

Appendix: Comments by A. Farson VA7OJ/AB4OJ

Based on a discussion with C. Paul DL4RAJ, 5 Mar. 2006

Conventionally, in IMD testing, IMD products must **equal** the noise floor (= MDS) which is the case when signal + noise lie 3 dB above noise alone. But we must bear in mind that the IMD3 products in JA7SSB's test are not at MDS level.

The test signals are at 2 kHz offset and -35 dBm per tone. Per [Fig. 2](#), the IMD3 products are 55dB below the test signals, and are thus at -90 dBm. MDS is -131 dBm; thus, the IMD3 products are 41 dB above MDS.

Assuming that the IMD3 products follow a 3rd-order law, we could extrapolate to MDS level:

Reducing the test signals by 13.7 dB would reduce IMD3 products by 41 ($\approx 3 \times 13.7$) dB, thus equalling MDS level.

Now we would have two test signals at -48.7 dBm each, and the IMD3 products at -131dBm.

The calculated value of IMD3 dynamic range (DR3) is now as follows:

$DR3 = -131 - (-48.7) = \mathbf{82.3 \text{ dB}}$ at 2 kHz offset (*as measured at the 455 kHz 2nd IF test point*).

This is so much lower than the results obtained by measurement at baseband level (via the ADC) that it tends to reinforce our experience that the actual on-air, operational performance of the IC-756Pro2 and IC-756Pro3 is considerably superior to what the lab "numbers" might suggest.

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