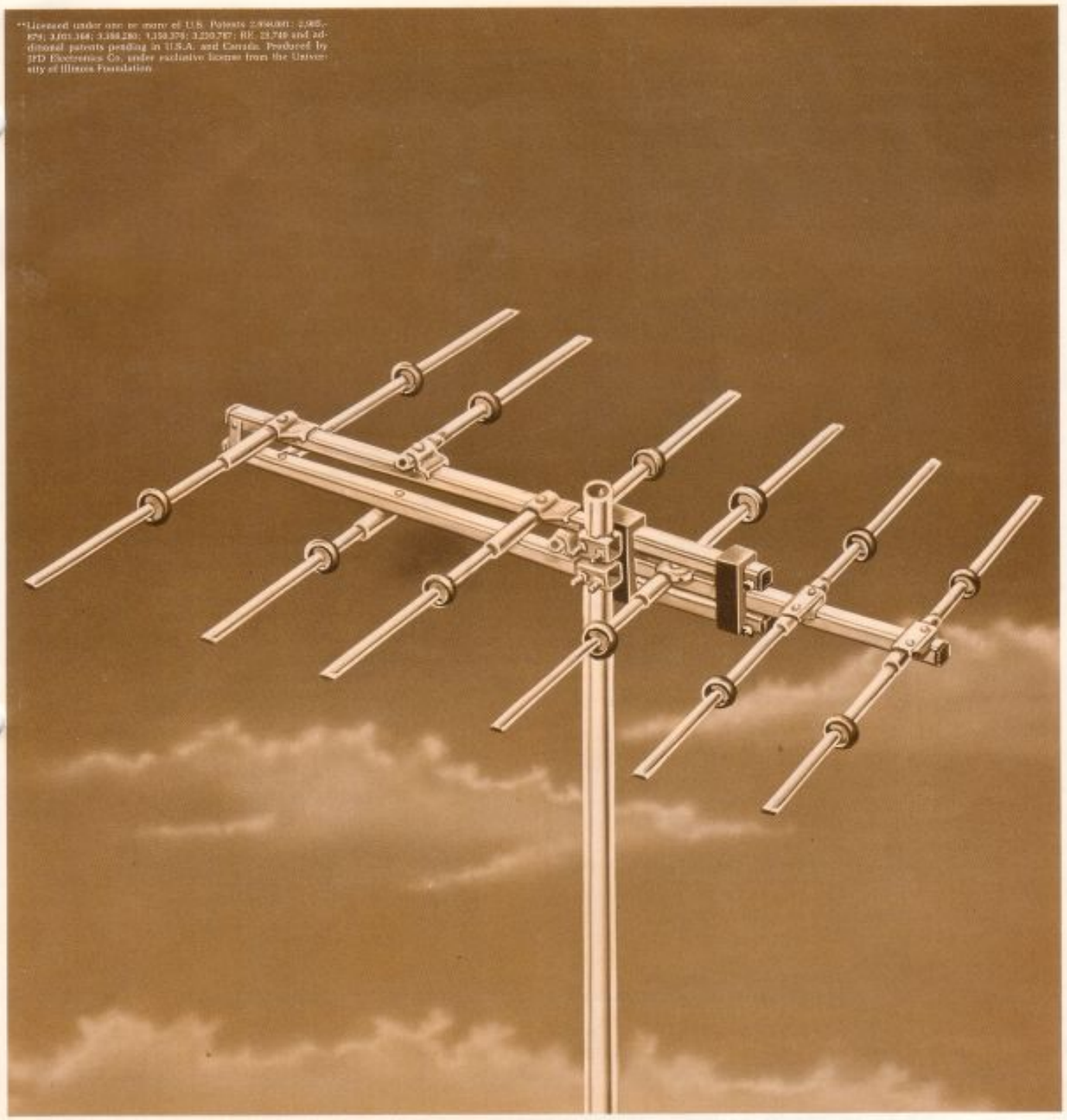


JFD®

LpL-fm

FM/STEREO
LOG PERIODIC
ANTENNA

NATIONALLY ACCLAIMED BY FM STEREO BROADCASTING EXPERTS

THE ONLY LOG PERIODIC ANTENNA DESIGNED EXCLUSIVELY FOR FM/FM STEREO.

JFD®

LPL-fm

FM/STEREO
LOG PERIODIC
ANTENNA

MEN WHOSE CAREERS DEMAND AN EAR FOR STEREO HAVE TESTED JFD FM STEREO LOG PERIODIC PERFORMANCE

"Along with 70 odd mono signals I've picked up a couple of dozen stereo emanations . . . and virtually all are now listenable minus background hiss. That's because (with the LPL-FMA) there is signal strength to spare."

Edward Catnell Canby, Music Editor
AUDIO

"We were able to pick up stations 250 miles away without difficulty."

David Saslaw, Editor
AUDIO

"Has very high gain reception in a directional pattern."

Bill Johnson, Chief Engineer
Station WCOR-FM, Lebanon, Tenn.

"My experience with this antenna will make me confident to recommend it to anyone who consults us from a difficult reception area. I, of course, realize the value of such an antenna in obtaining a satisfactory stereo signal near the periphery of our coverage area."

Lawrence Gahagan, Chief Engineer
Station WPRB-FM, Princeton, N. J.

"I know there really is a Santa Claus, because he brought me the best FM reception that I have ever had with my JFD-LPL-FMA antenna."

Paul Dean Ford, Licensee
Station WPFR-FM, Terre Haute, Indiana

"I have found the LPL-FM6A log periodic antenna to meet all requirements. I am very happy with this antenna and I highly recommend it."

Robert M. Kanner,
Engineering Maintenance Supervisor
RADIO STATION WMCA

"Our tests indicate that the full wavelength elements used in this new line provide twice the gain of the best 10-element FM yagis."

Ed Walter, Editor
ELECTRONIC DISTRIBUTING MAGAZINE

"One thing that we are impressed with about the LPL-FMA is the workmanship; it is well made and very rigid."

Harry E. Layman,
General Manager,
Station KONG-FM, Visalia, Cal.

"Until mounting the new LPL-FM10A, I thought that I was getting maximum reception with my original antenna. I was delighted to discover that my signal had improved as much as 10% to 15% — and that is the critical area that separates a clear from a muddy signal."

Geoffrey M. Nathanson,
Editor and Publisher,
FM & FINE ARTS

"One particular difficult pickup is a station across 46 miles of rugged mountain range. The LPL-FMA antenna solved all of the difficulties usually below marginal performance."

Jerry Cobb, Owner,
Station KNEV-FM, Reno, Nevada

"The LPL-FM10A performance is even better than we had expected. We are able to receive stereo from a station over 50 miles away with only 28,000 ERP and located in a valley with a mountain range between us."

Guy Dryden, Chief Engineer,
WTBC-FM, Tuscaloosa, Ala.

"We have found the extremely high directivity of the LPL-FMA antenna very important."

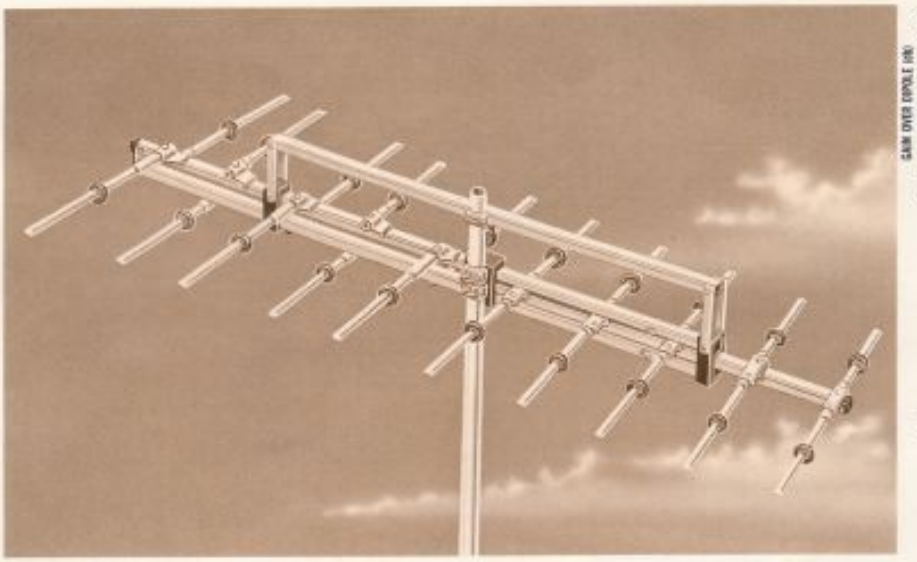
Mathew W. Rubin,
Chief Engineer,
Station WNCN-FM,
New York, N. Y.

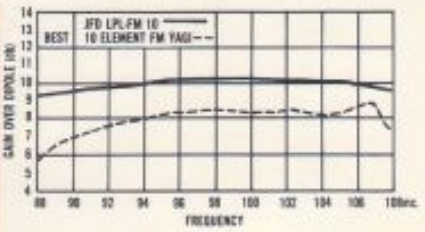
"I have installed a JFD LPL-FM8A at Lakeville, Conn., which is a little less than 90 miles away from New York City, to test whether or not WNYC-FM could be received there. All previous installations had resulted in poor reception. The LPL-FM8A brings the signal in with amazing clarity and strength."

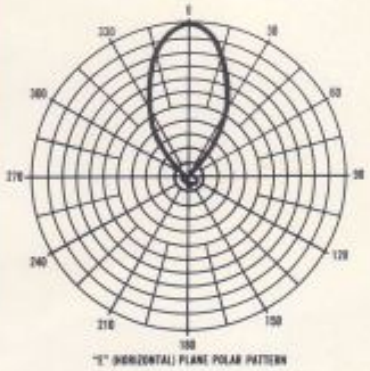
Seymour N. Siegel, Director,
Station WNYC-FM,
New York, N. Y.

"We needed an extra long range antenna for an FM pickup for programming purposes from a station 150 miles away. We have discovered that the LPL-FM10A is most satisfactory for this application."

Philip Whitney, Manager,
Station WRFL-FM,
Winchester, Virginia

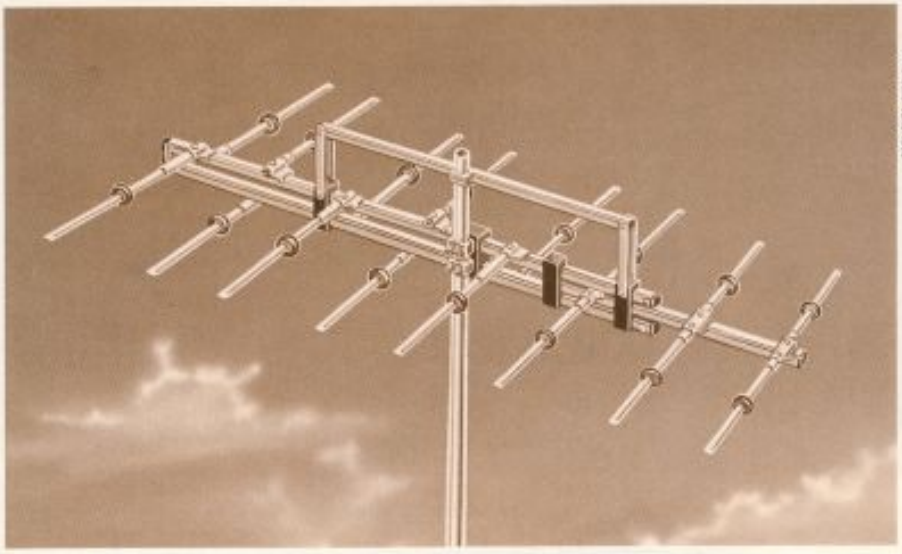


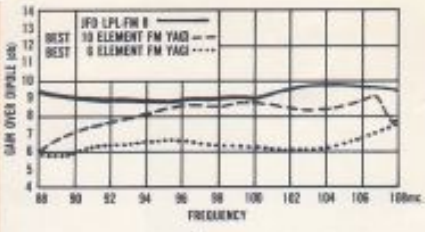




JFD LPL-FM10A; 10 Cell System
$49.95 List Price
For Far Fringe Reception

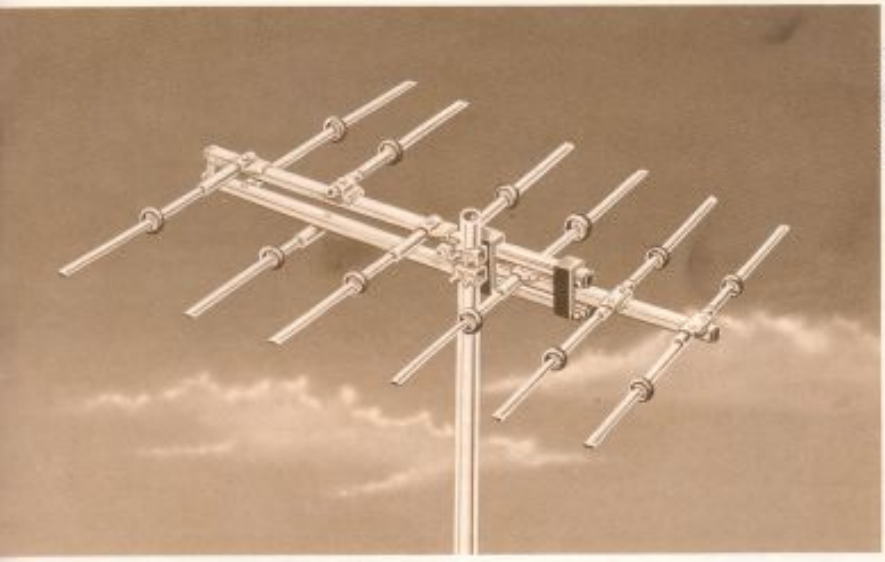
GAIN: 9.9 db. (± .6 db/half wavelength dipole)
"E" PLANE HALF-POWER BEAMWIDTH: 43° (± 5.0°)
VSWR: Median 1.5:1
NOMINAL IMPEDANCE: 300 ohms
FRONT TO BACK RATIO: Median 26.0 db
Turning Radius: 97"
Overall Dimensions: 166" L. x 112" W.
Weight: Approx. 9 lbs.

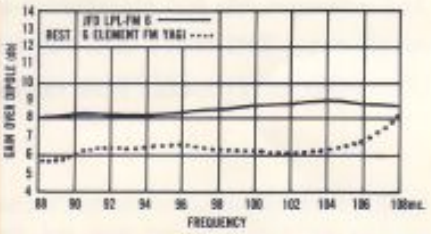




JFD LPL-FM8A; 8 Cell System
$39.95 List Price
For Fringe Reception

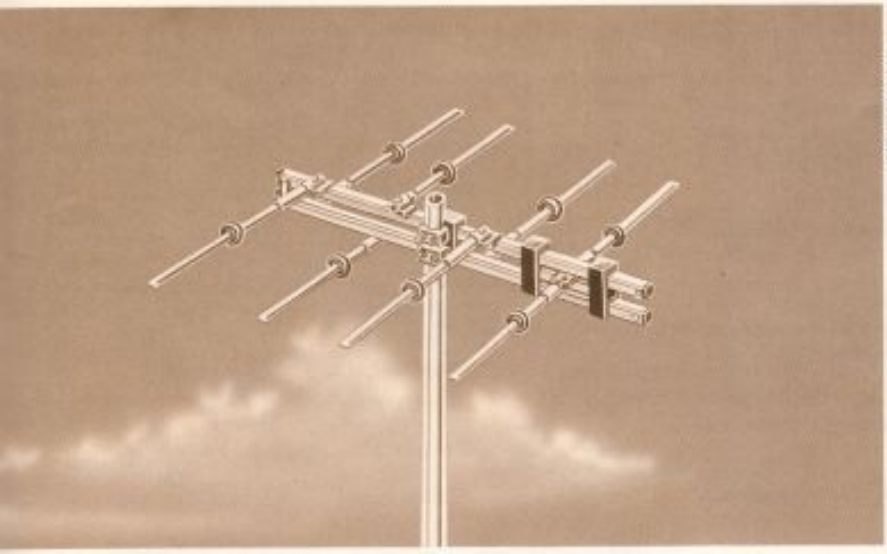
GAIN: 8.7 db (± 0.5 db/half wavelength dipole)
"E" PLANE HALF-POWER BEAMWIDTH: 46° (± 2.0°)
VSWR: Median 1.8:1
NOMINAL IMPEDANCE: 300 ohms
FRONT TO BACK RATIO: Median 20 db
Turning Radius: 84"
Overall Dimensions: 121" L. x 112" W.
Weight: Approx. 8 lbs.

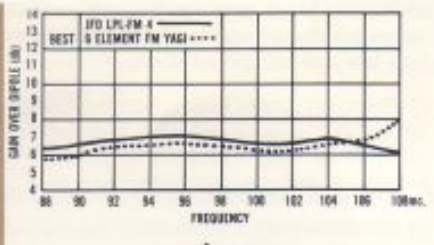




JFD LPL-FM6A; 6 Cell System
$29.95 List Price
For Near Fringe Reception

GAIN: 8.3 db (± 0.6 db/half wavelength dipole)
"E" PLANE HALF-POWER BEAMWIDTH: 48° ± 3.0°)
VSWR: Median 1.5:1
NOMINAL IMPEDANCE: 300 ohms
FRONT-TO-BACK RATIO: Median 18 db
Turning Radius: 72"
Overall Dimensions: 98" L. x 112" W.
Weight: Approx. 6 lbs.





JFD LPL-FM4A; 4 Cell System
$19.95 List Price
For Suburban-Local Reception

GAIN: 6.5 db (± 0.5 db/half wavelength dipole)
"E" PLANE HALF-POWER BEAMWIDTH: 49° (± 2°)
VSWR: Median 1.6:1
NOMINAL IMPEDANCE: 300 ohms
FRONT-TO-BACK RATIO: Median 16.6 db
Turning Radius: 63"
Overall Dimensions: 63" L. x 112" W.
Weight: Approx. 5 lbs.

The incomparable JFD FM/STEREO LOG PERIODIC ANTENNA — THE ONLY LOG PERIODIC ANTENNA DESIGNED EXCLUSIVELY FOR FM/FM STEREO.

☐ NEW FULL-WAVELENGTH CAP-ELECTRONIC DIPOLE DESIGN provides the higher, cleaner gain and directional selectivity needed for flawless FM stereo reception.

☐ ADAPTED FROM THE REVOLUTIONARY WIDE BAND SATELLITE-TRACKING LOG PERIODIC antenna design developed from research performed at the Antenna Research Laboratories of the University of Illinois.

THE ONE ANTENNA THAT MEETS ALL THE DEMANDS OF FM STEREO . . . JFD FM STEREO LOG PERIODIC.

The enjoyment of fully separated FM stereo demands an antenna that provides maximum transfer of signal to tuner — absolutely free of noise and distortion. The antenna must reject signals from co- or adjacent stations, as well as multipath signals. And it demands that this stereo performance be provided uniformly on every station in the FM band.

One FM antenna meets **all** these demands — the JFD FM Stereo Log Periodic with **full-wavelength cap-electronic** dipoles.

☐ HIGHEST GAIN OF ALL FM ANTENNAS (up to 41% more signal voltage than the best 10-element FM Yagis), is achieved by multiple dipole design with extra-length directors.*

☐ HIGH SIGNAL-TO-NOISE RATIO delivers subcarrier strong enough to lock in receiver's multiplex circuits.

☐ EXTRA-HIGH FRONT-TO-BACK RATIO (up to 30 db) OF BACK-FIRE BEAM provides as much as 96.8% rejection of co-station or adjacent station interference. Sustained by twin boom feed line with transposed dipoles.*

☐ PINPOINT DIRECTIVITY with horizontal beamwidth that is 10° to 25° narrower than the best FM Yagis, offers maximum rejection of stereo-distorting reflected or multipath signals — because of extra length capacitor dipoles.*

☐ EXTREMELY LOW VSWR helps maintain effective stereo separation without crosstalk.

☐ EXCLUSIVE LOW IMPEDANCE TRIPLE BOOM also serves as feeder harness to assure maximum signal transfer on every station. Strengthens antenna against wind and ice loading.

☐ GLEAMING GOLD ALODIZED AIRCRAFT ALUMINUM CONSTRUCTION resists corrosion. Keeps antenna looking and working like new. Improves electrical conductivity.

☐ TOP SUSPENSION BOOM SUPPORT rigidizes antenna against sway or droop. Keeps antenna pointed permanently in desired direction.

☐ 300 OHM IMPEDANCE MATCH results from log periodic design on driven elements plus integrated twin boom transformer.*

☐ INSTALLS EASY. Completely pre-assembled with snapout dipoles and directors.

☐ CONVERTS TO 75 OHM IMPEDANCE where noisy conditions warrant by means of JFD Color Shield-82 coaxial cable with pre-assembled 300 ohm-75 ohm matching transformer.

HOW THE JFD FM LOG PERIODIC MEETS CRITICAL REQUIREMENTS OF STEREO PERFORMANCE

Recognizing the requirements that a superior FM stereo antenna must meet, the JFD Research and Development Labs were first to design log periodic FM antennas with full-wavelength elements. The outstanding characteristic of these antennas is an exceptionally narrow response angle. When pointed toward the broadcasting station, the JFD LPL-FM receives the desired signal at much higher level than signals arriving from other directions. This directional response is particularly suitable for FM.

Unlike AM receivers, a good FM receiver can completely suppress an interfering signal broadcasting on the same frequency. To do this requires some difference in the level of the two signals. The minimum difference which will result in suppression of the weaker signal is the capture ratio of the receiver. The narrower the directional beam of the antenna, the smaller the capture ratio can be and still allow suppression of interfering signals on the same frequency. In certain areas, it is possible to receive three or four stations on the same frequency simply by rotating a JFD LPL-FM.

As a consequence, the gain of the LPL-FM is high. This makes it possible to receive signals at adequate level for stereo separation even though the broadcasting station may be miles away. Gain is particularly important for stereo. Whereas an FM stereo signal may be above the background hiss when received monaurally, the signal level may not be adequate in stereo. A few decibels of additional gain in the antenna will bring such a signal level up so that the stereo will equal the monaural from the same station. The gain charts on the preceding page show how this margin in gain is provided by the JFD LPL-FM as compared to the best of the YAGI designs which have been used for FM reception heretofore.

DISCRIMINATES AGAINST MULTIPATH SIGNALS

The narrow beam of the LPL-FM antennas will also discriminate against multipath signals. Between the broadcast station and receiver the waves carrying the FM program will be reflected and scattered by various obstacles such as hills, buildings, etc. Several waves carrying the same program may be arriving at the antenna from different directions. With a highly directional antenna, such as the JFD LPL-FM, the direct wave from the station can be selected above those arriving from other directions. Multipath effects are more easily detectable in stereo reception because of the more complicated nature of the stereo modulation and the critical manner in which the stereo signal must be reproduced.

While the achievement of narrow beam patterns was considered foremost in the design of an antenna specifically for FM stereo, JFD engineers did not overlook the other conventional requirements. These include good match to 300 or 75 ohm impedance transmission line, high f/b ratio, easy installation and rugged mechanical design. The manner in which each is achieved in the JFD LPL-FM is listed below:

Narrow beamwidth	Extra-length capacitor dipoles*
High gain	Multiple dipole design with extra-length directors*
Impedance match (300 ohms)	Log-periodic design on driven elements plus integrated twin-boom transformer*
Impedance match (75 ohms)	Color Shield-82 cable with transformer attached*
High front-to-back	Twin-boom feed line with transposed dipoles*
Rugged design	Twin and tri-boom construction with added top boom on longer models
Easy installation	Completely preassembled with snap-out dipoles and directors.

EXTRA LENGTH DIPOLES

To better understand how these features combine to produce outstanding performance, refer to the figures. Conventional Yagi (and log-periodics) use dipoles which are approximately one-half wavelength (λ/2) from tip to tip. As shown in

*Exclusive with JFD only.

Fig. 1, the radiation pattern of a half-wave dipole is broad, only slightly narrower than the pattern of a dipole which is a very small part of a wavelength. This is shown by the angle between points on the pattern which are 71% of the maximum. At these points the antenna is receiving half the maximum power. The angle between half-power points on the pattern of a half-wave dipole is about 80°. As the dipole length begins to exceed λ/2 the pattern begins to narrow rapidly. The pattern of the full-wave dipole is shown in Fig. 2 to have a half-power beam-width of about 50°. Furthermore, the dimension of a full-wave dipole for the FM band is not impractically large, being about 120". Slightly shorter dipoles can be used without sacrificing the advantage gained through extra length, thereby permitting a more compact antenna.

Fig. 1

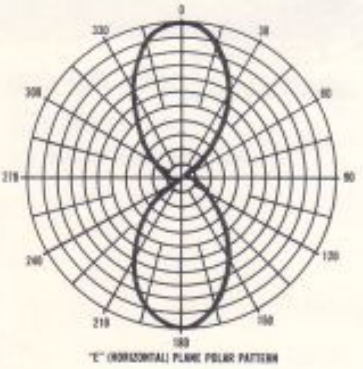


Fig. 2

If extra-length dipoles offer such an advantage in directivity, why are they not more widely used? The principal reason lies in the input impedance. The half-wave dipole is resonant, which results in a resistive impedance. Dipoles with lengths between one-half and one wavelength have impedance with inductive reactance as well as resistance. The impedance of such dipoles is a poor match to the resistive impedance of a feeder line. To overcome this defect JFD developed a dipole with a resistive impedance when the tip-to-tip length is just short of a full wavelength. This unusual characteristic is obtained through a capacitor. The resonant frequency and resistance at resonance can be controlled by adjusting the capacitance, its position along the dipole, and the total dipole length.

CONTROLLED CAPACITANCE

Details of the construction of the capacitor dipole are shown in Fig. 3. The aluminum dipole tubing is severed at the location of the capacitor. The two parts are electrically insulated by means of a dielectric disc. Dielectric arms extending from the disc are inserted into the hollow tube to restore rigidity to the severed dipole. The capacitance of the gap thus formed is increased by inserting a length of conducting rod into the insulator to form a pair of cylindrical capacitors in series. The capacitance is readily controlled by the rod length.

Fig. 3

To increase directivity and gain, several capacitor dipoles are used in an array. By connecting several dipoles to the same line in an appropriate manner, the response on the back of the array can be almost completely eliminated as shown in the directional patterns of each LPL-FM model on the preceding page. The phasing needed for high f/b ratio is obtained by connecting adjacent dipole halves to different conductors of the feeder. This is electrically equivalent to transposing the feeder between dipoles as shown schematically in Fig. 4.

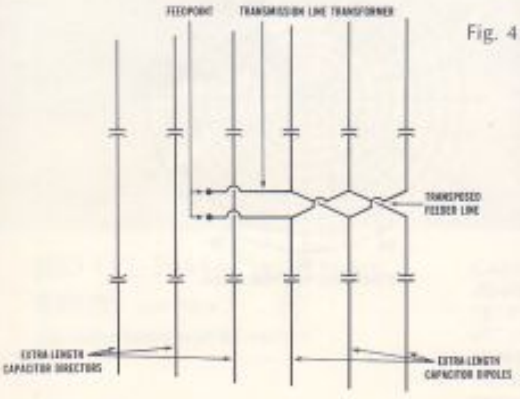


Fig. 4

300 OHM IMPEDANCE MATCH

The first consideration in achieving a good impedance match is to insure that the impedance does not change rapidly as frequency varies across the FM band. The impedance variation in a single dipole would be too great. However, minimum variation is readily accomplished by using log-periodic design in the selection of the dipole lengths. By properly staggering the resonances, the impedance at the location of the shortest dipole can be made almost constant. However, the feeder impedance and dipole impedance influence the value of the constant impedance at the shortest dipole. The values of feeder impedance and dipole impedance which lead to highest directivity and gain do not necessarily yield an impedance of 300 ohms at the shortest dipole. Since the impedance in a log periodic is almost constant, it is relatively simple to transform it to 300 ohms by adding a length of transmission line of the right impedance to the front end of the antenna. In the JFD LPL-FM the transformer is simply an extension of the twin-boom feeder sans dipoles.

The principles of capacitor dipole design have been applied to parasitic as well as driven elements in the LPL-FM. Each model in the series has one or more extra-length directors. By insertion of the capacitor the parasitic elements are made resonant and act as directors at the appropriate frequency, when the length exceeds one-half wave-length. Extra length directors add more gain than the conventional Yagi directors where the directors are slightly smaller than one-half wave.

JFD ELECTRONICS CO.
15th Avenue at 62nd Street, Brooklyn, N.Y. 11219
JFD International, 64-14 Woodside Ave., Woodside, N.Y. 11377 JFD Canada, Ltd., 51 McCormack Street, Toronto, Ontario, Canada
JFD de Venezuela, S.A., Avenida Los Haticos 125-97, Maracaibo, Venezuela

JFD® FM/STEREO LOG PERIODIC ANTENNA

Delivers the clean gain, directional selectivity, and wideband response your system needs for fully separated, distortion-free FM stereo!

THE SECRET IS IN THE FULL-WAVE CAP-ELECTRONIC DIPOLES . . . No other FM antenna can work like the JFD. It is the first ever to use full-wave log periodic cap-electronic dipole cells that perform with amazing frequency-independent efficiency over the 88 to 108 MHz FM/FM stereo range.

CLEAN HIGH GAIN—Your tuner requires 500% more signal on stereo—than on monaural—for best FM Stereo reception. And the new JFD FM Stereo Log Periodic delivers this vital high gain. Its superior signal-to-noise ratio furnishes FM Stereo tuner circuits with all the voltage they need for clean textured, clearly separated stereo.

DIRECTIONAL SELECTIVITY—High front-to-back ratio (up to 26 db). Selects the direct-from-the-station signals and rejects reflected ones—(particularly important because reflected signals "defocus" and distort desired stereo-effect).

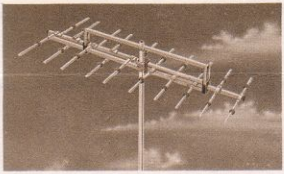
WIDE-BAND RESPONSE—Frequency-independent log periodic design makes the JFD FM Stereo Log Periodic equally receptive to all FM and FM stereo frequencies—(particularly important where weak or distant mono or stereo signals must be received with fidelity equal to that of local signals).

CAP-ELECTRONIC DIPOLES—Permits the use of short, compact elements to provide full-wavelength signal strength (up to 41% more gain than the best 10-element Yagis).

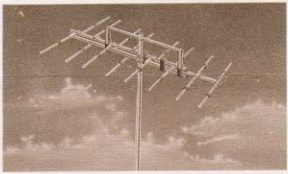
LOW IMPEDANCE TWIN-BOOM CONSTRUCTION—with boom support in larger models. The boom functions as a crossed feeder-harness to provide maximum signal transfer. Also provides tremendous strength and resistance to wind. Gold alodized finish resists corrosion, keeps antenna looking and working like new.

300 OHM IMPEDANCE can be converted to 75 ohm where noisy conditions warrant, by means of JFD Color Shield-82 75 ohm coaxial cable with pre-assembled 300 ohm-75 ohm matching transformer.

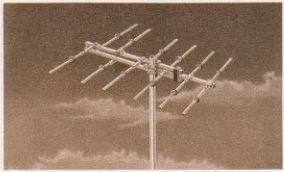
YOUR CHOICE OF 4 GREAT LPL-FMA LOG PERIODICS



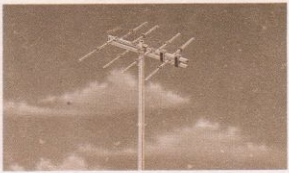
LPL-FM10A Far fringe $49.95 List



LPL-FM8A Fringe $39.95 List



LPL-FM6A Near fringe $29.95 List



LPL-FM4A Suburban/local $19.95 List