

Questions 'n Answers

1. Why is the folded dipole unsatisfactory?
Ans. Dipoles are usually cut for the center of the band, so fail to provide broadband coverage. Gain being 0 db. is inadequate for most needs of good FM operation.
2. What are the objections to using a TV antenna?
Ans. Most TV antennae reject the FM frequencies and cannot be expected to give good signal response for FM.
3. Do you recommend the use of a two set coupler?
Ans. As couplers impose an insertion loss of 3 db. they should be avoided because of the resultant signal loss.
4. How can auto ignition interference be eliminated?
Ans. Install a 72 ohm antenna system, using coax cable and approved matching baluns.
5. What type of coaxial cable is used for a 72 ohm system?
Ans. Use RG-59/U for 100 ft. or less of leadin and RG-11/U for greater lengths.
6. When should an antenna rotator be used?
Ans. Use the rotator with a yagi to orient the antenna for selective pick up of stations that are not in the forward path of signal interception.
7. How can distortion caused by signal propagation be lessened?
Ans. Distortion may occur from the reception of several reflected signals having a time lag sufficient to introduce an out-of-phase input to tuner. It may be minimized by installing a yagi, coax cable and, in some cases, a rotor.
8. Where can I obtain complete information on FM antenna systems and their installation?
Ans. Send 30¢ to APPARATUS DEVELOPMENT CO., Wethersfield, Conn. for a copy of the booklet "Theme And Variations".

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should know
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Factual advice by
L. F. B. CARINI, Ph.D.
Consultant on FM

FIRST HAND INFORMATION ON HOW TO GET THE BEST RESULTS...



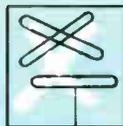
FM stereo multiplex is essentially a method whereby two, or more, signals may be broadcast simultaneously from a transmitter for reception by a tuner where they are separated into respective audio channels. It is a compatible system having the main FM signal and an AM sub-carrier, the segregation of which channels occur after detection in the FM tuner or adapter. From the output, we obtain the distinctive left and right audio channels for realistic stereo reproduction.

As more than the usual processing of the signal is involved in the receiving and conversion circuits, the chances for distortion are increased, necessitating improved circuit design and a greater care in the selection of equipment to be employed for the reception of these signals. Among the special considerations, aside from the use of compatible equipment, is the increased importance of providing for an adequate antenna. Multiplex will require that the antenna shall be capable of delivering a *much stronger* signal to the tuner. The type and adequacy of the receiving antenna now assumes a new importance for the added demands placed upon the tuner conversion operation will necessitate a stronger signal voltage to properly drive the system. This provision implies that the usual ribbon dipole, folded dipole, turn-stile and the ill-advised TV antenna will necessarily have to be discarded and replaced with a more efficient and higher gain FM antenna.

With multiplex operation requiring improved signal delivery to the tuner, the range of reception will also be substantially reduced from

30 to 50% of the normal coverage. Thus, while the usual range of mono-signal coverage may be 50 miles, the better designed tuners, possessing good sensitivity, may now have a working range of only 35 miles. Correspondingly, the many poorly designed tuners, whose usual range of reception may be 35 miles, will now be limited to a range of 25 miles or less.

Because a high signal level to tuner input is so essential to good stereo resolution, a *high gain FM antenna is a must* if the annoyance of distortion is to be averted. Such an antenna must also afford good broadband coverage, for unlike the dipoles, it must not be peaked for best pick up at the center of the band. Therefore, for best overall operation throughout the 88 to 108 mc. bandwidth, the FM broadband yagi is especially ideal and is, indeed, to be regarded as being a tailor made job for stereo multiplex. This design offers such significantly



desirable features as high gain, directional pick-up, good F/B discrimination and a low noise acceptance. All of these important attributes, not inherent in the dipole, are essential to the attainment of the best operation of your FM MX system.

In some locations, noise infiltration may also cause trouble; however, the use of a yagi antenna should be regarded as a most helpful asset in the solution of the problem. Effective

noise suppression calls for coaxial leadin cable to minimize noise pick up from antenna to tuner. Proper impedance matching must be observed, using approved type baluns to effect coupling between the yagi, cable and the tuner where 300 to 72 ohm matching cannot be disregarded if a low-loss signal transfer from antenna to tuner is to be effected. The ill-advised use of shielded 300 ohm line can only result in disappointment as it is ineffective, short lived and costly to replace and will not provide satisfactory noise suppression.



City listeners may complain of distortion, notwithstanding that the installation was made in an approved manner. Here we can suspect "multipath signal dispersion" or the interception of several signals at the antenna in an out-of-phase order. An FM yagi with 72 ohm line to tuner will minimize the trouble and the use of a rotator is recommended for locations where all of the stations received do not originate at a central location.

Lastly, it is recommended that you select a yagi antenna that offers both the best in electrical and mechanical design. *The old adage that 'you get just what you pay for' should be your guide* for what you buy can make the difference between years of good FM reception or continual frustration with decadent signals that can only be attributed to a deterioratnig antennac. For assurances of best FM service, FM/Q antennae offer unsurpassed quality and performance.