

The ICOM R-9000

by Don Moman

R70-2-1

The R-9000 is ICOM's top of the line full coverage receiver incorporating a spectrum display unit, similar to their IC-781 amateur transceiver. The U.S. list price is \$5495; the Canadian list is C\$6601 plus GST.

Basic features:

100 khz to 1999.98 MHz continuous coverage in AM, SSB, CW, FM, FM Wide, FSK and TV (displayed on built-in CRT). Has 1000 memory channels. The CRT display features a spectrum display and indicates memory channels, scan conditions, dual time zones, tuning steps etc. Tuning rates are 10 Hz to 100 kHz. It has dual clocks and sleep timers, 5 independent timers, automatic tape recorder control, IF shift and notch filter, Automatic Frequency Control (AFC) and seven Scan modes.

Obviously, this is one rather complete unit, capable of detecting almost any form of radio emissions that one is likely to encounter. It is essentially the R-71 and the R-7000 radios in one cabinet and considering how good those sets are, it would seem logical to give the combination very high marks indeed. But without any dual receive capability, the R-9000 cannot perform the basic operating function that most hobbyists demand: that of scanning the VHF/UHF bands while tuning around on the HF bands. However, with such a large price tag, one could argue that the receiver is targeted at a more professional monitoring market where other things are more important.

Filter selection is nothing special. In AM you have 15 kHz, 6 kHz and 2.4 kHz, while in SSB/CW you have 2.6 kHz, 2.4 kHz and 500 Hz. FM lets you select between 30, 15 or 6 kHz with a fixed 150 kHz filter for FM broadcast/TV. Selectivity occurs mainly at 455 kHz. The 2.4 kHz FL-44A and 500 Hz FL-52A are high quality filters, but inexpensive ceramic filters are used for AM; a quality 4 kHz filter would be useful here. The 2.6 filter is pretty muddy in AM but moving the IF shift all the way to one side improves the audio bandwidth. There is no synchronous AM detector, but the accurate and stable 10 Hz resolution allows ECSS tuning. The master oscillator is adjustable (recessed screwdriver slot) via the front panel, so you have a form of RIT to tune between the 10 Hz steps. The IF Shift and Notch Filter function in both AM and SSB. AGC is switchable between fast, slow and off. On AM, both AGC speeds are way too slow for quick bandscanning, while on SSB the speed seems fine.

Sensitivity is excellent from SW thru UHF (my signal generator runs out at 500 Mhz so above that.....). At 5 Mhz an AM signal of less than .1uv was detectable, and at 150 Mhz an FM signal of less than .15 uv was just discernable. MW performance is tailored for urban areas; a fixed 6 db pad is built into the 500 to 1600 khz bandpass filter section and the preamplifier is bypassed. At 1000 khz, one could just detect a .5 uv signal, which is less than adequate in a quiet location at sunrise enhancement.

I doubt that many R-9000's will be used on Beverage expeditions, but the R-9000 will function on 12 volts DC. It draws approximately 2.5 amps so an automotive or (preferably) deep cycle marine battery is needed.

Two HF antenna inputs are provided and are front panel switchable. In addition, a switched 12 volt line (100 ma output) is available to power a remote antenna relay and/or preamplifier. Separate N type connectors are provided for 30 to 1000 MHz and 1000 to 2000 MHz.

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As a scanner on the VHF/UHF bands the R-9000 performs very well. It has the delay before resume circuit that was so badly missed on the R-7000, and the delay time as well as the scan speed is adjustable. Scan speed is rated at about 13 ch/sec. Tuning steps are from 10 Hz to 100 kHz but the default step is 20 khz, which can let you tune right by some channels.

A wide array of scan modes is available for any of the 1000 memory channels plus 10 program ranges and 10 memory select tags. A voice scan function senses audio variations and rejects channels with carriers and/or tones. Having the roll function and the ability to see 10 memory channels at once on the CRT is very nice. All memory channels can be tagged with an 8 digit alphanumeric identifier, handy to keep track of what frequency is for what purpose.

Automatic Frequency Control is selectable (FM and FM wide modes only), and when turned on will actually change the frequency display until you are tuned to the center of the station. AFC is often needed on unstable receivers to keep them tuned; in this case you'll have to look for a drifting signal to actually make use of it!

Wideband FM is not particularly good in strong signal areas, but the R-7000 suffers similarly. TV reception is quite good although the amber display CRT leaves a lot to be desired. Hooking the video to a color monitor results in a very good picture. Selectivity and adjacent channel rejection is quite good, somewhat better than my R-7000 with the TV option. Like the R-7000, TV audio can be heard well before any recognizable picture appears.

Separate wide range bass and treble controls allow excellent high fidelity audio, somewhat limited by the smallish top mounted speaker. However, audio in all modes even with the built in speaker has to be rated as very good.

SPECTRUM DISPLAY

This displays 25, 50 or 100 khz on either side of the channel to which one is tuned. Band activity can be seen at a glance and off channel signals stand out clearly. The +/- 25 khz position makes each vertical marker equal 5 khz, handy for sizing up the SWBC activity, while on medium wave the +/- 50 khz position matches the channel spacing nicely. The frequency calibration of the display does not require any adjustment and is very accurate. For VHF and UHF scanning a much wider span would have been beneficial, even +/- 100 khz is a mere drop in the Megahertz bucket at those frequencies.

The ability to view the spectrum is a feature generally not appreciated by those who haven't had the chance to experience it. For the DX'er in the middle of a hot band opening, the ability to be many places at once is essential in catching a sign-on or a quick fade up.

On the negative side, the spectrum display lags behind the tuning dial enough to make tuning awkward if you are attempting to "move" a signal pip to the center of the display. Once you stop tuning, the display catches up quickly. I quickly became very comfortable with the display and I certainly missed the ability to see what the spectrum was doing when I returned to my own receiver. It's hard to say in qualitative terms how much use the display is, as it doesn't make the signals clearer or stronger in any way, but it certainly is nice to have.

CONCLUSION

Overall, the R-9000 rates as a very professional high quality receiver, with no real glaring performance shortcomings. Some features could have been implemented in a more user friendly fashion, but it's mainly a matter of getting used to the many features available on this set. Yet there is nothing in the signal path that sets it apart from any other good SW receiver, most of which sell for one quarter to one third the price of the R-9000. In common with high quality audio equipment, the law of diminishing returns means that you pay dearly for those extra features and/or that extra performance. In the case of the R-9000 you are mainly paying to have everything in one box, with lots of features...including the one that I got attached to, the spectrum display.