Supplement to IC-7600 User Evaluation & Test Report

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IC-7600 S/N 0201203

Additional Receiver Test

1. Two-Tone 3rd-Order Dynamic Range (DR_3) & Third-Order Intercept (IP_3). The purpose of this test is to determine the range of signals which the receiver can tolerate while essentially generating no spurious responses.

In this test, two signals of equal amplitude P_i and separated by a known offset Δf are injected into the receiver input. If the signal frequencies are f_1 and f_2, the offset $\Delta f = f_2 - f_1$ and the 3rd-order intermodulation products appear at $(2 f_2 - f_1)$ and $(2 f_1 - f_2)$. Due to test equipment limitations, f_1 is fixed at 10 MHz and $f_2 = f_1 + \Delta f$.

The two test signals are combined in a passive hybrid combiner and applied to the receiver input via a step attenuator. The receiver is tuned to the upper 3rd-order IMD product $(2 f_2 - f_1)$, which appears as a 600 Hz tone in the speaker. The per-signal input power level P_i is adjusted to yield 10 dB (S+N)/N, as measured at the audio output.

If the audio output drops by less than 3 dB when one of the test signals is removed, the measurement is noise-limited (indicated by NL in the table.)

$DR_3 = P_i - MDS$. Calculated $IP_3 = (1.5 * DR_3) + MDS$.

Test Conditions: CW mode, 500 Hz filter, AGC off, ATT off, NR off, APF off, NB off, CW Pitch = 60 (default). DR_3 in dB; IP_3 in dBm. NL = noise limited.

Measured MDS at 10 MHz = -131 dBm *(preamp off), -140 dBm (preamp 1), -143 dBm (preamp 2)*

Table 1: DR_3 and IP_3 at 10 MHz. Δf in kHz, DR_3 in dB, IP_3 in dBm.

	Preamp off						Preamp 1						Preamp 2					
Roof	15		6		3		15		6		3		15		6		3	
Δf	DR3	IP3	DR3	IP3	DR3	IP3	DR3	IP3	DR3	IP3	DR3	IP3	DR3	IP3	DR3	IP3	DR3	IP3
5	NL	-	78	-14	88	1	NL	-	77	-25	88	-8	NL	-	75	-31	86	-14
7	NL	-	84	-5	94	10	NL	-	82	-17	93	-1	NL	-	86	-14	91	-7
10	90	4	93	9	100	6	91	-4	92	-2	99	9	94	-2	90	-8	97	3
15	101	21	104	25	105	26	101	12	101	12	102	13	100	7	102	10	104	13
20	105	27	108	31	104	25	105	18	106	19	107	21	104	13	106	16	106	16
30	106	28	105	27	106	28	106	19	105	18	105	18	104	13	104	13	105	15
50	106	28	106	28	107	29	99	9	107	21	107	21	105	15	106	16	106	16