

# A Review of the ICOM IC 720 HF Transceiver

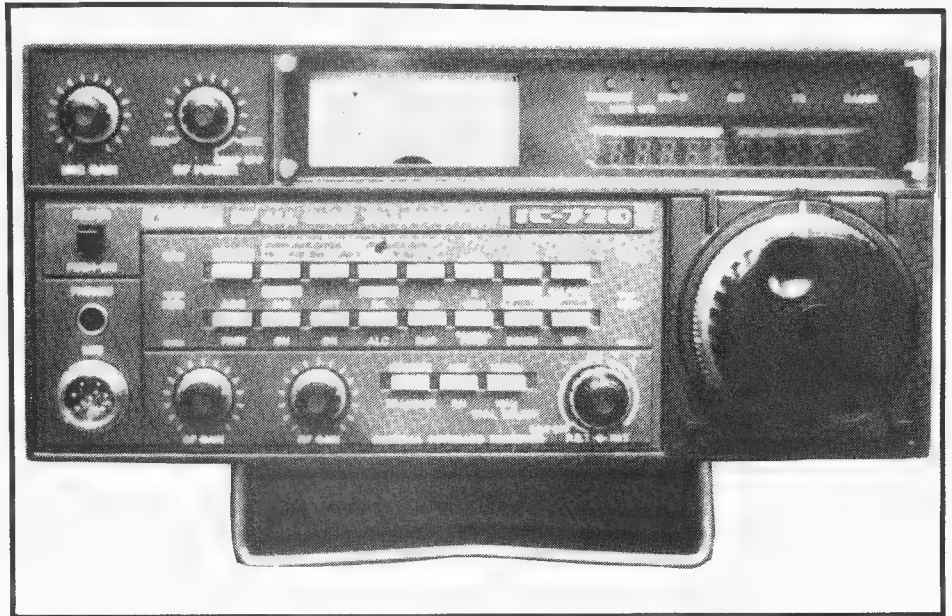
Ron Fisher VK3OM

**ICOM's latest entry in the HF transceiver market, the IC-720, follows the same physical format as its predecessor, the IC-701, but has been changed electrically in many interesting ways.**

Let's take a close look at just what the 720 is capable of. Like most of the new arrivals on the market, the 720 provides coverage of all amateur bands, including the new WARC 79 bands at 10, 18 and 24 MHz. However in addition to this, the 720 provides full general coverage receive facilities from about 50 kHz to 30 MHz with provision for AM, SSB, CW and RTTY reception. All of this is packed into a package essentially the same size as the older IC-701. The unique tuning system of the 701 has been improved and refined in the 720. The synthesised VFO is of course still employed but now provides greater flexibility.

While the general specifications are similar to the IC-701, let's look at the 720 and see just what ICOM claim for it. Firstly, they manage to fit 104 transistors, 17 FETs, 244 diodes and 55 ICs, plus one CPU. Quite a box full. As the photographs show, the general appearance is similar to the older 701 and is quite compatible with the current range of ICOM VHF gear such as the IC-251 and IC-551 and also the older IC-211. ICOM are to be congratulated for their policy of keeping appearance compatible with changes of model. Amateur band coverage from 1.8 to 2.0 MHz, 3.5 to 4.1 MHz, 6.9 to 7.5 MHz, 9.9 to 10.5 MHz, 13.9 to 14.5 MHz, 17.9 to 18.5 MHz, 20.9 to 21.5 MHz, 24.5 to 25.1 MHz and 28.0 to 30.0 MHz. The general coverage receive facility provides 31 MHz segments from 0 to 30 MHz. Reception actually starts at about 50 kHz, a shade lower than the specified 100 kHz. The transmitter is rated at 200 watts power input on all modes except AM, which is rated at 40 watts output (carrier). As mentioned earlier, the tuning has been improved to a marked degree and now has three tuning rates — one, ten and one hundred kHz per tuning knob revolution. The synthesised VFO is producing output in 10 Hz, 100 Hz and 1 kHz steps to provide the above tuning rates.

The frequency readout is now a very readable blue and as well as indicating frequency also indicates the mode status of the transceiver. Upper or lower sideband is indicated with a LED U or L. AM,



**PHOTO 1: Although essentially the same in size as the older IC701, the IC720 incorporates many more features for the enthusiastic HFER.**

CW and RTTY are likewise indicated with an appropriate LED display. The 720 also selects the correct or commonly used sideband for each band automatically.

The band change method is quite unique and does not use a band switch at all. Three push buttons select the required frequency, one giving either amateur or general coverage, the other two pulse the transceiver either up or down one amateur band or if in the general coverage mode, up or down in one MHz steps. This band change system, along with the two separate VFOs, can give some interesting combinations. For instance it is possible to set up the transceiver on two entirely different amateur bands and listen to two contacts in sequence just by selecting the appropriate VFO. You can in fact keep an ear on your 80 metre net while you are in contact with a DX station on 20 metres. As the bands are changed, the correct front end filters are switched by the motor band change system. Very neat.

The receiver uses a quadruple conversion chain. The first is an up conversion to 39.7315 MHz then to 9.0115, to 10.75 and then back to 9.0115 MHz. These last up-down changes are to provide the variable receiver selectivity by using two filters and a variable heterodyne frequency. The transceiver we had for review had filters for SSB, CW and AM installed. I believe that 720s sold in Australia will have these filters installed as standard.

ICOM have gone to considerable trouble to provide first class receiver front end performance. The receiver RF stage is a wideband push-pull device and the first mixer is a special double balanced type.

I noted with interest that ICOM have dropped their Hang AGC system previously rated highly in the IC-701 transceiver and have gone to a standard slow decay AGC system.

On transmit an effective RF speech processor is again used. Other features of



PHOTO 2: Close-up view of the IC720, showing function switches for the receive and transmit modes.

the 701 include a thermostatically controlled fan for the final transmitter stage, an automatic switch-off receiver offset tuning and the built-in SWR meter. One feature missing is the clutch release on the main tuning knob. The tension on the knob can be adjusted with a set screw from under the cabinet, but the old feature so well liked by IC-211 and IC-701 owners is gone.

Several controls are located under a small hatch in the top of the cabinet. These are CW monitor level control, frequency set, VOX delay set, SWR meter switch, RF out/collector current switch, CW delay control to set break in time delay, anti-VOX control, VOX gain control and SWR sensitivity set control. Rear panel controls include a multi-pin socket for connection to an external control unit. It appears that the earlier RM-2 or RM-3 are not compatible and as yet a suitable unit has not been released by ICOM. Most of the other connectors are standard with the exception of a low frequency antenna socket for use on the broadcast band and lower. The input to the 720 receiver is bridged through two connectors to allow a pre-amp to be inserted.

#### THE IC-720 ON THE AIR

Some of the excellent features have already been mentioned, however the 720 takes a little getting used to but once mastered the transceiver is delightfully easy to use. Setting up the transmitter audio gain controls was the most difficult. It seems that the ALC reading on the meter should only just move. The first few times on the air, I tried to talk it up to the end of the scale with resultant reports of slight distortion. While talking about the meter, this has been improved to the point

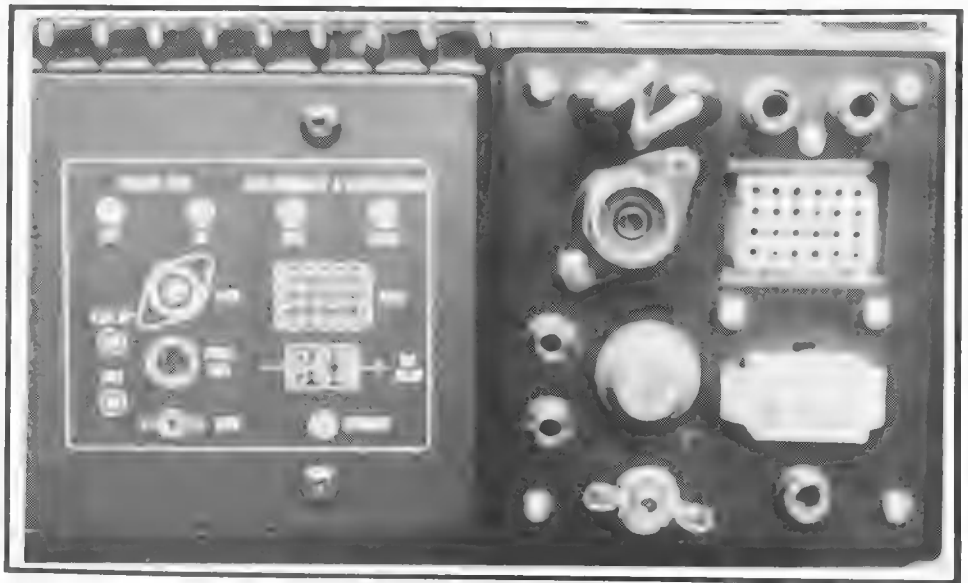


PHOTO 3: Rear view of the IC720.

where I can read it with ease. The old 701 meter was cluttered and difficult to read. Also note that ICOM have dropped their automatic dial light dimmer, not a great loss.

I found the 10 kHz per knob revolution the ideal speed. The synthesiser tunes in 100 Hz steps at this rate. The 1 kHz per revolution is ultra slow and ideal to set the pitch of the signal where required. The 100 kHz per revolution speed is selected with a push button under the tuning dial and is ideal for rapid shifting up and down the band.

I note that the electret desk microphone is no longer supplied as standard. I believe this will be available as an optional extra in the future. A standard PTT micro-

phone with curly cord is included. If you think that you might use your SM-2 desk microphone, sorry, they now use an eight pin connector. Perhaps this means that some time in the future a scanning type microphone will be available. In fact, perhaps its strange that the 720 does not at the moment have any provision for scanning!

Power output was checked on all the amateur bands, including the WARC 79 allocations and was found to be variable. Maximum output was on 160 and 80 metres with exactly 100 watts. Power dropped as the frequency increased with a minimum of 50 watts on the 24 MHz band and strangely up to 65 watts on ten metres. It is always hard to know if this is normal or not, as at the time of testing the IC-720, our test unit was the only one in the country. Bearing in mind the preceding statement, it was interesting to note that using the general coverage receiver, WWV had a transmission on 9, 10 and 11 MHz.

The 720 is available with a choice of AC power supplies, a heavy duty type incorporating no transformer and a light duty type which has a fully regulated trans-

former. The latter type was supplied with our review model and incorporated its own cooling fan for the heatsink. However what has happened to the speaker ICOM used to put in the front of their power supplies? Gone! Now you have to buy an external speaker at extra cost, of course. There is a speaker in the top of the 720 cabinet, but quality from this is just not acceptable.

I plugged in a medium sized external speaker and the quality improved immediately—but up came a very noticeable hum, not audible on the internal speaker of the 720.

#### INSTRUCTION BOOK

I can only guess that the instruction book will be OK. As this 720 was rushed out from Japan for early evaluation, it had the

Japanese instruction book with it, plus a draft copy of the English language edition. I will comment further when the normal book becomes available.

#### CONCLUSIONS

The 720 is a complex piece of gear—even more so than the 701. It of course

remains to be seen just how reliable the rig is. The early 701s did not enjoy a good reputation in this respect. However it is fair to say that VICOM, ICOM's local agent, have provided excellent service and have in many cases provided free service well outside of the normal warranty period. I hope that in the future I

might have the opportunity to look at the 720 again to see how it is shaping up in normal production.

Our review 720 was provided by VICOM International of 68 Eastern Road, South Melbourne, to whom all enquiries should be directed. ■

# Margaret, 70, becomes Amateur Operator

— Courtesy of the Manning River Times.

There was a time when Mrs. Margaret Gerity VK2BQG, of Wootton Crescent, Taree, couldn't stand the sight or sound of a radio. She married Lester Gerity, an amateur enthusiast, in 1954.

However, until recently, Margaret avoided all contact with the radios and paraphenalia.

Now, aged 70, Margaret has studied for and won her full call amateur radio operator's licence.

"Now I'm really keen," says Margaret.

She says she took it up when they moved from Bennett's Head, Forster, to Taree, a few years ago.

"I had broken my ankle so I couldn't play sport, and it seemed a good way to meet people," she said.



She took a year of free tuition with Geoff Hunzinker of the Taree Amateur Radio Club and then in 1978 began a technical college course in radio operation.

"When I started in 1977 I was blind and dumb and deaf to everything, then I started to cotton on," she said.


Margaret received her novice certificate two years ago. Lester, 73, is an old hand in the radio hobby, having received his first call code in New Zealand in 1928.

A former ships' operator, he is now a director of the Taree Amateur Radio Club. Margaret is a former secretary of the club.

Margaret studied for her certificate with enthusiasts of all ages, from school boys to engineers.

She says she loves the people you meet through radio, and is particularly fond of Morse Code, hoping to become really skilled in sending and receiving it. ■

## Solid Status

 BUT HENRY! WHAT REASON DO YOU HAVE TO EVEN THINK THAT I HAVE BEEN UNFAITHFUL?



TI CASO

## QSP

### MALICIOUS INTERFERENCE

The July meeting of the ARRL Board of Directors considered a report of the ad hoc Committee on Interference which covered, among other things, the response to the March editorial in QST on the problem of malicious interference possibly causing a crisis in amateur radio. The Board set up an interference task force to co-ordinate an educational programme, to provide a reference manual and guidelines and to provide liaison at the national level. The overall objective was stated to be the encouragement of the amateur radio service "to continue to justify its reputation as a self-policing service by the reduction or elimination of all types of interference on amateur frequencies".—QST September 1980.

An article by Doc Omelin in Worldradio September 1980 comments "When radio amateurs cry for help, they are admitting that we are no longer able to be self-policing". The problem of proving "maliciousness" is seen as a difficulty when read with "harassment", "carelessness" or "inadvertance". "All of us," he writes, "should make sure that we are not interfering with other stations in any way that might be considered 'malicious'. Above all, don't get involved in hassles with amateurs who you think might be causing 'malicious' interference." ■

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