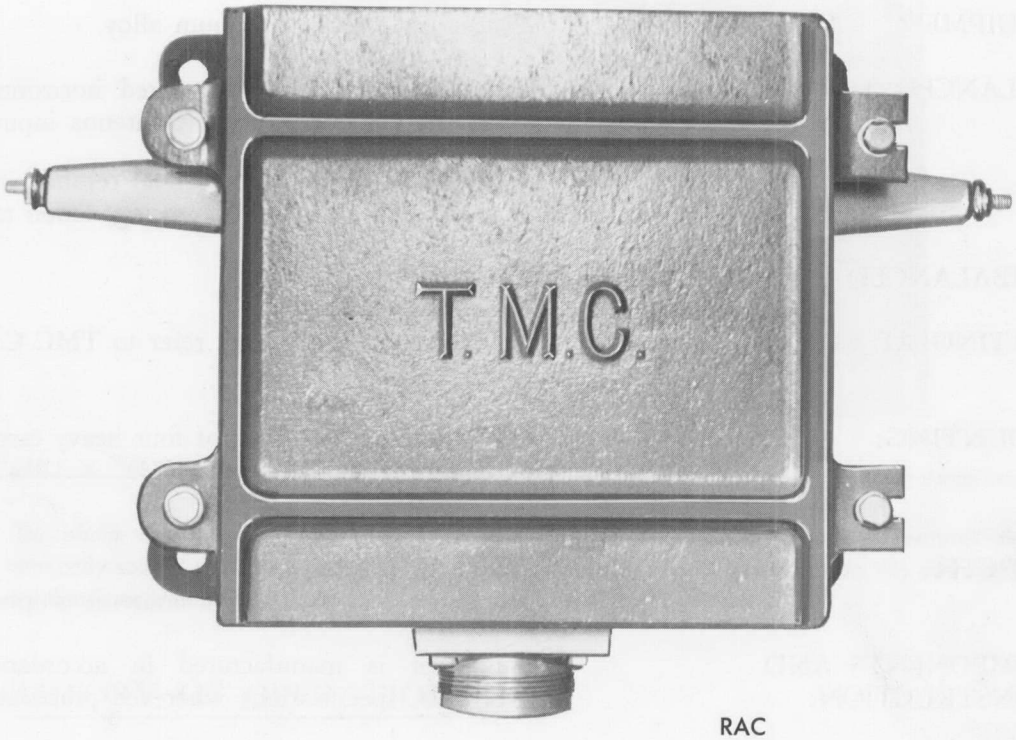
TECHNICAL BULLETIN NUMBER 8006

Rhombic Antenna Couplers, TMC Models RAC (CU-836/U)



RAC

TMC Models RAC are a series of passive receiving rhombic antenna couplers designed to provide optimum impedance matching over a wide range of frequencies between rhombic antennas and coaxial transmission lines to radio receivers.

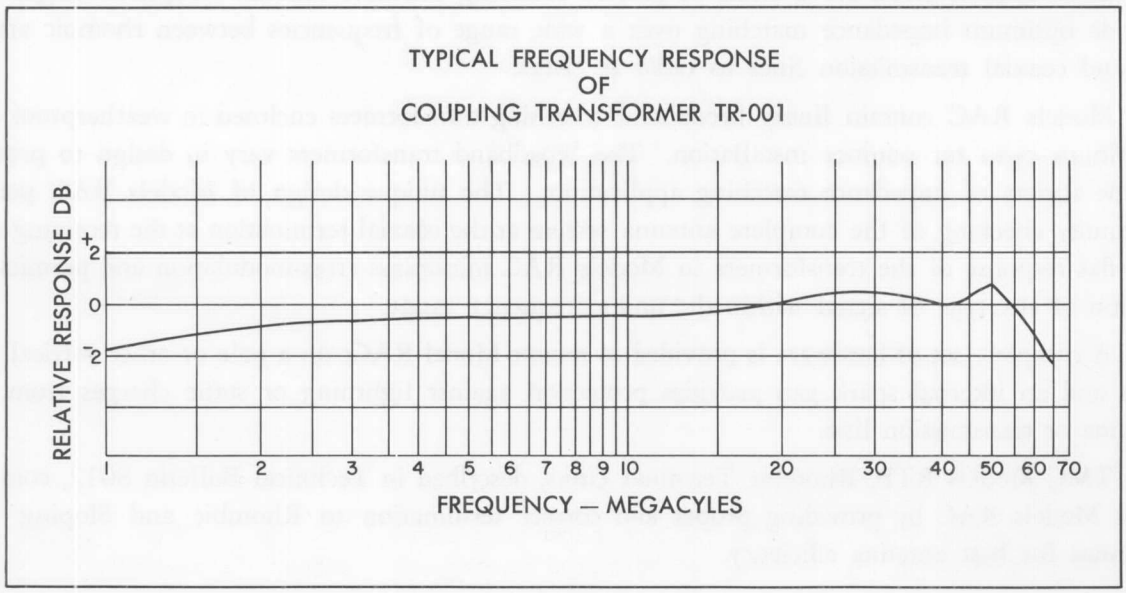
Models RAC contain linear broadband matching transformers enclosed in weatherproof cast aluminum cases for outdoor installation. The broadband transformers vary in design to provide a wide variety of impedance matching applications. The unique design of Models RAC permit continuity checking of the complete antenna system at the coaxial termination at the receiving site. The flat response of the transformers in Models RAC minimizes cross-modulation and permits reception of any type of signal within the unit's frequency range.

A complete set of hardware is provided to mount Model RACs on a pole or other vertical surfaces and an internal spark gap provides protection against lightning or static charges from the antenna or transmission line.

TMC Models RTB, Rhombic Terminal Units, described in Technical Bulletin 8012, complement Models RAC by providing proper and correct termination to Rhombic and Sloping Vee antennas for best antenna efficiency.

TECHNICAL SPECIFICATIONS

INPUT IMPEDANCE:	200 to 800 ohms balanced (see chart).
OUTPUT IMPEDANCE:	50 to 95 ohms unbalanced (see chart).
FREQUENCY RANGE:	(See Chart)
FREQUENCY RESPONSE:	Within ± 1.5 db in the frequency range.
EQUIPMENT CASE:	Weatherproof, cast aluminum alloy.
BALANCED TERMINALS:	Two ceramic insulators mounted horizontally opposite to accomodate rhombic antenna inputs. Model RAC 7A has two parallel ceramic insulators mounted vertically with 6″ spacing, center to center.
UNBALANCED TERMINALS:	See chart.
MATING RF CONNECTORS:	For mating RF connectors refer to TMC Connector Products Catalog.
MOUNTING:	Pole mounting by means of four heavy cast mounting flanges. Four ½″ holes on 7¾″ × 10¼″ mounting centers.
WEIGHT:	Net 13 lbs. Gross 16 lbs. packed for domestic shipment.
COMPONENTS AND CONSTRUCTION:	Equipment is manufactured in accordance with JAN/MIL specifications wherever practicable.



Typical Response Curve

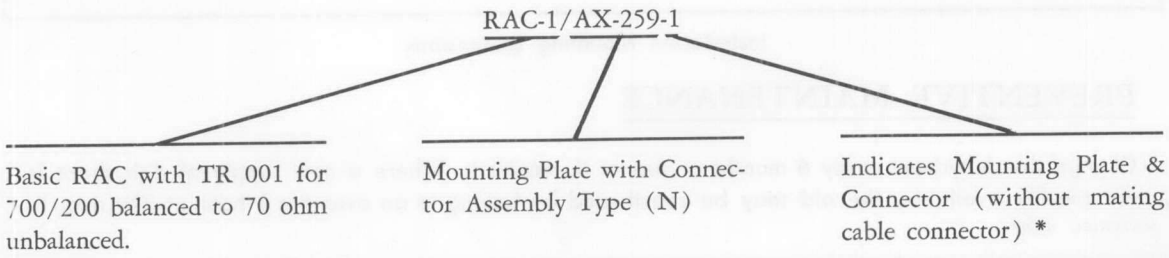
CHART I BASIC RHOMBIC ANTENNA COUPLERS

TMC Model No.	Military Nomenclature	Transformer Part No.	Frequency Range (MC/s)	Nominal Balanced Impedance (Ohms)	Unbalanced Impedance (Ohms)
RAC-1		TR-001	2 to 60	700/200	70
RAC-3		TR-048	2 to 30	700/400	95
RAC-7		TR-090	2 to 32	600/200	50
RAC-7A		TR-069	2 to 32	600	70
RAC-9		TR-034	2 to 30	500	50
RAC-11		TR-012	2 to 30	300	50
RAC-12		TR-112	2 to 30	800	50
RAC-13		TR-168	2 to 30	500	70
RAC-20†		TR-054	2 to 32	600/200	70
RAC-24		TR-032	2 to 32	600	50
RAC-30		TR-130	2 to 32	700/200	70
RAC-30A		TR-132	2 to 32	600/200	70
RAC-32	CU-836/U	TR-132	2 to 32	600/200	70
RAC-34		TR-088	4 to 15	516	75

† Antenna continuity readings not possible with this unit.

RAC-1 through RAC-24 are provided with air gap lightning protection. RAC-30 and higher are provided with hermetically sealed air gap lightning protection and plug-in fuses.

To provide flexibility for customer selection of a wide variety of RF fittings, Chart 2 is used in conjunction with Chart 1 as per the following sample:



* See Connector Products Catalog for mating cable connectors.

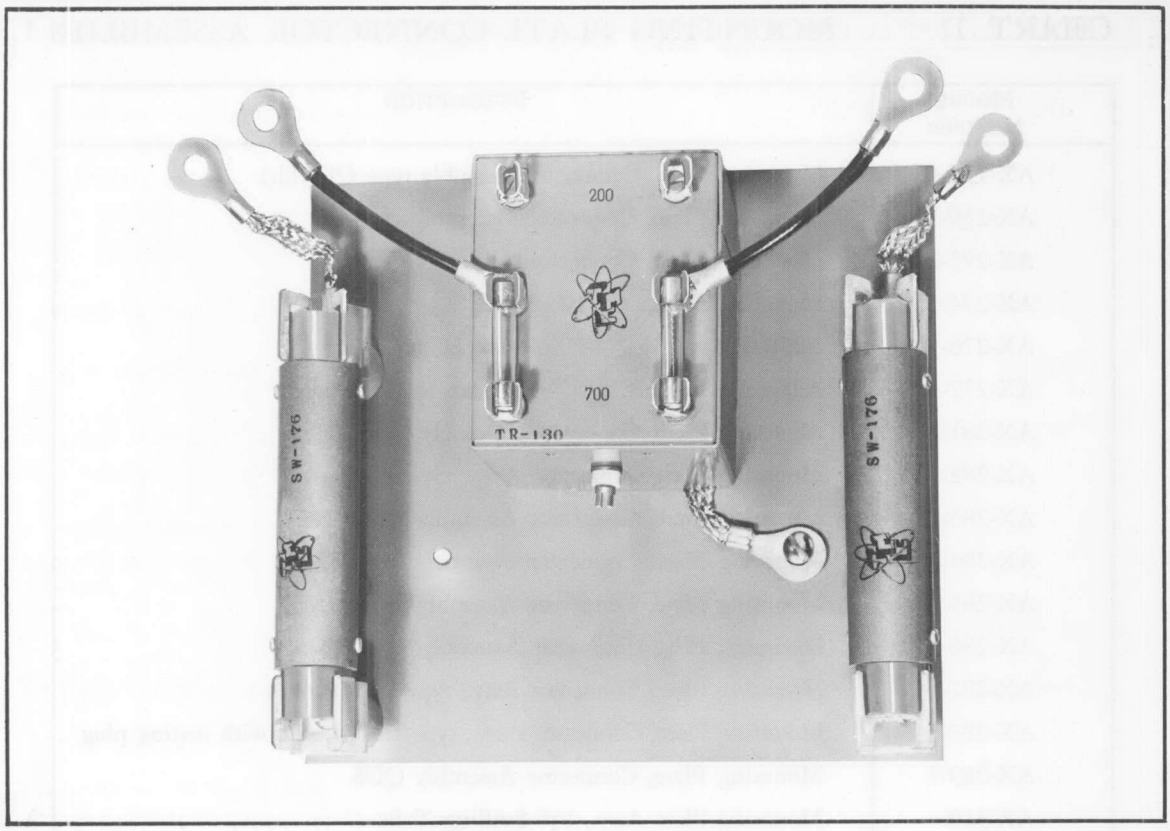
CHART II MOUNTING PLATE CONNECTOR ASSEMBLIES †

Model Number	Description
AX-256-1	Mounting Plate, Connector Assembly type UHF(L)
AX-259-1	Mounting Plate, Connector Assembly type N
AX-273-1	Mounting Plate, Connector Assembly QDL
AX-274-1	Mounting Flange for RG-85/U
AX-276-1	Adapter Assy, 3⅛"—50 ohm to LC female
AX-277-1	Adapter Assembly, 3⅛"—70 ohm to LC female
AX-281-1	Mounting Plate, Connector Assembly type UHF
AX-282-1	Mounting Plate Connector Assy., type UHF twin
AX-283-1	Mounting Plate, Connector Assembly type BN
AX-284-1	Mounting Plate, Connector Assembly type BNC
AX-285-1	Mounting Plate, Connector Assembly type HN
AX-286-1	Mounting Plate Connector Assembly, type C
AX-287-1	Mounting Plate, Connector Assy., type LC, 50 ohm
AX-287-5	Mounting Plate, Connector Assy., type LC, 70 ohm with mating plug
AX-289-1	Mounting Plate, Connector Assembly QDS
AX-310	Mounting Plate Assy., ½" Stuffing Tube
ES-ST7875	End Seal, Styroflex ⅞" 70 ohm
ES-ST5875	End Seal, Styroflex ⅞" 50 ohm

† Mounting plate and connector assemblies are priced separately.

Although the new RAC listing shown in Chart 1 eliminates some of the older RAC designations, the older models are still available with new designations as shown below.

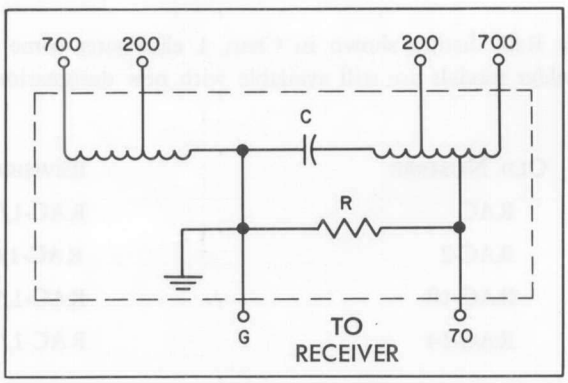
Old Number	Revised Number
RAC	RAC-1/AX-274-1
RAC-2	RAC-1/AX-259-1
RAC-10	RAC-1/AX-284-1
RAC-14	RAC-1/AX-285-1



The above illustrates the replacement sub-assembly for the RAC-30 series and features plug-in hermetically sealed gas filled lightning gaps and plug-in fuses. This sub-assembly fits into existing RAC's for those activities requiring vacuum spark gap and fuse protection.

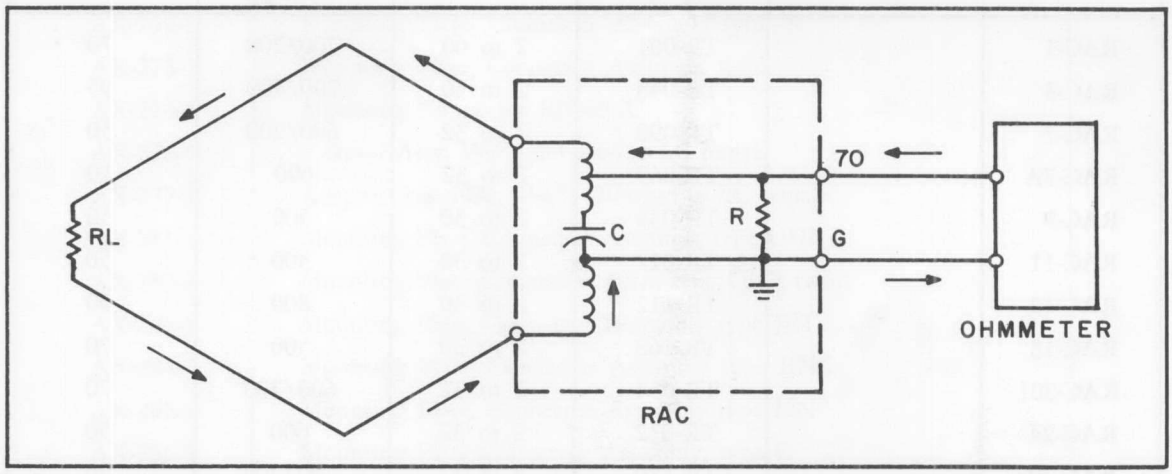
THEORY OF OPERATION

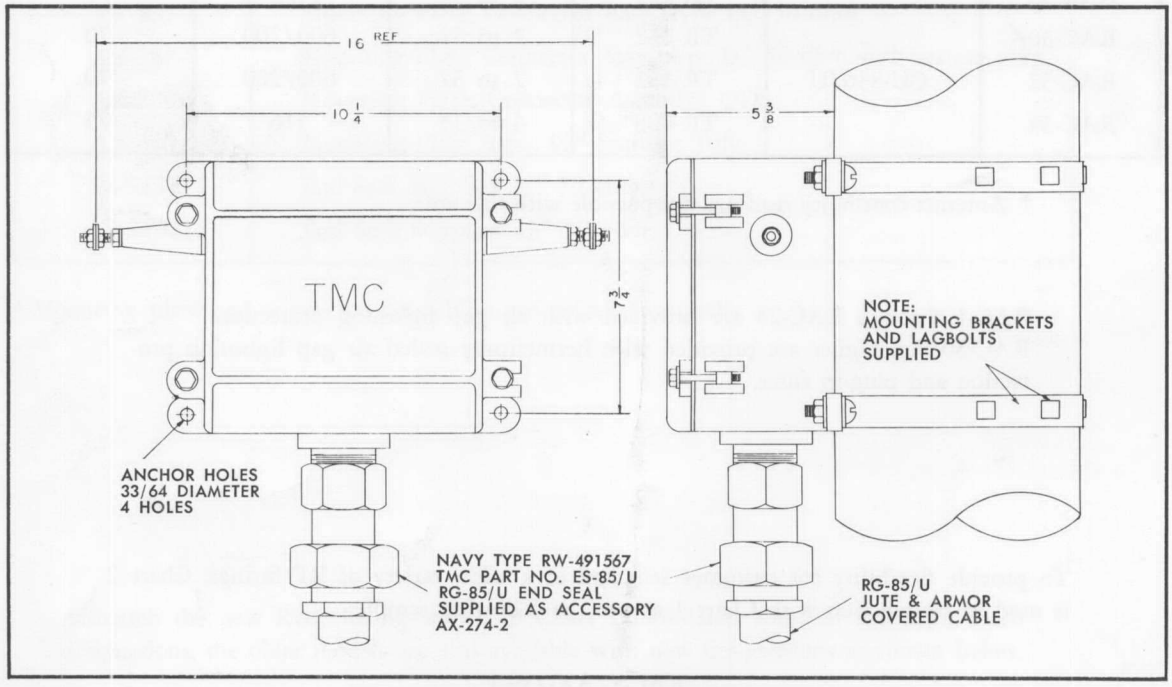
The coupler consists essentially of a broadband auto-transformer. TR001 is typical of this configuration and is shown below.



The resistor R has a value of 10,000 ohms that has a negligible effect on the 70 ohm input, but does provide an effective leakage path to ground for any static charge on the antenna.

The capacitor C connecting the halves of the transformer has a value of .05 mfd. Its reactance over the frequency range is also negligible, acting as a short circuit to radio frequencies. Its purpose is to isolate the windings for DC current to permit resistance measurements of antenna termination. Should the centertap of RL be grounded, ground should be removed before taking antenna continuity readings at the receiver coaxial fitting.





Installation Mounting Dimensions

PREVENTIVE MAINTENANCE

Change the dehydrant every 6 months or sooner if required. Where a new supply of dehydrant is not readily available, the old may be reactivated by baking in an oven for 1 hour at 220 deg. F.

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