

# AOR AR7030

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## A BRIEF LOOK AT THE NEW AOR AR7030 RECEIVER

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Well-balanced performance, sturdy construction, and minimalist controls are qualities that have marked John Thorpe's previous receiver designs. These characteristics are present in the AR7030 as well but there are unusual features sprinkled liberally throughout. Among these are auto-tuning synchronous detection, onboard filter calibration and measurement, automatic RF attenuation for extremely strong signals, and a comprehensive alphanumeric display of virtually all receiver parameters. Despite the automatic features available, the AR7030 is highly flexible. An infrared remote is supplied with the receiver, and it's very useful when DXing.

This is a feature-laden set even though the receiver has a sparse front panel. The full details are available on AOR's internet home page (<http://www.demon.co.uk/aor>) and the main points have been covered in other recent reviews. From a DXer's perspective, a number of these are worth commenting on.

This receiver is apparently designed around the concepts of total control and information feedback. The menu system and dot-matrix display (discussed below) are critical to the AR7030's approach. A few examples are: passband shift settings displayed in 0.1 kHz increments; bass & treble adjustments shown in plus or minus decibels from a "flat" passband; dual audio outputs independently adjustable in audio level and displayed as a percentage of total output; volume and I.F. gain displayed as a percentage of total output; and the 100 memories which can contain the tuned frequency, mode, I.F. bandwidth, passband shift setting, scan include/exclude, squelch setting, and BFO setting for CW & DATA modes.

**MENU SYSTEM:** A clear, backlit dot-matrix LCD display shows all receiver settings. Excellent use is made of a two-line display due to a carefully thought-out series of branching menus. The feel of DXing with the AR7030 reminds me of operating a laptop computer, such is the effect of the menus, the display, and the multi-function knobs and buttons. If it were not for this computer-like approach, the receiver would need numerous individual controls and a larger case. The price would also be higher. Frankly, the menu system and flexible controls of the AR7030 may

disenchant some radio hobbyists. Traditional design implies a single control for a single function, and a display or front panel that always shows the same information in the same spot.

John Thorpe has given us a new approach. Using just a modest LCD display, the AR7030 can report virtually all receiver settings and intelligently assign "soft labels" to push buttons and rotary controls. The only controls with single, dedicated functions are the frequently used ones: the power switch, menu button, volume control, up/down mode buttons, the fast tune button and the main tuning knob. Those who are comfortable with computer software will quickly grasp the logic behind the AR7030's menus.

**FILTER MEASUREMENT AND ALIGNMENT:** This is one of the unusual features of the AR7030, a capability it shares with the professional Racal RA-6790GM receiver. Many styles of MuRata ceramic filters (CFJ, CFK, CFW styles and others) plus Collins low-profile mechanical filters can be directly fitted. Other possibilities exist with Kiwa Electronics' Premium filter modules. The AR7030 will measure the bandwidth, determine the proper USB/LSB offset for each filter, and sort the filters in ascending order.

The sequence takes about 45 seconds and is interesting to watch. The resulting exact alignment is useful during ECSS tuning of an AM signal, as there is no change in audio pitch when alternating between USB and LSB (if the receiver is properly tuned beforehand). The AR7030 is the first receiver I've owned which does not exhibit at least a small amount of USB/LSB error due to normal variations in the manufacture of individual filters and receiver alignment.

The supplied bandwidths are nominally 2.2, 4.5, 7.0 and 10.0. Although four filters are standard with two optional filter positions, in reality any filter may be changed except the 10.0 kHz bandwidth (meant for narrowband FM). Any filter may be used in any mode. In my AR7030, these bandwidths are measured and displayed as: 2.0, 5.4, 6.4, and 9.5 kHz. The owners manual explains that most filters are named by their minimum passband and (if stated) their maximum stopband specifications. There can be variations from filter to filter, and even temperature of the filter affects the bandwidth. I've noticed a 0.1-0.2 kHz reduction in measured bandwidth of the filters in my AR7030 if I run the filter calibration routine after the receiver is completely warmed up (1/2 hour).

Kiwa Electronics' new "Premium Filter Modules" make an excellent addition to the AR7030's arsenal of filters. Hookup is simple, using miniature coax cable for input/output leads. All module circuitry is inside a fully shielded enclosure. A ground connection and 4.5 to 15 volts DC power (at 1 ma) is also required. These modules have ultimate rejection better than 100db; my particular 3.5 kHz (nom.) filter module measures 107db. This surpasses even the highly-regarded Collins mechanical filters. The shape factor is stated to be better than 1 to 1.8, typically 1 to 1.5 or 1.6. The modules are available in selected bandwidths in the approximate range of 2.5/2.7 to 8.0 kHz, and the price is \$70 US. A late addition to Kiwa's PFM series is a printed circuit board that holds up to three filter modules.

I also have Kiwa's "High Performance Ceramic Filter", the CLF-D2K, made especially for Kiwa Electronics by MuRata. It is nominally a 3.5 kHz filter but displays as 2.9. In addition I've recently replaced the stock 5.4 kHz bandwidth with another Kiwa PFM module, which the receiver measures as 4.4 kHz. The total of six bandwidths in my AR7030 measure and display as: 2.0, 2.9, 3.4, 4.4, 6.4, and 9.5 kHz. The difference between the 2.9 and 3.4 Kiwa filters is great enough in practice to make each one a worthwhile addition to the AR7030.

When bandscanning with the AR7030 it becomes apparent that selectivity is quite good. The best stock filter is the 2.2 (nominal) ceramic, and it's the filter of choice for serious DXing if no optional, higher quality filters have been installed. If all six filter positions are filled there are no less than ten individual I.F. filters comprising the I.F. chain (including "post-I.F." filters). This cascading of bandwidths results in very good adjacent channel rejection, even though most of the stock I.F. filters are inexpensive MuRata ceramics (such as used in low-cost portable receivers). The selectivity John Thorpe has achieved through careful circuit design and modest components is

impressive. (A similar approach is used in the design of Kiwa Electronics' Premium Filter Modules.)

The above average filtering and the AR7030's passband shift control are highly useful for DXing mediumwave "splits". As an example, while listening to T3K1 Kiribati on 846 kHz, it was possible to avoid interference from a strong semi-local on 850 kHz by tuning in LSB and using the wide-ranging (+/- 4.2 kHz) passband shift. In my opinion the AR7030 provided better reception than a MRD-535D on this station. Even though the MRD-535D has the unique variable bandwidth control (BWC), that filter degrades in shape factor as it is narrowed. Also, its passband shift does not have range approaching the AR7030's (the MRD-535D has a +/-1kHz passband shift).

Because of different bandwidths in the two receivers, it was tough to compare the selectivity of the AR7030 against the Drake R8A. The specifications would appear to give the AR7030 the edge. In actual use on foreign mediumwave and tropical band DX they both performed very well. More comparisons need to be done, but it appeared to me that the AR7030's stock filtering is at least the equal of the R8A. The extra Kiwa Electronics' bandwidths give a modest audible edge to the AR7030 when using those three filters in my receiver. Unfortunately, the R8A's filtering cannot be changed or upgraded because the bandwidths are composed of many individual parts.

The cumulative effect of the cascaded filters results in very good performance even with the wider stock bandwidths. I've been surprised by the usefulness of the stock 5.4 and 6.4 filters when coupled with passband shift and ECSS tuning. Even in the difficult mediumwave band the 5.4 filter is useable for DXing stronger trans-Pacific split frequency stations. The Kiwa PFM 4.4 module that replaced the stock 5.4 filter position in my AR7030 is an even better choice for stronger splits.

**AM SYNCHRONOUS DETECTION:** This mode has the tenacity of a mountain goat and clings to signals weak and strong without problems. It is the best I've ever encountered, period. The passband shift can be adjusted liberally in synchronous AM (SNC) mode without causing squeals of complaint or loss of lock. Finally, a synchronous detector that a DXer can use.

DXpedition use of the AR7030 with Beverage antennas revealed that the preamplifier is needed when listening to extremely weak signals, at or above the noise level under truly quiet conditions. In sensitivity comparisons to a MRD-525 and Drake R-8, the AR7030 equaled the competition only when its preamplifier was activated. (The test signal was Radio Enga, 2410 kHz, during fade-in with audio at 0820 UTC.) Note that the preamp helped intelligibility only for the weakest of signals under quiet circumstances. Another example is my reception and subsequent verification of 2AM Sydney, Australia, on 1620 kHz. This tourist radio station in the Australian expanded mediumwave band runs 400 watts of power. On two different DXpeditions, 2AM's signal was audible without the AR7030's preamp but intelligibility was nil. With the preamp engaged, 2AM improved enough to catch an occasional phrase or sentence.

Those desiring further details about the AR7030 may read my lengthy review posted on the Radio Graffiti web page: <http://espresso.ts.uvic.ca> Included in the review are independent lab test results. I would be glad to answer any questions via e-mail: [gatkings@seanet.com](mailto:gatkings@seanet.com) or [gatkings@zetec.com](mailto:gatkings@zetec.com)

The AR7030 is a very good value, and for the money it's a lot of receiver. Current U.S. price is \$1149 (at Universal Radio Inc.). How willing are you to sacrifice a larger front panel, separate controls and the traditional approach to receiver operation in exchange for high performance, portability, and reasonable cost? It's not easy for long-time DXers, who have strong opinions about "real" radios. Will this receiver become a DXer's workhorse or languish on retailers' shelves as a collectable curiosity? AOR management will readily know our consensus answer to this question, when they study sales figures in the years ahead.

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