

AOR AR-3000A

The AOR AR-3000A is not a new receiver. It was introduced in the mid 1990s and will likely be replaced by the AR-8600, shown at the 2000 Dayton Hamvention. The odds are that you are not familiar with the AR-3000A. The \$1000+ price tag and relatively small number of dealers may explain why Americans own fewer AR-3000As than other receivers. Nonetheless, the AR-3000A is held in high regard by its owners and we tested an AR-3000A to learn why.

The AR-3000A covers an extremely wide part of the radio spectrum, from 100 kHz to 2036 MHz. The step size is programmable between 50 Hz and 999.95 kHz in increments of 50 Hz. A small "x10" pushbutton increases the step size by a factor of 10, making the largest step size 9.9995 MHz. Step size flexibility makes the AR-3000A useful for monitoring radio and television systems employing uncommon channel spacing, e.g., 6.25 kHz, 7.5 kHz, or 6 MHz. Reception modes include narrow FM, wide FM, AM, USB, LSB, and CW.

❖ Memory, Scanning, and Searching

The AR-3000A has one VFO, termed "dial mode," and 400 channels divided among four banks of 100 channels each. The 100 channel bank size is too large and we would have preferred 10 banks of 40 channels each. Frequency, tuning step size, mode, and attenuator setting are programmed into each memory.

You can tune the VFO or scroll through the memory channels using a front panel tuning knob. The knob is rubber padded and turns smoothly, without detent, making it easy to tune around the HF bands or well into the UHF region. A "slow" pushbutton cuts the number of tuning steps per knob revolution by a factor of 5. Our radio makes a "chuffing noise" when tuning the knob in NFM or WFM modes with the squelch open.

You can scan memory channels, but only a single bank at a time. Global rescan delay is adjustable between 0 and 9 seconds. Memory channels may, of course, be locked out from the scan list. Our radio measures a pokey 11 channels/sec while scanning a mixture of AM and NFM memories in different bands.

The first channel (00) of the active bank may be designated a priority channel and that chan-

nel can be checked for activity every 1 to 19 seconds, depending on user preference.

Four pairs of frequency limits may be programmed for limit searches. Up to 100 frequencies may be locked out, or "passed," in each limit search bank.

❖ Other Features

The AR-3000A LCD display shows the frequency and all other indicators, including a 9 segment S-meter and a 24 hour clock. You must be positioned above the radio to read the display; therefore, we couldn't read the display with the radio resting on a shelf at eye-level. While the display is backlit, the keypad is not. We found the white and brown keypad lettering almost impossible to read against the silver panel unless the room lighting was just right.



An internal lithium battery allows the digital clock to remember the time when power is interrupted. One can set the AR-3000A to turn on at a given time or turn off after a "sleep" interval, but we didn't use this feature.

A global frequency offset facility, which AOR terms "shift," adds or subtracts a preprogrammed offset to the current frequency at the push of a button. This is handy for monitoring repeater inputs or communications which take place between two stations on different frequencies, e.g., VHF-high band taxis.

The AOR-3000A rear panel (fig. 2) contains several connectors. An external speaker jack provides full volume output, unlike the front panel earphone jack. The supplied AC wall wart and mobile power cord plug into an odd 3-pin power jack. The power cord contains no fuse.

A genuine DB-25 connector is provided for computer control and the interface com-

mands are described in the instruction manual.

You must supply your own 8-pin DIN plug to use the accessory jack. The jack is primarily intended for connection to a tape recorder. There are pins for squelch activated tape recorder control and pins for two different audio output levels.

There is only one antenna jack, a BNC connector. More expensive receivers, like the IC-R8500, provide separate jacks for shortwave and VHF/UHF antennas, so you don't have swap feedlines or buy a coax switch.

❖ Performance

Our testing focuses on using the AR-3000A above 30 MHz. Our AR-3000A's image rejection at 155, 460, and 860 MHz with respect to 3 IFs, is excellent – over 60 dB in most cases.

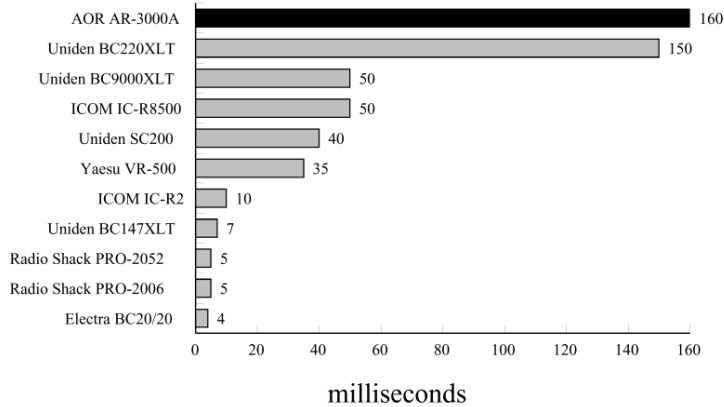
In the NFM mode, our radio has outstanding IF selectivity, much better than our two Uniden BC9000XLTs. The AR-3000A listens on FRS channels without hearing strong GMRS repeaters 12.5 kHz away. Our BC9000XLTs experience significant adjacent channel interference in the same situation.

Our AR-3000A emits an extremely long squelch tail, measuring 160 ms. (See the bar chart for comparison with other models.) This long noise burst at the end of each NFM transmission is annoying. We spoke with other AR-3000A owners who reported the same behavior.

Every modern scanner we've tested has birdies, that is, the receiver "hears itself" on various frequencies due to radiation from its own circuitry. Our AR-3000A has birdies which open the squelch while searching the 25 - 500 MHz range: 25.14, 25.6, 46.78, 51.2, 63.54, 64, 76.8, 89.6, 93.56, 115.2, 128, 140.345, 153.6, 162.865, 170.63, 200.38, 230.4, 278.065, 307.2, 323.085, 370.74, 384, 400.76, 430.78, 447.54, 448, and 460.8 MHz. We didn't look for birdies outside this range.



SQUELCH TAIL LENGTH

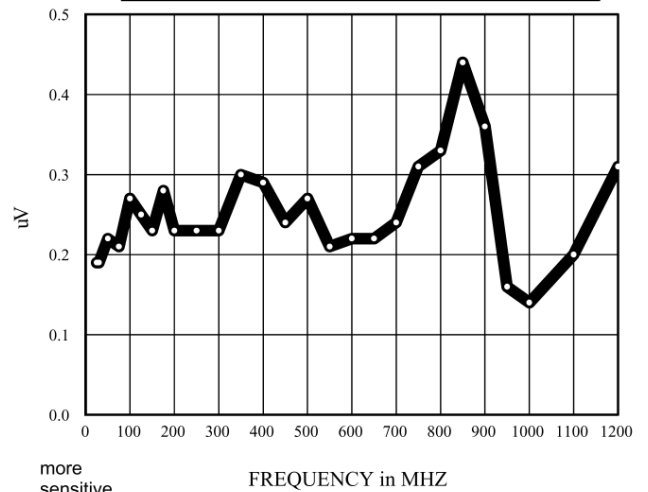


Notes:
One sample of each model tested.
Produced by a 155 MHz, 1uV unmodulated signal.
Squelch control set beyond threshold in NFM mode.

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AR-3000A NFM SENSITIVITY

12 dB SINAD, 3 KHZ DEVIATION, Serial #059773



Measurements

AOR AR-3000A Receiver S/N 059773

List price \$1,349.95
AOR U.S.A., INC.
20655 S. Western Ave., Suite 112
Torrance, CA 90501
Phone: 310-787-8615
Fax: 310-787-8619
<http://www.aorusa.com>

Frequency coverage (MHz):
0.1 - 2036

Steps: 0.05 kHz - 999.95 KHz
in 0.05 kHz increments

NFM modulation acceptance: 8 kHz

Intermediate Frequencies (MHz):
1) 736.23, 352.23, or 198.6
2) 10.7 or 45.03
3) 0.455

Image rejection due to 1st IF:
77 dB at 155 MHz
68 dB at 460 MHz
77 dB @ 860 MHz

Image rejection due to 45.03 MHz IF:
82 dB at 155 MHz
51 dB at 460 MHz
50 dB at 860 MHz

Image rejection due to 455 kHz IF:
64 dB at 155 MHz
63 dB at 460 MHz
68 dB at 860 MHz

Audio output power, measured at speaker jack:
744 mW @ 10% distortion

Squelch tail near threshold (1 uV @ 155 MHz): 160 ms.

Practical memory scan speed: 11 channels/sec.
Search speed: 46 steps/sec.

Other wide band receivers we've tested, like the AR-5000, AR-7000, and ICOM IC-R8500, contain electro-mechanical relays which make a "click" noise when tuning across band boundaries. Our AR-3000A's relay is energized at 30 and 940 MHz, which permits scanning a mixture of frequencies in the common VHF/UHF ranges without suffering relay chatter.

❖ Modifications

AOR UK (<http://www.aoruk.com>) and clever AR-3000A owners have devised several modifications for the AR-3000A and are willing to share them on the Internet. Dave Alden's AR-3000A Scanner Stuff web site (<http://www.concentric.net/~d-alden>) is a good starting place. You can download different computer programs to control your AR-3000A.

Dave also provides files containing tips like how to change the priority sampling rate, increasing the audio base response, tapping the discriminator output, adding a 4 or 6 kHz AM IF filter, a wide filter for WEFAX, a 10.7 MHz IF output jack, and a tape recorder control relay.

Other modifications are documented at Erik Hansen's web site, <http://www.mods.dk>, including a simple tip by Mark Persson to double or quadruple the number of memory channels by "liberating" unused address leads on the memory chip. Some of the modifications involve soldering and unsoldering surface mount components and are not for the faint of heart.

❖ Wrap-up

Most everyone scans local police and fire activity. But, there's a lot more to monitor and the AR-3000A is a good wide coverage receiver for such spectrum snooping.

The drawbacks include a long squelch tail, difficult to read button labels, and large channel banks. Otherwise, the super wide frequency coverage, SSB detector, excellent NFM selectivity, S-meter, computer port, and smooth tuning knob make it an attractive radio.

The AOR AR3000A is available from Grove Enterprises. See ad in this issue.

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