

Product Review

Conducted By Paul K. Pagel,* N1FB

Yaesu FT-707 Transceiver

Do good things still come in small packages? Well, with respect to the FT-707, that old saying could be considered noteworthy depending upon one's point of view — objective, subjective or a little bit of both.

Our review model arrived at Hq. in late October of 1980, just in time for this writer to bundle it up and carry it to Tortola, British Virgin Islands, for a two-week "hamcation" as VP2VGT. It was definitely the proper size for traveling by air after packing it into a portable electric typewriter case along with a keyer, paddle, microphone, antenna wire, coaxial cable and some hand tools. The parcel fit handily under the seat of the 727 jet. The power supply was carried in another suitcase and made the trip in the belly of the plane.

Long Bay Hotel on Tortola proved to be a good testing ground for the FT-707, because the temperature ranged from 75° F (24° C) at night to 95° F (35° C) in the daytime giving the internal cooling fan plenty of exercise whenever the heat sensor actuated it. The fan noise was minimal, but audible, and was considered acceptable in the interest of protecting the transistors in the power amplifier. Also the ac line voltage on the island ramped from as low as 95 to as high as 125 depending on the peak demand at various times of the day. The transceiver continued to operate properly, except for a drop in output power during periods of low line voltage. There were no noticeable effects from the salt air and high humidity respective to overall performance.

We didn't realize it when we left Connecticut, but that particular FT-707 did not contain a cw filter (an accessory). A fair amount of nail biting followed, since 90% of the operation was to be on cw! Fortunately, the FT-707 has an i-f width control, which varies the pass-band from approximately 300 Hz to 2.4 kHz. This feature made it possible to obtain sufficient selectivity for cw reception, and the problem was solved. It would have been much better, however, to have the 350- or 600-Hz accessory filter installed for enhanced skirt selectivity and ultimate rejection. Both filters are available from Yaesu — so is an i-f filter for a-m reception.

The only anomaly we observed during the two weeks of vigorous operation with the first unit (serial no. OFO20793) was VFO drift. From a cold start to approximately two hours later, the drift was roughly 1.5 kHz. It was gradual enough after the first 15 minutes to pose only minor problems. A second FT-707 (serial no. OJO80841) was obtained after we returned to the USA, and it drifted in a like manner. Scattered reports of substantial drift were also received from owners in the field. We checked this out with Yaesu, and were told that there was no case history problem with drift. We were sent a third review unit, and it drifted only 10 Hz (measured at the antenna jack, key down, 25 watts of output). The test period was one hour long. Close inspection of the VFO interior revealed no evidence of circuit changes



or "customizing" of the third review unit. Perhaps the later FT-707s contain different compensating capacitors in the VFO, or the drifting units simply had defective capacitors.

The FT-707 receiver exhibited good dynamic range during the VP2VGT operation. There was no IMD or overloading evident from the strong Region 2 commercial stations to the south of us. Even more dramatic was the ability of the receiver to function satisfactorily when W8JUY/VP2VGW and the reviewer operated the same band (one on cw and the other on ssb). The two stations were only 30 ft (9.1 m) apart and the antennas were even closer. Of course, there were IMD products and hash in the receiver, but no cross-modulation or high-order desensing was noted.

FT-707 Features

The operating modes are ssb and cw, with a rating of 100 watts output. There is also an a-m mode, for which the output power is specified as 50 watts. Frequency readout is by means of a digital display, but analog readout is also provided.

The S meter uses a string of LEDs, illuminating left to right in accordance with the incoming signal strength. Green, yellow and red banks of lights indicate different regions of signal strength. We had fun giving out signal reports such as, "you're Q5 and S red." The LED "meter" also indicates relative power output and the alc level during ssb operation. There is a built-in speaker, noise blanker, RIT and crystal calibrator. The VOX controls are located on the front panel for easy access.

One can purchase the FP-707 ac-operated

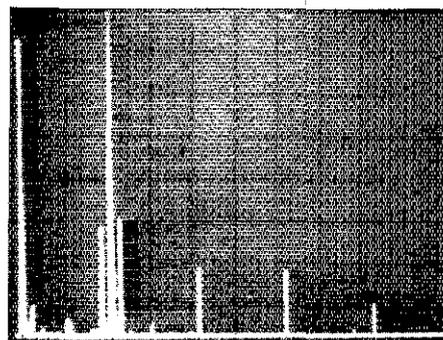


Fig. 1 — Worst-case spectral output of the Yaesu FT-707 operating at 10.1 MHz. Vertical divisions are each 10 dB. Horizontal divisions are each 5 MHz. Worst-case harmonic output is approximately 61 dB down from the fundamental. Worst spurious output is approximately 49 dB down from the fundamental. The Yaesu FT-707 complies with present FCC specifications for spectral purity. All measurements were taken in the ARRL lab.

power supply as an accessory. It delivers 13.5 volts dc and has a built-in speaker. Another accessory is the synthesized outboard VFO (FV-707DM), which has 12 memory channels. The resolution is 10 Hz. When using the YM-35 mating microphone and FV-707DM synthesizer, the operator can shift the frequency up or down by means of QSY buttons on the microphone — ideal for mobile operation. Yaesu also sells an FC-707 mating Transmatch. The entire setup can be mounted in a special

*Assistant Technical Editor

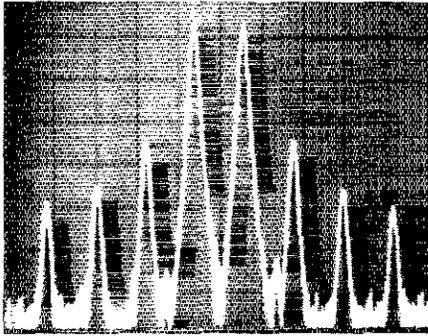


Fig. 2 — Spectral photograph of the two-tone, third-order transmitter IMD characteristics of the FT-707. Vertical divisions are each 10 dB; horizontal divisions are each 1 kHz. Third-order IMD products are down approximately 34 dB from the PEP level, and fifth-order products are down approximately 44 dB. Each tone is 6 dB below the PEP level.

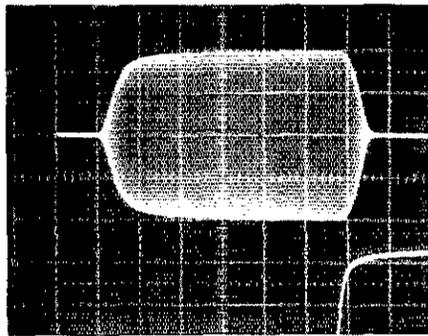


Fig. 3 — Cw keying waveform of the FT-707. The partially visible lower trace is the switching waveform at the key jack, and the upper trace is the output envelope. Output is generated approximately 5 ms after key closure. Good rise and fall times as indicated produce a clickless wave.

mainframe that is available from the manufacturer.

Other Considerations

No mention of use with an external amplifier is found in the instruction book, and two letters to Yaesu inquiring about the use of outboard amplifiers elicited no response. There are no terminals available for actuating the T-R circuitry of an outboard amplifier. It appears, however, that the operator could connect an external 12-V relay in parallel with the FT-707 VOX/PTT relay for use in controlling a separate amplifier.

The three WARC-sanctioned amateur bands (10, 18 and 24 MHz) are included in the 80-through 10-meter coverage of this transceiver. *Warning: The U.S. Government has yet to authorize amateur use of these bands!*

The FT-707 appears to be an excellent unit for mobile operation and field use. It can serve nicely as a home-station transceiver as well, and should appeal particularly to those who favor compact equipment. — *Doug DeMaw, W1FB*

THE KLM KT-34XA TRIBAND YAGI ANTENNA

□ When one thinks of the usual triband anten-

Yaesu FT-707 Transceiver Serial No. OJ100772

Manufacturer's Claimed Specifications

Frequency coverage: 80-10 meters, inclusive of WARC bands.
 Readout: Analog and digital.
 Resolution: Analog — 1 kHz; digital — 100 Hz.
 KHz, one turn of knob: Not specified.
 Backlash: Not specified.
 RIT/XIT range (kHz): ± 3
 I-f width control: 300 Hz to 2.5 kHz.
 Receiver attenuator: None.
 S-meter sensitivity ($\mu\text{V/S9}$): Not specified.
 Receiver sensitivity: Ssb/cw — $0.25 \mu\text{V}$ for 10 dB S/N; a-m — $1.0 \mu\text{V}$ for 10 dB S/N.

Audio power output (4 ohms): 3 watts.
 Power consumption: At 13.5 volts dc, 20 A (transmit) and 1.5 A (receive).
 Transmitter power output (watts): Not specified. Input: 240 watts for ssb and cw; 80 watts a-m.
 Spurious suppression: At least 50 dB.
 Harmonic suppression: Not specified.
 Transmitter two-tone, 3rd-order IMD: At least -31 dB.
 Key-down limitation: 30 seconds with a 2-minute pause between key-down periods.
 Frequency stability: 300-Hz drift over 30 minutes after 10-minute warm-up; then 100-Hz drift after 30-minute warm-up.
 Size (HWD): 3-5/8 x 9-1/2 x 11-5/8 in. (93 x 240 x 295 mm).
 Weight: 15 lb (6.5 kg).
 Color: Two-tone gray.

ARRL Lab Measurements

As specified plus approx. 60 kHz on low ends of bands and 10 kHz on high end of 80 m. 150 kHz or more on high end of remaining bands.
 As specified.
 As specified.
 15
 Nil.
 -3 to +3.5
 As specified.

 80 m — 30; 40 m — 27; 30 m — 27; 20 m — 40; 17 m — 45; 15 m — 45; 12 m — 45; 10 m — 71.
 Dynamic range measured with optional 600 Hz i-f filter installed.

	80 M	20 M
MDS (dBm):	-126	-127
Blocking DR (dB):	noise limited	noise limited
IMD DR (dB):	77 lo	83 lo
	76 hi	80 hi
3rd-order input intercept (dBm):	-10.5 lo	-1.5 lo
	-12.0 hi	-6.0 hi

As specified. Quality good.
 Not measured.
 80 m — 135; 40 m — 120; 30 m — 120; 20 m — 120; 17 m — 120; 15 m — 120; 12 m — 125; 10 m — 125.
 Approximately 49 dB (see spectral photograph).
 >60 dB
 -34 dB. See spectral photograph.
 Not measured.
 10-Hz drift from cold start to 1 hour later. Measured at antenna jack with transmitter key down, 25 watts output.
 As specified.
 Not checked.
 As specified.

na, a vision of compactness and compromise generally comes to mind. Not so with the KLM KT-34XA. This antenna is a direct descendant of the KT-34A (a KT-34A to XA conversion kit is available for \$225). For a tribander, the 34XA is big: It weighs 68 pounds (31 kg), has a longest element length of 24 feet 8 inches (7.5 m), a 3-inch (76-mm) diameter, 32-foot-long (9.6-m) boom (braced by means of overhead cables) and a projected wind surface area of 9 square feet (0.84 m²). The turning radius is 21 feet 6 inches (6.5 m), and KLM rates the antenna at a 4-kW capability and a wind survivability of 100 mi/h (161 km/h). A full-sized,

10-meter element has been added as has another tri-resonant element. There are now six working elements on 10 meters and five elements on 15 and 20 meters. KLM suggests that suitable rotators may include the TR-44, Ham M types, HD and KR-400.

Assembly

If your usual plan for antenna erection is from box to tower in one day, forget it! It took about an hour to open and empty the single carton and check the contents against the parts list. There are *many* parts. Approximately 25 hours were required to bring the antenna to the

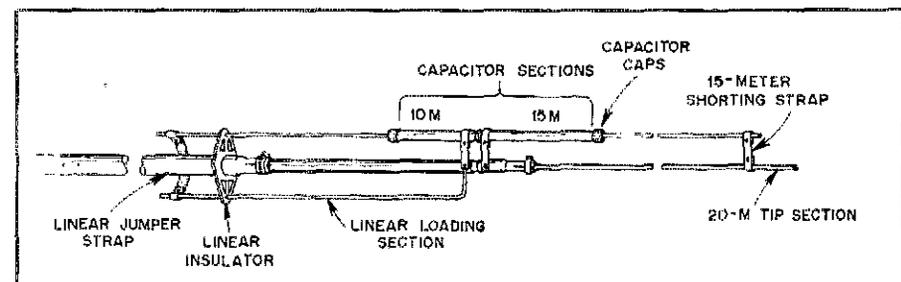


Fig. 4 — A tri-resonant section of the KT-34XA antenna. There are two of these sections in each of five elements. The sixth element is a separate 10-meter director.