

## Sherwood Engineering HF Test Results

**Model Hilberling PT-8000A** Serial # 12080134 Tests: Sept & Oct 2012 + May 2013

Note: Hardware updates were installed in October from Rev 1.00 to Rev 2.00

Note 2: A new filter board was installed in May 2013 for hardware Rev 3.00.

This added a 250-Hz 16-pole CW filter for both Main and Sub receivers.

At this point this update will be standard in US transceivers, and an option in Europe.

All measurements made on 20 meters unless otherwise noted.

IF BW 3100 -3 / -6 / -60: 3180 / 3670 / 5100 Hz	Ultimate	>100	dB
IF BW 2700 -3 / -6 / -60: 2470 / 3070 / 4200 Hz	Ultimate	>100	dB
IF BW 2400 -3 / -6 / -60: 2210 / 2670 / 3800 Hz	Ultimate	>100	dB
IF BW 2000 -3 / -6 / -60: 1810 / 2140 / 3200 Hz	Ultimate	>100	dB
IF BW 1800 -3 / -6 / -60: 1480 / 1790 / 2800 Hz	Ultimate	>100	dB
IF BW 500 -3 / -6 / -60: 440 / 550 / 1090 Hz	Ultimate	>100	dB
IF BW 250 -3 / -6 / -60: 250 / 300 / 700 Hz	Ultimate	>100	dB

Note: The -60 dB SSB bandwidths are approximate and will be updated soon.

The -3 and -6 dB values are exact, as are the CW -60 dB bandwidths.

First IF rejection @ 40.7 MHz	123	dB
First IF rejection @ 40.7 MHz with pre-selector enabled	>100	dB
Second IF rejection @ 10.7 MHz	95	dB

Dynamic Range with radio, no preamp

Dynamic Range 20 kHz	105*	dB	IP3	+33	dBm
Dynamic Range 5 kHz	105*	dB	IP3	+33	dBm
Dynamic Range 2 kHz	105*	dB	IP3	+33	dBm
Dynamic Range 1 kHz	104*	dB	IP3	+31	dBm

\* Combination of phase noise and 3<sup>rd</sup> order product

Dynamic Range with radio, Preamp 1

Dynamic Range 20 kHz	105*	dB	IP3	+20	dBm
Dynamic Range 5 kHz	105*	dB	IP3	+20	dBm
Dynamic Range 2 kHz	105*	dB	IP3	+20	dBm

\* Combination of phase noise and 3<sup>rd</sup> order product

Blocking above noise floor, 1uV signal @ 100 kHz, AGC On: < 142 ^ dB

^ Receiver protection triggered at +17.5 dBm

Note: The protection circuitry triggered at different values depending on band.

Ranged from +11 dBm to + 19 dBm

Phase noise measured on 20 meters using HP 8642A

Phase noise (normalized) at 2.5 kHz spacing:	-143	dBc
Phase noise (normalized) at 5 kHz spacing:	-143	dBc
Phase noise (normalized) at 10 kHz spacing:	-144	dBc
Phase noise (normalized) at 20 kHz spacing:	-147	dBc
Phase noise (normalized) at 30 kHz spacing:	-146	dBc
Phase noise (normalized) at 40 kHz spacing:	-149	dBc
Phase noise (normalized) at 50 kHz spacing:	-149	dBc
Phase noise (normalized) at 60 kHz spacing:	-148	dBc
Phase noise (normalized) at 70 kHz spacing:	-147	dBc
Phase noise (normalized) at 80 kHz spacing:	-147	dBc
Phase noise (normalized) at 90 kHz spacing:	-148	dBc
Phase noise (normalized) at 100 kHz spacing:	-148	dBc
Phase noise (normalized) at 200 kHz spacing:	-149	dBc
Phase noise (normalized) at 300 kHz spacing:	-149	dBc
Phase noise (normalized) at 400 kHz spacing:	-150	dBc
Phase noise (normalized) at 500 kHz spacing:	-150	dBc
Noise floor, 500 Hz, 10.1 MHz, no preamp	-127	dBm
Noise floor, SSB bandwidth 14 MHz, no preamp	-124	dBm
Noise floor, SSB bandwidth 14 MHz, Preamp 1 On	-137	dBm
Sensitivity at 14 MHz, no preamp (+100 Hz PBT offset)	0.45	uV
Sensitivity at 14 MHz, Preamp 1 On (+100 Hz PBT offset)	0.11	uV
Noise floor, 500 Hz, 14.2 MHz, no preamp	-128	dBm
Noise floor, 500 Hz, 14.2 MHz, Preamp On	-141	dBm
Noise floor, 500 Hz, 50.125 MHz	-142	dBm
Noise floor, 2.4 kHz, 50.125 MHz	-138	dBm
Sensitivity, 2.4 kHz, 50.125 MHz	0.1	uV
Noise floor, 500 Hz, 144.205 MHz	-141	dBm
Noise floor, 2.4 kHz, 144.205 MHz	-137	dBm
Sensitivity, 2.4 kHz, 144.205 MHz	0.11	uV
Signal for S9, no preamp	-73	dBm
Signal for S9, Preamp 1	-73	dBm
Gain of preamp	15	dB
Attenuator	10	dB
AGC threshold at 3 dB, no preamp	5.4	uV
AGC threshold at 3 dB, Preamp 1 ON	1.0	uV

Note:

The S-meter linearity is very accurate, as are the S-meters in the Flex products and the Perseus. The S meter reading is not affected by preamp, attenuator or hybrid splitter settings.

If the splitter is not desired for the Sub receiver, be sure to switch the Sub receiver to antenna #2 to take the splitter out of the circuit if maximum sensitivity is desired on the higher HF bands. Due to band noise on 30 meters and below, having the splitter in the circuit would cause no practical degradation of reception of weak signals.

The LCD display is outstanding, with excellent brightness at the default backlight level. The display is angled internally, so it is not mandatory to use the tilt-bail for easy viewing of the screen.

Markings on the front panel are very legible in white on the dark charcoal background. No need to use a flashlight to read the panel, unlike some other brands.

With very weak signals, broadband noise outside the crystal-filter passband is dramatically reduced by enabling the audio DSP filtering. While this only has a minor effect on measured noise floor (1 to 1.5 dB), audibly the improvement is significant.

With the addition of the 16-pole CW filter, the audio-derived AGC option will no longer be available or needed. This feature caused problems with S9 or stronger signals, particularly if the preamp was enabled. (This change will occur in firmware update.)

Rev D