

## Icom IC-R2 Portable Scanner

In the world of portable scanners, size *DOES* matter. Regardless of how distracted I become, it's never quite possible to forget I'm carrying a Uniden BC3000XLT, an AOR AR8200, or any of their contemporaries. That's all changed with the new Icom IC-R2 portable scanner.

The new IC-R2 is tiny. It fits inside the palm of my hand and can share shirt pocket space with pens, cough drops, and other doodads. The 7-inch rubberized antenna, fitted with an SMA connector, is over twice as long as the radio. When loaded with batteries, the IC-R2 weighs merely 6.3 ounces versus the BC3000XLT's 14.2 ounces.

### ■ General Features

The IC-R2 is made in Japan. It tunes the spectrum from 495 kHz to almost 1310 MHz, which affords coverage of the AM/FM broadcast bands, television audio, shortwave, and VHF/UHF. Users may choose AM, NFM, and WFM reception modes and 10 selectable tuning step sizes, ranging from 5 to 100 kHz. Continuous Tone Controlled Squelch System (CTCSS) decoding and CTCSS search are built in, along with the ability to program duplex frequency offsets.

The IC-R2 does not require a special, high cost battery pack — a sore point with hobbyists. Instead, the radio uses two common AA batteries and the US version is furnished with Saft 700 mAh NiCd cells. You cannot recharge batteries while they are inside the radio. Icom includes a night-light-shaped wall charger, model BC-127A/D, which holds and charges two or four AA NiCd cells in 7 or 9 hours, respectively.

I get about 5-1/2 hours of scanning between charges. Battery life can be extended when not scanning or searching by enabling the power saver. In addition, an auto power off function is configurable to turn the radio off after 30, 60, 90, or 120 minutes since the last key press.

The IC-R2 contains a single, detent control knob, used for tuning and navigating through menus of options. A side mounted function key (FUNC) is used in tandem with the knob and other keys, but requires a bit too much pressure for comfort.

The volume is adjusted using up and down keys. The squelch can be opened fully, set in

an automatic mode or nine different thresholds by twisting the selector knob while pressing the side-mounted SQL key. While not nearly as handy as a simple squelch potentiometer, I found the squelch consistently well behaved across all frequencies and modes even at the lowest threshold.

A 1/8-inch three-conductor jack atop the radio is used for earphone or serial connection to a personal computer. 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

There is no numeric keypad. The IC-R2 sports one variable frequency oscillator (VFO) and 400 channels, organized into eight banks of 50 channels each. Frequencies are entered into the VFO using a combination of the Band 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-R2 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. You can program a duplex frequency offset for listening on repeater inputs, too.

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. The little IC-R2 is big in this department — it 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 set up 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 six steps between 0 and 5 seconds. This is the type of scanning I use most often and appreciate being able to tailor the delay.

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-R2 detects a signal. At 9 channels/sec., my IC-R2 scans and searches about 50% faster than the IC-R10 I tested in March 1997 *MT*, and that's with CTCSS programmed into several channels.

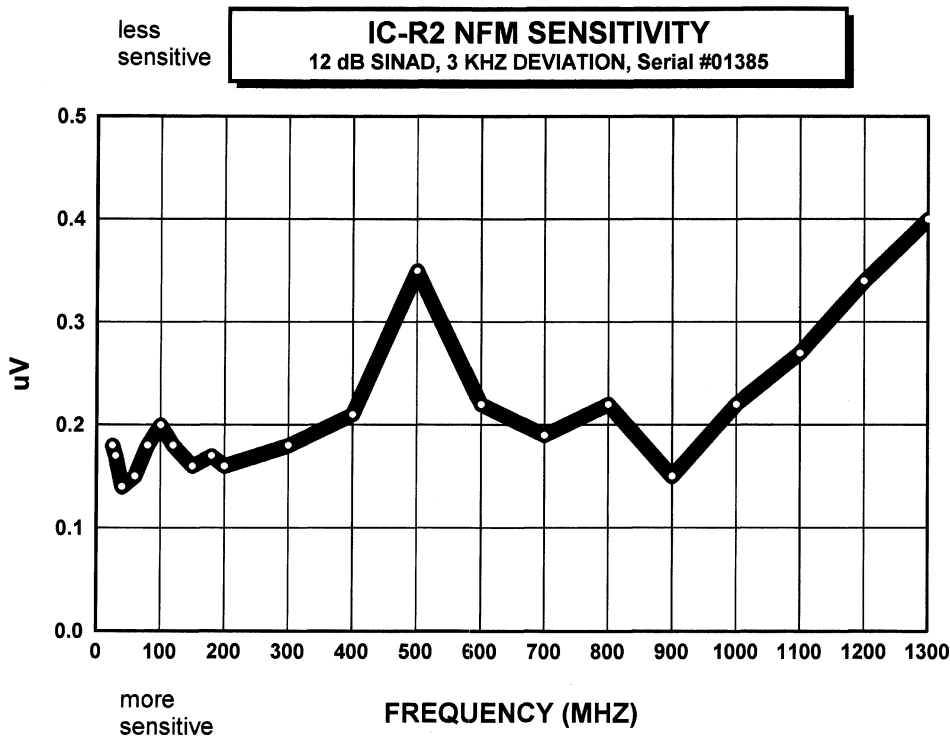
The IC-R2 does not include an Auto Store search (a.k.a. auto memory write) as found in more expensive models.

### ■ How Does It Play?

I was pleasantly surprised that a radio as small as the IC-R2 produces good audio, both in amount and qual-

### MEASUREMENTS IC-R2 PORTABLE SCANNER S/N 01385

Frequency coverage (MHz):	0.495 - 1309.995, except 824 - 848.995 and 869 - 893.995
Step sizes (kHz):	5, 6.25, 10, 12.5, 15, 20, 25, 30, 50, 100
Modes:	AM, WFM, NFM
NFM Sensitivity:	see graph
AM Sensitivity (12 dB SINAD, 30% modulation):	1.4 $\mu$ V @ 0.5 MHz 1.7 $\mu$ V @ 1 MHz 1.0 $\mu$ V @ 5 MHz 0.8 $\mu$ V @ 10 MHz 0.8 $\mu$ V @ 20 MHz 0.7 $\mu$ V @ 30 MHz
FM modulation acceptance:	9.9 kHz
Audio output (measured at earphone jack):	69 mW @ 6.8% distortion 82 mW @ 17% distortion
Intermediate Frequencies (MHz):	266.7, 19.95, 0.45
Image rejection due to 1st IF:	95 dB @ 155 MHz 38 dB @ 868.9 MHz 74 dB @ 336.6 MHz
Practical memory scan speed:	9 channels/sec.
Search speed:	26 steps/sec.
Current consumption at 3 Vdc:	off - 0.09 mA manual - 106 mA scan - 109 mA full volume - 178 mA lamp - 10 mA additional
Battery saver:	after 5 sec. Manual mode.
Low battery warning:	at 2.2 Vdc or less.
Shutdown:	at 1.85 Vdc or less.



ity. Audio power available at the headphone jack measures less than 100 mW, but that's not a reliable indicator of how the radio actually sounds when using the internal speaker. Many models, e.g., the Uniden BC200XLT, use a resistor to limit the audio available at the earphone jack, though we don't know if that's true in this case.

Though the radio is small, the frequency digits are large enough to see without squinting. A green LED lights the LCD display for 5 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 very good. My IC-R2 is quite sensitive, in the vicinity of 0.2  $\square$  V SINAD below 1000 MHz as shown in the accompanying graph. Reception is clean and mostly free from images and intermod, though I do receive paging intermod near 860 MHz while in close proximity to a transmitting tower, and a friend's IC-R2 hears intermod near 476 MHz. When searching for NFM signals, my IC-R2 often stops 5 kHz away from the center frequency of an active transmission.

None of the handheld scanners I've tested lately, including my IC-R2 (S/N 01385), hears well on shortwave. That's due to the supplied antenna, not because the radio is insensitive. At the other extreme, my IC-R2 overloads on shortwave and medium wave when connected to a 132-foot dipole — even when using the global, internal attenuator. The best compromise is a random length of wire a few feet

long.

Don't expect to use the IC-R2 to monitor shortwave utilities because it has no product detector or fine step size for SSB reception.

■ **Go for It**

At a street price of about \$220, the IC-R2 is a great value and an impressive performer in a tiny package. For me, it was love at first sight. The affair will continue 'til the day that I am forced to return this loaned IC-R2 to Icom.

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## ITT Mackay Marine 3031A Receiver

This is supposed to be a scanner equipment column, but readers may enjoy learning about an older, exotic shortwave / longwave receiver which I recently acquired — an ITT Mackay Marine model 3031A. Made in USA, the 3031A is a 1980s vintage dual conversion solid state model used aboard ships and in coastal stations. It tunes 15 kHz - 30 MHz in 10 Hz, 100 Hz, or 100 kHz steps. Frequencies



*ITT Mackay Marine 3031A, a 1980s vintage 15 kHz-30 MHz receiver*

are boldly displayed down to 10 Hz resolution on a large red LED readout. Velvet smooth tuning is accomplished using a fly-wheel weighted optical chopper.

Intended for maritime use and 19-inch rack mounting, the Mackay is built like a tank and has 1 PPM (part per million) stability, too. The front panel is an aluminum rack panel — no sculpted plastic here! The IF bandwidths are 8, 2, 1, and 0.4 kHz.

An internal 9-band preselector permits honest VLF reception without interference from strong broadcast band stations, but the preselector can be bypassed. The 3031A contains no memory channels or noise blanker, though an internal NiCd battery remembers the VFO frequency when the power is off. Like other marine and military receivers, there's a fixed level, 600 ohm audio output connection on the rear panel in addition to a 3.2 ohm speaker port. The front mounted speaker employs a huge magnet and produces better audio than my fancier imported radios.

Mackay Radio Systems, Inc., now a part of Thomson-CSF, is still making radio communication gear. They are located at 2721 Discovery Dr., Raleigh, NC 27616.

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