

Sherwood Engineering HF Test Results

Model Icom IC-7851 Serial # 02001020 Test Date: 3/25/2016 – 3/31/2016

IF BW 2400 –6 / -60, Hz 2350 / 3450	Ultimate	95	dB
IF BW 500 –6 / -60, Hz 500 / 660	Ultimate	100	dB

Front End Selectivity (A – F) Tracking preselector A *

* See Notes below on Digi Select

First IF rejection +/- kHz 100 dB

Dynamic Range with radio, no preamp, 20 meters

Dynamic Range 20 kHz 110 dB

Dynamic Range 10 kHz 109 dB

Dynamic Range 5 kHz 110 dB

Dynamic Range 2 kHz 105 dB

Combination of phase noise and 3rd order product

* Consisted of phase noise only

Dynamic Range with radio, Preamp 1, 10 meters

Dynamic Range 20 kHz 110 dB

Dynamic Range 2 kHz 103 dB

Dynamic Range 1 kHz 96 dB

Combination of phase noise and 3rd order product

* Consisted of phase noise only

Dynamic Range with radio, no preamp, 80 meters

Dynamic Range 20 kHz 106 dB

Dynamic Range 10 kHz 106 dB

Dynamic Range 5 kHz 106 dB

Dynamic Range 2 kHz 102 dB

Dynamic Range 1 kHz 96 # dB

Combination of phase noise and 3rd order product

Dynamic Range with radio, no preamp 40 meters, 20 kHz 107 dB

Dynamic Range with radio, no preamp 160 meters, 20 kHz 106 dB

Blocking above noise floor, 1uV signal @ 100 kHz, AGC On,
See comments under Notes. 149 dB

Digi Sel is a tracking preselector. See Notes below.

Data column 1: 10 MHz HP 10811, data column 2: 14 MHz HP 8642A sources			
Phase noise (normalized) at 2.5 kHz spacing:	-142	dBc	-142 dBc
Phase noise (normalized) at 5 kHz spacing:	-145	dBc	-145 dBc
Phase noise (normalized) at 10 kHz spacing:	-148	dBc	-148 dBc
Phase noise (normalized) at 20 kHz spacing:	-152	dBc	-151 dBc
Phase noise (normalized) at 30 kHz spacing:	-153	dBc	-152 dBc
Phase noise (normalized) at 40 kHz spacing:	-154	dBc	-152 dBc
Phase noise (normalized) at 50 kHz spacing:	-154	dBc	-153 dBc
Phase noise (normalized) at 100 kHz spacing:	-154	dBc	-154 dBc
Phase noise (normalized) at 200 kHz spacing:	-154	dBc	dBc
Phase noise (normalized) at 300 kHz spacing:	-156	dBc	dBc
Phase noise (normalized) at 400 kHz spacing:	-156	dBc	dBc
Phase noise (normalized) at 500 kHz spacing:	-158	dBc	dBc
Noise floor, SSB bandwidth 14 MHz, no preamp			-120 dBm
Noise floor, SSB bandwidth 14 MHz, Preamp 1 On			-132 dBm
Noise floor, SSB bandwidth 14 MHz, Preamp 2 On			-136 dBm
Sensitivity SSB at 14 MHz, no preamp			0.65 uV
Sensitivity SSB at 14 MHz, Preamp 1 On			0.16 uV
Sensitivity SSB at 14 MHz, Preamp 2 On			0.11 uV
Noise floor, 500 Hz, 14.2 MHz, no preamp			-123 dBm
Noise floor, 500 Hz, 14.2 MHz, Preamp 1 On			-135 dBm
Noise floor, 500 Hz, 14.2 MHz, Preamp 2 On			-141 dBm
Noise floor, 500 Hz, 28.5 MHz, no preamp			-122 dBm
Noise floor, 500 Hz, 28.5 MHz, Preamp 1 On			-136 dBm
Noise floor, 500 Hz, 28.5 MHz, Preamp 2 On			-139 dBm
Noise floor, 500 Hz, 7.1 MHz, no preamp			-122 dBm
Noise floor, 500 Hz, 3.80 MHz, no preamp			-122 dBm
Noise floor, 500 Hz, 3.80 MHz, Preamp 1 On			-135 dBm
Noise floor, 500 Hz, 3.80 MHz, Preamp 2 On			-141 dBm
Noise floor, 500 Hz, 1.815 MHz, no preamp			-122 dBm
Noise floor, SSB, 50.125 MHz, no preamp			-124 dBm
Noise floor, SSB, 50.125 MHz, Preamp 1			-134 dBm
Noise floor, SSB, 50.125 MHz, Preamp 2			-136 dBm
Sensitivity, SSB, 50.125 MHz, no preamp			0.40 uV
Sensitivity, SSB, 50.125 MHz, Preamp 1			0.13 uV
Sensitivity, SSB, 50.125 MHz, Preamp 2			0.10 uV

Noise floor, 500 Hz, 50.125 MHz, no preamp	-127	dBm
Noise floor, 500 Hz, 50.125 MHz, Preamp 1 On	-138	dBm
Noise floor, 500 Hz, 50.125 MHz, Preamp 2 On	-141	dBm
Signal for S9, no preamp	-74 dBm	47 uV
Signal for S9, Preamp 1	-87 dBm	10 uV
Signal for S9, Preamp 2	-91 dBm	6 uV
Gain of preamp(s)		
Preamp 1		13 dB
Preamp 2		17 dB
Attenuators	6, 12 & 18	dB
AGC threshold at 3 dB, no preamp		8.5 uV
AGC threshold at 3 dB, Preamp 1 On		1.85 uV
AGC threshold at 3 dB, Preamp 2 On		1.16 uV
Hybrid split loss for second receiver		3 dB
* See Notes		

S meter linearity

S1 to S7 = 2 dB/S unit.

S7 to S9 = 2.5 dB/S unit.

Above S9, S meter reads accurately from S9 to S9+60 dB

Notes:

Roofing filters: 1.2 kHz use for CW measurements, 3 kHz used for SSB measurements

Digi Sel: Enabling Digi Select increases receiver gain, lowers the noise floor 3 or 4 dB with the no preamp, and degrades dynamic range about 3 dB as measured on 160, 80 & 40 meters. No measurements were made above 40 meters.

Blocking: The value is excellent at 149 dB above noise floor.

Blocking at 100 kHz measured on 20 meters was an actual 3 dB drop in audio. At a 2 dB lower test level, phase noise increases audio by just under 3 dB.

Splitter for second receiver

Initial tests indicate the signal loss to the second receiver is 3 dB, but not the main receiver. This is not what is expected. This needs to be resolved.

Phase noise and dynamic range on 80 meters

Phase noise and DR3 is slightly worse on 80 meters compared to 20 meters.

The 1 kHz DR3 measurement is mostly phase noise.