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AOR AR16 Portable Scanner

We were impressed with the tiny ICOM IC-R2 wide range scanner we reviewed in April 1999 *MT*. The IC-R2 has a competitor – the new AOR AR16. Termed the Wide Ranger, the AR16 is a shirt pocket portable which tunes 0.5 - 1300 MHz.

Simply Powered

Two AA batteries power the AR16 and our radio was furnished with two 1300 mAH NEXcell nickel metal hydride cells. The included Maha MH-C124S charger requires 18 - 22 hours to recharge the NEXcell batteries, but has room for four batteries and can charge older style 600 mAH NiCd cells in 9 - 12 hours. The IC-R2 is furnished with two 700 mAH AA NiCd batteries and a four cell, 7 hour wall charger.

Our AR16 emits a "pop" sound every few seconds in Manual mode. The pop coincides with a split second dip in current consumption, which implicates the battery saver circuit. Measurements indicate that our battery saver does not work.

Fundamentals

The AR16 covers the spectrum in 12 selectable step sizes of 1 to 100 kHz. AM, narrow FM, and wide FM detectors are provided.

Neither the IC-R2 nor AR16 has a full numeric keypad, which makes frequency entry a matter of stepping to the proper band, then twisting the VFO knob. The IC-R2's "tuning accelerator" lets you tune to a frequency faster as you twist the knob faster. Tuning frequencies, especially in the 225 - 400 MHz military air band, takes much longer in the AR16 because it provides no acceleration.

The AR16 forces one to first select the proper band (bank) to tune the VFO. It took us two days to find a way to program 462.975 MHz into the AR16 because the minimalist manual supplied with our radio doesn't contain a chart of the 25 pairs of band edges. Bob Grove reported the same frustration. The first 20 bands in our AR16 are factory programmed to specialty slivers of the spectrum, e.g., bank 13 was 462.55 - 462.75 MHz. We have to step to bank 23 to tune our first frequency, but how should we have known this?

The AR16 and IC-R2 provide 25 pairs of search limits, but you cannot program the AR16's search limits without a computer and the proper software!

Frequencies and modes can be stored in 500 memory channels divided among five banks. Compare this to the IC-R2's array of 400 channels in eight banks. Both the AR16 and IC-R2 permit you to scan only one bank of memory channels at a time. At 19 channels/second, our AR16 scans memory twice as fast as our IC-R2 (see bar graph). The channels may be locked out from the AR16 scan, but that hides them from manual access as well.

The AR16 squelch is automatic – a euphemism meaning you have no control over it. Our AR16 misses weak signals while scanning and, like other models, sometimes locks up on weak carriers we want to ignore. The lack of a squelch control limits our options. Pressing the side-mounted MONI button opens the squelch temporarily, but stops the scanning.

The AR16's display and keypad are backlit via a timer and can be locked on. The AR16's conventional volume control knob is easier to use than the IC-R2's up and down pushbuttons. Using the internal speaker, our IC-R2 provides better audio than our AR16, which isn't as clear and begins to distort at a lower level.

The IC-R2 has a wonderful CTCSS decoding squelch and tone finder, both features missing from the AR16. Early AR16 advertisements mention a speech descrambler, a feature deleted from the version approved by the FCC for sale to the public (AR16B).

Both the IC-R2 and AR16 memories can be downloaded with a computer by using an optional cable, level converter, and software. The AR16 setup is more powerful because a computer can control the radio. Software developers will appreciate that the AR16 command set is publicly documented on the AOR web page **http://www.aorusa.com**.

AR16 vs. IC-R2

If you've read this far, you know our AR16 has shortcomings. On the plus side, our sample AR16 scans faster, has an easy to use volume knob, and can be controlled via computer if equipped with the proper options.

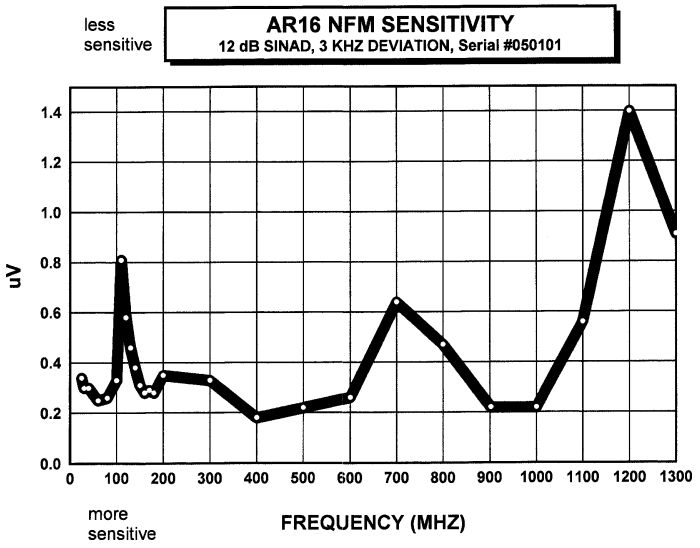
The IC-R2 is smaller, has faster tuning (a major advantage), an adjustable carrier squelch, CTCSS squelch, fewer memory channels per bank, a scan lockout scheme which permits manual channel selection, more rescan delay options, and a belt clip. Our IC-R2 also has better audio, consumed less current, and has a working battery saver.

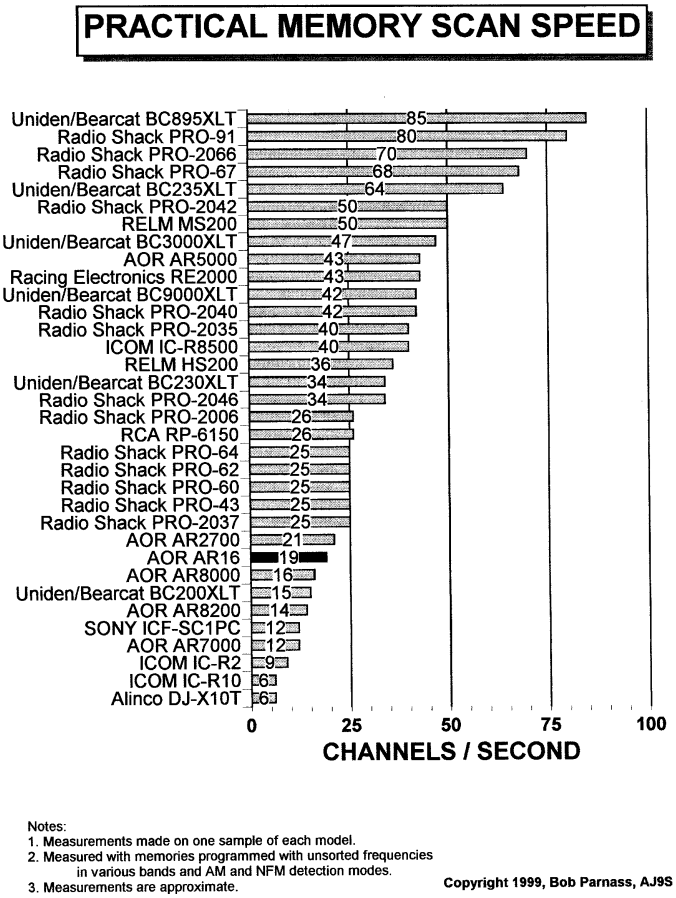
Both radios come equipped with similar antennas. The IC-R2 earphone jack is mounted atop the radio – more convenient for shirt pocket use than the AR16's side mounted jack. The manuals for

AOR AR16 MEASUREMENTS
SERIAL NO. 050101

List price $299
AOR USA, INC.
20655 S. Western Ave., Suite #112
Torrance, CA 90501

Weight: 5.4 ounces
Dimensions: 2.4 x 4.2 x 1.2 inches
Antenna jack: SMA 50 ohms
Frequency coverage (MHz):
0.5 - 1300 MHz (minus cellular phone bands) in steps of 1, 5, 6.25, 9, 10,12.5, 15, 20, 25, 50, and 100 kHz.
Modes: AM, FM-N, FM-W
FM sensitivity:
(12 dB SINAD, 1 kHz tone, 3 kHz deviation, see charts)
Modulation acceptance: 8.6 kHz
Practical scan rate (approx.):
19 channels/sec.
Search rate (approx.):
22 steps/sec.
Audio output power (measured at earphone jack):
22 mW @ 10% distortion into 8 ohm load
Current consumption @ 6VDC:
0.4 μA off
134 mA manual
135 mA scanning
173 mA open squelch, max. volume
30 mA additional for lamp
Battery saver ineffective (see text)





Notes:
1. Measurements made on one sample of each model.
2. Measured with memories programmed with unsorted frequencies in various bands and AM and NFM detection modes.
3. Measurements are approximate.

both radios need improvement, especially the AR16 manual that lacks a chart of band edges and an index or table of contents.

Harris RF-590 Receiver

Our mention of the ITT Mackay Marine 3031A premium receiver (April 1999 *MT*) evoked several letters from interested readers. Since writing that column, we obtained another premium receiver – a Harris RF-590. The RF-590 and its variants were built to military specifications and marketed primarily to government users, including the US Navy and the State Department. It is a double conversion receiver, with IFs of 40.455 and 0.455 MHz.

The RF-590 is built for 19" rack mounting and is a heavy, rugged radio. Inside, each stage is enclosed within a separate shielded box to minimize birdies. A large aluminum knob and numeric keypad permit tuning FM, AM, SSB, and CW signals in the 0 - 30 MHz spectrum. The frequency is shown down to 1 Hz on a bright blue vacuum fluorescent display.

Most of the RF-590s are equipped with 455 kHz Collins filters. AM bandwidths are 16, 6, and 3.2 kHz. The SSB bandwidth is 2.8 kHz and FM bandwidth is 16 kHz. We especially like the 1 kHz and 300 Hz CW bandwidths. A front panel squelch knob controls a noise operated squelch in FM mode and voice squelch in the other modes. The FM detector lets us snoop in the 29.7 - 30 MHz splinter during band openings.

The RF-590 has 100 memory channels and memory scanning. The rear panel has both pre- and post-filtered 0.455 MHz IF output jacks and oodles of other terminals that permit interfacing the radio with external devices. There are several options, including computer control, internal bandswitching preselector, ISB (independent side band), and high stability oven time base. None of the other RF-590 owners we've contacted have the noise blanker, and the list price of that option is rumored to be about $2000!

The RF-590 provides four AGC settings, but lacks a notch filter, passband tuning, sync detector, and other conveniences found in upscale consumer models. Truth be told, our JRC NRD-535D is more sensitive. Nonetheless, operating the RF-590 is a pleasure that cannot be quantified and the audio is superb.

Harris Corp., still a major player in the communications field, is located at 1680 University Ave., Rochester, NY 14610. Late 1980s vintage RF-590s are appearing on the used market as they are replaced by the newer RF-590A. You can find used RF-590s advertised by individuals and two Canadian surplus dealers on the Internet. Toronto Surplus and Scientific, **http://www.torontosurplus.com**, tel. (416) 490-8865, sells RF-590s and RF-590As.

W. J. Ford Surplus Enterprises, *testequipment@falls.igs.net*, tel. (613) 283-5195, sells surplus receivers, too. Visit their web site **http://www.falls.igs.net/~testequipment**.