

# Equipment Review

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## *Yaesu FT-890 HF all mode transceiver.*

At long last Yaesu have brought out an update for the FT-757. For you Yaesu stalwarts out there, the wait has been worth while. This transceiver has brought Yaesu fully into the 1990s, along with the proven and undoubtedly most popular top line transceiver on the market, the FT-1000, the excellent FT-990, and the value leader FT-747. Yaesu are well and truly back in the amateur HF market. From that, you have probably deduced that I like the FT-890 which indeed is absolutely correct.

### Enter the FT-890.

**T**HE FT-890 RETAINS most of the desirable features of the old 757 but also incorporates many new ones. Measuring 238 mm wide, 93 mm high, 243 mm deep it is only 5 mm deeper than the 757. All other measurements are the same. Weight is up a mere 6 kg. This makes the FT-890 one of the smallest and lightest HF transceivers. It is beaten only in weight by the FT-747, but not in size which is essentially the same. Consider this. The smallest transceiver on the market, now with an optional built-in automatic ATU which covers the full range of amateur bands from 160 to 10 metres and you start to get the picture. All of its rivals' ATUs only cover 80 to 10 m, not 160 m. Let's look at a few of the other nice new features. A most effective RF speech processor. A clarifier with a  $\pm 9.9$  kHz tuning range, similar to the clarifiers you find on the top line rigs. A notch filter operating at the lowest IF and an IF shift control help attack QRM.

One of the very handy new features is the ability of each selected frequency range to retain the last used frequency. This can in effect give you many extra memories. Talking of memories, the FT-890 has thirty two multi-function memories. A variety of scanning options is also provided.

Let's take a look around the front and rear panels to see what's available for the keen operator. In the top left hand corner are the MOX, VOX and main DC power switches. Under these is a standard 6.5 mm headphone socket (stereo compatible) and the eight pin microphone socket. The meter function switches are placed under the meter and in addition to the "S" meter function on receive, give transmit readings of ALC, power output and SWR. Unfortunately there is no metering of compression level with the RF speech processor on.

Under the meter selection buttons are five buttons which operate with a very soft but positive feel. These are for processor on/off, AGC fast/slow selec-

tion, IPO in/out, attenuator in/out and RPT/T. A couple of these obviously need explaining. The IPO (Intercept Point Optimisation) switches the receiver RF amplifier in and out to give improved intermod characteristics. The attenuator switch inserts a 12 dB pad into the receiver input. The RPT/T enables the repeater offset and an adjustable sub-audible tone for use in the FM mode on ten metres. Four rotary controls at the lower left are for microphone gain and transmitter RF power output. This latter control accurately sets the output of all modes from the full 100 watts down to a watt or so which prevents overdriving a linear amplifier or transverter. The next pair of controls is for receiver RF gain and receive audio gain. The vertical row of buttons to the left of the main tuning control select the various modes (LSB, USB, CW, AM and FM). There is no morse code identification provided.

At the top right hand side are the selection buttons for VFO A/B, VFO A = B and split operation (transmitting on one VFO and receiving on the other). Three buttons are for memory operation and two for the automatic antenna tuning operation.

To the top right are four buttons, the two smaller for Ham/Gen and clarifier on/off. The Ham/Gen selects either consecutive amateur bands or full general coverage reception. In the general coverage mode, up/down stepping is in either 100 kHz steps or with the "Fast" function selected down in 1 MHz steps.

The rotary controls below are for noise blanker level and squelch (left hand side). The on/off button for the blanker is just above left of the control and, like the meter switches, it illuminates when operated. The right hand concentric pair are for notch and IF shift. Again the notch "On" button is illuminated when in use. The clarifier control is on the far right. This uses an optically encoded tuning system and covers a range of  $\pm 9.9$  kHz. To the left of the clarifier are the up/down buttons for band changing and memory selection.

The front panel has a very clean layout with all controls well spaced, easy to get at, and with the best status indicators I have ever seen. The rear panel has the VOX controls, compression level control and inputs for a phone patch and external ALC and outputs for external speaker, data in/out plus connectors for the DVS-2 digital voice recorder, external ATU, band data output to the Yaesu FL-7000 linear amplifier. There is also an output for CAT control data, and a key

input. A standard SO-239 connects to the antenna and a six pin plastic socket for the 13.8 volt DC input.

There is also a relay connection via a phone connector to control a linear amplifier such as an FL 2100.

### The FT-890 On The Air.

The FT-890 operates from 13.8 volts only, so requires an external DC power supply with a twenty ampere peak current rating. At long last, Yaesu now fit a standard six pin plastic DC connector of the type that has been used by Kenwood and Icom for many years. Let's hope that the old Jones type power connectors have gone for good. The only thing they did well was scratch cabinets with their metal locating plates.

Luckily I have a couple of old (and very good) Yaesu FP-707 power supplies in the shack already fitted with the new six pin DC connectors. So plug it in and off we go. Well, no! Nothing! A quick check shows there is plenty of DC both from the power supply and at the output of the plastic connector but still nothing from the 890. To make a long story short, I found (after quite a while) that the MOX switch on the transceiver panel had been pushed in without my noticing. Release it and everything comes to life, but no mention is made of this in the otherwise excellent instruction manual. Watch out for this safety feature.

As is usual these days, many functions can be set on power-up. Yaesu call this "Power-up customisation and button combination settings", which actually takes longer to say than it takes to enable your function. Some of the things you can set are; 10 Hz or 100 Hz digit displayed, fast button press on/off or active only while pressed, set scan-resume mode, select lock mode where only the tuning control is locked or all operating buttons plus tuning knob is locked. There are in all ten functions that can be "customised" with the power-up feature. In a similar way, while the rig is actually on, several functions can be set by holding the "fast" button plus one other control. Some of these include; The beeper audio frequency can be set anywhere between 220 and 7000 Hz. I found 1 kHz about right. You can set the digital display to any one of eight different brightness levels, however the intensity of the "S" meter does not change. The transmitted audio response can be tailored to suit different voices and microphones (more about this later), the tuning rate can be set, the CTCSS tone for 10 metre FM can

be selected and a memory skip function can be initiated.

The tuning control is superb. It has a very free action similar to the FT-1000 and 990 transceivers. The meter is brightly illuminated and calibrated for "S" meter, power output in watts, ALC action and SWR. The SWR reading is automatic and does not require forward setting. The three last functions are available on transmit only of course, and are selectable via three small push buttons under the meter which illuminates when selected. A very nice effect.

Back to the tuning control. As well as the excellent mechanical action, the FT-890 has a direct digital synthesiser. This results in very clean tuning with an almost total absence of bleeps and clicks. This is particularly noticeable on AM where the 890 tunes like an analog VFO receiver.

"S" meter action is good and produced an S9 reading with an average input of about 60  $\mu$ V. However around 86  $\mu$ V input was required on 28 MHz. AGC action is well controlled on SSB with the slow position selected but there is no provision to switch the AGC off. With the "IPO" selected, the sensitivity drops about 10 dB and a further 12 dB with the attenuator selected.

Receive audio quality from the internal speaker is very acceptable and with a good quality external speaker plugged in, excellent. Audio power output was measured at 1.6 watts with 10% distortion and a four ohm load. With an 8 ohm load the output dropped to 1.2 watts. The notch filter was effective, but as usual with notches operating at the IF, it had quite a detrimental effect on the audio quality. This is caused by the wide notch at the top of the response curve which removes a large slice of the wanted audio. The IF shift was useful in helping to reduce the effects of adjacent QRM. I like the action of the clarifier, however it lacks two important features. Firstly there is no "Clear" button to return to the normal frequency readout to show the amount of offset. The main readout moves in sympathy with the clarifier, but you have to hit the transmit button to see where you have come from!

I thought receiver selectivity on SSB was good. It can however be improved with an optional crystal filter. If you rag-chew on 40 and 80, you won't need this, but a keen DXer might prefer the extra selectivity of the optional filter. Optional CW filters with 500 Hz and 250 Hz bandwidth can also be installed.

Frequency readout is selectable to either 10 or 100 Hz resolution. The 10 Hz digit is smaller than the rest of the display, and disappears when the memory mode is in use.

Frequency stability is excellent and did not vary by more than about 20 Hz or so during the period of our tests. If you are very fussy, this stability can be improved by installing the optional TCXO-3 temperature compensated crystal oscillator, but you won't need to be very fussy.

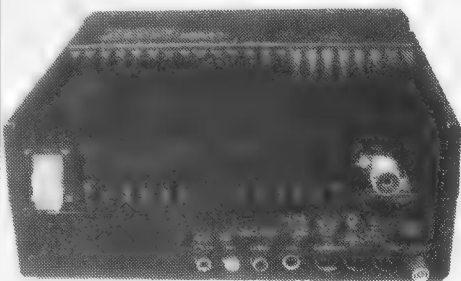
The automatic ATU will match up to about a 3:1 SWR. It was somewhat slower in action than many available these days, sometimes taking 20 or 30 seconds to find a suitable match. However, once a band setting is stored, it recalls the setting very quickly. There are 31 memories for the ATU — very handy when hopping from band to band.

The transmitter power output was measured at an average of 110 watts output over all bands with current drain averaging 19 amps (at 13.8 volts). With a reduction of voltage to 11.5 the power output dropped to about 95 watts with the current remaining about the same. Initial transmit quality reports were somewhat on the bassy side. However, this was easily resolved using the RF processor shift which is a unique feature of this transceiver. As received the RF processor shift was set at the zero point. This was then set to +200 Hz with a dramatic improvement in quality. Naturally this will depend on the voice and microphone you use. The RF speech processor worked very well and was markedly superior to the usual audio based processors used in many other transceivers in this price class. I set the rear compression control to about the 10 o'clock position. All of our tests were carried out with the supplied MH-1 hand held microphone.

The power output metering was found to be very accurate, but it was hard to get a meaningful reading on the SSB speech peaks. I would like to see the meter slowed down to somewhat overcome this. On CW the keying was clear and free of clicks and of course the FT-890 is fully packet compatible.

### The FT-890 Instruction Manual

The FT-890 Instruction Manual is presented in a similar form to those supplied with the FT-1000 and FT-990. In other words it's very well presented. The mistakes that I noted in the FT-990 manual have been corrected and in fact a hard



look failed to find any errors at all. The print quality of the manual is the best of the Big Three manufacturers by far and the touches of colour really make things stand out. Five full pages are devoted to the CAT system computer control.

Again there is no technical description of the transceiver in the manual. No doubt this is well covered in the workshop manual when this becomes available. However as a general instruction manual I will give it almost top marks — nine out of ten. A couple of pages of circuit description would take that up to full marks.

### Conclusions

The performance of the FT-890 is, in a word, excellent for a transceiver in its class. I feel that the only thing that Yaesu have left out is a clear button for the clarifier. With this added, a clarifier is almost as good as a second receiver. If you are a keen DXer then the optional SSB crystal filter would be a must but nonetheless, in standard form the transceiver is at no disadvantage to its main competitors.

Our review transceiver was kindly supplied to us by Dick Smith Electronics to whom all enquiries should be directed.

The FT-890 will retail at \$1995 which includes the MH-1 hand microphone. The optional automatic tuner (ATU-2) will be \$429.

# Shepparton Balloon Found

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**S**HEPPARTON AND DISTRICT *Amateur Radio* Club launched a "voice weather balloon" on Saturday 23 May 1992. The launch created much excitement among local amateurs in reporting its signal, and tracking it. The flight proved most successful, and provided more than 100 reports, with the best distance being more than 1200 kilometres.

The prevailing winds took it in a north-easterly direction. The highest recorded reading was at 65,000 feet over Wagga. At this altitude the balloon is believed to have burst, causing its parachute to open.

The airborne package floated to the ground and landed approx 1 km from the road, in a pine plantation on the Lower Bago Road, near Courabyra, NSW. Its resting place eluded keen followers for almost 72 hours, and on Wednesday 27 May 1992, David VK2OC and XYL Sue, together with Trevor VK2ACZ and Terry VK2ETR spotted the missing package with binoculars.

With Sue standing atop a four wheel drive, she directed by radio the male contingent, who had made their way into the plantation carrying a white flag on a stick (obviously to beat the package into submission once located!).

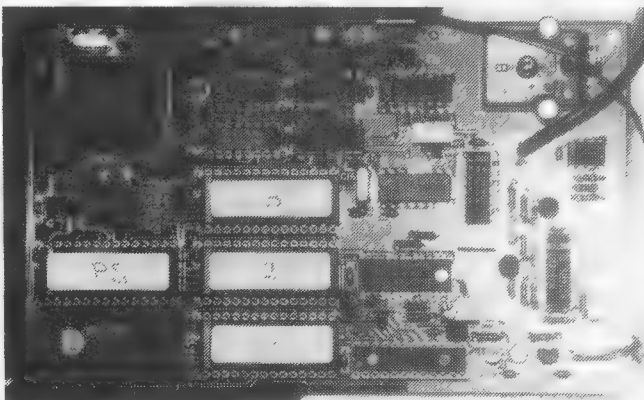
When located, the balloon remains, radar reflector and parachute were in one



David Mann VK2OC, Terry Reeckmann VK2ETR and Trevor Hoodless VK2ACZ proudly display the balloon transmitter and parachute after its successful recovery.

tree, and the radio package in another, in good condition and undamaged.

The \$100 bounty for the return of the package was increased to \$200 by Peter VK3MU in a spontaneous gesture. Although the main purpose of the exercise was the flight itself, the recovery simply adds icing to the cake, and the organisers of the Shepparton and District Amateur Radio Club have expressed their grateful thanks to the recovery team, and all who participated in the activities.



The main control circuit board of the Shepparton Balloon Instrument Package Transmitter.

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frequencies**