

Sherwood Engineering HF Test Results

Model ALT-512 Serial # N1310419 Starting test Date: 7/11/2019

IF BW 2400 –6 / -60, Hz / Ultimate dB

IF BW 500 –6 / -60, Hz / Ultimate dB

Front End Selectivity (A – F)

First IF rejection +/- kHz dB

Dynamic Range, no preamp	DC		IF Offset
Dynamic Range 20 kHz	89	dB	91
Dynamic Range 10 kHz	89	dB	91
Dynamic Range 5 kHz	89	dB	91
Dynamic Range 2 kHz	89	dB	91

Dynamic Range, preamp ON			
Dynamic Range 20 kHz	88	dB	89
Dynamic Range 10 kHz	88	dB	89
Dynamic Range 5 kHz	88	dB	89
Dynamic Range 2 kHz	88	dB	89

Blocking overload above noise floor

1uV signal @ 100 kHz, AGC On,

Preamp OFF	114	dB*	122
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Preamp ON	119	dB*	121
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* See notes

Reciprocal Mixing Dynamic Range (RMDR)

Spacing kHz	dB	IF Offset
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2.5	102	dB	103
5	104	dB	104
10	106	dB	106
15	107	dB	106
20	107	dB	107
25	107	dB	108
30	107	dB	108
40	105	dB	107
50	104	dB	106
75	104	dB	106
100	105	dB	107
200	110	dB	111
300	115	dB	114
350	117	dB	115

Phase noise (normalized) at 2.5 kHz spacing:	-129	dBc/Hz	
Phase noise (normalized) at 5 kHz spacing:	-131	dBc/Hz	
Phase noise (normalized) at 10 kHz spacing:	-133	dBc/Hz	
Phase noise (normalized) at 20 kHz spacing:	-134	dBc/Hz	
Phase noise (normalized) at 30 kHz spacing:	-134	dBc/Hz	
Phase noise (normalized) at 40 kHz spacing:	-132	dBc/Hz	
Phase noise (normalized) at 50 kHz spacing:	-131	dBc/Hz	
Phase noise (normalized) at 75 kHz spacing:	-131	dBc/Hz	
Phase noise (normalized) at 100 kHz spacing:	-132	dBc/Hz	
Phase noise (normalized) at 200 kHz spacing:	-137	dBc/Hz	
Phase noise (normalized) at 300 kHz spacing:	-142	dBc/Hz	
Phase noise (normalized) at 350 kHz spacing:	-144	dBc/Hz	
Noise floor, SSB bandwidth 14 MHz, no preamp			dBm
Noise floor, SSB bandwidth 14 MHz, Preamp 1 On			dBm
Noise floor, SSB bandwidth 14 MHz, Preamp 2 On			dBm
Sensitivity SSB at 14 MHz, no preamp			uV
Sensitivity SSB at 14 MHz, Preamp 1 On			uV
Sensitivity SSB at 14 MHz, Preamp 2 On			uV
	DC	IF Offset	
Noise floor, 500 Hz, 14.2 MHz, no preamp	-115	dBm	-120
Noise floor, 500 Hz, 14.2 MHz, Preamp 1 On	-133	dBm	-136
Noise floor, SSB, 50.125 MHz, no preamp			dBm
Noise floor, SSB, 50.125 MHz, Preamp 1			dBm
Noise floor, SSB, 50.125 MHz, Preamp 2			dBm
Sensitivity, SSB, 50.125 MHz, no preamp			uV
Sensitivity, SSB, 50.125 MHz, Preamp 1			uV
Sensitivity, SSB, 50.125 MHz, Preamp 2			uV
Noise floor, 500 Hz, 50.125 MHz, no preamp			dBm
Noise floor, 500 Hz, 50.125 MHz, Preamp 1 On			dBm
Noise floor, 500 Hz, 50.125 MHz, Preamp 2 On			dBm

Signal for S9, no preamp	-56 dBm	333	uV
Signal for S9, Preamp 1	-77 dBm	30	uV

Gain of preamp(s)			
Preamp 1		20	dB

AGC threshold at 3 dB, no preamp	9	uV
AGC threshold at 3 dB, Preamp 1 On	0.75	uV

Notes:

There is some digital “switching” noise around the same level as the noise floor when mixing to DC. This noise goes away when run in IF Offset mode.

Minor RF gain changes significantly affect AGC threshold.
Test were all run at RF gain of 95.

An HP lab supply was set for 12.6 volts on the transceiver’s display.

In DC mode, blocking is unusual. With the preamp OFF, the value listed is for the signal plus noise to go up 3 dB. The noise is some kind of digital switching noise noted at the noise floor, but louder. This would imply a pseudo phase-noise type of limitation.

With the preamp ON (and the test level much lower), the classic block where the audio goes down 3 dB is the more typical value. Since the AGC threshold is so low with the preamp ON, the blocked signal was reduced from 1.0 microvolts to about 0.3 microvolts.

In IF Offset mode, with the preamp OFF, the blocking signal makes the audio go up 3 dB, as is typical of RMDR limited. The same is also true with the preamp ON, up to a 2 dB increase in RMDR noise. Increase the blocking signal 2 more dB, and the radio actually blocks, with the audio going down 2 dB. Increase the blocking signal 1 additional dB (3 dB total), and the audio blocks about 5 dB.

Overall comment on DC if vs. IF Offset. The digital noise problem goes away 100% when switching from DC to offset mode. This improved the noise floor significantly, but did not significantly affect the dynamic range. RMDR is hardly changed between the two modes, which is what I would expect. Any difference in RMDR between the two modes is insignificant.

No change was observed as far as the S meter calibration, or the AGC threshold.

Current draw in RX mode is slightly in excess of 400 mA.