

Transistor Radio Shoot-Out at Menotomy Rocks Park

Mark Connelly, WA1ION – 14 APR 2009

I ran a series of tests on a number of transistor radios to assess comparative sensitivity, selectivity, and strong-signal handling ability.

Five divisions were defined. Those divisions and the receivers in each used in the initial set of qualifying runs at several sites are listed below. An asterisk (*) next to an item indicates that it moved on to the final set of daytime tests held at Menotomy Rocks Park (Arlington, MA: GC = 42.41 N / 71.169 W) on 14 APR 2009. This location is adjacent to where I had lived and DX'ed from 1958 to 1974 and is about 8 miles / 13 km south of my present home in the Pinehurst section of Billerica. The site is on the eastern flank of a large hill facing Boston and the Atlantic Ocean about 7 miles / 11 km away.

The receiver in each division that was selected to go to the final round was the one exhibiting the best weak signal audio recovery. Selectivity and immunity to images / spurs were secondary considerations in the qualifying rounds.

Unmodified Ultralight Division – Analog Readout

Sony SRF-59 (optimally aligned by Gary DeBock, N7EKX)

* Sony SRF-39FP (optimally aligned by Gary DeBock, N7EKX)

Kaito WRX-911

Comments: All three of these radios came very close in sensitivity but the SRF-39FP had the slight edge especially on the low end of the dial where it produced somewhat readable audio on WABC-770 NYC and a carrier trace from WMCA-570 NYC in the metro-Boston area daytime groundwave tests. Selectivity also seemed a bit better on the SRF-39FP. Both Sonys were essentially image free even with very strong locals on 680, 1510, and several other frequencies. The Kaito had some 'squeals'.

Unmodified Ultralight Division – Digital Readout

Sangean DT-200V

* Sangean DT-400W

Eton E100

Comments: The digital readout Ultralights tested came in a bit less sensitive than the analog units. Low end was somewhat "deaf" on all of the models with only the top two New Yorkers (660 and 880 from the City Island site) making a show over the noise floor. The DT-200V was poorest. The better audio on the DT-400W gave it a slight edge over the E100.

Modified Ultralight Division

* C. Crane SWP (with Murata filter and “Slider” ferrite antenna)

Comments: I also had access to a filter-modified E100 but, of course, it was far less sensitive than the “sliderized” SWP. If the E100 had the slider modification done to it, it would have been identical or very close in performance.

Midsized Radio Division

Realistic 12-655 “TRF” (‘70s-era)

Sony ICF-SW7600GR

Realistic DX-398

* Kaito KA1103

Comments: Generally these radios had sensitivity better than that of the unmodified Ultralights. That is certainly no surprise. The Kaito KA1103 edged out the others on the lower end of the dial with the old Realistic TRF a close second. These were only a bit below Large Radio Division gain numbers. By comparison, the other two barely outdid the Sony SRF-39FP Ultralight.

Large Radio Division

Sony ICF-2010

Sony ICF-6500W

* Sony ICF-S5W

C. Crane CCRadio

Comments: These sets all came very close in sensitivity but for overall clean audio on weak signals, the ICF-S5W was the winner.

TO THE FINAL ROUND ...

Sony SRF-39FP:

Weak signal test stations WMCA-570, WABC-770, and WINY/WEZS-1350 were at or slightly above noise threshold so this was best of the unmodified Ultralights. Amazingly, despite a large load of very strong local signals (as noted in the appendix), there were no images or spurs noted ! This is quite remarkable (and unique among the receivers in the final test round).

Sangean DT-400W:

Notably less sensitive on the low end of the dial than the SRF-39FP though about equal to it above 1200 kHz. Selectivity slightly inferior to the SRF-39FP. A few minor spurs noted. Of course you do get a speaker and digital readout, so those would be advantages over the SRF-39FP to most users.

C. Crane SWP with filter and slider mod's:

Of course this is the most selective by a wide margin thanks to the filter modification. The slider loopstick gives gain about equal to that of the most sensitive radio tested, the ICF-S5W of the Large Radio Division. A bit more noise was noted on WMCA-570 as compared to reception on the ICF-S5W but understandable audio was had in both cases. With the substantial sensitivity, enhanced selectivity, and 1 kHz digital steps, this radio comes close to being the ultimate portable foreign DX machine. The preselection provided by the adjustable Slider does help to some degree with image and spur suppression though a fat image on 600 kHz was still there from monster-loud WWZN-1510 even though the slider was correctly adjusted for the low part of the band.

Kaito KA1103:

This midsize radio showed up well in terms of sensitivity, coming quite close in gain to such famous larger receivers as the ICF-S5W, ICF-2010, and CCRadio. But on the strong-signal handling side of things, results were a train wreck. There were intermod products, images, and cross-modulation effects liberally scattered throughout the dial.

Sony ICF-S5W:

This wonderful classic radio was still king in sensitivity, albeit by a slight margin. Selectivity was reasonable (though obviously not as good as the filter-modified SWP). A hefty 1510-(2x455) = 600 image and a few lesser "birds" were noted but overloading effects in general weren't too bad (and certainly better behaved than the KA1103).

Overall comments:

For serious DXing these days, digital readout and the ability to tune (at least) both 9 and 10 kHz spaced channels – if not even finer steps – are mandatory. High sensitivity is also desirable so you don't have to use external antennas. This is especially valuable when you want to DX at a beach, on a ship deck, on an apartment balcony, or in a public park. When you have to pack a light air-travel suitcase for a trip (e.g. family vacation or business) where DX is not the main emphasis, this really cuts down on your external antenna options too. Selectivity, good audio, and strong-signal handling (spur-free) performance are also highly desirable. Sometimes the goals are conflicting: excellent selectivity generally means more restricted audio. High gain opens up more overloading opportunities. Each of the radios above has its own niche area of close-to-perfect capabilities but no one set can "do it all". For most situations I could get by with the Sangean DT-400W for general listening and a "filterized, sliderized" SWP (or E100) for the serious DXing as far as portables go. For most of us this would mean use during travel situations. Really serious DXing in this part of the country does demand one or more external antennas with cardioid or narrowly-beamed lobes so then you might as well use a professional grade receiver such as Perseus, SDR-IQ, WinRadio, Drake R8B, AOR 7030+, NRD-525, R-390A, HQ-180A, etc.

Appendix:

Local signal environment (daytime, strongest first) at Menotomy Rocks Park, based on V-Soft data for zip code 02474:

Above 80 dBu (10 mV/m):

<u>dBu</u>	<u>mV/m</u>	<u>call</u>	<u>freq</u>
107.2	231.03	WRKO	680
104.8	174.00	WWZN	1510
93.7	48.66	WWDJ	1150
93.4	46.77	WEEI	850
89.0	28.07	WBZ	1030
88.6	26.80	WILD	1090
87.8	24.61	WJIB	740
87.1	22.62	WEZE	590
84.7	17.14	WXKS	1430
84.6	16.90	WRCA	1330
83.3	14.58	WAZN	1470
80.8	11.00	WROL	950
80.7	10.84	WNTN	1550
80.3	10.32	WBIX	1060

60 dBu (1 mV/m) to 80 dBu (10 mV/m):

<u>dBu</u>	<u>mV/m</u>	<u>call</u>	<u>freq</u>
79.0	8.92	WAMG	890
75.2	5.79	WUNR	1600
72.2	4.10	WBNW	1120
69.0	2.83	WKOX	1200
68.8	2.75	WMKI	1260
67.3	2.33	WNNW	800
66.3	2.08	WCRN	830
65.9	1.98	WNSH	1570
65.2	1.82	WESX	1230
65.1	1.81	WLYN	1360
63.1	1.43	WJDA	1300
62.5	1.34	WSRO	650

Pictures:



Radios used in the final round of tests



Nice day for a walk in the park