

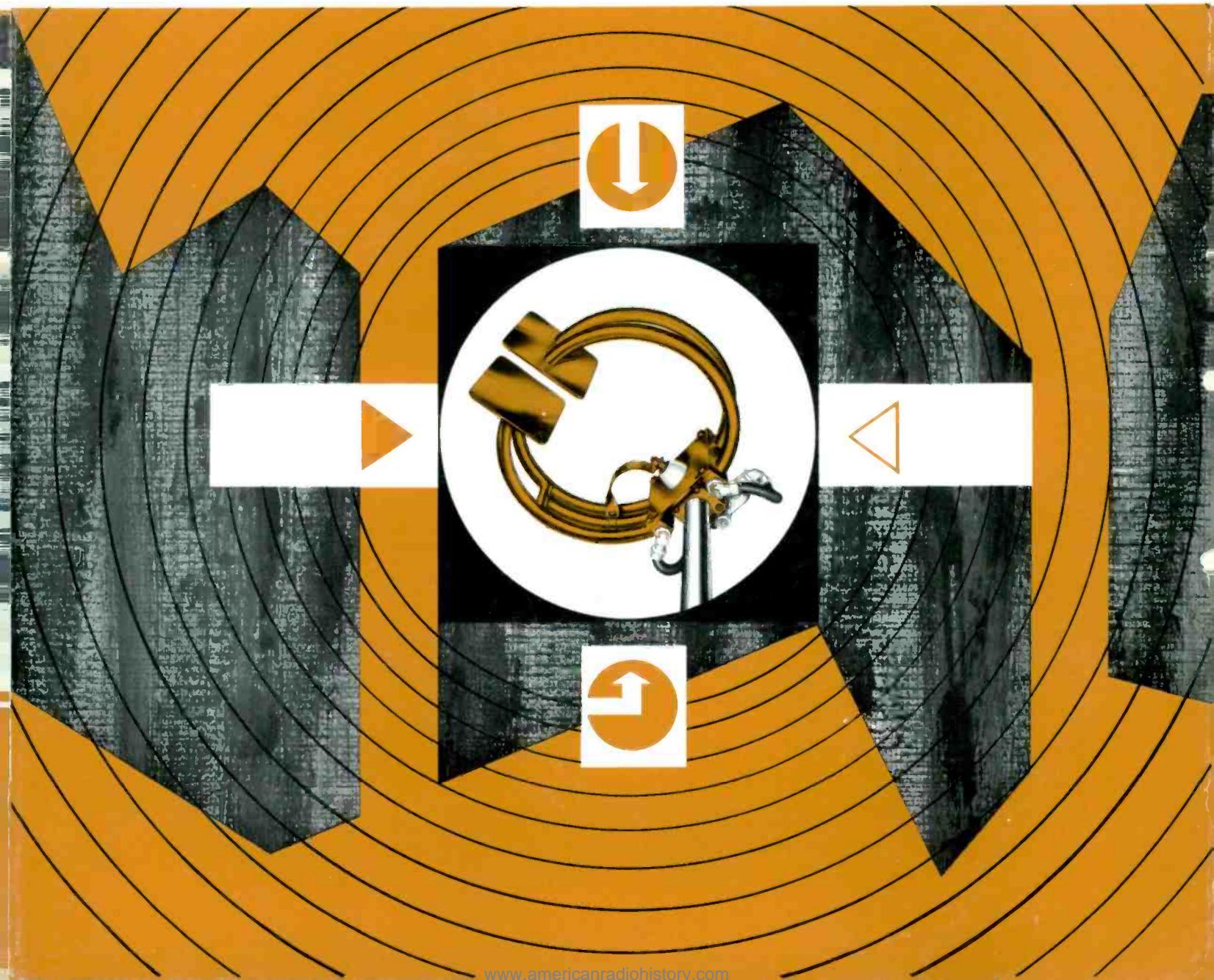
GATES

GATES CYCLOID



ANTENNA

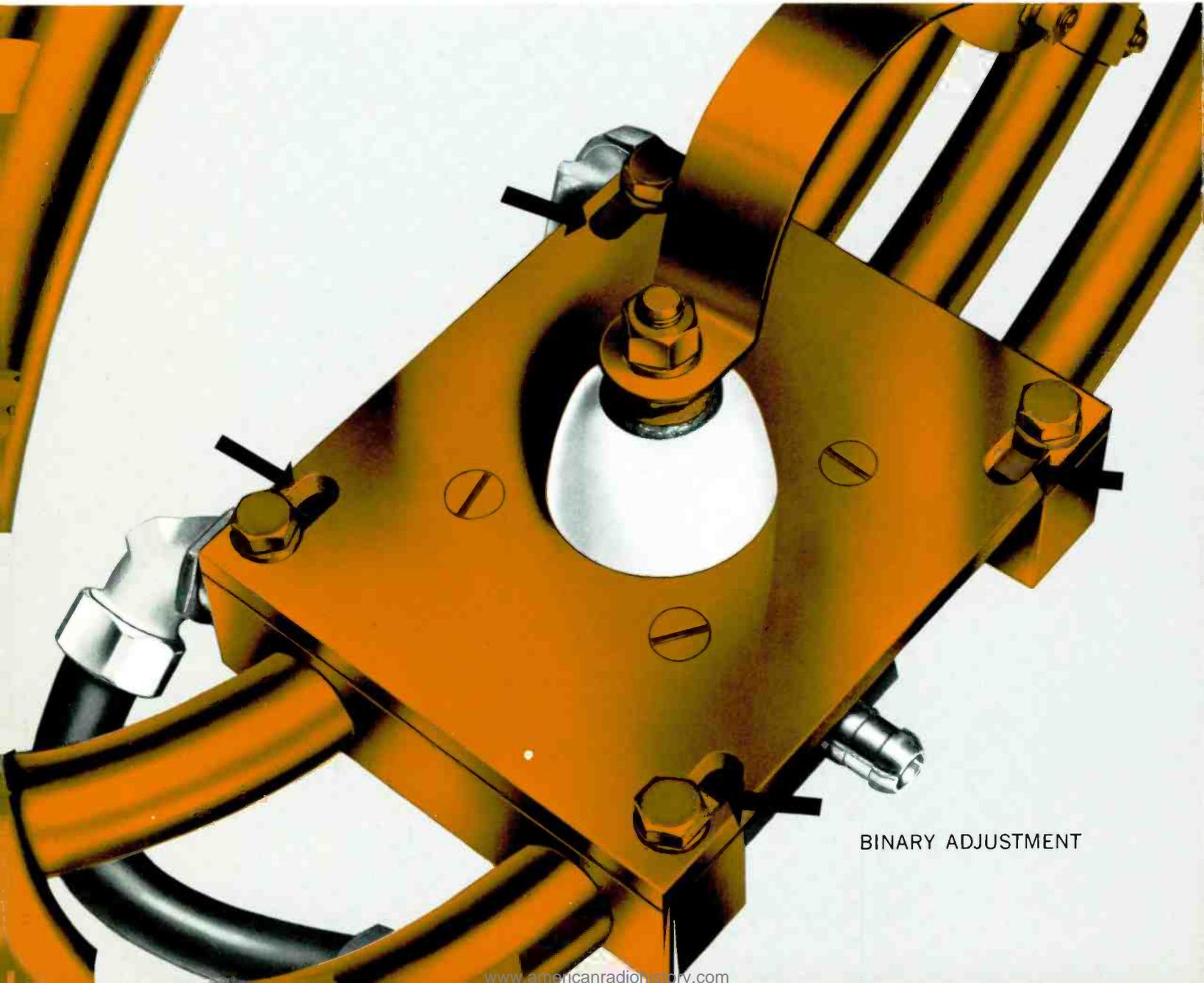
- Designed for FM Stereo and Multiplex broadcasting
- Shunt Fed—Binary Adjustment (Pat. Pending).
- Lowest possible VSWR
- Top, side or inside tower mounting
- Optional deicing with high or low power heaters
- Circularity . . . ± 1 db in free space
- Field-proven performance
- Minimum windloading
- High gain
- Directional patterns available



GATES CYCLOID



ANTENNA



BINARY ADJUSTMENT



SPECIFICATIONS

FREQUENCY RANGE: Factory tuned on customer's frequency in 88-108 Mc band.

POLARIZATION: Horizontal.

HORIZONTAL PATTERN: Circular, ± 1.0 db in free space.

INPUT IMPEDANCE: 50 ohms, on $1\frac{1}{8}$ " or $3\frac{1}{8}$ " coax.

VSWR (without field tuning):
Top Mounting—1.2 to 1.
Side Mounting—1.5 to 1.

VSWR (with field tuning):
Top Mounting—1.1 to 1.
Side Mounting—1.1 to 1.

WINDLOAD: 20 lbs. per square foot.

DIMENSIONS (1 bay):

Height (over-all)—6"
Ring Diameter—approx. 18"
(depends on frequency)

WEIGHT: 25 lbs. per ring.

EQUIPMENT FURNISHED:

Antenna Mounting hardware—
(specify tower manufacturer).
Antenna elements as required.
Interconnecting rigid coax $1\frac{1}{8}$ " or $3\frac{1}{8}$ " as ordered.
Standard EIA $1\frac{1}{8}$ " or $3\frac{1}{8}$ " flanges as ordered.

ACCESSORY EQUIPMENT:

De-icers: 200 watt—FMH-200
400 watt—FMH-400
Power cable for heaters

FIGURE 4. Horizontal Polarization Chart (side or top mounting)

TYPE NUMBER	FMA-1	FMA-2	FMA-3	FMA-4	FMA-5	FMA-6	FMA-7	FMA-8*
NO. OF BAYS	1	2	3	4	5	6	7	8
Field Gain	.95	1.41	1.73	2.02	2.28	2.51	2.70	2.90
Power Gain	.9	2	3	4.1	5.2	6.3	7.3	8.4
Length in feet	6 in.	10 ft.	20 ft.	30 ft.	40 ft.	50 ft.	60 ft.	70 ft.
Weight in lbs.	25	50	95	120	150	180	210	240

*Power and field gain of additional number of bays quoted upon request.

1. It is not advisable to use more than a 10 KW transmitter on $1\frac{1}{8}$ " line or 20 KW on a $3\frac{1}{8}$ " line.
2. Windloads are based on 20 pounds per sq. ft. on projected areas of cylindrical surfaces with all sections considered round.

3. Power gains compared to $\frac{1}{2}$ wave dipole.
4. Type number will be followed by an "A" or "B" indicating coax size. Example—FMA-4A.
A = $1\frac{1}{8}$ " coax B = $3\frac{1}{8}$ " coax



ORDERING INFORMATION

TYPE	LINE	# OF RINGS	TYPE	LINE	# OF RINGS
FMA-1A	$1\frac{1}{8}$ "	1	FMA-8A	$1\frac{1}{8}$ "	8
FMA-1B	$3\frac{1}{8}$ "	1	FMA-8B	$3\frac{1}{8}$ "	8
FMA-2A	$1\frac{1}{8}$ "	2	FMA-10A	$1\frac{1}{8}$ "	10
FMA-2B	$3\frac{1}{8}$ "	2	FMA-10B	$3\frac{1}{8}$ "	10
FMA-4A	$1\frac{1}{8}$ "	4	FMA-12A	$1\frac{1}{8}$ "	12
FMA-4B	$3\frac{1}{8}$ "	4	FMA-12B	$3\frac{1}{8}$ "	12
FMA-6A	$1\frac{1}{8}$ "	6	FMA-16A	$1\frac{1}{8}$ "	16
FMA-6B	$3\frac{1}{8}$ "	6	FMA-16B	$3\frac{1}{8}$ "	16

Above are listed the most frequently ordered antennas, however, the Cycloid antenna is available with any number of bays from 1 to 16. Specify number of rings and line size.

If heaters are required order: FMH-200 (200 watt heaters) or FMH-400 (400 watt heaters).



GATES RADIO COMPANY

A Subsidiary of Harris-Intertype Corporation

QUINCY, ILLINOIS, 62302

Offices: NEW YORK, HOUSTON, LOS ANGELES, WASHINGTON, D. C. Export: ROCKE INTERNATIONAL CORP., N.Y.C. In Canada: CANADIAN MARCONI COMPANY, MONTREAL

■ With the resurgence of FM broadcasting and the obvious need for improved equipment, the Gates engineering plan has been to *create, rather than redesign*. Gates FM transmitters and associated broadcast equipment lead the field and provide the increased fidelity that listeners now demand. To achieve a "total sound" transmission, however, the entire FM system from the transmitter to the antenna must be designed to create, maintain and transmit the full fidelity signal. Now, the *Cycloid** FM antenna completes Gates' *total FM system* to provide a highly efficient antenna for FM stereo and all FM broadcasting needs. The *Cycloid* offers many new innovations and improvements and is available exclusively from Gates.

BINARY ADJUSTMENT

The new Gates *Cycloid* antenna features *Binary Adjustment*, an exclusive and long awaited concept. *Binary Adjustment* is the first major technological advance in antenna design since the initial development of ring type radiating elements. With this patented** product exclusive, the Gates FM antenna is adjusted for capacitive tuning while the same adjustment changes the inductance of the ring. The advantage is that one ring can be adjusted to cover a major portion of the FM spectrum. (See close-up photograph.)

The nature of *Binary Adjustment* permits the antenna to be tuned to an extremely low standing wave ratio over a wide range of frequencies. Fine tuning of the inductance is achieved by moving the feed strap up or down the middle semicircular element. Since all of the adjustment is incorporated in the antenna, it is not necessary to buy costly extras such as transformers or field tuning kits to achieve the optimum low standing wave ratio.

The Gates *Cycloid* FM antenna is pretuned at the factory to the customer's frequency assuring the most efficient installation.

VOLTAGE STANDING WAVE RATIO

A voltage standing wave ratio of 1.1 to 1 is attainable with the Gates *Cycloid* antenna by field tuning the array. If the antenna is mounted on a supporting pole and pretuned at the factory, a voltage standing wave ratio of 1.2 to 1 or better, at the one megacycle bandwidth points should be expected. A side mounted antenna, pretuned at the factory should provide a voltage standing wave ratio of 1.5 to 1 or better, at one megacycle bandwidth points. The bandwidth of the Gates *Cycloid* antenna is ideal for stereo and multiplexing (see Figure 3) and is sufficient to minimize the detuning effect sometimes caused by atmospheric conditions.

GAIN

FIGURE 1

ANTENNA BAYS	ANTENNA LENGTH	ANTENNA GAIN
2	10	2
3	20	3
4	30	4.1
5	40	5.2
6	50	6.3
7	60	7.3
8	70	8.4
9	80	9.4
10	90	10.5
11	100	11.5
12	110	12.5
13	120	13.6
14	130	14.6
15	140	15.6
16	150	16.6

ANTENNA LENGTH AND POWER GAIN for GATES *CYCLOID* ANTENNA

*Trade Name. **Patent applied for.

Gain of the Gates *Cycloid* FM antenna is in direct relation to the number of bays in the antenna array. This measurement is possible due to rigid quality controls that assure identical electrical and mechanical characteristics of the antenna rings. Gates *Cycloid* antenna is available for one to sixteen element arrays to cover any FM antenna application. By referring to Figure 1 you can estimate the antenna gain in relation to the antenna length and number of bays. The *Cycloid* antenna is neither a high "Q" nor a low "Q" device, but has a "Q" that makes it ideal for today's stereo and multiplex operations.

CIRCULARITY

A horizontal radiation pattern is influenced by many factors, including the type and location of transmission lines, guy wires and other conducting elements in the area of the antenna, the nature of the supporting structure, spacing of the antenna elements and other antennas in the area. These factors are all variables, however, and can be controlled by requesting factory recommendations for proper installation procedures.

The most important determining factor for a good horizontal pattern is the circularity of the antenna element in free space. The Gates *Cycloid* FM antenna is circular within ± 1 db in free space (see Figure 2) to provide the best possible starting point for an optimum horizontal pattern.

HEATERS

To accommodate extreme regional weather variations, Gates offers a choice of two heating elements with the *Cycloid* antenna. For extreme icing, the FMH-400 heater is recommended. It provides 400 watt elements, operating on 115 volts to handle the most rugged and demanding icing conditions. Where limited icing is encountered, but heaters are still desirable, the FMH-200 with 200 watt elements, operating on 115 volts, is available. The cartridge type heater elements are flexible and extend the full circumference of the ring. They can be replaced in the field if necessary. For areas where icing may occur, heaters should be specified when ordering.

MOUNTING

Care has been taken in the design of Gates *Cycloid* FM antenna to provide for simple, yet stable and durable installation. Mounting brackets are tailored to each installation and are furnished for pole or side mounting. The mechanical simplicity of the feed system allows for easy installation, either side mounted on an existing tower, or top mounted with a special mounting pole. In addition, the antenna may be mounted inside the tower, thus offering the widest choice of installation possibilities. The low windload design of the *Cycloid* antenna and the simplicity of its design will reflect a direct savings in construction and maintenance costs. A single, interconnecting feed line consisting of standard EIA rigid coaxial line is used to feed the antenna. The rings are supported by this sturdy Teflon insulated line which is available in either $1\frac{5}{8}$ " or $3\frac{1}{8}$ " size. A standard EIA 50 ohm flange couples the transmission line directly to the antenna feed point.

CONSTRUCTION

The Gates *Cycloid* FM antenna is fabricated from high grade steel for rigidity and is heavily copper plated to provide a non-corrosive coating which has excellent electrical properties. The rugged construction and unique features of this antenna make it the finest FM antenna value in the broadcast industry —available only from Gates.

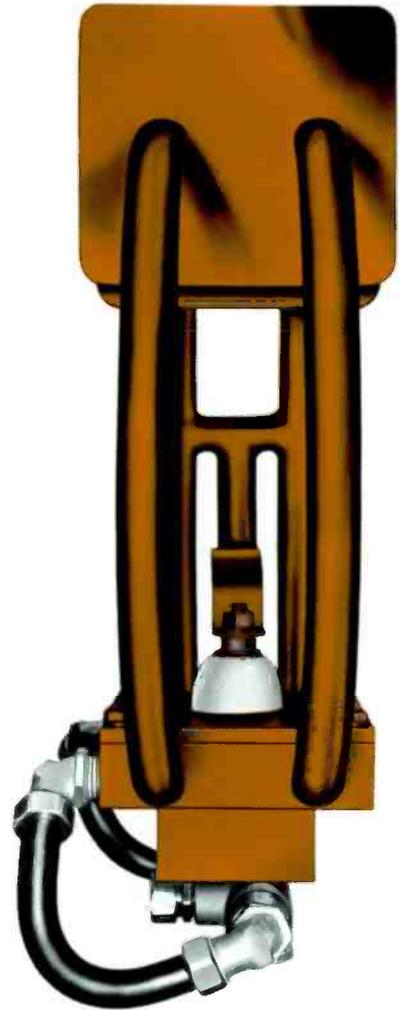
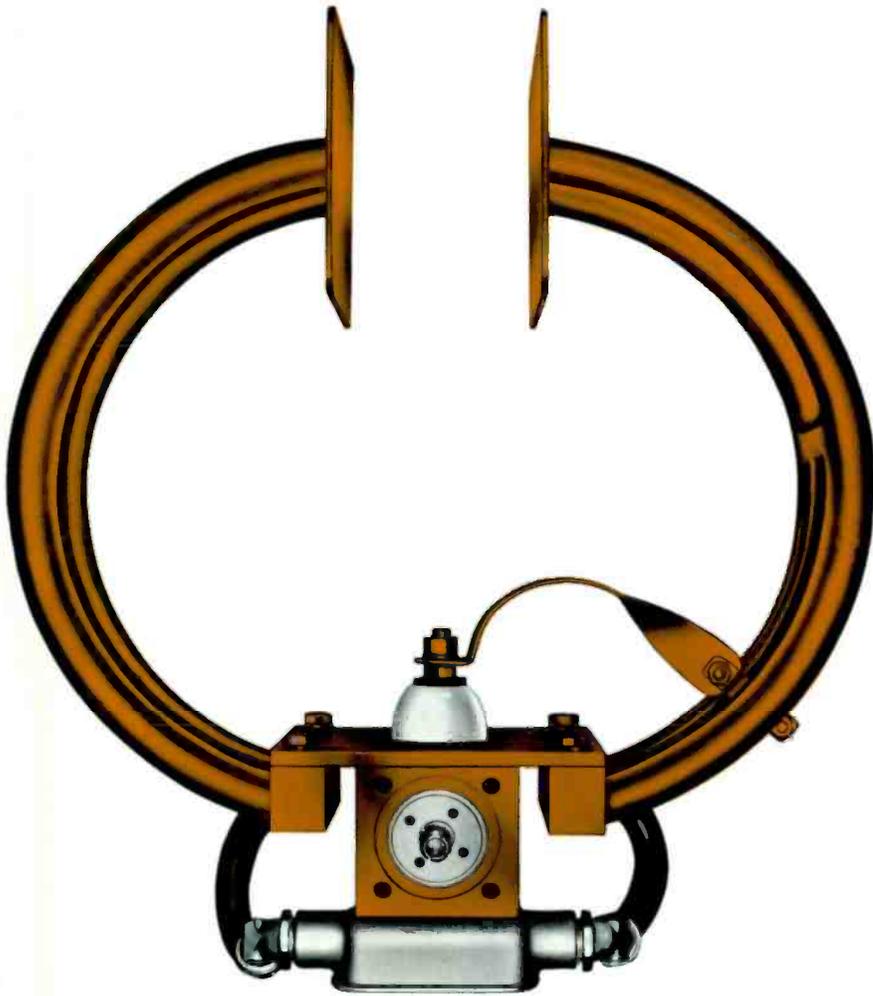
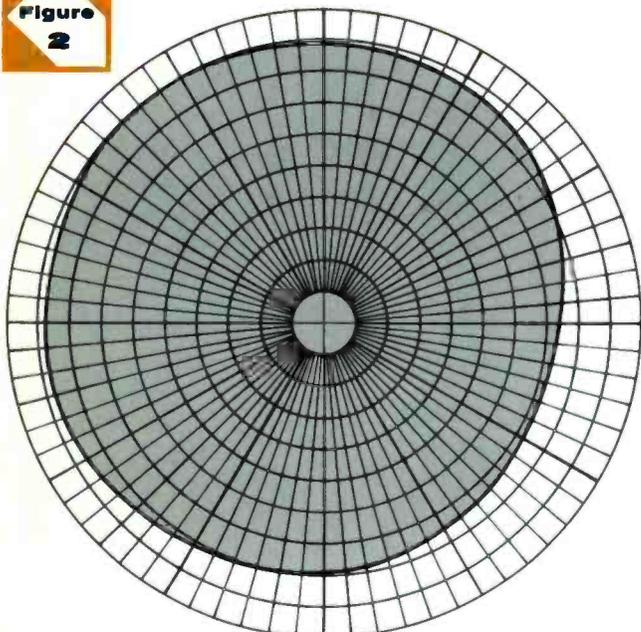
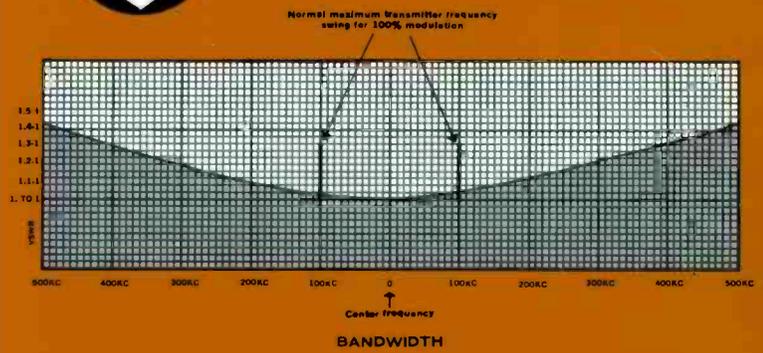


Figure 2



CIRCULARITY . . . ± 1 db in free space.

Figure 3





NEWEST *FIELD-PROVEN* DEVELOPMENT
IN FM RADIATING ELEMENTS.