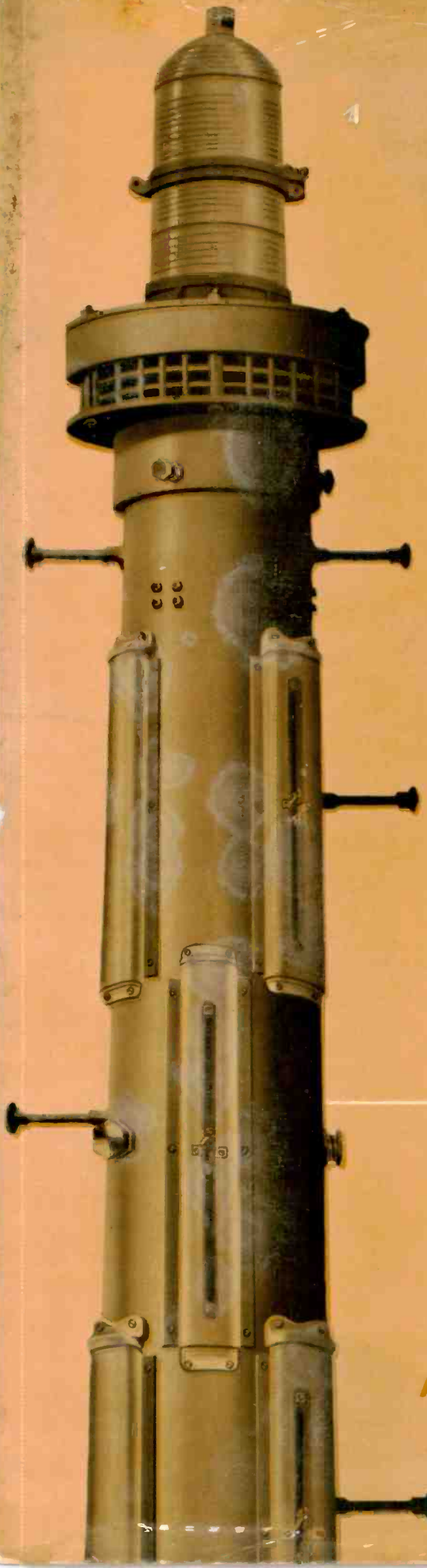

RCA 1954

BROADCAST ANTENNA EQUIPMENT

for

UHF • VHF • TELEVISION

VHF SUPERTURNSTILES
UHF PYLONS
ANTENNA ACCESSORIES

CUSTOM ANTENNAS
TOWERS
DIPLEXERS

PRICE LIST

FOR

Broadcast Antenna Equipment

PRICES EFFECTIVE AUGUST 15, 1954

Broadcast Equipment Sales
Radio Corporation of America
Engineering Products Division
Camden, N. J.

ORDERING INFORMATION

RCA broadcast equipment is sold directly to broadcast stations through the RCA Victor Division Field Sales Representatives operating out of the convenient field offices listed below. These Broadcast Specialists are available to assist you in discussing the application of broadcast equipment and related problems.

In ordering equipment, please indicate the Master Item (MI) number for each equipment. This will help us to speed the shipment to you. You will find the Master Item (MI) numbers are used to identify the equipment on the invoices and packing slips.

The Purchaser shall be responsible for all transportation charges, and shipments will normally be forwarded with shipping charges "collect." However, shipping charges can be prepaid and added to the billing invoice if your purchase order authorizes this method. We suggest that you consider the latter procedure since it eliminates the necessity of your having petty cash on hand at the time of delivery. Your purchase order should specify the method of transportation desired, otherwise RCA will use its best judgment. The cheapest method of transportation is not always used as this may not always result in the most rapid delivery. Certain items, such as vacuum tubes, are usually shipped by Express because of the design of carrying container, insurance, etc.

Field Offices

CAMDEN 2, NEW JERSEY
Woodlawn 3-8000

522 Forsyth Building
Forsyth & Luckie Streets, N.W.
ATLANTA 3, GEORGIA
Lamar 7703

2301 John Hancock Building
200 Berkeley Street
BOSTON 16, MASSACHUSETTS
Hubbard 2-1700

666 North Lake Shore Drive
CHICAGO 11, ILLINOIS
Delaware 7-0700

718 Keith Building
CLEVELAND 15, OHIO
Cherry 1-3450

1907 McKinney Avenue
DALLAS 1, TEXAS
Riverside 1371

1560 North Vine Street
HOLLYWOOD 28, CALIFORNIA
Hollywood 9-2154

340 Dierks Bldg.
1006 Grand Avenue
KANSAS CITY 6, MISSOURI
Harrison 6480

36 West 49th Street
NEW YORK 20, NEW YORK
Circle 6-4030

1355 Market Street
SAN FRANCISCO 3, CALIFORNIA
Hemlock 1-8300

2250 First Avenue, South
SEATTLE 4, WASHINGTON
Maine 8350

1625 "K" Street, N.W.
WASHINGTON 6, D. C.
District 7-1260

INDEX

Broadcast Antenna Catalog

ANTENNA EQUIPMENT

VHF ANTENNA ACCESSORIES

Cat. Page	MI NUMBER	DESCRIPTION	PRICE	REMARKS
		For Superturnstile TV Antennas:		
14	19009-B1	Sleetmelting equipment—1 bay—channels 2 & 3 (3C, 6AL, 12AL)	$350.00	Power cable from bottom sleetmelter junction box to base of tower not included.
14	19009-C1	Sleetmelting equipment—1 bay—channels 4, 5 (3D, 6BM, 12AM)	290.00	
14	19009-J1	Sleetmelting equipment—1 bay—channels 7-13 (6AH, 12AH, 12BH)	206.00	
		For Supergain TV Antennas:		
—	19009-E	Sleetmelting equipment—½ bay—channel 2	390.00	See above notes
—	10009-F	Sleetmelting equipment—½ bay—channels 3 & 4	376.00	"
—	19009-G	Sleetmelting equipment—½ bay—channels 5 & 6	338.00	"
—	19009-H	Sleetmelting equipment—½ bay—channels 7-13	277.00	"
		For Superturnstile Antennas:		
14	27325-L	Lightning protector, channels 2-3	175.00	For 3A, 3C, 5B, 6AL, 12AL
14	27325-M	Lightning protector, channels 4-6	165.00	For 3B, 3D, 4A, 5A1, 6AM, 6BM, 12AM
14	27325-H	Lightning protector, channels 7-13	155.00	For 6A, 6A1, 6AH, 12AH, 12BM
				Lightning protector incl. with all current models.

VHF SUPERTURNSTILE TV ANTENNAS

15	ES-19212-C	TF-3C	Three Section Superturnstile Antenna for channels 2 & 3 Power rating (see note) less diplexer & sleetmelters but incl. 1 MI-19010-C feedlines & accessories 1 MI-19012-C pole top section & batwings 1 MI-19042-A pole bottom section for tower mounting. Antenna assembly supervision and electrical check out on ground is included.	11,450.00	POWER RATING: CH. 2—24.6 KW CH. 3—23.1 KW
16	ES-19212-C	TF-3CP	Three Section Superturnstile Antenna for channels 2 & 3. Power rating (see note) less diplexer & sleetmelters but incl. 1 MI-19010-C feedlines & accessories 1 MI-19012-C pole top section & batwings 1 MI-19042-D pole bottom section for pedestal mounting. Antenna assembly supervision and electrical check out on ground is included.	12,450.00	POWER RATING: Same as TF-3C
17	ES-19292	TF-6AL	Six Section Superturnstile Tower Mounting Antenna for channels 2 & 3. 50 KW power rating. Less diplexer & sleetmelters but including 1 MI-19092 pole & accessories for tower mounting 1 MI-19173-(CH#) feedlines & accessories Antenna assembly supervision and electrical check out on ground is included.	30,750.00	
18	ES-19294	TF-12AL	Twelve Section Superturnstile Antenna for channels 2 & 3. 50 KW power rating, less diplexer & sleetmelters but incl. 1 MI-19094 pole & accessories for tower mounting 1 MI-19175-(CH) feed lines & accessories 1 MI-19343 combining network Antenna assembly supervision and electrical check out on ground is included.	89,500.00	
19	ES-19212-D	TF-3D	Three Section Superturnstile Antenna for channels 4, 5 & 6. Power rating (see note) less diplexer & sleetmelters but incl. 1 MI-19010-D feedlines & accessories 1 MI-19012-D pole top section & batwings 1 MI-19042-B pole bottom section for tower mounting. Antenna assembly supervision and electrical check out on ground is included.	9,800.00	POWER RATING: CH. 4—21.8 KW CH. 5—19.8 KW CH. 6—18.8 KW
20	ES-19212-D	TF-3DP	Three Section Superturnstile Antenna for channels 4, 5 & 6. Power rating (see note) less diplexer & sleetmelters but incl. 1 MI-19010-D feedlines & accessories 1 MI-19012-D junction box & feedline assembly 1 MI-19042-E pole bottom section for pedestal mounting. Antenna assembly supervision and electrical check out on ground is included.	10,800.00	POWER RATING: Same as TF-3D

Cat. Page	MI NUMBER	TYPE	DESCRIPTION	PRICE	REMARKS
			VHF SUPERTURNSTILE TV ANTENNAS . . . *continued*		
21	ES-19218 (CB)	TF-5A1	FIVE SECTION SUPERTURNSTILE ANTENNA for channels 4, 5 & 6. Rating, less diplexer & sleetmelters but including . . . . . 1 MI-19018 Superturnstile complete for tower mounting only. Antenna assembly supervision electrical check out on ground is included.	$27,000.00 (CB)	CUSTOM BUILT POWER RATING: CH. 4—21.8 KW CH. 5—19.8 KW CH. 6—18.8 KW
22	ES-19291	TF-6BM	SIX SECTION SUPERTURNSTILE TOWER MOUNTING ANTENNA for channels 4, 5 & 6. 50 KW power rating. Less Diplexer & sleetmelters but including . . . . . 1 MI-19093 pole & accessories for tower mounting 1 MI-19174-(CH#) feedlines & accessories. Antenna assembly supervision and electrical check out on ground is included.	28,000.00	
23	ES-19295	TF-12AM	TWELVE SECTION SUPERTURNSTILE ANTENNA FOR CHANNELS 4, 5 & 6. 50 KW power rating, less diplexer & sleetmelters but incl. . . . . 1 MI-19095 pole & accessories for tower mounting 1 MI-19176-(CH) feedlines & accessories 1 MI-19144 combining network Antenna assembly supervision and electrical check out on ground is included.	67,500.00	
24	ES-19213-C	TF-6AH	SIX SECTION SUPERTURNSTILE TOWER MOUNTING ANTENNA for channels 7-13. 35 KW power rating, less diplexer & sleetmelters but including . . . . . 1 MI-19011-B feedlines & accessories 1 MI-19013-B pole and accessories for tower mounting. Antenna assembly supervision and electrical check out on ground is included.	13,500.00	
25	ES-19296	TF-12AH	TWELVE SECTION SUPERTURNSTILE TOWER MOUNTING ANTENNA for channels 7-13. 50 KW power rating, less diplexer & sleetmelters but including . . . . . 1 MI-19096 pole & accessories 1 MI-19177-(CH#) feedlines & accessories 1 MI-19192-E pole butt & supports for tower mounting 1 MI-19345 combining network Antenna assembly supervision and electrical check out on ground is included.	38,500.00	
26	ES-19296-H	TF-12AH-P	TWELVE SECTION SUPERTURNSTILE PEDESTAL MOUNTING ANTENNA for channels 7-13. 50 KW power rating, less diplexer & sleetmelters, but including . . . . . 1 MI-19096 pole & accessories 1 MI-19177-(CH#) feedlines & accessories 1 MI-19192-F pole butt & supports for pedestal mounting 1 MI-19345-H combining network Antenna assembly supervision and electrical check out on ground is included.	40,500.00	
27	ES-19297	TF-12BH	TWELVE SECTION SUPERTURNSTILE TOWER MOUNTING ANTENNA for channels 7-13. 50 KW power rating less diplexer & sleetmelters, but including . . . . . 1 MI-19096 pole & accessories 1 MI-19192-E pole butt & supports for tower mounting 1 MI-27347-(CH#) feedlines & accessories 1 MI-19345 combining network Antenna assembly supervision and electrical check out on ground is included.	38,500.00	
28	ES-19297-H	TF-12BH-P	TWELVE SECTION SUPERTURNSTILE PEDESTAL MOUNTING ANTENNA for channels 7-13. 50 KW power rating, less diplexer & sleetmelters, but including . . . . . 1 MI-19096 pole & accessories 1 MI-19192-F pole butt & supports for pedestal mounting 1 MI-27347-(CH#) feedlines & accessories 1 MI-19345-H combining network Antenna assembly supervision and electrical check out on ground is included.	40,500.00	

Cat. Page	MI NUMBER	TYPE	DESCRIPTION	PRICE	REMARKS
29-36			***VHF CUSTOM ANTENNAS**		
37-52			***UHF PYLON ANTENNAS**		
53-54			***UHF HIGH GAIN ANTENNAS**		
55-61			***TELEVISION TOWERS**		
			*Because of the nature of these antennas and towers, they are custom built. Prices will be supplied on application. Consult your RCA Broadcast Sales Representative.		
			UHF ANTENNA ACCESSORIES		
52	27341-L		Sleetmelters for CH-14-30 Antennas (10" pipe)	On Appli.	
52	27341-M		Sleetmelters for CH. 31-50 Antennas (8" pipe)	On Appli.	
52	27341-H		Sleetmelters for CH. 51-83 Antennas (6" pipe)	On Appli.	
46	19397		Pedestal for Adapting all Antennas to Steel FM Pylon	Later	
			DIPLEXERS		
64	19390-CH(2-6)		10KW Bridge Diplexer ceiling mounted channel 2-6	$500.00	Specify Channel
64	19390-CH(7-13)		10KW Bridge Diplexer ceiling mounted channel 7-13	475.00	Specify Channel
65	19391-CH(2-6)		25KW Bridge Diplexer ceiling mounted channel 2-6	1,150.00	Specify Channel
66	19394-CH(7-13)		50KW Bridge Diplexer ceiling mounted channel 7-13	1,000.00	Specify Channel
66	19313-10		Inner Adapter for MI-19313 Coaxial Line	2.10	
66	19113-8		Straight Coupling	12.75	
66	19314-13		Reducer, 6⅛" to MI-19113 Coaxial Line	123.00	
66	19313-13		Reducer, 6⅛" to MI-19313 Coaxial Line	115.00	
			RF LOAD & WATTMETERS		
68	19196 L/H*		300-1200 Watt RF Load & Wattmeter for VHF Transmitter up to 2 KW picture rating. This load is air cooled. Equipped with flexible cable & unflanged fitting for 1⅝" 51.5 OHM Line	800.00	
68	19197		1200 Watt RF Load & Wattmeter for UHF Transmitter up to 2 KW peak picture. This load is air cooled. Equipped with flanged fitting for 3⅛" 50 OHM Line	800.00	
68	19024-A		3 to 5 KW RF Load & Wattmeter for VHF Transmitters CH 2-13 water cooled equipped with flexible cable and unflanged fitting for 1⅝" 51.5 OHM Line	850.00	
69	19199 L/H*		6 KW RF Load & Wattmeter for VHF Transmitters up to 10 KW picture power. Equipped with 3⅛" 51.5 OHM unflanged fitting	1,375.00	
	19398		Water saver for MI-19199 RF load	142.00	
69	19198-A		10 KW RF Load & Wattmeter for UHF Transmitters up to 16.5 KW picture. Equipped with 3⅛" flanged 50 OHM flanged fitting	2,750.00	
69	19193 L/H*		25 KW RF Load & Wattmeter for VHF Transmitters up to 40 KW picture rating. Equipped with 3⅛" unflanged 51.5 OHM fitting	3,385.00	
70	19191 L/H*		50 KW RF Load & Wattmeter for VHF Transmitters up to 84 KW picture power. Equipped with 6⅛" unflanged 51.5 OHM fitting	5,950.00	
			*Specify (-L) for Ch 2-6 and (-H) for Ch 7-13 Operation		

BROADCAST EQUIPMENT SALES POLICY

FOREWORD

The present statement sets forth basic conditions under which RCA sells broadcast equipment as described in our catalog, and notes certain supplemental information. This statement does not apply to the sale of tubes or sound film recording equipment, for which separate standard sales and lease policies are in effect.

RCA broadcast equipment is sold directly through RCA Regional representatives, who are familiar with broadcast equipment and related problems.

CONTRACT PROCEDURE

All sales based on orders for transmitters, antennas and custom built or special apparatus and on orders over $5,000 are made in accordance with the conditions of the RCA Standard Proposal Form for the sale of broadcast equipment and with any agreement stipulated thereon for individual customers.

PRICES

RCA broadcast equipment domestic prices are net f.o.b. factory or warehouse, which is Camden, New Jersey, for most items. These prices do not include any federal, state or local taxes based upon use or measured by sale or use and unless otherwise noted do not include federal excise tax. Any such taxes in effect at the time of shipment will be billed separately or will be included in the prices when required and will be due and payable upon delivery.

RCA's prices do not include installation or installation supervision unless specifically mentioned in a written condition or proposal. Purchaser assumes responsibility for installation and operation of the equipment as well as for obtaining all necessary licenses, permits, etc.

NOTE: The service of factory trained personnel who are specialists in the supervision of the installation of broadcast equipment and its maintenance and repair may be obtained through an order placed with the RCA Service Company, Inc. It is recommended that the advantages of this service be considered at the time of purchase of any major broadcast equipment.

In the case of orders under the Standard Proposal Form the billing prices are based on those prices effective at the date of the order to the extent indicated in the final contract. In the case of orders not under the Standard Proposal Form the billing prices are those prices in effect on the date of shipment.

RCA endeavors to keep its published prices current; however, all published prices are subject to change without notice.

Prices for items marked with a symbol (e) in the price column are estimates only and are subject to adjustment to those in effect on the date of shipment.

In the event the estimated prices quoted herein are exceeded by more than 10% and the billing price cannot be established by mutual agreement prior to shipment, such items may be cancelled without liability to RCA or Purchaser by either party giving written notice to the other.

PAYMENT

Terms of payment are subject to approval of RCA's Credit Department at Camden, New Jersey.

DELIVERY

RCA's delivery of broadcast equipment will be f.o.b. factory or warehouse, which is Camden, New Jersey for most items. The Purchaser shall be responsible for all transportation charges, and shipments will normally be forwarded with shipping charges "collect". As an accommodation, when specifically requested to do so by the Purchaser's order, RCA will prepay transportation charges and invoice them to the Purchaser as a separate item.

Delivery will be made to a carrier specified by the Purchaser, unless none is specified, in which event it will be to a common carrier selected by RCA. In the absence of specific routing instructions from the purchaser, RCA's judgment with respect to the selection of a route will be final.

As a special service with respect to shipments overland, by inland waterways or by air we carry All Risk Transportation Insurance for the benefit of our Broadcast Equipment customers, and your interests will be amply protected in all shipments of equipment while in transit by the methods indicated above, at no additional expense to you, provided that you inspect all shipments upon receipt and report any shortages or damages at once, in writing, to the carrier and to RCA.

RCA will endeavor to meet delivery schedules but it assumes no liability for damages of whatever kind for delays in delivery. No delays in delivery shall relieve the purchaser of his obligation of performance.

PATENT LICENSES

RCA broadcast equipment is licensed for radio telephone or television broadcast transmission under United States patents owned by RCA or under United States patents under which RCA is licensed.

PATENT PROTECTION

RCA, at its own expense, will defend any suit which may be brought against purchaser for infringement of United States patents by the equipment furnished when sold or used for radio telephone or television broadcast transmission, and in any such suit will satisfy any final award for such infringement. This is upon the condition that purchaser gives RCA prompt notice of such suit and full right and opportunity to conduct the defense thereof, together with full information and all reasonable cooperation, and upon the further condition that the claimed infringement does not result from the combination of the equipment furnished with other equipment, apparatus, or devices not furnished by RCA. No costs or expenses shall be incurred for the account of RCA without its written consent. If purchaser's sale or use of such equipment for radio telephone or television broadcast transmission shall be prevented by permanent injunction, RCA shall substitute for the infringing equipment or parts other equally suitable equipment or parts, or at RCA's option obtain for purchoser the right to sell or continue the use of such equipment, or at RCA's option take back such equipment and refund any sums purchaser has paid RCA therefor, less a reasonable amount for use, damage and obsolescence.

WARRANTY

Except for electronic tubes, which bear their own warranty which accompanies them at the time of their sale, RCA warrants its broadcast equipment to be free from defects in material and workmanship under normal use and service for a period of one year from the date of delivery. RCA's obligations under this warranty are limited to the repair or replacement of defective parts and the shipment of such repaired or replacement parts to the purchaser f.a.b. factary. Equipment furnished by RCA but listed as manufactured by another bears only the warranty given by such other manufacturer. No warranties other than those set forth herein are given or are to be implied with respect to broadcast equipment. In no event is RCA liable for consequential damages.

REPAIRED AND RETURNED APPARATUS

Before an apparatus is returned to RCA for repairs or adjustments shipping instructions and an identifying number should be obtained from the nearest RCA Regional Office. RCA assumes no responsibility for unauthorized returns.

EQUIPMENT MODIFICATIONS AND WITHDRAWALS

RCA reserves the right to make, without notice, modifications of the equipment described in this catalog without affecting its right to sell such equipment under orders based on the catalog description, provided, however, that the modifications shall not materially affect performance. These modifications of equipment may be made by RCA or its suppliers from time to time for reasons such as improvement in performance, simplification in design, or availability of material. RCA also reserves the right to withdraw from sale, without notice, any equipment described in our catalog.

ACCEPTANCE OF ORDER

No order shall be binding upon RCA until accepted by it in writing at Camden, New Jersey, and the banking, negotiation or other use of the down payment shall not constitute an acceptance by RCA. Orders received by Regional Offices will be forwarded promptly to RCA's Camden office.

Form 2J 2432

Printed in U.S.A.

BROADCAST ANTENNA EQUIPMENT CATALOG

for UHF and VHF TELEVISION

BROADCAST EQUIPMENT SECTION

RADIO CORPORATION OF AMERICA

Engineering Products Division — Camden, N. J.

2J8976

ABOUT THIS CATALOG

This Catalog is devoted solely to information on RCA Television Antenna equipment designed especially for broadcast station use. Other RCA Broadcast Equipment Catalogs contain similar information on TV, AM and FM Transmitters, Transmission Line, Test Equipment, Audio Equipment and Video Equipment.

The information contained in this catalog is intended to serve as a buying guide for the users of this type of equipment. In the belief that broadcast engineers want facts, rather than generalities, the content has purposely been kept brief and factual. Readers who desire more information or individual bulletins on particular equipment items are invited to write to the RCA Broadcast Representative in the RCA Regional Office nearest them (see opposite page).

FAMILY OF 3 CATALOGS ON TRANSMITTING SYSTEMS

For complete information on all of the equipment required to plan an RCA "Matched Television System" from transmitter to antenna, the Broadcaster should use this catalog and two others—"Television Transmitting Equipment" and "Transmission Line Equipment." Their family color and appearance keys them as a related group. Every transmitting component from the smallest to the largest is listed and described. System layouts, photographs, outline dimensions of components, specifications, curves, charts and detailed data are all included.

OTHER RCA TECHNICAL PRODUCTS

The RCA equipment described in this catalog is specifically designed for broadcast station use. In similar manner RCA builds electronic equipment for many other industries. These include: a complete line of equipment for theatres; optical and magnetic film recording equipment; sound systems of all types; 16mm projectors and magnetic recorders; high-fidelity components for home music systems; industrial inspection equipment; scientific equipment, such as the electron microscope; industrial television systems; intercoms; tape recorders; TV Eye; Antenaplex systems; and many types of custom-built equipment for industry and the military services. Information, and catalogs or bulletins, describing these may be obtained from RCA Regional Offices.

HOW TO ORDER

The RCA Broadcast Antenna Equipment shown in this catalog is sold directly through RCA Broadcast Representatives, who are familiar with broadcast equipment and related problems. One or more of these RCA Representatives are located in each of the RCA Regional Offices listed below.

Orders for equipment shown in this catalog, or requests for additional information, should be directed to the nearest one of these offices. Complete information on the conditions under which RCA sells broadcast equipment is given on the following page.

PRICES

The prices of the various equipment units shown in this catalog are given in a separate price list. Prices are listed in the order in which they are shown in the catalog. To determine the price of any equipment first note the page on which it is shown in the catalog, then consult the price list in accordance with this page number. Equipments are identified by type and MI (Master Item) numbers which are used to identify apparatus on invoices and packing slips.

YOU CAN LOCATE YOUR NEAREST RCA REPRESENTATIVE FROM THIS LIST

REGIONAL OFFICES

36 West 49th Street
NEW YORK 20, NEW YORK
Circle 6-4030

•

1907-11 McKinney Avenue
DALLAS 1, TEXAS
Riverside 1371

•

718 Keith Building
CLEVELAND 15, OHIO
Cherry 1-3450

•

2301 John Hancock Building
200 Berkeley Street
BOSTON 16, MASSACHUSETTS
Hubbard 2-1700

522-533 Forsyth Building
Forsyth and Luckie Streets, N.W.
ATLANTA 3, GEORGIA
Lamar 7703

•

340 Dierks Building
1006 Grand Avenue
KANSAS CITY 6, MISSOURI
Harrison 6480

•

1560 North Vine Street
HOLLYWOOD 28, CALIFORNIA
Hollywood 9-2154

1355 Market Street
SAN FRANCISCO 3, CALIFORNIA
Hemlock 1-8300

•

666 North Lake Shore Drive
CHICAGO 11, ILLINOIS
Delaware 7-0700

•

1625 K Street, N.W.
WASHINGTON 6, D. C.
District 7-1260

•

2250 1st Avenue, South
SEATTLE 4, WASHINGTON
Maine 8350

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Delivery will be made to a carrier specified by the Purchaser, unless none is specified, in which event it will be to common carrier selected by RCA. In the absence of specific routing instructions from the purchaser, RCA's judgment with respect to the selection of a route will be final.

As a special service with respect to shipments overland, by inland waterways or by air we carry All Risk Transportation Insurance for the benefit of our Broadcast Equipment customers, and your interests will be amply protected in all shipments of equipment while in transit by the methods indicated above, at no additional expense to you, provided that you inspect all shipments upon receipt and report any shortages or damages at once, in writing, to the carrier and to RCA.
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Except for electronic tubes, which bear their own warranty which accompanies them at the time of their sale, RCA warrants its broadcast equipment to be free from defects in material and workmanship under normal use and service for a period of one year from the date of delivery. RCA's obligations under this warranty are limited to the repair or replacement of defective parts and the shipment of such repaired or replacement parts to the purchaser f.o.b. factary. Equipment furnished by RCA but listed as manufactured by another bears only the warranty given by such other manufacturer. No warranties other than those set forth herein are given or are to be implied with respect to broadcast equipment. In no event is RCA liable for consequential damages.

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Before an apparatus is returned to RCA for repairs or adjustments shipping instructions and an identifying number should be obtained fram the nearest RCA Regional Office. RCA assumes no responsibility for unauthorized returns.

EQUIPMENT MODIFICATIONS AND WITHDRAWALS

RCA reserves the right to make, without notice, modifications of the equipment described in this catalog without affecting its right to sell such equipment under orders based on the catalog description, provided, however, that the modifications shall not materially affect performance. These modifications of equipment may be made by RCA ar its suppliers from time to time for reasons such as improvement in performance, simplification in design, or availability of material. RCA also reserves the right to withdraw from sale, without notice, any equipment described in our catalog.

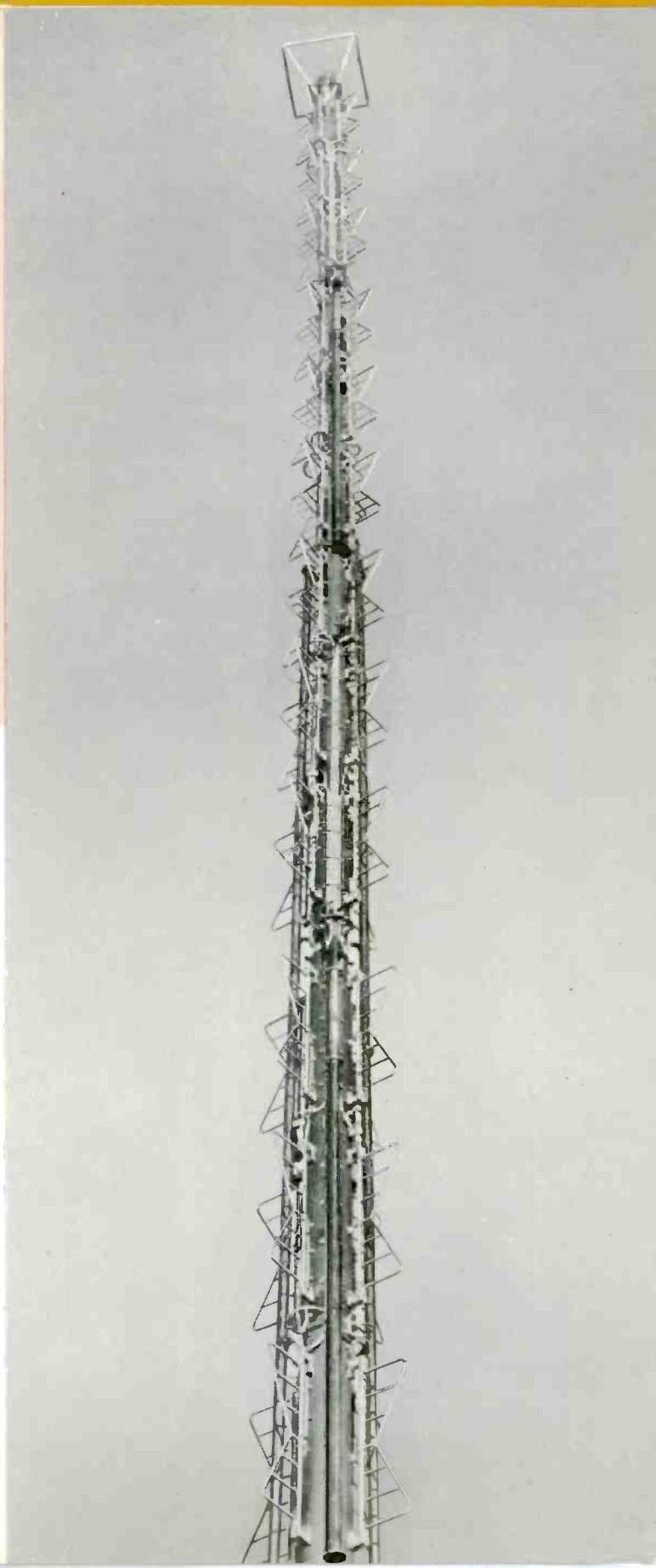
ACCEPTANCE OF ORDER

No order shall be binding upon RCA until accepted by it in writing at Camden, New Jersey, and the banking, negotiation or other use of the down payment shall not constitute an acceptance by RCA. Orders received by Regianal Offices will be forwarded promptly to RCA's Camden office.

VHF SUPERTURNSTILE ANTENNAS

FEATURES

- Complete line of antennas for gains of 3 to 12 and TV powers up to 50 kw
- High gains available for all channels
- 50 kw antennas for high power
- Tailored vertical patterns for high gain antennas
- Stacking for "community" operation
- Adjustable beam tilting puts signal where it counts
- Versatile feed system permits optimum "power-split" for more uniform coverage
- Rugged mechanical construction
- Radiators attached directly to steel pole (top and bottom)—no weight supported by insulators
- Grounded for lightning protection
- Superturnstile is type employed by majority of present day VHF stations



USES

RCA Superturnstile Antennas are designed for operation on TV channels 2-13. The Superturnstile radiates well in all directions and provides power gains up to 12. These antennas together with RCA Transmitters make possible effective radiated powers up to 600 kw. Because of its high gain, exceptional coverage, and rugged construction, the Superturnstile has become the standard antenna of "present-day" television.

Superturnstile Antennas are available for use by the television broadcaster in a variety of ratings. For example 3- and 6-section antennas are available with power ratings up to 20 kw and RCA's high power Superturnstiles are available in 6- and 12-sections with power ratings of 50 kw.

Special vertical pattern shaping is provided in the high gain antennas for uniform close-in coverage—and adjustable beam tilting yields stronger signals in a desired segment or location.

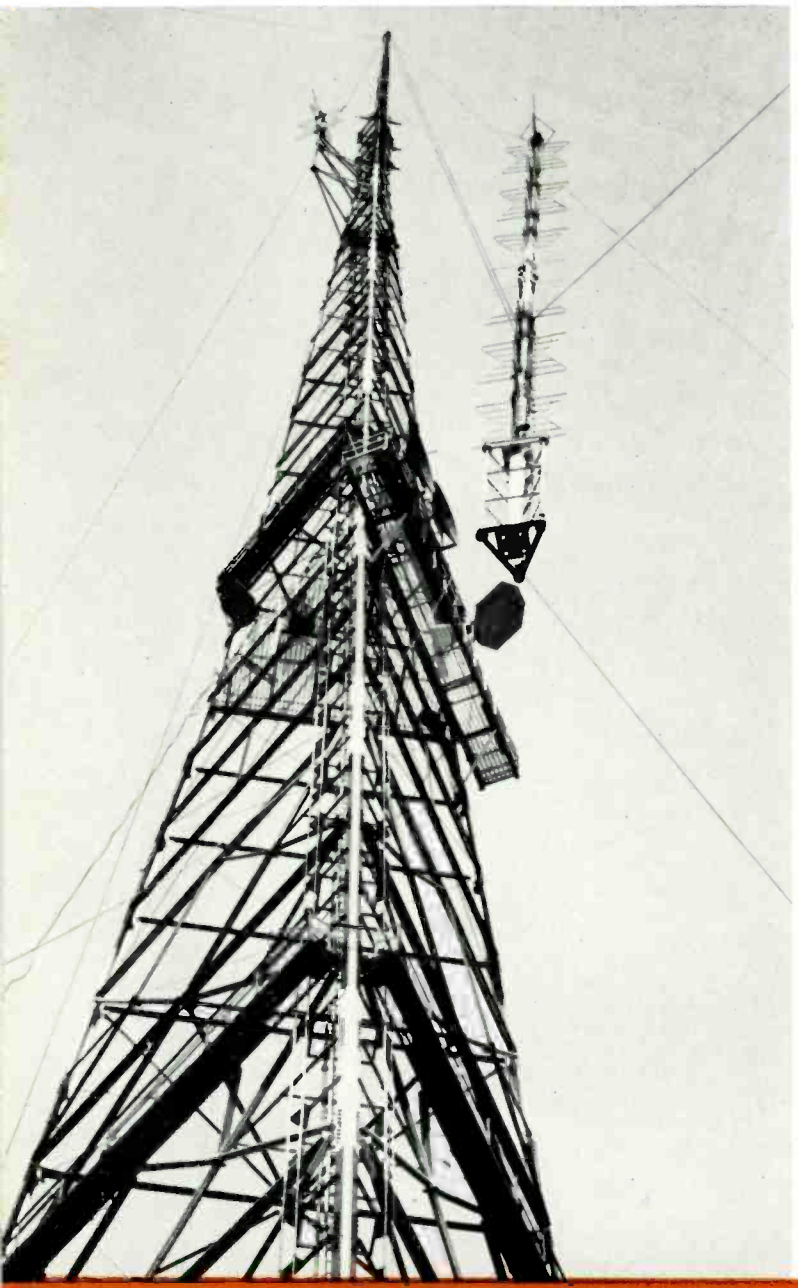
RCA Superturnstile Antennas are separately mounted on their own supporting towers, or may be employed in a variety of combinations with AM Antennas, FM Pylons, VHF Supergain Antennas, UHF Pylons—and even with other Superturnstiles.

DESCRIPTION

RCA Superturnstile Antennas are made up of a series of radiating elements in which increased gain is accomplished by concentrating the radiation at a low vertical angle. The gain increases with the number of sections or layers used in the antenna.

Each section of the Superturnstile Antenna consists of four radiators, mounted at 90-degree intervals around the pole. Sections are mounted approximately a wavelength above each other, center to center. Electrical feed is by means of coaxial transmission lines. Each radiator has its own feedline, the impedance of which is carefully matched to that of the radiator. The line feeds the center of the radiator, at low impedance, so that ice formation has little or no detrimental effect. Such ice formation can be alleviated by the use of sleet melting resistors which are available as accessories.

TF-6AL Superturnstile is hoisted to top of WPTZ tower.



Feedlines are combined in sets of twelve (for 6- and 12-Section Antennas) at junction boxes which perform two functions: (1) feed power simultaneously to all feedlines, and (2) transform the combined impedance of these lines to 51½ ohms, an exact match with the transmission line carrying power from the base of the antenna. The latter is achieved by three-stage transformers located immediately below the junction box.

At the base of the antenna, the transmission lines are combined by appropriate coaxial networks with transmission lines carrying power from the transmitter up the supporting tower. This "combining" network makes possible a number of desirable features of the RCA Superturnstile.

Versatility—Flexibility

One of the most outstanding of these features is versatility. With transmission lines leading directly to the base of the antenna instead of combining on the antenna structure, it is possible to feed 12-Section antennas with one. two, or four tower lines—and 6-section antennas with one or two lines.

In addition to a choice of methods of feed and provision for emergency operation—the combining network incorporates two other outstanding features—unequal power division to achieve more uniform coverage and beam tilt for special requirements.

Durability—Stability

All components of the antenna are designed of the finest materials obtainable and are specially selected for their ability to withstand severe weather conditions. Virtually no change is experienced due to changing temperatures, or to rain or snow.

Radiators, radiator supporting brackets, feedline clamps, and hardware are hot-dip galvanized to provide against the effects of weather. The pole is painted during manufacture and again upon erection.

All antenna components are designed to withstand the windloading resulting from an actual (not "indicated") wind velocity of 110 miles per hour without ice, or 85 miles per hour with 1 inch of radial ice on all members.

Wide Choice of Types

There are many different RCA standard Superturnstile Antennas from which the TV Broadcaster may make his selection (see Table A). The choice of course will depend

TABLE A

Type No.	Number of Sections	H_3	H_2	Channel	Db Gain	Power‡ Gain	**TV Power Rating KW	Dbk
TF-3C	3	25′	49′	2	4.62	2.9	24.6	13.9
(Pedestal Mtg. TF-3CP)		32′ 1″	56′ 1″	3	4.91	3.1	23.1	13.6
TF-3D	3	20′ 4″	40′	4	4.62	2.9	21.8	13.4
(Pedestal Mtg. TF-3DP)		28′ 4″	48′	5	4.91	3.1	19.8	13.0
				6	5.19	3.3	18.8	12.7
TF-4A*	4	27′ 10″	54′ 8″	4	6.02	4.0	21.8	13.4
(Custom-Built)				5	6.23	4.2	19.8	13.0
				6	6.44	4.4	18.8	12.7
TF-5B*	5	42′	83′	2	6.90	4.9	24.6	13.9
(Custom-Built)				3	7.08	5.1	23.1	13.6
TF-5A1	5	35′	68′ 9″	4	6.90	4.9	21.8	13.4
				5	7.24	5.3	19.8	13.0
				6	7.32	5.4	18.8	12.7
TF-6AL	6	50′ 6″	101′	2	7.71	5.9	50	17.0
				3	7.85	6.1	50	17.0
TF-6BM	6	42′	82′ 9″	4	7.78	6.0	50	17.0
				5	8.06	6.4	50	17.0
				6	8.13	6.5	50	17.0
TF-6AH	6	19′ 3″	37′ 3″	7	7.92	6.2	All Channels	
				8	7.99	6.3	35	15.4
				9	8.26	6.7		
				10	8.26	6.7		
				11	8.33	6.8		
				12	8.33	6.8		
				13	8.39	6.9		
TF-6A1	6	19′ 3″	37′ 3″	7	7.71	5.9	14.0	11.5
(Pedestal Mtg. TF-6A1P)		26′ 7″	44′ 7″	8	7.78	6.0	14.0	11.5
(Discontinued—Superseded by TF-6AH)				9	8.06	6.4	14.0	11.5
				10	8.06	6.4	14.0	11.5
				11	8.13	6.5	14.0	11.5
				12	8.13	6.5	14.0	11.5
				13	8.20	6.6	14.0	11.5
TF-12AL†	12	121′ 11″	202′	2	10.57	11.5	50.0	17.0
				3	10.61	11.5		
TF-12AM†	12	100′ 10″	166′ 9″	4	10.72	11.8	All Channels	
				5	10.79	12.0	50.0	17.0
				6	10.83	12.1		
TF-12AH†	12	44′ 3⅛″	72′ 11″	7	10.61	11.5	All Channels	
(Pedestal Mtg. TF-12AH-P)				8	10.68	11.7	50.0	17.0
				9	10.83	12.1		
				10	10.93	12.4		
				11	10.83	12.1		
				12	10.72	11.8		
				13	10.68	11.7		
TF-12BH	12	37′ 2 15/16″	72′ 11″	7	9.82	9.6	All Channels	
(Pedestal Mtg. TF-12BH-P)				8	9.82	9.6	50.0	17.0
(SPECIAL VERTICAL PATTERN)				9	10.00	10.0		
				10	10.21	10.5		
				11	10.21	10.5		
				12	9.91	9.8		
				13	9.91	9.8		

General Notes

H_3: Height of radiation center above top of tower.

H_2: Overall height above top of tower (does not include any necessary obstruction lighting).

* Four and Five Section Superturnstiles are fabricated on order. The Standard Line of 3, 6 and 12 Section Superturnstiles are recommended where feasible.

** The power rating shown is the "TV Power" rating and represents the power at peak of Synch. of the visual carrier at the equipment input. With black level condition, the average visual power is 0.6 times the rating shown. To this is added the aural power of one half the value at peak of Synch. is assumed, giving a total average power of 1.1 times the "TV Power" rating indicated in the chart. Under conditions other than as assumed, the total average power must not be larger than the above value times 1.1, as otherwise the rating will be exceeded.

† The TF-12AL, TF-12AM and TF-12AH incorporate with provision for power splitting for null fill-in, and phasing for beam tilt.

‡ Gain Figures above are for 70/30 power division. For 50/50 power division Power gain is 4% higher and electrical center (H3) is reduced to the following heights: TF-12AL—101′ 6″, TF-12AM—84′ 0″, TF-12AH—37′ 3″, TF-12AH-6—39′ 9″.

Description (cont'd)

upon one or more of the following factors: (1) power gain needed, (2) coverage pattern desired, (3) input power to be handled, (4) channel or frequency, and (5) nature of surrounding terrain.

RCA Superturnstiles are available to meet almost any particular requirement such as: (a) special fringe area performance, (b) close-in coverage, and (c) null fill-in and pattern reinforcement.

20 kw and 50 kw Antennas Available

In addition to the familiar 3- and 6-section 20 kw Superturnstile Antennas which are so widely used RCA has designed a complete line of 50 kw Superturnstiles for channels 2-13. Available in gains of 6 and 12, these antennas offer many exclusive features not provided by any other antenna. Capable of high gain and correspondingly higher power handling, they more than meet FCC maximum limits when used with RCA high power TV transmitters. Some of the features resulting from the design of these antennas are: (1) Styroflex feedlines for better flexibility, greater protection and low "VSWR", (2) versatile feed systems, (3) 70/30 power division for vertical pattern shaping, (4) Null fill-in built into 12-section antennas, (5) special phasing available for ideal vertical pattern shape, (6) advanced junction box design with provisions for reflectometers to measure VSWR of each feedline, and (7) certification for 50/30 wind loading.

Pattern Shaping for Uniform Field Strength

RCA 12-section VHF antennas can be furnished to provide a substantially uniform service throughout the primary service area of the TV station. This assures effective "close-in" coverage and is accomplished by two methods: (1) use of optimum power ratios between upper and lower halves of the antenna, and (2) special phasing between sections.

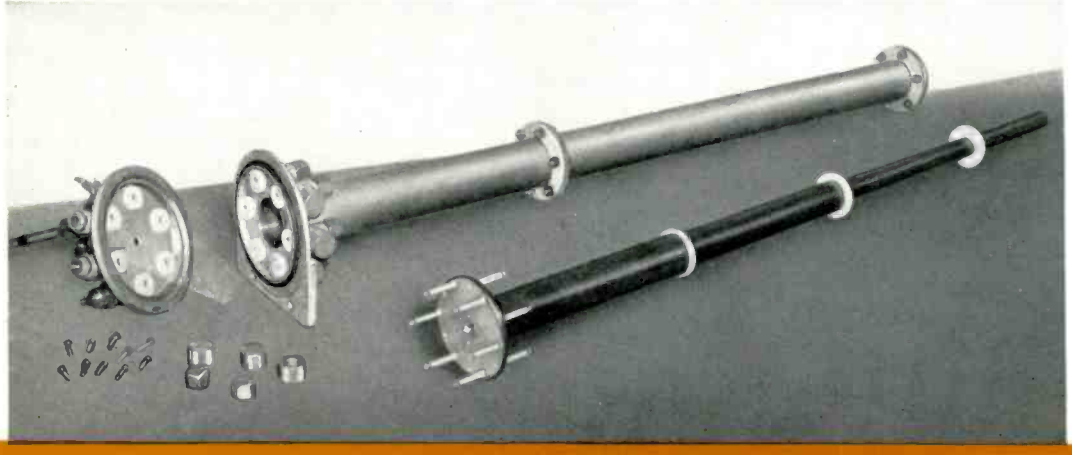
View of a section of Styroflex feedline with segments cut out to illustrate construction.

The TF-12BH antenna is an example of one which employs phasing for pattern shaping. It makes possible better fringe area and close-in coverage than that obtained from other types. The TF-12BH which has a lower resultant gain (approximately 9) requires greater power input but has fewer areas of minimum signal strength. The TF-12BH does have ample gain to achieve 316 kw ERP on a 1000-foot tower using existing RCA transmitters. (See Field Strength vs Distance.)

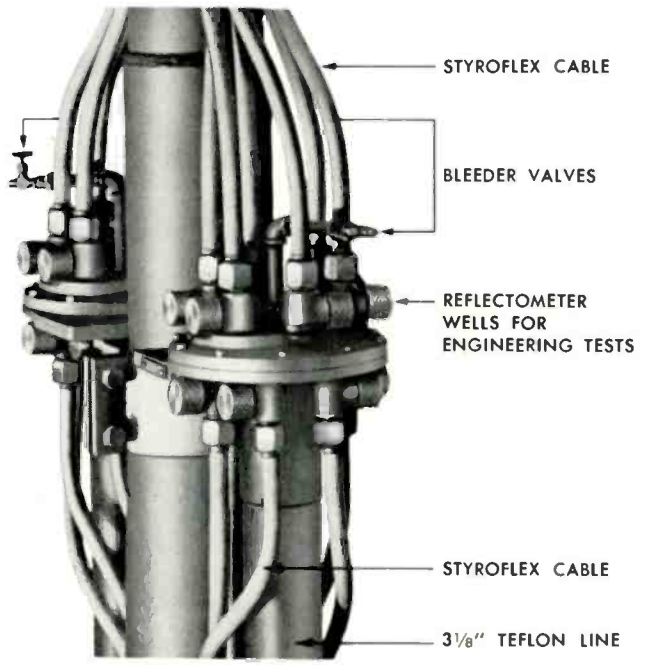
Unless otherwise specified by the customer, TF-12AL, TF-12AM and TF-12AH 12-section VHF antennas will be supplied with a 70/30 ratio of power division between upper and lower sections. This is a discreet choice which applies for the majority of applications.

Combining tees are used to divide the power from the transmitter in any desired ratio between two sections of the antenna. With the power split of 70/30 ratio, the first null is almost completely eliminated with practically no sacrifice in gain.

The versatile combining network in the top of the tower is designed for flexibility to permit single, dual, or four line transmission from the transmitter to the antenna and to provide flexibility in power division and phasing between the upper and lower half for pattern shaping and beam tilt.



For Superturnstile Antennas, except for 3-section types, the "combined" feedline impedance is different from 51.5 ohms and therefore requires the coaxial transformer shown here which results in an exact impedance match.



New style junction boxes of 50-KW antennas.

Advanced Junction Box Design

A junction box of advanced design is used in RCA Superturnstile Antennas. It is constructed of cast brass with the required number of feedline outlets and with 1⅝" transmission line (for 3- and 5-section antennas) or 3⅛" transmission line (for all others) feeding them. Special flare fittings assure water-tight and air-tight connections to the junction box. The method of connection at this point is such that it permits slight axial movements of the inner conductor to occur during extreme temperature changes. Special reflectometer wells are provided so that characteristics may be constantly monitored, if desired.

Beam Tilting for Special Conditions

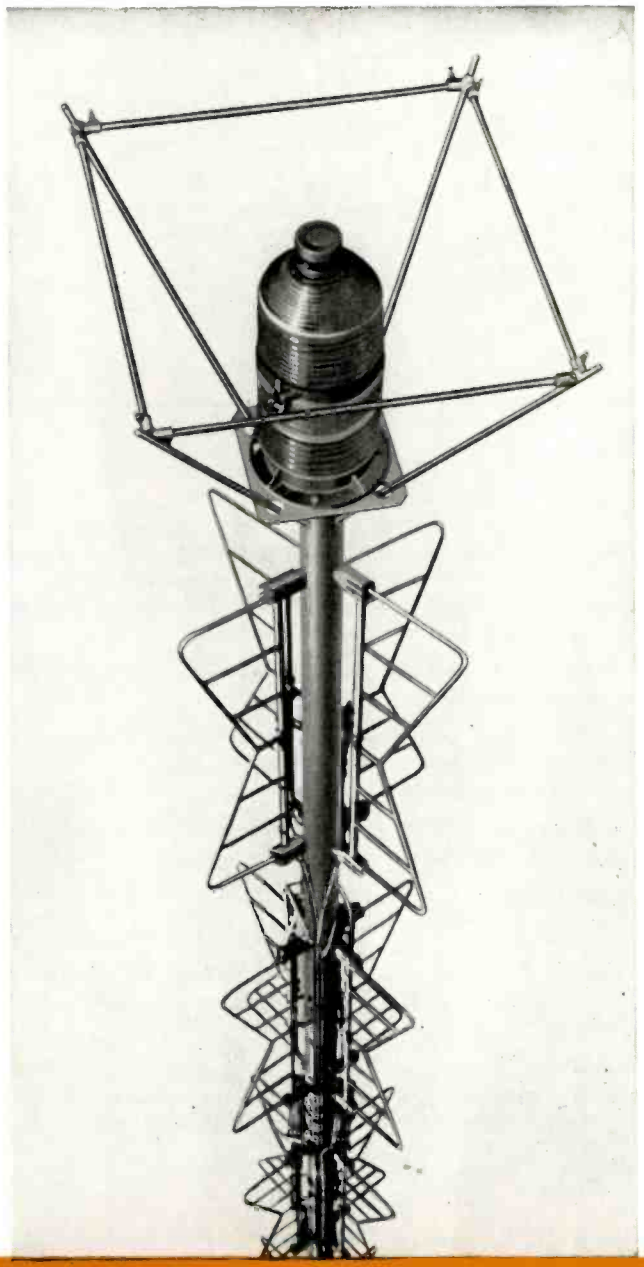
The beam tilting feature, easily obtained with RCA 12-section Superturnstile Antennas, provides greater field strength for selected portions of the primary service area. This is obtained by changing the phasing between the upper and lower halves of the antenna with the standard feed system (see tilting adjustment in "antenna feeding" charts).

A change in the tilt angle is made by exchanging the sections of line labeled "T" for other sections to provide the desired tilt. All 12-section antennas can readily be provided with beam tilt of one or two degrees as desired by specifying the corresponding tilt lines.

Versatile Feed Systems

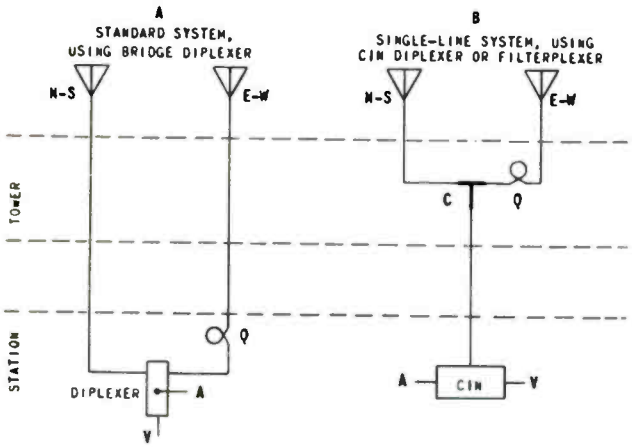
All 12-section antennas have four transmission lines brought down through the tower top. A feature of these antennas which permits sectionalized connections is the separately fed upper and lower layers. This plus the advanced junction box design permits the switching of transmitter power to another part of the antenna for lower power operation, should the occasion arise. Four separate methods of feeding power to the antenna are illustrated by charts included here. The proper choice of feed system will depend upon individual station requirements and the type of diplexer or filterplexer employed.

RCA Superturnstile antennas include the new "Lightning Protector" for the protection of the antenna feedlines and beacon.



Versatile Feed Systems (cont'd)

TRANSMISSION LINE SYSTEMS FOR FEEDING ANTENNAS OF SIX OR LESS LAYERS OF RADIATORS



EMERGENCY OPERATION	
FIGURE-8 PATTERN FROM ANTENNA	NONE

The standard system is used in most cases since it provides for emergency operation and uses the bridge diplexing system for combined visual and aural operation into the antenna. For emergency operation in case of failure of the E-W transmission line (for instance), the E-W transmission line is replaced at the diplexer by a R-f Load and Wattmeter, so that the N-S side of the antenna continues to radiate with a figure-8 coverage pattern. The bridge diplexer is the least expensive type of diplexer.

The single-line system is used where the transmission line length is very great and where other emergency antenna facilities are available.

LEGEND:

CIN.....Constant impedance notch diplexer or filterplexer
C.....Combining tee
A.....Aural input
V.....Visual input
Q.....Quadrature phasing length
Filterplexer.....Combination vestigial sideband filter and constant impedance notch diplexer.

The (A) standard system is used in most cases since it provides for emergency operation and uses the bridge diplexing system for combined visual and aural operation into the antenna. If one line fails it is replaced at the diplexer by a R-f Load and Wattmeter.

The (B) system provides greater flexibility by the addition of two more transmission lines.

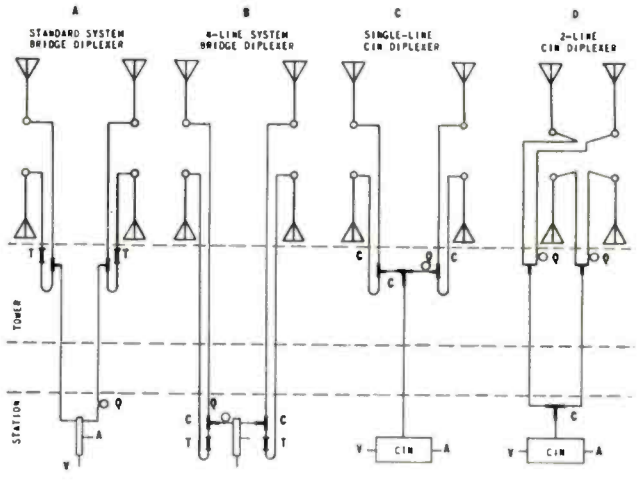
The (C) system can be used where the transmission line length is very great and where other emergency antenna facilities are available.

The (D) system results in a half-power circular pattern for emergency operation.

LEGEND:

C.....Combining tee
T.....Beam tilting adjustment
Q.....Quadrature phasing length
A.....Aural input
V.....Visual input
CIN.....Constant impedance notch diplexer. A filterplexer (combined vestigial sideband filter and diplexer) may also be used.

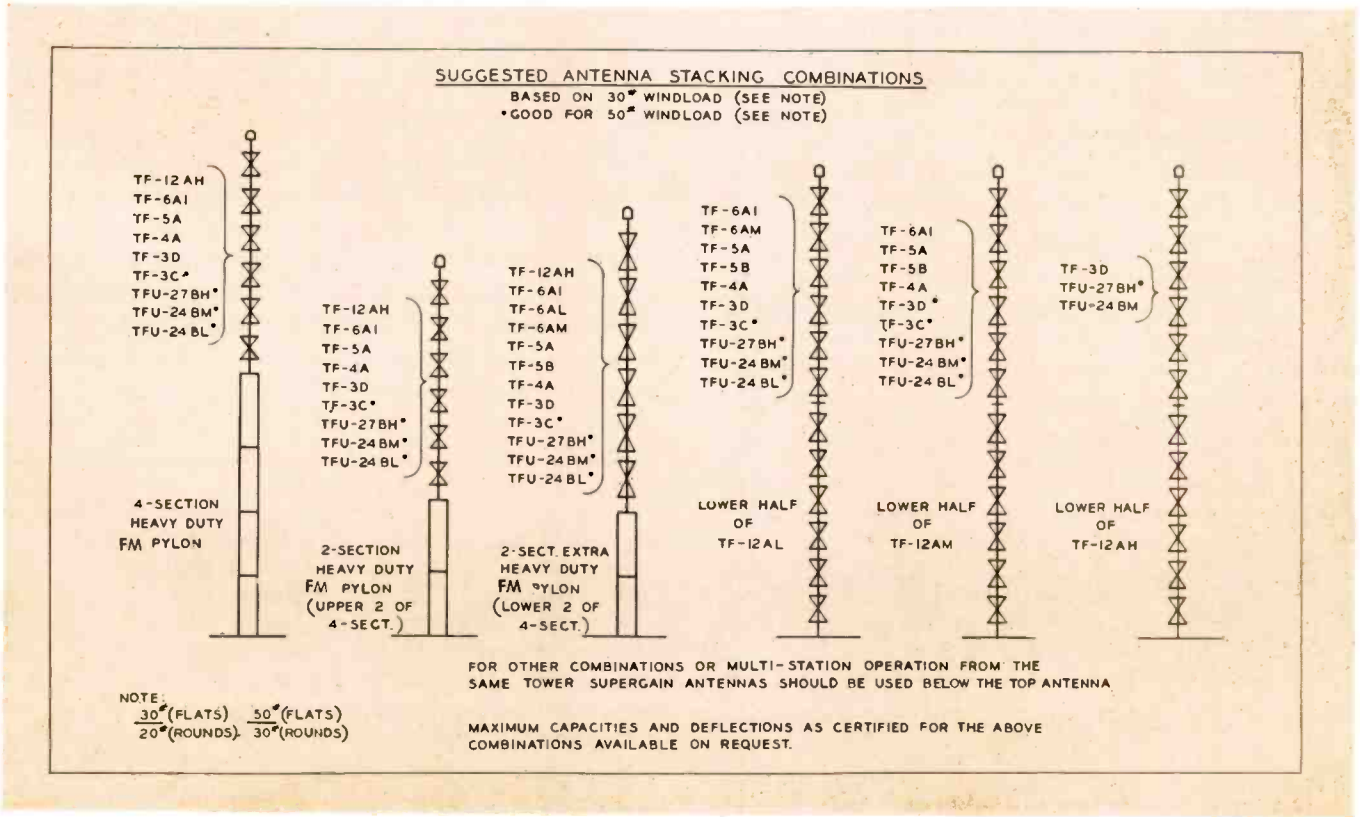
TRANSMISSION LINE SYSTEMS FOR FEEDING ANTENNAS OF MORE THAN SIX LAYERS



EMERGENCY OPERATION			
FIGURE-8 PATTERN	MODIFIED FIGURE-8 PATTERN	NONE	CIRCULAR, HALF POWER

Antenna Stacking

Various combinations of stacking RCA antennas are illustrated by the accompanying chart. All combinations shown are certified for 50/30 or 30/20 wind loading as indicated and make possible divided antennas for "two-station" operation. Additional combinations to permit a common tower for several stations can be obtained with the "Supergain" Antenna.



Antenna Equipment Supplied

RCA Superturnstile Antennas may be ordered by specifying the "MI" or Stock Identification number shown on the Specification sheets to follow.

In general, the antenna equipment supplied will consist of the following: (a) antenna pole, (b) radiator sections or batwings, (c) necessary hardware for assembly, (d) lightning protector, (e) feedlines, (f) junction boxes and (g) combining networks for 12-section antennas, and (h) complete assembly instructions.

The assembly and erection of the antenna are not included as a part of the services supplied, however, assembly supervision and electrical checkout by a qualified RCA Service Co. engineer is provided. This will include tests made before the antenna is raised to the tower top. The services of the RCA Service Co. engineer assure the customer of minimum assembly time, correct installation and a comprehensive final test. All antennas are shipped disassembled. The pole is shipped in two or more sections, depending on its length and weight. Sections do not exceed 8000 pounds in weight or 30 feet in length.

Accessories

RCA has a complete line of antenna equipment for the broadcaster. A few such items are: Sleet Melters, Antenna Warning Beacons, Diplexers, Beam Tilting Sections, R-F Loads, Transmission Line and Transmission Line Accessories.

Technical Specifications and Design Data

The various types of RCA Superturnstile Antennas are illustrated on the specification and data sheets which follow. Ordering information, accessories, wind loading, gain, and electrical and mechanical data are included. In order to assist the reader, the accompanying abbreviations and terms normally used are listed here as a reference.

ABBREVIATIONS AND TERMS USED:

#	Pounds
psf	Pounds per square foot
psi	Pounds per square inch
o.d.	Outside diameter
mph	Miles per hour (actual velocity)
agc	Automatic gain control
Diplexer	R-f network to permit use of single antenna for visual and aural transmission.

Technical Specifications and Design Data—(Cont'd)

Filterplexer.....R-f network which combines functians of constant impedance notch diplexer and vestigial sideband filter.

Power rating.....KW (TV rating)

50/30 psf (etc.).....Wind load. The wind load on a square foot of projected area is greater for flat surfaces than for cylindrical surfaces. The first number in this case (50) denotes the pressure for a square foot of flat surface and the second number (30) denotes the pressure for a square foot of cylindrical surface.

Mechanical Specifications

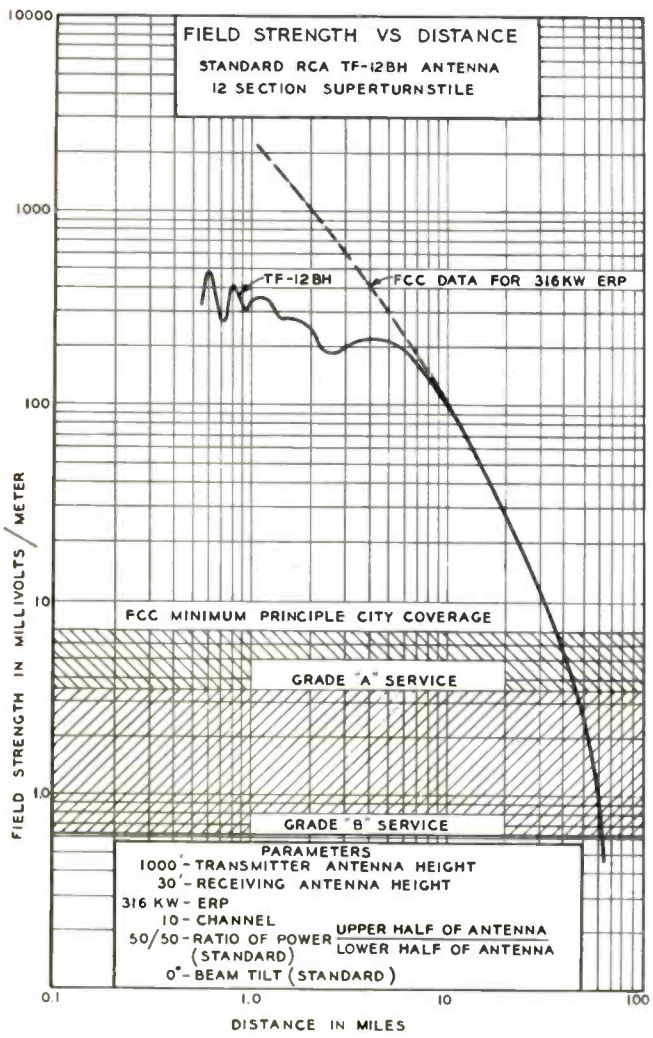
The TF-6AL, TF-6BM, TF-6AH and all 12-section antennas are designed for 50/30 psf loading.

The antenna "Recommended Base Stability" is the recommended maximum variation from horizontal of the tower top, measured in degrees, at the rated wind velocity. This is not directly related to the design wind load which is the wind velocity at which the maximum bending stress in the steel is 20,000 psi. The rated wind velocity is the velocity at which the rated base stability occurs. This "Recommended Base Stability" is important in maintaining signal stability of the received picture in the service area due to the bending deflection of the antenna and the tilting of the tower top. The choice of the rated wind velocity should be determined by consideration of the magnitude and frequency of occurrance of extreme wind velocities in the area where the antenna will be installed and the greatest permissible number of times per year that partially degraded service is acceptable.

In determining the rated wind velocity, it is desirable to consult the local weather bureau records, recognizing that the wind pressure increases with elevation above ground. The following table, taken from AMERICAN STANDARD BUILDING CODE REQUIREMENTS FOR MINIMUM LOADS IN BUILDINGS AND OTHER STRUCTURES, (Nat'l Bur. of Standards Misc. Publication M179) shows the design wind pressure at various elevations for a surface wind pressure of 20 psf.

Height Zone	Wind Pressure	Height Zone	Wind Pressure
Less than 50 feet	20 psf	600 to 799	35 psf
50 to 99	24 "	800 to 999	36 "
100 to 199	28 "	1000 to 1199	37 "
200 to 299	30 "	1200 to 1399	38 "
300 to 399	32 "	1400 to 1599	39 "
400 to 499	33 "	1600 and over	40 "
500 to 599	34 "		

"Field Strength vs Distance" curve for the TF-12BH as compared to the ideal FCC curve for 316 kw ERP.



Lightning protection for the Superturnstile TV Antennas is provided by means of a four-pronged assemblage at the top of the pole. The prongs extend outward and upward at about 45 degrees, and are in the planes of the radiators. The prongs are long enough to extend above a 300mm beacon, if one is installed. This arrangement is very successful in reducing damage to beacons and antenna r-f components due to lightning hits.

SLEET MELTING is accomplished by the use of enclosed heater units which are inserted in the riser tube of the radiator. The riser is the vertical member of the radiator which is closest to the pole. Application of heat to the riser is an aid to the prevention of ice formation in the slot between radiator and pole. Inasmuch as this is the only region in which a large r-f gradient exists, the rest of the antenna need not be heated to prevent an impedance mismatch on the antenna or echoes in the received picture during sleet storm.

Sleet melter kits are available for each size of antenna. One kit provides the four resistor units, connecting cables, and junction for one section of radiators, together with a riser cable for interconnection between sections.

Sleet melting is usually considered necessary in the range of 25 F to 35 F since at other temperatures sleet does not form readily. The control for the sleet melters is usually

accomplished by a thermostat located at the same elevation as the antenna. An automatic control to prevent operation of the sleet melters in dry weather is also useful since it prevents the waste of power during cold dry weather. It is essential to avoid prolonged operation of the sleet melters during warm weather as the feed lines may be raised to a temperature beyond the rating.

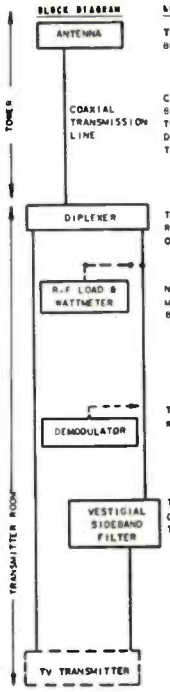
THE WIND VELOCITIES listed on the accompanying Engineering Data sheets are actual and not indicated values. A velocity of 110 mph results in a pressure on a square foot of projected area of 50 pounds for a flat surface and 30 pounds for a cylindrical surface; hence the 50/30 designation used in the Engineering Data sheets.

Electrical Specifications and Features

All antennas will provide an impedance match with a VSWR of 1.1/1.0 or better when connected to the designated transmission line. Swivel flanges are used at the feed points. Connection can be made to other types of lines by using suitable adapters. These adapters connect between the different flange fittings of the two types of line, and where necessary provide the required impedance transformation. The adapters are designated on the list of fittings for the type of line to be used.

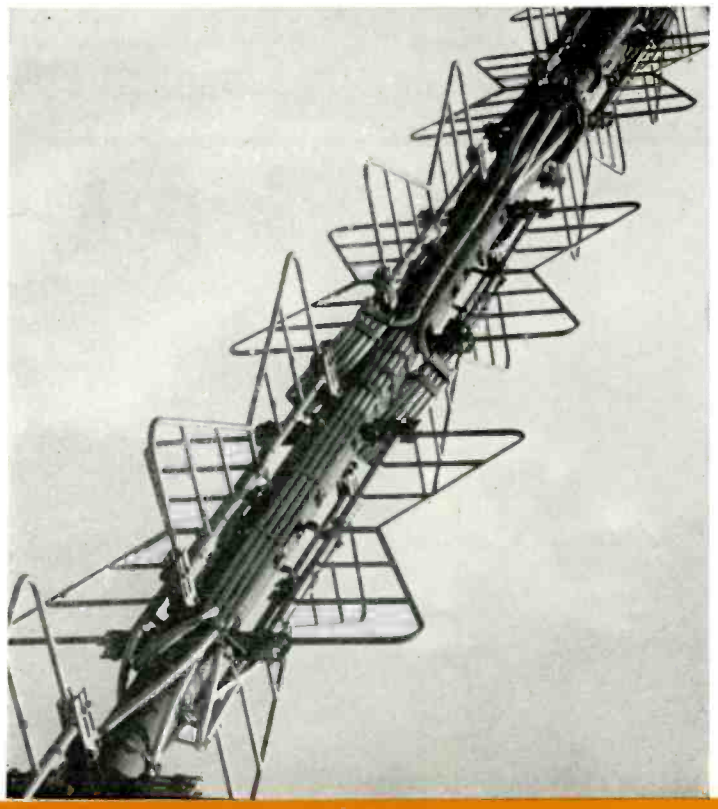
Transmission line systems, for the line connecting between the transmitter room and the antenna can be chosen from several available types. Normally a bridge diplexer with twin transmission lines is used. Other systems are available using either a bridge diplexer, or a Filterplexer.

VHF Antenna Equipment



FUNCTION AND DESCRIPTION
Radiates transmitter power. E.R.P. equals: Antenna Gain x Transmission Line Efficiency x Transmitter Power x Diplexer Efficiency.
Line is 1⅝", 3⅛" or 6⅛". It is pressurized from diplexer to antenna. Twin lines are used for bridge diplexer; single line for constant impedance notch diplexer. If antenna is split-fed for emergency use, the number of lines to the antenna is doubled.
Combines visual and aural signals so they can radiate from the same antenna.
This is test equipment used in measuring power output and in adjusting transmitter. It may be connected to the following: Transmitter visual or aural output, sideband filter output, or diplexer output.
Provides video signal equivalent to high-quality home receiver for picture monitoring, and signal for waveform monitoring and for measurements of depth of modulation.
Absorbs unused portion of lower sideband to prevent radiation outside of assigned channel while maintaining constant resistance load on transmitter.

Closeup of 50 kw Superturnstile showing typical feedline dress (TF-12AH).

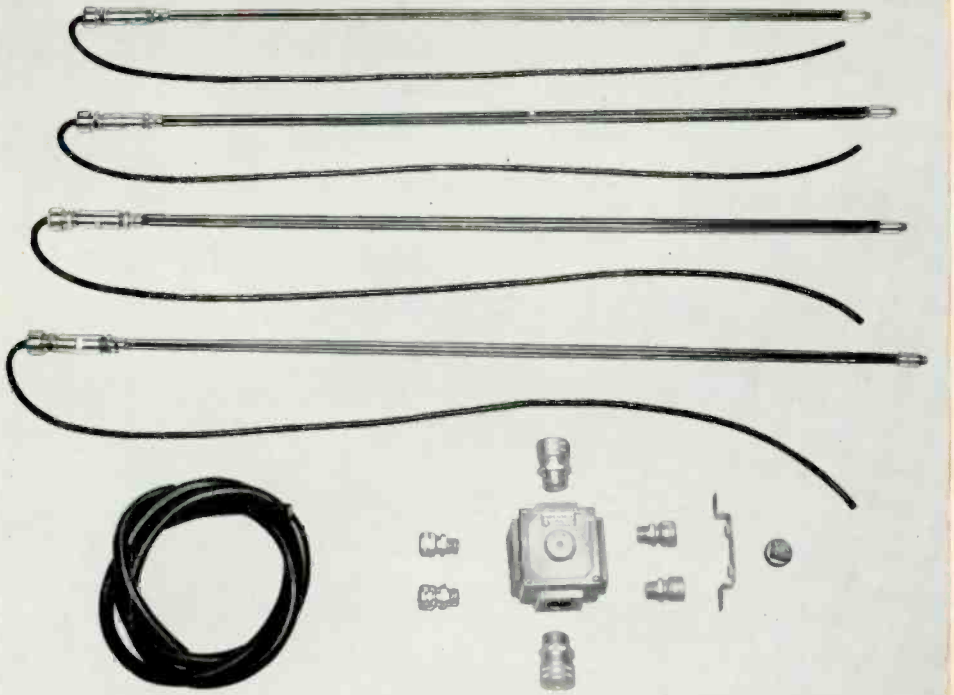


THE ANTENNA POWER RATING is the TV rating of the r-f power fed to the antenna. For instance an antenna rated at 50 kw will take the output of a 50 kw television transmitter. The antenna is limited by heating due to the r-f power and not by voltage considerations. The maximum average power for the 50 kw transmitter occurs at black level. Under this conditions the visual power is 30 kw. This added to the 25 kw of aural (the aural is one-half of the peak visual) results in an average power of 55 kw. This is within the rating of the 50 kw antenna.

RCA antenna power ratings are based on continuous black level picture, aural power 50% of TV peak, ambient temperature 110° F with still air.

EMERGENCY CONNECTIONS can be made with most transmission line arrangements to provide temporary service when a fault occurs in one of the transmission lines. Systems which use the bridge-type diplexer and two transmission lines are changed to emergency operation by substituting the R-f Load and Wattmeter for the faulty transmission line at the diplexer. Systems using the Filterplexer can also be connected for emergency use if two or more transmission lines have been installed. R-f switches of several types are available to aid in rapid transition of connections.

VHF ANTENNA ACCESSORIES



VHF ANTENNA SLEETMELTERS

MI-19009-B-1

MI-19009-C-1

MI-19009-D-1

MI-19009-J-1

Each of the MI's includes the components pictured left—four heater elements, junction box, connecting cable and necessary hardware.

USES

Sleetmelters are used in localities where the formation of ice on an antenna will impair its normal operating characteristics. It is usually desired within the temperature range of 25°F to 35°F, since this is the range at which ice readily forms.

DESCRIPTION

Sleet Melter Kits are available for all RCA Superturnstile antennas. Each MI includes four heaters, a junction box, connecting cables, and necessary hardware. One complete kit or MI is necessary for each section of the antenna.

SPECIFICATIONS

MI	*Channel*	*Power Required*
MI-19009-B-1	2-3	750 watts per heater; 3 kw per section
MI-19009-C-1	4-6	500 watts per heater; 2 kw per section
MI-19009-D-1	7-13 (TF-6A1)	250 watts per heater; 1 kw per section
MI-19009-J-1	7-13 (TF-6AH, TF-12AH, TF-12BH)	250 watts per heater; 1 kw per section

Each heater is designed for 115 volts and may be connected in a junction box for 115, 230, or 460 volts.

VHF ANTENNA LIGHTNING PROTECTORS

MI-27325-L

MI-27325-M

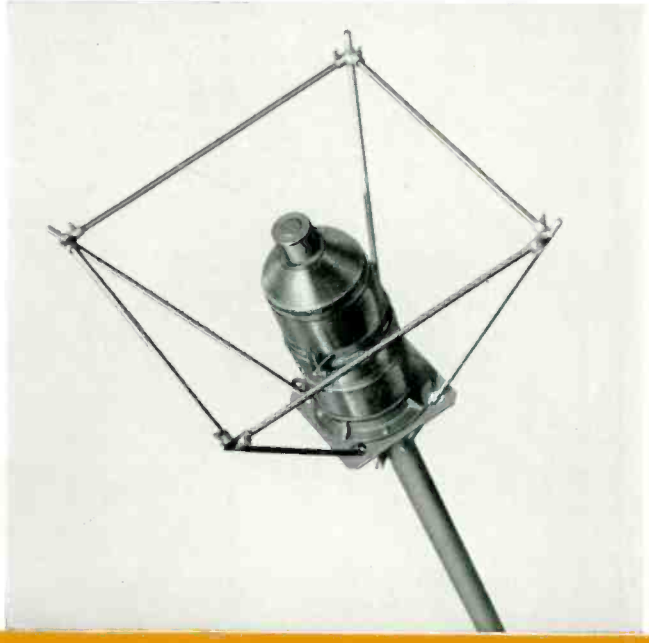
MI-27325-H

DESCRIPTION

Lightning protectors are supplied as part of all current RCA Superturnstile antennas. However, for broadcasters who may have earlier model antennas without suitable lightning protection, the following MI's are available:

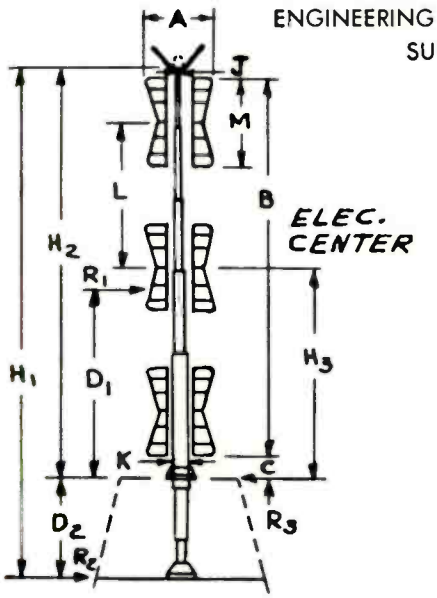
MI-27325-L for Channels 2 and 3
MI-27325-M for Channels 4, 5, and 6
MI-27325-H for Channels 7 to 13

Pictured right is an RCA Lightning Protector for a Superturnstile antenna. Each protector includes a beacon mounting plate and cross arms for protection of personnel changing beacon bulbs.



CHANNELS 2 & 3, 3 SECTION SUPERTURNSTILE

TYPE TF-3C - TOWER MOUNTED



GUIDE FLANGE DWG: 445695-1
POLE SOCKET DWG: 445694-1

ENGINEERING DATA FOR TF-3C TOWER MOUNTED (54-66 MC) SUPERTURNSTILE TELEVISION ANTENNA

MECHANICAL SPECIFICATIONS

WEIGHT	5500#	H_2	49'-0"
A	9'-0"	H_3	25'-0"
B	44'-7"	J	5" O.D.
C	2'-8 1/2"	K	10 3/4" O.D.
D_1	23'-9"	L	17'-0"
D_2	12'-0"	M	10'-7"
H_1	61'-0"		

SHIPPING LENGTHS: (17'-6") (23'-0") (24'-0")
SHIPPING WEIGHTS: (324#) (774#) (1266#)
TRANS. LINE CONN.: 16'-0" ABOVE TOWER TOP

LOADING (NO ICE)

	50/30 psf	30/20 psf (MAX. LOAD. 60/35)
R_1	2265	1510
R_2	4483	2960
R_3	6748	4470
$R_1 \times D_1$	53800 ft.#	35000 ft.#

SUGGESTED BASE STABILITY: 2°

DESIGN ASSUMPTIONS

WIND VELOCITY: MAX. WIND VELOCITY (1" RAD. ICE) 85 mph
MAX. WIND VELOCITY (NO ICE) 110 mph
WIND VELOCITIES ARE TRUE, NOT INDICATED
DESIGN STRESSES: A.I.S.C. 20,000 psi (IN BENDING)

ELECTRICAL SPECIFICATIONS

CIRCULARITY: ± 2 DB
INPUT IMPEDANCE: TO MATCH 51.5 OHM MI-19112 LINES OVER DESIGNATED CHANNEL WITH TRANS. LINE CONN. SHOWN BELOW (V.S.W.R. 1.1 OR BETTER)

GAIN (AT VISUAL CARRIER) & POWER RATING

CHANNEL	2	3
GAIN	2.9	3.1
POWER RATING	24.6	23.1

ACCESSORIES

SLEET MELTERS: 3 OF MI-19009-B-1 POWER REQUIRED: 9 KW, 230 VOLTS 3Ø, OR 460 VOLTS 1Ø OR 3Ø

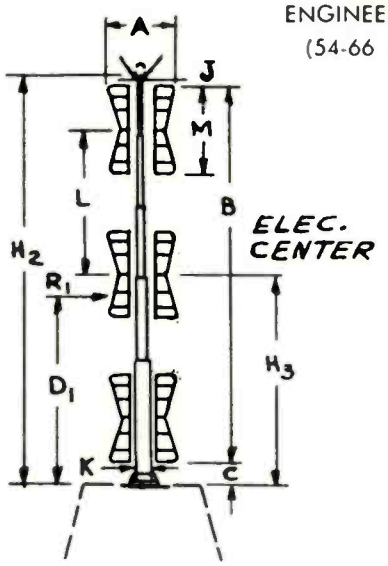
TRANSMISSION LINE CONNECTIONS

TYPE NO.	LINES	DIPLEXER	DWG. AND TYPE
TF-3C	TWO-1 5/8	BRIDGE	B-464591-A

B-466337

CHANNELS 2 & 3, 3 SECTION SUPERTURNSTILE

TYPE TF-3C-P - PEDESTAL MOUNTED



PEDESTAL DWG: 728294-1

ENGINEERING DATA FOR TF-3C-P PEDESTAL MOUNTED (54-66 MC) SUPERTURNSTILE TELEVISION ANTENNA

MECHANICAL SPECIFICATIONS

WEIGHT	5391#	H_3	32'-1 1/2"
A	9'-0"	J	5" O.D.
B	44'-7"	K	10 3/4" O.D.
C	9'-10"	L	17'-0"
D_1	28'-3"	M	10'-7"
H_2	56'-1 1/2"		

SHIPPING LENGTHS: (17'-6") (23'-0") (19'-1 1/2")
SHIPPING WEIGHTS: (324#) (774#) (1040#)
TRANS. LINE CONN.: 23'-1 1/2" ABOVE TOWER TOP

LOADING (NO ICE)

	50/30 psf	30/20 psf (MAX. LOAD. 50/30)
R_1	2550	1700
$R_1 \times D_1$	72165 ft.#	48100 ft.#

SUGGESTED BASE STABILITY: 2°

DESIGN ASSUMPTIONS

WIND VELOCITY: MAX. WIND VELOCITY (1" RAD. ICE) 85 mph
MAX. WIND VELOICTY (NO ICE) 110 mph
WIND VELOCITIES ARE TRUE, NOT INDICATED

DESIGN STRESSES: A.I.S.C. 20,000 psi (IN BENDING)

ELECTRICAL SPECIFICATIONS

CIRCULARITY: ±2 DB

INPUT IMPEDANCE: TO MATCH 51.5 OHM MI-19112 LINES OVER DESIGNATED CHANNEL WITH TRANS. LINE CONN. SHOWN BELOW (V.S.W.R. 1.1 OR BETTER)

GAIN (AT VISUAL CARRIER) & POWER RATING

CHANNEL	2	3
GAIN	2.9	3.1
POWER RATING	24.6	23.1

ACCESSORIES

SLEET MELTERS: 3 OF MI-19009-B-1 POWER REQUIRED: 9 KW, 230 VOLTS 3Ø, OR 460 VOLTS 1Ø OR 3Ø

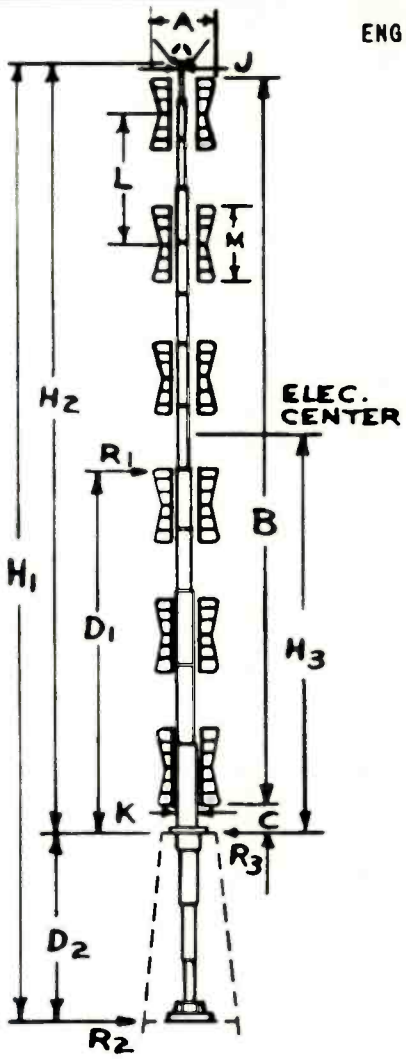
TRANSMISSION LINE CONNECTIONS

TYPE NO.	LINES	DIPLEXER	DWG. AND TYPE
TF-3C-P	TWO-1 5/8	BRIDGE	B-464591-A

B-466363

CHANNELS 2 & 3, 6 SECTION SUPERTURNSTILE

TYPE TF-6AL - TOWER MOUNTED



GUIDE FLANGE DWG: 745164-501
POLE SOCKET DWG: 745167-501

466342-2

ENGINEERING DATA FOR TF-6AL SERIES (54-66 MC) SUPERTURNSTILE TELEVISION ANTENNA

MECHANICAL SPECIFICATIONS

WEIGHT	14000#	H_2	101'-0"
A	9'-0"	H_3	51'-6"
B	95'-7"	J	5" O.D.
C	3'-8 1/2"	K	20" O.D.
D_1	43'-4"	L	17'-0"
D_2	20'-0"	M	10'-7"
H_1	121'-0"		

SHIPPING LENGTHS:
(17'-6") (23'-0") (25'-9") (26'-3") (20'-0") (18'-0")
SHIPPING WEIGHTS:
(322#) (758#) (1820#) (2760#) (2200#) (1958#)
TRANS. LINE CONN.: 1'-9" ABOVE TOWER TOP

	LOADING (NO ICE) 50/30 psf	30/20 psf (MAX. LOAD. 50/30)
R_1	5880	3920
R_2	12748	8487
R_3	18628	12407
$R_1 \times D_1$	254800 FT. #	169900 FT. #

SUGGESTED BASE STABILITY: 2°

DESIGN ASSUMPTIONS

WIND VELOCITY: MAX. WIND VELOCITY (1" RAD. ICE) 85 mph
MAX. WIND VELOCITY (NO ICE) 110 mph
WIND VELOCITY ARE ACTUAL, NOT INDICATED
DESIGN STRESSES: A.I.S.C. 20000 psi (IN BENDING)

ELECTRICAL SPECIFICATIONS

POWER RATING: 50 KW
CIRCULARITY: ± 2 DB
INPUT IMPEDANCE: TO MATCH 51.5 OHM MI-19113 LINES OVER DESIGNATED CHANNEL WITH TRANS. LINE CONN. SHOWN BELOW. (V.S.W.R. 1.1 OR BETTER)

GAIN (AT VISUAL CARRIER)

CHANNEL	2	3
GAIN	5.9	6.1

ACCESSORIES

SLEET MELTERS: 6 OF MI-19009-B-1. POWER REQUIRED: 18 KW, 230 VOLTS 3Ø, OR 460 VOLTS 1Ø OR 3Ø.

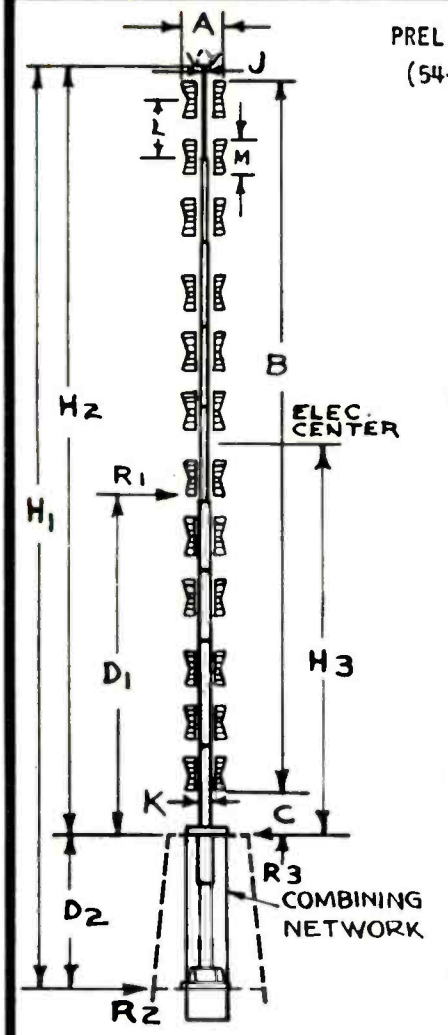
TRANSMISSION LINE CONNECTIONS

TYPE NO.	LINE	DIPLEXER	DWG. AND TYPE
TF-6AL	TWO 3 1/8	BRIDGE	B-464591-A
TF-6AL-A	ONE 3 1/8	NOTCH	B-464591-B
TF-6AL-B	ONE 6 1/8	NOTCH	B-464591-B

B-466342

CHANNELS 2 & 3, 12 SECTION SUPERTURNSTILE

TYPE TF-12AL - TOWER ONLY



NOT FURNISHED WITH GUIDE FLANGE AND POLE SOCKET. REFER TO 747072 FOR 3-1/8 LINE OR 634416 FOR 6-1/8 LINE SHOWING PROPOSED METHOD OF INSTALLATION TO TOWER.

PRELIMINARY ENGINEERING DATA FOR TF-12AL SERIES (54-66 MC) SUPERTURNSTILE TELEVISION ANTENNA

MECHANICAL SPECIFICATIONS

WEIGHT	80000#	H_2	202'-0"
A	9'-0"	H_3*	121'-10 3/4"
B	197'-7"	J	5" O.D.
C	2'-8 1/2"	K	26 1/2" O.D.
D_1	85'-0"	L	17'-0"
D_2	30'-0"	M	10'-7"
H_1	232'-0"		

SHIPPING LENGTHS: 16 SECTIONS
GREATEST LENGTH: 26'-0"
HEAVIEST SECTION: 6982#
TRANS. LINE CONN.:

LOADING (NO ICE)

	50/30 psf	30/20 psf (MAX. LOAD. 50/30)
R_1	16300	10866
R_2	46183	30788
R_3	62483	41655
$R_1 \times D_1$	1385500 ft.#	923600 ft.#

SUGGESTED BASE STABILITY: 1°

DESIGN ASSUMPTIONS

WIND VELOCITY: MAX. WIND VELOCITY (1" RAD. ICE) 85 mph
MAX. WIND VELOCITY (NO ICE) 110 mph
WIND VELOCITIES ARE TRUE, NOT INDICATED
DESIGN STRESSES: A.I.S.C. 20,000 psi (IN BENDING)

ELECTRICAL SPECIFICATIONS

POWER RATING: 50 KW
CIRCULARITY: ± 2 DB
INPUT IMPEDANCE: TO MATCH 51.5 OHM MI-19113 LINES OVER DESIGNATED CHANNEL WITH TRANS. LINE CONN SHOWN BELOW (V.S.W.R. 1.1 OR BETTER)

GAIN (AT VISUAL CARRIER)

CHANNEL	2	3
GAIN **	11.4	11.5

ACCESSORIES

SLEET MELTERS: 12 OF MI-19009-B1 POWER REQUIRED: 36 KW. 230 VOLTS 3Ø, OR 460 VOLTS 1Ø OR 3Ø
BEAM TILT SECTIONS: FOR 1°, 1 OF MI-19395-C. FOR ½°, 1 OF MI-19395-D

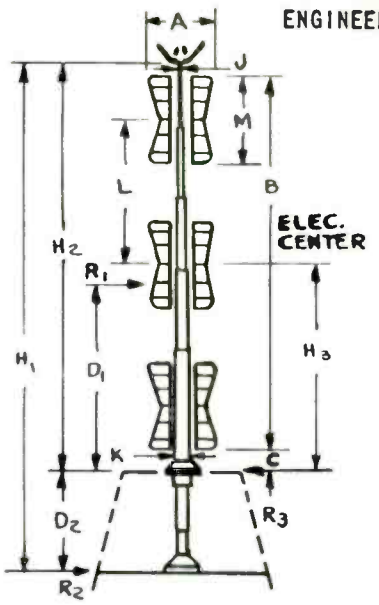
TRANSMISSION LINE CONNECTIONS

TYPE NO.	LINES	DIPLEXER	DWG. AND TYPE	COMBINING NETWORK DWG.
TF-12AL	TWO-3 1/8	BRIDGE	B-464592-A	
TF-12AL-A	FOUR-3 1/8	BRIDGE	B-464592-B	
TF-12AL-B	TWO-3 1/8	NOTCH	B-464592-D	
TF-12AL-C	ONE-3 1/8	NOTCH	B-464592-C	
TF-12AL-D	TWO-6 1/8	BRIDGE	B-464592-A	
TF-12AL-E	FOUR-6 1/8	BRIDGE	B-464592-B	
TF-12AL-F	TWO-6 1/8	NOTCH	B-464592-D	
TF-12AL-G	ONE-6 1/8	NOTCH	B-464592-C	

*H_3 FOR 70-30 POWER DIVISION. H_3 FOR 50-50 POWER DIVISION: 101'-6"
**GAINS ARE FOR 70-30 POWER DIVISION (STANDARD ANTENNA). GAINS ARE 4% HIGHER FOR 50-50 POWER DIVISION

CHANNELS 4, 5 & 6, 3 SECTION SUPERTURNSTILE

TYPE TF-3D - TOWER MOUNTED



GUIDE FLANGE DWG: 445695-2
POLE SOCKET DWG: 445694-2

ENGINEERING DATA FOR TF-3D TOWER MOUNTED (66-88 MC) SUPERTURNSTILE TELEVISION ANTENNA

MECHANICAL SPECIFICATIONS

WEIGHT	3500#	H_2	40'-0"
A	6'-11"	H_3	20'-4"
B	36'-10"	J	5" O.D.
C	1'-11"	K	8 5/8" O.D.
D_1	19'-8"	L	14'-1"
D_2	10'-0"	M	8'-8"
H_1	50'-0"		

SHIPPING LENGTHS: (21'-6") (30'-0")
SHIPPING WEIGHTS: (386#) (1138#)
TRANS. LINE CONN.: 10'-5" ABOVE TOWER TOP

LOADING (NO ICE)

	50/30 psf	30/20 psf (MAX. LOAD. 60/35)
R_1	1680	1120
R_2	3309	2206
R_3	4989	3326
$R_1 \times D_1$	33000 ft.#	22000 ft.#

SUGGESTED BASE STABILITY: 2°

DESIGN ASSUMPTIONS

WIND VELOCITY: MAX. WIND VELOCITY (1" RAD. ICE) 85 mph
MAX. WIND VELOICTY (NO ICE) 110 mph
WIND VELOCITIES ARE TRUE, NOT INDICATED
DESIGN STRESSES: A.I.S.C. 20000 psi (IN BENDING)

ELECTRICAL SPECIFICATIONS

CIRCULARITY: ± 2 DB
INPUT IMPEDANCE: TO MATCH 51.5 OHM MI-19112 LINES OVER DESIGNATED CHANNEL WITH TRANS. LINE CONN. SHOWN BELOW. (V.S.W.R. 1.1 OR BETTER)

GAIN (AT VISUAL CARRIER) & POWER RATING

CHANNEL	4	5	6
GAIN	2.9	3.1	3.3
POWER RATING	21.8	19.8	18.8

ACCESSORIES

SLEET MELTERS: 3 OF MI-19009-C-1 POWER REQUIRED: 6 KW 230 VOLTS 1Ø OR 3Ø , OR 460 VOLTS 1Ø OR 3Ø

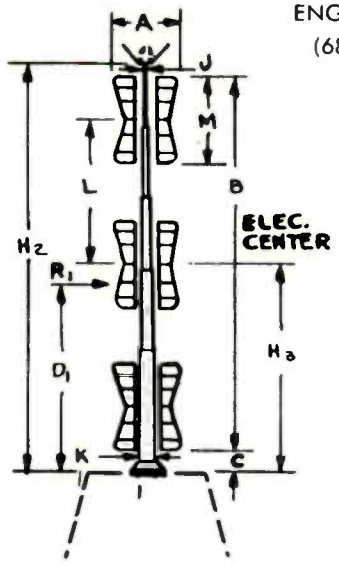
TRANSMISSION LINE CONNECTIONS

TYPE NO.	LINES	DIPLEXER	DWG. AND TYPE
TF-3D	TWO-1 5/8	BRIDGE	B-464591-A

B-466338

CHANNELS 4, 5 & 6, 3 SECTION SUPERTURNSTILE

TYPE TF-3D-P - PEDESTAL MOUNTED



PEDESTAL DWG: 728293-1

ENGINEERING DATA FOR TF-3D-P PEDESTAL MOUNTED (68-88 MC) SUPERTURNSTILE TELEVISION ANTENNA

MECHANICAL SPECIFICATIONS

WEIGHT	3985#	H_3	28'-4"
A	6'-11"	J	5" O.D.
B	36'-10"	K	8 5/8" O.D.
C	9'-11"	L	14'-1"
D_1	25'-0"	M	8'-8"
H_2	48'-0"		

SHIPPING LENGTHS: (21'-6") (28'-0")
SHIPPING WEIGHTS: (386#) (1093#)
TRANS. LINE CONN.: 18'-5" ABOVE TOWER TOP

LOADING (NO ICE)

30/20 psf (MAX. LOAD. 40/25)

R_1	1276
$R_1 \times D_1$	31900 ft.#

SUGGESTED BASE STABILITY: 2°

DESIGN ASSUMPTIONS

WIND VELOCITY: MAX. WIND VELOCITY (1" RAD. ICE) 85 mph
MAX. WIND VELOCITY (NO ICE) 110 mph
WIND VELOCITIES ARE TRUE, NOT INDICATED

DESIGN STRESSES: A.I.S.C. 20,000 psi (IN BENDING)

ELECTRICAL SPECIFICATIONS

CIRCULARITY: ± 2 DB

INPUT IMPEDANCE: TO MATCH 51.5 OHM MI-19112 LINES OVER DESIGNATED CHANNEL WITH TRANS. LINE CONN. SHOWN BELOW (V.S.W.R. 1.1 OR BETTER)

GAIN (AT VISUAL CARRIER) & POWER RATING

CHANNEL	4	5	6
GAIN	2.9	3.1	3.3
POWER RATING	21.8	19.8	18.8

ACCESSORIES

SLEET MELTERS: 3 OF MI-19009-C-1. POWER REQUIRED: 6 KW. 230 VOLTS 1Ø OR 3Ø, OR 460 VOLTS 1Ø OR 3Ø

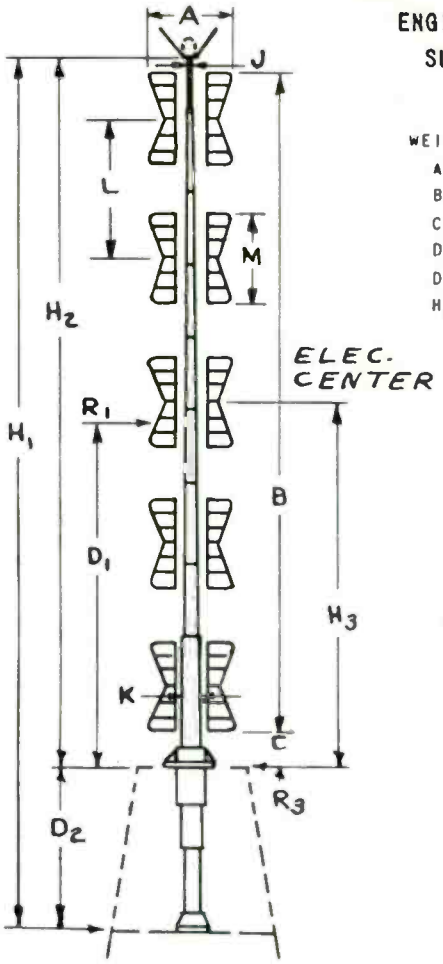
TRANSMISSION LINE CONNECTIONS

TYPE NO	LINES	DIPLEXER	DWG AND TYPE
TF-3D-P	TWO-1 5/8	BRIDGE	B-464591-A

B-466365

CHANNELS 4, 5 & 6, 5 SECTION SUPERTURNSTILE

TYPE TF-5AI - TOWER MOUNTED



GUIDE FLANGE DWG: 737146-1
POLE SOCKET DWG: 737146-2

ENGINEERING DATA FOR TF-5AI (66-88 MC) SUPERTURNSTILE TELEVISION ANTENNA

MECHANICAL SPECIFICATIONS

WEIGHT	8000#		
A	6'-11"	H_2	68'-9"
B	64'-8"	H_3	35'-0"
C	2'-8"	J	5" O.D.
D_1	32'-2"	K	12 3/4" O.D.
D_2	16'-5"	L	14'-0"
H_1	85'-2"	M	8'-8"

SHIPPING LENGTHS: (28'-8") (31'-0") (29'-0")
SHIPPING WEIGHTS: (588#) (1417#) (1863#)
TRANS. LINE CONN.: 25'-6½" ABOVE TOWER TOP

LOADING (NO ICE)
30/20 psf (MAX. LOAD. 40/25)

R_1	2076
R_2	4076
R_3	6152
$R_1 \times D_1$	66800 ft.#

SUGGESTED BASE STABILITY: 2°

DESIGN ASSUMPTIONS

WIND VELOCITY: MAX. WIND VELOCITY (1" RAD. ICE) 85 mph
MAX. WIND VELOCITY (NO ICE) 110 mph
WIND VELOCITIES ARE TRUE, NOT INDICATED

DESIGN STRESSES: A.I.S.C. 20000 psi (IN BENDING)

ELECTRICAL SPECIFICATIONS

CIRCULARITY: ± 2 DB
INPUT IMPEDANCE: TO MATCH 51.5 OHM MI-19112 LINES OVER DESIGNATED CHANNEL WITH TRANS. LINE CONN. SHOWN BELOW (V.S.W.R. 1.1 OR BETTER)

GAIN (AT VISUAL CARRIER) & POWER RATING

CHANNEL	4	5	6
GAIN	4.9	5.3	5.4
POWER RATING	21.8	19.8	18.8

ACCESSORIES

SLEET MELTERS; 5 OF MI-19009-C-1, POWER REQUIRED: 10KW, 230 VOLTS 3Ø, OR 460 VOLTS 1Ø OR 3Ø

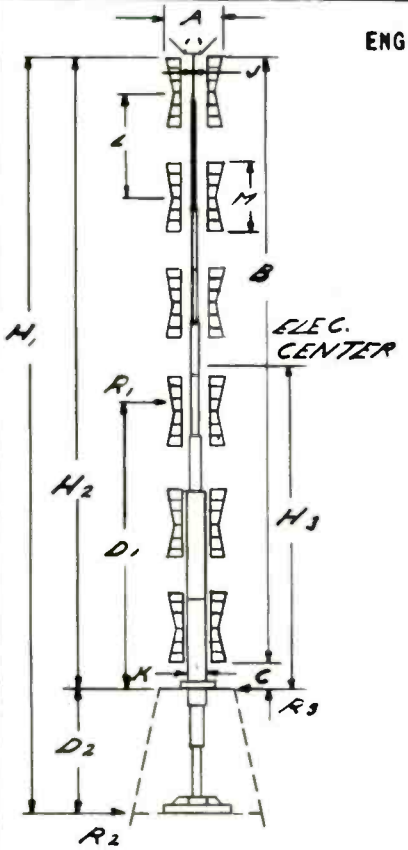
TRANSMISSION LINE CONNECTIONS

TYPE NO.	LINE	DIPLEXER	DWG. AND TYPE
TF-5AI	TWO 1 5/8	BRIDGE	B-464591-A

B-466339

CHANNELS 4, 5 & 6, 6 SECTION SUPERTURNSTILE

TYPE TF-6BM, - TOWER MOUNTED



GUIDE FLANGE DWG: 745163-501
POLE SOCKET DWG: 745167-502

ENGINEERING DATA FOR TF-6BM SERIES (66-88 MC) SUPERTURNSTILE TELEVISION ANTENNA

MECHANICAL SPECIFICATIONS

WEIGHT	10000#	H_2	82'-9"
A	6'-11"	H_3	42'-0"
B	78'-8"	J	5" O.D.
C	2'-8"	K	16" O.D.
O_1	36'-6"	L	14'-0"
D_2	16'-5"	M	8'-8"
H_1	99'-2"		

SHIPPING LENGTHS: (23'-6") (29'-0") (28'-8") (23'-6")
SHIPPING WEIGHTS: (1858#) (2588#) (590#) (1090#)
TRANS. LINE CONN.: 6'-8" BELOW TOWER TOP

LOADING (NO ICE)

	50/30 psf	30/20 psf (MAX. LOAD 50/30)
R_1	4320	2880
R_2	9620	6413
R_3	13940	9293
$R_1 \times D_1$	157700 FT.#	105100 FT.#

SUGGESTED BASE STABILITY: 2°

DESIGN ASSUMPTIONS

WIND VELOCITY: MAX. WIND VELOCITY (1" RAD. ICE) 85 mph
MAX. WIND VELOCITY (NO ICE) 110 mph
WIND VELOCITIES ARE ACTUAL, NOT INDICATED
DESIGN STRESSES: A.I.S.C. 20000 psi (IN BENDING)

ELECTRICAL SPECIFICATIONS

POWER RATING: 50 KW
CIRCULARITY: ± 2 DB
INPUT IMPEDANCE: TO MATCH 51.5 OHM MI-19113 LINES OVER DESIGNATED CHANNEL WITH TRANS. LINE CONN. SHOWN BELOW. (V.S.W.R. 1.1 OR BETTER)

GAIN (AT VISUAL CARRIER)

CHANNEL	4	5	6
GAIN	6.0	6.4	6.5

ACCESSORIES

SLEET MELTERS: 6 OF MI-19009-C-1. POWER REQUIRED: 12 KW, 230 VOLTS 3Ø, OR 460 VOLTS 1Ø OR 3Ø

TRANSMISSION LINE CONNECTIONS

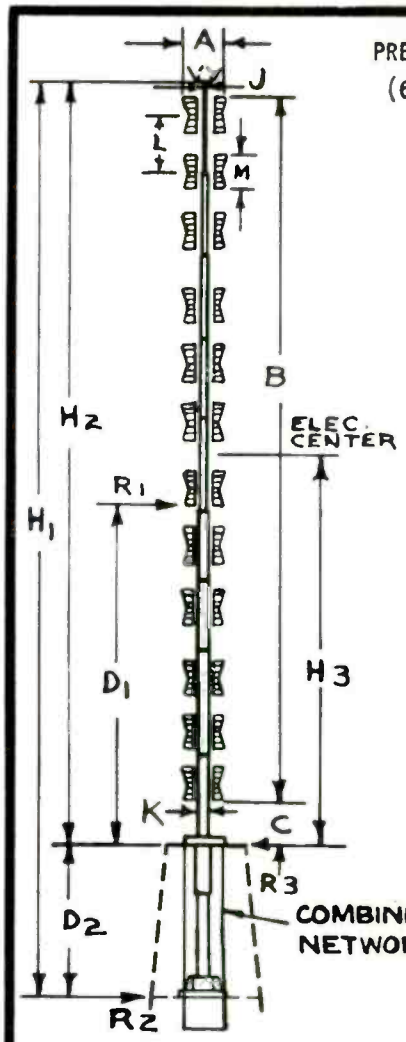
TYPE NO.	LINE	DIPLEXER	DWG. AND TYPE
TF-6BM	TWO 3 1/8	BRIDGE	B-464591-A
TF-6BM-A	ONE 3 1/8	NOTCH	B-464591-B
TF-6BM-B	ONE 6 1/8	NOTCH	B-464591-B

469823-1

469823

CHANNELS 4, 5 & 6, 12 SECTION SUPERTURNSTILE

TYPE TF-12AM - TOWER ONLY



NOT FURNISHED WITH GUIDE FLANGE OR POLE SOCKET. REFER TO 750757 FOR 3-1/8 LINE OR 634415 FOR 6-1/8 LINE SHOWING PROPOSED METHOD OF INSTALLATION TO TOWER.

PRELIMINARY ENGINEERING DATA FOR TF-12AM SERIES (66-88 MC) SUPERTURNSTILE TELEVISION ANTENNA

MECHANICAL SPECIFICATIONS

WEIGHT	44000#	H_2	166'-9"
A	6'-11"	H_3*	100'-9 5/8"
B	162'-8"	J	5" O.D.
C	2'-8"	K	25" O.D.
D_1	68'-6"	L	14'-0"
D_2	24'-0"	M	8'-8"
H_1	190'-9"		

SHIPPING LENGTHS: 11 SECTIONS
GREATEST LENGTH: 28'-8"
HEAVIEST SECTION: 5648#
TRANS. LINE CONN.: 8'-11" ABOVE TOWER TOP

LOADING (NO ICE)

	50/30 psf	30/20 psf (MAX. LOAD. 50/30)
R_1	12542	8361
R_2	35796	23863
R_3	48338	32224
$R_1 \times D_1$	859100 ft.#	572700 ft.#

SUGGESTED BASE STABILITY: 1°

DESIGN ASSUMPTIONS

WIND VELOCITY: MAX. WIND VELOCITY (1" RADIAL ICE) 85 mph
MAX. WIND VELOCITY (NO ICE) 110 mph
WIND VELOCITIES ARE TRUE, NOT INDICATED

DESIGN STRESSES: A.I.S.C. 20,000 psi (IN BENDING)

ELECTRICAL SPECIFICATIONS

POWER RATING: 50 KW
CIRCULARITY: ± 2 DB
INPUT IMPEDANCE: TO MATCH 51.5 OHM MI-19113 LINES OVER DESIGNATED CHANNEL WITH TRANS. LINE CONN. SHOWN BELOW (V.S.W.R. 1.1 OR BETTER)

GAIN (AT VISUAL CARRIER)

CHANNEL	4	5	6
GAIN **	11.8	12.0	12.1

ACCESSORIES

SLEET MELTERS: 12 OF MI-19009-C-L POWER REQUIRED: 24 KW. 230 VOLTS 3Ø, OR 460 VOLTS 1Ø OR 3Ø
BEAM TILTING SECTIONS: FOR 1°, 1 OF MI-19395-E. FOR ½°, 1 OF MI-19395-F

TRANSMISSION LINE CONNECTION

TYPE NO.	LINES	DIPLEXER	DWG. AND TYPE	COMBINING NETWORK DWG.
TF-12AM	TWO-3 1/8	BRIDGE	B-464592-A	631151
TF-12AM-A	FOUR-3 1/8	BRIDGE	B-464592-B	
TF-12AM-B	TWO-3 1/8	NOTCH	B-464592-D	
TF-12AM-C	ONE-3 1/8	NOTCH	B-464592-C	
TF-12AM-D	TWO-6 1/8	BRIDGE	B-464592-A	631151
TF-12AM-E	FOUR-6 1/8	BRIDGE	B-464592-B	
TF-12AM-F	TWO-6 1/8	NOTCH	B-464592-D	
TF-12AM-G	ONE-6 1/8	NOTCH	B-464592-C	

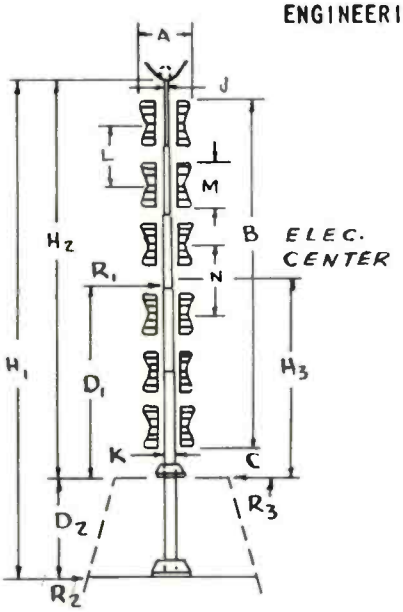
*H_3 IS FOR 70-30 POWER DIVISION. H_3 FOR 50-50 POWER DIVISION IS 84'-0".
**GAINS ARE FOR 70-30 POWER DIVISION (STANDARD ANTENNA). GAINS FOR 50-50 POWER DIVISION ARE 4% HIGHER.

B-466352

CHANNELS 7 to 13, 6 SECTION SUPERTURNSTILE

TYPE TF-6AH - TOWER MOUNTED

ENGINEERING DATA FOR TF-6AH TOWER MOUNTED (174-216 MC) SUPERTURNSTILE TELEVISION ANTENNA



GUIDE FLANGE DWG: 750098-501
POLE SOCKET DWG: 745167-503

MECHANICAL SPECIFICATIONS

WEIGHT	3000	H_2	37'-3"
A	3'-2"	H_3	19'-2 15/16"
B	33'-2 3/8"	J	5" O.D.
C	2'-7 3/4"	K	8 5/8" O.D.
D_1	18'-8"	L	5'-8"
D_2	10'-0"	M	3'-7 3/8"
H_1	47'-3"	N	6'-11" (AT CENTER)

SHIPPING LENGTHS: (26'-8") (22'-1")
SHIPPING WEIGHTS: (491#)) (996#)
TRANS.LINE CONN.: 1'0" ABOVE TOWER TOP

LOADING (NO ICE)

	50/30 psf	30/20 psf (MAX.LOAD. 40/25)
R_1	1500	920
R_2	2805	1720
R_3	4305	2640
$R_1 \times D_1$		17200 FT.LBS.

SUGGESTED BASE STABILITY: 2°

DESIGN ASSUMPTIONS

WIND VELOCITY: MAX. WIND VELOCITY (1" RAD. ICE) 85 mph
MAX. WIND VELOCITY (NO ICE) 110 mph
WIND VELOCITIES ARE TRUE, NOT INDICATED
DESIGN STRESSES: A.I.S.C. 20,000 psi (IN BENDING)

ELECTRICAL SPECIFICATIONS

POWER RATING 35 KW
CIRCULARITY: ± 2 DB
INPUT IMPEDANCE: TO MATCH 51.5 OHM MI-19313 LINES OVER DESIGNATED CHANNEL WITH TRANS. LINE CONN. SHOWN BELOW (V.S.W.R. 1.1 OR BETTER)

GAIN (AT VISUAL CARRIER)

CHANNEL	7	8	9	10	11	12	13
GAIN	6.2	6.3	6.7	6.7	6.8	6.8	6.9

ACCESSORIES

SLEET MELTERS: 6 OF MI-19009-J-1POWER REQUIRED: 6 KW, 230 VOLTS 1Ø OR 3Ø, OR 460 VOLTS 1Ø OR 3Ø

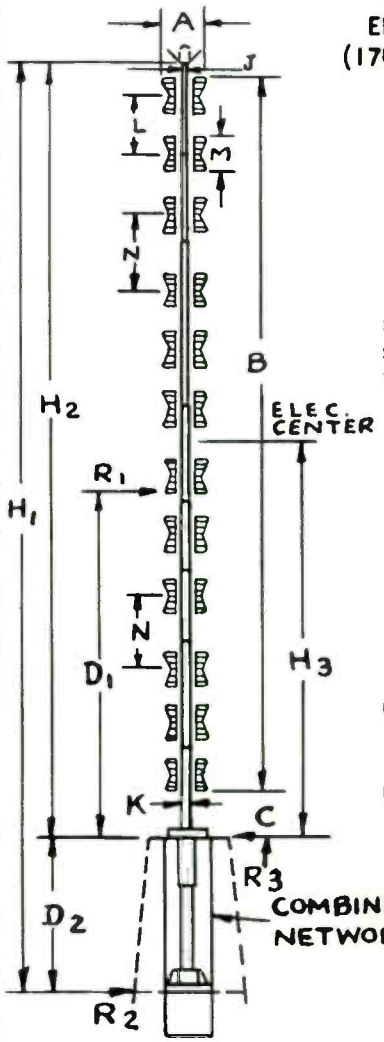
TRANSMISSION LINE CONNECTIONS

TYPE NO.	LINE	DIPLEXER	DWG. AND TYPE
TF-6AH	TWO 3 1/8	BRIDGE	B-464591-A

B-470090-1

CHANNELS 7 to 13, 12 SECTION SUPERTURNSTILE

TYPE TF-12AH - TOWER MOUNTED



GUIDE FLANGE DWG: 745166-501
POLE SOCKET DWG: 745167-504

ENGINEERING DATA FOR TF-12AH TOWER MOUNTED (174-216 MC) SUPERTURNSTILE TELEVISION ANTENNA

MECHANICAL SPECIFICATIONS

WEIGHT	8000#	H_2	72'-11"
A	3'-2"	H_3*	44'-3 7/16"
B	68'-5 3/8"	J	5" O.D.
C	3'-0 1/4"	K	12 3/4" O.D.
D_1	32'-2"	L	5'-8"
D_2	11'-6"	M	3'-7 3/8"
H_1	84'-5"	N	6'-11" (AT CENTER)

SHIPPING LENGTHS: (26'-8") (23'-9") (17'-8") (21'-10")
SHIPPING WEIGHTS: (491#) (1226#) (1749#) (2213#)
TRANS. LINE CONN.: 2"-2 11-16A ABOVE TOWER TOP

FLANGES, MI-19113 TYPE

LOADING (NO ICE)

	50 psf	30 psf
R_1	3954	2636
R_2	11071	7317
R_3	15025	9953
$R_1 \times D_1$	126200 FT.#	84800 FT.#

SUGGESTED BASE STABILITY: 1°
MAX. LOADING 50/30 psf

DESIGN ASSUMPTIONS

WIND VELOCITY: MAX. WIND VELOCITY (1" RAD. ICE) 80 mph
MAX. WIND VELOCITY (NO ICE) 110 mph
WIND VELOCITIES ARE TRUE, NOT INDICATED

DESIGN STRESSES: A.I.S.C. 20,000 psi (IN BENDING)

ELECTRICAL SPECIFICATIONS

POWER RATING: 50 KW (35 KW EACH HALF)
CIRCULARITY: ± 2 DB
INPUT IMPEDANCE: 51 1/2 OHMS (ACTUAL) (V.S.W.R. 1.1 OR BETTER) FOR MI-19113 LINE USE MI-MI-191138-48 TRANSFORMERS.

GAIN (AT VISUAL CARRIER)

CHANNEL	7	8	9	10	11	12	13
GAIN **	11.5	11.7	12.1	12.4	12.1	11.8	11.7

ACCESSORIES

SLEET MELTERS: 12 OF MI-19009-J-1 POWER REQUIRED: 12 KW
230 VOLTS 3#, OR 460 VOLTS 1# OR 3#
BEAM TILTING SECTIONS: FOR 1°, 1 OF MI-19395-A
FOR 1/2°, 1 OF MI-19395

TRANSMISSION LINE CONNECTIONS

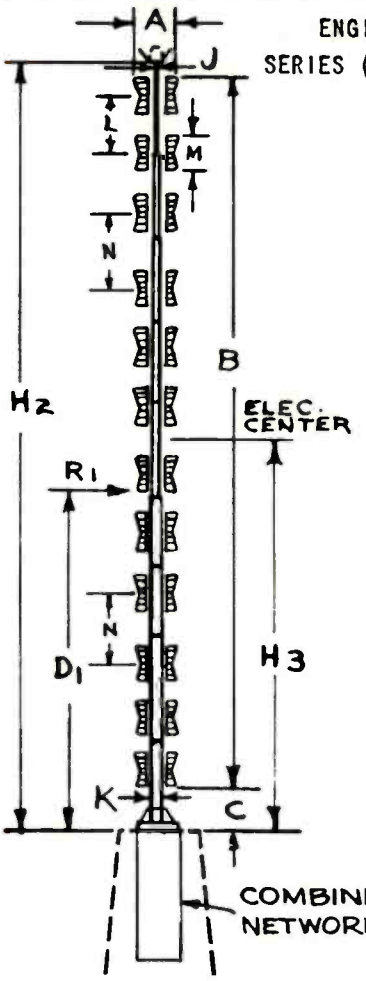
TYPE NO.	LINES	DIPLEXER	DWG. AND TYPE	COMBINING NETWORK DWG.
TF-12AH	TWO-3 1/8	BRIDGE	B-464592-A	627844
TF-12AH-A	FOUR-3 1/8	BRIDGE	B-464592-B	627844
TF-12AH-B	TWO-3 1/8	NOTCH	B-464592-D	
TF-12AH-C	ONE-3 1/8	NOTCH	B-464592-C	
TF-12AH-D	TWO-6 1/8	BRIDGE	B-464592-A	627844
TF-12AH-E	FOUR-6 1/8	BRIDGE	B-464592-B	627844
TF-12AH-F	TWO-6 1/8	NOTCH	B-464592-D	
TF-12AH-G	ONE-6 1/8	NOTCH	B-464592-C	

* H_3 IS FOR 70-30 POWER DIVISION (STANDARD ANTENNA). H_3 FOR 50-50 POWER DIVISION IS 37'-2 13/16".
** GAIN FIGURES ARE FOR 70-30 POWER DIVISION. GAINS FOR 50-50 POWER DIVISION ARE 4% HIGHER.

B-466344

CHANNELS 7 to 13, 12 SECTION SUPERTURNSTILE

TYPE TF-12AH-P - PEDESTAL MOUNTED



PEDESTAL DWG; 463057-501

ENGINEERING DATA FOR TF-12AH-P PEDESTAL MOUNTED SERIES (174-216 MC) SUPERTURNSTILE TELEVISION ANTENNAS

MECHANICAL SPECIFICATIONS

WEIGHT	7675#	* H_3	46'-9 1/16"
A	3'-2"	J	5" O.D.
B	68'-5 3/8"	K	12 3/4" O.D.
C	5'-5 7/8"	L	5'-8"
D_1	34'-0"	M	3'-7 3/8"
H_2	75'-4 5/8"	N	6'-11" (AT CENTER)

SHIPPING LENGTHS: (26'-8") (23'-9") (17'-8") (10'-9 5/8")
SHIPPING WEIGHTS: (491#) (1226#) (1749#) (1112#)
TRANS. LINE CONN.: 4'-9 3/16" ABOVE TOWER TOP
DWG. FLANGES MI-19313 TYPE

LOADING (NO ICE)
30/20 psf (MAX. LOAD.)**

R_1	2700
$R_1 \times D_1$	92800 ft. #

SUGGESTED BASE STABILITY: 1°

DESIGN ASSUMPTIONS

WIND VELOCITY: MAX. WIND VELOCITY (1" RAD. ICE) 80 mph
MAX. WIND VELOCITY (NO ICE)110 mph
WIND VELOCITIES ARE TRUE, NOT INDICATED
DESIGN STRESSES: A.I.S.C. 20,000 psi (IN BENDING)

ELECTRICAL SPECIFICATIONS

POWER RATING: 50 KW (35 KW EACH HALF)
CIRCULARITY: ± 2 DB
INPUT IMPEDANCE: 51# OHMS ACTUAL. (VSWR 1.1 OR BETTER). FOR MI-19113 LINE USE MI-191138-48 TRANSFORMERS.

GAIN (AT VISUAL CARRIER)

CHANNEL	7	8	9	10	11	12	13
GAIN ***	11.5	11.7	12.1	12.4	12.1	11.8	11.7

ACCESSORIES

SLEET MELTERS: 12 OF MI-19009-J-1 POWER REQUIRED: 12 KW
230 VOLTS 3Ø, OR 460 VOLTS 1Ø OR 3Ø
BEAM TILTING SECTIONS: FOR 1°, 1 OF MI-19395-A.
FOR ½°, 1 OF MI-19395

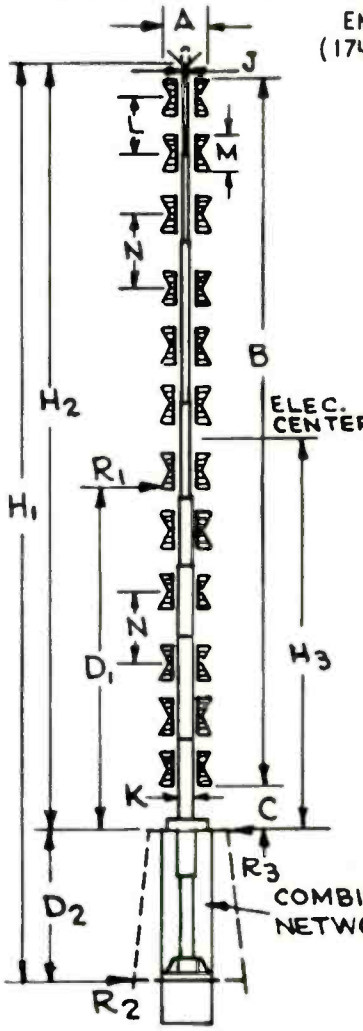
TYPE NO.	TRANSMISSION LINE CONNECTION LINES	DIPLEXER	DWG. AND TYPE	COMBINING NETWORK DWG.
TF-12AH-P	TWO-3 1/8	BRIDGE	B-464592-A	
TF-12AH-PA	FOUR-3 1/8	BRIDGE	B-464592-B	
TF-12AH-PB	TWO-3 1/8	NOTCH	B-464592-D	
TF-12AH-PC	ONE-3 1/8	NOTCH	B-464592-C	
TF-12AH-PD	TWO-6 1/8	BRIDGE	B-464592-A	
TF-12AH-PE	FOUR 6 1/8	BRIDGE	B-464592-B	
TF-12AH-PF	TWO-6 1/8	NOTCH	B-464592-D	
TF-12AH-PG	ONE-6 1/8	NOTCH	B-464592-C	

* H_3 FOR 70-30 POWER DIVISION. H_3 FOR 50-50 POWER DIVISION IS 39'-8 9/16".
** SUBJECT TO PEDESTAL DESIGN FOR HIGHER LOADING.
*** GAINS ARE FOR 70-30 POWER DIVISION (STANDARD ANTENNA). GAINS ARE 4% HIGHER FOR 50-50 POWER DIVISION.
FOR VERTICAL PATTERN DATA SEE B-466344

B-466362

CHANNELS 7 to 13, 12 SECTION SUPERTURNSTILE

TYPE TF-12BH - TOWER MOUNTED



ENGINEERING DATA FOR TF-12BH TOWER MOUNTED (174-216 MC) SUPERTURNSTILE TELEVISION ANTENNA

MECHANICAL SPECIFICATIONS

WEIGHT	8000#	H_2	72'-11"
A	3'-2"	H_3	37' – 2 15/16"
B	68'-5-3/8"	J	5" O.D.
C	3'-0-1/4"	K	12-3/4" O.D.
D_1	32'-2"	L	5'-8"
D_2	11'-6"	M	3'-7-3/8"
H_1	84'-5"	N	6'-11" (AT CENTER)

SHIPPING LENGTHS: (26'-8") (23'-9") (17'-8") (21'-10")
SHIPPING WEIGHTS: (491#) (1226#) (1749#) (2213#)
TRANS. LINE CONN.: 2'-2 11/16 ABOVE TOWER TOP

FLANGES, MI-19313 TYPE

LOADING (NO ICE)

	50 psf	30 psf
R		
R_1	3954	2636
R_2	11071	7317
R_3	15025	9953
$R_1 \times D_1$	126200 FT.#	84800 FT.#

SUGGESTED BASE STABILITY: 1°
MAX. LOADING 50/30 psf

DESIGN ASSUMPTIONS

WIND VELOCITY: MAX. WIND VELOCITY (1" RAD. ICE) 80 MPH
MAX. WIND VELOCITY (NO ICE) 110 MPH
WIND VELOCITIES ARE TRUE, NOT INDICATED

DESIGN STRESSES: A.I.S.C. 20,000 psi (IN BENDING)

ELECTRICAL SPECIFICATIONS

POWER RATING: 50 KW
CIRCULARITY: ±2 DB
INPUT IMPEDANCE: 51 1/2 OHMS (ACTUAL) (V.S.W.R. 1.1 OR BETTER) FOR MI-19113 LINE USE MI-191138-48 TRANSFORMERS.

GAIN (AT VISUAL CARRIER)

CHANNEL	7	8	9	10	11	12	13
GAIN	9.6	9.6	10.0	10.5	10.5	9.8	9.8

GUIDE FLANGE DWG: 745166-501
POLE SOCKET DWG: 745167-504

ACCESSORIES

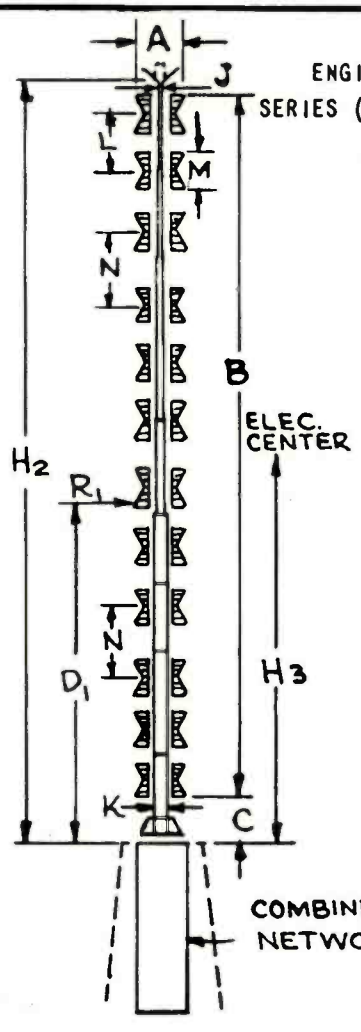
SLEET MELTERS: 12 OF MI-19009-J-1 POWER REQUIRED: 12 KW 230 VOLTS 3Ø, OR 460 VOLTS 1Ø OR 3Ø
BEAM TILTING SECTIONS: FOR 1°, 1 OF MI-19395-A FOR 1/2°, 1 OF MI-19395

TRANSMISSION LINE CONNECTIONS

TYPE NO.	LINES	DIPLEXER	DWG. & TYPE	COMBINING NETWORK DWG.
TF-12BH	TWO-3-1/8	BRIDGE	B-464592-A	627844
TF-12BH-A	FOUR-3-1/8	BRIDGE	B-464592-B	627844
TF-12BH-B	TWO-3-1/8	NOTCH	B-464592-D	
TF-12BH-C	ONE-3-1/8	NOTCH	B-464592-C	
TF-12BH-D	TWO-6-1/8	BRIDGE	B-464592-A	627844
TF-12BH-E	FOUR-6-1/8	BRIDGE	B-464592-B	627844
TF-12BH-F	TWO-6-1/8	NOTCH	B-464592-D	
TF-12BH-G	ONE-6-1/8	NOTCH	B-464592-C	

CHANNELS 7 to 13, 12 SECTION SUPERTURNSTILE

TYPE TF-12BH-P - PEDESTAL MOUNTED



PEDESTAL DWG: 463057-501

ENGINEERING DATA FOR TF-12BH-P PEDESTAL MOUNTED SERIES (174-216 MC) SUPERTURNSTILE TELEVISION ANTENNAS

MECHANICAL SPECIFICATIONS

WEIGHT	7675#		
A	3'-2"	H_3	39' - 8 9/16"
B	68'-5-3/8"	J	5" O.D.
C	5'-5-7/8"	K	12-3/4" O.D.
D_1	34'-0"	L	5'-8"
H_2	75'-4-5/8"	M	3'-7-3/8"
		N	6'-11" (AT CENTER)

SHIPPING LENGTHS: (26'-8") (23'-9") (17'-8") (10'-9-5/8"

SHIPPING WEIGHTS: (491#) (1226#) (1749#) (1112#)

TRANS. LINE CONN.: 4½Q 3/16" ABOVE TOWER TOP

FLANGES-MI-19313 TYPE.

LOADING (NO ICE)
30/20 PSF (MAX. LOAD)*

R_1 2700

$R_1 * D_1$ 92800 FT. #

SUGGESTED BASE STABILITY: 1°

DESIGN ASSUMPTIONS

WIND VELOCITY: MAX. WIND VELOCITY (1" RAD. ICE) 80 MPH
MAX. WIND VELOCITY (NO ICE) 110 MPH
WIND VELOCITIES ARE TRUE, NOT INDICATED

DESIGN STRESSES: A.I.S.C. 20,000 psi (IN BENDING)

ELECTRICAL SPECIFICATIONS

POWER RATING: 50 KW

CIRCULARITY: ±2 DB

INPUT IMPEDANCE: 51-1/2 OHMS ACTUAL. (VSWR 1.1 OR BETTER). FOR MI-19113 LINE USE MI-19113B-48 TRANSFORMERS.

GAIN (AT VISUAL CARRIER)

CHANNEL	7	8	9	10	11	12	13
GAIN	9.6	9.6	10.0	10.5	10.5	9.8	9.8

ACCESSORIES

SLEET MELTERS: 12 OF MI-19009-J-1 POWER REQUIRED: 12 KW 230 VOLTS 3Ø, OR 460 VOLTS 1 Ø OR 3 Ø

BEAM TILTING SECTIONS: FOR 1°, 1 OF MI-19395-A. FOR 1/2°, 1 OF MI-19395

* SUBJECT TO PEDESTAL DESIGN FOR HIGHER LOADING.

TRANSMISSION LINE CONNECTION

TYPE NO.	LINES	DIPLEXER	DWG. AND TYPE
TF-12BH-P	TWO-3-1/8	BRIDGE	B-464592-A
TF-12BH-PA	FOUR-3-1/8	BRIDGE	B-464592-B
TF-12BH-PB	TWO-3-1/8	NOTCH	B-464592-D
TF-12BH-PC	ONE-3-1/8	NOTCH	B-464592-C
TF-12BH-PD	TWO-6-1/8	BRIDGE	B-464592-A
TF-12BH-PE	FOUR-6-1/8	BRIDGE	B-464592-B
TF-12BH-PF	TWO-6-1/8	NOTCH	B-464592-D
TF-12BH-PG	ONE-6-1/8	NOTCH	B-464592-C

B-47140

VHF CUSTOM ANTENNAS

SUPERGAIN AND SUPERTURNSTILE

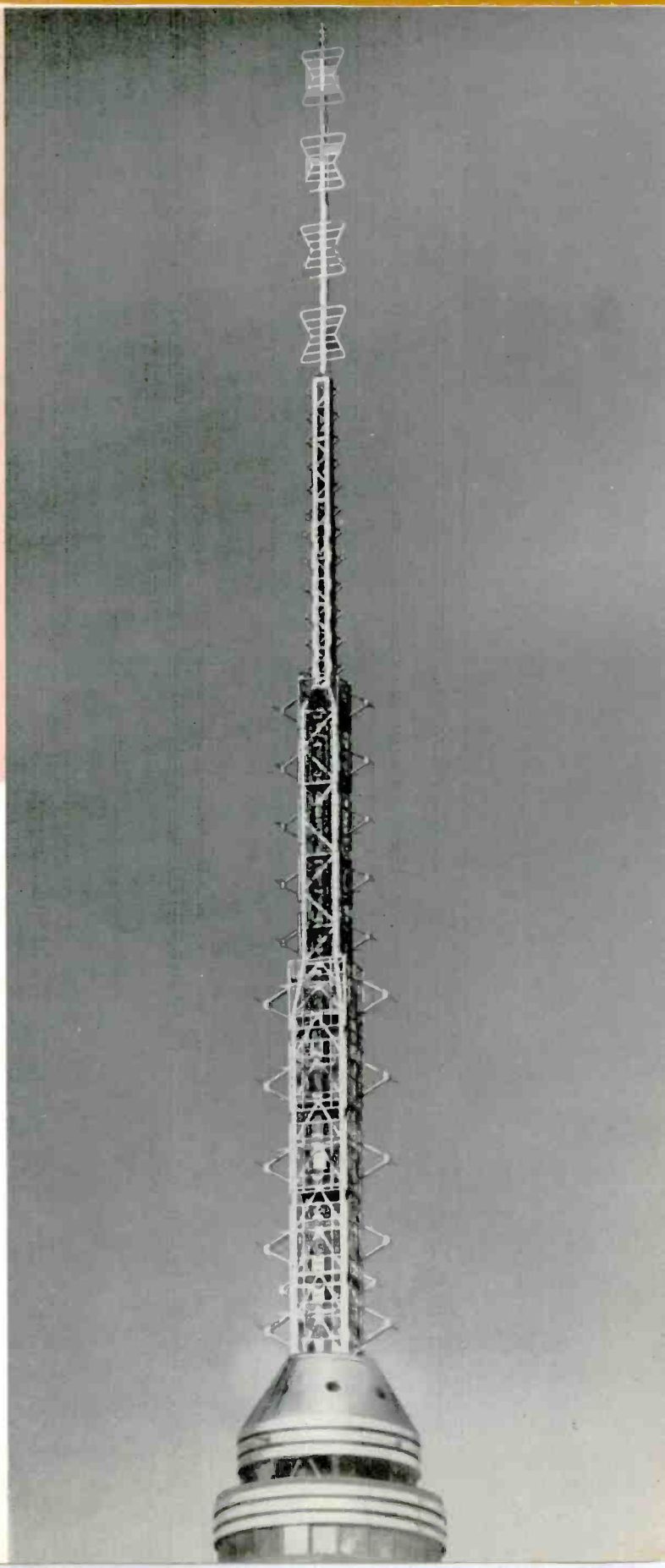
FEATURES

- Provide precise tailored coverage patterns
- Designs are engineered to meet special power, gain and/or terrain conditions
- Supergain or Superturnstile types available
- "Community tower" installations are engineered for economical, yet superior coverage
- All antennas are backed by the vast design experience of RCA Broadcast Antenna engineers
- RCA Engineers and TV Station Engineers collaborate on special antenna designs

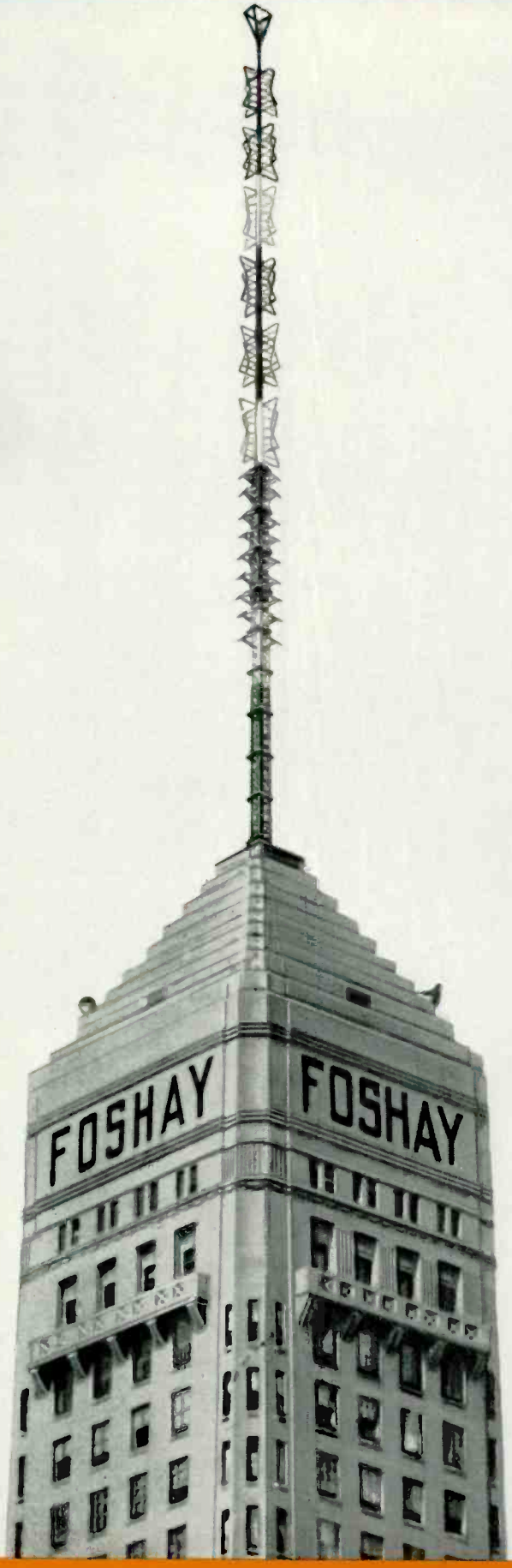
USES

RCA Custom Built VHF Television Antennas (Supergain and Superturnstile) are specially engineered by RCA Broadcast Antenna engineers to meet specifications, or TV coverage requirements that are unique. There are a great many cases when the consideration of RCA Custom Antennas will improve coverage and prove more economical. Some of the uses for RCA Custom Antennas are as follows:

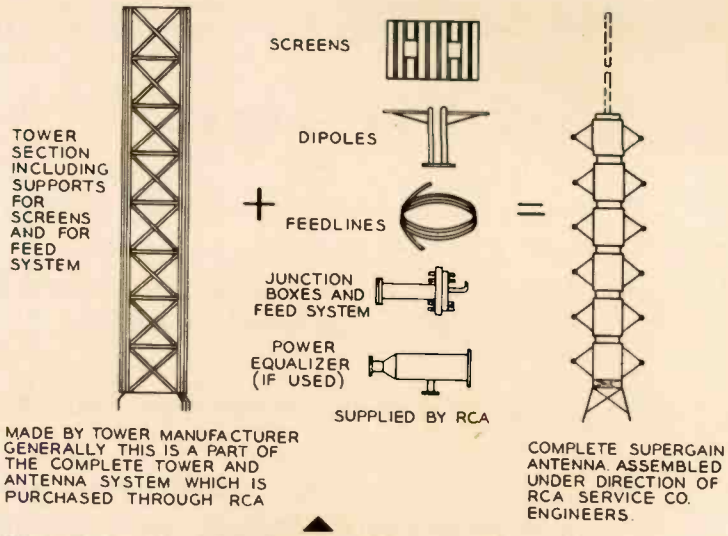
1. Multiple station installations where combination or multiple antennas are installed on a common tower.
2. Custom vertical patterns for special terrain conditions.
3. Special power gain requirements.
4. Heavy-duty wind loading specifications.
5. Excessive power handling capability requirements.
6. A combination of two or more of any of the above requirements.



Closeup view of the Empire State Custom Antenna installation which was originally designed by RCA to accommodate five TV and three FM services.



THE SUPERGAIN ANTENNA



Sketch showing the various elements which go to make up the RCA Supergain Antenna.

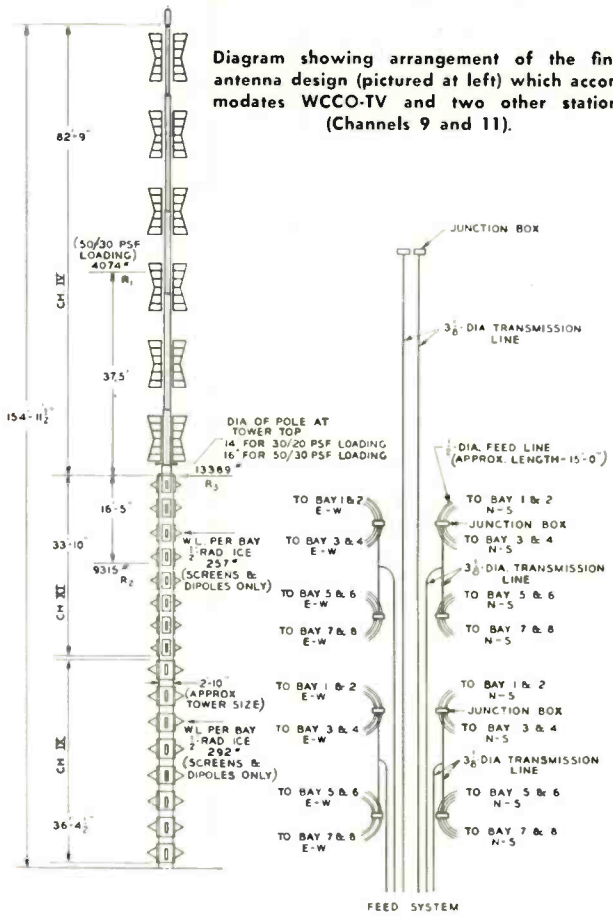


Diagram showing arrangement of the final antenna design (pictured at left) which accommodates WCCO-TV and two other stations (Channels 9 and 11).

Closeup of the Foshay Tower Building which shows an RCA six-section antenna mounted on the "multiple use" structure. The nine-section Supergain is used to accommodate Channels 9 and 11.

DESCRIPTION

RCA Custom-built Antennas are available in two types of designs. These are the Supergain and the popular RCA Superturnstile.

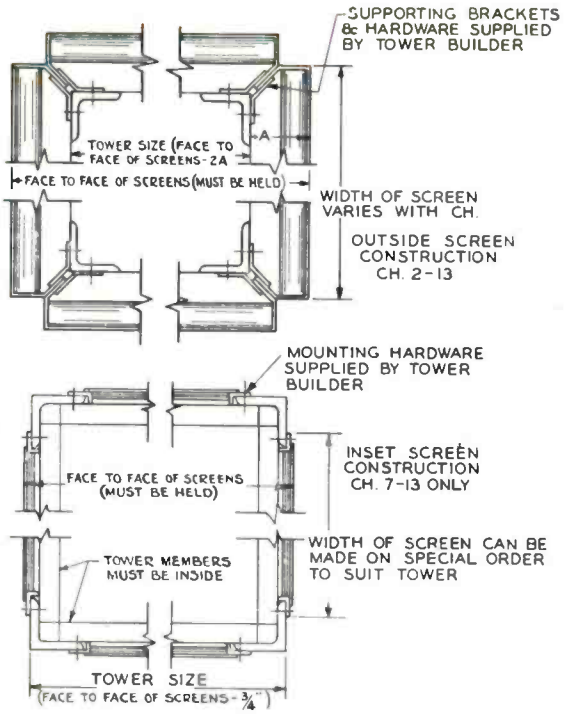
Perhaps one of the best known examples of RCA custom antenna engineering is the multiple TV-FM antenna installation atop the Empire State Building in New York City, which combines Superturnstile and Supergain arrays. Complete description of this installation is impossible here because of limited space, however—the Empire State Television System was designed with special consideration being given to the following factors.

1. Provision for five TV and three FM services.
2. Coupling effects between the eight antennas involved.
3. Bandwidth sufficient for television transmission.
4. Maximum gain in the aperture available.
5. Horizontal pattern suitable for area to be covered.
6. Power handling for 100 kw, ERP for TV services.

Another example of an RCA Superturnstile and Supergain mounted on a single tower is the Foshay installation which is pictured on these pages.

The Supergain Antenna consists of dipoles mounted a quarter-wave in front of the reflecting screen. Four of these dipole screen combinations are used in a square for each section of the antenna. See Figure 1. The required number of sections are stacked vertically to achieve the desired power gain. Phasing between adjacent sections may be adjusted for vertical pattern shaping.

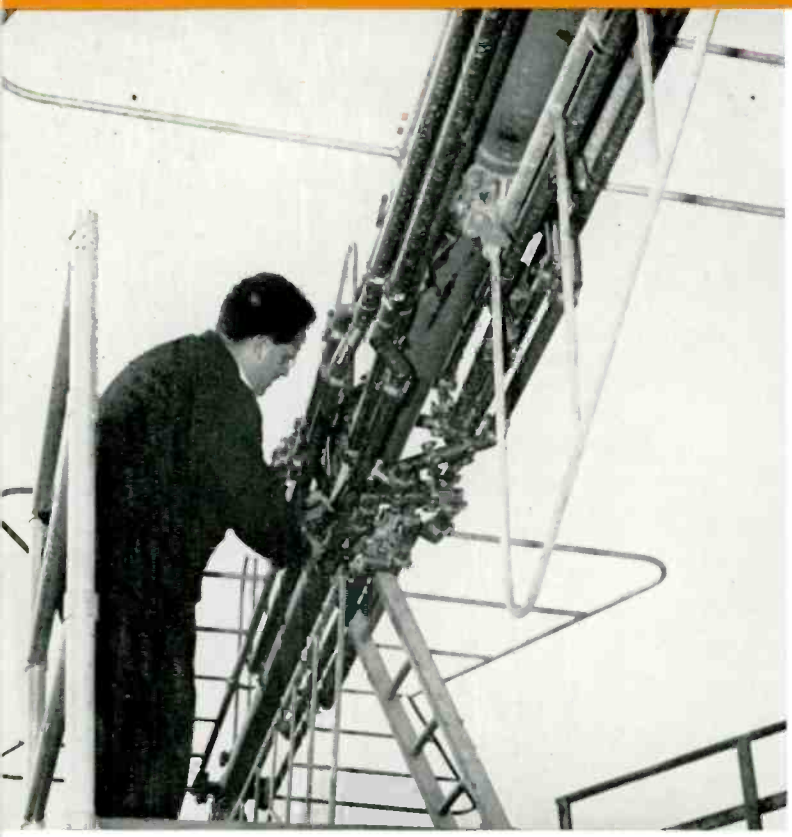
The **Custom-built Superturnstile Antennas** are basically modifications of the standard line of TV antennas and are made up of a series of radiating elements in which increasing gain is accomplished by vertical stacking of a number of sections. Each section consists of four radiators mounted in 90° intervals around the pole. Sections are mounted approximately a wave length above each other center to center.



Sketch showing the detail of the RCA Supergain screen which varies from approximately 2½ feet face-to-face width for Channel 12 to 9 feet for Channel 2.

SUPER GAIN ANTENNA HEIGHTS VS CHANNEL

Sections	CHANNEL 2	3	4	5	6	7	8	9	10	11	12	13	Approx. Gain
2	24′-8″	22′-2⅛″	20′-5⅝″	17′-7¾″	16′-5″	7′-9 15/16″	7′-8⅛″	7′-6⅝″	7′-1⅛″	6′-11 11/16″	6′-10⅜″	6′-9¼″	1.6
3	37′-11⅜″	34′-2⅞″	31′-3¼″	27′-2½″	25′-4″	12′-1⅜″	11′-9¾″	11′-6¾″	10′-11¾″	10′-8⅜″	10′-6¼″	10′-4″	2.4
4	51′-2¾″	46′-2⅞″	42′-2⅞″	36′-9¼″	34′-3″	16′-4 13/16″	15′-11⅜″	15′-6⅞″	14′-10⅜″	14′-6 1/16″	14′-2⅛″	13′-10¾″	3.2
5	64′-6⅛″	58′-2⅞″	53′-2½″	46′-4″	43′-2″	20′-8¼″	20′-1″	19′-7″	18′-9″	18′-3¼″	17′-10″	17′-5½″	4.0
6	77′-9½″	70′-2⅞″	64′-2⅛″	55′-10¾″	52′-1″	24′-11 1/16″	24′-2⅝″	23′-7⅛″	22′-7⅝″	22′-7/16″	21′-5⅞″	21′-¼″	4.8
7	91′-⅜″	82′-2⅞″	75′-1¾″	65′-5½″	61′	29′-3⅛″	28′-4¼″	27′-7¼″	26′-6¼″	25′-5⅝″	25′-1¾″	24′-7″	5.6
8	104′-4¼″	94′-2⅞″	86′-1⅜″	75′-¼″	69′-11″	33′-6 9/16″	32′-5⅞″	31′-7⅜″	30′-4⅞″	29′-6 13/16″	28′-9⅝″	28′-1¾″	6.4
9	117′-7⅝″	106′-2⅞″	97′-1″	84′-7″	78′-10″	37′-10″	36′-7½″	35′-7½″	34′-3½″	33′-4″	32′-5½″	31′-8½″	7.2
10	130′-11″	118′-2⅞″	108′-⅝″	94′-1¾″	87′-9″	42′-1 1/16″	40′-9⅛″	39′-7⅝″	38′-2⅛″	37′-1 3/16″	36′-1⅜″	35′-3¼″	8.0
11	144′-2⅜″	130′-2⅞″	119′-⅛″	103′-8½″	96′-8″	46′-4⅞″	44′-10¾″	43′-7¾″	42′-¾″	40′-10⅜″	39′-9¼″	38′-10″	8.8
12	157′-5¾″	142′-2⅞″	125′-11⅞″	113′-3¼″	105′-7″	50′-8 5/16″	49′-⅜″	47′-7⅞″	45′-11⅜″	44′-7 9/16″	43′-5⅛″	42′-4¾″	9.6
14	184′-½″	166′-2⅞″	151′-11⅛″	132′-4¾″	123′-5″	59′-3 3/16″	57′-3⅝″	55′-8⅛″	53′-8⅝″	52′-1 15/16″	50′-8⅞″	49′-6¼″	11.2
18	237′-2″	214′-2⅞″	195′-9⅝″	170′-7¾″	59′-1″	76′-4 15/16″	73′-10⅛″	71′-8⅝″	69′-3⅛″	67′-2 11/16″	65′-4⅜″	63′-9¼″	14.4
24	316′-10¼″	286′-2⅞″	261′-7⅜″	228′-¼″	212′-7″	102′-1 9/16″	98′-7⅞″	95′-9⅜″	92′-6⅞″	89′-9 13/16″	87′-3⅝″	85′-1¾″	19.2



Closeup photo showing the construction of a special copper feedline dress for a custom designed RCA Superturnstile Antenna.

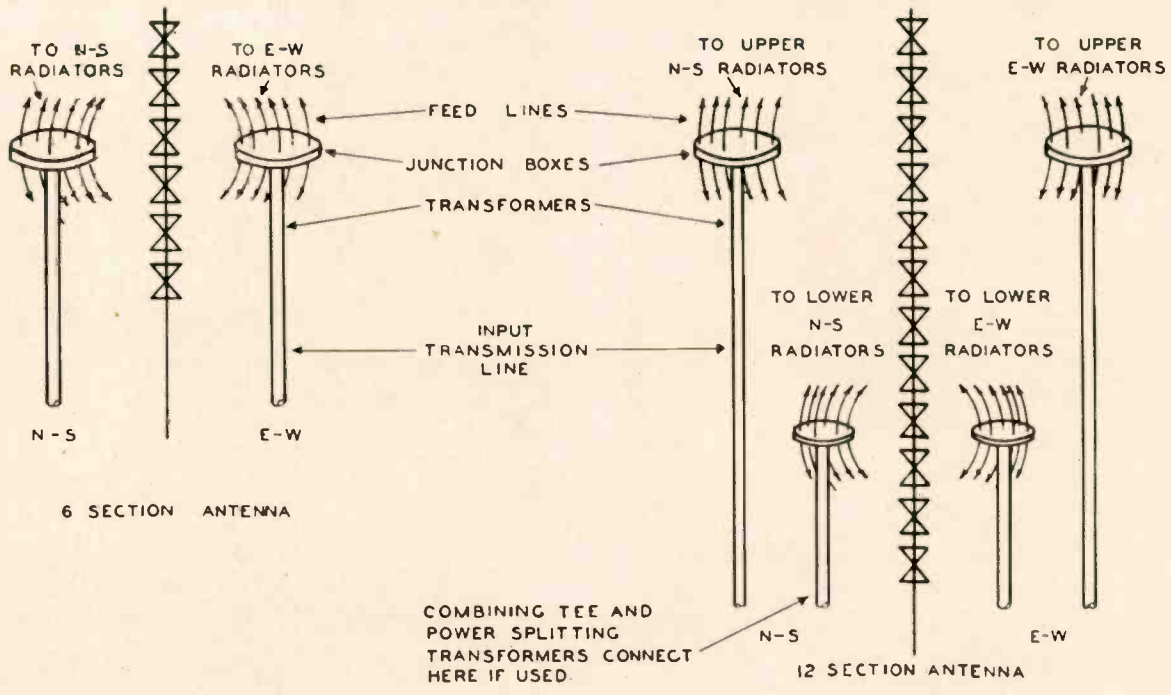
Electrical feed to both types of antennas is by means of coaxial transmission lines. The main transmission lines terminate in a junction box from which branch coaxial feed lines are in parallel and feed the center of the individual radiators at a low impedance point.

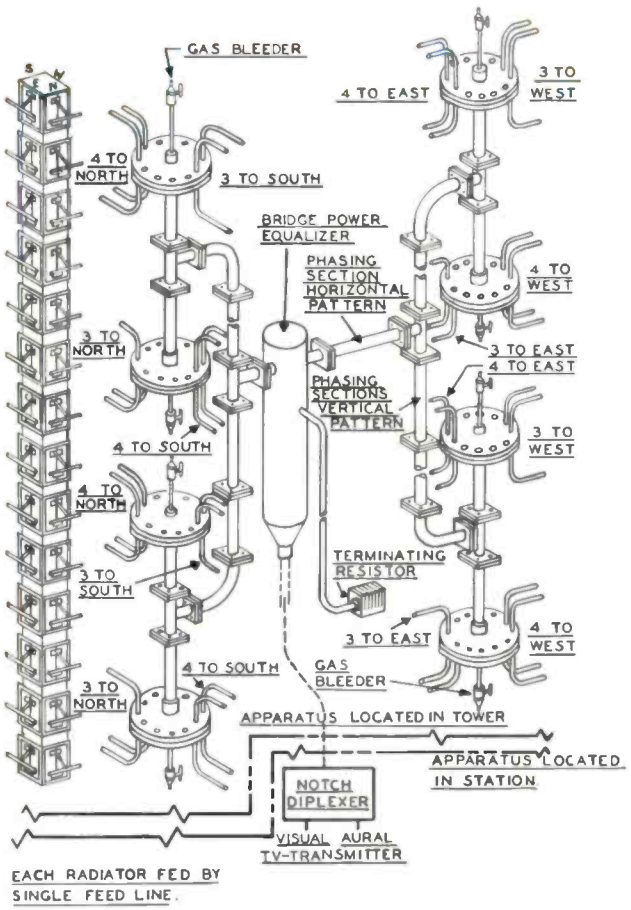
The feed systems for RCA Custom Antennas normally employ ¾ inch Styroflex line. Four lines are required for each antenna section. Heating of feed lines is the limiting factor in the power rating of an antenna. Accordingly, a high-gain antenna can normally be rated for a higher maximum power input than antennas with fewer sections and fewer feed lines. Where greater power handling is required, larger size Stylroflex may be employed, or in some cases 1⅝ inch copper coaxial transmission line.

Mechanical dimensions for the various size Supergain Antennas are illustrated in accompanying diagrams. Superturnstiles may be unique designs or may be electrical modifications or mechanical reinforcements of the RCA standard types. Mechanical dimensions for the standard line of Superturnstiles are contained under "VHF Superturnstile Antennas".

Perhaps the simplest and most direct way of describing RCA Custom VHF Antennas is to discuss their applications enumerated previously under "USES".

6- AND 12-SECTION ANTENNA FEED SYSTEMS





Detailed sketch showing layout of the feed system for an RCA Supergain—14 layers—non-directional.

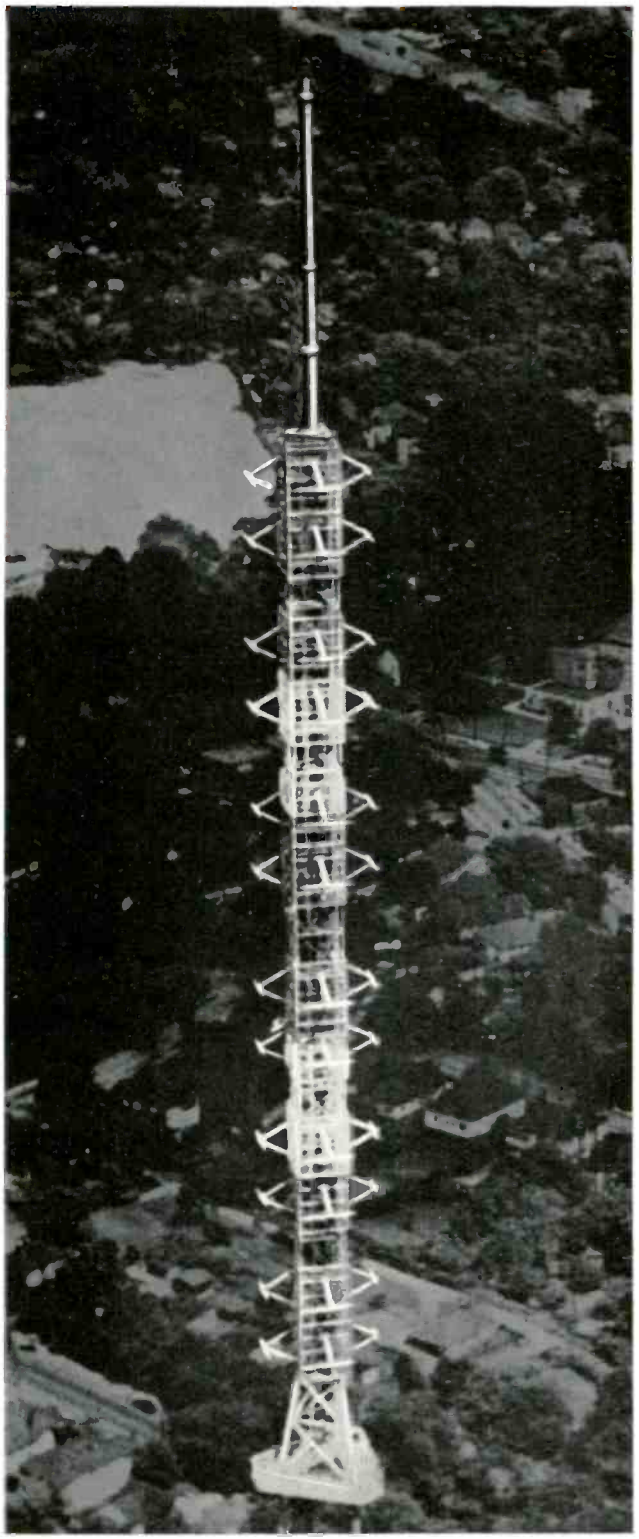
Multiple Station Installation

Many advantages may be derived from the common use of a single tower by two or more television stations. With a single high tower, the following benefits may result:

(a) Economy in sharing total investment costs (b) greater public satisfaction in a common receiving antenna orientation for receiving all stations and (c) may provide a solution where the number of locations with aeronautical approval is limited.

RCA 12-Section Superturnstile Antennas may in many instances be used,, or two 6-section antennas for different channels. Typical Superturnstile stacking combinations are illustrated in the Superturnstile Catalog description.

Other means of obtaining multiple antenna installations include "side-by-side" mounting of Standard Superturnstiles on a cross arm, or the use of one or more Supergains with Standard RCA Superturnstiles on top. Any combination of VHF channels may operate on a common tower with vertical stacking of Supergain antennas.



Supergain Antenna at WSB, Atlanta, Ga. Since this photo was made, the antenna has been changed from a 12-section to a 14-section type.

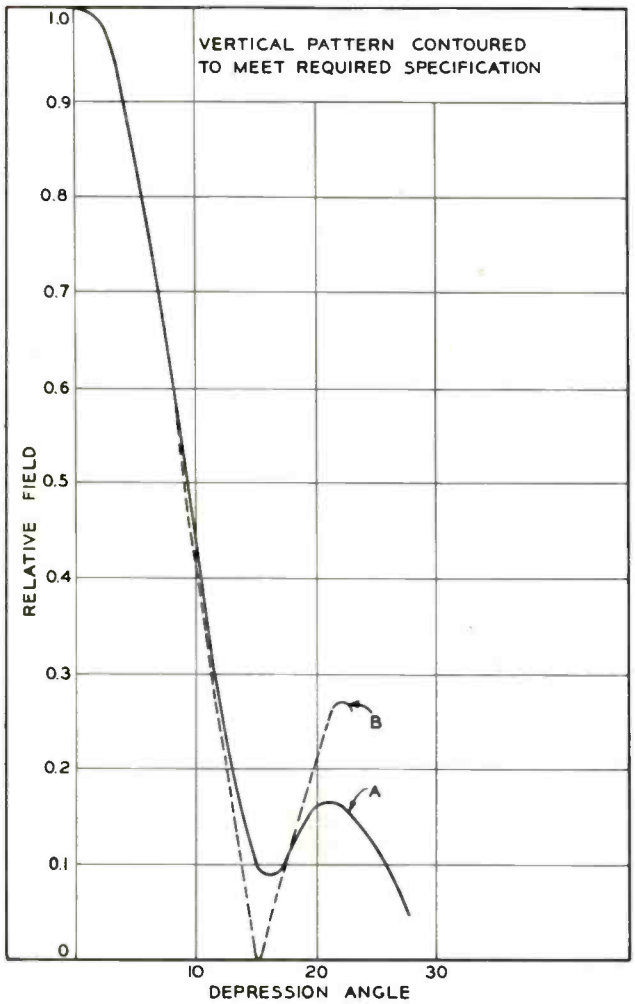
Custom Vertical Patterns

Frequently, special terrain conditions and/or unusually high mountain top elevations require special vertical pattern shaping for satisfactory coverage. Vertical pattern shaping may be achieved in either Superturnstile or Supergain antennas by four methods:

(1) Unequal power distribution between antenna sections.
(2) Control of electrical phase relation between sections.
(3) Beam tilting.
(4) Combinations of (1) and (2) above.

The first method is used in RCA antennas which are sectionalized, for example, the 70-30 power division between upper and lower sections of the TF-12AL, AM, AH Antennas.

Where greater minimum fill-in is desired, the second method is normally preferred—since unequal power division limits the antenna power rating by concentrating larger portions of power in a few feed lines. A considerable latitude of control in the vertical pattern shape can be exercised by phasing between sections, by unequal feed line lengths. The power gain in the main load is less than that achieved with uniform phasing and power distribution due to a greater power radiated in other directions. Special vertical patterns are furnished on request.



VERTICAL PATTERN CONTOURED TO MEET REQUIRED SPECIFICATIONS (see curves at left). Curve A shows calculated vertical pattern of standard four-section antenna, with deep null at 15.1°. Curve B shows calculated vertical pattern of four-section antenna with unequal vertical spacing between sections of radiators. The spacing is calculated so that the specified field strength of 0.1 at 15° is obtained.

Special Gain Requirements

If a greater power gain than that obtainable in a standard antenna is required, additional gain may be achieved by vertical stacking of a greater number of sections. The Supergain antenna is offered in 18 and 24 sections with power gains of 14.4 and 19.2 respectively.

Heavy-Duty Wind Loading

The new line of RCA Standard Superturnstile Antennas is designed for 50/30 psf wind loading. This is equivalent to a wind velocity of 110 mph. For unusual mountain top locations, hurricane areas, or to meet requirements of special local building codes, the Superturnstile antenna may be reinforced by increasing the wall thickness of the supporting pole. Any RCA Superturnstile may be supplied in a heavy-duty design without altering the electrical performance and specifications or mechanical dimensions as listed under "VHF Superturnstiles". Heavy-duty antennas have previously been suppied for operation in wind velocities of as much as 150 mph, and with a heavy ice coating on the antenna. The wind load limitation of the Supergain is dependent upon the tower design and power specifications.

RCA Custom antennas can be designed to meet the same specifications that apply to the standard Superturnstile or Supergain antennas, except that components of greater power handling capability are required to permit the increased power rating.

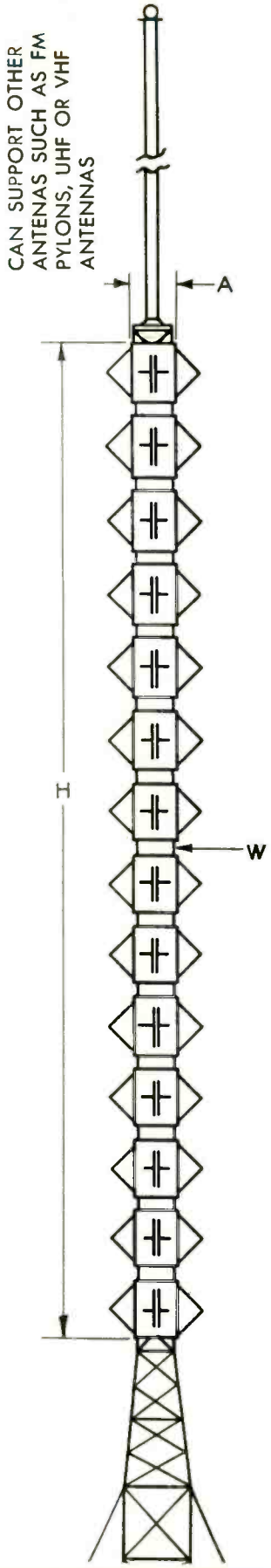
This is achieved through the use of one or more of the following: A larger size of transmission line, junction boxes of larger size or constructed of materials which will either have lower losses or will carry more power without deterioration, feedlines of greater power handling capability, or a rearrangement of radiators to permit the use of a greater number of feedlines so that the power per feedline is reduced to a value which is within the safe rating.

Table 2
WIND VELOCITIES AND CORRESPONDING PRESSURES

TRUE "EXTREME" VELOCITY MILES PER HOUR (Note No. 1) V_a	FLAT SURFACES Pressure in Lbs./Sq. Ft. of Projected Area $P = 0.0042V_a^2$	CYLINDRICAL SURFACES Pressure in Lbs./Sq. Ft. of Projected Area $P = 0.0025V_a^2$	INDICATED VELOCITY MILES PER HOUR (Note No. 2) V_1	
10	.42	.25	11	
15	.95	.56	17	
20	1.7	1.00	23	
25	2.6	1.6	30	
30	3.8	2.3	37	
35	5.2	3.1	44	
40	6.7	4.0	50	
45	8.5	5.1	57	
50	10.5	6.3	64	
55	12.7	7.6	71	
60	15.1	9.0	78	
65	17.8	10.6	85	
70	20.6	12.3	91	
75	23.6	14.1	98	
80	26.9	16.0	105	THESE FIGURES ARE NOT SUBSTANTIATED BY ACTUAL TESTS BUT ARE EXTRAPOLATED
85	30.4	18.1	112	
90	34.0	20.3	118	
95	37.9	22.6	125	
100	42.0	25.0	132	
105	46.3	27.6	138	
110	50.8	30.3	145	
115	55.5	33.1	152	
120	60.5	36.0	159	
125	65.6	39.1	166	
130	70.9	42.3	173	
135	76.5	45.6	180	
140	82.3	49.0	187	
145	88.3	52.6	194	
150	94.5	56.3	201	
155	100.9	60.1	208	
160	107.5	64.0	215	
165	114.3	68.1	222	
170	121.4	72.3	229	
175	128.6	76.6	236	
180	136.1	81.0	243	
185	143.7	85.6	250	
190	151.6	90.3	257	
195	159.7	95.1	264	
200	168.0	100.0	271	
205	176.5	105.1	278	
210	185.2	110.3	285	
215	194.1	115.6	292	
220	203.3	121.0	297	
225	212.6	126.6	304	

NOTE No. 1—Since 1932 published weather data based on 5 minute average known as "Maximum" and frequently on fastest mile known as "Extreme." Selection of antenna loads should be based on Extreme (increase "Maximum" by 15% if no data on Extreme).

NOTE No. 2—RCA bases strength of antennas on True Velocities, not Indicated. Indicated Velocities are those given by the Robinson 4 Cup Anemometer (now obsolete).



SPECIFICATIONS

1. PURPOSE

   The Supergain is used for special requirements of gain and pattern and in multiple stacked antenna systems.

2. MECHANICAL DESCRIPTION

   The Supergain consists of vertical stacked array of horizontal dipoles each backed by reflecting screen. Radiators vertically spaced 0.77 wavelength apart are used. Antenna fed by single transmission line on Channels 2-6 and dual line on Channels 7-13.

3. ELECTRICAL PERFORMANCE

   Gain determined by number of layers and is approximately 0.8 times number of layers. Directional patterns, providing much higher gain values in favored directions can be obtained by grouping dipoles on one or more sides of the tower or by dispersing them to obtain desired pattern.

4. ASSOCIATED EQUIPMENT

   Notch diplexer or Filterplexer needed to feed aural and visual signals when single line is used. A bridge power equalizer in antenna system tends to make all dipoles take equal power. For Channels 7-13 a bridge diplexer is used to feed dual transmission line. Transmission line 3⅛" or 6⅛", depending on power to be handled.

5. FEATURES

   A. Additional feature of controlled vertical pattern to provide constant field strength through coverage area of antenna can be provided.

   B. Beam tilting, to increase field strength in desired close-in area, can also be arranged.

   C. R-F switching, to sectionalize the antenna, for emergency operation can be supplied.

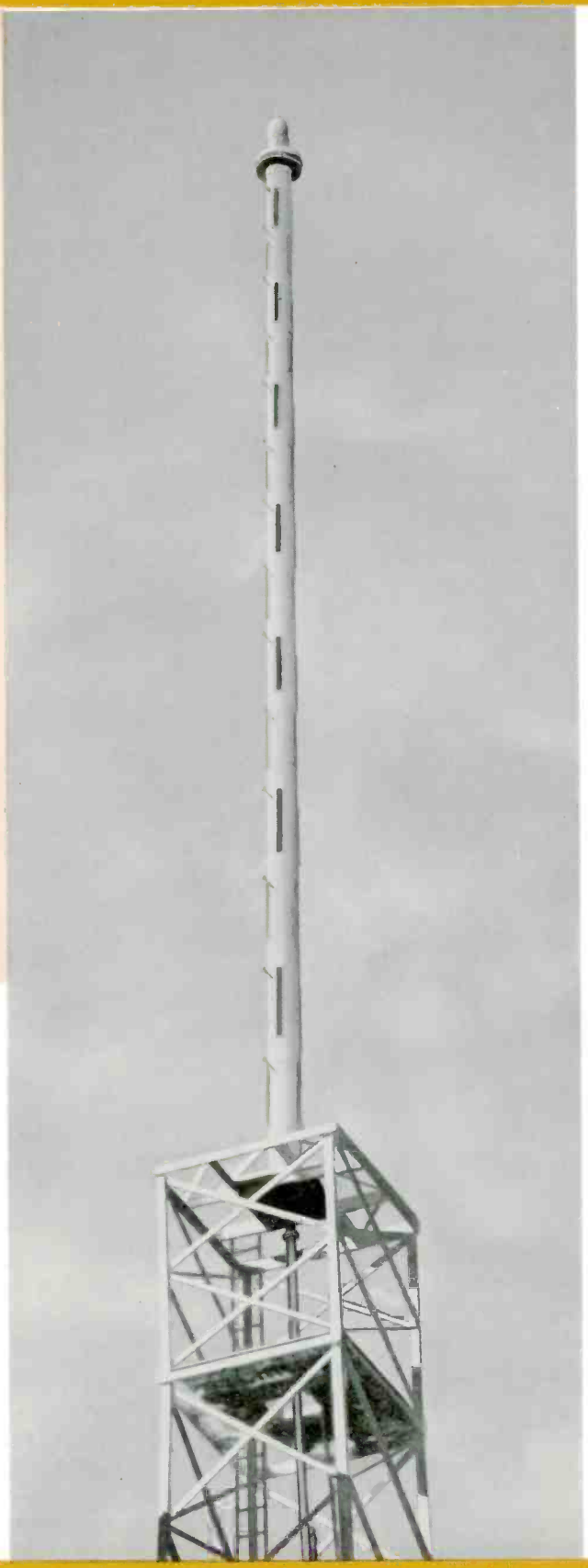
CH.	H (HEIGHT) 14 LAYER	H (HEIGHT) 12 LAYER	H (HEIGHT) 6 LAYER	A (WIDTH) FACE TO FACE OF SCREENS	W WINDLOAD
2	184'-4"	157'-8"	77'-11"	9'-1¼"	COMPOSITE CALCULATION BY TOWER MANUF. OF RCA SCREENS AND DIPOLES PLUS TOWER STRUCTURE
3	166'-3"	142'-3"	70'-3"	8'-2¼"	
4	151'-11"	130'-0"	64'-2"	7'-5½"	
5	132'-5"	113'-3"	55'-11"	6'-5½"	
6	123'-5"	105'-7"	52'-1"	6'-0"	
7	59'-3"	50'-8"	25'-0"	2'-10"	
8	57'-4"	49'-0"	24'-2"	2'-10"	
9	55'-8"	47'-8"	23'-7"	2'-10"	
10	53'-9"	46'-9"	22'-8"	2'-6¾"	
11	52'-2"	44'-7"	22'-0"	2'-6¾"	
12	50'-9"	43'-5"	21'-6"	2'-6¾"	
13	49'-6"	42'-5"	21'-0"	2'-6¾"	

DIMENSIONS AND INFORMATION RELATING TO OTHER NUMBERS OF LAYERS ON APPLICATION

UHF TV PYLON ANTENNAS

FEATURES

- Rugged, simple construction—smooth surface of antenna is the radiator
- Not critical to ice, rain or snow—no protruding elements or complicated appendages
- Only one feedpoint for line input
- Equal signal strength in all directions for circular patterns
- Adjustable beam tilt assures best "close-in" coverage
- RCA can furnish "contour-engineered" coverage pattern you want—circular or directional—standard or custom
- Choice of gains and power ratings available
- Complete RCA Matched UHF Systems available—transmitter, antenna, transmission line and accessories



USES

The RCA UHF Pylon is the antenna being used by the majority of today's UHF stations for operation on television channels 14 to 83. Antennas are available with power input ratings up to 50 KW and power gains up to 27. Television stations can choose from a wide variety of patterns (circular or directional) to provide "contour-engineered" coverage.

All RCA UHF Pylons have built-in "Beam Tilt" which may be adjusted in the field by moving the antenna feed system. This assures best possible coverage with minimum power loss due to radiation above the horizon. RCA can also furnish a complete *matched* system—from transmitter to antenna to assure you of maximum performance.

View taken at the 300-foot level of WKNB-TV's (New Britain, Connecticut) tower where the RCA UHF Pylon is shown "on-the-way-up". Note that erectors easily handle the RCA antenna as a single unit, thereby reducing precious installation time.

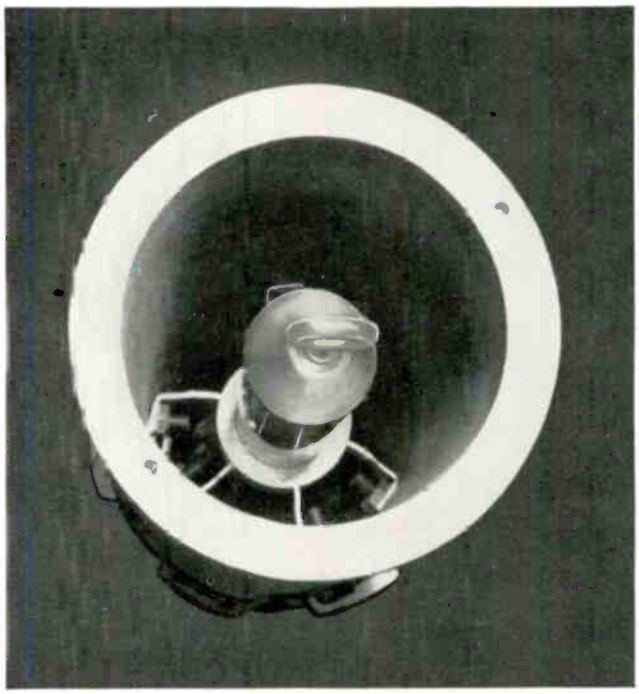
DESCRIPTION

The RCA UHF Pylon Antenna employs a slotted cylinder, thus the smooth surface of the antenna itself is the radiating element. The ruggedly constructed Pylon Antenna is free from complicated appendages or protruding elements and is not critical to rain, snow, or ice. There are no fragile parts to bend or break under strong wind loads. All elements are completely enclosed by protective slot covers. Each radiating layer consists of three one-inch wide slots approximately 1.3 wavelengths long, parallel to the axis of the cylinder, and equally spaced around the circumference. Adjacent layers of slots are staggered 60 degrees to obtain maximum mechanical strength and a circular horizontal radiation pattern.

The R-F energy is fed to the layers of slots by means of a single coaxial line feed system within the self-supporting, slotted-cylinder radiator. A coaxial line is installed within the inner conductor using off-set feed, with the attendant benefits of adjustable vertical pattern tilt, symmetrical patterns independent of frequency, and greater bandwidth than with an end-fed antenna.

Easily Installed as Single Unit

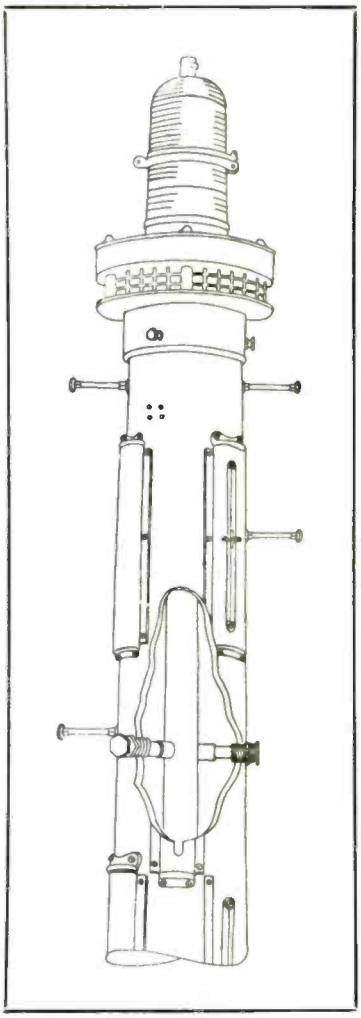
RCA medium power UHF Pylons are erected as a single assembled unit and are inexpensive and easy to install. In most cases, they may be installed in one or two hours after the rigging is set up. RCA UHF Pylon Antennas are designed to withstand wind velocities in excess of 100 mph ("Actual") and up to 200 mph ("Indicated"). Since RCA UHF Pylon Antennas have round surfaces, 41.5% less wind loading is experienced than that of antennas with flat surfaces.



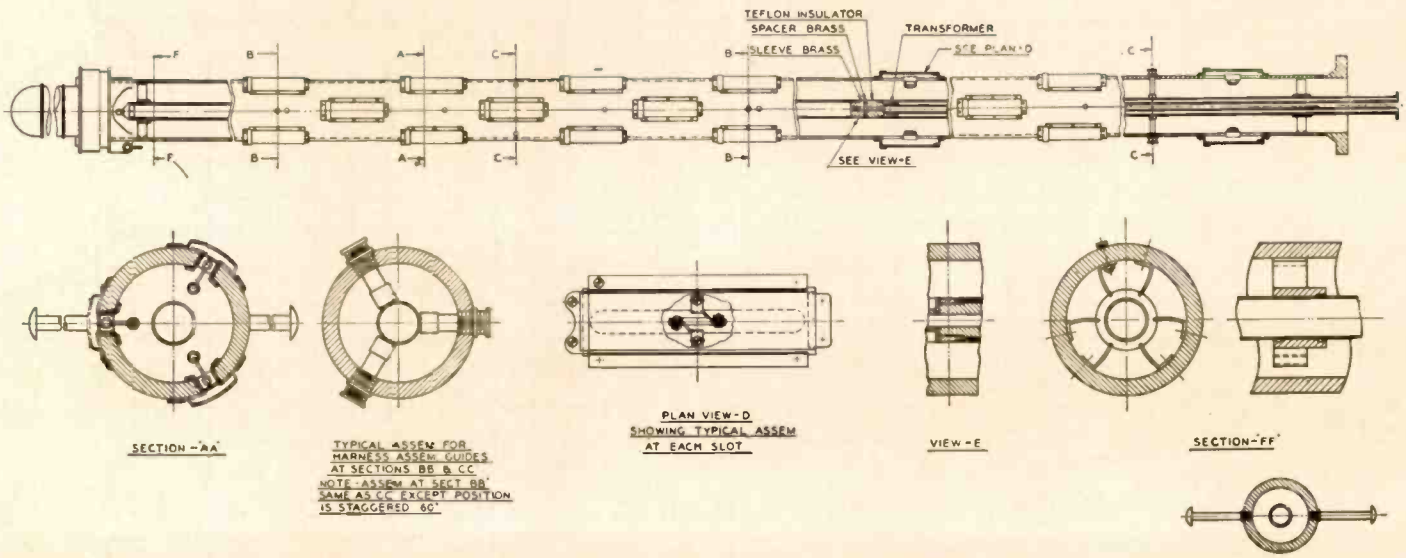
Top view of the RCA UHF Pylon Antenna with beacon removed to illustrate the "Spoke-Type" shorting plug and transmission line. Note that complete harness may be raised by use of lifting ring at top.

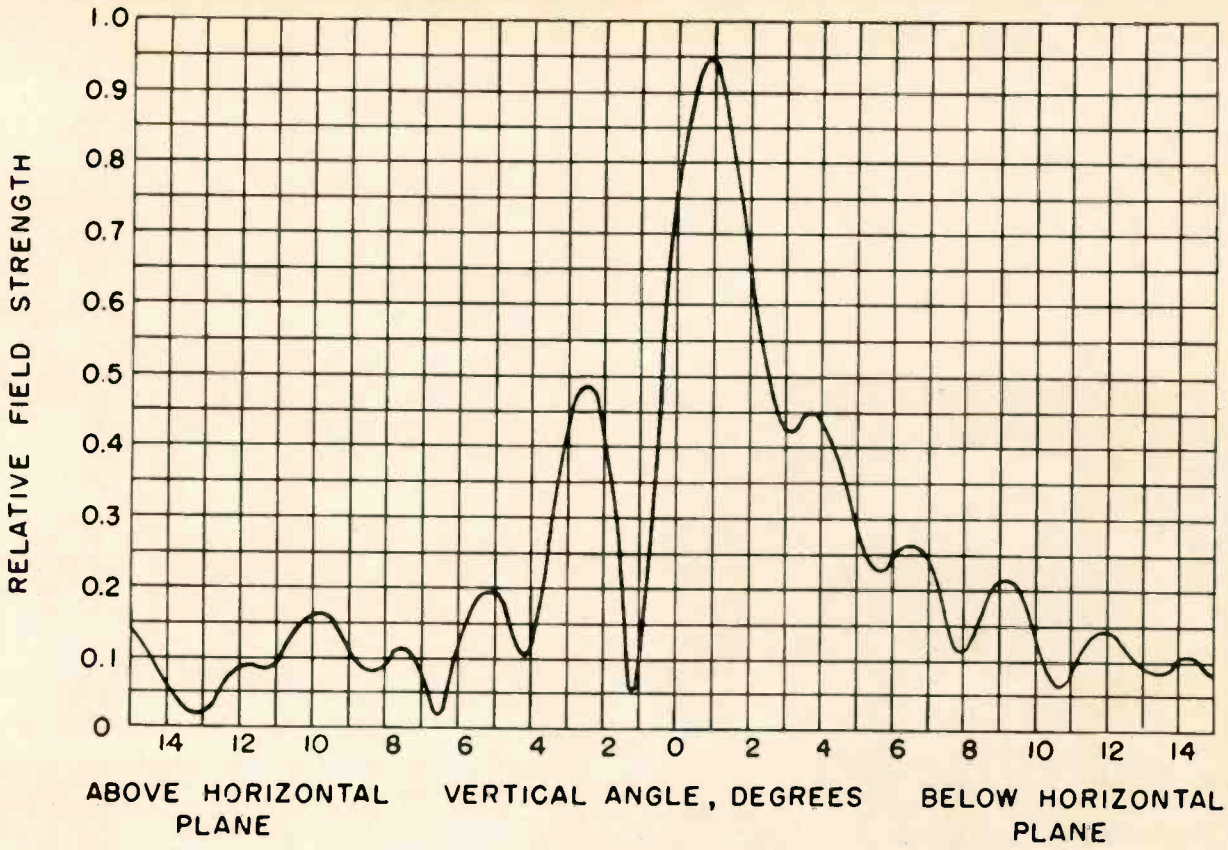
SIMPLICITY IS THE KEYNOTE

Shown here is a cross-sectional sketch of the RCA UHF Pylon Antenna. Note how sturdiness and simplicity are highlights of the design. The inner-conductor of the antenna is centered in the cylinder by Teflon centering pins. Slot covers provide complete protection to all elements within the antenna cylinder. Picture quality is assured since the RCA UHF Pylon is unaffected by ice and snow.

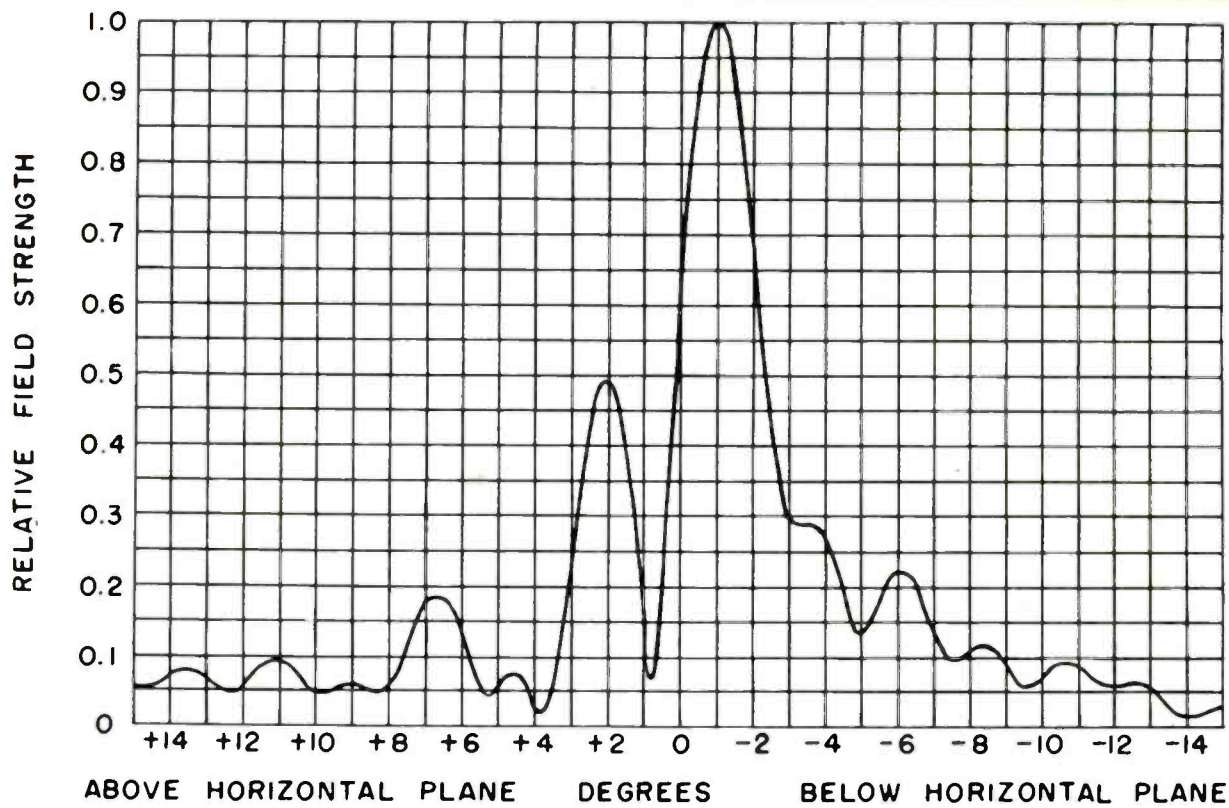


CONSTRUCTIONAL DETAILS OF THE RCA UHF PYLON





A near ideal vertical field radiation pattern which yields essentially constant field strength versus distance throughout a desired coverage area, custom engineered for an "on-the-air" commercial TV station.



Typical Measured Vertical Field Pattern of an RCA Standard UHF Pylon, Type TFU-27BHS, with 1° electrical Beam Tilt.

You Get the Pattern You Need

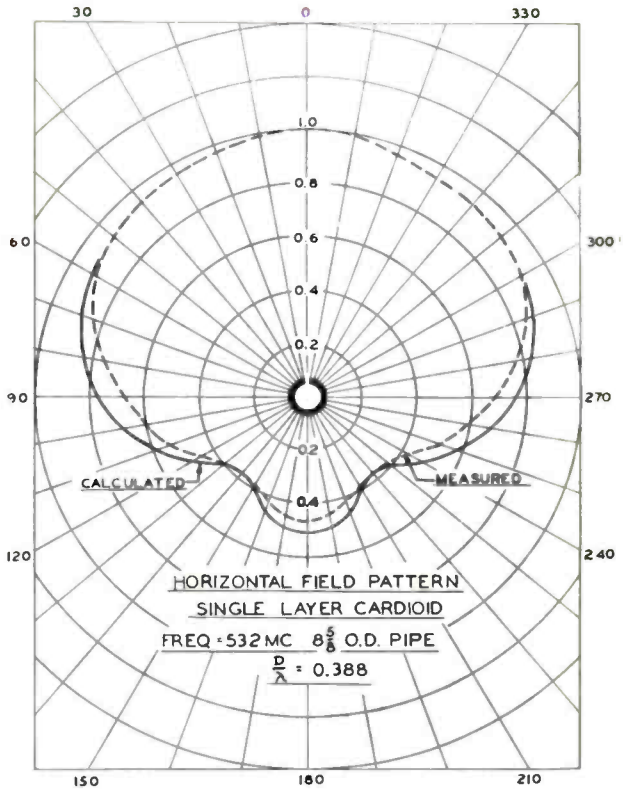
With a choice of RCA UHF Pylons available, you can secure the coverage pattern to suit your particular needs. You can obtain coverage patterns of circular shape, peanut-shaped, Cardioid-shaped—or one of a number of special directional patterns. Directional UHF antennas are custom designed for a particular application and the RCA Broadcast Equipment Section should be consulted.

Simplicity with Just One Feedpoint

RCA UHF Pylon Antennas differ from other types in that there are no external feedlines, radiators or appendages required. Only one feedpoint is needed for the line input. The signal is radiated directly from the surface of the antenna cylinder in which each layer of slots acts as a radiating section.

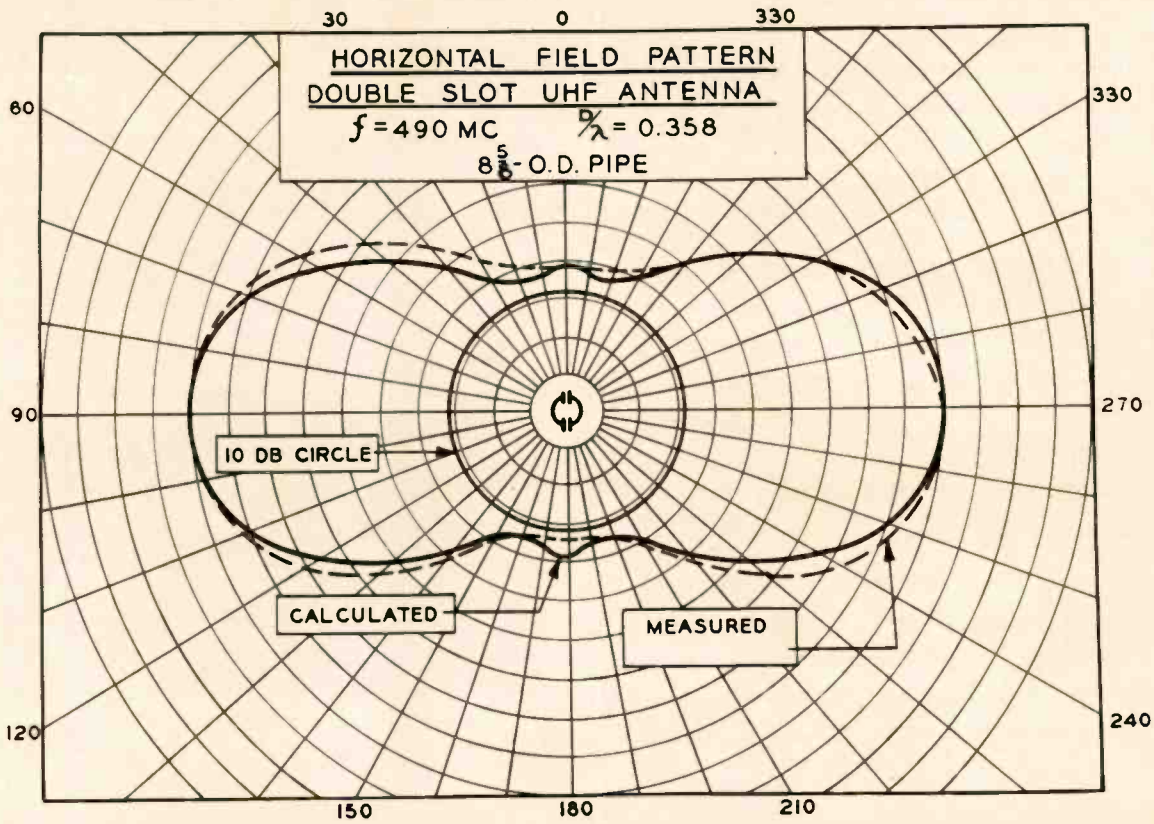
Beam Tilting for Best "Close-in" Coverage

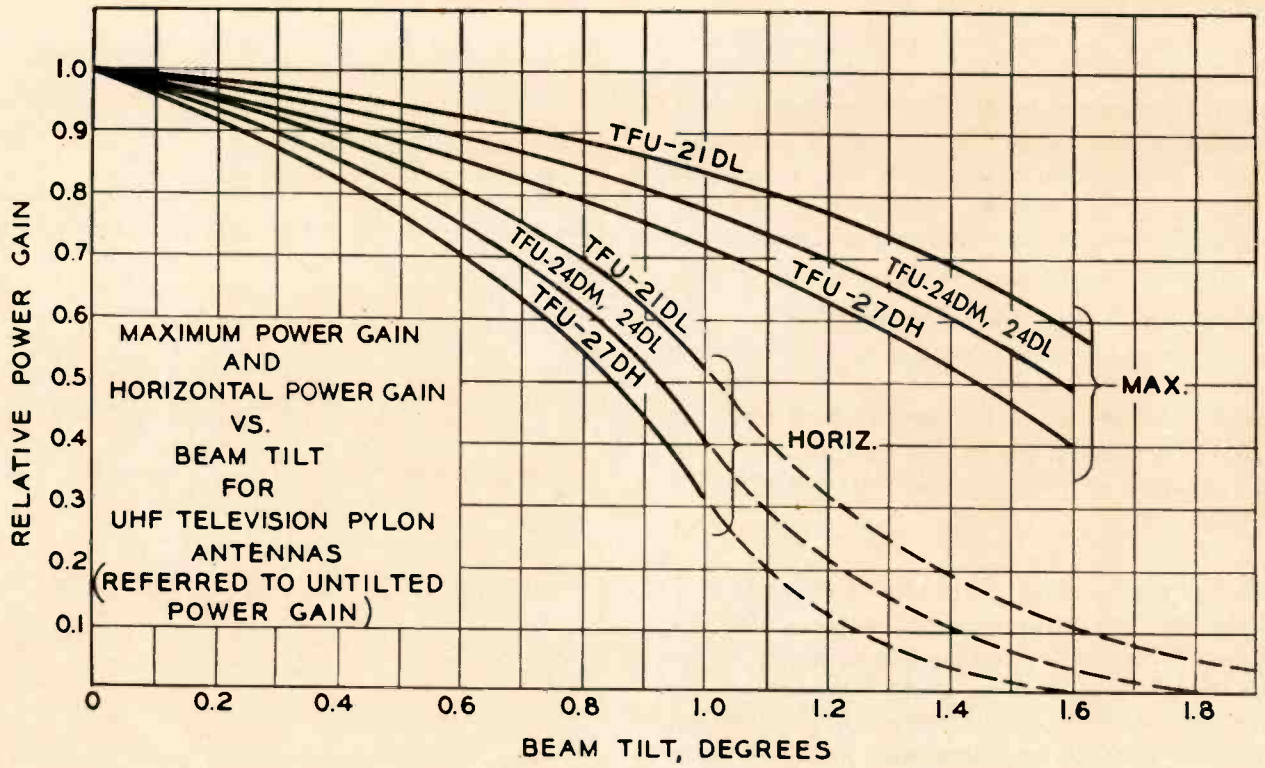
With the RCA UHF Pylon, the radiated signal is concentrated in a horizontal direction for more effective coverage of the service area. Because of this concentration, the vertical pattern exhibits a relatively narrow beam. The features of electrical and mechanical beam tilt permit maximum utilization of this beam for effective "close-in" coverage.



Calculated Pattern and a measured model pattern of a "Cardioid Directional" UHF Pylon.

Calculated Pattern and a measured model pattern of a "Peanut Directional" UHF Pylon.



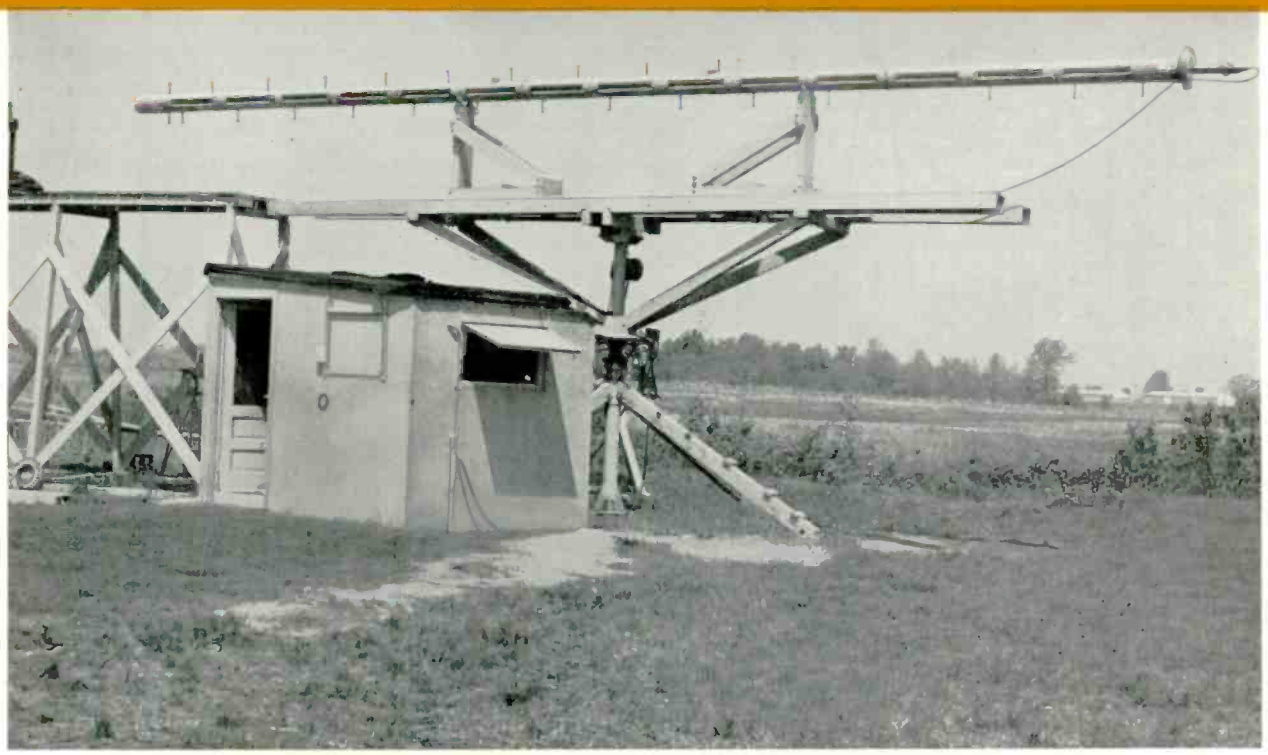


ELECTRICAL BEAM-TILTING is accomplished by moving the inner conductor (feed system) up or down, which shifts the phasing of the signals radiated from the upper and lower halves of the antenna. The effect of this is to raise or lower the beam uniformly around the antenna, thus expanding or contracting the cone of radiated power, umbrella fashion.

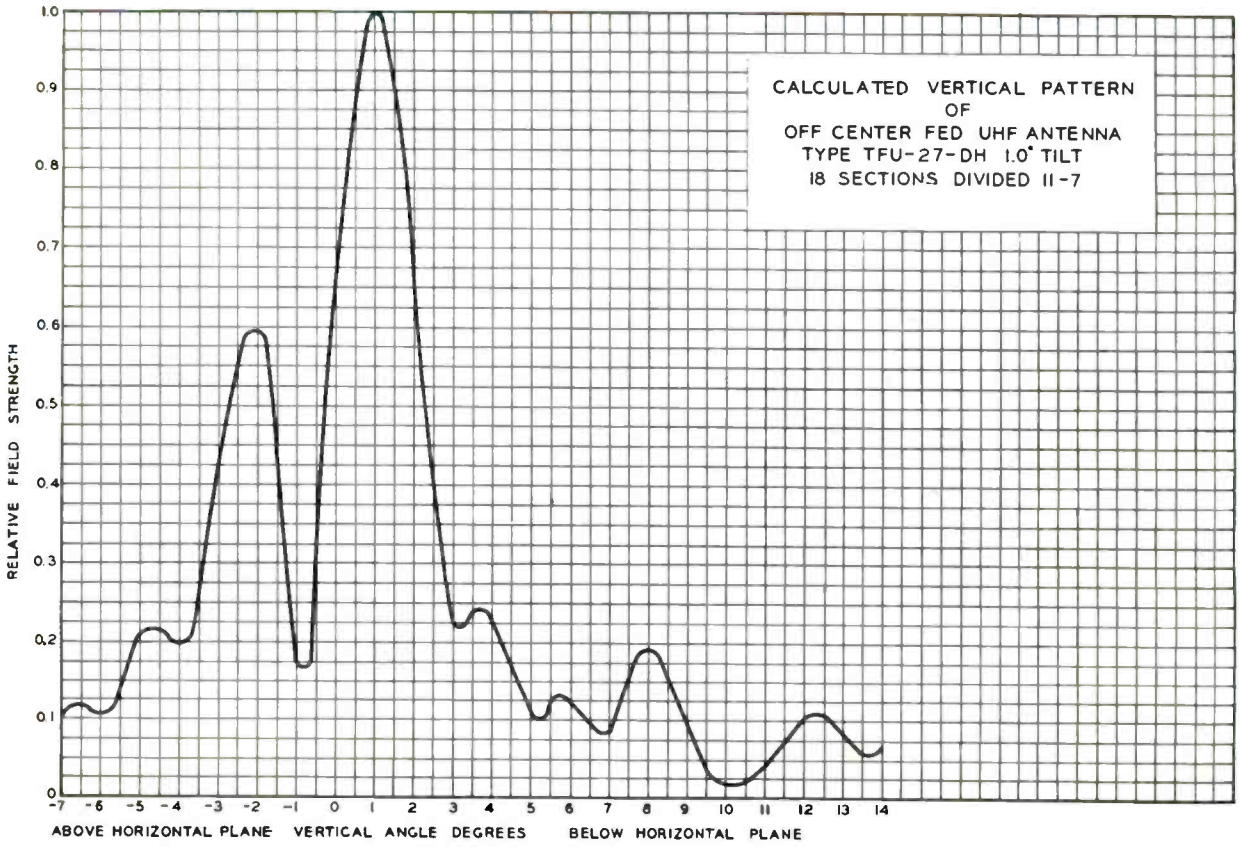
MECHANICAL BEAM-TILTING is effected by adjusting leveling plates between the antenna base and the tower mounting flange. The antenna is thus actually tilted physically. The result of this tilting is to raise the pattern on one side and lower it on the opposite side. A combination of electrical beam tilt and mechanical beam tilt may be desirable under terrain conditions existing at some UHF television antenna sites.

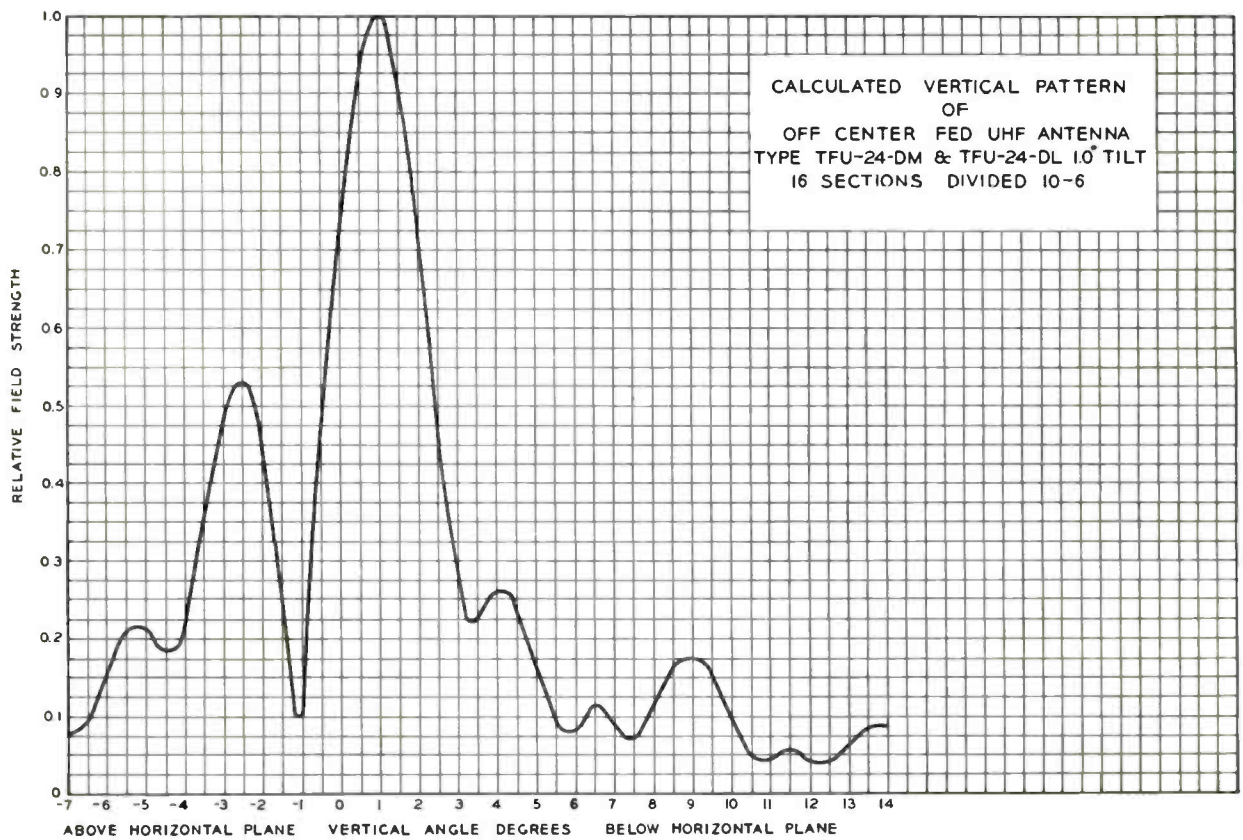
Techniques of beam tilting and null fill of the vertical pattern may be used with directionals as well as with omnidirectional antennas. The effects of beam tilt on power gain in the major lobe of the vertical pattern, and in the horizontal plane, are the same as the effects with omnidirectionals. The vertical patterns are essentially symmetrical around the vertical axis of the antenna except for amplitude.

Bottom view of an RCA UHF Pylon Antenna showing the mounting flange and the transmission line connection.



Every RCA UHF Pylon Antenna is subjected to actual vertical field pattern tests by use of a rotatable, built-up platform. Television stations are furnished (free of charge) with a measured curve of their antenna for permanent station engineering records. Antenna shown here under test is a channel #24 directional.


CALCULATED VERTICAL PATTERN
OF
OFF CENTER FED UHF ANTENNA
TYPE TFU-27-DH 1.0° TILT
18 SECTIONS DIVIDED 11-7
RELATIVE FIELD STRENGTH
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
ABOVE HORIZONTAL PLANE VERTICAL ANGLE DEGREES BELOW HORIZONTAL PLANE


CALCULATED VERTICAL PATTERN
OF
OFF CENTER FED UHF ANTENNA
TYPE TFU-24-DM & TFU-24-DL 1.0° TILT
16 SECTIONS DIVIDED 10-6
RELATIVE FIELD STRENGTH
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
ABOVE HORIZONTAL PLANE VERTICAL ANGLE DEGREES BELOW HORIZONTAL PLANE

Sturdy, Long-Life Antenna

The slotted radiator is constructed of hot-dip galvanized, open-hearth structural steel to obtain extremely long life. Particular attention has been paid to all parts of the antenna to assure maximum durability and all hardware and metal parts are made of corrosion-resistant metals. For example, pole steps are hot-dipped galvanized forged steel; mounting flange bolts stainless steel or hot-dip galvanized high strength alloy steel; leveling plates hot-dip galvanized steel; transmission line copper with brass or bronze parts and teflon insulators; coupling loop capacitors use teflon dielectric; shorting spokes brass and bronze; beacon mounting and ventilator aluminum or hot-dip galvanized steel; and slot covers polyethylene containing antioxidant and ultra-violet inhibiting dye. The pole mounting flange is of special high strength alloy steel having high impact resistance at temperatures of —60°C.

View illustrating how polyethylene protective covers are placed over all slots to protect the inside harness.

Types of UHF Pylons Available

RCA UHF Pylon Antennas are available in various power gains and input power ratings (see chart). All antennas listed produce essentially circular horizontal patterns except those listed as "Custom". The "D" series of antennas shown employ two layers of "off-set" feed to effect special vertical pattern null fill-in. Four directional antenna types are listed; however, many others are also available on a custom basis. Directional antenna types listed refer to nominal RMS gains for the respective channels shown. Horizontal pattern types are custom-shaped to customer requirements.

Channel	Type	No. of Sections	Gain in Db	Power Gain	**TV Power Rating KW	DBK
14-83′	*TFU-24C	16	13.8	24	50.0	17.0
14-30	TFU-21DL	14	13.22	21	10.0	10.0
14-30	TFU-24DL	16	13.80	24	10.0	10.0
31-50	TFU-24DM	16	13.80	24	10.0	10.0
51-83	TFU-27DH	18	14.31	27	10.0	10.0
14-30	TFU-21DAL (Custom)	14				
14-30	TFU-24DAL (Custom)	16				
31-50	TFU-24DAM (Custom)	16				
51-83	TFU-27DAH (Custom)	18				

THESE ARE DIRECTIONAL TYPES. HORIZONTAL PATTERN SHAPES, RMS AND MAXIMUM POWER GAINS ARE DEPENDENT UPON CHANNEL. BEAM TILTING AND NULL FILL-IN FEATURES OPTIONAL. ALL DIRECTIONAL ANTENNAS ARE CUSTOM BUILT AND SPECIFICATIONS ARE SUBJECT TO INDIVIDUAL STUDY AND APPLICATIONS.

* Preliminary data.

** Power ratings given are maximum visual power to input of antenna and assume aural carrier of one-half peak of visual sync. rating. For other values of aural carrier the total average power is 1.1 X TV power rating listed above.

Shipped as Complete Unit

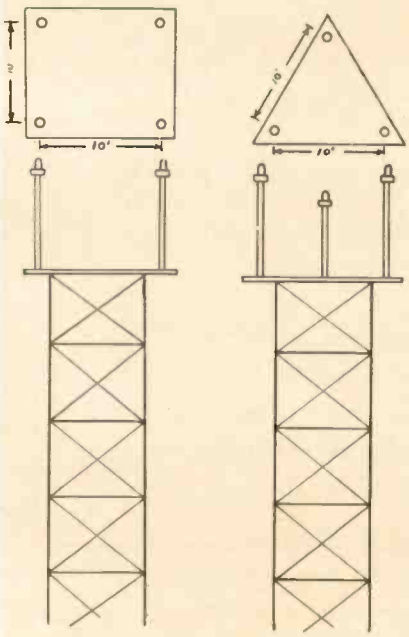
RCA UHF Pylons are shipped complete in one unit—"custom-tuned" for your frequency at the RCA factory—and tested by the most modern methods known to the television industry.

Due to the sturdy construction of these antennas, they will require little in the way of maintenance other than a routine check and periodic painting. RCA Service Company Television Broadcast Engineers are available to "check out" the antenna system on arrival and assure a minimum of installation delay or expense.

Complete UHF Antenna Accessories

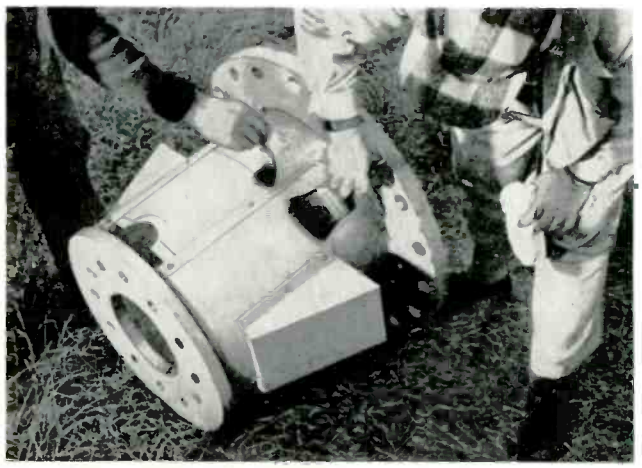
Only when everything in your transmitting system *is matched*—from transmitter to antenna—can you be sure of maximum performance. In this respect, everything is designed specifically to work with the UHF Pylon. RCA can supply every accessory required to complete a UHF antenna installation including the tower; mitered elbows, line transformers, spring hangers, dummy loads, wattmeters, frequency and modulation monitors, filterplexers, and hardware.

Another example of RCA's "Custom Engineering Service" is illustrated in this view which shows a special UHF Pylon being "pattern-tested" to determine effect of installation within a "three-legged" tower.



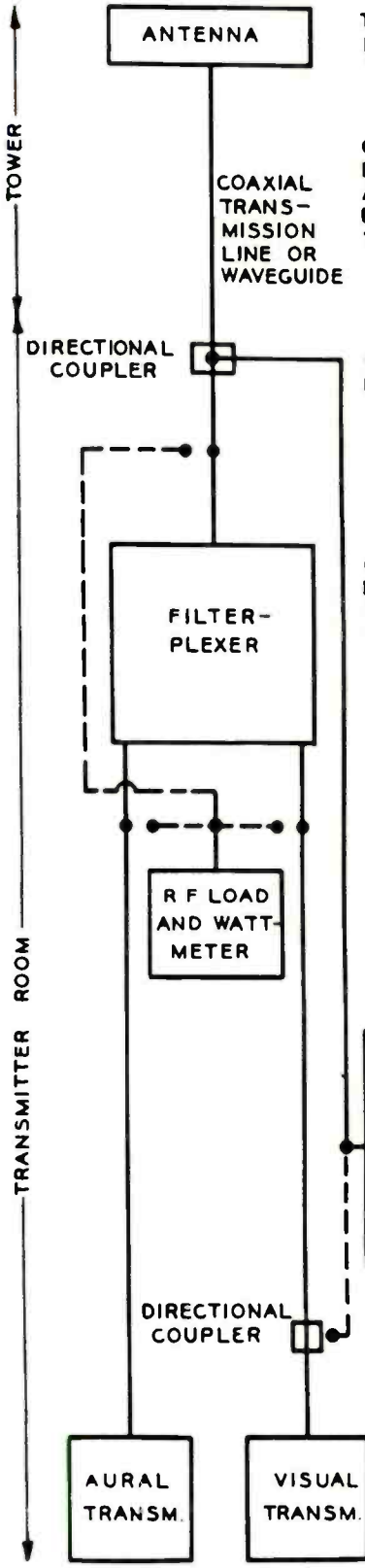
CUSTOM APPLICATIONS

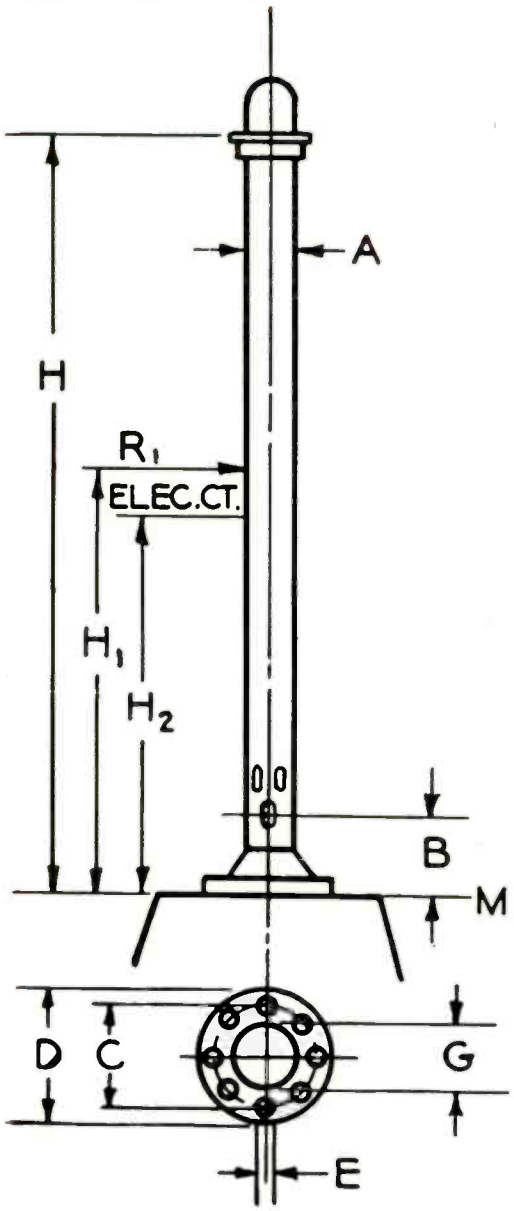
RCA will assist in all special or custom applications—for example, like the one suggested here where more than one UHF Pylon is mounted on a single supporting tower. You can save tower costs by sharing the tower with another station. For special community operation or for UHF Pylons with custom tailored patterns, consult with RCA.



View, during painting, of a special Flange Pedestal Adapter (MI-19397) which can be used to mount the UHF Pylon atop an FM Pylon. Wedge-shaped extensions are vent louvres.

SKETCH SHOWING TYPICAL RCA UHF ANTENNA SYSTEM





ELECTRICAL SPECIFICATIONS

Power Handling ..... (See Table below)

Maximum Ambient Temperature, at Full Power ..... 45° C.

Input Impedance ..... 50 ohms, V.S.W.R. less than 1.1/1

Input Connection ..... Single 3⅛ UHF flanged coaxial line

Hor. Pattern Circularity ..... Within 0.5 db total variation

MECHANICAL SPECIFICATIONS

Design Assumptions

Max. Wind Velocity ..... See Tables 1 and 2

Max. Stress on Bolts ..... 18,000 p.s.i.

Table 1
WIND VELOCITIES BY TYPES

TFU-21DL		*TFU-24DL*		*TFU-24DM*		*TFU-27DH*	
Chan.	*Wind Load Capacity Lbs./Sq. ft.*	*Chan.*	*Wind Load Capacity Lbs./Sq. ft.*	*Chan.*	*Wind Load Capacity Lbs./Sq. ft.*	*Chan.*	*Wind Load Capacity Lbs./Sq. ft.*
14 to 18	67/40	14 to 16	50/30	31 to 35	58/35	51 to 57	50/30
19 to 23	75/45	17 to 22	58/35	36 to 42	67/40	58 to 68	58/35
24 to 28	83/50	23 to 29	67/40	43 to 49	75/45	69 to 79	67/40
29 to 30	92/55	30	75/45	50	83/50	80 to 83	75/45
Power Rating 15 kw to 10,000 feet		*Power Rating* 15 kw to 10,000 feet		*Power Rating* 13.5 kw to 10,000 feet		*Power Rating* 12.5 kw to 10,000 feet	

Channels (approx.)	14 to 30 incl.	14 to 30 incl.	31 to 50 incl.	51 to 83 incl.
Type Number	TFU-21DL	TFU-24DL	TFU-24DM	TFU-27DH
MI Number	MI-19304-D*	MI-19304-A*	MI-19304-B*	MI-19304-C*
Weight, (Pounds)	Varies with Channel — See Table 3			
A, Inches (Diam.)	10¾	10¾	8⅝	6⅝
B, Inches	37 to 32	37 to 32	32 to 28	30 to 25
C, Inches (Bolt Circle)	15¼	15¼	13	10⅝
D, Inches (Diam.)	17 9/16	17 9/16	15	12½
E, Inches (Bolt Diam.)	1⅛	1⅛	1	⅞
F, Number of Holes	16	16	12	12
H, Feet	Varies with Channel — See Table 3			
H_1 (All channels)	H_2 + 1 ft.			
H_2 (Elect. Ctr.)	Varies with Channel — See Table 3			
R_1 (50/30 P.S.F.) No ice	Varies with Channel — See Table 3			
M, Ft./Lbs. (Moment) (30 p.s.f.)	Varies with Channel — See Table 3			
Relative Gain	21	24	24	27
G, Top Cap Hole (Diam.)	9¾"	9¾"	7⅝"	5¾"

* Note: Suffix Number added to MI Number indicates Channel Number.

Table 2
WIND VELOCITIES AND CORRESPONDING PRESSURES

TRUE "EXTREME" VELOCITY MILES PER HOUR (Note No. 1) V_a	FLAT SURFACES Pressure in Lbs./Sq. Ft. of Projected Area $P = 0.0042V_a^2$	CYLINDRICAL SURFACES Pressure in Lbs./Sq. Ft. of Projected Area $P = 0.0025V_a^2$	INDICATED VELOCITY MILES PER HOUR (Note No. 2) V_1	
10	.42	.25	11	
15	.95	.56	17	
20	1.7	1.00	23	
25	2.6	1.6	30	
30	3.8	2.3	37	
35	5.2	3.1	44	
40	6.7	4.0	50	
45	8.5	5.1	57	
50	10.5	6.3	64	
55	12.7	7.6	71	
60	15.1	9.0	78	
65	17.8	10.6	85	
70	20.6	12.3	91	
75	23.6	14.1	98	
80	26.9	16.0	105	THESE FIGURES ARE NOT SUBSTANTIATED BY ACTUAL TESTS BUT ARE EXTRAPOLATED
85	30.4	18.1	112	
90	34.0	20.3	118	
95	37.9	22.6	125	
100	42.0	25.0	132	
105	46.3	27.6	138	
110	50.8	30.3	145	
115	55.5	33.1	152	
120	60.5	36.0	159	
125	65.6	39.1	166	
130	70.9	42.3	173	
135	76.5	45.6	180	
140	82.3	49.0	187	
145	88.3	52.6	194	
150	94.5	56.3	201	
155	100.9	60.1	208	
160	107.5	64.0	215	
165	114.3	68.1	222	
170	121.4	72.3	229	
175	128.6	76.6	236	
180	136.1	81.0	243	
185	143.7	85.6	250	
190	151.6	90.3	257	
195	159.7	95.1	264	
200	168.0	100.0	271	
205	176.5	105.1	278	
210	185.2	110.3	285	
215	194.1	115.6	292	
220	203.3	121.0	297	
225	212.6	126.6	304	

NOTE No. 1—Since 1932 published weather data based on 5 minute average known as "Maximum" and frequently on fastest mile known as "Extreme." Selection of antenna loads should be based on Extreme (increase "Maximum" by 15% if no data on Extreme).

NOTE No. 2—RCA bases strength of antennas on True Velocities, not Indicated. Indicated Velocities are those given by the Robinson 4 Cup Anemometer (now obsolete).

Table 3

PRELIMINARY UHF ANTENNA DATA
WEIGHTS, HEIGHTS AND MOMENTS FOR FILING

Channel No.	H_2 (Ft.)	H (Ft.)	Weight	R_1 (Ft./Lbs.)	M (Ft./Lbs.)	
14	23.85	46.83	2880	1595	39790	
15	23.65	46.25	2855	1585	39460	
16	23.50	45.83	2835	1575	38930	
17	23.10	45.42	2800	1550	37680	
18	22.80	44.75	2760	1530	36740	
19	22.55	44.08	2740	1515	36000	
20	22.35	43.75	2710	1500	35370	
21	22.15	43.33	2690	1490	34840	
22	21.80	42.75	2650	1485	33680	TFU-21DL
23	21.60	42.25	2630	1455	33160	
24	21.40	41.75	2610	1440	32530	
25	21.20	41.42	2590	1425	31950	
26	20.95	40.92	2560	1415	31360	
27	20.75	40.50	2540	1400	30730	
28	20.55	40.00	2515	1485	30200	
29	20.30	39.75	2485	1370	29560	
30	20.15	39.25	2470	1360	29140	
14	27.023	53.08	3090	1820	51800	
15	26.668	52.42	3052	1795	50550	
16	26.417	51.83	3015	1775	49550	
17	26.083	51.42	2988	1755	49000	
18	25.750	50.75	2980	1735	48500	
19	25.417	49.92	2950	1720	47750	
20	25.167	49.58	2900	1695	44550	
21	24.917	49.08	2875	1680	43650	
22	24.584	48.42	2850	1665	42850	TFU-24DL
23	24.334	47.83	2820	1645	42000	
24	24.000	47.25	2800	1625	41250	
25	23.750	46.92	2770	1615	40450	
26	23.500	46.25	2750	1600	40000	
27	23.250	45.83	2720	1590	39250	
28	23.000	45.25	2690	1570	38800	
29	22.750	45.00	2660	1550	38300	
30	22.500	44.42	2630	1540	37750	
31	22.250	43.33	2440	1275	30750	
32	22.000	43.00	2400	1265	30300	
33	21.834	42.75	2340	1255	29750	
34	21.584	42.08	2320	1245	29300	
35	21.417	41.83	2300	1235	28750	TFU-24DM
36	21.167	41.58	2280	1225	28300	
37	20.917	40.92	2260	1215	27800	
38	20.750	40.58	2250	1205	27250	
39	20.584	40.33	2230	1195	26750	

Table 3 (Continued)

Channel No.	H_2 (Ft.)	H (Ft.)	Weight	R_1 (Ft./Lbs.)	M (Ft./Lbs.)	
40	20.334	39.92	2210	1185	26350	
41	20.167	39.58	2200	1175	25950	
42	20.000	39.25	2180	1165	25450	
43	19.834	38.83	2160	1155	25000	
44	19.584	38.67	2150	1145	24700	
45	19.417	38.25	2140	1135	24250	TFU-24DM
46	19.250	38.00	2120	1125	23900	
47	19.000	37.67	2100	1110	23400	
48	18.751	37.25	2090	1095	23000	
49	18.584	37.08	2080	1085	22600	
50	18.414	36.75	2070	1075	22300	
51	20.584	40.08	1910	985	22600	
52	20.417	39.58	1895	980	22500	
53	20.250	39.33	1875	970	22000	
54	20.083	39.00	1860	965	21780	
55	19.917	38.66	1850	955	21350	
56	19.750	38.42	1840	950	21000	
57	19.584	38.18	1830	945	20800	
58	19.417	38.00	1820	940	20450	
59	19.250	37.58	1800	930	20100	
60	19.083	37.33	1785	925	19950	
61	18.917	37.08	1775	920	19650	
62	18.750	36.92	1760	915	19250	
63	18.584	36.66	1755	905	19000	
64	18.500	36.42	1750	900	18850	
65	18.334	36.08	1740	895	18550	
66	18.167	35.92	1730	890	18200	
67	18.000	35.58	1715	885	17990	TFU-27DH
68	17.917	35.42	1700	880	17800	
69	17.834	35.18	1690	870	17500	
70	17.668	35.00	1675	865	17100	
71	17.500	34.92	1660	860	16990	
72	17.417	34.58	1655	855	16840	
73	17.250	34.25	1650	850	16460	
74	17.083	34.08	1640	845	16240	
75	17.000	33.92	1630	840	16000	
76	16.917	33.58	1620	835	15850	
77	16.751	33.42	1610	830	15600	
78	16.668	33.33	1600	825	15400	
79	16.584	33.00	1590	820	15100	
80	16.417	32.75	1580	815	14950	
81	16.334	32.66	1575	810	14750	
82	16.167	32.50	1570	805	14500	
83	16.083	32.25	1560	800	14350	

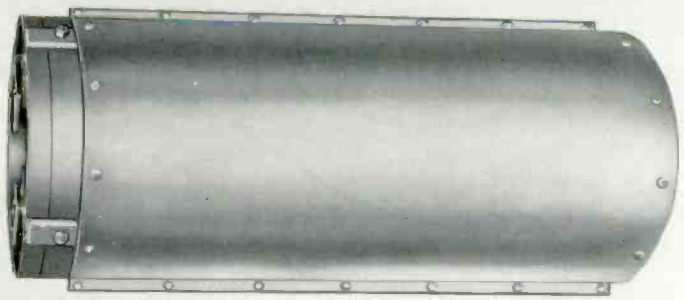
H_2—Height to Electrical Center.
H —Overall Height. (Does not include obstruction sighting. Add 32 inches to include lighting.)
R_1—Wind Load at 50/30 p.s.f.
M—Overturning Moment at 50/30 p.s.f.

UHF ANTENNA DE-ICER

MI-27341-L/M/H

FEATURES

- Ample heating capability for eliminating several inches of radial ice
- Sturdy construction . . . withstands long exposure to weather
- Heater elements capable of long-life without replacement



DESCRIPTION

The MI-27341 De-Icer for UHF Antennas consists of a group of heating elements mounted on a frame which fits concentrically around the transmission line directly below the antenna. Heat shields restrict the transfer of heat to the transmission line. These shields are positioned between the heater elements and line. Exterior heat shields prevent loss of heat to the surrounding air. The entire assembly mounts directly to the bottom of the antenna at the base mounting plate, forming a direct air coupling to the interior column of the antenna.

Heating for prevention of icing or elimination of existing ice is thus accomplished by the transfer of heat by convection throughout the interior of the antenna and by conduction from the heated air column to the exterior surfaces of the antenna.

A thermal cut-off relay is attached to the lower end of the feed system harness within the antenna. If the antenna feed system temperature should rise above a safe limiting value, the thermal relay opens the heater circuit until the harness temperature falls below the operating temperature of the thermal relay.

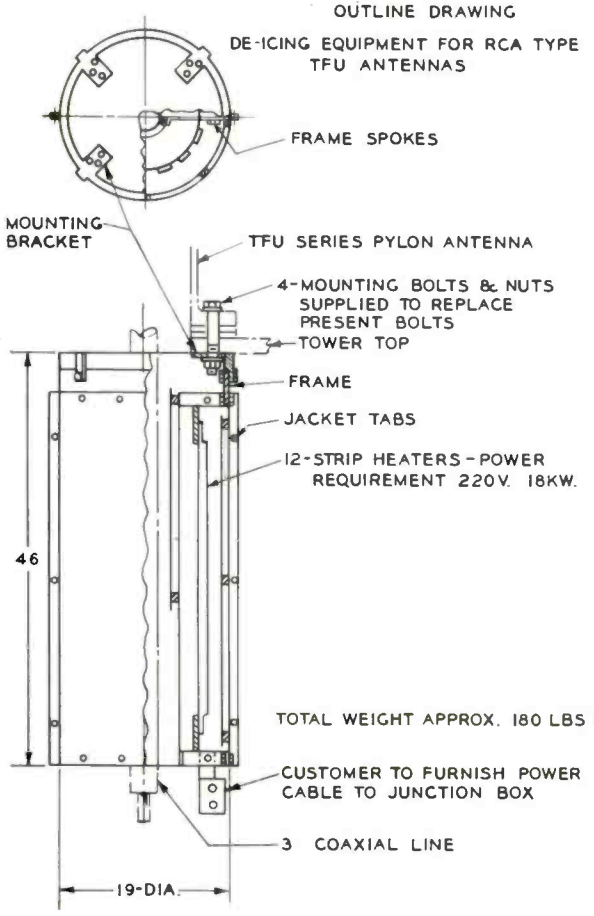
The entire de-icing assembly is assembled in split sections around the transmission line; thus it can be easily installed on existing antenna and after erection of transmission line.

Heater strips are furnished for 230 volt, 60 cycle primary power systems. Heaters may be wired for single phase or three phase circuits. Three phase heater circuits are recommended in order to reduce the current in each circuit and thus reduce the feeder wire size and the voltage drop in the feeder circuit.

SPECIFICATIONS

Approximate Weight	200 lbs.
Dimensions:	
Height	46"
Outside Diameter	19"

OUTLINE DRAWING



Power Requirements....220 volts single phase or 3 phase (approx. 18 kw)

Stock Identification MI-27341-L/M/H

MI-27341-L for mounting with TFU-21DL or TFU-24DL UHF Antennas
MI-27341-M for mounting with TFU-24DM UHF Antennas
MI-27341-H for mounting with TFU-27DH UHF Antennas

Equipment Supplied

Weather-proof wiring junction box included with each of the above equipments (MI-27341-L/M/H).

UHF HIGH-GAIN, HIGH-POWER PYLON ANTENNAS

TYPES TFU-46AL, 52AM, 60AH

USES

RCA's high-gain, high-power antennas are especially intended for operation with transmitters rated at 10 kw or more. The RCA high-gain antenna when used with the 12½ kw transmitter will provide an effective radiated power of 500 to 600 kw.

The design of the antenna is based on vertical pattern requirements and optimum gain for essentially constant field strength versus distance for a fixed primary service area. The field strength, as well as being uniform, is at a sufficiently high level to assure noise-free pictures throughout metropolitan areas. The distance and field strength achieved for a given pattern shape and gain are dependent upon the power input to the antenna, and optimum performance is obtained when the antenna is operated with 10 to 60 kw input.

Pattern shaping employed permits the most efficient use of R-F power, minimizes unnecessary close-in saturation, and extends the primary service area. High angle radiation is practically negligible, thus avoiding interference and loss of signal.

DESCRIPTION

The high-gain, high-power antennas are of slotted-cylinder construction, employing the same radiation principles and mechanical characteristics so successfully used in 10 kw, medium-gain RCA UHF Pylon antennas.

The high-gain antenna consists of two sections, a 16" O.D. lower section and a 14" O.D. upper section, thus keeping size and weight to a minimum. RCA high-gain Pylon antennas are mechanically strong and are capable of withstanding very severe wind conditions. Rugged construc-

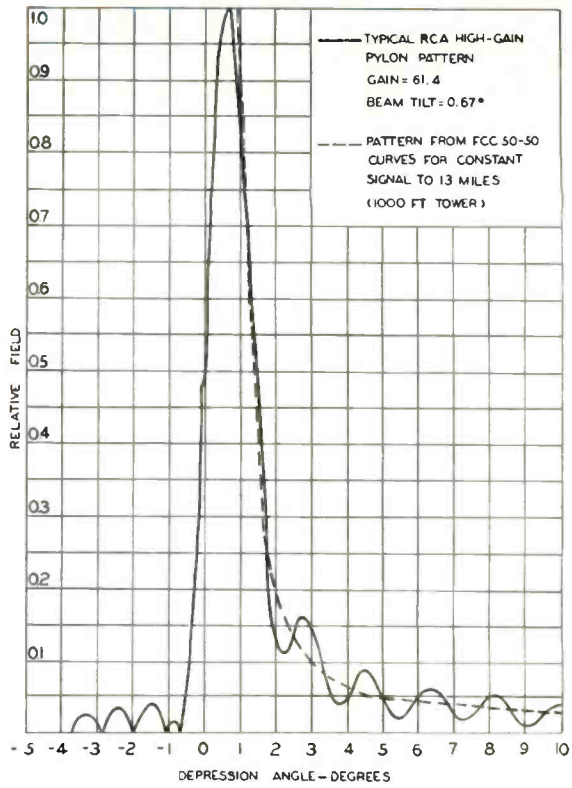
Type	*Channel*	*No. of Sections*	*Gain in DB*	*Approx. Power Gain*	*TV Power* KW	DBK
TFU-46AL	14-40 incl.	34	16.62	46	60	17.78
TFU-52AM	41-65 incl.	38	17.16	52	60	17.78
TFU-60AH	66-83 incl.	44	17.78	60	60	17.78

FEATURES

- **Up to 500 kw ERP possible with RCA high-gain antenna and RCA 12½ kw transmitter**
- **RCA high-gain design is engineered for best distribution of r-f power—extends service area**
- **Pedestal type mounting simplifies tower requirements**
- **Simple mechanical design**
- **Null fill-in, beam tilt, and pattern shaping combine to assure uniform coverage**
- **Variations in beam tilt optional to special requirements**
- **Avoids high angle interference radiation**
- **Easy to assemble and erect**

tion, which does not employ external radiating elements or appendages, provides ease of installation, minimum maintenance and immunity to icing damage.

Four slots per layer assure circularity better than ±0.5 db for all UHF channels. Special techniques of phase and amplitude distribution of the input power to the antenna results in a vertical pattern designed to yield essentially constant high-level signals to all receivers in a large metropolitan area.



SPECIFICATIONS

Electrical Specifications

Power Input	60 kw (17.78 dbk)
Power Gain:	
TFU-46 AL Ch. 14-40	46 (16.62 db)
TFU-52 AM Ch. 40-65	52 (17.16 db)
TFU-60 AH Ch. 66-83	60 (17.78 db)
Input Impedance	75 ohms
Input Terminal	6⅛" RETMA UHF flange
Beam Tilt	As specified
VSWR	1.10/1.0, or less

Mechanical Specifications (See Chart Below)

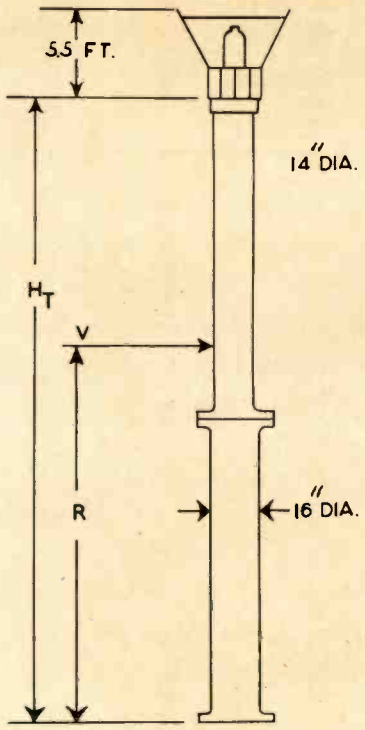
Wind shear load in pounds and bending moment in foot pounds are tabulated for 30/20 pounds per square foot including beacon and lightning rods.

Maximum wind loading in pounds per square foot on rounds is given for pipe bending stress of 20,000 psi and 16,000 psi tensile stress on flange mounting bolts.

PRELIMINARY MECHANICAL SPECIFICATIONS

Channel No.	Height Ft.	Weight Lbs.	R Ft.	Wind Loading 30/20 PSF V Shear Lbs.	Wind Loading 30/20 PSF M Moment Ft.-Lb.	Maximum Wind Load PSF	Maximum Wind Velocity Actual MPH
14	111.8	17,080	56.2	3124	176,000	36.5	121
17	107.6	16,610	54.1	3014	163,000	39.3	125
20	104.2	16,000	52.4	2906	152,000	42.2	130
23	100.6	15,450	50.9	2826	144,000	44.7	134
26	97.4	15,050	49.2	2744	135,000	47.4	138
29	94.3	14,570	47.8	2660	127,000	50.3	142
32	91.8	14,210	46.5	2954	121,000	52.7	145
35	89.1	13,830	45.2	2518	114,000	55.6	149
38	86.6	13,480	44.0	2452	108,000	58.8	153
40	84.9	13,230	43.2	2408	104,000	61.3	156
41	93.6	14,590	47.4	2642	125,000	52.2	144
44	91.0	14,200	46.2	2572	119,000	55.2	148
47	88.7	13,870	45.7	2472	113,000	58.2	152
50	86.3	13,530	43.8	2448	107,500	60.6	155
53	84.4	13,250	43.0	2394	103,000	63.4	159
56	82.4	12,950	42.1	2338	98,000	66.1	152
59	80.5	12,700	41.2	2290	94,000	69.3	166
62	78.6	12,430	40.2	2240	90,000	72.3	170
65	76.9	12,170	39.3	2192	86,000	75.5	173
66	88.0	13,620	44.7	2490	112,000	51.5	143
69	85.7	13,320	43.5	2428	106,000	54.4	147
72	83.9	13,050	42.7	2380	101,500	56.5	150
75	82.1	12,790	42.2	2330	98,000	58.7	153
78	80.5	12,560	41.1	2288	94,000	61.2	156
83	77.9	12,190	39.8	2218	88,000	65.0	161

OUTLINE DRAWING



TELEVISION ANTENNA TOWERS

FEATURES

- Wide selection available
- Self-supporting or guyed types of standard or custom-made designs
- RCA also furnishes tower accessories
- Free TV engineering assistance from RCA Representatives
- RCA will help you plan your entire installation

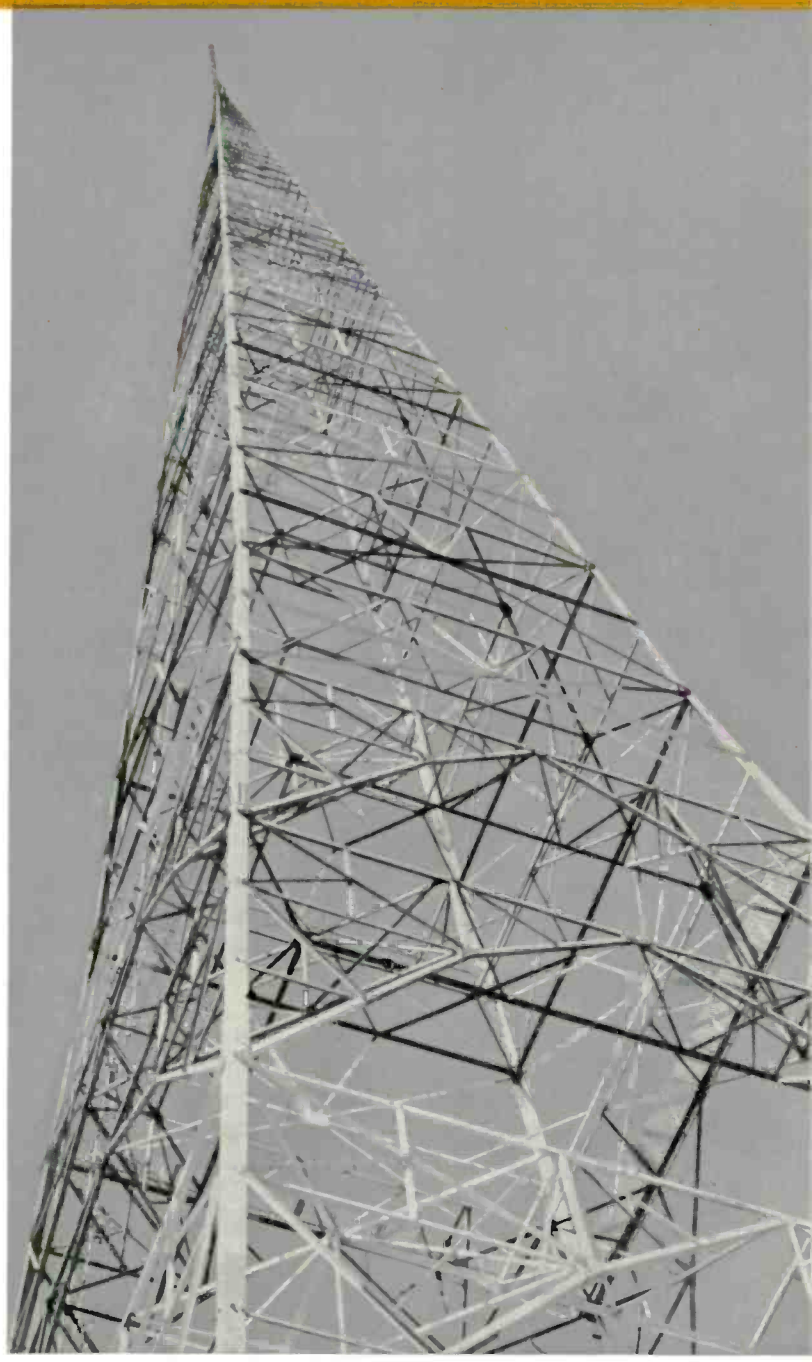
DESCRIPTION

RCA, as a representative of antenna tower manufacturers is well-qualified to assist you in planning and selection of the proper tower and a qualified erector to complete your installation. RCA supplies (as part of the antenna purchase) antenna assembly, supervision, and electrical check-out (before and after erection) by a qualified RCA Service Company engineer. Improper or insufficient tower designs and poor erection and installation techniques are to be avoided since they can be very costly to the Broadcaster.

Tower Considerations

The following procedure may be helpful as a check list in considering your tower requirements.

1. Determine station location with respect to service area. This study which will involve among other things joint operation with other stations, CAA approval, cost of land, zoning restrictions, local regulations, etc., will result in a decision to use:
   a. A self-supporting tower when land is unavailable as in city limits or on top of a building where total height of a tower is 500 feet or less.
   b. Or a guyed tower where land is available and a greater height is desired.
2. Determine design parameters:
   a. Wind load for area in which tower is located.
   b. Deflection at tower top for type of service required.
   c. Type of antenna which is to be supported.
3. Determine tower accessories such as:
   a. Ladders.
   b. Platforms.
   c. Railings.
   d. Lighting.
   e. Microwave dishes.
4. Determine method of routing transmission line taking into account:
   a. Accessibility.
   b. Location of structural members.
   c. Location of special networks below tower top.



TOWERS FOR EVERY APPLICATION . . .

Wide Variety of Types

A wide selection of towers is available for all applications . . . these include standard self-supporting and guyed designs as well as custom designs. In order to facilitate selection of the tower most suitable, and as an aid to the station in determining specific requirements, a sample questionnaire is included here.

Antenna Tower Questionnaire

LOCATION

City..... State.....

QUOTATIONS TO BE FURNISHED

(Check those required)

Tower — Guyed.....( )
Self-supporting.....( )

Tower Lighting Equipment.....( )

Tower Erection:
Antenna and Assembly Installation.....( )
Transmission Line Installation.....( )

SPECIFICATIONS

Tower Height: Ground to top of tower.....
Ground to top of base insulator.....

Tower Use: Antenna support.....

Channel or Frequency.....

TV Antenna: Type.....
Description.....

Transmission Lines:

	Size	No.
Design Load: B-1 Open Country.....		
B-2 Congested Area.....		

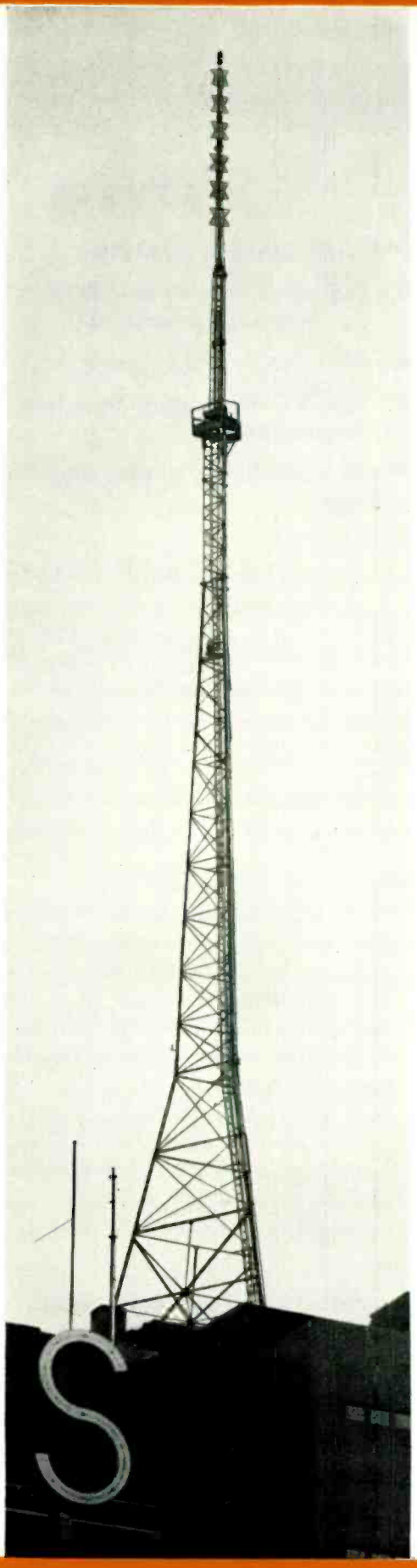
Remarks:
(Special requirements, site accessibility, etc.)

Guyed Towers

Relatively flat country with low surrounding hills lends itself well to the installation of tall supporting structures. Towers over 500 feet in height are usually guyed and the usual cross sectional shape is triangular so that three point guying can be used. Guyed tower costs are normally lower than for self-supporting structures because less steel is used. The availability of land and the area involved for guy anchorage are the main disadvantages of this type of tower. A useful method for estimating the land required for a guyed structure is to consider the distance to the farthest guy anchorage as being approximately 70% the tower height.

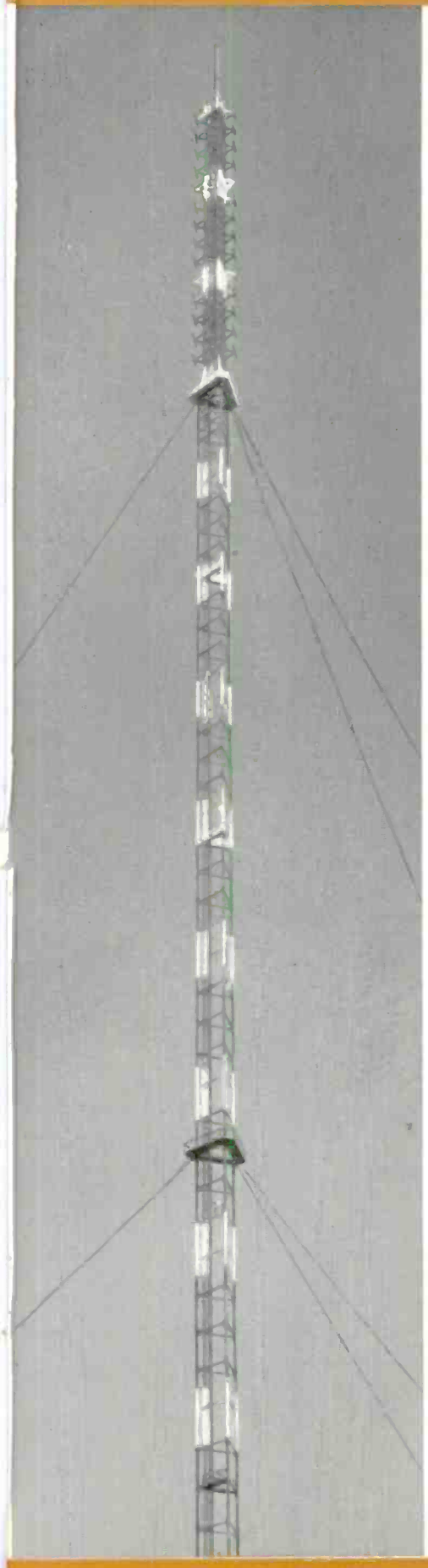
Self-Supporting Towers

Self-supporting towers are especially advantageous in city and congested districts where land is expensive. For estimating required space for a self-supporting tower, the distance between tower legs can normally be considered as ⅛ the height of the structure. The illustration (at right) shows a self-supporting tower located in a congested area.



The WCAU-TV antenna and tower atop the Philadelphia Saving Fund Building, Philadelphia—a congested downtown district.

EXCEPTIONAL HEIGHTS . . . MULTIPLE USES . . .



◀ A 1000-foot guyed tower at WSB-TV, Atlanta, Georgia. A similar 1000-foot tower is installed at WBEN, Buffalo, New York.

▲ Photo showing a closeup of the "multiple-use" TV antenna supporting tower located atop the Foshay Building, Minneapolis, Minn. The seven diaphragms on lower portion are for strengthening and permit supergain elements to be mounted in between them.

. . . ANY TERRAIN OR LOCATION

Shared Towers

RCA can furnish a single tower for use by two or more TV stations. It is good engineering from the standpoint that all receiving antennas will automatically be oriented in the right direction for all channels. The sharing of operational expenses will normally offset the expense of such a structure.

Towers Atop Buildings

The use of towers upon tall buildings is often quite practical. This normally results in smaller towers and shorter transmission lines, especially if the building is high enough to conform to the desired antenna height. Building frameworks, however, must usually be reinforced and erection problems sometimes become quite serious.

Mountain Top Towers

The transmission of television signals requires the transmitting antenna to be mounted as high in the air as possible because field strength at the receiver location is proportional to antenna height. The antenna should also be mounted in the clear so that the transmitted signal will not be reflected by close in objects. Mountain top installations are of course ideal from the standpoint of elevation and non-interfering objects. Wind and ice conditions, however, as well as accessibility in bringing up equipment, may present problems.

Tower Modifications

Some towers presently used for AM or FM can be modified to support TV antennas. These structures must be checked by the manufacturer to find out if they are capable of supporting the antenna to be used. It will probably be necessary to replace the upper sections of the tower with heavier ones. This may reduce the tower height.

A typical mountain top tower installation is RCA-equipped TV station CBFT—Canada's first television station, situated atop Mount Royal, overlooking the city of Montreal.

CONVENTIONAL OR CUSTOM MOUNTINGS . . .

Types of Antenna Mountings for Top of Tower

SUPERTURNSTILE ANTENNAS

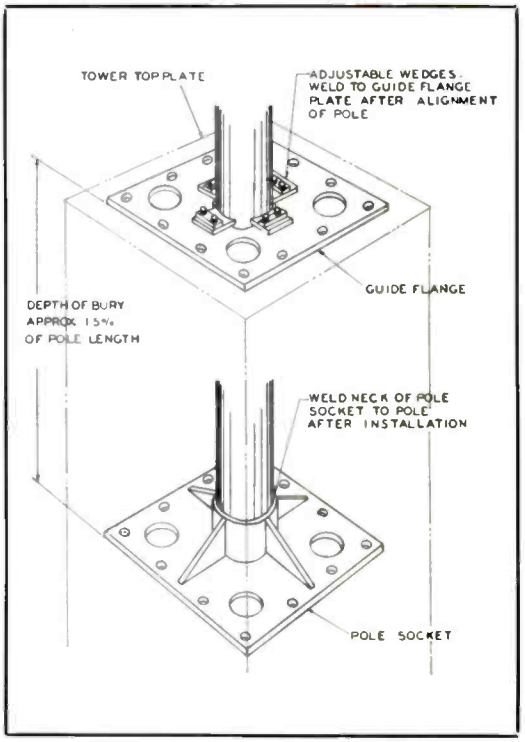
RCA furnishes the mounting used at the top of the tower to support and hold most antennas. These supports for type TF-12AM and TF-12AL antennas are supplied by the tower manufacturer. In the case of the VHF Superturnstile a guide flange holds the antenna pole perpendicular. A pole socket is mounted approximately 15% of the pole length below the tower top to support the antenna and balance the overturn moment.

Where superturnstiles are mounted on FM Pylons a pedestal type mounting is available.

The twelve-section superturnstiles have an r-f combining network which must be accommodated below the pole socket. Provision must be made so that tower cross bracing does not interfere. Mounting provision must be supplied for hangers to support this network.

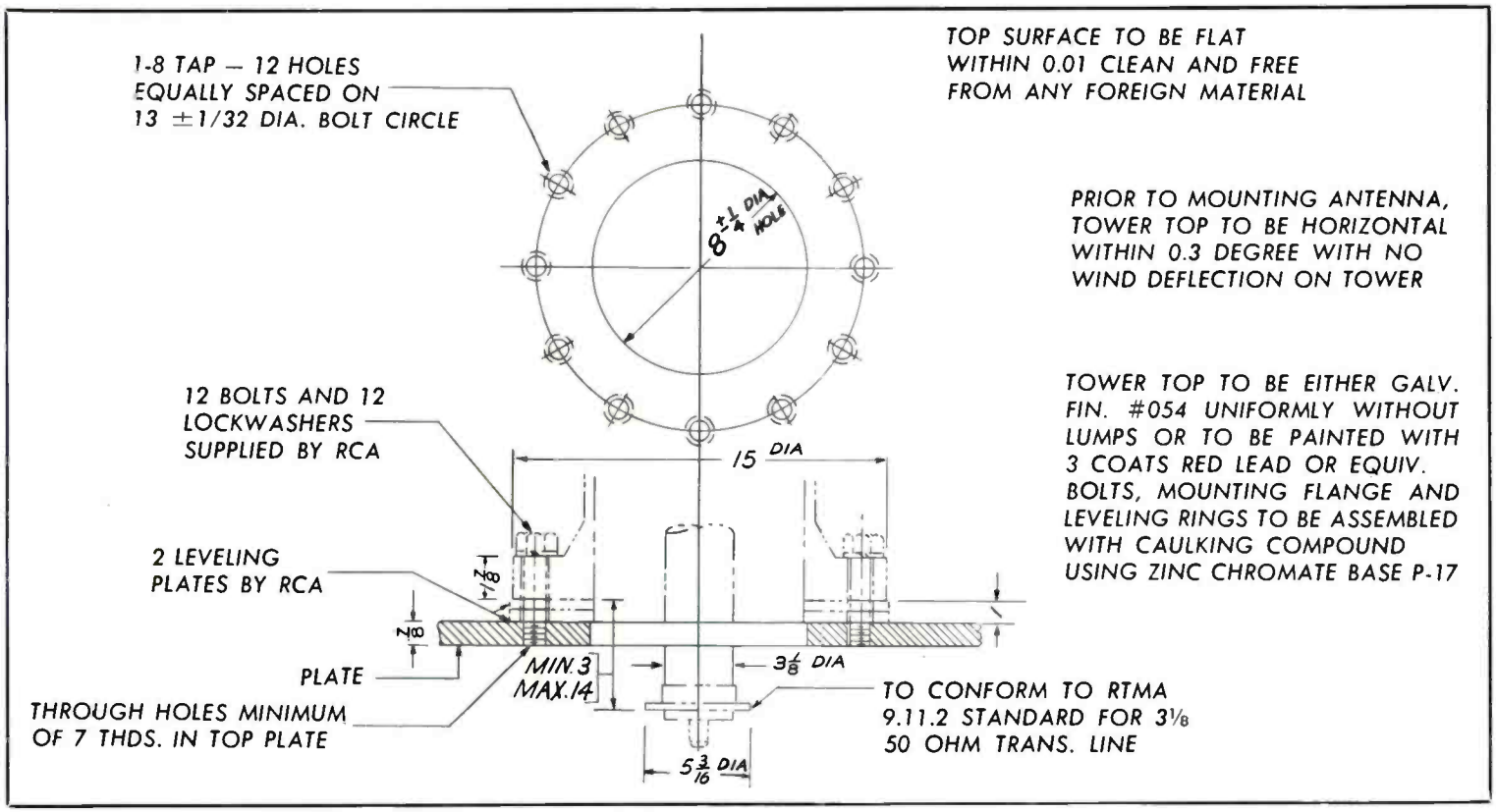
SUPERGAIN ANTENNAS

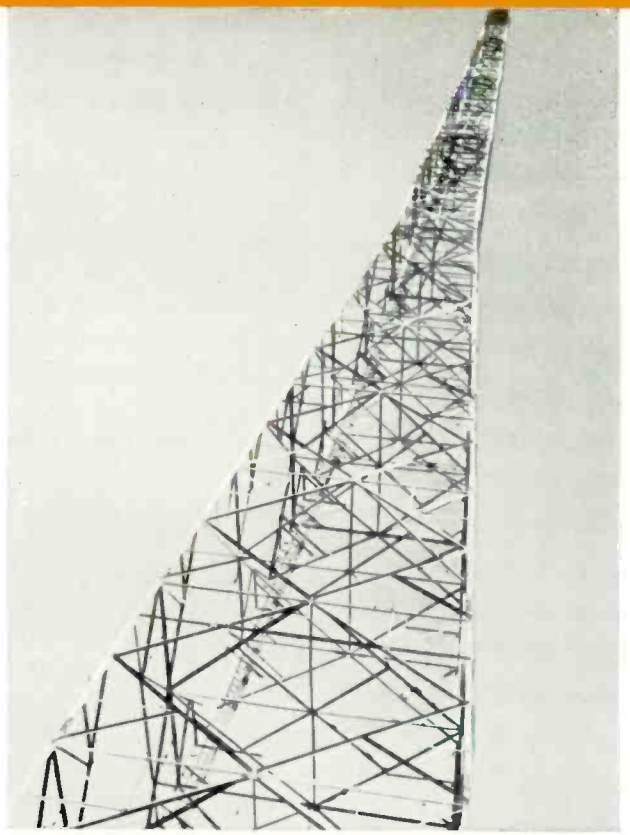
In the application of VHF supergain antennas, tower construction can be either square or triangular. If a triangular structure is used, outrigger framing or brackets attached to the screens will be necessary to permit a square screen array. Guys are permissible in the screen area if four point



Sketch showing guide flange and pole socket installation.

Tower top installation drawing for 8⅝" UHF antenna.





View of the KMTV antenna tower. Transmission line run is located along side of ladder. This affords accessibility for periodic inspection and maintenance.

guying is used. By guying at the corners of the screen location (45° to face of screens) the guys will not cross the screen surface, thus any electrical effect is eliminated.

UHF ANTENNA

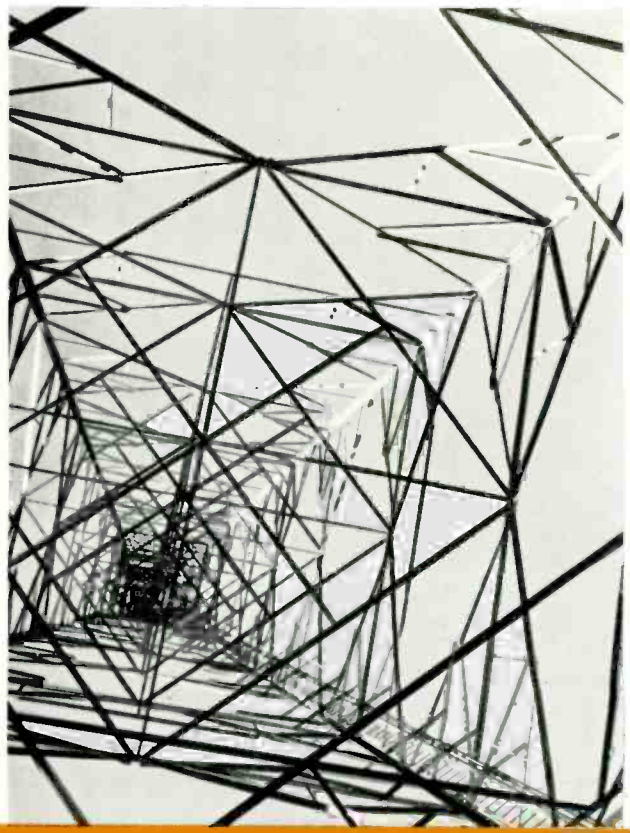
The standard UHF transmitting antenna is the UHF Pylon. It is flange mounted directly to the tower top plate. A set of tapered leveling plates is provided to align the antenna vertically if the tower top plate is not exactly level. These plates are also used to obtain mechanical beam tilting of the antenna.

Transmission Lines

Careful consideration should be given to the layout and support of transmission line at the top of the tower. The tower manufacturer should consult with RCA engineers to be sure there is adequate support for the line and that a minimum number of elbows are used between the antenna input and the vertical run down the tower. The tower company must also supply supports for spring hangers from the top to the base of the tower. Outline drawings with dimensions are available for all types of transmission lines and should be used in making a layout. These are shown in the RCA Transmission Line Catalog which will be sent upon request.

Tower Construction

Steel towers may be hot dip galvanized, where corrosive action due to fumes, salt air, etc., are likely to occur. When CAA regulations require painting, galvanizing can be omitted if the tower sections are heavy and painting is done frequently. Climbing ladders should be located inside the tower if at all possible and preferably near the tower legs. By placing the ladder within the tower, the lattice braces form a safety cage for the serviceman. The ladder is also an excellent support for transmission line runs as it is accessible at all times. The type of hangers (usually direct mounting) should be specified so that proper supporting members can be provided in the tower.



At KMTV, an interesting view looking up through the tower supporting structure. Close inspection will reveal transmission line run at right of the ladder.

STRUCTURAL DEPENDABILITY

Flatforms for rest and maintenance purposes should be planned at convenient intervals. Where railings at the tower top are required, the platform should be located so that the height of the rail does not extend above the top of the tower. Structures over 750 feet in height may be equipped with elevator facilities. Hoist or man lift elevators can be supplied by the tower builder.

Wind Load

Experienced tower builders rarely design for less than a 30/20 lb. loading. This means that the tower members are designed to resist a horizontal wind pressure of 30 lbs. per square foot of projected area on all flat surfaces and 20 lbs. on round surfaces. This is the equivalent of an actual wind velocity of 85 miles per hour.

Provision should be made for all additional loadings caused by antenna, ladders, transmission and power lines, etc. and should be applied to the projected area of the structure. The total load specified should be applied in the direction which will cause the maximum stress in the various members. Where high winds or heavy icing is prevalent a 50/30 loading is often specified.

Since 1932 the U. S. Weather Bureau has published wind velocity data based on a 5 minute average known as "maximum" and frequently on fastest mile known as "extreme". The selection of antenna loads should be based on "extreme" velocity. If no data is available on "extreme", the published "maximum" figures should be increased by approximately 15%. Suggested loadings are given for the area in which the indicated cities are located. These figures are derived from studies of the entire area based on monthly and yearly average velocities, frequency, probability of extremes, topographical conditions, etc. Building codes and zoning restrictions should be thoroughly investigated. Mountainous and other topographical features and areas subject to heavy icing conditions should be given special consideration.

WIND VELOCITY AND PRESSURE MAP

~ KEY ~

FIRST NUMBER. Designates extreme wind velocity (fastest mile)* as recorded by U.S. Weather Bureau for the particular city. These velocities have been taken at an average anemometer height of 100 ft. above ground.

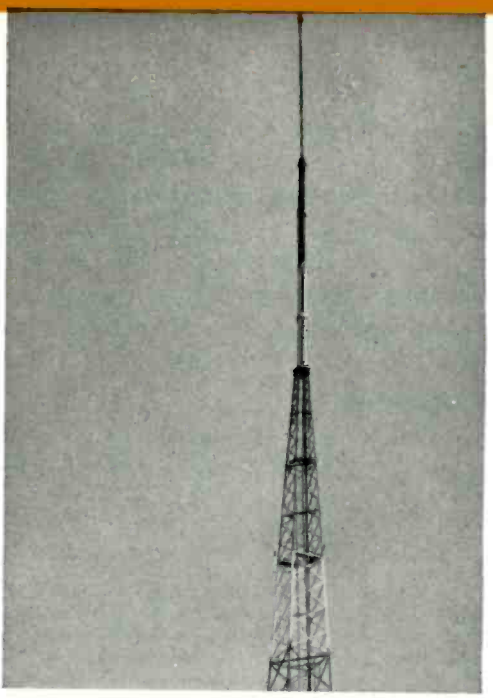
SECOND NUMBER. Designates the suggested wind loading (refer to table) for towers and antennas located in the particular area. These pressures are recommended for structures 500 to 1200 ft. high. Mountains and other topographical features should be given special consideration.

THIRD NUMBER UNDERLINED. Designates elevation of U.S. Weather Bureau above sea level.

WIND PRESSURES AT 500-1200 FT.

1	30 psf	4	45 psf	7	70 psf
2	35 psf	5	50 psf		
3	40 psf	6	60 psf		

* FASTEST MILE
Speed of the fastest mile of air passing the anemometer



View of RCA UHF Pylon Antenna mounted atop an FM Pylon. The Flange Pedestal Adapter shown in the views below is supplied as an accessory item to facilitate this method of mounting.

SPECIFICATIONS

Towers are designed in accordance with RETMA Specifications. Consultation with RCA Broadcast Representatives will help to determine your requirements. Call or write your nearest representative.

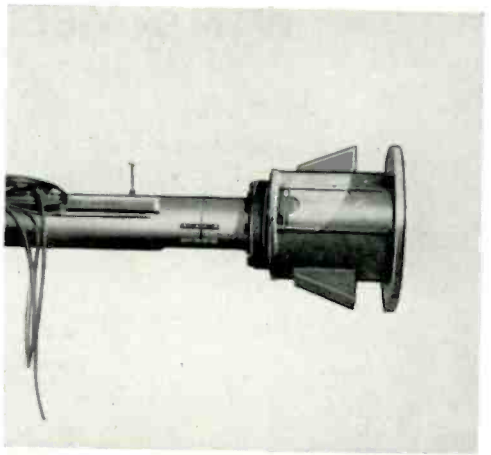
Accessories

RCA can furnish in addition to the antenna supporting tower, the following accessories:

(A) Tower lighting equipment.

(B) Special Antenna base mounting.

(C) Installation and Erection assistance.

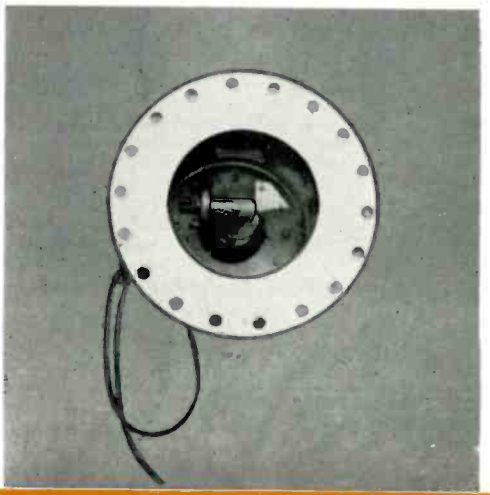


Side view of Flange Pedestal Adapter fastened to base of UHF Pylon. Note hole in adapter near antenna base through which transmission line passes.

Antenna Tower Erection

Do not try to economize on erection. Get the best erector you can. A little extra money spent for this purpose can possibly save you many dollars of time off the air. Failure of station equipment can keep you off the air only for a short time because your personnel is trained to repair this equipment. Also, you probably will have stand-by equipment. If your antenna system fails you may be off-air for hours because no one is immediately available to repair it.

RCA has experienced erection contractors who can furnish a complete installation.



Lower-end view of Flange Pedestal Adapter showing mitre-elbow in position for connecting with external transmission line.

TV DIPLEXERS

FEATURES

- **Permits feeding both aural and visual signals to one transmitting antenna**
- **Compact, saves floor space—can be mounted overhead with transmission line**
- **Easy to install**
- **Enclosure keeps out dust**
- **Furnished precut to channel—no adjustment required**

USES

The Diplexer is a device constructed of transmission line sections which permits feeding both the aural and visual counterparts of the television signal to the same antenna without detrimental crosstalk. This makes it possible to use one antenna for radiating both the aural and visual signals. The Diplexer is designed particularly for use in transmission lines for Superturnstile and Super-Gain antennas; however, it can be used with any TV antenna which utilizes a quadrature phased dual transmission line.

The diplexing systems vary in size and weight dependent upon the frequency band used. The input and output impedances of each system matches the standard transmission line characteristic impendance. It has a low insertion loss—usually less than 0.1% because it uses no tuned traps or other circuits carrying high circulating current. The power handling capacity is correspondingly high because the power dissipated is roughly equivalent to that of an equal length of transmission line of the same dimensions.

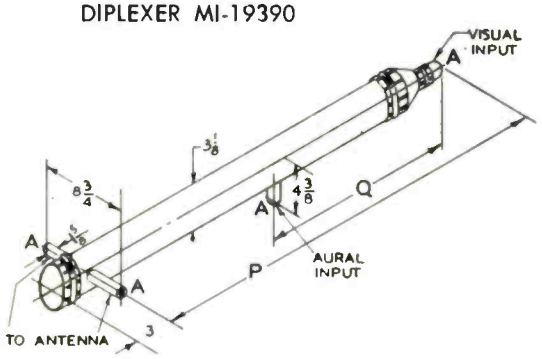
The following diplexers are recommended for use with the various type RCA television transmitters.

MI-19390 Diplexer*	TT-500A/B	500 watts max. power
	TT-2AL/AH	2 kilowatts max. power
	TT-5A	5 kilowatts max. power
MI-19391 Diplexer	TT-10AL/AH	10 kilowatts max. power
	TT-25BL	25 kilowatts max. power
MI-19394 Diplexer	TT-25BH	25 kilowatts max. power
	TT-50AH	50 kilowatts max. power

* The MI-19390 Diplexer is rated for 10 kw use, however terminals of the TT-10AL/AH and associated VSBF are $3\frac{1}{8}$", hence the MI-19391 Diplexer with $3\frac{1}{8}$" terminals is recommended.

10 KW DIPLEXER (MI-19390)

DIPLEXER MI-19390



CHANNEL	P	Q
2	107 7/16	55 5/8
3	97 9/16	50 11/16
4	89 7/16	46 5/8
5	78 9/16	41 3/16
6	73 5/16	38 9/16
7	37 9/16	20 11/16
8	36 5/16	20 1/16
9	35 5/16	19 9/16
10	34 5/16	19 1/16
11	33 9/16	18 11/16
12	32 9/16	18 3/16
13	31 13/16	17 13/16

DESCRIPTION

The MI-19390 Television Diplexer for use with transmitters having a maximum power output of 10 kw is a coaxial bridge-type unit—the type generally used with the Superturnstile Antenna which has equal input impedances at the two halves (North-South and East-West sides) of the antenna. The diplexer, together with the antenna circuit, is equivalent to a Wheatstone Bridge circuit. The two equal resistive arms of the bridge represent the N-S and E-W sides of the antenna respectively, while the diplexer contains the two equal reactive arms. The visual and aural inputs are connected as shown; and from each, the power divides equally to feed to the two sides of the antenna without interaction between visual and aural signals. An important feature of this type of diplexer is the ability to transmit visual and aural r-f energy of the same frequency; thus, the upper visual sideband at 4.5 megacycles modulation is the same as the aural carrier frequency, but both are transmitted without interaction.

The construction of the diplexer is based on the split balun in which the outer conductor of a coaxial line is split for a quarter wave-length, and the inner conductor is connected to one side of the end of the split section. The two ends of the split section assume opposite polarities, thus the single-ended input is converted to a double-ended circuit. This original outer conductor is surrounded by a coaxial shield which forms the new electrical outer conductor. The aural input circuit inner conductor is connected to the crotch of the split section so that the aural energy flows along as on two parallel conductors connected push-push (i.e. the aural signal is fed to the two antenna terminals in phase).

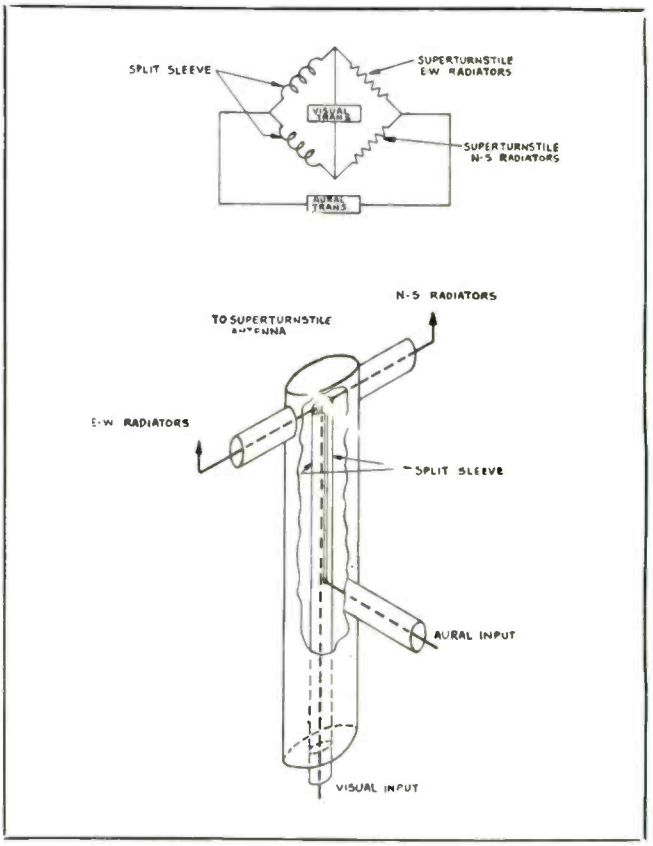
The electrical characteristics of the unit, as well as the physical dimensions are shown in the outline drawing. Note particularly that the physical dimensions of the diplexer will vary in accordance with the channel for which it is built. The unit may be mounted in any position. All input and output terminals are designed for use with 1⅝ ohm transmission line (RCA MI-19112).

SPECIFICATIONS

Frequency	54-216 MC
Maximum Power	10 KW
R.F. Input and Output	51.5 ohms—1⅝ inch coaxial line
R.F. Efficiency	99.9%
Attenuation	.004 db
Visual Input	VSWR less than 1.05
Aural Input	VSWR less than 1.15
Weight	12 to 30 pounds
Mounting	Any position
Dimensions	See outline drawing
Stock Identification	MI-19390-*

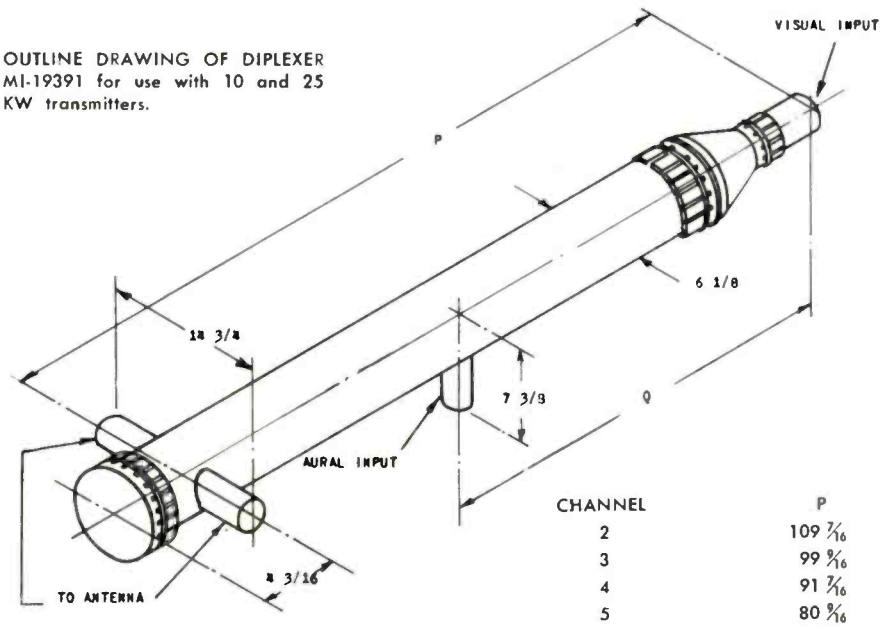
* MI number to include channel, i.e.: MI-19390-2 for channel #2, etc.

The bridge-type diplexer is simply constructed and equivalent to a Wheatstone Bridge.



25 KW DIPLEXER (MI-19391)

OUTLINE DRAWING OF DIPLEXER MI-19391 for use with 10 and 25 KW transmitters.



CHANNEL	P	Q
2	109 7/16	57 5/8
3	99 9/16	52 11/16
4	91 7/16	48 5/8
5	80 9/16	43 3/16
6	75 5/16	40 9/16

DESCRIPTION

The MI-19391 Television Diplexer is a coaxial bridge-type unit designed for operation on any one of the VHF television channels from channel 2 to channel 6. Each unit is pretuned and adjusted for the desired channel and requires no adjustments at the time of installation.

The diplexer is designed to handle r-f powers up to 25 KW and is used primarily with Superturnstile Antennas, hence two outputs are provided for feeding the East-West radiators and the North-South radiators respectively. In construction and principle it is identical to the type MI-19390 TV diplexer.

The insertion loss of this diplexer is very low, due to the fact that no tuned traps or other circuits carrying a high circulating current are used. The power handling capability is correspondingly high because the power dissipated is roughly equivalent to that of an equal length of transmission line of the same dimensions.

The electrical characteristics of the unit, as well as the physical dimensions, are shown on the accompanying outline drawing. Since the size of the diplexing system will vary with channel frequency, all orders must specify the operating frequency of the station.

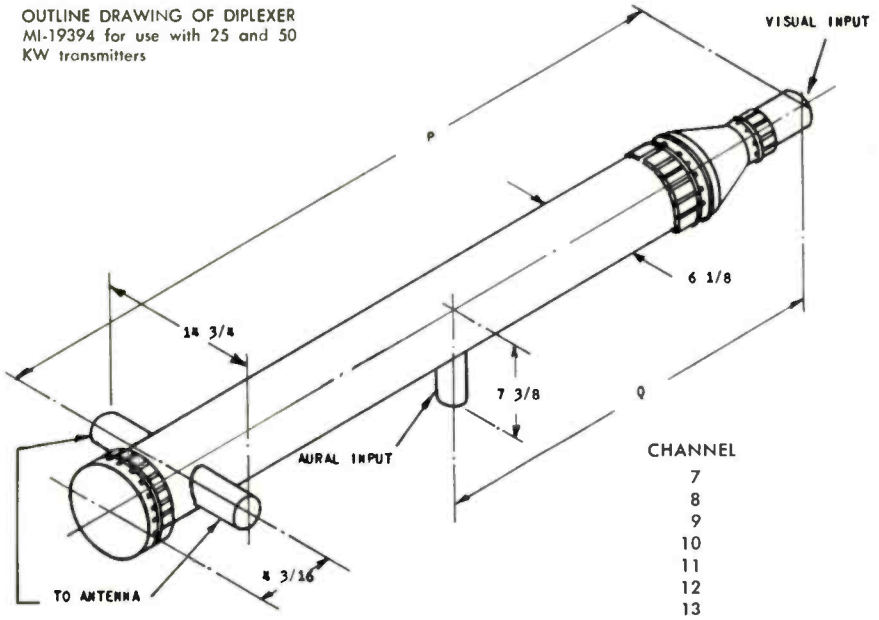
The unit should be mounted near the transmitter, preferably ceiling mounted, but it may be mounted in any posiion. The two antenna transmission lines are connected to the diplexer output terminals. The output of the aural transmitter is attached to the aural input of the diplexer, and the output of the vestigial sideband filter to the visual input of the diplexer. All input and output terminals are designed for use with 3⅛ inch, 51½ ohm transmission line; (RCA MI-19113).

SPECIFICATIONS

Frequency	54-88 MC
Maximum Power	25 KW
R.F. Input and Output	51.5 ohms, 3⅛ inch coaxial line
R.F. Efficiency	99.9%
Attenuation	.004 db
Visual Input	VSWR less than 1.05
Aural Input	VSWR less than 1.15
Weight	48 to 175 pounds
Mounting	Any position
Dimensions	See outline drawing
Stock Identification	MI-19391-*

* MI number to include channel, i.e.: MI-19391-6 for channel #6, etc.

50 KW DIPLEXER (MI-19394)



CHANNEL	P	Q
7	39 9/16	22 11/16
8	38 5/16	22 1/16
9	37 5/16	21 9/16
10	36 5/16	21 1/16
11	35 9/16	20 11/16
12	34 9/16	20 3/16
13	33 13/16	19 13/16

DESCRIPTION

The MI-19394 50 KW Television Diplexer is a coaxial bridge-type unit designed for operation on any one of the VHF television channels from channel 7 to channel 13. Each unit is pretuned and adjusted for the desired channel and requires no adjustments at the time of installation. The system has been designed primarily for use with Superturnstile Antennas, hence two outputs are provided for feeding the East-West radiators and the North-South radiators respectively.

This diplexer is quite similar to the 25-KW unit (MI-19391), with proper dimensions for channels 7-13 and the inner conductor is silver-plated to permit a higher maximum temperature rise. Like the 25-KW unit, the insertion loss of the diplexer is low, due to the fact that no tuned traps or other circuits carrying a high circulating current are used. The power handling capability is correspondingly high because the power dissipated is roughly equivalent to that of an equal length of transmission line of the same dimensions.

The electrical characteristics of the unit, as well as the physical dimensions, are shown in the outline drawing. Note particularly that the physical dimensions of the diplexer will vary in accordance with the channel for which it is built.

The principle of the diplexer unit and its construction is discussed under the description of the MI-19390 unit, which illustrates the electrical circuit and physical construction.

All input and output terminals are designed for use with 3⅛ inch, 51½ ohm transmission line (RCA MI-19113). Special adaptors are included for use with this VHF Teflon Line.

SPECIFICATIONS

Frequency	174-216 MCS
Maximum Power	50 KW
R.F. Input and Output	51.5 ohms, 3⅛ inch coaxial line
R.F. Efficiency	99.9%
Attenuation	.004 db
Visual Input	VSWR less than 1.05
Aural Input	VSWR less than 1.15
Weight	48 to 60 pounds
Mounting	Any position
Dimensions	See outline drawing
Stock Identification	MI-19394-*

* MI number to include channel, i.e.: MI-19394-7 for channel #7, etc.

Accessory Items

Adaptor, Inner for MI-19313 Coaxial Line	MI-19313-10
Coupling, Straight	MI-19113-8
Reducer, 6⅛" to MI-19113 Coaxial Line	MI-19314-13
Reducer, 6⅛" to MI-19313 Coaxial Line	MI-19313-13

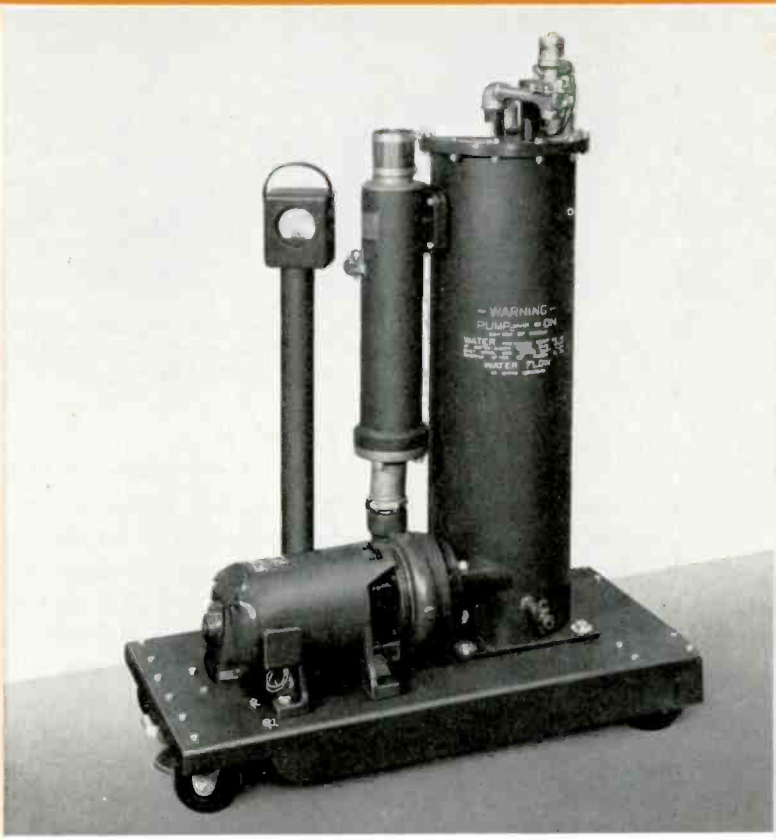
R-F LOADS AND WATTMETERS

FEATURES

- Combines dummy TV antenna and r-f power-measurement functions
- Easily installed—occupies little space
- Power indications given directly in watts
- Meets FCC standards
- Wide choice of ratings (300 w, to 50 kw) at any VHF or UHF frequency

USES

The R-F Loads and Wattmeters are designed for use in measuring the power output of the aural and visual sections of television transmitters. The load properly terminates the output of either the visual or aural transmitter and gives a measurement of the average r-f power as required by FCC standards. It is also used as a dummy antenna for transmitter tuning. A choice of ratings is available for any frequency between 54 mc and 890 mc and for any power level.



MI-19193-L/H R-F Load and Wattmeter (see p. 70 for Specifications)

DESCRIPTION

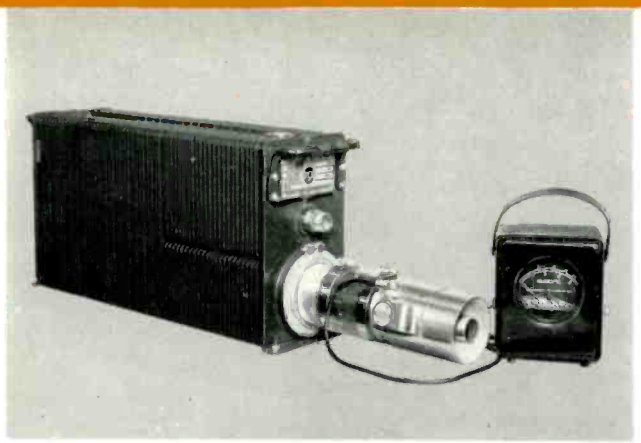
The RCA Series of R-F Loads and Wattmeters consists of a resistor element for terminating a transmission line in its characteristic impedance, and a current indicating meter for measuring power dissipated. The power dissipating section consists of a resistor unit immersed in a coolant liquid, which is cooled by air in the low power units, by tap water in the medium power units, and by forced water in high power loads. In order to prevent excessive use of tap water during the time the r-f power is at a low level, a water saver is used in most cases. This consists of a thermostatically controlled solenoid valve which allows the water to flow only when needed.

The power measuring section consists of a short length of transmission line (Thruline), a meter, and a wattmeter element. A socket is provided on the side of the transmission-line-coupling section to accommodate a calibrated wattmeter element, which, when coupled to the transmission line, develops a d-c current approximately proportional to the forward wave voltage across the load resistor. This current is supplied to a remote meter calibrated to indicate directly the power dissipated in the load.

The wattmeter element is a reflectometer which consists of a coupling loop, a crystal detector, and a filter network. The wattmeter element may be rotated 180° in the transmission line housing. This permits it to indicate the incident power to the load, or the reflected power from the load. The MI-19198-A and MI-19024-A models differ in important respects from the above, and are described hereafter.

R-F Loads and Wattmeters for TV Transmitters

MI Number	*Frequency*	*Ave. Power*	*Usable Range*	*Input Imped.*	*Type of Cooling*
19196-L/H	Ch. 2-13	1200 W VHF	240 to 1200 W	51.5 ohms	Natural Air Convection
19197	Ch. 14-83	1200 W UHF	240 to 1200 W	50 ohms	Natural Air Convection
19024-A	Ch. 2-13	3 KW VHF	1.0 to 3 KW	51.5 ohms	Tap Water (1 GPM)
19199-L/H	Ch. 2-13	6 KW VHF	1.0 to 6 KW	51.5 ohms	Tap Water (4 GPM)
19198-A	Ch. 14-83	10 KW UHF	0.1 to 10 KW	50 ohms	Tap Water (5.5 GPM)
19193-L/H	Ch. 2-13	25 KW VHF	3.0 to 25 KW	51.5 ohms	Water & Pumped Coolant (10 GPM)
19191-L/H	Ch. 2-13	50 KW VHF	6.0 to 50 KW	51.5 ohms	Water & Pumped Coolant (20 GPM)



The MI-19196-L/H is a natural air-convection-cooled portable unit, which may be connected to either the transmitter output, the sideband filter output, or either output of the diplexer.

MI-19196-L/H

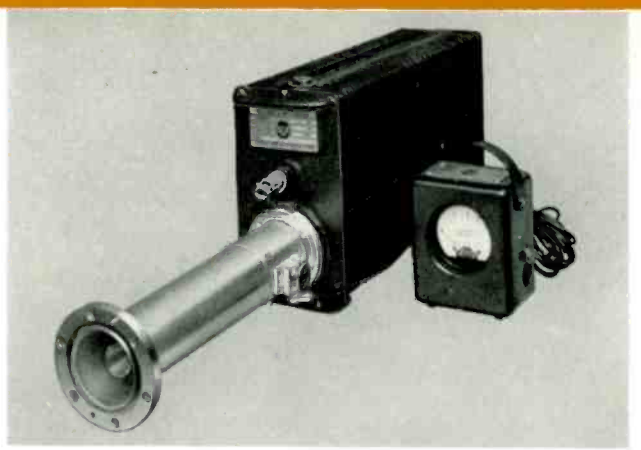
The RCA 300/1200-Watt R-F Load and Wattmeter (2 kw peak picture power) is an air-cooled, termination type unit for operation in either the 54 to 108 mc (MI-19196-L) or 108 to 216 mc (MI-19196-H) frequency range. It is equipped with unflanged fitting for 3⅛"—51.5 ohm line and is designed for use with TT-500A/B and TT-2AL/AH RCA VHF transmitters. The equipment's power dissipating section consists of the load resistor and a liquid coolant which are contained in a finned radiator structure. The power measuring section consists of a short length of transmission line (Thruline), a meter, and two wattmeter elements which provide 0 to 375-watt or 0 to 1500-watt full-scale meter deflection. Connection between the power measuring section and the power dissipating section is made by means of an inner conductor connector and a straight coupling.

Equipment Supplied

1 R-F Load Assembly, 1 Straight Coupling, 1 Inner Conductor Connector, 2 Hose Clamps, 1 Thruline Section, 1 Meter Assembly, and 2 Wattmeter Elements.

Accessory Equipment

Adapter, Inner for MI-19313 Coaxial Line	MI-19313-10
Coupling, Straight	MI-19113-8
Reducer, 3⅛" to 1⅝" Coaxial Line	MI-19112-7



The low-power UHF MI-19197 Load and Wattmeter shown above is the companion unit to the MI-19196 VHF equipment which it resembles in appearance and operation.

MI-19197

The RCA 1200-Watt R-F Load and Wattmeter (2 kw peak picture power) is similar to the MI-19196 VHF Equipment, but designed for operation in the 470 to 890 mc UHF frequency range. It is equipped with flanged fitting for 3⅛"—50 ohm line, and is specified for use with RCA's type TTU-1B UHF transmitter.

The MI-19197, in addition to functioning as a load, serves as the reject load resistor on the RCA MI-19086 Filterplexer. In this application, the inner conductor of the transmission line coupling is surrounded by a specially made sleeve, the coupling forming a matching section which will give a VSWR of 1.02 or better for the operating channel.

Equipment Supplied

1 R-F Load, 1 Meter, 1 Wattmeter Element (0-1500 watts), and 1 Wattmeter Element (0-150 watts).

Accessory Equipment

Reducer, 50 ohm 3⅛" to Type N	MI-19089-17
Adapter, Type N to Type HN	MI-19089-19
Connector (anchor insulation)	MI-19089-10

MI-19024-A

The RCA 3-KW R-F Load and Wattmeter (5 kw peak visual power) is designed for use with VHF transmitters with up to 5 kw picture ratings. It is a termination type unit supplied for operation in the 54 to 216 mc frequency range. Channel frequency must be included in ordering information since the equipment is calibrated and adjusted at the factory for a particular channel. The unit may be connected to either the transmitter output, the sideband filter output, or either diplexer output. The power dissipating section consists of the load resistor, an intermediate coolant, a heat exchanger, and a flexible RG-19/U cable which fits a 1⅝"—51.5 ohm transmission line. The unit is cooled with tap water which enters and leaves the top of the unit through special ½" I.P.S. union connections. The unit is designed for wall or rack mounting.

Equipment Supplied

1 R-F Load Assembly, 1 Wattmeter, and 1 Cable, 10 feet long.

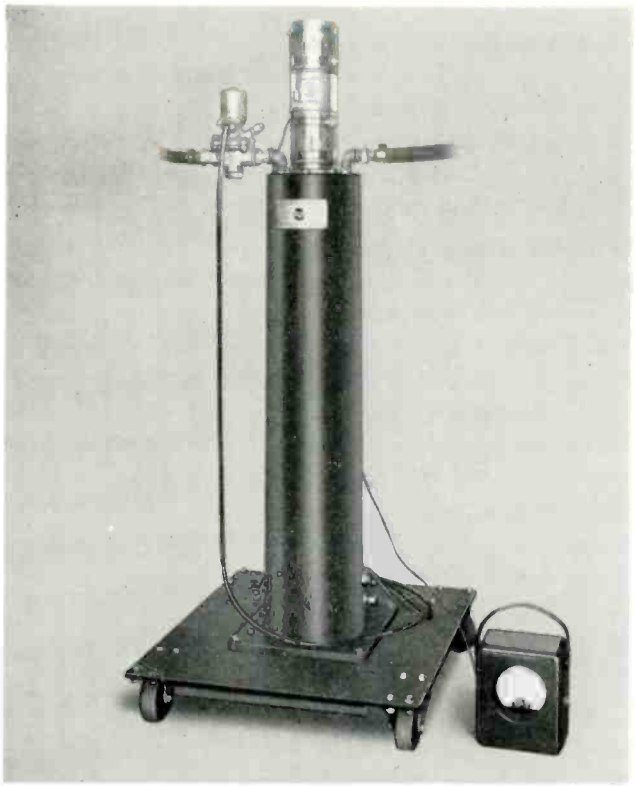
Accessory Equipment

Reducer, 3⅛" to 1⅝" Coaxial Line	MI-19112-7
Transformer, Impedance Matching (for use with 72 ohm line)	MI-19111-10

MI-19199-L/H

The RCA 6-KW R-F Load and Wattmeter (10 kw peak visual power) is a water-cooled, termination type unit for the 54 to 108 mc (MI-19199-L) or 108 to 216 mc (MI-19199-H) frequency range. This fixed or portable floor-mounting unit is equipped with unflanged fitting for 3⅛"—51.5 ohm line. It is designed for use with the RCA type TT-10AL/AH VHF transmitter.

The MI-19199 Equipment employs water instead of air to cool the intermediate coolant, which has been chosen for chemical inactivity to prevent damage to the resistor. The cooling coil is a double helix of finned copper tubing which circulates water between the inner and outer helix. A water saver valve, MI-27348, is an accessory item available to minimize water flow. It is controlled by an automatic thermoswitch so that water flows only when the intermediate coolant temperature reaches a certain maximum limit.



The MI-19199-L/H 6-kw VHF load is mounted on a wheeled truck to aid in changing connections.

Equipment Supplied

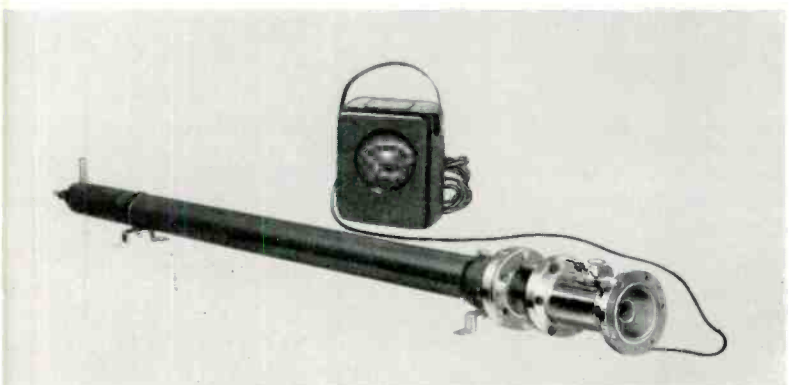
1 R-F Load Assembly, 1 Transport, 1 Straight Coupling, 2 Hose Clamps, 1 Inner Conductor Assembly, 1 Thruline Section, 1 Meter Assembly, and 1 Wattmeter Element.

Accessory Equipment

Water Saver	MI-27348
Adapter, Inner for MI-19313 Transmission Line	MI-19313-10
Coupling, Straight	MI-19113-8

MI-19198-A

The RCA 10-KW R-F Load and Wattmeter (16.5 kw peak visual power) is a termination type unit for operation in the 470 to 890 mc UHF frequency range. It is recommended for use with the RCA type TTU-12A transmitter. The unit may be connected to either the transmitter outputs, or the output of the filterplexer. The unit is equipped with a 3⅛"—50 ohm flanged fitting and thermoswitch.



The MI-19198-A UHF high power load and wattmeter above operates on the "direct-power-dissipation" principle rather than the liquid-cooled load resistor.

The load utilizes a column of tap water for power dissipation rather than a liquid cooled load resistor. The input of the load consists of a polyethylene transformer section to provide a correct impedance match to the connecting line. The opposite end of the line is short circuited and contains the input and output water connections. The water flows through the inner conductor and enters the space between the inner and outer conductor through small perforations in the inner conductor adjacent to the transformer section. The water flow then continues to the output drain connection. A very broadband wattmeter with scale ranges of 0 to 1500 watts and 0 to 15 kw is provided together with a directional coupler which allows direct incident power readings, or with a 180° turn, a reading of the reflected power.

Equipment Supplied

1 R-F Load Assembly, 1 Wattmeter, and 1 Inner Conductor Connector.

Accessory Equipment

Connector (anchor insulator)	MI-19089-10

MI-19193-L/H

The unit is illustrated on page 67.

The RCA 25-KW R-F Load and Wattmeter (40 kw peak visual power) is also a water-cooled termination type unit for operation in the 54 to 108 mc (MI-19193-L) or 108 to 216 mc (MI-19193-H) frequency range. It is equipped with 3⅛"—51.5 ohm unflanged fitting and designed for use with RCA type TT-25-AL/AH or TT-25-BL/BH VHF transmitters.

The power dissipating sections consist of the load resistor, an intermediate coolant, a heat exchanger (cooling coil) and a motor-driven pump assembly which are mounted on a wheeled truck. Two upright steel cylinders, joined at top through a conduit, and at bottom through a motor-driven centrifugal pump, house the load resistor, coolant and cooling coil. Cooling water is forced through the helix system as in the MI-19199 model. A 115/230 volt a-c motor with a self-contained thermal overload switch drives the circulating pump. The MI-19193, -L and -H loads are equipped with 60 cps motors.

Equipment Supplied

MI-19193-L/H: 1 Heat Exchanger, 1 R-F Load Unit Assembly, 1 Coupling, 1 Thruline Section, 1 Meter Assembly and 1 Wattmeter Element.

Accessory Equipment

Adapter, Inner for MI-19313 Coaxial Line	MI-19313-10
Coupling, Straight	MI-19113-8

MI-19191-L/H

The RCA 50-KW R-F Load and Wattmeter (84 kw peak visual power) for VHF transmitters is supplied for operation in either the 54 to 108 mc (MI-19191-L/AL) or 108 to 216 mc (MI-19191-H/AH) frequency range. It has a 6⅛" flanged 51.5 ohm fitting and is designed for use with the RCA type TT-50-AH transmitter.

This forced water cooled unit is almost identical to the MI-19193 model. The power measuring section consists of a short length of transmission line (Thruline), a meter, and a wattmeter element which reads average and not peak power values. The a-c motor used to drive the circulating pump is supplied for either 60 or 50 cps operation. The entire equipment is mounted on a wheeled truck, and is similar in appearance to the MI-19193 unit.

Equipment Supplied

1 Heat Exchanger, 1 R-F Load Unit Assembly, 1 Straight Coupling, 1 Thruline Section, 1 Meter Assembly, 1 Wattmeter Element, 2 Hoses.

Accessory Equipment

Coupling, Straight	MI-19314-7
Reducer, 6⅛" to 3⅛" for MI-19113 Transmission Line	MI-19314-13
Adapter, Inner for MI-19313 Transmission Line	MI-19313-10
Reducer, 6⅛" to 3⅛" for MI-19313 Transmission Line	MI-19313-13

SPECIFICATIONS

Electrical Specifications

	MI-19196-L/H	MI-19197	MI-19199-L/H	MI-19193-L/H	MI-19191-L/H	MI-19024-A	MI-19198-A
Frequency Range	54 to 108 mc 108 to 216 mc	470 to 890 mc	54 to 108 mc 108 to 216 mc	54 to 108 mc 108 to 216 mc	54 to 108 mc 108 to 216 mc	54 to 216 mc	470 to 890 mc
Power Rating (Ave.) (5000 ft. max. elev.)	1200 watts	1200 watts	6 kilowatts	25 kilowatts	50 kilowatts	3 kw	10 kw
R-F Input Impedance	51.5 ohms	50 ohms	51.5 ohms	51.5 ohms	51.5 ohms	51.5 ohms	50 ohms
A-c Power Input	———	———	———	115/230 volts, 50/60 cycles, single phase	115/230 volts, 50/60 cycles, single phase	None (tap water cooled)	None (tap water cooled)
Power Consumption	———	———	———	1.125 kw	1.125 kw	———	———
Ambient Air Temp.:							
Maximum	45° C	45° C	45° C	45° C	45° C	45° C	45° C
Minimum	15° C	15° C	15° C	15° C	15° C	15° C	15° C

Mechanical Specifications

Mounting	Horizontal	Horizontal	Floor (fixed or portable)	Floor (fixed or portable)	Floor (fixed or portable)	Vertical surface	Horizontal, water output up
Coolant Capacity	1.7 gallons	1.7 gallons	4 gallons	15 gallons	26 gallons	2 gallons	None
Water Required	None (air cooled)	None (air cooled)	4 gpm (30° C max.)	10 gpm (30° C max.)	20 gpm (30° C max.)	1 gpm (30° C max.)	1.5 to 5.5 gpm (40° C max.)
Water Connections	None	None	½" hose	Inlet ¾" std. pipe Outlet 1¼" std. pipe	1¼" hose	½" std. pipe	Input ¾" O.D. Output ⅞" O.D.
Weight	48 lbs.	48 lbs.	175 lbs.	750 lbs.	1000 lbs.	46 lbs.	50 lbs.
Dimensions, Overall:							
Length	32 9/16"	36 5/8"	24"	42½"	45 5/8"	———	89 5/16"
Width	6⅜"	6⅜"	20"	20½"	24⅝"	5" dia.	5¾" dia.
Height	10¾"	10¾"	46⅝"	57⅛"	64"	33½"	———

INDEX

VHF SUPERTURNSTILE ANTENNAS

VHF CUSTOM ANTENNAS

UHF PYLON ANTENNAS

UHF HIGH-GAIN PYLON ANTENNAS

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