

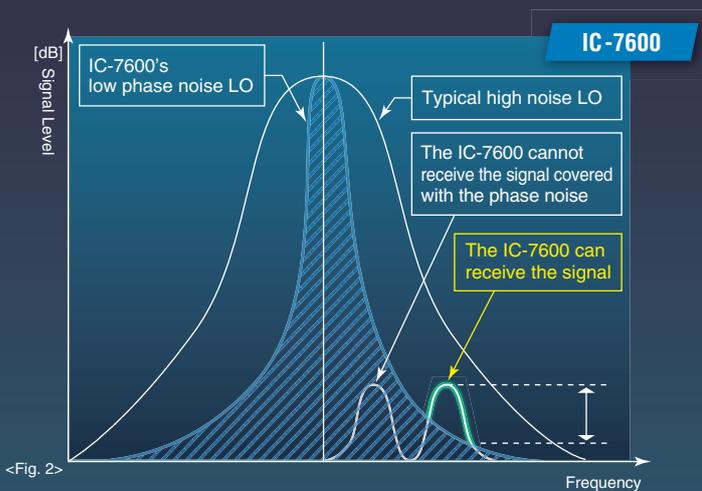
IC-7610 best in class for weak signals. RMDR is the key to success.

RMDR Comparison (2 kHz frequency separation)

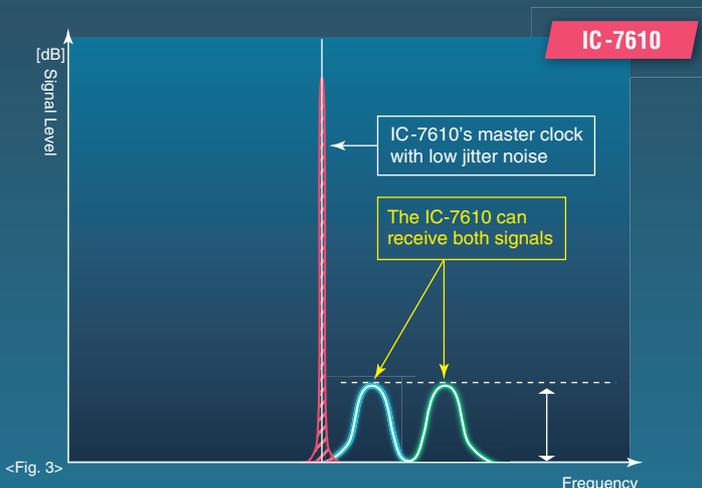


<Fig. 1>

RMDR Outline



<Fig. 2>



<Fig. 3>

What is RMDR (Reciprocal Mixing Dynamic Range)

Reciprocal mixing occurs when a strong out-of-band interferer mixes with the phase noise of the receiver's local oscillator to "throw" noise into the detection passband. RMDR is a receiver measurement, defined as the difference in the amount of power, in dB, by an interfering signal required to raise the receiver's noise output by 3 dB, and the receiver's noise floor (MDS).

The higher the RMDR, the less impact a strong signal will have over the receiver's capability of hearing a weak signal. In simpler terms, the higher the RMDR specification, the better the receiver's ability to "hear" weak signals with a "loud" station 2 kHz away. (Based on a 2 kHz specification) For example, when trying to work a rare, weak DX station or a weak multiplier in a contest, a receiver with a high RMDR rating will be able to hear the weak station respond while strong stations continue to call out their call signs. Receiver performance like the IC-7610 makes the difference between you logging the QSO or hearing another station working the weak station!

The power of more than 110 dB RMDR

In 10 short years, we have seen vast improvements in receiver design for RMDR without compromising overall receiver designs. The IC-7600, an industry leading receiver released in 2009, had an RMDR of 80 dB. As the 7600 was a rig commonly used on many DXpeditions and contest stations around the world, the IC-7610 will become the "Go-To" rig as we see a RMDR improvement of 30 dB!

Receiver evolution – Direct Sampling

While there have been improvements in superheterodyne design over the years, Icom changed the way the world looks at Amateur Radio receiver design with the introduction of a Direct Sampling receiver in a traditional radio format. The IC-7300 revolutionized the ham shack by incorporating an ADC/FPGA, direct sampling design, with Icom's industry leading DSP technology, in a compact radio.

High-precision master clock

In a direct-sampling SDR, the ADC/DAC clock is the principal phase noise source, similar to phase noise from an LO in a legacy receiver design. This means the purity of the master clock is extremely critical to maintain low phase noise.

In Figure 2 and 3, you will see the phase noise characteristics of the IC-7600 LO and the IC-7610 Master Clock. In most superheterodyne receiver designs, the LO generates a noise pattern that is similar to the slopes on a mountain. As shown in Figure 2, if the desired weak signal is below the phase noise slope, the weak signal will be masked by the receiver's self-generated noise. With the 7600, only the second weak signal can be heard, as it is above the noise floor of the LO/Mixer. In Figure 3, it is evident that with the low "jitter", the term for clock generated noise, design used in IC-7610, both weak signals are clear of any internal noises, or RMDR degradation caused by clock jitter. With this new clock design, the shape of the clock jitter is near vertical, and enables a clean receiver, as well as excellent C/N transmit characteristics.

This master clock advantage leads to the IC-7610's clean transmitting signal capability, with superior C/N characteristics, and the lowest phase noise.



HF/50MHz Transceiver

IC-7610

Watch the Video



<http://www.icom.co.jp/r/rmdre/>