

THE MOST IMPORTANT FM SPEC

by Bill Thompson

Just how much selectivity do you need in a receiver or a tuner for FM DXing? Since many of us got started DXing on the shortwave or mediumwave broadcast bands, we already know that you just can't get the best results without the kind of selectivity that is not commonly found in equipment that may be intended for simple listening. Thus FM DX enthusiasts, like most all DX enthusiasts, have become "specs oriented."

Problem is, you have to know what the specs are telling you. It is true that, in general, the better the sensitivity is, the better the selectivity has to be for the unit to be used for DXing. It turns out that almost all tuners and receivers in the \$250-and-higher range have sensitivity performance that is so good, they are practically all the same in that area. This is quite a change from a few years ago, when the primary spec for a good FM tuner was its sensitivity. With the advent of the field effect transistor, and some truly amazing recent circuit advances, which have quickly become fairly standard, many engineers actually feel that sensitivity in modern tuners and receivers has come close to theoretically perfect limits. That means that a DXer should pay close attention to what is now the prime consideration of a unit's performance as a "DX machine:" selectivity. Selectivity is the ability of the unit to reject signals on other frequencies that are not related to the signal (or noise) that you happen to be tuned to. It is the one spec that usually is conspicuous by absence, to the DX enthusiasts, in a catalog or product advertisement.

Very few people, other than the DXer and the design engineer, really care about selectivity. One attitude is that it applies only to certain difficult reception situations that may not ever be encountered by the "average" listener in the "typical" urban or suburban location, so who cares?

This "who cares?" attitude towards selectivity is a real problem for DX enthusiasts. In many cases, you may see everything from stereo separation to frequency response listed in manufacturers literature, with no mention of selectivity specs. Often, you'll only be able to find data on the alternate channel rejection figure. Where's the adjacent channel spec? Incredibly, this figure is often so poor, manufacturers are sometimes actually afraid to publish it!

The best tuners or receivers for FM DXing purposes employ very steep IF filtering methods, and these can often introduce distortion, due to the phase shift they tend to cause. Distortion is a dirty word in audio engineering circles, and since tuners and receivers are designed with the high fidelity enthusiast in mind, less distortion is better—even if it means making a piece of equipment a bit less selective than it could be.

Fortunately, with state-of-the art filters, distortion is now much less of a problem. Unfortunately, you can still expect to have to pay a premium for very selective equipment. In general, you will tend to find better selectivity performance on a tuner than on a receiver—but there have been some notable exceptions in recent years.

Just how much alternate channel selectivity does the FM DXer need? These days, considering crowded band conditions, the ideal may be 100 dB or more. Perhaps the best available may be found on professional grade monitor equipment such as the Sequerra Model I Broadcast Analyzer—an incredible 130 db of alternate channel rejection in the NARROW mode, with a WIDE mode setting (94 dR) that is better than most top-line units' own narrow settings!

The tuner mentioned above would be ideal for most any FM DXer, but there's a slight problem—it costs around \$4,500 these days. Fortunately, tuners and receivers approaching that kind of performance are becoming available at much lower prices. It's not unusual to see tuners with 90 dB or more alternate channel rejection in the \$500 range now. In fact, if design engineers perceived a real demand for tuners with 130 dB alternate channel rejection, they would be much easier to find.

If you consider yourself seriously interested in FM DXing, don't consider any unit with less than 70 dB of alternate channel rejection—you may find it difficult to live with less than that under DX conditions, and in fact, if you live anywhere within a few miles of FM locals, as much as 90dB alternate channel rejection may be essential, especially if you ever want to be able to hear DX near that local. If you want to use a good FM antenna, the best selectivity you can find will be useful, in conjunction with high overload rejection. You want to have as much open space on the dial as possible, and high selectivity is your first consideration.

Once you know the alternate channel rejection of a tuner or receiver you may be considering, remember that you have only half the overall selectivity picture. The true test of selectivity, when all is said and done, may well come in the adjacent channel performance. For instance, a tuner with 90 db of alternate channel rejection and 6 db of adjacent channel rejection would not be as good for DXing as another one offering say, 90 alternate and 30 dB adjacent—but both may be categorized as having "90 dB selectivity" by a salesperson, catalog, or advertisement. Knowing both the alternate and adjacent Channel rejection tells you more of the true picture of a unit's own characteristic "selectivity skirts."

If you are considering a new tuner or receiver for FM DXing, it's best to try it out under DX conditions first before buying. Most of the better audio shops will let enthusiasts do this, and when it comes to a tuner or receiver, you may want to make such an arrangement. Ideally, it should be compared, "A-F" with a known tuner or receiver. Many FM DX enthusiasts find that high performance alternate channel selectivity claims are often also accompanied by poor or mediocre adjacent channel performance, so this is the best way to get the unit's full selectivity performance picture. Remember, if everything else about a tuner or receiver meets your needs, it still all comes down to this: selectivity will be your most important spec.

-Bill Thompson from the January 1983 VHF-UHF Digest pp20-21