

## COMMENT ON INCONSISTENT SPECS:

A comment on “inconsistent specs” for the TS-990S on my web site.

Some radios have a reciprocal mixing dynamic range (RMDR) that varies by band. The TS-990S is one example, as is the Orion I and II. This is because the local oscillator (on some bands in the Kenwood case) is divided down from a higher frequency.

Within limits, this improves the phase noise of the local oscillator (LO) by as much as 6 dB per octave. The Orion has lower phase noise on 80 and 160 meters than it has on 10 meters. For the same reason, the TS-990S is better on 40 meters than 20 meters by 5 to 6 dB because the LO is divided by 8 on 40 meters and only 4 on 20 meters.

I wouldn't call this “inconsistent”, but simply the way the radio works. It is just physics in this case.

What level of performance do we need close-in on CW for a radio to perform well most of the time? **I think 85 dB will suffice most of the time.** Certainly one may want a 100 dB dynamic range radio, but other factors of a transceiver's performance are very important, too. Ten-Tec receive audio is better (cleaner) than Elecraft K3 audio, for instance.

On SSB transmitted intermodulation products from QRM 3 to 5 kHz away is usually far above the LO phase noise (RMDR) of today's top receivers.

**Thus the “holy grail” of wanting a 100 dB radio is only a CW pile-up issue.**

If every other feature or specification of a radio was top notch, it would seem logical to pick a 100 dB radio over an 85 or 90 dB radio, however this is rarely the case. With good firmware, Ten-Tec and Elecraft have made their DSP radios much less susceptible to having the AGC “load up” or “over react” to impulse noise (clicks, tick and pops). No Japan, Inc. radio at the moment has figured this out.

For radios that will never be run mobile, it would be nice if more transmitter PAs used 50-volt designs instead of 13.8 volt designs since the transmitter will be somewhat cleaner from an intermodulation standpoint.

The TS-990S is a case in point, with improved transmit IMD on the order of 5 to 6 dB over a 13.8 volt PA.

That said, it is possible to implement pre-distortion on some radios and improve the IMD 15 to 20 dB. So there are other ways to make a transmitter cleaner and our bands less full of crud.

Maybe the day will come when all radios have a DC to DC converter inside to provide 50 volts for the PA in addition to using 13.8 volts for the other stages.

How a ham picks one transceiver over another is likely all over the map. For me if the ergonomics are poor, or if the receive audio is fatiguing to listen to, then that radio falls off my selection list. At the end of the day, hopefully whatever we buy we enjoy using.

I sold an expensive radio about 10 years ago that worked OK, but I just didn't like it compared to my 15 year old radio of the same brand.

**73, Rob, NC0B**

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(NOTE: **BOLD** and UNDERLINE added for emphasis by DJ0IP).