

ICOM IC-R3 Wide Coverage Receiver

The ICOM IC-R3 is a portable, wide coverage scanner with built-in television video.

In addition to a small, monochrome display, a novel color LCD display distinguishes the IC-R3 from previous models. The color LCD can be used for watching television video, displaying operational menus and status, as a bandscope, or to show signal strength over time. During battery operation, the IC-R3 powers up with the color LCD off. A multi-key sequence turns the display on and selects its personality.

The new model inherits the memory organization, CTCSS, and other features from the tiny IC-R2 (April 1999 *MT*). The upper frequency limit has been expanded to 2450 MHz and a new lithium ion battery is utilized to provide the extra voltage and current to power the video circuitry.

The IC-R3 is almost twice the size of the IC-R2. The larger battery and video hardware add another 4 ounces to its weight. Still, the IC-R3 is smaller than most scanners. Instead of the familiar helical antenna, the IC-R3 is furnished with a telescoping antenna, hinged at the bottom, and fitted with a BNC connector.

❖ General Features

The IC-R3 is made in Japan. We borrowed a Canadian IC-R3 (s/n 02190) for evaluation before the FCC certifies a cell frequency inhibited version for the USA.

It tunes the spectrum from 495 kHz to just over 2450 MHz, which affords coverage of the AM/FM broadcast bands, television audio, shortwave, and VHF/UHF. The Canadian version tunes the cellular phone bands, but the USA version will not. Users may choose AM, NFM, and WFM reception modes and 10 selectable tuning step sizes from 5 to 100 kHz. CTCSS decoding and CTCSS search are built in, along with the ability to program duplex frequency offsets.

The IC-R3 is more complicated to operate than the IC-R2, though the color LCD can be used to navigate option menus more easily. Both models contain a single, detent control knob, used for tuning and navigating through menus of options. A side-mounted FUNC key is used in tandem with the knob and other keys, a two-handed task. The IC-R3's joystick key adjusts the volume, selects

the band and display mode, and can be pressed in four directions.

The squelch may be opened fully, set in an automatic mode or nine different thresholds by twisting the selector knob while pressing the SQL key.

A 1/8-inch three-conductor jack atop the radio serves as either earphone or cloning port. Audio is sent to only one side of a pair of stereo headphones. When not in use, the jack is protected from dust by a captive rubber plug.

❖ Memory and VFOs

The IC-R3, like the smaller IC-R2, sports one VFO and 400 channels, organized into eight banks of 50 channels each. The TV memory banks are separate. Lacking a numeric keypad, frequencies must be entered into the VFO using a combination of the Band joystick key and the top mounted tuning knob.

To program a memory channel, you first tune the VFO to the right frequency and use menus to select other parameters. The IC-R3 can store the information in the next empty memory channel or you can choose a specific channel instead. Mode, tuning step size, and CTCSS code can be programmed for each memory channel, but the IC-R3 does not support alpha labels. You can program a duplex frequency offset for listening on repeater inputs, too. The IC-R3 may be cloned via serial connection to a personal computer or another IC-R3.

Like other ICOM models, you can scan one memory bank at a time, not multiple banks.

The limit search lets you search for active signals between two frequency limits of your choosing and provides 25 pairs of search limits. You can skip over frequencies during limit and VFO searches. Ordinary memory channels are used to store the locked out frequencies, so you can inspect them or setup the skip frequencies ahead of time.

There are three choices for when to continue scanning (or searching) in the presence of a signal: Resume, Pause, and Hold. A global rescan delay waits for the signal to drop and is programmable in 6 steps between 0 and 5 seconds.

Instead of a rescan delay, you can choose to pause the scan for 2 to 20 seconds and restart the

scan after that interval even if the station is still transmitting. The Hold setting halts the scan the first time the IC-R3 detects a signal.

The IC-R3 does not include an Auto Store search (a.k.a. auto memory write) as found in more expensive models.

❖ Video Reception

The IC-R3 lets you view two type of television: broadcast television and amateur television (ATV). Broadcast television can be tuned by channel number or by frequency. Our Canadian IC-R3 is configured to use the television channel plan common to the USA and Canada.

The IC-R3 provides 10 separate memories for TV frequency reception and another 10 memories for TV channels. Much like the newer TV sets, the IC-R3 has automatic TV channel programming which hunts for active TV broadcasters and memorizes the channels. You can then use the top mounted knob as a channel selector. You can listen to and view television channels, or you can turn off the video to conserve power (see below).

We live several miles from the closest broadcast TV transmitter. Using the supplied telescoping antenna indoors, our IC-R3's broadcast video reception is as good as, or better than our home television sets. The small screen makes TV viewing a challenge, of course, and LCD picture quality cannot compare with a conventional CRT. Our color LCD display washed out in bright, direct sunlight.

The ATV mode is useful for amateur fast scan television and other video sources, but is limited to the 900 - 1300 and 2250 - 2450.095 MHz ranges. The upper frequency limit precludes the possibility of using the IC-R3 to monitor certain Westinghouse AID video surveillance transmitters which transmit in the 2450 - 2483.5 MHz band. A separate 50-channel bank is dedicated to storing ATV frequencies.

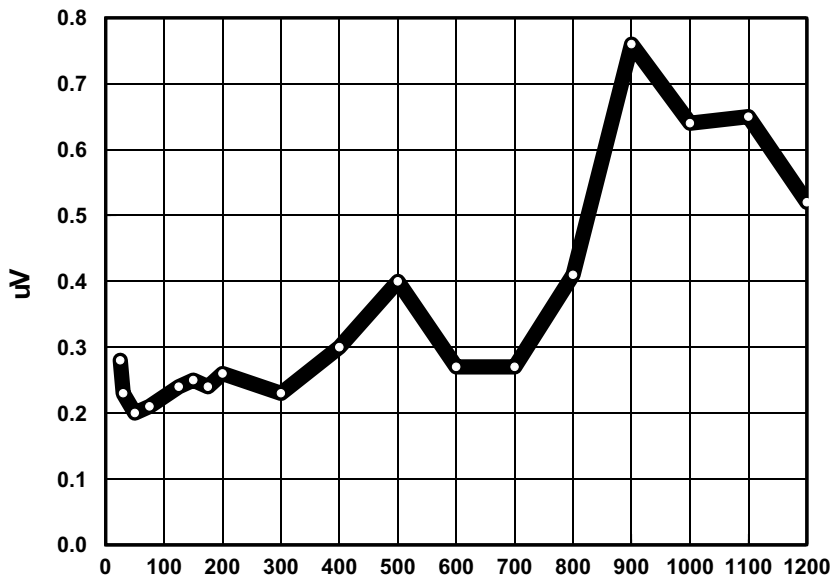
We didn't have an opportunity to test the IC-R3 with the mobile cameras used at auto races. Instead, we experimented with a friend's XCam2 camera/transmitter that is labeled 2.4 GHz (www.x10.com). We tuned the IC-R3 from 2250 to 2450 MHz while standing within a few feet of the transmitter. The IC-R3 displayed a weak video picture on several frequencies, but could not detect audio. The test is inconclusive, because we don't know the transmitter's modulation scheme and the audio may be transmitted on a completely separate frequency.

Audio and composite video output appears at a 3-conductor 1/8" jack only when the IC-R3 is set to broadcast or amateur TV mode, but not when the color LCD is used for menu, frequency display, or band scope.



less sensitive

IC-R3 NFM SENSITIVITY 12 dB SINAD, 3 KHZ DEVIATION, Serial #02190



more sensitive

FREQUENCY in MHZ

Measurements

ICOM IC-R3 Wideband Receiver S/N 02190

List price: \$500-\$600 (not yet released)
ICOM America, Inc.
2380 116th Ave. NE
Bellevue, WA 98004
Phone: (425) 454-8155

Frequency coverage (MHz):
0.495 - 2450.095 (Canadian version)

Step sizes (kHz):
5, 6.25, 9, 10, 12.5, 15, 20, 25, 30, 50, 100

FM modulation acceptance: 10 kHz

Intermediate Frequencies:
240.1, 26.05 (AM, NFM), 13.25 (WFM), and 0.45 MHz

Image rejection due to 1st IF:
89 dB at 40 MHz
67 dB at 155 MHz
59 dB at 460 MHz
47 dB at 860 MHz

Audio output power, measured at ext. speaker jack:
110 mW @ 10% distortion

Practical memory scan speed: 10 channels/sec.
Practical search speed (12.5 kHz step): 43 steps/sec

Current consumption @ 3.7 VDC
off: < 1mA
scanning: 136 mA
full volume: 175 mA
scanner screen enabled (black & white): additional 535 mA
television video: 880 mA

Power Grab

Our IC-R3 is equipped a BP-206 lithium ion battery pack which furnishes 3.7 volts at a 1650 mAH capacity. It fits tightly inside the battery compartment and removing it is difficult. A supplied plastic spacer permits operation by 3 AA alkaline cells instead. The included wall wart charger will replenish the Li-ion battery in 15 hours but cannot supply enough current to power the IC-R3. The optional BC-135 desktop charger can recharge the Li-ion pack in 2.5 hours. You can power the IC-R3 externally using a 6 VDC, 4 A power supply or via the optional CP-18 cigarette lighter cable.

The video screen requires lots of current. If we use the screen while scanning, current consumption jumps from 136 to a whopping 671 mA. Our IC-R3 draws 880 mA while watching television. The smaller LCD can display battery voltage when the larger screen is enabled.

How Does It Perform?

The IC-R3 produces good audio, on par with the IC-R2. The frequency digits are smaller than those in the IC-R2, but large enough to see without squinting. Two green LEDs light the LCD display for a few seconds each time you press a key to twist the selector knob. You can latch the light so it stays on.

VHF and UHF reception is good, but this IC-R3 is not as sensitive as our IC-R2 (s/n 01385), particularly above 700 MHz. There are a few birdies, including one on 123.45 MHz, the air-to-air chat frequency. We receive pager intermod in the 147 MHz range but the 490 MHz range is free from cellular interference. When searching for NFM signals, our IC-R2 and IC-R3 often stop 5 kHz away from the center frequency of an active transmission.

The squelch threshold is consistent across all frequencies. Our IC-R3 emits an annoying pop a fraction of a second after the squelch closes and disabling the battery saver doesn't eliminate the pop.

The color LCD can display signal strength over time using a scrolling scheme. ICOM euphemistically terms this the "direction finding" function. It may be more aptly named a "signal fade" display.

Our IC-R3 hears well on shortwave using the telescoping antenna, but its AM BCB performance isn't as impressive. The 12 kHz AM bandwidth is comparable to other wide band scanners and is not up to separating signals in a crowded band. Don't expect to use the IC-R3 to monitor shortwave utilities because it has no product detector or fine step size for SSB reception.

Summary

The IC-R3's video capability is unique among portables, though it adds considerably to the current consumption and price. The color LCD makes option setting easier but is too power hungry for use over extended periods. The wide frequency coverage and CTCSS decoding are useful. The tiny IC-R2 is a better choice if you don't require video reception.

The Icom IC-R3 will be available from Grove Enterprises (see ad this issue) for \$500-\$600. Call 800-438-8155 for price and availability.

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