NEW!

ICOM IC-761

A NEW ERA DAWNS

- **Built-in AC Power Supply**
- **Built-in Automatic Antenna Tuner**
- **SSB, CW, FM, AM, RTTY**
- **Direct Keyboard Entry**
- **160-10m/General Coverage Receiver**
- **Passband Tuning plus IF Shift**
- **QSK up to 60 WPM**

The IC-761 ushers in an exciting new era of amateur radio communications; an era filled with all the DX'ing, contesting, and multi-mode operating pleasures of a fresh new sunspot cycle. The innovative IC-761 includes all of today's most desired features in a single full-size cabinet. This is ham radio at its absolute best!

Work the World. The IC-761 gives you the competitive edge with standard features including a built-in AC power supply, automatic antenna tuner, 32 fully tunable memories, self-referencing SWR bridge, continuously variable RF output power to 100 watts in most modes, plus much, much more!

Superb Design, Uncompromised Quality. A 105dB dynamic range receiver features high RF sensitivity and steep skirted IF selectivity that cuts QRM like a knife. A 100% duty cycle transmitter includes a large heatsink and internal blower. The IC-761 transceiver is backed with a full one-year warranty and ICOM's dedicated customer service with four regional factory service centers. Your operating enjoyment is guaranteed!

All Bands, All Modes Included. Operates all HF bands, plus it includes general coverage reception from 100kHz to 30MHz. A top SSB, CW, FM, AM, and RTTY performer!

Passband Tuning and IF Shift plus tunable IF notch provide maximum operating flexibility on SSB, CW, and RTTY modes. Additional features include multiple front panel filter selection, RF speech processor, dual width and adjustable-level noise blanker, panel selectable low-noise RF preamp, programmable scanning, and all-mode squelch. The IC-761 is today's most advanced and elaborate transceiver!

Direct Frequency Entry Via Front Keyboard or enjoy the velvet-smooth tuning knob with its professional feel and rubberized grip.

Special CW Attractions include a built-in electronic keyer, semi or full break-in operation rated up to 60 WPM, CW narrow filters and adjustable sidetone.

Automatic Antenna Tuner covers 160-10 meters, matches 16-150 ohms and uses high speed circuits to follow rapid band shifts.

Complementing Accessories include the CI-V computer interface adapter, SM-10 graphic equalized mic, and an EX-310 voice synthesizer.

You're The Winner with the new era IC-761. See the biggest and best HF at your local ICOM dealer.

ICOM

First in Communications

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ICOM IC-761

by Bill Clarke WA4BLC

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Price Class $2499

"Give me the luxuries of life and I will willingly do without the necessities."

Frank Lloyd Wright

ICOM's IC-761 is the latest HF entry from the Land of the Rising Sun. It is a fully solid state, digital displayed, highly sophisticated radio communications device. I know those are not words normally used to describe a piece of ham radio equipment, but the 761 is no plain piece of ham radio gear. It is the most precision-crafted and complete ham transceiver from ICOM to date.

Photo 1. Front panel of the IC-761.

First Impressions

The IC-761 is larger than the Kenwood TS-940, and is black. It is solid in appearance and feel, with a formidable 69-control front panel. It rounds itself out with memory functions, a built-in antenna tuner, full break-in keying, electronic keyer, and high-stability crystal unit. Naturally, the 761 can be used as a very effective short wave receiver. It can also be remotely controlled by computer via an RS-232C/serial-port connection.

The instruction manual that comes with the 761 is the best laid out manual I have seen in several years. Replete with pictures, diagrams, and easy-to-understand explanations of each individual control, it is as much state of the art as is the transceiver itself.

Operating Impressions

With a rig as sophisticated and complicated as this one, I needed to completely review the manual before any on-the-air operation was done.

The smooth weighty feel of the tuning dial is impressive (and adjustable) giving the feeling of total control. This is a welcome improvement over other manufacturer's radios. The digital readout is very nice, with no background flicker during tuning, and easy-to-read large blue numbers. Additionally, the memory numbers (and some of the other information that appears on the display) are in red. No confusion here.

I do wish, however, that there was 10 Hz readout. This is available by switch selection (or internal modification) on many other contemporary HF transceivers.

The tuning rate is adjustable from 5 to 500 kHz per turn. Under ordinary circumstances the user will be tuning at the rate of 5 kHz per turn of the dial. If the dial is turned at a fast rate, the tuning rate picks up to 25 kHz per turn. If the TS button is pushed, you clip along at 500 kHz per turn. I thought this was a change from some of the earlier ICOM transceivers, so I did some checking. The 751A tunes at 2 kHz per turn in slow speed, and the venerable 730 tunes at 1 kHz per turn. I like the slower tuning rates better; however, the large tuning dial of the 761 makes for easy tuning.

The digital keypad, used for direct frequency entry, has excellent tactile and audio feedback. You push a button, and know you did, not think you did.

With the advent of all the solid state radios over the past few years, I think everyone knows all about passband tuning and i-f shift. The 761 has both, and they perform as expected. They share a common control that is detented for the zero point. In addition to these tunable receive features, there is a filter switch that allows switching to alternate filter schemes.

The memory feature is particularly nice in that when a memory frequency is selected, you can immediately tune away from it by turning the main tuning dial. To return, merely push the MEMO button.

The notch filter works very well, allowing easy night operation on 40 meters. It is a deep notch, however; very sensitive to tuning.

I tuned in the local country-western station on AM and listened to it. The audio quality was excellent. It makes a nice change after you've been in a few pileups with the Saturday afternoon kilowatt bunch.

The quality of the receive audio from the built-in speaker compares favorably with my main station speaker. It is not tinny sounding. There is a tone control for base and treble. There is not a large amount of variation, but enough to make a light voice sound more authoritative.

The receiver is very quiet, and doesn't get overly excited by summer static. Background noise is almost nonexistent. I found the noise blanker capable of removing offensive woodpeckers and the garbage caused by a faulty florescent light in my laundry room.

Scanning is possible, with several modes to select from. I found that scanning the 10-meter band was profitable when checking to see if the band was open and when looking for beacons. It was easy to scan the memories for activity on any of the several nets I operate on.

Transmitter

The 761 has two VFOs—really handy for working SSB splits. For CW splits, you can normally get by with the use of RIT (transmit). Split-band operation is possible with the 761.

The 761 is easily modifiable for use on oddball MARS frequencies, although many can be reached with the factory set up.

The keyer behaved wonderfully, and QSK is where it's at for the CW operators. I could find no fault when operating QSK, and could be broken with single dit. The note was approved of by all.

The monitor feature is a great adjunct when setting up your compression levels or testing various mikes for tonal qualities. Just put on the headphones and listen to your own voice.

It's also possible to vary transmitted voice tones with a pot inside the 761. The pot can be preset to highlight highs or lows, at your choice.

The audio reports I received were interesting. Most indicated I had excellent audio, a couple stated I was overdriving the rig. Several contacts asked what amplifier I was running. Just remember, audio reports vary with the receiving operator's hearing and preference. Reports from stations knowing my voice were all positive.

The built-in antenna tuner got a poor workout here, as my antenna system is pretty well peaked up. However, I was able to give it a test on 80 CW by using the 75 phone antenna. It took only 2 to 3 seconds for the automatic tuner to do its work, and I was on the air again.

The relay used to key linear amplifiers is a little anemic. I recommend the use of an external keying relay. ICOM is not alone with this problem. I recommend an external relay for most of the current transceivers.

Contrary to popular belief, a failure of the lithium memory backup battery will not place the entire transceiver off the air. It will only mean you cannot save and recall frequencies. Replacement does not appear to be a complicated matter.

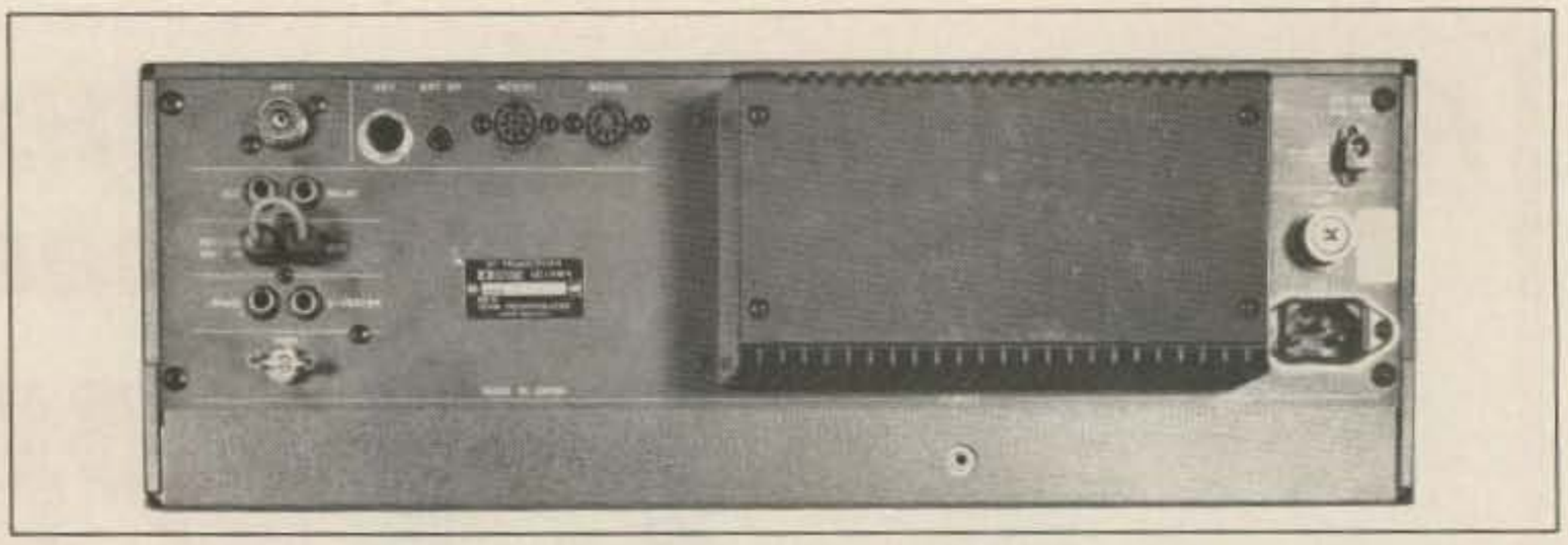

Photo 2. Rear panel of the IC-761.

Bench Testing

Bench testing is the only true method of measuring performance of any of the currently available amateur transceivers. I feel that all of them are capable of performing above and beyond the capabilities of the human ear, and certainly over the poor band conditions we often experience.

The following equipment was used in checking the performance of the IC-761:
Leader LDC 8243 Frequency Counter
Marconi Instruments 2022 Signal Generator
Hewlett Packard 606 HF Signal Generator
Hewlett Packard 651A Audio Generator
Bird 43 Wattmeter
Hewlett Packard 8551B/851B Spectrum Analyzer
Cushman CE-5 Monitor
Tectronics 475 Oscilloscope

The specificatons and test results of the rig are shown in the sidebar.

I could find no fault with bench operation of the 761, and found no place where the advertised specifications were not met or exceeded. Again, the rig is capable of outperforming many ears and conditions.

Wrap Up

Not all the features of the IC-761 (or any other top of the line transceiver) will be of use to all operators, nor will the price be acceptable to everyone. However, feature for feature, the IC-761 is a most capable piece of equipment and is real competition for other top of the line transceivers. With the exception of the few faults I indicated in my observations, I feel comfortable in recommending the 761 as a good piece of equipment, albeit a little rough on the wallet.

Thanks to the folks at the Electronic Equipment Bank of Vienna, VA, for the loan of the IC-761, and the use of their very complete test bench.■

SPECIFICATIONS

Frequency Coverage

Receive: 0.1 MHz–30.0 MHz
Transmit: 1.8–2.0
3.45–4.1
6.95–7.5
9.95–10.5
13.95–14.5
17.95–18.5
20.95–21.5
24.45–25.1
27.95–30.0
Modes: SSB (A6J) / CW (A1) / FM (F3) / RTTY (F1) / AM (A3)
Frequency Control: CPU-based 10-Hz step digital PLL synthesizer
Frequency Stability: (±) 100 Hz (14–140°F)
Antenna Impedance: 50 Ohms
Power Requirements: 100–120 Vac
Dimensions: 424 mm x 150 mm x 390 mm w/o projections
(16.7 in x 5.9 in x 15.4 in)
Weight: 17.5 kg
38.6 lbs

Receiver

Conversion System: SSB, CW, RTTY, AM quadruple conversion
FM triple conversion

I-f Frequencies:		
	1st i-f all modes	70.4515 MHz
	2nd i-f SSB	9.0115
	CW/RTTY	4.0106
	FM/AM	9.0100
	3rd i-f all modes	455 kHz
	4th i-f SSB	9.0115
	CW/RTTY	9.0106
	AM	9.0100

Sensitivity (preamp on): SSB/CW/RTTY
for 10-dB S/N .1–.5 MHz less than .5 microvolt
.5–1.6 1.0
1.6–30.0 .15
AM (narrow filter)
.1-.5 MHz less than 3 microvolt
.5–1.6 6
1.6–30.0 1
FM
28–30 MHz less than .3 microvolt at
12 dB SINAD (Signal to Noise and Distortion)
Squelch Sensitivity: less than .3 micro volt

Selectivity:		
	SSB (filter on)	2.4 kHz/-6 dB
		3.8 -60
	CW/RTTY (filter on)	500 Hz/-6 dB
		1 kHz -60
	AM	6 kHz/-6 dB
		18 kHz -50
	FM	15 kHz/-6 dB
		30 kHz/-50

Audio Output: greater than 2.6 W at 10% distortion into an 8-Ohm load

Notch Filter Attenuation: greater than 45 dB
RIT Range: (±) 9.9 kHz

Transmitter

Output Power:	
SSB	max 100 W PEP
AM	40
CW	100
RTTY	100
FM	100

FM Deviation: (±) 5 kHz
RTTY Shift: 170 and 850 Hz
Spurious Emissions: less then -60 dB
Carrier Suppression: greater than 40 dB
Unwanted Sideband Suppression: greater than 55 dB
Microphone Impedance: 600 Ohms

Antenna Tuner

Output Matching Range: 16.7–150 Ohm unbalanced feedline
Minimum Input Power: 8 W
Band Switching Time: 3 seconds or less
Auto Tuning Time: 3 seconds or less
Auto Tuning Accuracy: vswr 1.2:1 or less
Insertion Loss: 0.5 dB or less (after tuning)