



YAESU



FT-ONE

**GENERAL COVERAGE
ALL MODE SOLID STATE TRANSCEIVER**

Two panel meters allow the operator to monitor several circuits at once; a must for really precise transmitter adjustments and receiver monitoring.

Automatic Microphone Gain Control circuit allows squelching out background noise pickup at the microphone between words and sentences during voice transmission.

The internal RF speech processor, available as a standard feature, can be accurately adjusted with these two concentric controls using the dual metering to monitor speech compression and ALC at the same time.

Adjustable VOX gain and forward power set control for built-in SWR meter circuit.

During transmit, the inner knob controls the drive level; while during receive, the outer knob controls the noise blanker threshold level for precise setting under various noise situations.

With SSB, CW, FSK and AM standard features, you may also select two optional narrow CW bandwidths, and optional AM and FSK bandwidths. This selector also allows you to receive on one sideband and transmit on the other, such as during cross band split operation.

Either a standard or scanning microphone can be used here.

VOX and CW delay are adjustable right down to full break-in (OSK), and with the optional CMOS keyer unit installed, keyer speed can be controlled right from the front panel.

Diecast front panel, plus extra-rugged case with solid, built-in circuit shielding throughout; for protection to last a lifetime.

IF passband width and center frequency controls on a specially designed knob system that shows you visually the size and position of the continuously adjustable IF passband in relation to receiver frequency. Allows incredible flexibility in high QRM situations on SSB, CW and FSK.



DUAL VFO ACCESS

Ten digital VFOs with memory are provided, in conjunction with an A-B selection scheme that allows instant recall of any transmit, receive, or transceive frequency desired. For split-frequency operation, such as on 7 MHz SSB, the operator may select TX on VFO-A and RX on VFO-B, automatically storing the calling and listening frequencies for each pile-up. For net operations, use the optional RAM board to eliminate the possibility of dumping memory in case of power interruption.

TWO DIGITAL DISPLAYS, 12 LED STATUS INDICATORS, DUAL METERS

In addition to the main seven digit frequency display is a small red LED three digit display which shows the VFO channel selected and the clarifier frequency offset for that channel, all stored in the memory along with the main frequency. Twelve status indicating LEDs show the states of various operating functions.

Not one, but two meters allow you to monitor a choice of two operating variables at the same time; thus allowing measurements and adjustments not previously possible, without additional test equipment and switch toggling. While one meter shows you either Final PA IC, Supply VCC, FM Discriminator Tuning, SSB Speech Processor Compression or SWR; the other shows you either receiver S-units or transmit ALC. The sum of these display features gives you complete information on the operating conditions of the transceiver at a glance.



An active IC audio filter switchable between either peak or notch configurations can be tuned through the audio passband to null out heterodyne interference or provide a single tone CW passband.

Selectable AGC: slow-fast-off.

12 status indicating LEDs to tell you the operating status of each circuit at a glance.

Continuously adjustable RF attenuator utilizes a novel PIN diode system to eliminate interference from large signals that might otherwise prohibit copy with the receiver, while allowing the maximum useable sensitivity.

Dual VFO Selectors for extremely simple channel access and control for split operation.

VFO mode and control selector for the final touch in giving the operator his choice of VFO functions and method of access—Selectors or keyboard.

Optical coupling system provides dependable, highly accurate frequency derivation through a simple and highly reliable mechanism. Tuning steps of 10 Hz, 100 Hz, or 1 MHz.

Keyboard access to all 10 VFOs and the entire 30 MHz frequency range, including scan functions, clarifier, and tuning rate. Split frequency operation may also be controlled completely from the keyboard.

The RF gain control can be used to preset the signal level for the automatic scanning to stop on signal. Manual scanning can be controlled either via the keyboard or scanning microphone.

AF gain and FM Squelch control on concentric shafts. (Squelch control operates through the optional internal FM unit only.)

DATA KEYBOARD, 10 VFOS, SCANNING

One of the first things one notices on the FT-ONE is the 24 button keyboard, which includes a numerical keyboard for frequency entries (in addition to the dial) into any of the 10 internal VFOs; and control keys for the scanning system, tuning rate selection and clarifier. The scanning system (controllable either from the front panel or an optional scanning microphone) includes a choice of two scanning rates, automatic stop-on-signal (at presettable levels via the RF gain control), and covers all of the frequency range from 150 kHz to 30 MHz continuously in selectable 100Hz or 100 kHz steps. The PLL steps are 10 Hz which can be tuned by the dial in 2 kHz, 20 kHz or 10 MHz per turn rates. The simple VFO system allows independent programming of each channel for transmit or receive from either the keyboard or the dial at the touch of a button, and permits cross-band split operation, even will full break-in (QSK).

TOTAL CONTROL FROM THE FRONT PANEL

In addition to those already mentioned, the FT-ONE gives you fingertip control of the noise blanker threshold, IF speech processor compression level, VOX gain and delay, CW break-in delay right down to QSK, optional internal keyer speed, FM squelch, AGC "hang" time (slow, fast, off), and Automatic Microphone Gain Control (AMGC--removes background noise pickup during transmission), right on the front panel.

YAESU MUSEN COMPANY, LTD.

For over a quarter of a century, Yaesu Musen has brought top quality equipment to the radio amateurs of the world. Today, Yaesu is a fast-growing company of over 700 employees, the industry leader in production capacity and quality innovation.

Yaesu's ambitious engineering staff is continually advancing the state of the art in amateur communications. Not only are they highly skilled experts in circuit design; the Yaesu engineers are masters of packaging, making available highly sophisticated communications instruments smaller than most typewriters.

Yaesu's production workers are also specialists. Only experienced personnel are considered for placement within the Yaesu organization, and each employee receives an intensive training course prior to joining the assembly team. Our assembly facilities are located some 250 km. north of Tokyo in Fukushima prefecture, a pastoral setting with an outstanding employee base.

Four years ago, Yaesu's President initiated a top-secret design project involving all divisions of the company. The goal: to make an elite-class transceiver which would eclipse all competition in performance and features. Besides having the most modern, flexible computer circuitry for frequency control, painstaking attention to the fundamentals of transceiver design was to be utmost in the minds of the designers. Filter skirt selectivity, IF gain distribution, audio quality and durability were to be second to none.

The engineers and production staff made repeatability their primary objective in their joint meetings. Electrical designs insensitive to individual component variations were developed, automated quality control procedures were mapped out, and patented circuit achievements were evaluated in new product introductions in the late 1970's.

As technology progressed, the design was revamped to take advantage of the more sophisticated devices available to the engineers. Finally, early in 1981, the last major component was soldered in place, and the arduous task of evaluating the final design in computer simulations and field torture tests was begun. Assembly line fixtures were built, computerized testing programs were debugged, and hundreds of thousands of parts were ordered. A proud research and development staff presented its report to their President: "We've done it!"

The FT-ONE is thus a fitting opening to the second quarter century of Yaesu Musen Company. But more than simply an end unto itself, the FT-ONE stands as a springboard for even greater things to come. For the tools, techniques, and know-how generated by this monumental challenge will be brought to bear for years to come in countless future Yaesu models.

We're Yaesu, and this is the story of the FT-ONE. Both are second to none!

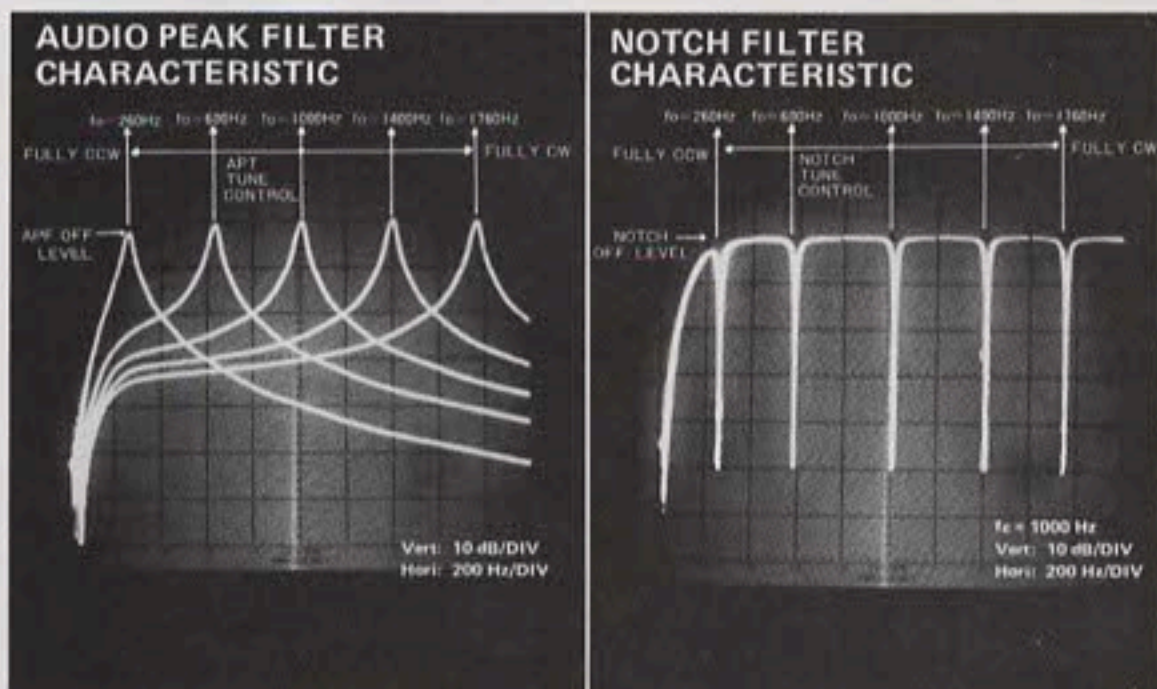
FT-ONE ALL MODE SOLID STATE GENERAL COVERAGE TRANSCEIVER

As the fruit of a revolutionary project in our Research and Development laboratory for the last few years, YAESU now unveils the Super Radio. The latest solid state technology and bold breakthroughs in engineering and design are now brought together for the first time in one incredible unit; giving you total operating control, unsurpassed performance and a new standard of quality blended together with classical harmony. Join us as we examine this bold adventure in engineering . . . the FT-ONE from YAESU!



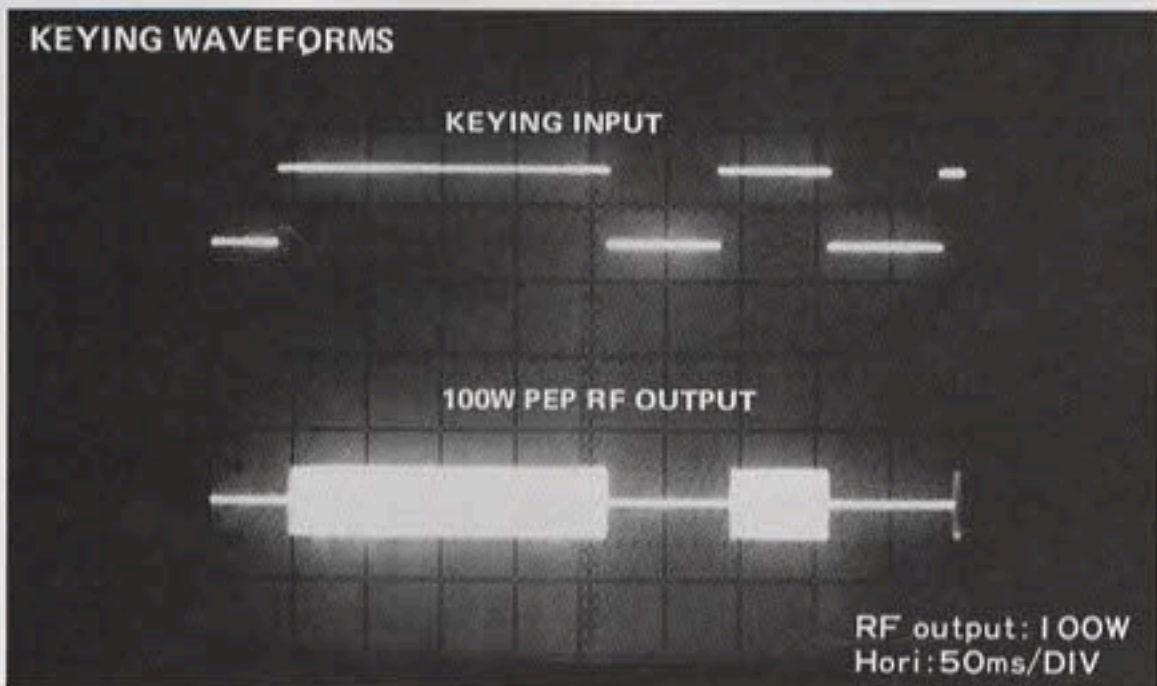
AUDIO PEAK AND NOTCH FILTERS

In the audio section, peak and notch active filters are built-in, with the frequency controlled from the front panel. The audio peak filter provides for single-signal CW reception while dramatically reducing background noise. The notch filter can be selected to null out any interfering carrier in the receiver passband. A large internal speaker provides full-range audio.



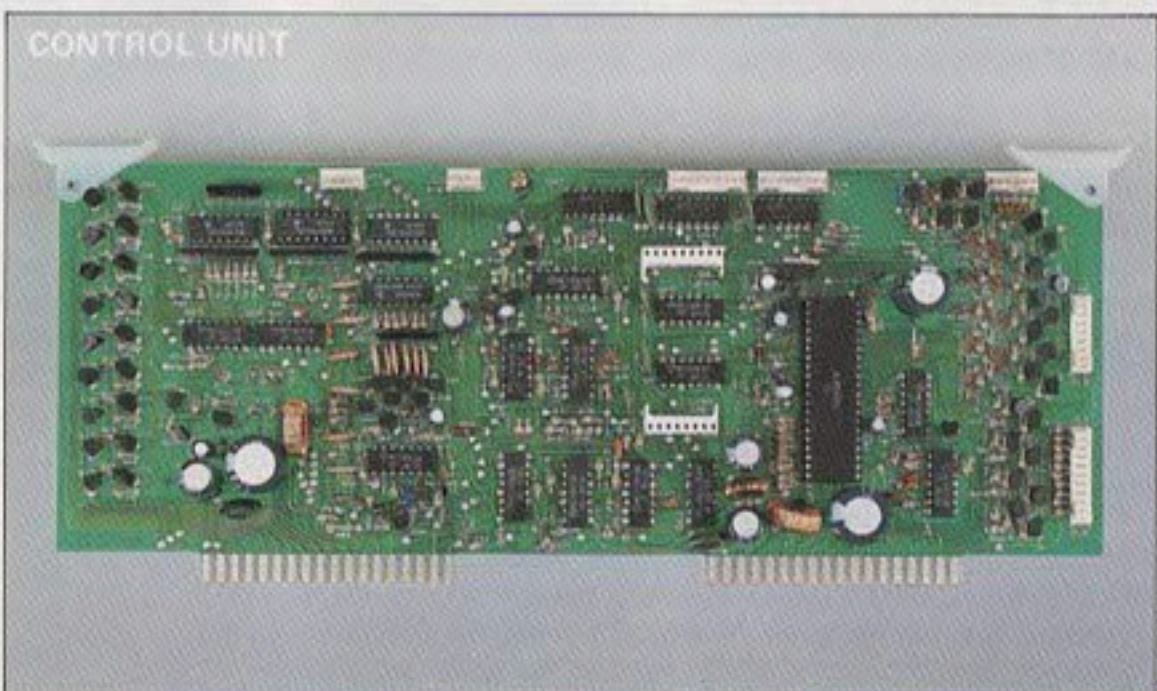
FULL CW BREAK-IN

Recent advances in solid-state technology have finally made full CW break-in reliable enough to be incorporated into a Yaesu product. Now you can select traditional semi-break-in (for use with amplifiers not equipped for full break-in) or full high-speed break-in. When the optional Keyer Unit is installed, the keyer output lead may be interrupted via a rear panel jack and routed to the break-in sequencing input on your full break-in amplifier.



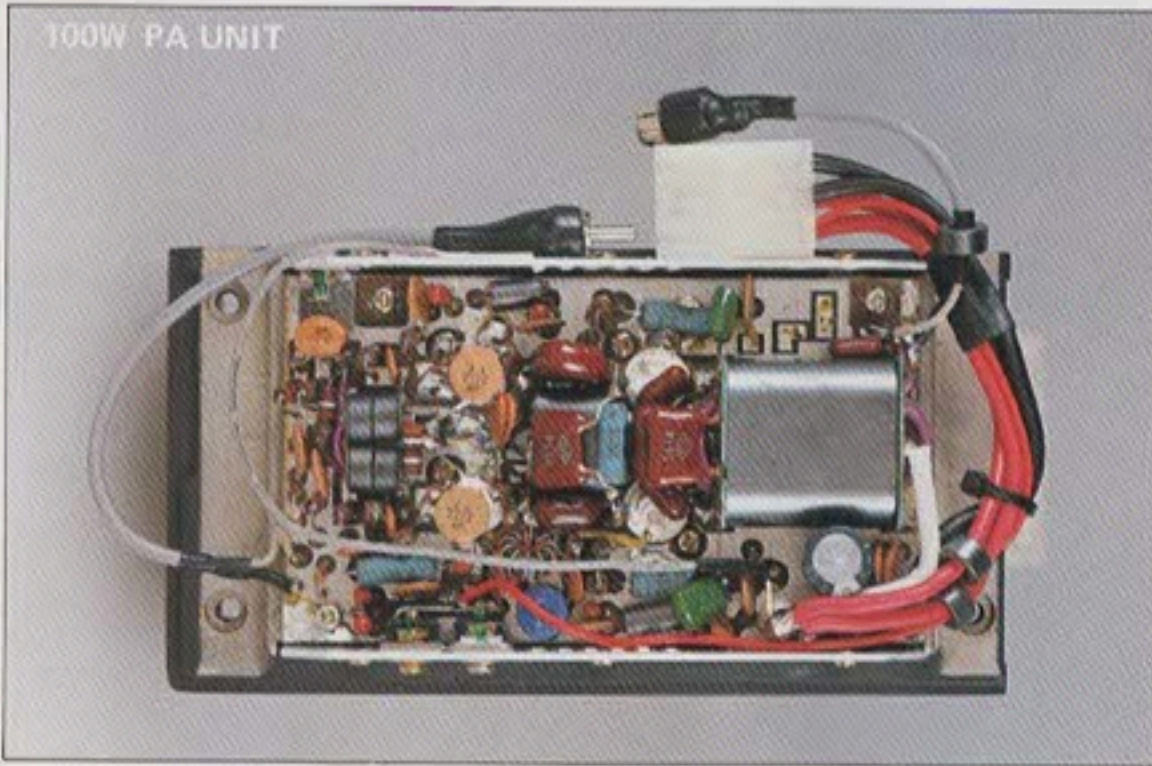
FOUR BIT CPU FOR OPERATING COMMANDS

The heart of the FT-ONE control circuitry is a four-bit central processing unit. The microprocessor provides the operator with fingertip control over frequency selection, VFO selection, clarifier offset, and scanning operation, with internal filter selections and protection commands being performed automatically as the microprocessor monitors transceiver data. Split-second control over all aspects of transceiver is yours to enjoy, bringing you unparalleled flexibility in your daily operating.



ALL SOLID STATE POWER AMPLIFIER

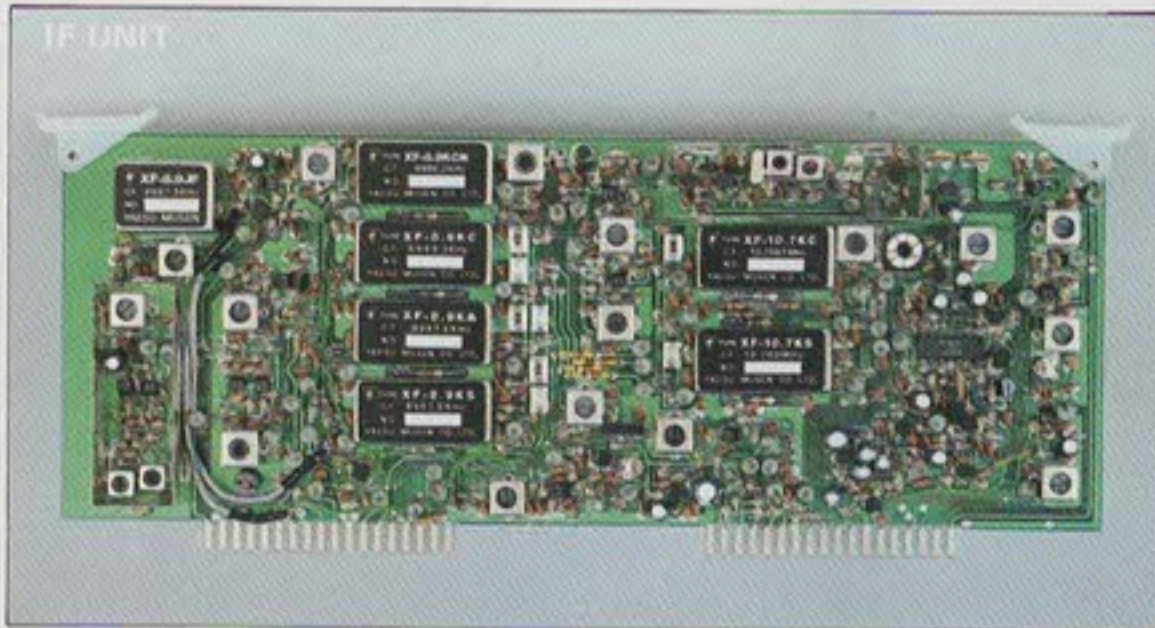
100W PA UNIT



Rugged power transistors with extensive protection circuitry are your assurance of reliable operation for many years to come. Completely broadbanded, the FT-ONE transmitter requires no tuning for instant operation on any band for which it is configured. Crossband full break-in operation is a prime example of the flexibility afforded by the broadband solid state design.

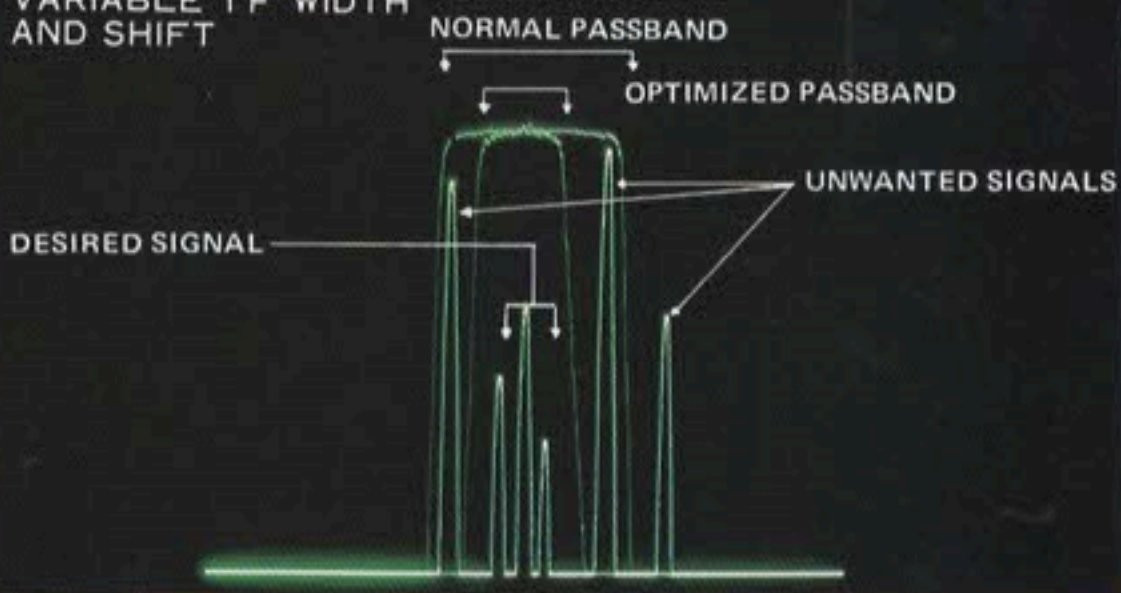
EXPANDED CHOICE OF BANDWIDTHS

IF UNIT



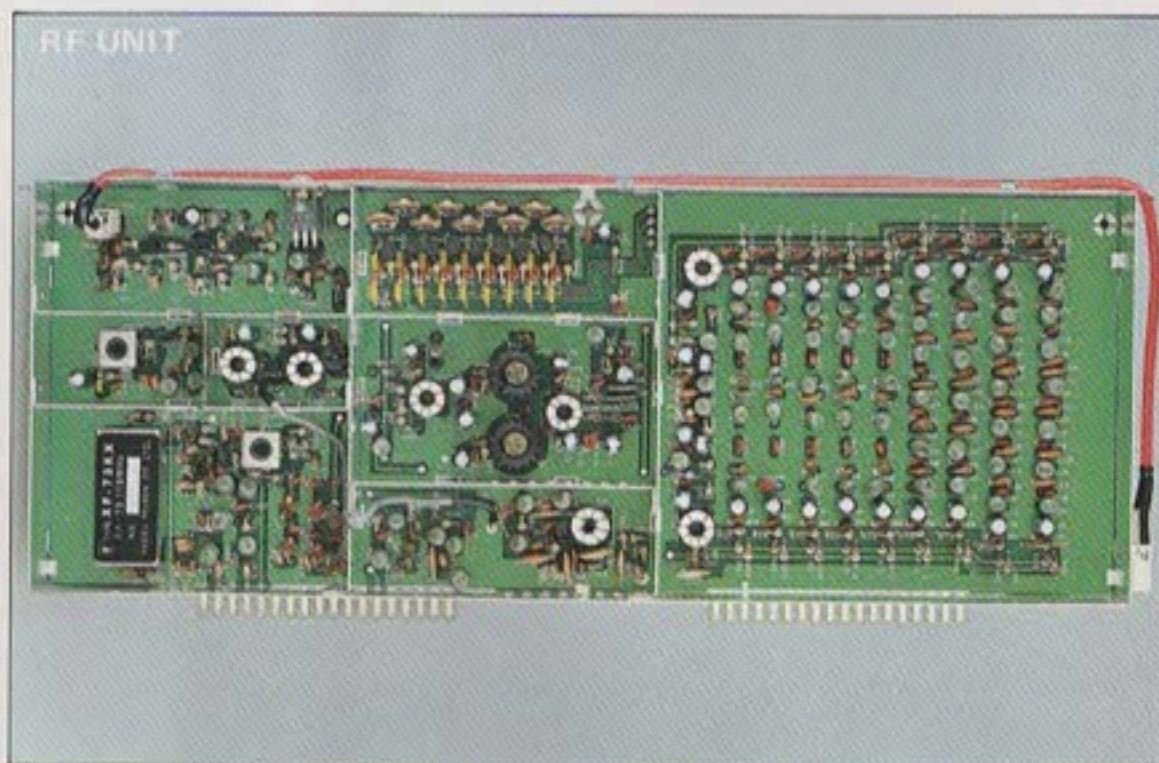
Carrying on with Yaesu's superb variable IF bandwidth system, which uses two crystal filters to provide continuously variable bandwidth from 300 to 2400 Hz, the FT-ONE adds provisions for two optional CW bandwidths and a narrow FSK bandwidth, changing not just one IF filter stage but two. This means that, in addition to the first filter section having a narrow 8-pole filter the second 6-pole filter can also be narrow. The total of 22-poles of crystal filtering, standard with the FT-ONE, gives simply unbelievable selectivity; while every one of the optional bandwidths can be installed at the same time and switched from the front panel. A special insertion loss correction amplifier ensures that your received signal level remains constant regardless of the bandwidth selected. With the optional AM filter installed, the IF Shift control operates in the AM mode also.

VARIABLE IF WIDTH AND SHIFT



POWER BIPOLAR RCVR RF AMPLIFIER WITH PIN DIODE ATTENUATOR

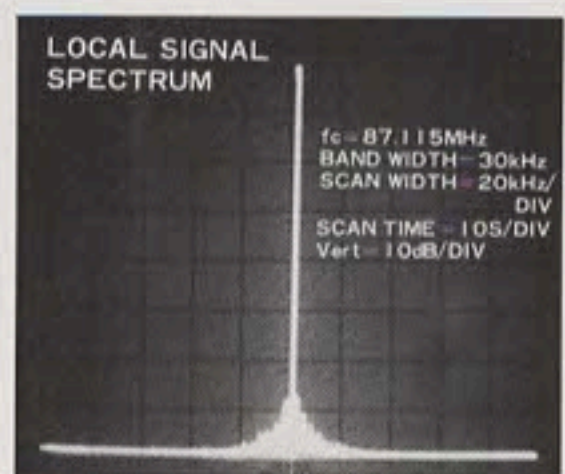
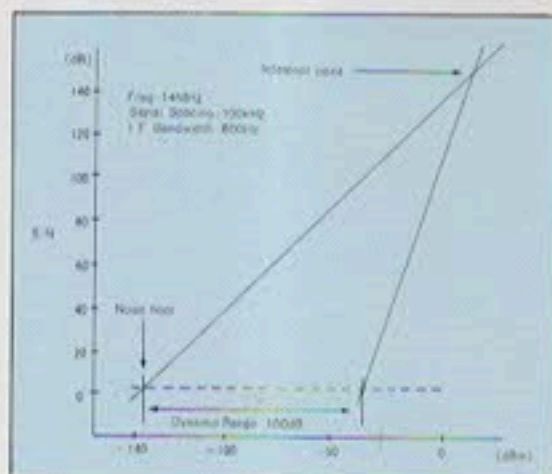
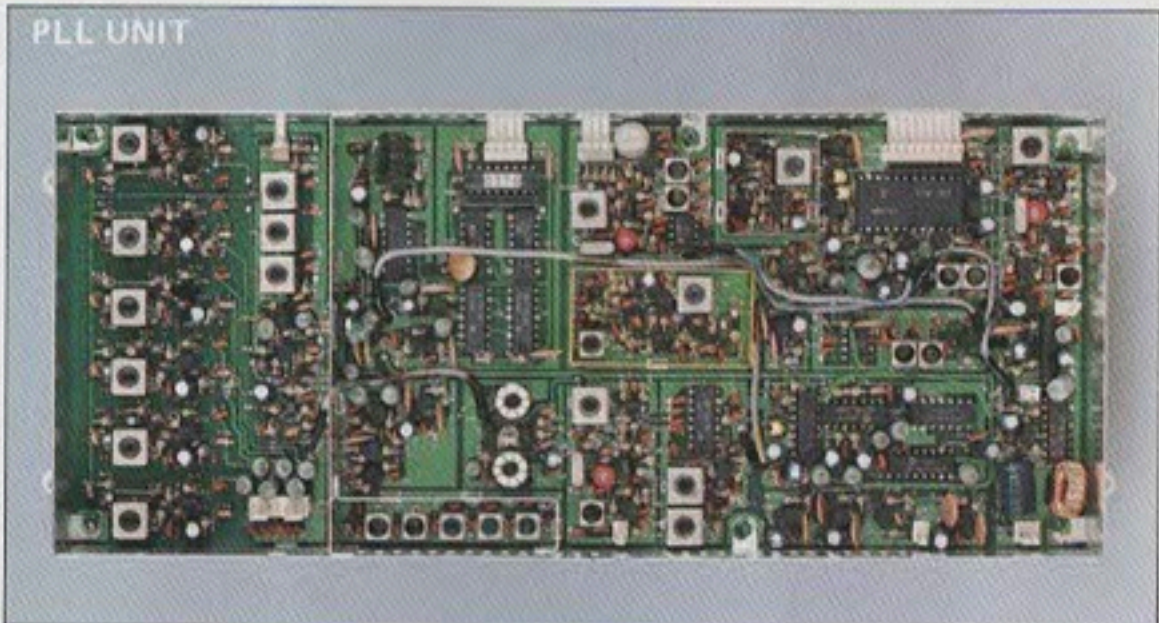
For precise tailoring of the system noise figure to atmospheric and cosmic noise levels encountered on different bands, a PIN diode RF attenuator is incorporated into the front end. The RF attenuator allows you to reduce the signal levels presented to the receiver without affecting the biasing of the main IF amplifiers, thus preserving their excellent low-distortion characteristics; while the automatic attenuator system reduces the input level of very strong signals through the same PIN diode circuit without need for the operator to adjust the control. The push-pull RF amplifier uses two medium power bipolar transistors, giving a whopping output intercept point of +40dBm on receive, while doubling as a power amplifier predriver on transmit!



A NEW PRECEDENCE IN DYNAMIC RANGE

With the push-pull power transistor RF amplifier, special buffer amplifiers for the first local oscillator, Schottky diode ring module mixer and a first IF of 73 MHz; the FT-ONE presents a dynamic range in excess of 97 dB in the CW narrow bandwidth (90 dB in SSB) at maximum sensitivity, 14 MHz. The 73 MHz first IF frequency keeps the FT-ONE remarkably free of images, while 6 VCOs are employed in the first local signal scheme to cover the 73 to 103 MHz local range in 5 MHz segments, resulting in low phase noise generation.

The noise blanker in the FT-ONE has its own 20 kHz BW, 4-pole crystal filter and independent 455 kHz IF to show an overall noise blanker dynamic range of more than 90dB, with the threshold level adjustable on the front panel. This noise blanker is very effective at removing even very low-level impulse noise without disturbing the signal you wish to copy.



UNCOMPROMISING SENSITIVITY AND SELECTIVITY

It is a curious fact that top of the line amateur transceivers usually boast of very low noise, spurious free dynamic range, clear audio receivers; while selectivity and sensitivity are treated very low-key, or not mentioned at all.

Often manufacturers will show you each specification under optimum conditions for measuring that particular quality, neglecting to mention the degradation of the other factors and of overall performance in actual operation. Others will draw your attention to one or another outstanding specification, such as super sensitivity; while either presenting in a confusing manner, or not

mentioning at all the specification that had to suffer, such as selectivity, dynamic range, or image response. This is done, of course, to try to make you think that a transceiver is better than it really is.

The FT-ONE was developed with the goal in mind of a finely balanced harmony of each attribute of the circuit, with the only constraint being that of the state-of-the-art of the electronics industry. The focus of the design effort was performance, without limit to cost or complexity, and the result is a transceiver that can truly offer you top performance with regard to high sensitivity and sel-

SPECIFICATIONS

TRANSMITTER

Frequency range:

160m band	1.8 to 2.0 MHz
80m band	3.0 to 4.0 MHz
40m band	7.0 to 8.0 MHz
30m band	10.0 to 11.0 MHz
20m band	14.0 to 15.0 MHz
17m band	18.0 to 19.0 MHz
15m band	21.0 to 22.0 MHz
12m band	24.0 to 25.0 MHz
10m band	28.0 to 29.99 MHz

Tuning steps:

Selectable 1 MHz, 100 kHz, 100 Hz, 10 Hz

Emission types:

LSB, USB (A3J/J3E*), CW (A1/A1A*), AM (A3/A3E*), FSK (F1/F1B*), **FM (F3/F3E*)

* New emission designation per WARC '79

** With optional FM unit installed.

Power output (minimum):

	160m through 15m	10m
SSB, CW	100W (PEP)	90W (PEP)
AM	25W	25W
FM, FSK	50W	50W

Carrier suppression:

better than -40 dB below peak output.

Unwanted sideband suppression:

better than -50 dB below peak output, (measured at 14 MHz, 1 kHz tone)

Non-harmonic spurious radiation:

better than -40 dB below peak output

Harmonic radiation:

better than -50 dB below peak output

Audio response:

better than -6 dB from 300 Hz to 2700 Hz

3rd order intermodulation distortion:

better than -31 dB below peak output

Frequency stability:

less than 300 Hz drift during the first 30 minutes after 10 minutes warm-up; less than 100 Hz every 30 minutes thereafter.

Modulation type:

A3J:	Balanced Modulator
A3:	Low Level Modulation
F3:	Variable Reactance

Maximum deviation (FM, optional Unit installed):

± 5 kHz

FSK shift frequency:

170 Hz.

Output impedance:

50 ohms, unbalanced (nominal)

RECEIVER

RF attenuator performance:

from 0 dB to 25 dB attenuation, continuously adjustable

Dynamic range:

better than 90 dB with standard SSB filter

better than 95 dB with optional 600 Hz CW(M) filter

better than 97 dB with optional 300 Hz CW(N) filter

Audio output power:

3-watts minimum (into 4 ohms, with less than 10% THD)

Audio output impedance:

4 to 16 ohms

Microphone impedance:

Low Impedance (500 to 600 ohms)

Frequency range:

150 kHz to 29.9999 MHz (continuous)

Clarifier range:

± 9.9 kHz

Sensitivity:

(CW, SSB, and AM figures measured for 10 dB S+N/N)

(*) 1.8 to 30 MHz

(**) 150 kHz to 1.8 MHz

SSB/FSK(W)/CW(W)

* better than 0.3 μ V,

** better than 5.0 μ V

CW(N)

(with optional XF-8.9KCN filter installed)

* better than 0.2 μ V,

** better than 2.5 μ V

CW(M)/FSK(N)

(with optional XF-8.9KC filter installed)

* better than 0.25 μ V,

** better than 3.0 μ V

AM

* better than 2.0 μ V,

** better than 30 μ V

AM

(with optional XF-8.9KA filter installed)

* better than 3.0 μ V,

** better than 50 μ V

FM

(with optional FM unit installed)

better than 0.6 μ V for 20 dB of Quieting from 1.8 to 29.99 MHz

COMMERCIAL GRADE CONSTRUCTION, RELIABILITY

Glass epoxy plug-in circuit cards are used throughout the standard FT-ONE, with very spacious component layouts and alignment access so easy that many of the procedures can be performed without removing anything but the top cover. Simplicity without shortcut is obvious when you look inside the FT-ONE. Every unit will receive an extra "burn in"

time not usually accorded amateur equipment, and the complete Service Manual is included along with the Instruction Manual with each unit at no extra charge. Extended heat and vibration tests throughout the construction of this equipment are your assurance of many years of trouble-free operation.

REAR PANEL JACKS FOR EASY INTERFACE TO ACCESSORIES

In addition to the jumpered key lead for break-in amplifier operation, rear panel connections are provided for interface to more traditional linear amplifiers using semi-break-in type relay control. For footswitch operation, PTT input is provided via a phono jack. A wide variety of ALC, relay control, and operating voltage connections are all provided, in addi-

tion to two key leads (one for paddle input, one for straight key or external keyer input).

When using a low-noise receive antenna, such as a 160 meter Beverage, a separate jack on the rear panel of the FT-ONE accommodates the receive-only antenna line. A rear panel jack is also provided for using

a spotting receiver during contest operation.

INTERNAL POWER SUPPLY, SPEAKER AND COOLING FAN

Building on Yaesu's vast experience incorporating AC power supplies in transceivers, we now offer a supply allowing more space and features than ever before in one cabinet at a mere 42 pounds. There is no external power supply or speaker needed, yet

the station can be operated on either 13.5 VDC or any AC voltage from 100 to 120 or 200 to 240 VAC. The built-in cooling fan cools both the PA and the power supply, so no optional fan is needed.

VSWR TURNDOWN

While minor excursions from the nominal 50 ohm antenna impedance are of no consequence, the FT-ONE final protection circuitry will protect your final transistors in case antenna problems develop. The FT-ONE is tolerant of typical antenna installa-

tions, however, producing 90% of full power output into a 2:1 SWR referenced to 50 ohms. Current and heat sensing protection are also provided via the power supply.

activity (SSB: better than $0.3 \mu\text{V}$ for 10 dB S+N/N, better than 1.67:1 at -60/-6dB in SSB) without sacrificing IF image rejection and receiver IMD or dynamic range. We invite you to test the performance yourself.

Solid copy requires a front end that does not fall apart under strong signal conditions, an IF system that provides tight selectivity without modifying the signal characteristics significantly, and an audio section that faithfully reproduces the input signal. On all counts, the FT-ONE is a magnificent performer. Answering the call for an elite class receiver that is equal to the task under the toughest interference conditions, the Yaesu design

team is proud to usher in a new era in receiver performance with the introduction of the FT-ONE!

*The specifications listed for the FT-ONE are absolutely worst case figures, with no attempt to snow the customer; and we are certain that you will find that the performance of the FT-ONE is truly beyond comparison.

Intermediate frequencies:

1st IF:	73.115 MHz
2nd IF:	8.9875 MHz
Width/Shift IF:	10.76 MHz
Noise Blanker IF:	455 kHz
FM IF (with optional FM unit installed):	455 kHz

Image rejection:

better than -80 dB

IF rejection:

better than -70 dB for all frequencies

Selectivity:

-6 dB -60 dB

SSB, CW(W), FSK(W)	2.4 kHz	4.0 kHz
CW(N)*	300 Hz	900 Hz
CW(M)*, FSK(N)*	600 Hz	1.3 kHz
AM*	6 kHz	11 kHz
FM**	12 kHz	24 kHz

* with optional filter installed

** with optional FM unit installed

NOTE: These figures apply as maximum bandwidths with Width control set to maximum.

GENERAL

Voltage:

AC: 100 to 120V, or 200 to 240V; 50 to 60 Hz

DC: 13.5V \pm 10%, negative ground

Power consumption:

	AC	DC
Receive	90 VA	2.7 A
Transmit (100W output)	560 VA	24 A
Backup (Power Switch OFF)	3.5 VA	0.07 A

Dimensions (WHD):

approximately 370mm x 157mm x 350mm; 380mm x 165mm x 465mm with all feet, knobs and heatsink

Weight:

approximately 19 kg.

SEMICONDUCTORS:

Transistors	214
FETs	35
ICs	72
Diodes	344

FT-ONE AVAILABLE OPTIONS

Internal CMOS Keyer Unit

FM Unit

RAM Unit

IF Crystal Filters:

CW-N; 300 Hz*, 8-pole, 8.9882 MHz

CW-M (FSK-N); 600 Hz*, 8-pole, 8.9982 MHz

CW, FSK; 800 Hz*, 6-pole, 10.7593 MHz

AM; 6 kHz*, 8-pole, 8.9875 MHz

* -6 dB BW

FT-ONE(G) GENERAL COVERAGE TRANSCEIVER

Yaesu now offers the FT-ONE(G) transceiver for use by government agencies and other users authorized to transmit on frequencies from 1.8 to 30 MHz. The FT-ONE(G) is a completely self-contained general coverage transceiver incorporating all of the features of the FT-ONE plus the added capability of general coverage transmission. The FT-ONE(G) is available by special order through any authorized Yaesu dealer.

NOTE: The use of some accessories and/or options may vary from country to country, according to local conditions and regulations. Check with the Authorized Yaesu Representative in your locality for details.

FROM:

STAMP
HERE

TO:

Specifications are subject to change without notice due to design changes.

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