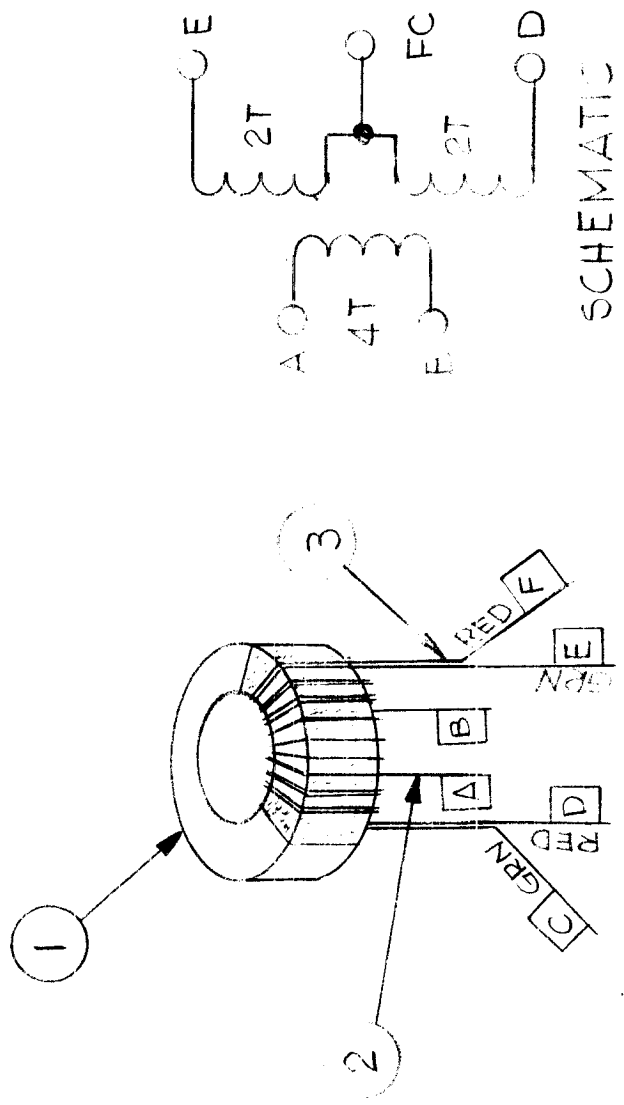


APPLICATION		REVISIONS							
QTY	MODEL USED ON	ASSY NO.	LTR	DESCRIPTION	DATE	E.M.N.O	DRAFT	CHKD	APPD
1	GPR 110-A	A5632							
1	KIT 416	A5632							



SCHEMATIC

OBBOLE USE TR 195

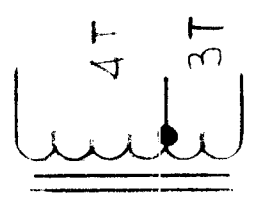
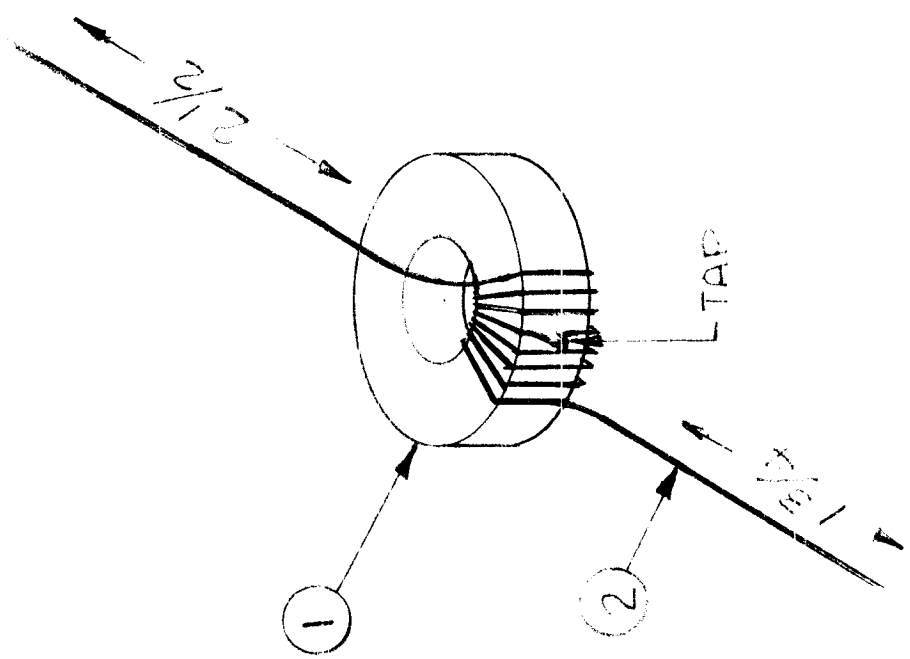
X	5	GL 130	ADHESIVE Q DOPE		
X	4	TA108-1	INS TAPE EL GL		
X	3	WI148-34-25	WIRE,ELEC MAGNET		
X	2	WI141-28	WIRE,ELEC MAGNET		
1	1	CI127-7	CORE TOROID		

REQ'D	ITEM	PART NUMBER	DESCRIPTION	SYM.
LIST OF MATERIAL				
THE TECHNICAL MATERIEL CORP. MAMARONECK, NEW YORK				
X-FMR PHASE DETECTOR				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES				
DECIMALS	FRACTIONS			
.X ± .05	1/64			
.XX ± .01	TOLS. ANGLES			
.XXX ± .005	0°-30°			
MATERIAL				
FINISH				
DRAWN GIDE 0304 4-16-76				
FINAL APPROVAL		DATE		
MECH. DES.		DATE		
ELECT. DES.		DATE		
CHECKED		DATE		

SIZE	CODE IDENT. NO.	DWG NO.	ISSUE
A	82679	TR 195	1
SCALE		SHEET	OF

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APPLICATION			REVISIONS						
QTY	MODEL USED ON	ASS'Y NO.	LTR	DESCRIPTION	DATE	E.M.N.O	DRAFT	CHKD	APPD
1	WFL-100A	A5605	Ø	ORIGINAL RELEASE FOR PROD	7/29/76	~	CL	W.P.	*
			A	ITEM CI128-4 CH. CI128-4	11/22/76	21487	KP	W.P.	*



SCHEMATIC

REQ'D	ITEM	PART NUMBER	DESCRIPTION	SYM.
X	3	BS100	SOLDER TIN ALLOY	
X	2	WI123-14	WIRE ELECT. MAGNETIC	
1	1	CI128-4	CORE TOROID	

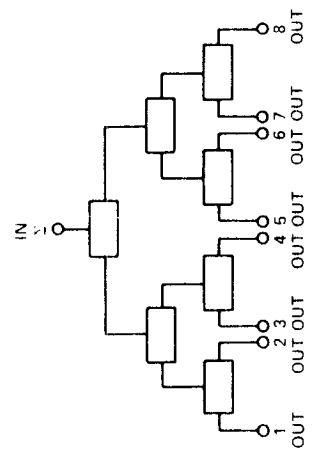
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES		LIST OF MATERIAL	
DECIMALS	FRACTIONS		
.X ± .05	1/64	FINAL APPROVAL	DATE
.XX ± .01	TOLS.	<i>[Signature]</i>	
.XXX ± .005	ANGLES	MECH. DES.	DATE
	60°-90°	ELECT. DES.	DATE
MATERIAL		CHECKED	DATE
FINISH		DRAWN	DATE
			6-23-76
		THE TECHNICAL MATERIEL CORP. MAMARONECK, NEW YORK	
		HF OUTPUT XFMR	

SIZE	CODE IDENT. NO.	DWG NO.	ISSUE
A	82679	TR	A
SCALE		SHEET	OF

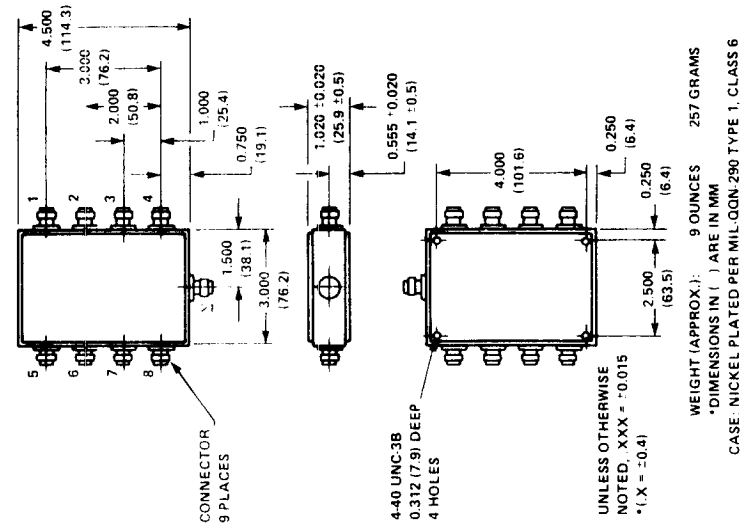
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APPLICATION			REVISIONS						
QTY	MODEL USED ON	ASSY NO.	LTR	DESCRIPTION	DATE	E.M.N.O	DRAFT	CHKD	APPD
1	MAC-2		Ø	ORIGINAL RELEASE FOR PRODUCTION	7/24/63				

### Block Diagram



### Mechanical Data



2-200MHZ  
1.5:1 VSWR  
35db Isolation

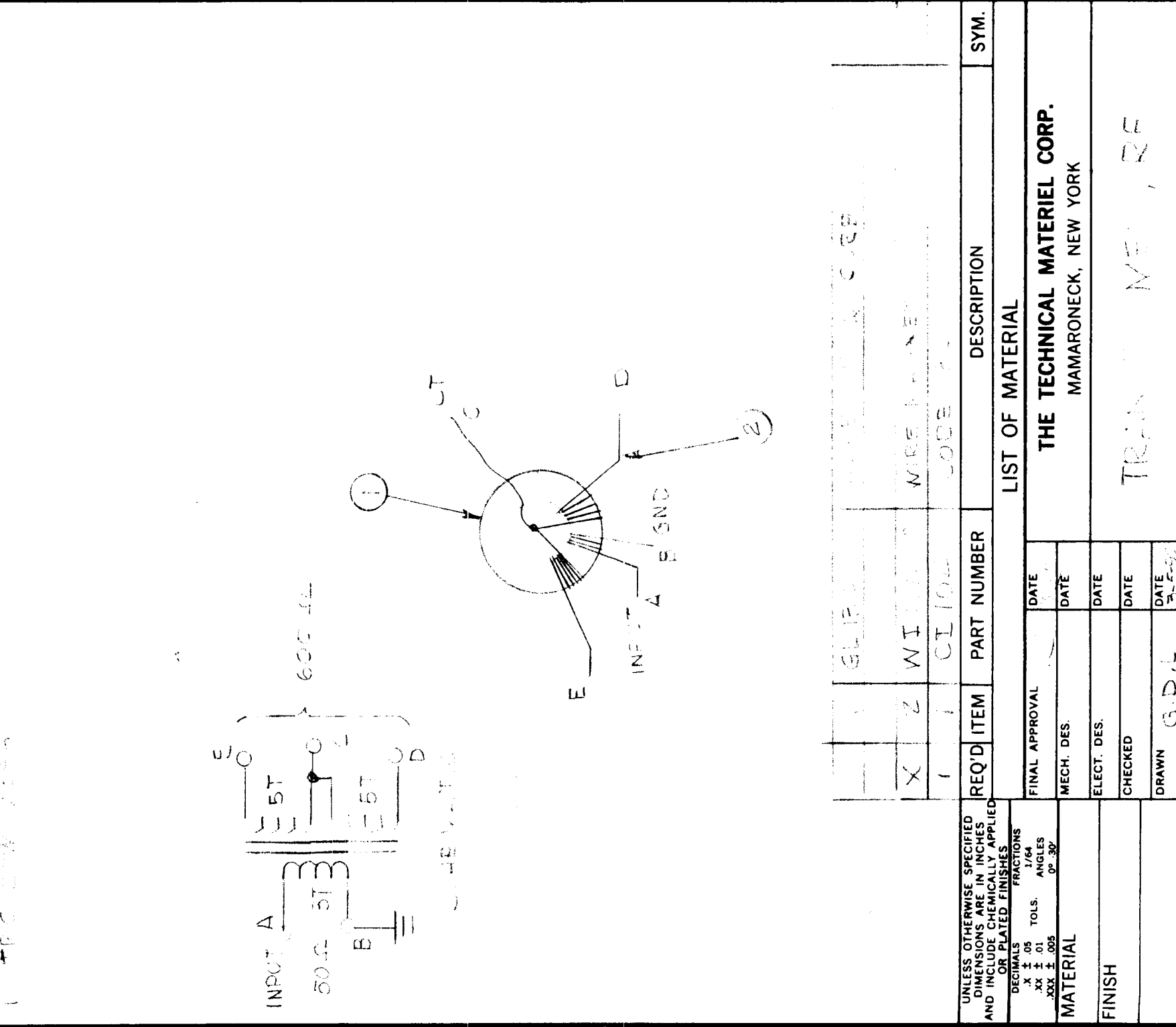
ANZAC (CAMBRIDGE MASS)  
DS-309-BNC (PART NO 8251)

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES	REQ'D ITEM	PART NUMBER	DESCRIPTION	SYM.
DECIMALS			LIST OF MATERIAL	
FRACTIONS				
.X ± .05	FINAL APPROVAL			
.XX ± .01	MECH. DES.		THE TECHNICAL MATERIEL CORP.	
.XXX ± .005	ELECT. DES.		MAMARONECK, NEW YORK	
1/64	CHECKED		POWER COMBINER	
ANGLES	DRAWN			
Ø .30				
MATERIAL				
FINISH				

SIZE	CODE IDENT. NO.	DWG NO.	ISSUE
A	82679	TR 208	Ø
SCALE		SHEET	OF

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APPLICATION		REVISIONS							
QTY	MODEL USED ON	ASSY NO.	LTR	DESCRIPTION	DATE	E.M.N.NO	DRAFT	CHKD	APPD



1	GLP	THE TECHNICAL MATERIEL CORP.
2	WI	WIRE HARNESS
1	CI 104	JOB NO. 104

REQ'D	ITEM	PART NUMBER	DESCRIPTION	SYM.
LIST OF MATERIAL				
<b>THE TECHNICAL MATERIEL CORP.</b> MAMARONECK, NEW YORK				
TRAINING MATERIAL, RE				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES				
DECIMALS	FRACTIONS			
.X ± .05	TOLS. 1/64			
.XX ± .01	ANGLES 0°-30°			
.XXX ± .005				
MATERIAL				
FINISH				
FINAL APPROVAL		DATE		
MECH. DES.		DATE		
ELECT. DES.		DATE		
CHECKED		DATE		
DRAWN		DATE		
G.D.L.		3-5-62		

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LYINGWELKING JINTECH

APPLICATION

REVISIONS

QTY	MODEL USED ON	ASS'Y NO.	LTR	DESCRIPTION	DATE	E.M.N.NO	DRAFT	CHKD	APPD
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UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
AND INCLUDE CHEMICALLY APPLIED  
OR PLATED FINISHES

DECIMALS      FRACTIONS  
.X ± .05      TOLS.      1/64  
.XX ± .01      ANGLES  
.XXX ± .003      0°-30'

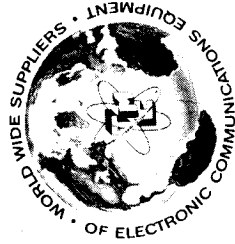
MATERIAL

FINISH

REQ'D ITEM	PART NUMBER	DESCRIPTION	SYM
LIST OF MATERIAL			
FINAL APPROVAL	DATE	THE TECHNICAL MATERIEL CORP. MAMARONECK, NEW YORK	
MECH. DES.	DATE		
ELECT. DES.	DATE		
CHECKED	DATE		
DRAWN	DATE		

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SIZE	CODE IDENT. NO.	DWG NO.	ISSU
A	82679	200	5



TO HARRY HARDGRAVE

# Vertical Receiving Antenna

## VRA Series

Product Brief 110335B

VRA-14

### ■ Multiple Operating Ranges:

VLF/LF	15 to 300kHz
LF/MF/HF	100kHz to 30MHz
LF/MF	200 to 800kHz
HF	2 to 30MHz
HF (opt)	3 to 15MHz

### ■ Broadband - No Tuning

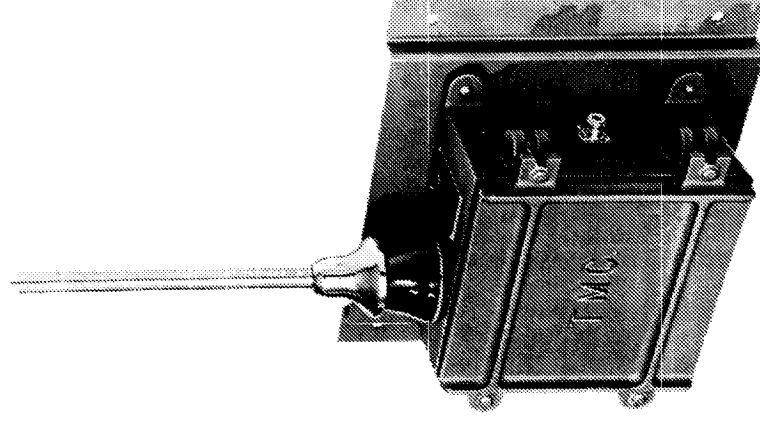
### ■ Flat Response Curve

### ■ Weatherproofed Case

### ■ Multiple Antenna Mast Types

VRA vertical receiving antennas are used in practical communication systems worldwide, whether on board ships, fixed shore stations, or land-mobile facilities. This antenna adapts extremely well to many different conditions in both military and commercial applications. It is easily installed by one individual with minimal training and can be quickly disassembled for storage in a compact "fly-away" case. One of three types of masts can be supplied to suit operating conditions: a multi-section telescoping mast made of aluminum or stainless steel tubing and a multi-section fiberglass mast. All masts are free-standing but can be equipped with anchors, guy wires and support collars for high-wind conditions. The metal masts reduce to a compact 6'-4" length for easy transport. Fiberglass models are embedded with parallel copper wires to simulate a cyclinder. Extra epoxy is added to prevent corrosion and maximize strength since these masts are free-standing and must often withstand winds up to 100mph (166km/h).

An important feature of the VRA system is the use of unbalanced RF



*VRA antenna assembly shown with a telescoping self-supporting mast that is secured to an insulator assembly on top of the weatherproof case. Fiberglass whips can also be provided. The optional rear plate, shown in bulk-head-mount position, can be re-set for base mount.*

coaxial connectors at the input. This makes it easier to install, route and switch RF paths between antenna and a terminal device such as a pre-selector, receiver or analyzer. The RF cables are often terminated on TMC series SPP switching patch panels so that changes in the RF path may be made with minimal interruption of service.

Each VRA contains a highly efficient network that compensates for any variation in impedance detected over its operating range. The typical frequency response is flat within +/-1.5dB. Field tests show that these internal networks improve the over-all electrical characteristics of

the antenna significantly. They are designed to provide an optimal match near the center of the band with less efficiency at the extreme ends of the spectrum.

The VRA antenna requires little maintenance to perform within specification over its normal service life of ten years. The broadband matching networks are individually sealed and securely anchored in rugged, weatherproof cases that are constructed of aluminum alloy to assure protection from any hostile environment. In the event of major damage, any component can easily be replaced in the field by removal of a few mounting screws.

Harry! I will design XEMR 400KHz - 5MHz THAT  
 will handle 100w with GRND'S PRI. & SEC.

**TECHNICAL SPECIFICATIONS**

Frequency Range 10KHz to 32MHz. (See models)  
 Nominal Gain +1dB except at 1/4-wave points.  
 Impedance Matches into 50 or 70 ohms nominal  
 RF Fittings See Unbalanced Connector Assemblies  
 Equipment Case All-weather cast aluminum alloy  
 Mounting Bulkhead or base mount using four heavy-duty cast mounting flanges and optional steel plate  
 Safety Feature Spark gap for protection from lightning or static discharge between antenna mast and ground  
 Case Dimensions 9H x 11.5W x 5.5D inches, 27 lbs.  
 22.9H x 29.2W x 14D cm, 12.3Kg.

**Antenna Mast/Base Weight**

/F Fiberglass 16'-0" 2.0 lbs. 35'-0" 65 lbs  
 /A Aluminum 16'-0" 2.5 32'-0" 55  
 /S Stainless Steel 16'-0" 4.0 32'-0" 85

Note: Aluminum mast is standard unless otherwise specified.

Operating Temperature -40°C to +75°C

**Replacement Transformers**

For VRA-[5][8]  
 VRA-[6][9]  
 VRA-[11][13]  
 VRA-12  
 VRA-[7][10]

**TMC#**

TR042  
 TR044  
 TR080  
 TR081  
 TR160

Model	Range	Antenna Type
VRA-5	200-800KHz	16-foot AS
VRA-6	2-32MHz	16-foot AS
VRA-7	3-15MHz	32-foot* AS
VRA-8	200-800KHz	16-foot F
VRA-9	2-32MHz	16-foot F
VRA-10	3-15MHz	35-foot* F
VRA-11	0.1-30MHz	32/35-foot* A,S,F
VRA-12	10-300KHz	32/35-foot* A,S,F
VRA-13	0.5-30MHz	32/35-foot* A,S,F

\*Separate steel base is provided; Fiberglass mast is 35-foot

**Unbalanced Connector Assembly Options:**

/BN	BN type	AX283-1
/BNC	BNC type	AX284-1
/C	C type	AX286-1
/HN	HN type	AX285-1
/ILC	LC type/50-ohm	AX287-1
/TLC	LC type/70-ohm	AX287-5
/N	N type	AX259-1
/QDS	QDS type	AX289-1
/UHF	UHF type	AX281-1
/UHF (L)	UHF (L) type	AX256-1
/RG85	RG-85U Coax Flange	AX274-1

See Connector Products Catalog for other assemblies

Specifications are subject to change without notice - Please verify with TMC before ordering.

VRA-14

400KHz - 5MHz

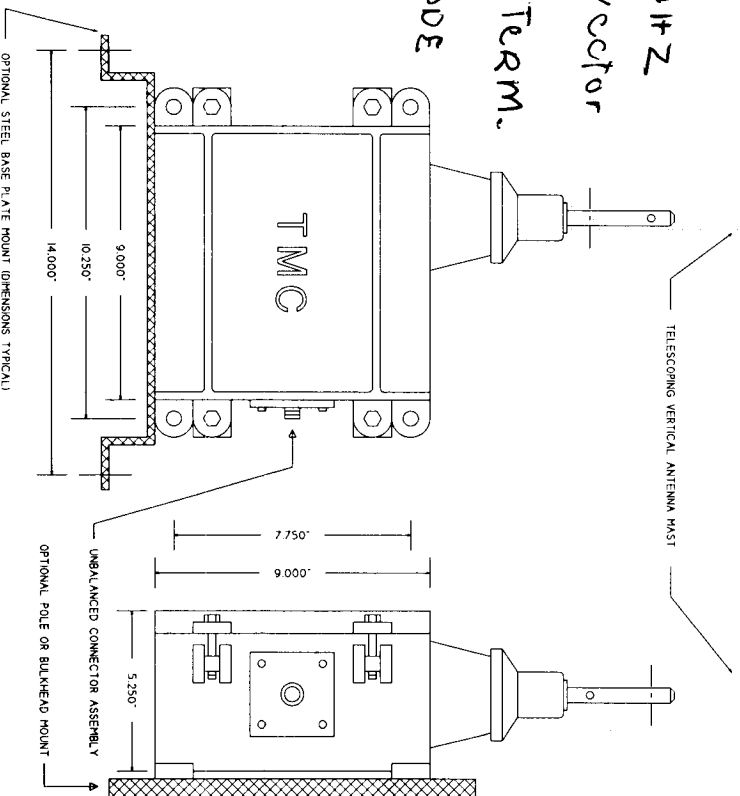
7/8 50w connector

Bowl at ANT Term.

100watt, GAS DIODE

Protected

NO ANT,



**The Technical Materiel Corporation**

Communication Products Division

700 Fenimore Road

Mamaroneck, New York 10543-2300 USA

Phone: (914) 698-4800

(800) TMC-1224

Fax: (914) 698-4805

APPLICATION		REVISIONS				ISSUE	
QTY	USED IN	ASSEMBLY NO.	DATE	BY	CHKD	APPD	

LIST OF MATERIAL

THE TECHNICAL MATERIEL CORP.

TRC 150, 180, 200, 220

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