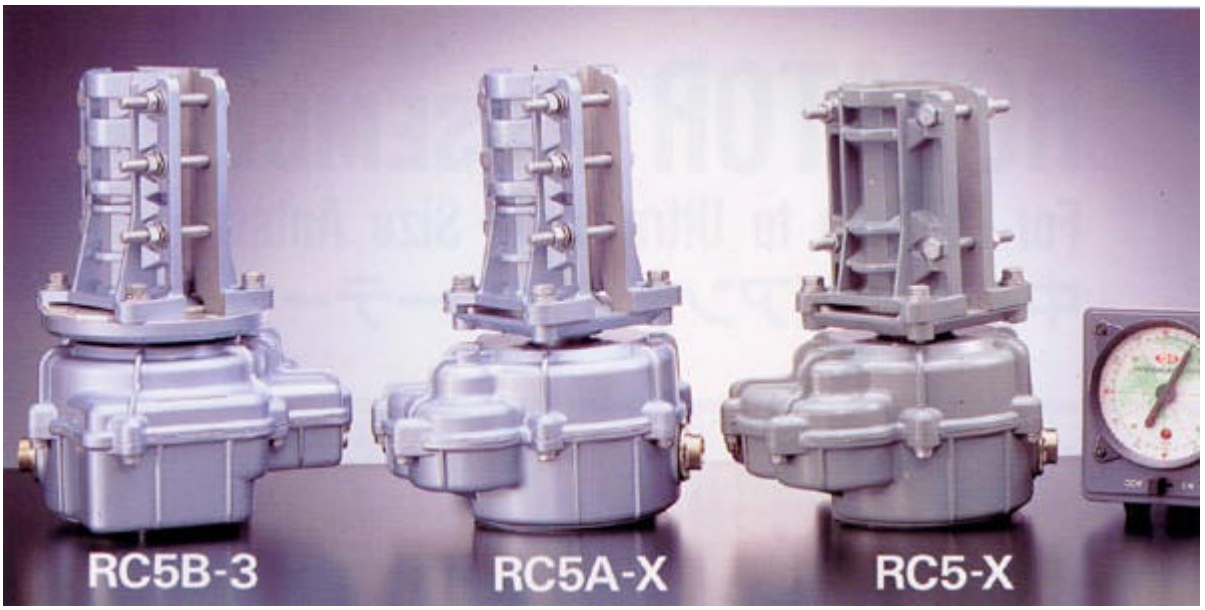
Azimuth Rotator RC5-x Series

Advanced Driving Mechanism and Gear Structure in Use of Incomparable Quality Gear Materials Makes Large Rotating with Minimum Backlash.



1. GENERAL

CD rotator model RC5-x series is a rotator setforamateur radio antennas sizing range from medium to ultra-large type. The RC5-x series is modeled after the CD medium-size antenna rotator used by professionals of which its durability is unequaled, and is incorporates a number of novel mechanism with incomparable reliability and durability.

ROTATOR UNIT As in the medium-size rotators used by professionals, the reduction gear of the model RC5-x series can withstand an external torque that provides a powerful braking force, making gear protection and braking torque via a separate mechanism unnecessary. RC5's reduction gear mechanism counters pressure exerted by strong impacts from wind and the antenna's inertia during rotation and braking. The reducer mechanism consists of spur gears of large diameter and thickness, a worm gear and a powerful motor. These low-backlash components offer quiet rotating features. Much care has been taken into consideration in other details, such as a mast guide, which permits centering of the mast guide, which permits centering of the mast merely by setting it in the guide during insertion.

CONTROL UNIT The RC5 control unit is de signed and to be able to give user for ease of use and easy readability. The direction indicator permits reading of two beam bearings and free section of the reference bearing point by overlay (subscaleplate). All the models are equipped with speed control circuits for ease of operation.

2. CHARACTERISTIC OF EACH MODEL

RC5-1, RC5-3 This series is for medium-size antenna and uses low-cost gears and a small motor. RC5-1 is an economy set, with simplified control circuits in the control unit and a simplified display on the indicator unit though outer-looks of both model RC5-1 and RC5-3 are the same. RC5-3 provides standard with the P.SET function and RDC circuit.

RC5A-2, RC5A-3 RC5B-3 This series was produced for large-size antennas, high-yield materials are used for gears and other rotary parts in the rotor and a high-output motor is used to guarantee rotating torque of at least 16kg·m for RC5A and 22kg·m for RC5B type which is designed for rotating an extra large-size antenna offering powerful braking and rotating torque, and retarding torque of at least 200 and 250 respectively. With respect to the control unit, RC5A-x and RC5B are provided standard with the RDC circuit.

For Super Heavy-Duty Rotator

RC10S

This CD extra large rotator model RC10S is originally designed for rotating a big commercial use log-periodic antenna. It has a high reliability and durability, applicable to use even under these strict conditions, such as a large torque applications are required, with an icy snowy strong wind are imposed. The unique speed reduction system by use of large torque of driving motor, high impact chains and steel housing make it possible to rotate a big antenna that requires a high braking torque and vertical load.

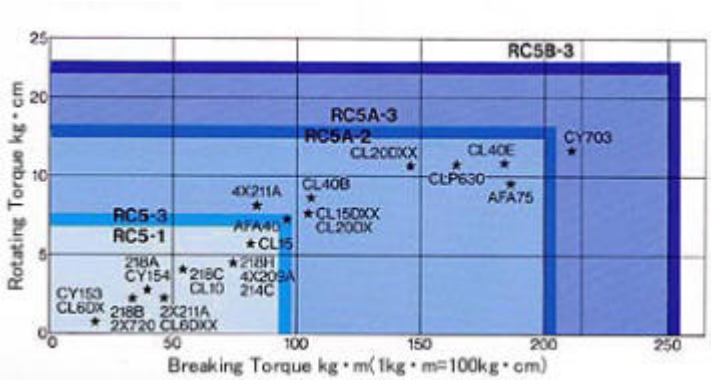
3. SELECTION OF ROTATOR

The most important criteria in the selection of a rotator are retarding torque and rotating torque. Because different antenna have different weights and slenderness ratios, the rotator's characteristics vary to a large extent. Even among antennas of the same weight, large braking torque is required for an antenna of long boom length. The list below indicates the required performances of representative CD antenna rotator models, thatthese performances were calculated based on a wind velocity of about 30m/s.

These performances are applicable to one antenna only, so a sufficient margin should be considered for the rotators to be used for more than two antennas. If the rotator is in use at reduced speed, the tolerance for braking torque increases by 20~30%.

4. OVERLAY/CONTROL UNIT

Great Circle map printed overlay is available as an optional parts. This option is provided standard in all the models above type RC5x. Contact your local dealer for the details in obtaining this option.



SPECIFICATION

Model		RC5-1	RC5-3 RC5-3P	RC5A-2	RC5A-3 RC5A-3P	RC5B-3 RC5B-3P	RC5B-4 RC5B-4P	RC5-1DC	RC10S RC10SP
Rotating Torque (kg/m)		6		16		22		5	30
Brake Torque (kg/m)		80	90	200		250		90	400
Mast Diameter (mm)		48~63							66~77
Vertical Load (kg)		400		700				400	1,000
Horizontal Load (kg)		800		1,000				800	1,500
Speed Sec.	50Hz/360°	75~110					94~144	60~160	75~110
	60Hz/360°	60~95					78~120	60~160	60~95
Reversal Time (sec.)		0	1	2	3			0	3
Preset Function		—	Provided	—	Provided			—	Provided
Preset Accuracy		—	±8 °	—	±8 °			—	±8 °
Power Requirement		90VA		150VA		200VA		12~15VDC	170VA
Indicator Accuracy		Less than ±4 °						Less than ±3 °	
Weight (kg)	Rotor	4.0	4.0	6.0	6.0	7.0	7.0	5.0	27.5
	Controller	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Notes: 1. RC5x-P is PC tracker connectable type.
2. Those models which attaches 25m long cable are also available.
3. Power Requirement is 100VAC, Control cable requires 7-core. (*RC5-1DC: 12VDC, 6-core)

SECTION 1

INSTALLATION

1. 1 UNPACKING AND INSPECTION

Be sure to check the rotator and indicator/control after unpacking. especially if there is noticeable damage to the carton. Inspect the rotor for cracks and the indicator for damaged or loose components. Use the parts list in SECTION 5 to count the accessories.

1.2 INSTALLATION AND WIREING

1.2.1 GENERAL

Description in this manual is for installation on an ordinary rooftop tower or steel tower, but the basic points made here should be observed even when installing the rotor on another sort of fixture.

1.2.2 ROTATOR INSTALLATION

The RC-5xx basically consists of a rotor and an indicator/control unit. Place the rotor on top of a flat mouning plate with the mast clamp pointing up, as shown in Fig. 1.1. The mast must be perfectly vertical. Screw the five M8x19 bolts with S-washers up through five of six holes in the mounting plate to secure the rotor. Follow the tightening sequence given in paragraph 1.4. If a mounting plate of tickness other than 1.2-4.0 mm is used, then bolts of different length must be used. Use zinc galvanized or electroplated - not stainless steel - bolts. These will minimize electrical contact with the rotor.

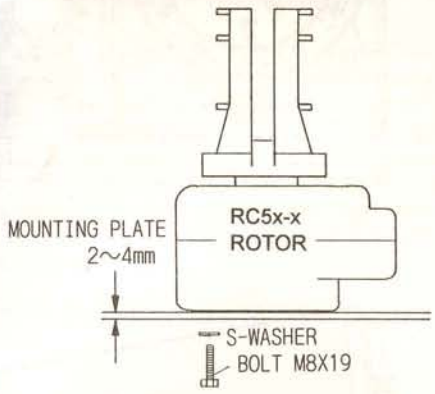


Figure 1-1. Rotor Installation

CAUTION

1. Be sure to select zinc galvanized or electroplated bolts if not using the bolts provides with the rotator set.
2. The plane of contact between the mounting plate and the rotor must be level to within 0.5mm.
3. Make bolt holes in the mounting plate no more than 9mm in diameter. Larger diameters than this will reduce fastening strengh.

1.2.3 WIRING

Connect the rotor and indicator/control unit as shown in Fig. 1.2, with 7-core cable. The cable plugs into a 7-pin socket on the rotor and the seven wires are connected to a crimp contact terminal board on the indicator/control unit. Solder must be used to connect the cable to the rotor. For connection to the indicator/control unit, the wires can either be fastened by pliers or soldered to the terminal board. Make a written not of which wires are connected to which connector pins on the rotor so that they can be connected to the corresponding terminals on the indicator/control unit.

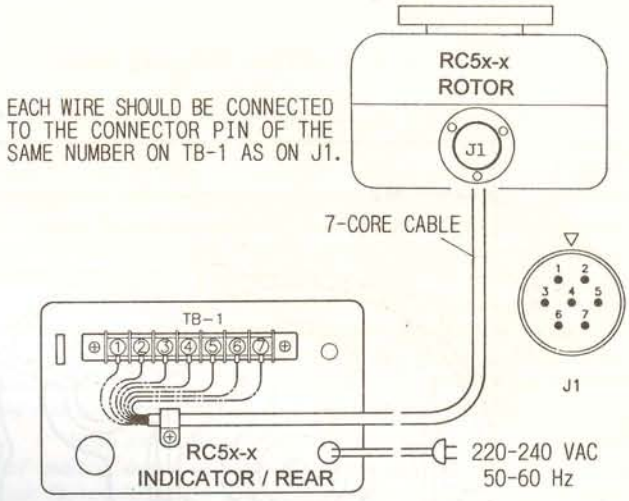


Figure 1-2. Interconnections

1.2.4 REMOTE CABLE LENGTH AND PRESET OPERATION

It may occurs voltage dropping if the entire length of the remote cable is extended more than to approx. 80 to 100m, hence if consequently makes rotating power of the rotator unit reduce. Preset fnction itself in the present model does not work properly either when the longer length of control cable is being used. This is because an unnecessary noise current (ripple wave) is generated and joined together on the angle control signal cable. It needs the mofification in the signal wires. One of the best countermeasure to prevent this is to use a shielded cable. Assign 5 pin to be core wire and 6 pin to be ground wire if the shielded cable. Assign 5 pin to be core wire and 6 pin to be ground wire if the shielded cable is used. Refer to the following chart between the patial cross section and the cable length required.

TABLE 1-1. REMOTE CONTOROL CABLE

Model No.	Cable length and section area of individual cores	
	Less Than 50m	50 Thru. 80m
RC5-x	0.75mm^2	1.25mm^2
RC5x-x	1.25mm^2	2.00mm^2

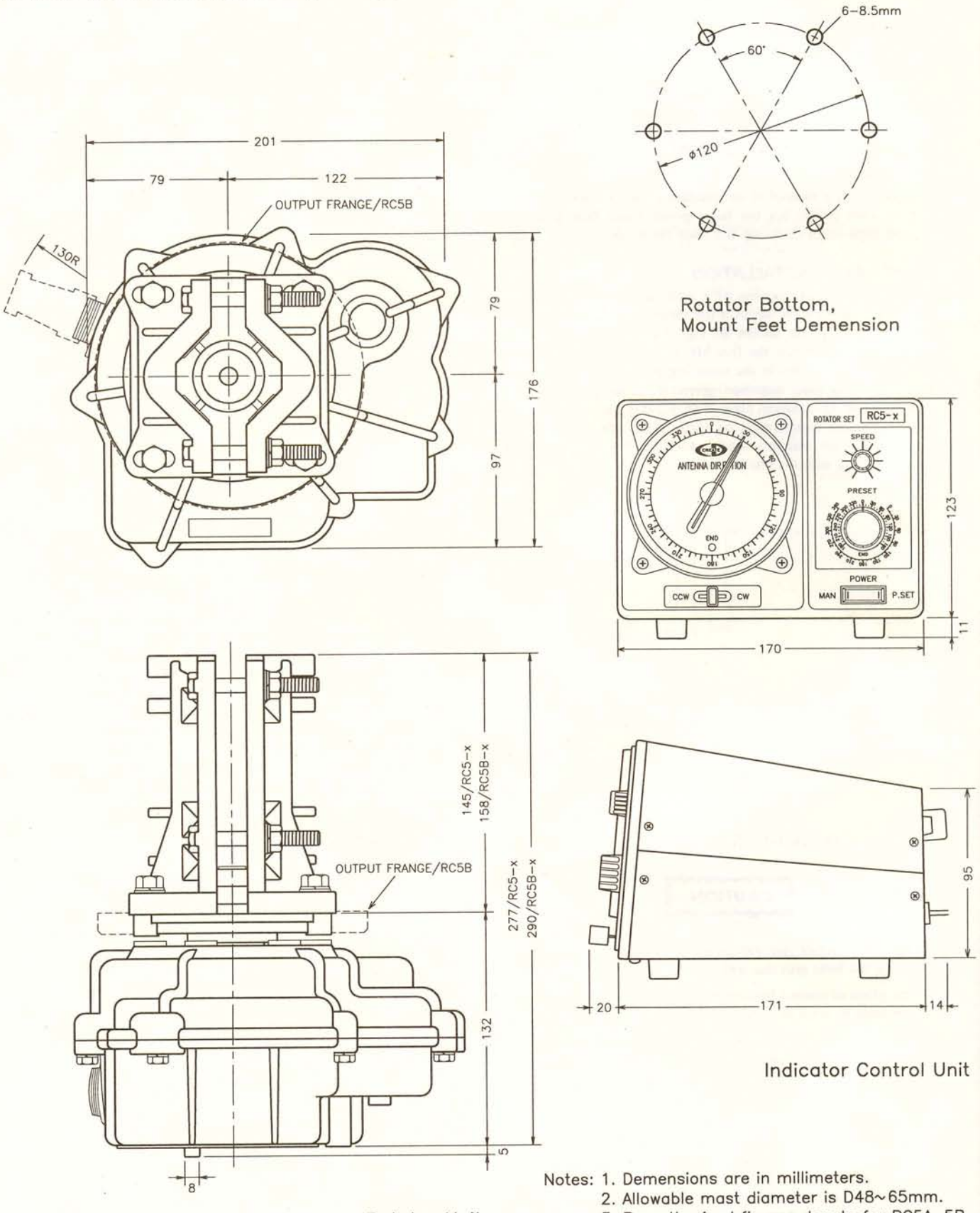
(Example of cable nomenclature: VCTF-0.5/7 means a 7-wire cable with sectional area of 0.5mm^2)

1.2.5 CABLE POSITIONING

The remote control cable linking the rotor and indicator/control units should be positionined as far as possible from the coaxial antenna cable. When transmitting at over 500W, the cables should be separated by at least 20-30cm. Locating them too close to each other can produce high-frequency interference in the indicator circuit that will cause inaccurate readings. When connecting the remote control cable to the rotor, secure it to a brace on the tower or installation fixuture close to the rotor so that its weight will not pull on the connector. Be sure to tape the fitting when connection work is complete. are also provided with a turning limit feature.

1.3 INSTALLATION DIMENSIONS

Rotor and indicator/control unit dimensions are given in Fig. 1.3.



Notes: 1. Demensions are in millimeters.
2. Allowable mast diameter is D48~65mm.
3. Parenthesized figures denote for RC5A, 5B.
4. PRESET function is equipped with only RC5x-3 models.

Figure 1-3. RC5x-x, Outline and Mounting Dimension

1.4 BOLT TIGHTENING SEQUENCE

Tightening the bolts in the wrong order when securing the rotor and the antenna mast will shorten the operating life of the rotor. Tighten them in the order indicated in Fig. 1.4. That is, begin with the mounting plate bolts, then tighten the bolts on the mast clamp, and then tighten flange bolts.

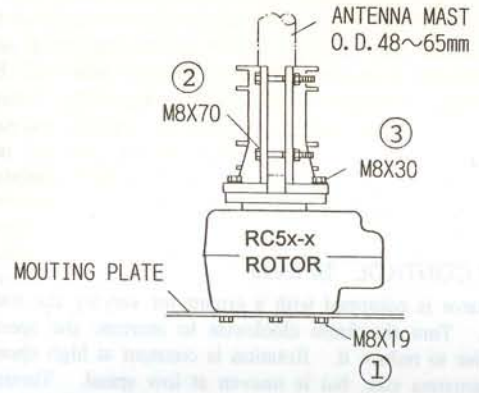


Figure 1-4. Rotor Mounting Bolts

1.5 EXAMPLE OF RC5x-x INSTALLATION

The manner in which the RC5xx is installed will affect its durability and torque. Fig. 1.5 is for installation on a typical steel tower, but the same principles apply to installation on a rooftop tower. The most important thing to keep in mind here is that the central axes of the antenna mast and rotor must be within 0.5° of each other. This is usually not much of a problem with rooftop towers, which tend to be precisely engineered. It can be a problem with large towers, though, where precision is lower and it is difficult to make structural modifications to correct for discrepancies.

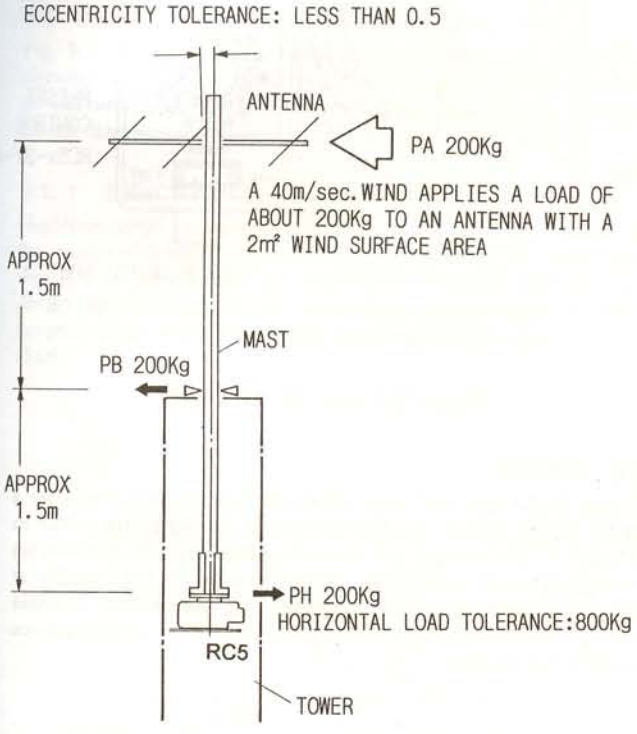


Figure 1-5. Rotor Eccentricity

Fig. 1.5 also indicates the horizontal load on an antenna with a 2m² wind surface area in a 40 m/sec. wind. Horizontal pressure on the rotor and a bearing can be reduced by increasing the distance between them. This does not affect the load on the internal gears.

1.6 MAST BEARING INSTALLATION

A bearing or similar item is usually installed at the top of an antenna tower to prevent the antenna from swaying. Such a bearing must be used for only this purpose. Using it to support any of the weight of the antenna or antenna mast would have an adverse effect on the rotor. This is not only because the rotor is more thrust-effective than the bearing but also because eccentricity arising from structural imprecision cannot be absorbed at the top of the tower and so the resultant, waste force would work on the bearing and rotor. Accordingly, the fastening bolts should not be tightenend to the point of holding the antenna mast when a standard bearing for "ham" radio antennas is used. With bearing having both top and bottom bolts, the top ones should be removed.

With an antenna having a wind surface area of greater than 2m² padding should be inserted between the bolts and the antenna mast. Do not tighten the bolts down directly onto the mast, as doing so will increase the danger of buckling in strong winds.

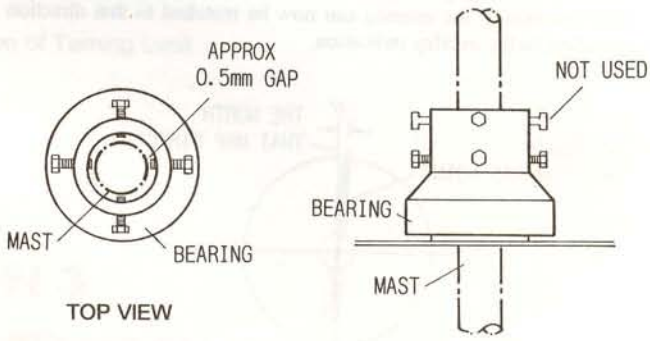


Figure 1-6. Mast Bearing Installation

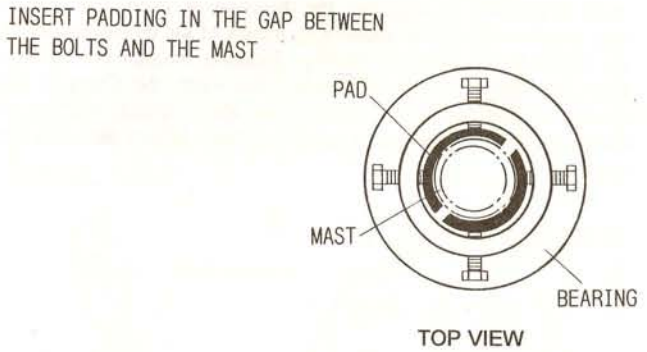


Figure 1-7. Mast Protection

1.7 PAINTING

Painting the rotor exterior and bolted joints will lengthen the life of these parts. Refer to SECTION 7 for a more detailed explanation.