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UNCLASSIFIED

TECHNICAL MANUAL
for
TRANSMITTING ANTENNA
COUPLER
MODEL TRC-20K



THE TECHNICAL MATERIEL CORPORATION
MAMARONECK, N. Y. OTTAWA, ONTARIO

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IN-526

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WARNING

Extremely high currents
exist in this equipment
when it is installed in
a transmitting system.
Observe all standard
safety procedures.



THE TECHNICAL MATERIEL CORPORATION

C O M M U N I C A T I O N S E N G I N E E R S

700 FENIMORE ROAD

MAMARONECK, N. Y.

W a r r a n t y

The Technical Materiel Corporation, hereinafter referred to as TMC, warrants the equipment (except electron tubes, fuses, lamps, batteries and articles made of glass or other fragile or other expendable materials) purchased hereunder to be free from defect in materials and workmanship under normal use and service, when used for the purposes for which the same is designed, for a period of one year from the date of delivery F.O.B. factory. TMC further warrants that the equipment will perform in a manner equal to or better than published technical specifications as amended by any additions or corrections thereto accompanying the formal equipment offer.

TMC will replace or repair any such defective items, F.O.B. factory, which may fail within the stated warranty period, PROVIDED:

1. That any claim of defect under this warranty is made within sixty (60) days after discovery thereof and that inspection by TMC, if required, indicates the validity of such claim to TMC's satisfaction.
2. That the defect is not the result of damage incurred in shipment from or to the factory.
3. That the equipment has not been altered in any way either as to design or use whether by replacement parts not supplied or approved by TMC, or otherwise.
4. That any equipment or accessories furnished but not manufactured by TMC, or not of TMC design shall be subject only to such adjustments as TMC may obtain from the supplier thereof.

Electron tubes furnished by TMC, but manufactured by others, bear only the warranty given by such other manufacturers. Electron tube warranty claims should be made directly to the manufacturer of such tubes.

TMC's obligation under this warranty is limited to the repair or replacement of defective parts with the exceptions noted above.

At TMC's option any defective part or equipment which fails within the warranty period shall be returned to TMC's factory for inspection, properly packed with shipping charges prepaid. No parts or equipment shall be returned to TMC, unless a return authorization is issued by TMC.

No warranties, express or implied, other than those specifically set forth herein shall be applicable to any equipment manufactured or furnished by TMC and the foregoing warranty shall constitute the Buyers sole right and remedy. In no event does TMC assume any liability for consequential damages, or for loss, damage or expense directly or indirectly arising from the use of TMC Products, or any inability to use them either separately or in combination with other equipment or materials or from any other cause.

PROCEDURE FOR RETURN OF MATERIAL OR EQUIPMENT

Should it be necessary to return equipment or material for repair or replacement, whether within warranty or otherwise, a return authorization must be obtained from TMC prior to shipment. The request for return authorization should include the following information:

1. Model Number of Equipment.
2. Serial Number of Equipment.
3. TMC Part Number.
4. Nature of defect or cause of failure.
5. The contract or purchase order under which equipment was delivered.

PROCEDURE FOR ORDERING REPLACEMENT PARTS

When ordering replacement parts, the following information must be included in the order as applicable:

1. Quantity Required.
2. TMC Part Number.
3. Equipment in which used by TMC or Military Model Number.
4. Brief Description of the Item.
5. The *Crystal Frequency* if the order includes crystals.

PROCEDURE IN THE EVENT OF DAMAGE INCURRED IN SHIPMENT

TMC's Warranty specifically excludes damage incurred in shipment to or from the factory. In the event equipment is received in damaged condition, the carrier should be notified immediately. Claims for such damage should be filed with the carrier involved and not with TMC.

All correspondence pertaining to Warranty Claims, return, repair, or replacement and all material or equipment returned for repair or replacement, within Warranty or otherwise, should be addressed as follows:

THE TECHNICAL MATERIEL CORPORATION
Engineering Services Department
700 Fenimore Road
Mamaroneck, New York

TABLE OF CONTENTS

<u>Paragraph</u>		<u>Page</u>
	<u>SECTION 1 - GENERAL DESCRIPTION</u>	
1-1	Purpose-----	1-1
1-2	Description-----	1-1
	<u>SECTION 2 - INSTALLATION</u>	
2-1	General-----	2-1
2-2	Unpacking-----	2-1
2-3	Installation-----	2-1
	<u>SECTION 3 - TECHNICAL SPECIFICATIONS</u>	
3-1	Technical Specifications for TRC-20K-----	3-1

LIST OF ILLUSTRATIONS

<u>Figure</u>		
	<u>SECTION 1 - GENERAL DESCRIPTION</u>	
1-1	Front View, Transmitting Antenna Coupler, TRC-20K-----	i
	<u>SECTION 2 - INSTALLATION</u>	
2-1	Installation, TRC-20K-----	2-3

LIST OF TABLES

<u>Table</u>		
	<u>SECTION 2 - INSTALLATION</u>	
2-1	Installation Data, TRC-20K-----	2-2
3-1	Technical Specifications, TRC-20K-----	3-1

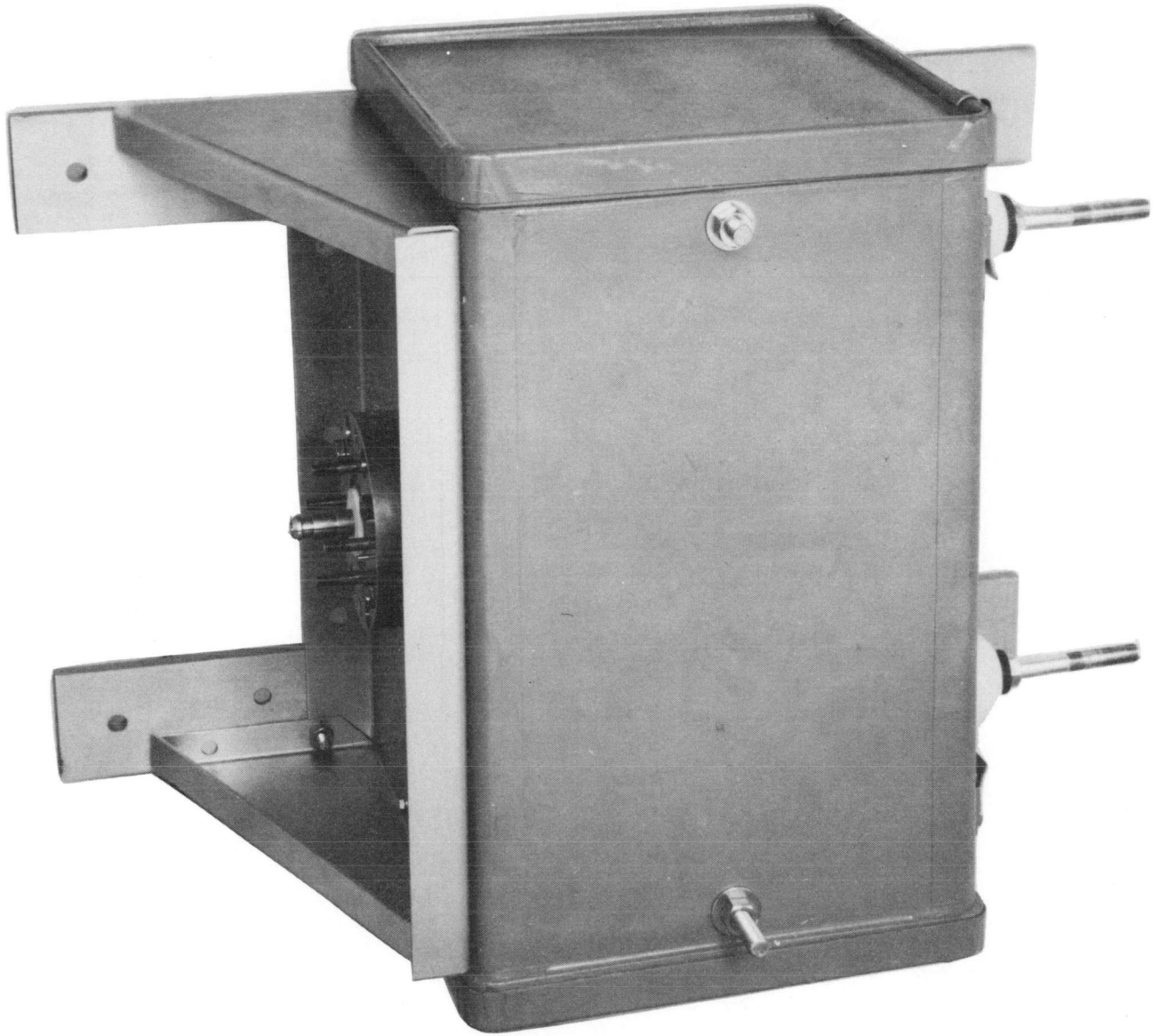


FIGURE 1-1. FRONT VIEW, TRANSMITTING ANTENNA COUPLER, TRC-20K

SECTION 1 - GENERAL DESCRIPTION

1-1 PURPOSE

The TMC Model TRC-20K Transmitting Antenna Coupler is a passive bi-directional device capable of coupling 50/70-ohm coaxial transmission lines to 600-ohm balanced lines. Use of the TRC-20K at the balanced output of a high frequency transmitter or at the input of a rhombic antenna will eliminate cumbersome open wire transmission lines and facilitate the application of coaxial switching systems. Another use of the TRC-20K is in conjunction with TMC's TER-25K Dummy Load to produce a 600-ohm balanced phantom antenna.

1-2 DESCRIPTION

The TRC-20K shown in Figure 1-1 is a broadband RF transformer that provides coupling of RF energy at 20 kw average and 40 kw peak power. Insertion loss is less than 1 db and VSWR does not exceed 2:1. The TRC-20K provides an efficient impedance match over the frequency range of 4 to 30 megacycles between 50 and 600-ohms or between 70 and 600-ohms. The transformer is hermetically sealed, potted in a special compound and encased in a rugged weatherproof fiberglass container. Standard allowable ambient operating temperatures range from -40° C to $+75^{\circ}$ C. Spark gaps provide protection against static electricity on the antenna as well as against lightning discharge. These units may be either wall or pole mounted and can be used in such isolated places as antenna fields since they require no maintenance. A wide variety of RF fittings can be provided to match any transmission system. The TRC-20K is available in two models:

50-ohms unbalanced, designated TRC-20K-50U/600B

70-ohms unbalanced, designated TRC-20K-70U/600B

SECTION 2 - INSTALLATION

2-1 GENERAL

The TRC-20K is shipped in one crate and is completely assembled at the time of delivery. Each unit has been factory tested.

2-2 UNPACKING

When the unit is uncrated it should be inspected for any damage incurred in transit. Although the carrier is liable for any damage to the equipment, TMC will assist in describing and providing for repair or replacement of damaged items.

2-3 INSTALLATION

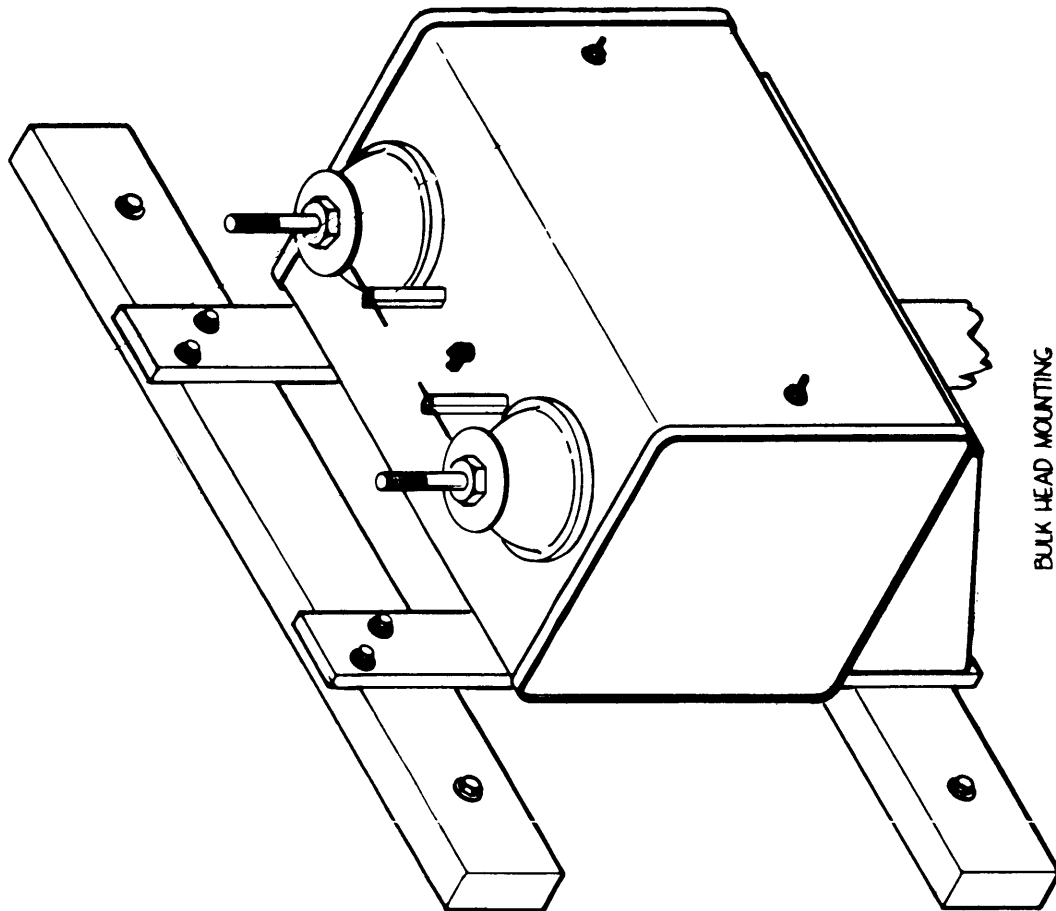
The TRC-20K may be mounted in two basic ways: pole and bulkhead. Both methods are illustrated in Figure 2-1 with complete dimensions and recommended materials. Installation data along with shipping volume and weight are presented in Table 2-1. This table also shows the different types of fittings available with the TRC-20K and the proper method of ordering these fittings.

TABLE 2-1. INSTALLATION DATA, TRC-20K

TMC MODEL NUMBER	FREQUENCY RANGE (MC)	AVERAGE POWER (WATTS)	PEAK POWER (WATTS)	HEIGHT (INCHES)	WIDTH (INCHES)	DEPTH (INCHES)	WEIGHT (LBS)	SHIPPING DATA		MTG PLATE CONNECTOR ASSEMBLIES*				
								VOLUME (CU.FT.)	WEIGHT (LBS)	(50 μ) 3-1/8 EIA FLANGE	(70 μ) 3-1/8 EIA FLANGE	AX-278 (50 μ) 3-1/8 to 1-5/8 ADAPTER	AX-279 (70 μ) 3-1/8 to 1-5/8 ADAPTER	
TRC-20K-50U/600B	4-30	20,000	40,000	20-1/2	20	14	80	16	170	0	0	X		
TRC-20K-70U/600B	4-30	20,000	40,000	20-1/2	20	14	80	16	170	0	0			X

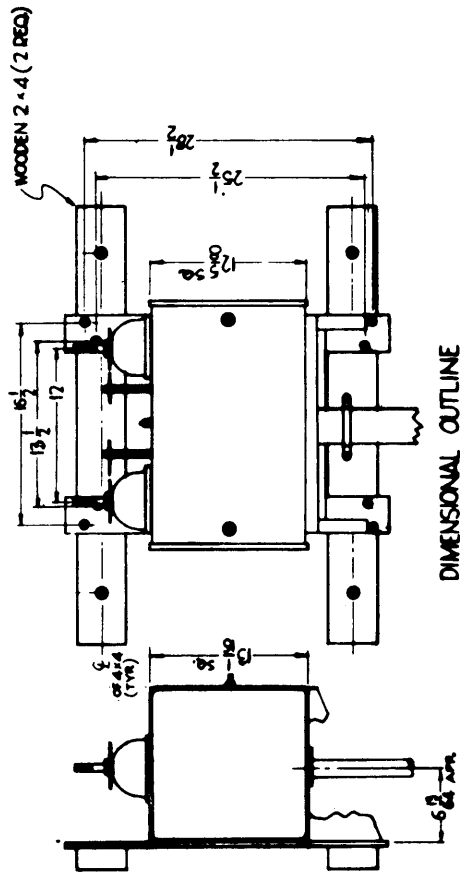
NOTES:

- *1. 0 Indicates standard mounting plate connector assembly provided.
X Indicates other fittings available.
When other fittings are desired, please use appropriate AX number.
Sample: TRC-20K-50U/600B/AX-278
- 2. Under conditions of a 64 tone voice frequency modulation, TRC-20K will operate at 100-kw PEP on a 20% duty cycle.

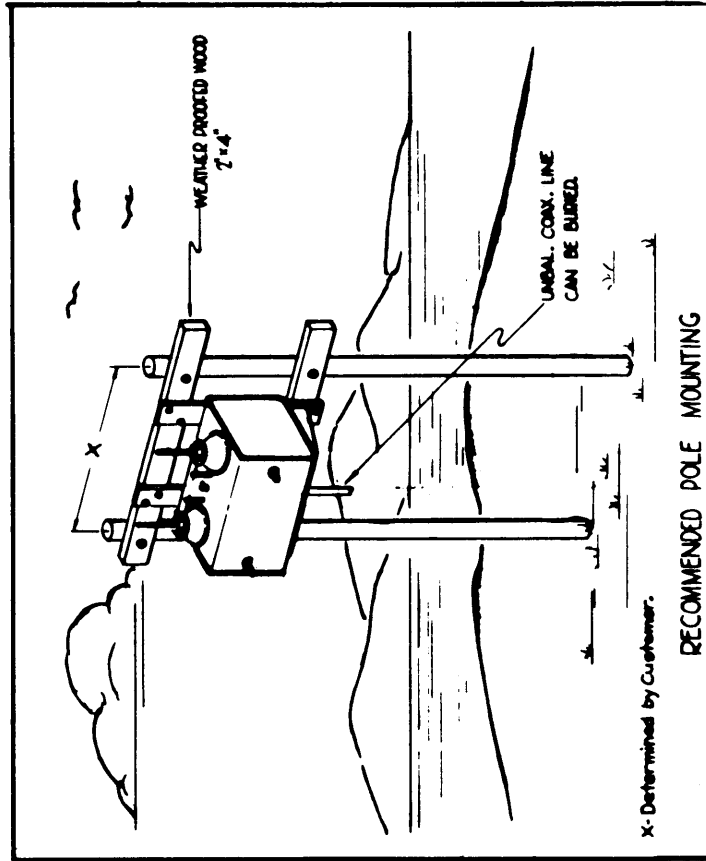


BULK HEAD MOUNTING

SUPPLIED WITH:
 (6) LAG BOLTS (SC-111)
 (6) FLAT WASHER (FN/5048M)
 2 x 4 SUPPLIED BY CUSTOMER



DIMENSIONAL OUTLINE



X- Determined by Customer.

RECOMMENDED POLE MOUNTING

FIGURE 2-1. INSTALLATION, TRC-20K

SECTION 3 - TECHNICAL SPECIFICATIONS

3-1 TECHNICAL SPECIFICATIONS FOR TRC-20K

Table 3-1 lists technical specifications to which the TRC-20K series of couplers are built.

TABLE 3-1. TECHNICAL SPECIFICATIONS, TRC-20K

ITEM	CHARACTERISTICS
FREQUENCY RANGE:	4-30 megacycles
POWER RATING:	20 kw average, 40 kw peak <u>NOTE:</u> Under conditions of a 64 tone voice frequency modulation, this TRC will operate at 100 kw PEP on a 20% duty cycle.
INSERTION LOSS:	Less than 1 db
IMPEDANCES:	50 or 60 ohms unbalanced to 600 ohms balanced (Units may be used unbalanced to balanced or vice versa.)
RF FITTINGS:	Two porcelain bowls with 1/2-inch bolts on 12 inch centers for 600-ohm balanced connection. See Table 2-1 for 50/70-ohm fittings.
MOUNTING:	See Figure 2-1.
SAFETY FEATURES:	Spark gap for protection against static charge or lightning.
INSTALLATION AND SHIPPING DATA:	See Table 2-1.
OPERATING TEMPERATURE:	-40° C to +75° C ambient
COMPONENTS AND CONSTRUCTION:	Equipment manufactured in accordance with JAN/MIL specifications wherever practicable.