



# Equipment Review

**YAESU FT-747GX**

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*Are you one of those amateurs who believes that the modern HF transceiver has become too complex? That it has far too many controls? That the prices are putting this sort of equipment out of the reach of many people?*

Then this latest rig from the Yaesu stable may be just the rig for you!

Along with other major transceiver manufacturers, Yaesu have obviously been doing their market research and discovered that many amateurs are asking for "simplicity" of operation in state-of-the-art HF transceivers.

The first impressions of the FT-747GX are the smallness, the light weight and, most of all, a clean, uncluttered front panel with a minimum number of controls.

Subsequent checks showed that this modern, 100 watt, all-band HF transceiver was not only lighter than the ubiquitous FT-7, but it was also considerably smaller.

## FACILITIES

As you would expect from a state-of-the-art rig the FT-747GX has a general coverage receiver that tunes from 100 kHz to 30 MHz, and provides 100 watts of RF output on the HF amateur bands on SSB and CW, 100 watts peak AM, and 100 watts of FM with the optional plug-in board.

Also, in common with most modern Yaesu transceivers, a significant feature is the RS232 computer interface facility which enables Computer Aided Transceiver operation with an external computer.

There is the usual dual VFO facility, and 20 memory channels which store the mode as well as the frequency. Split frequency operation is possible with 18 of these memory channels. A feature of the memory operation is the ability to move from VFO to memory frequency, and back, without losing the VFO frequency. Further, even while tuning the receiver, it can periodically check a priority channel stored in one of the memories.

Wide band AM (6 kHz) and narrow band CW (500 Hz) filters are available as options.

Because the front panel controls are few in number, they are of a large size, eminently suitable for large, Australian style fingers. The ergonomic layout of these controls cannot be faulted, particularly for right handed operators.

The switch controls, which are all push button, include power on/off, clarifier, dial lock, tuning rate, band selection, mode selection, VFO memory transfer, VFO split, priority channel, monitor, normal/narrow IF filter selection, 20 dB attenuator, noise blanker and manual transmit.

The tuning knob dominates the front panel and tunes in 25 Hz or 2.5 kHz steps for SSB/CW. AM tuning rates are 1 and 10 kHz. FM rates are 5 and 12.5 kHz.

The remaining front panel controls are two concentric sets of knobs controlling receive audio gain, squelch (which operates on all modes), microphone gain and drive level.

An impressive feature of the transceiver is the large, very easy to read, amber coloured LCD display, which shows the operating frequency to 100 Hz, the memory channel in use, VFO A or B, modes, and status of the front panel controls.

The remarkable uncluttered back panel of the rig provides facilities for carrier frequency adjustment, connection of DC powered accessories, external speaker, key, tape recorder, linear amplifier and ATU switching, 13.5 volts DC socket, earth terminal and antenna socket.

Also, unusual in a modern HF transceiver, the speaker is mounted on the front panel.

In order to minimise stray RF pickup and radiation, the entire plastic case has been effectively metallised. The reviewers were impressed by the precision in manufacture of the case, particularly as it does not screw together in the conventional manner but successfully employs a system using two sliding clips.

For extended operation with FM, RTTY, Packet, SSTV and AMTOR, a heavy duty power supply rated at 19 amps minimum is required.

Considerable reduction in the size of the PA heat sink has been accomplished by a unique design, completely contained inside the case,

which relies heavily on forced convection cooling provided by an internal fan.

In order to achieve the aim of compactness and simplicity of operation, without sacrificing performance, Yaesu have excluded some of the lesser used bells and whistles features that have almost become standard in modern transceivers, namely VOX, speech processing, IF shift or passband tuning, RF gain control (although a 20 dB attenuator is included), meter switching and a notch filter.

## TECHNICAL DESCRIPTION

The receiver is basically a dual conversion, superheterodyne employing up-conversion to a first IF at 47.055 MHz, with the main IF frequency being at 8.215 MHz, where crystal filters provide the appropriate selectivity.

The first mixer has been designed to provide a very wide dynamic range, and yet, at the same time, achieve a low noise figure. Therefore, no RF stage is necessary. A somewhat unusual feature of the receiver is the provision of a surge suppressor and a small lamp fuse in series with the antenna connection to protect the receiver circuitry from high voltage pulses appearing at the antenna terminal.

Extensive bandpass filtering ahead of this first mixer eliminates significant responses to out-of-band signals.

FETs are used almost exclusively in the receiver RF circuitry which undoubtedly assists with the 100 dB dynamic range quoted.

Five voltage-controlled oscillators provide the injection signals. The frequency synthesiser, and other receiver functions, are controlled by an 80-pin micro-processor chip.

The transmitter generates sideband signals in the conventional manner. CW purists will be pleased to note that the CW carrier is generated, not by an audio oscillator, but by pulling the upper sideband carrier crystal into the filter passband, hence giving a very clean CW signal. Semi-QSK operation is provided.



The Microphone demonstrates the compact size of the Yaesu FT-747GX.

Negative feedback is used in the power amplifier stages to ensure very linear operation. Thermal overload and excess reflected power level protection is provided to the final transistors.

#### ON TEST

The specification on frequency stability quotes 200 Hz without stating a period of time. Our tests showed that the unit took one hour and 15 minutes to reach this amount of drift which is typical of the modern, amateur bands transceiver. A high stability oscillator is available as an optional extra.

Several low level spurious responses were noted on receive, but none were strong enough to register on the S-meter and are unlikely to trouble anyone.

The linearity of the S-meter was only fair, being somewhat generous at the accepted S9 level, and rather "Scotch" at the low signal level. However, the AGC action was very good and we could not find a receive situation that required the use of an RF gain control. The omission of such a control is obviously not a problem with this receiver.

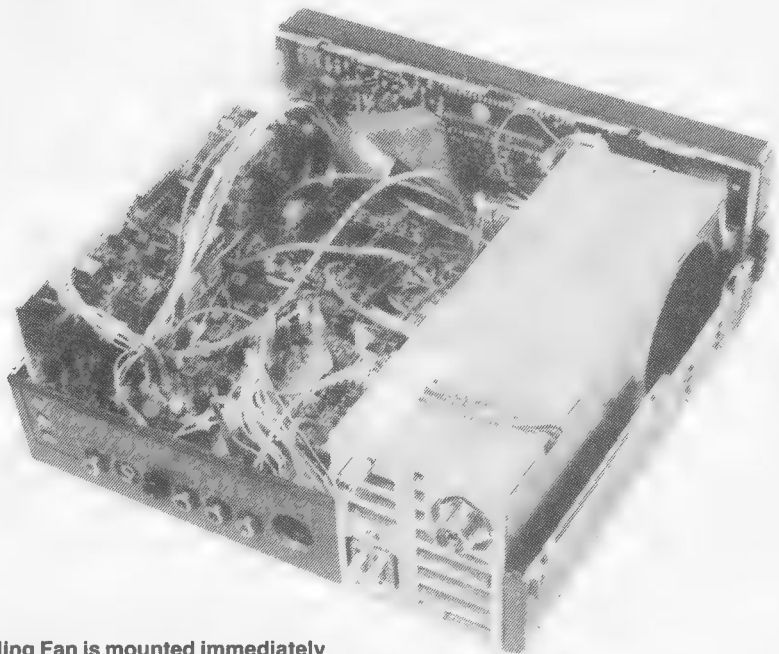
The noise blanker dealt effectively with impulse noise but, as was expected, did not produce any noticeable reduction in the *Woodpecker* on the one occasion we tried.

Although the audio from the miniature, in-built speaker was surprisingly good, it improved noticeably when a large, external speaker was connected. Internally generated noise seemed to be lower than some other similar transceivers.

The transmitter output power was measured on all bands and ranged from 75 watts on the top end of 10 metres to 100 watts on 40 metres. Output on 160 metres was 90 watts.

On-air reports of the transmitted audio quality were very complimentary.

The relay operation was extremely quiet; however, the noise of the cooling fan was louder than one has come to expect from a modern transceiver. The noise was possibly due, as much as anything else, to the unusual placement of the fan on the side of the case, close to the front panel. Because of the small thermal capacity of the heat sink, the fan came into operation after only a short period of transmission, and turned off almost immediately transmission ceased.



The Cooling Fan is mounted immediately behind the circular exhaust port on the front panel end of the Heat Sink.

Although the fan noise was noticeable the reviewers did not consider it to be a problem.

Unfortunately we were unable to check out the CAT capabilities of the unit.

#### ON THE AIR

At first it seemed strange to be reviewing a new HF transceiver with so few controls on the front panel. Nevertheless, it soon established itself as a very "user friendly" unit and, unlike some other units tested recently, did not require frequent reference to the manual to learn how to use its various features.

This must be one of the easiest to use transceivers on the market today, requiring only adjacent of the frequency and audio levels to achieve normal operation.

An unusual feature is the indented action of the VFO knob reminiscent of some of the channelised VHF transceivers. One of the reviewers felt uncomfortable with the lack of smoothness in tuning, but the other reviewer believed that this form of digitised tuning had a number of advantages, particularly in a mobile situation.

#### INSTRUCTION MANUAL

As has now become fairly common, the manual addresses operational features with almost no technical information but is quite adequate for the average amateur.

A section at the back gives sufficient detail of the Computer Aided Transceiver facility.

#### SUMMARY

The FT-747GX transceiver is a surprisingly small and light rig, providing all of the basic facilities expected by today's amateur radio operator. The reviewers consider that it may well become one of Yaesu's classic models.

At the advertised price of \$1399, it is excellent value for money.

The transceiver reviewed was kindly supplied by Andrews Communications Systems.