

The World's smallest h.f. to u.h.f. Amateur Yaesu FT-857 Tra



● The Yaesu FT-857...the standard-sized pen demonstrates how small the transceiver is!

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takes a look at
the FT-857 h.f.,
v.h.f. and u.h.f.
transceiver.

Why is it, that when I was given the opportunity to review one of the latest transceivers for *Practical Wireless* the band conditions become the worst they have been for sometime? This was the case when the postman arrived with a small package containing the FT-857!

It was certainly going to be interesting putting the new Yaesu transceiver through its paces and see just how well it could cope with the poor h.f. conditions. So, it was on with the review!

World's Smallest?

The Yaesu FT-857 is claimed by the manufacturers to be the

world's smallest h.f. and v.h.f./u.h.f. multi-mode mobile/portable transceiver. It measures just 155 x 52 x 233mm and weighs 2.1kg.

The FT-857 is capable of 100W maximum output on h.f. and 50MHz, 50W on 144MHz and 20W output on 430MHz. And I've no doubt that QRP enthusiasts will be pleased to know that the power level can be dropped to as low as 5W on all bands.

Don't let the transceiver's size deceive you though...it's packed full of features, many of which can only be found on more expensive base station models. These include a high performance receiver with wide frequency coverage, dual v.f.o.s,

Digital Signal Processing (Bandpass Filtering, Noise Reduction, Auto-Notch and Microphone Equalisation), i.f. Shift, a built-in keyer and CTCSS to name but a few.

Die-cast Chassis

The diecast chassis is certainly built to take the knocks! The front panel is removable and can be unclipped to mount away from the main body using the YSK-857 separation kit which is available as an optional extra. (this kit includes a holder for the front panel, extension cables for the controller and speaker,

Radio Rig? Transceiver

double-sided tape and all the mounting screws, nuts and washers).

The knobs and buttons have a very positive feel, and all the controls can be easily reached with one hand. This is particularly convenient for the operator who is using the FT-857 when mobile in a vehicle.

Underneath the body, folded back against the bottom of the transceiver, are two 'feet'. These can be tilted down for better viewing of the display when the rig is mounted on a flat surface.

Neat & Compact

The front panel is very neat and compact and is home for all the transceiver's important main controls. These include the combined a.f. **Volume** control (for either the internal or external speaker) and **Squelch/RF** knob which can be programmed by the user to adjust either the **Squelch** or the gain of the receiver's r.f. and i.f. stages.

A 'dented' rotary switch is used for v.f.o. tuning, memory selection and function selection for the A, B or C keys of the FT-857 in a similar fashion to those found on the smaller FT-817. A **Home** key allows the operator to retrieve a favourite frequency from memory and below this is a further key that activates the Receiver Clarifier.

When in use, the **Select** knob can be set to offset the frequency in use by upto $\pm 9.99\text{kHz}$ without the transmission frequency being affected. This knob also allows channelised tuning in minimum steps of 1kHz on c.w. and s.s.b. and 5kHz on f.m.

Additionally, if the key is pressed and held for one second, the **IF Shift** feature is activated. This allows you to adjust the centre frequency of the i.f. filter's pass-band.

Pressing the **Function** key

momentarily lets you select the three-multi function keys **A**, **B** and **C** and the various operating functions they can perform. By rotating the **Select** knob you can scroll the display through 17 rows of functions which include various items such as **VFO A** or **B** or split frequency, speech processor, **VOX**, **Keyer**, narrow filter, etc.

Mode Keys

Pressing the **Mode keys** enables the operator to scroll either up or down the menu and choose from either **LSB**, **USB**, **CW**, **CW Reverse**, **AM**, **FM**, **Digital** or **Packet**. Alongside these keys is the **DSP** button that allows instant access to the d.s.p. system. (This had already been installed on the review model).

If you hold the d.s.p. button down for one second, you activate a memory item. This permits adjustment of the d.s.p. microphone equaliser and is a feature that I will cover a little later.

Main Tuning

The transceiver has an excellent main tuning knob, similar in size to those on my base station rigs. It allows a secure non-slip grip and has a nice soft feel to it and over the review period I found it to be very smooth in operation and pleasant to use.

Above the main tuning knob are two buttons for band selection marked **UP** and **DWN** and to the right of this are two more buttons

marked **V/M** and **LOCK**. Pushing the V/M button switches frequency control between the v.f.o. and memory systems. If you press and hold this key you can store a frequency in the transceiver's **Quick Memory Bank** while the lock button prevents the accidental changing of frequency

Rear Panel

Let's now take a look at the transceiver's rear panel, and I'll start with the d.c. power supply connection which can be found. The supplied cable can be used to connect the FT-857 to either a car battery or a d.c. power supply which must be capable of supplying at least 22A at 13.8V.

The jack can also provide a **Transmit Power Control Terminal** (TPCT) if you connect pin-3 (the battery sensor) of the terminal to the 'ground'. The FT-857 will then automatically switch to 20W (10W on 430MHz) output.

Seven other sockets are provided. The first is an 8-pin mini DIN jack used to connect an optional external automatic antenna tuner (a.a.t.u.) such as the FC-30, personal computer (PC), tape recorder or linear amplifier such as the Yaesu VL-1000.

There's also a data socket which will accept AFSK input from a TNC via a 6-pin mini jack plug. It also provides fixed level receiver audio output, push-to-talk (p.t.t.), squelch and ground lines.

Product

Yaesu FT-857

Company

Yaesu UK Ltd,

Contact

Tel: (01962) 866667

Supplied Accessories

Operating Manual
DC Power Cable
MH-31 Hand Microphone
MMB-82 Mounting Bracket

Pros and Cons

Pros The FT-857 is very easy to set up once you have read the manual and has a superb specification for the price. The FT-857 would be ideal for the beginner or experienced Amateur who is looking for a versatile mobile/portable transceiver or those who require a compact base station radio.

Cons It pays to spend a few hours reading the instruction manual to fully understand what functions there are...and how you can best set them up to suit your operating style

Price

£849 inc. VAT

Supplier

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Also provided are three 3.5mm jacks that allow you to connect a key, external speaker or accessories such as a TNC. Finally, there are two antenna sockets.

The first socket is an SO-239 for h.f. and 50MHz. The second is the more v.h.f./u.h.f. efficient 'N' type for 144/430MHz. Both are designed for use with any antenna system providing a 50Ω impedance, though it will cope with minor deviations. (If there's a mis-match of more than 50%, the power amplifier's protection circuitry will begin to reduce the power output).

Main Display

The main liquid crystal display (l.c.d.) is very clear and has good contrast. There are four options for illuminating it, starting with **Off** which disables all background lighting. **Auto 1** illuminates the l.c.d. for three seconds when any button is pressed or if you rotate the **Select** knob. **Auto 2** illuminates the panel continuously when the FT-857 is operating on an external power supply. Finally there's **On** which provides back lighting continuously.

The contrast can also be adjusted, as can the display brightness. (These are selected when the Menu Mode is activated).

One interesting feature is the ability to choose the display colour. In fact, there are 32 options are available and they can be set in a variety of combinations for a wide number of operating conditions.

For example, you could have different colours for each band used, or each mode, the type of meter selected or for the v.f.o. in use. I first thought the feature to be a bit of a gimmick...but found it quiet useful when I was able to choose a colour more suited to operating in the bright sunlight coming through the shack window!

Digital Signal Processing

As I mentioned earlier, the DSP-2 d.s.p. was installed in the FT-857 and is fitted as standard on all UK models. This appeared to work extremely well...especially when I was using s.s.b.

The processing feature is selected by pushing the **DSP** key which then activates the **A**,



● Inside view of the main p.c.b. panel.

● Close up view of the main tuning control. This control also carries out many other functions (see text).

B, and **C** keys as **DNR** (Noise Reduction Level), **DNF** (Auto Notch Filter) and **DBF** (Receiver Band-pass Filter). Next, by holding in each key for one second you can recall the **Menu Mode** and use the **Select** knob to adjust each level as required.

The receiver's selectivity can be enhanced via the d.s.p. **Band-pass Filter** to suit your operating needs. Both low-cut (**High-Pass Filter**) and high-cut (**Low-Pass Filter**) levels can also be adjusted.

When operating in the a.m., s.s.b. and f.m. modes you can push the DSP button for one second to activate yet another menu mode for d.s.p. **Microphone Equalisation**. By rotating the main tuning dial you can then select several equalisation options.

The setting **OFF** is selected when no equalisation is required, **LPF** is for high-cut where lower frequencies are emphasised, **HPF** is for low-cut where the higher frequencies are emphasised and **BOTH** selects high and low-cut where the mid range frequencies are accentuated.

During the review, it took me a while to set Microphone Equalisation up for best results. I think it would be much easier to do if you have the help of another station...one that's preferably a good distance away.

The Morse Mode

The FT-857 has an array of features for the c.w. operator. For example when operating on



the Morse mode there's the option of using either a straight key, a paddle using the built-in electronic keyer which also includes weight control or computer keyboard.

The **CW Pitch** control allows the transmitted signal to be offset by 400/500/600/700 or 800Hz from zero beat with the receive frequency. When this pitch control is adjusted, it also varies the centre frequency of the receiver's pass band together with the **CW Sidetone** pitch. This means you can use the sidetone as a reference during tuning.

There's also three-message memory which can be used to programme exchanges such as those found in contests. A 'Beacon' mode is also provided and this can send a repetitive message continuously for up to four hours. (This would be extremely useful for those with an interest in DXpeditions...particularly on the 50MHz band.

Finally, the FT-857 has a built-in c.w. trainer! This helpful feature will send random groups of five letters and/or numbers which can be heard through the speaker. (Should help to keep up your c.w. reading skills!).

Incidentally, an optional YF-122C 500Hz Collins filter is available for the FT-857, and it had been installed in the review model. Personally speaking, I would consider this an essential extra if you were a keen c.w. operator...especially when operating on crowded bands such as 7MHz or when working in contests.

Stacked VFO System

One menu item I did use a good deal was the 'Stacked' v.f.o. system. This controlled the v.f.o.s and was found by simply pressing the **FUNC** key momentarily and rotating the select knob to the menu **A/B**, **A=B** and **SPL**.

The **A/B** function button then allows you to toggle between the two v.f.o.s (**A** or **B**) for each band. For example, you could have v.f.o. **A** set for the c.w. section of a band and v.f.o. **B** set for the s.s.b. section. (This is how I set up the transceiver as both mode and frequency information are remembered until they're changed).

When you do change bands using either the **A** or **B** v.f.o., the two v.f.o.s don't change bands together. This would prove useful to those of you who operate split bands when working - for instance - **Low Earth Orbit** (LEO) f.m. satellites. This procedure is well covered by the appendix in the supplied instruction manual. I must admit that I have never tried this myself but have every intention to do so in the near future.

The **A=B** function allows you to have both v.f.o.s on the same frequency. Here, **SPL** selects the 'split' function...which was very useful when trying to work some of the pile-ups on several DXpeditions heard during the review period.

Advanced VHF/UHF Features

The v.h.f./u.h.f. operator using the FT-857 has not been forgotten either! The transceiver has a host of useful features that will be useful on v.h.f. and u.h.f.

For repeater use both a 50-tone CTCSS system and 104 code **Digital Code Squelch** (DCS) encoders and decoders are already built in. The ability to encode either CTCSS or DSC if required and a 'Split Tone' feature has been included.

When you use the 144 or 430MHz bands, the transceiver will automatically activate your personally programmed repeater shift for the band in use. And...you're travelling and visit a new location a **Smart Search** system can scan in f.m./a.m. modes for any activity

and load those frequencies into a special memory bank.

You can also use a **Spectrum Scope** feature that will create a bar graph display of active channels above and below your chosen frequency. Another interesting feature is the **Auto Range Transponder System** that lets you know if a low power station has gone out of range. This could be useful for groups like RAYNET who provide safety cover at various events throughout the country.

Earth Connection

One item that I was surprised to find missing was an earth connection of some sort. However, the manual states: *"Although satisfactory grounding in most installations will be achieved via the d.c. cable's negative lead and the antenna systems coaxial shield, it is often recommended that you provide a direct ground connection to the vehicle chassis at the mounting location of the transceiver."*

The FT-857 does actually come supplied with the MMB-82 Mounting Bracket...and providing this is installed and connected to a vehicle's chassis you should be okay. If you do decide to install the transceiver in a vehicle, I would certainly recommend you double-check the installation position carefully, just to be sure you are actually making an earth!

While using the transceiver in my shack, I used a screw and washers from the mounting kit supplied, connecting my earth wire to one of the bracket mounting holes. With this set-up I experienced no problems such as r.f. feedback or noise pick-up during the review period.

Sensitive Receiver

I found the receiver to be very sensitive and the audio quality from the small speaker to be excellent. Away from the Amateur bands I listened into several broadcast stations on both Band II v.h.f. f.m. and also on a.m. on medium wave, and h.f.

There's always plenty of activity around the South Wales coastline...so I also monitored several marine channels. The FT-857 coped with everything it heard and the receiver showed

no signs of being overloaded at anytime.

On occasion I did need to use the attenuator, which reduces the received audio signal and noise by about 10dB. It might be worth mentioning at this point, that this function doesn't operate on the 144 or 430MHz bands.

On The Air

As I stated earlier, band conditions were very poor for the duration of this review and my on the air tests! I only had an inverted full size G5RV at my disposal, which was fixed in a north/south direction.

To tune the antenna I used my MFJ-971 portable tuner as this would allow me to work on most bands. On the first day of the review I could only hear stations on 7MHz and most of those were based in the UK. Static noise was terrible and signals would appear very strong at S9+ one moment and then fade down into the noise.

However, all was not lost and several stations did respond to my "CQ" calls, which were made with the supplied MH-31 hand microphone. I should mention at this point that Yaesu offer the MH-59 Remote Microphone as an optional extra and this provides control of all the major functions of the transceiver from the microphones keypad as well as rotary controls to adjust the frequency or audio levels.

The first call came from **John G4XBL** in Aspatria near Carlisle in Cumberland who was able to comment on the "clear audio" just before his signal faded away. Next, **Vic G4KEE** in Exeter then called in...but it was very difficult to hold a conversation with him. He also commented on the audio quality which had improved slightly when I switched in the d.s.p.!

These difficult QSOs were then followed by a call from **Tony G3RKL** in Sheffield, South Yorkshire, who ran a Yaesu FT-

817 with a Yaesu FL-110 linear at about 60W. We were able to hold a long QSO and experiment with gain levels on both our microphones, sometimes with Tony running just 5W.

Incidentally, both **Jack EI7HX** in Dublin and **David G4YER** in Barnsley, South Yorkshire monitored these tests. They gave excellent signal and audio reports to both of us! I was very grateful for their assistance.

Pick of the DX for me was **Bruce ZD7VC** on 21MHz who was enjoying a large pile-up at his home in Jamestown, on the Island of St. Helena. It took a while to work him, but he finally heard my call sign and responded with a 5/6 report.

Bruce was interested to know a little more about the Yaesu and we enjoyed a short chat before he returned to the pile-up. Incidentally, this was a new country for me, so I was more than pleased to work him. I followed this a few days later with a c.w. contact with **Koji JY9NX** in Jordan...and his 599 report gave me another new country on the 21MHz band.

I concentrated my operating mainly on h.f. bands but did try the 50, 144 and 430MHz bands. This was limited to f.m. contacts only and included contacts with **Denzil GW3CDP** and **Brian GW0KZK** who had both been monitoring me during the review period, and they reported the audio as being "Good".

- The detached FT-857 front panel, shown in this fashion to demonstrate the relative proportions of what is a very small h.f. to u.h.f. transceiver (see text).



Superb Specifications

In summing up, I think the design engineers at Yaesu have worked very hard to produce a transceiver that would end up with superb specifications and meet the needs of today's modern amateur. I'm sure that they have succeeded in this and have even been able to include a few bells and whistles along the way!

I think the FT-857 is very compact, ruggedly built and designed to easily withstand the abuse that it's sure to receive when used for either mobile or portable work. However, the menus do take some time to get used to and occasionally I had problems when I wanted to operate split frequency quickly or adjust the d.s.p. settings. Despite this...it has to be said that regular use would make the operator more familiar with these controls and their operation would in time become second nature!

The FT-857 performed exceptionally well in the poor h.f. band conditions when using both c.w. and s.s.b. I would seriously consider this as a replacement for my ageing IC-706 Mark 1 as in my opinion it is the best value transceiver available at this time.

As with any new model like this, it does pay to spend a few hours reading the instruction manual to fully understand what functions there are...and how you can best set them up to suit your operating style. The FT-857 would be ideal for the beginner or experienced Amateur who is looking for a versatile mobile/portable transceiver or those who require a compact base station radio

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