

Bottom view of the T-4XC. In this picture the final amplifier is at the top left, with the driver stage at the top right.

for it. For example, in working with Oscar 6 it's necessary to be able to hear the satellite output on ten meters at the same time you're transmitting on two meters. This is mighty hard to do if your station consists of an hf transceiver with transmitting converter!

If you decide on a separate transmitter and receiver you'll almost certainly obtain both from the same manufacturer, and your choice of equipment will probably depend more upon the receiver than the transmitter. If your requirements include 160-meter coverage and provision for coverage of accessory ranges with both the receiver and the transmitter, chances are that your station will have been built and engineered in Miamisburg, Ohio. — *K1ZND*

Drake T-4XC Transmitter

Frequency coverage: 3.5-4.0, 7.0-7.5, 14.0-14.5, 21.0-21.5, 28.5-29.0 MHz standard; provision for 4 additional 500-kHz ranges between 1.8 and 30.0 MHz, excluding 2.3-3.0, 5.0-6.0, 10.5-12.0 MHz.*

Power input: 200 watts PEP, ssb and a-m; 200 watts cw.*

Carrier suppression on ssb: Rated 60 dB or better, measured over 70 dB.*

Unwanted sideband suppression: 60 dB or better.*

Frequency response, ssb: 325 to 2725 Hz at 6 dB down.

Dial calibration: to 1 kHz.*

Calibration accuracy: Better than 1 kHz when calibrated to nearest 100-kHz point.*

Spurious outputs: Better than 50 dB down except as noted in text.*

Power amplifier tubes: Two parallel 6JB6As.

Meter functions: Power amplifier cathode current, relative rf power output.

Dimensions (HWD) and Weight:

5-1/2 × 10-3/4 × 11-5/8 inches, 14 pounds, 10 ounces.*

Power requirements: 650 V dc at 200 mA average, 330 mA maximum; 250 V dc at 120 mA; -45 to -65 V dc adjustable bias; 12.6 volts ac or dc at 3 A. Requirements supplied by AC-4 (\$100) or by DC-4 (\$125) external power supply.

Price class: \$530.

Manufacturer: R. L. Drake Company, Miamisburg, Ohio 45342.

* Measurements made in the ARRL lab.

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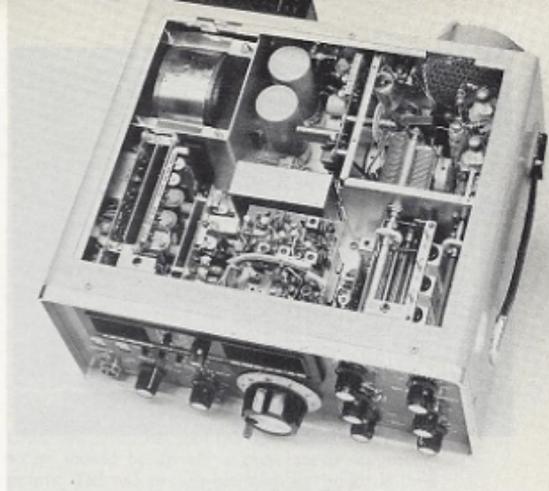


Yaesu Muse FT-101B Transceiver

PACK IT UP and take it with you, the man said, so we took the 13-1/2 × 6 × 11-1/2-inch gray box to the West Indies for a two-week shakedown test. Hand carrying some 30 pounds of phone/cw transceiver (power supply built in) can

be convenient when one travels, and the FT-101B qualifies. It is small enough to fit under the seats of most jet airliners, and is not too heavy to carry by hand through air terminals. As the writer learned, having a multiband rig (160 through 10 meters) with you on vacation can provide many hours of pleasure, assuming that the XYL is willing to share her "prime time" with ham-band denizens to whom you address your CQs and replies. This writer was fortunate in that regard, for the XYL

Top view of the FT-101B interior. The cover has been removed from the PA compartment (upper right). The noise-blanker module is visible at the lower center.



(W1CCKK/8P6FJ) helped test the transceiver for on-the-air worthiness from 8P6 land.

The relative compactness of the FT-101B package results in part from the use of semiconductors — 12 FETs, 29 bipolar transistors, and 3 ICs. Yaesu was *sympatico* with the vacuum-tube enthusiasts, however, for three tubes are included in the lineup. A 12BY7A serves as the driver, and two parallel-connected 6JS6C TV sweep tubes repose in the final-amplifier compartment.

Mobile or fixed-station operation is possible with the single built-in power supply. All the operator need do to switch from 12-volt dc to ac-line operation (117- or 235-volt ac mains) is change rear-apron power cords. Our vacation site featured by circumstance an ac power system that was at times so weak it needed crutches! That is to say, the voltage would drop to some level between 95 and 105 (50 Hz) during periods of peak demand, but the FT-101B continued to spew out chirpless cw signals. No adverse effect other than a marked reduction in loaded plate current was observed. When the mains were low in output the maximum dc input to the PA stage mangled near 100 watts rather than the normal rated 180 watts on cw. No damage to the rig resulted from low line voltage.

A possible problem was avoided by ensuring increased ventilation of the PA compartment while in that tropical environment. Operation took place from a veranda which was sun-drenched during afternoon periods. Though Yaesu offers a PA cooling fan as an accessory, the unit we had was without one. Therefore, it became necessary to remove the transceiver top cover, plus the PA cage lid. This helped keep the overall transceiver much cooler. It is recommended that those living in warm-climate regions include the fan as part of the package. Despite the intrusion of an occasional insect into the PA compartment, no adversities were noted from having the 6JS6Cs exposed.

Some Observations

The FT-101B has been subjected to daily use for the past four months, afield and at home. Only one failure has occurred thus far, and that was the result of an open coax line during 10-meter operation from 8P6EU. It was disconcerting to see the plate current rise slowly until the needle was almost pinned against its stop! The thin, ominous tendrils of smoke rising from the PA compartment were not an encouraging sign either. Fortunately, the problem was cured quickly by snipping loose a shorted silver-mica capacitor which was part of a wave-trap circuit in the PA.

The following comments are based purely on the reviewer's operating point of view, and may or may not represent scoring points of consequence to prospective buyers of the FT-101B.

Desirable Characteristics

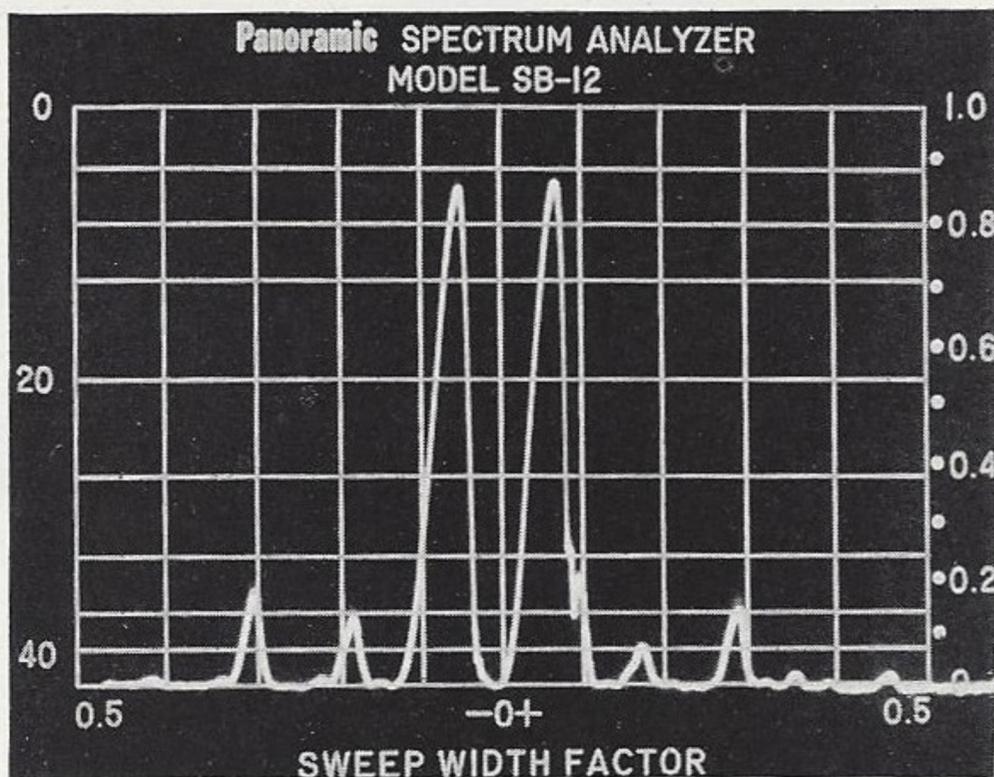
- 1) Good receiver sensitivity.
- 2) Band or mode switching done quickly and easily.
- 3) Dial readout accurate to 1 kHz.
- 4) Smooth operation of main tuning.
- 5) Excellent audio-quality reports on ssb.
- 6) Includes 160-meter band.
- 7) Includes RIT (optional actuation), ± 5 kHz.
- 8) Has WWV band position (15 MHz), plus internal 100- and 25-kHz calibrator
- 9) Tube heaters can be turned off for low-drain band monitoring (500 mA).
- 10) Excellent VFO stability.
- 11) Contrary to reports received at ARRL Hq., lab tests show the transmitter output to be relatively clean with respect to harmonics and spurious products. (See Table I.)

Table I

Band (MHz)	Pwr. Output (W) At 300 mA Plate Current	Harmonics Down (-dB) or Greater	Spurious Products Down (-dB) or Greater
1.810	54*	-37*	-40*
3.700	110	-38	-50
7.200	145	-39	-50
14.200	120	-40	-40
21.200	120	-38	-52
28.500	90	-40	-50

Power output and spurious response chart for the FT-101B.

* 160-meter measurements made at reduced dc input to PA (100 W). Measurements on other bands were made at 180-W input. Measurements were made with equipment tuned (stages ahead of PA) by manufacturer. Rf power-output readings were taken into a 50-ohm noninductive load while using a Bird Thru-line meter. Spurious and harmonic figures were obtained while using a Hewlett-Packard spectrum analyzer system.



Some Other Observations

- 1) Receiver cross modulates and overloads on strong local signals. (Built-in selectable 20-dB receiver front-end pad helps reduce the problem.)
- 2) Agc characteristics cause popping and clicking unless rf gain is turned back approximately one third of full amount.
- 3) Loud transient click occurs in headphones when VOX drops out after transmit periods.
- 4) Wasted band position results from inclusion of 27-MHz CB range.
- 5) Microphone must be disconnected during cw operation to prevent VOX from constantly cycling on and off.
- 6) Power supply has sufficient ripple to cause T8 cw note. (Shunting additional 100- μ F of capacitance across power-supply filter output cured problem.)
- 7) Noise blanker ineffective. (Three FT-101 transceivers were tested, and the blankers performed poorly even though adjusted in accordance with the instruction manual. Also, the blanker caused cross modulation to worsen when strong signals were present.)

Some Options

An external VFO (FV-101) can be used with the transceiver to permit outboard control of the

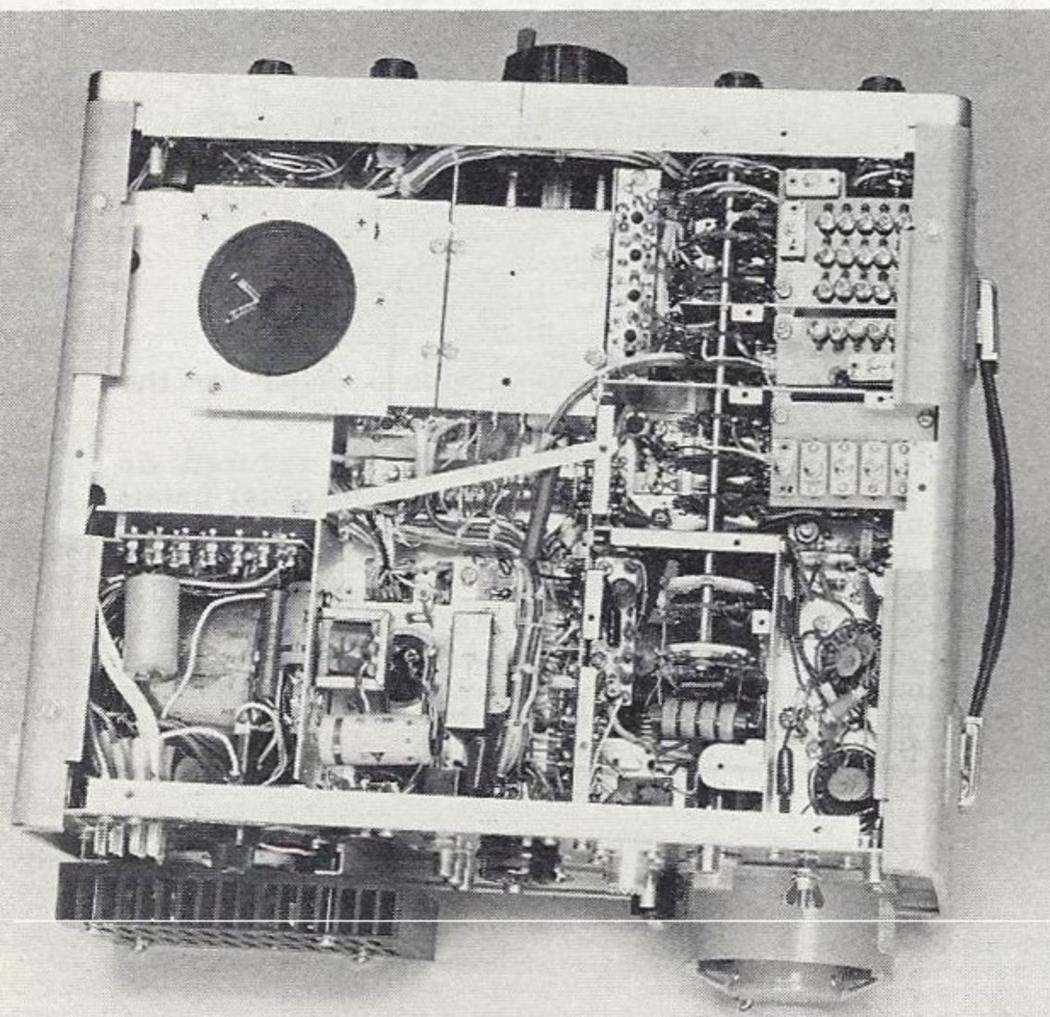


Fig. 1 — Spectrum-analyzer display of the output of the Yaesu FT-101B transceiver with a two-tone 240-W PEP input. The horizontal axis of the display represents frequency, and the vertical axis amplitude. Each "pip" represents a single-frequency component of the rf output. The display is adjusted so the amplitude of each component may be read from the scale at left, directly in decibels below the peak-envelope power (PEP) output, as rated by the manufacturer. Each reticle division represents 5 dB. Responses other than the two individual tones near the center are distortion products; third-order products 34 dB down may be seen here. Individual tones of the two-tone signal are down by 6 dB from the PEP output. This is because the tones are displayed as two discrete frequencies. At the instant when voltages of the individual tones are in phase, they add to produce a peak in the envelope wave-form pattern which is twice the voltage amplitude of a single tone alone. The power at the peaks of the envelope (PEP) is therefore four times that of a single tone, a 4:1 power ratio being equivalent to 6 dB.

transmitter or receiver sections. An external speaker/phone patch (SP-101P) is available as an accessory. One can purchase and install a 600-Hz i-f filter for cw reception. The filter pc board has a space for the second filter. Most of the circuit is built on plug-in modules to permit repair service on an exchange basis.

It is the opinion of the reviewer that the FT-101B is worth the asking price if one wants versatility and compactness in a transceiver. The designers could have deleted the a-m feature for transmit and receive by not including the Citizen's Band, but for those who still find the a-m mode fascinating the feature is included. — *WICER*

Yaesu Musen Co., Ltd. FT-101B Transceiver

Dimensions (HWD):

6 × 13-1/2 × 11-1/2 inches.*

Weight: 33 pounds.*

Power requirements: 12 V dc, 500 mA receive and 20 A maximum on transmit; 117 V ac, 35 W receive and 300 W on transmit.

Modes: Usb, lsb, a-m and cw.

Receiver sensitivity: A 0.1- μ V signal is plainly audible on all bands (cw receive mode).*

Price class: \$650.

Manufacturer: Yaesu Musen USA Inc., Paramount, CA 90723.

* Tested in the ARRL lab.

Interior view of the bottom side of the FT-101B. A cooling fan is seen at the lower right of the photograph, and can be obtained as an accessory (see text).