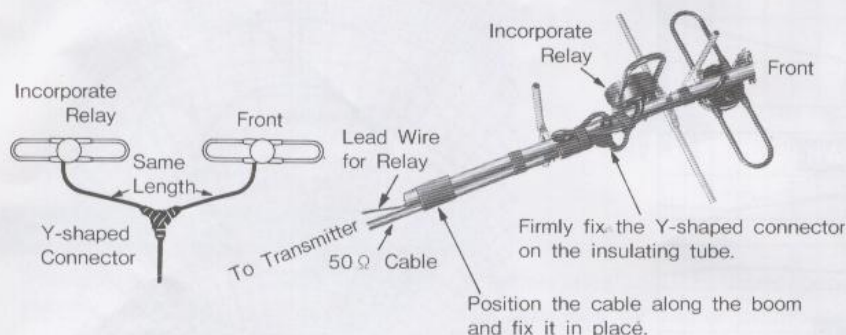
- Actuation of the relay during transmission may sometimes damage the relay. The polarization changeover shall be done during the standby mode.
- The circularly polarized wave from the satellite may vary due to its attitude. However the uplink and downlink do not change at the same time. Always changeover to the side where best transmission and reception can be made while communicating.



How to Wire Matching Cable

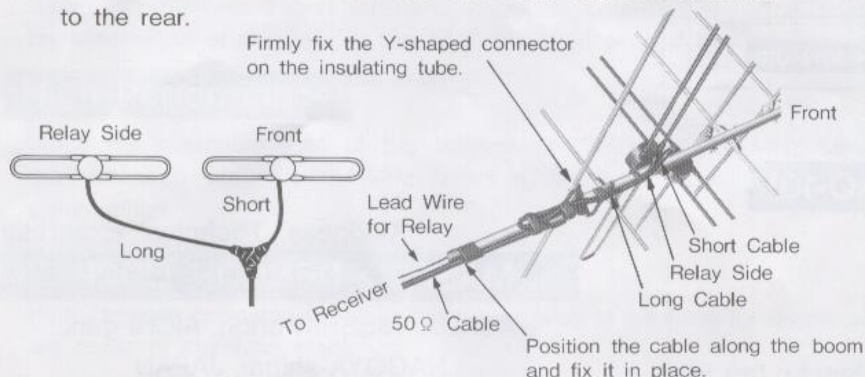
Transmission Antenna (430 MHz Band)

- Both cables have the same length.
- The radiator which incorporates the relay must be installed to the rear.



Reception Antenna (144 MHz Band)

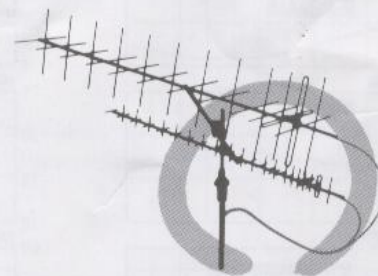
- The radiator which incorporates the relay must be installed to the rear.



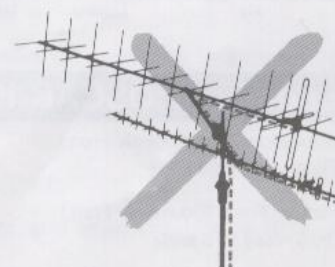
How to Wire Cable

- The 50 Ω cable connected to the transmitter and receiver shall be wired so that it always protrude to the rear of the reflector together with the lead wire of the relay.
- Do not run the cable along the stacking boom as shown in the "Incorrect Example", otherwise it may decrease the gain by as much as 1.5 dB.

Correct Example



Incorrect Example



Proper Handling Procedures

Check the following for proper use of antenna :

- ① When a Beacon cannot be received, or when it can be received but communication through satellite cannot be made : [Beacon : 145.81 MHz (± 5 kHz)].

● If any communication (both in 430 MHz and 144 MHz bands) with the nearby station is possible without relaying through the satellite, the antenna is functioning properly.

1. Disconnect the 50 Ω cable from the transmitter or receiver, and check conduction of the ground (copper wire) and the center conductor. If conduction is confirmed, the cable is okay.

2. Disconnect the N-type connector from Y-shaped connector, and check short circuit at the part of N-type connector.

- ② If VSWR will not lower :

Check to see if the radiator of each antenna is set on a proper position.

(The antenna that incorporates the relay on the rear.)

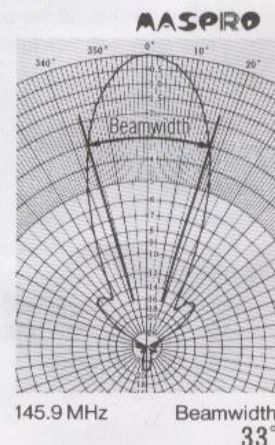
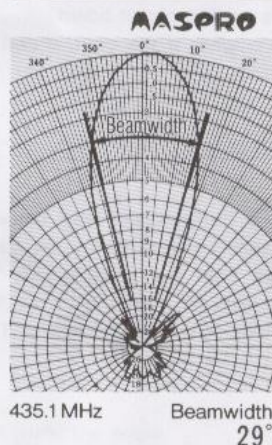
Check that the color markings on the boom and the elements correspond.

Specifications

AASPRO

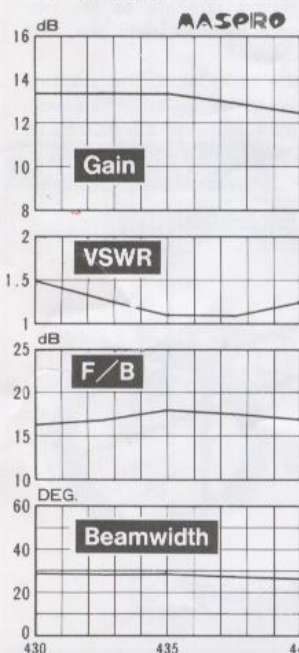
| Items | 430 MHz Band | 144 MHz Band |
|---------------------------|--|----------------|
| Frequency Range | 430 ~ 440 MHz | 144 ~ 146 MHz |
| Polarization | Right-hand / Left-hand Circularly Polarized Wave | |
| Gain | 12.5 ~ 13.4 dB | 10 ~ 12 dB |
| VSWR | 1.1 ~ 1.5 | |
| Front-to-Back Ratio (F/B) | 16.5 ~ 18.3 dB | 20.7 ~ 22.5 dB |
| Beamwidth | 27 ~ 29° | 33 ~ 35° |
| Impedance | 50 Ω | |
| Withstanding Power | 50 W | |
| Weight | Approx. 8.7 kg (2 Antennas + Stacking Boom) | |
| Length | 3.68 m | 4.11 m |
| Radius of Rotation | Approx. 2.6 m | |
| Connector | N-type | |

Directivity Pattern

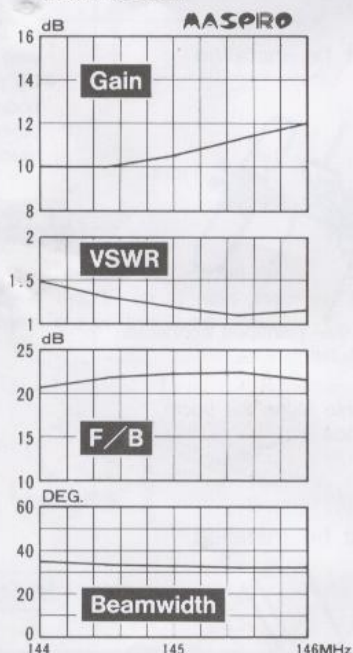


Frequency Characteristics

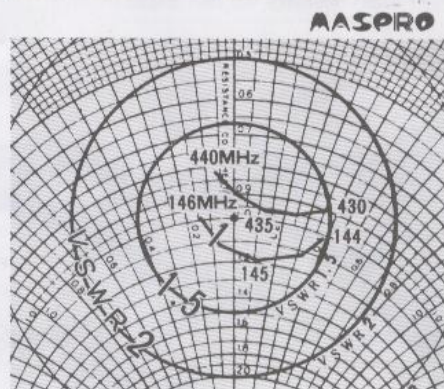
430 MHz Band



144 MHz Band



Impedance Characteristics <Smith Chart>



These data are 100% accurate.

Frequency of OSCAR 10 (AO-10)

● Transmission Freq. (Uplink Freq.)
435.179 ~ 435.029 MHz

● Reception Freq. (Downlink Freq.)
145.825 ~ 145.975 MHz

Transmission Freq. (MHz) = 581.004 MHz - Reception Freq. (MHz)

Kindness, Technical Expertise

MASPRO DENKOH CORP.

ASADA, NISSHIN-choh, AICHI-gun,
NAGOYA-shigai, JAPAN