

# Yaesu FT-897D and FT-857D MF/HF/VHF/UHF All-Mode Transceivers

*Reviewed by Bob Schetgen, KU7G  
Senior Assistant Technical Editor*

## **It's Been Fun . . .**

I reviewed the FT-897 in the spring of 2003.<sup>1</sup> My review experience and the re-

<sup>1</sup>R. Schetgen, "Product Review: Yaesu FT-897 MF/HF/VHF/UHF All-Mode Transceiver," *QST*, May 2003, pp 63-67.

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sults of our Lab tests sold me. I bought one, and I've not regretted it.

I had not yet completed a mobile installation, while on vacation in Maryland, so I operated on the Yaesu's internal battery from the back of my wagon with the hatch open and an old Hustler whip clamped to the hatch. A contact in Michigan from under a water tower was a good start.

While CW QRP with a reasonable

antenna is great fun, operating ARRL Field Day from my father-in-law's yard taught me that 20 W fed to a mobile whip greatly limits SSB contacts. The flexibility of being able to operate the '897 either as a self-contained low power transceiver using the (optional) internal batteries or as a full 100 W transceiver from an auto battery or ac supply (optional internal FP-30 supply that fits in

## Bottom Line

The “D” models offer useful enhancements to make us consider an upgrade or make it a desirable choice for a first-time buyer—at the same prices as the original models without accessories.

the battery compartment or external supply) has contributed to its popularity.

My desire for a mobile station came from my wife’s business. I support her, but the trips take me far from home with a lot of time on my hands. My old Hustler now resides on the wagon with a coax line that reaches the front seat or the hood. I can operate from inside or outside the vehicle comfortably with only a moment’s notice.

One such trip found me in the rain outside a restaurant near Boston. The result was a wonderful contact with Argentina. We had landline quality, and the OM on the other end asked what I was running. The circuit ran from his amplifier and four-element Yagi to my FT-897 and the whip!

Okay, you know I’m happy with the old rig. The question for me, and many other users, is “why do I need a D?”

### What’s a “D” Model?

When the initial demand for the FT-100 began to diminish, Yaesu introduced a “D” model with some of the most popular accessories as standard equipment. The result was an enduring product that remains in their catalog.

Continuing that strategy, they have introduced the FT-857D and FT897D. Both operate *conveniently* on the five new 60 meter channels authorized for US hams. Also included is the temperature-controlled crystal oscillator stage that was optional on the previous models. In addition, the ’857D includes the DSP circuit that was formerly an extra-cost option. The rest of the features and performance of the D models are comparable with the previous models. See the earlier reviews for the basic features, which remain unchanged in the new versions. Table 2 is the lab data taken to verify that the performance is similar to the original units. We installed the optional 500 Hz CW filters in one of the two open filter slots of each radio for testing. As noted there were some changes in receiver performance. Yaesu has made an attempt to improve dynamic performance through a change in roofing filter design, resulting in a significant improvement in wide-spaced dynamic range. Other data is similar to the earlier version.

### 60 Meter Operation

The conditions for use of the 60 meter channels are unusual for amateur operation and are spelled out at [www.arrl.org/FandES/field/regulations/faq-60.html](http://www.arrl.org/FandES/field/regulations/faq-60.html). The five channels are specified by their center frequencies, bandwidth, mode and radiated power. The D models

come factory programmed with five memories set indicating the channel center frequencies and in USB mode. Manually entered memory locations show the suppressed carrier frequency rather than the center of the channel and there has been some confusion resulting from this. The ARRL Lab confirmed that the

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Figure 1—Front view of FT-897D with MH-59 Remote Control Microphone.



Figure 2—Front view of FT-857D with standard mic.

Figure 3—View of FT-857D with panel removed. The YSK-857 Separation Kit can be used to allow the front panel to be remotely mounted.



60 meter channels are indeed on the allocated frequencies when the factory provided channels are selected.

This makes 60 meter operation as simple as switching from VFO mode to memory mode and selecting the desired

channel. Note that the FCC regulations limit output power to 50 W effective radiated power (ERP) compared to a dipole. If you have a dipole with no transmission line loss, you need to set your output power to 50 W to be compliant.

With any other type of antenna you will need to compute and record the allowable power to be compliant.

## Why TCXO?

The TCXO option is popular because many operators want a temperature-compensated crystal oscillator reference to ensure that their operating frequency stays constant over a wide range of ambient temperatures. It is also a good idea considering the close frequency tolerances for 60 meter operation and V/UHF on CW and SSB. The option is also useful when the radio is used as a microwave IF. Finally, it's a necessity for narrow-bandwidth work such as the JT modes for EME at VHF and higher.

## To Buy or Not to Buy?

Before purchasing the FT-897, I considered the FT-857, but I was looking for more than a mobile radio. Since then, the '897 has become my radio of choice and inspired a renewed interest in operating. I've put up a 525-foot-perimeter horizontal loop in the trees around the house, and now operate from home when I get the chance. Hence, I need to disconnect, carry and reconnect the rig for every trip. What a drag! How about a dedicated mobile rig for the car? Shortly after the FT-897, Yaesu introduced its mobile-dedicated counterpart, the FT-857.<sup>2</sup>

## FT-857

Electronically, the two are nearly identical. The '857 gives up the compartment for internal batteries or power supply to achieve a *much* smaller package designed especially for mobile, rather than portable operation. The DSP board became an extra-cost accessory (now standard in the D model). The '857 also takes an accessory remote control microphone (MH-59A8J) that puts most of the radio's features in the operator's hand. (The microphone works with '897s, as well.<sup>3</sup>) The '857 has a removable front panel

<sup>2</sup>R. Arland, "Product Review: Yaesu FT-857 MF/HF/VHF/UHF Transceiver," *QST*, Aug 2003, pp 63-67.

<sup>3</sup>To work with the microphone, early (before about June 2003) FT-897s require a Yaesu firmware update. For the update, you must send the radio to a Yaesu repair facility. If the radio's warranty has expired, there is a small charge for the service.

You can determine whether a particular radio needs the update by repeatedly pressing the DSP button on the front panel. If the action simply brings up the DSP multifunction menu and leaves you there, the radio needs the upgrade. If repeated presses toggle between the current multifunction menu and the DSP menu, the radio should work with the microphone.

**Table 2**  
**Yaesu FT-857D, serial number 4H0260120**

### Manufacturer's Specifications Receiver

SSB/CW sensitivity, bandwidth not specified, 10 dB S/N: 1.8-30 MHz, <0.2 μV; 50-54 MHz, <0.13 μV; 144-148, 430-450 MHz, <0.13 μV.

Blocking dynamic range: Not specified.

Two-tone, third-order IMD dynamic range: Not specified.

Third-order intercept: Not specified.

Second-order intercept: Not specified.

### Transmitter

Power output: HF and 50 MHz: SSB, CW, FM, 100 W, AM, 25 W (carrier); 144 MHz, SSB, CW, FM, 50 W, AM, 12.5 W (carrier); 430 MHz, SSB, CW, FM, 20 W, AM, 5 W (carrier).

Spurious-signal and harmonic suppression: ≥50 dB on HF; ≥60 dB on VHF and UHF.

SSB carrier suppression: >40 dB.

Undesired sideband suppression: >50 dB.

Third-order intermodulation distortion (IMD) products: Not specified.

Note: Unless otherwise noted, all dynamic range measurements are taken at the ARRL Lab standard spacing of 20 kHz.

**Bold type** indicates data from the original FT-857 review.

\*Measurement was noise-limited at the value indicated.

### Measured in the ARRL Lab Receiver Dynamic Testing

Noise floor (mds), 500 Hz filter:

|         | Preamp off | Preamp on |
|---------|------------|-----------|
| 3.5 MHz | -126 dBm   | -135 dBm  |
| 14 MHz  | -128 dBm   | -137 dBm  |

Noise floor (mds), 2.4 kHz filter:

|         | Preamp off | Preamp on |
|---------|------------|-----------|
| 5.3 MHz | -121 dBm   | -129 dBm  |

Blocking dynamic range, 500 Hz filter:

| Spacing | Preamp off/on | Preamp off/on |
|---------|---------------|---------------|
| 20 kHz  |               | 5 kHz         |

|         |              |          |
|---------|--------------|----------|
| 3.5 MHz | 125*/123* dB | 96/95 dB |
|---------|--------------|----------|

|             |                |               |
|-------------|----------------|---------------|
| <b>orig</b> | <b>111/109</b> | <b>99/102</b> |
|-------------|----------------|---------------|

|        |              |          |
|--------|--------------|----------|
| 14 MHz | 122*/120* dB | 96/95 dB |
|--------|--------------|----------|

|             |                |                |
|-------------|----------------|----------------|
| <b>orig</b> | <b>109/106</b> | <b>96*/89*</b> |
|-------------|----------------|----------------|

Blocking dynamic range, 2.4 kHz filter:

| Spacing | Preamp off/on | Preamp off/on |
|---------|---------------|---------------|
| 20 kHz  |               | 5 kHz         |

|         |              |          |
|---------|--------------|----------|
| 5.3 MHz | 116*/116* dB | 91/91 dB |
|---------|--------------|----------|

IMD dynamic range, 500 Hz filter:

| Spacing | Preamp off/on | Preamp off/on |
|---------|---------------|---------------|
| 20 kHz  |               | 5 kHz         |

|         |          |          |
|---------|----------|----------|
| 3.5 MHz | 84/83 dB | 68/67 dB |
|---------|----------|----------|

|             |              |              |
|-------------|--------------|--------------|
| <b>orig</b> | <b>91/90</b> | <b>68/67</b> |
|-------------|--------------|--------------|

|        |          |          |
|--------|----------|----------|
| 14 MHz | 88/88 dB | 68/67 dB |
|--------|----------|----------|

|             |              |              |
|-------------|--------------|--------------|
| <b>orig</b> | <b>86/89</b> | <b>67/65</b> |
|-------------|--------------|--------------|

IMD dynamic range, 2.4 kHz filter:

| Spacing | Preamp off/on | Preamp off/on |
|---------|---------------|---------------|
| 20 kHz  |               | 5 kHz         |

|         |          |          |
|---------|----------|----------|
| 5.3 MHz | 81/80 dB | 64/63 dB |
|---------|----------|----------|

| Spacing | Preamp off/on | Preamp off/on |
|---------|---------------|---------------|
| 20 kHz  |               | 5 kHz         |

|         |               |             |
|---------|---------------|-------------|
| 3.5 MHz | +2.3/-6.8 dBm | -18/-26 dBm |
|---------|---------------|-------------|

|             |                  |                |
|-------------|------------------|----------------|
| <b>orig</b> | <b>+5.6/-1.9</b> | <b>-21/-29</b> |
|-------------|------------------|----------------|

|        |               |             |
|--------|---------------|-------------|
| 14 MHz | +4.1/-4.9 dBm | -20/-29 dBm |
|--------|---------------|-------------|

|             |                  |                |
|-------------|------------------|----------------|
| <b>orig</b> | <b>+1.3/-6.7</b> | <b>-24/-32</b> |
|-------------|------------------|----------------|

|         |               |             |
|---------|---------------|-------------|
| 5.3 MHz | +3.5/-5.6 dBm | -19/-27 dBm |
|---------|---------------|-------------|

### Transmitter Dynamic Testing

CW, SSB, FM, typically 107 W high.

144 MHz: CW, typically 49 W high;

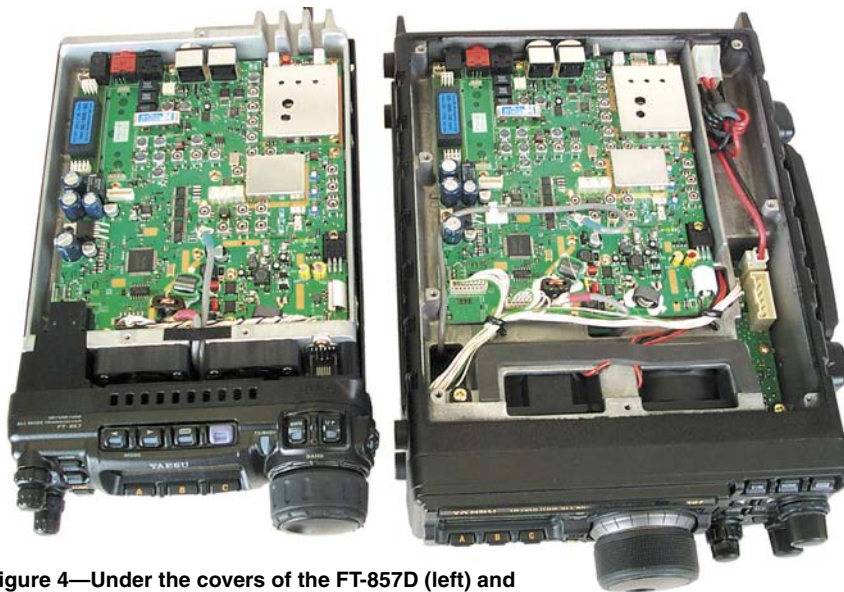
432 MHz: CW, typically 19 W high.

HF, 53 dB; 50/144 MHz, 61/63 dB. Meets FCC requirements.

>70 dB.

56 dB.

3.5 MHz, third order, -21 dB PEP, fifth order, -32 dB PEP. (5.3 MHz data, -23 and -37 dB PEP).



**Figure 4—**Under the covers of the FT-857D (left) and FT-897D. Their common ancestry is evident in spite of the difference in size. The optional CW filters are plugged in at the upper left of each radio.

that can be remotely mounted, as is common with many mobile transceivers, but with a couple of twists. Many mobile radios forgo a front-panel headphone jack to save panel space, but there is a front-panel  $\frac{1}{8}$  inch headphone jack on the '857, as well as a speaker jack on the rear panel. By spacing several control buttons around the perimeter of the front panel—including the circular area behind the tuning knob—Yaesu has made them easier to locate by touch.

With FT-857D street prices below \$800, I'll be looking when the payments on that new wagon are finished.

### The MH-59 Microphone—Now That's Control

Figure 5 shows front and Figure 6 the side views of the mic. Anyone familiar with an '897 will recognize that many of the button labels match those on the '897 front panel. Some buttons serve three

functions—as a tone pad in the DTMF mode, as a number keypad in frequency entry mode and specific functions when commanding the transceiver.

A small thumbwheel at the upper right of the mike also performs several functions controlled by the nearby AF/SEL/DIAL button. After a short press of the button, the wheel adjusts frequency as if it were the main dial on the front panel. Fast and slow tuning rates apply according to the action of the power buttons on the mic and front panel. A long press of the mic D/F button puts the radio in menu mode, and the thumbwheel acts as the SEL dial to select the various menus. After a long press of the AF/SEL/DIAL button, the wheel sets the AF gain.

Frequencies may be entered directly by pressing the ENT button followed by numbers from the keypad (D serves as the decimal point), with ENT pressed again to complete the entry. (The microphone



**Figure 5—**Details of the MH-59 Remote Control Microphone front panel.



**Figure 6—**Tuning wheel on the side of the MH-59 Remote Control Microphone.

essentially functions as a small CAT control pad, and it works with '897s, as well.<sup>3</sup>

*Manufacturer:* Vertex Standard, 10900 Walker St, Cypress, CA 90630; tel 714-827-7600; [www.vxstdusa.com](http://www.vxstdusa.com). Price: FT-857D, \$769.99; YF-122C 500 Hz CW filter, \$159.99; MH-59A8J Remote Control Microphone, \$64.99; YSK-857 Separation Kit, \$54.99; FT-897D, \$879.99; FP-30 internal power supply, \$209.99; FNB-78 Ni-MH battery pack (one or two can be used) \$99.97; CD-24 charge adapter \$119.99.