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Yaesu FT-891

The Latest Mobile/Portable from Yaesu Reviewed

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The Yaesu FT-891

Don Field G3XTT takes a look at the latest mobile/portable offering from Yaesu, the FT-891.

I was delighted recently to be offered an FT-891 to try out on behalf of *PW* readers. I first saw this rig in the middle of last year and, like many others, was intrigued as to its place in the Yaesu product line-up as well as, naturally, being interested in how it performed.

Product Placing & Specification

With my recent reviews of HF transceivers, I've tried to understand just what market they are addressing, particularly as Yaesu's home market in Japan is rather different to that in the UK or USA (mobile and portable operation being much more prevalent in Japan because so many amateurs live in tiny houses or flats in heavily populated urban areas).

The FT-891, as many of you will have seen from the advertisements, is described as Field Gear and as an Innovative Multi-band, Multi-mode Transceiver within an Ultra Compact Body.

Compact the FT-891 certainly is (52 x 155 x 218mm and weighing 1.9kg), with a removable front panel designed very much for mobile operation. Multi-band it is too, although it covers 160 through 6m so many of those discussing it on internet forums have questioned how it sits against the FT-857, which also covers 2m and 70cm.

Talking with **Paul Bigwood G3WYW** of Yaesu UK, I gather that the FT-891 is seen very much as a successor to the popular FT-100 and the later FT-857 although there are currently no plans to discontinue the latter. The popular budget FT-450D will also continue, which I'm pleased to hear – I consider the FT-450D a rather underrated rig. We used FT-450Ds to great effect on the T32C expedition and I have owned three of them since then, one of which my son has been using. However, the FT-891 uses more recent technology drawing on the heritage of the FT-3000, FT-1200 and FT-991.

Paul explained to me that the absence of 2m and 70cm is because Yaesu see the VHF/UHF market nowadays as being driven by their Fusion offering of a combined FM/digital voice capability. This is very different from the HF requirement of CW, SSB, data modes and, to a lesser extent, AM, all of which the FT-891 offers along with FM. Output power is 100W (derated to 25W for AM operation).

Description

As far as technology is concerned, the FT-891 has triple-conversion superhet architecture with a 3kHz roofing filter and 32-bit floating point DSP offering the usual range of filtering and noise reduction facilities to fight interference and various types of noise. Yaesu are finally offering a USB port as standard on their transceivers, supporting full rig control via a virtual serial port connection.

The display takes up much of the front panel, providing lots of information as well as showing the functions of the three programmable function keys (of which more later). The tuning knob is as large as the overall dimensions of the rig allow and the torque is fully adjustable.

The optional FC-50 is a microprocessor-controlled antenna tuner that is designed specifically for the FT-891 and matches it in appearance and size. The FC-50 can be easily coupled with the FT-891 and includes all necessary interconnect cables for operation right out of the box. I also look at the FC-50 in this review. The FT-891 also fully supports the ATAS-25 and ATAS-120A Active Tuning Antenna System (optional) allowing for plug and play field and mobile operation. Additionally, there are interfaces on the back panel for the sort of accessories you might want to connect for fixed station purposes such as data modes, a linear amplifier and, of course, a Morse key (paddle to work with the internal keyer or a connection to an external keyer).

As you would expect, the firmware can also be updated from the internet as and when new releases become available.

I won't try to go into more detail here. If you want to see the full specification or, indeed, download any of the user documentation, all this is available from the Yaesu website, below. I should also mention that the rig comes with a compact operating manual as well as a one-page quick start guide (very handy to keep by the rig) but those wanting the advanced manual (114 pages in all) or the detailed CAT commands need to download these from the internet. The virtual COM port drivers can also be downloaded along with related installation instructions.

www.yaesu.com

Out of the Box

I have to say that I was quite taken aback by the packaging of the FT-891 – it must have required quite a computer program just to design the cardboard box! Gone are the days of a simple box and lots of polystyrene. There is, within the package, rig, microphone and mobile mounting kit – the recommendation for mobile operation is to sit the head unit on top of the dashboard for good visibility and the main unit beneath the dash.

As always with Yaesu kit, the rig is very solid and all the controls have a nice feel to them. Initial setup was easy and I was soon listening round the bands. Paul who, like me, runs an Expert amplifier, had also kindly loaned me the interface cable so, again, setting that up was trivial once I had figured out the menu system (you need to tell the radio that there is an amplifier connected). On the subject of the menu system, there are 160 menu options in total, if I have counted correctly. That's an awful lot. The good news is that most will not be needed, at least once you have set up your initial preferences. There are various function screens accessible from the Function key, allowing a number of key settings to be accessed quickly using the A, B and C soft keys. Perhaps more important, once you have used the rig for a while, is that you can programme these soft keys for those settings that you find yourself wanting to change most frequently. These might include, for example, having quick access to different filter bandwidths or speed settings for Morse.

Although the front panel is detachable, it clips firmly into place for normal base station operation, with the various interfaces on the back panel. A clip-out foot brings the front panel up to a more useful viewing angle.

Fig. 1: The spectrum display is handy and remarkably clear given the screen size.

Fig. 2: The FC-50 ATU, below the FT-891 (But not attached with the Yaesu brackets).

In Use

I started by putting the rig to good use in the CW and SSB legs of the RSGB AFS Contest. Each leg runs for four hours on the 40 and 80m bands and is pretty competitive, with lots of entrants vying for the limited spectrum space and with some big signals. In my own case, I ran 400W in the CW leg and 100W in the SSB leg, using a rotary dipole at 20m for the 40m band (the Innov antenna that I reviewed some months ago) and a wire inverted-vee dipole for 80, just below the 40m antenna.

Given that I had had relatively little time to familiarise myself with the FT-891 prior to the CW leg of the contest, I was pleased to make 235 contacts, all keyed manually with an external keyer (as against computer-sent). I used semi-break-in (there is no full QSK facility with the 891), and the keying seemed to be clean when monitored on another receiver. The FT-891's own receiver coped well with the band activity – I used the filtering in the narrow setting. I was aware of stations outside the immediate passband, which doesn't happen with my Elecraft K3 but that costs probably four times as much and is fitted with mechanical filters that supplement the DSP (digital signal processing). However, unlike with some receivers I have used previously, I didn't lose any contacts as a result of off-channel interference. In the SSB leg I received some unsolicited comments about the excellent audio from strong local stations who know my voice (I was using the supplied microphone and hadn't made any adjustments to the equalisation) and found the receiver to be excellent, even when pulling out very weak calling stations.

USB Interface

I downloaded the virtual COM port driver and manual from the Yaesu website. The driver creates two virtual COM ports, one of which is used for CAT communications (radio control, interface to logging program for frequency and mode data and similar) plus firmware updating while the other is used for transmitter control (PTT, Keying, FSK). Instructions for setting it up are a little limited, in my view, although to some extent it's understandable because some of the setup is dependent on the software you are using on the PC. However, I was slightly bemused when the virtual COM port came up at a default of 9600 baud while the default for the FT-891 CAT interface is 4800 baud. Of course, it's simple enough to change the settings to match once you realise what's going on.

I don't know how many logging programs, for example, currently support the FT-891 but it was there on the list for the N1MM+ contest logging program and I feel sure most others will already be supporting what will undoubtedly become a popular transceiver.

Data modes operation requires reference to the Advanced manual. There are various ways it can be achieved. The simplest is to connect the sound card interfaces on your PC to the RTTY/DATA interface on the FT-891 and use VOX for transmit/receive switching. This works fine if you get the levels set correctly. The FT-891's USB interface will let you control the transmit/receive switching manually from

your data modes program but requires a bit more setting up.

Spectrum Display

The FT-891 features a spectrum display, **Fig. 1**, that can be adjusted to display various segments of the current band. It can be repopulated as a one off or left running although in this latter case the audio remains muted as long as the spectrum display feature is operational (because, as with the FT-1200 for example, the spectrum display works directly from the main receiver). The display is remarkably clear given the small size of the radio and could be particularly useful for, for example, monitoring the 6m band for Sporadic E openings in the summer months.

60m Operation

For UK use, seven of the memory channels are preprogrammed for the authorised 5MHz channels.

FC-50 ATU

The FC-50 ATU is designed to match the FT-891 in appearance, **Fig. 2**, as well as to interface seamlessly with it. It's size is 45 x 155 x 210.5mm and it weighs 1.35kg so is very slightly smaller and lighter than the FT-891. More to the point, brackets are supplied to attach it below the FT-891 and the clip-out foot can be transferred to the FC-50 as can be seen in the photograph, to allow the combined unit to be tilted to a suitable angle. Setup is simply a case of using the supplied interconnection cable and then telling the FT-891 (via the menu system) that the FC-50 is in place.

The FC-50 specification says that it will handle SWRs or up to 3:1 on the HF bands and 2:1 on the 6m band. Don't, therefore, assume you can put up any old length of wire and leave the FC-50 to take care of matching it on all bands – you would need a more versatile external tuner to do that. However, it should be fine for handling slight mismatches if, say, your mobile antenna wasn't quite on frequency or your portable SOTA dipole wasn't at its usual height.

Tuning is accomplished in five seconds or less by selecting the tuner from the FUNCTION-1 list screen and pressing the MULTI function knob. However, if you are likely to use the tuner regularly, it makes more sense to assign the job to one of the soft keys.

In practice, I found the tuner straightforward to install and use and it does what it says on the can. What I did find awkward was using the various buttons on the FT-891 when it was sat on the tuner so, in practice, if I was using this setup regularly at home, I think I would 'lose' the tuner off to one side rather than physically attach it to the FT-891.

Under the cover. The small speaker is more than adequate for communications purposes.

A size comparison with the author's FT-847, a typical base station transceiver.

Conclusions

The FT-891 is remarkably fully featured for such a tiny rig and, compared with mobile rigs of, say, 10 years ago, has much better receive performance making it more than suitable for portable or base station operation if you prepared to put up with the limited number of external controls and the need to access menu items from time to time to make adjustments. It has all the interfaces you would need for data mode operation, an external linear amplifier and suchlike. The USB interface also means that interfacing the shack PC is straightforward. It works competently on CW and sounds excellent on SSB (perfect for most mobile operating!). I know that a lot of amateurs nowadays are expecting new gear to use SDR technology but there's still a lot to be said for a traditional superhet architecture with a decent roofing filter, which is what the FT-891 has. It will be interesting to see the detailed performance measurements as and when they become available from other reviewers who are able to run the appropriate tests.

Personally, this is not a radio I would use as a main rig but, then, I'm an active DXer and contester and want most controls immediately accessible on the front panel. Neither am I am mobile operator but I can see that it would be an ideal transceiver for mobile operation, with a nice clear display that can be mounted on the dashboard or some other handy spot, with the main unit out of sight. I would certainly consider the FT-891 for holiday operations – it's small and light enough to slip into a suitcase or even your hand baggage (along with a lightweight power supply, or run it off the battery of your hire car when you arrive). Of course, if you choose to take the FC-50 tuner with you too, you will be doubling the weight and volume of what you need to carry. Personally, I always opt for resonant antennas, even on portable operations. It's usually easy enough to hang several wire dipoles from a lightweight fishing pole, for example.

The FT-891 is available from all the usual UK amateur radio retailers at a price around £600 (so somewhat cheaper than the FT-857) while the FC-50 retails for around £250. A number of other accessories are available, perhaps most important of which is the separation kit for around £35. This allows you to site the head unit some distance from the main unit, useful not only for mobile operation but perhaps also for some home situations. My thanks to Paul Bigwood of Yaesu UK for the loan of the review units.

The radio... YAESU

Exciting New Yaesu Field Gear

HF/50 MHz 100 W All Mode Transceiver

FT-891

Actual Size

An Innovative Multi-band, Multi-mode Transceiver within an Ultra Compact Body

- Rugged construction in a Compact Mobile Package (W 155 x H 52 x D 218 mm)
- Stable 100 Watts of RF Power Output with efficient Dual Internal Fans
- Legendary Yaesu Receiver Performance
- Triple Conversion receiver with a 1st IF frequency of 69.450 MHz
- 3 kHz Roofing Filter (equipped as standard)
- Detachable Front Panel permits convenient mounting and operation
- Large Dot Matrix LCD display with Rapid Spectrum Scope
- Enhanced Operating Features:
  - Large diameter Main Tuning Dial (41 mm) with Torque adjustment
  - Pop-up Menus for quick and easy operation
  - Large Transmit /Receive indicator
  - Three Programmable Front Panel Function Keys
- Especially designed FC-50 External Antenna Tuner (Option)

YAESU 60th Anniversary

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