

COMPUTER AIDED HF TRANSCEIVER

FT-980

YAESU

CAT

CAT SYSTEM



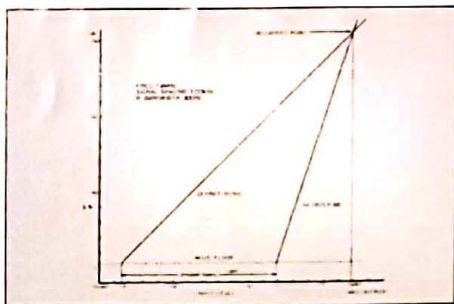
FT-980

The FT-980 CAT* presents a new leap forward in the amateur field, incorporating an 8-bit microprocessor (80C85) for the highest level of built-in computer control ever offered in an all mode, all solid state HF transceiver.

Every frequency-related function is digitally synthesized and microprocessor controlled, including all new features such as user programmable band limits, 5kHz or 500kHz step tuning and scanning, dual digital displays and split frequency offset display capability.

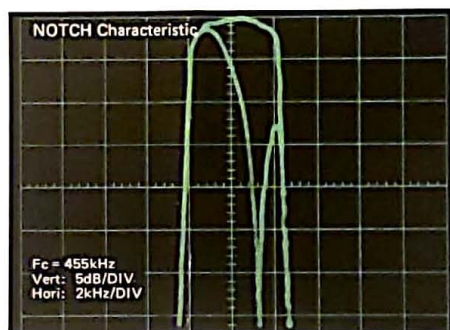
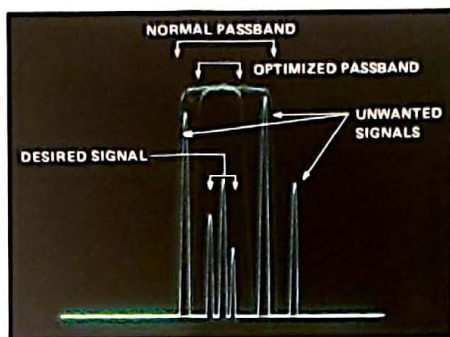
A New Grade of Reception

Two independent receiver front ends are included, one for continuous general coverage reception from 150kHz to 29.99999 MHz, and the other for the amateur bands only. Seven high I_{dss} JFETs are used in the early receiver stages, providing extraordinarily wide dynamic range; and ten VCOs are used over the local signal range to secure a low carrier-to-noise ratio close to the local signal. A three-step input attenuator is provided to deal with very strong signals.



The triple conversion design of the FT-980 receiver incorporates four cascaded stages of IF filtering for all modes, and is equipped for SSB, CW, AM, FSK and FM transceiving in standard models (optional filters for CW and AM available for enhanced selectivity). The IF Width and Shift systems are digitally synthesized for the ultimate in flexibility, allowing the operator to choose the most appropriate receiver bandwidth for optimum readability, even for AM shortwave broadcasts. The latest noise blanker design and independently tunable IF notch and audio peak filters are also included, adding up to comfortable armchair copy even through savage conditions.

The digital tuning system offers the operator two totally independent VFOs with a choice of five different methods of tuning; including a flywheel type tuning knob, two-speed scanning in 10Hz steps from the

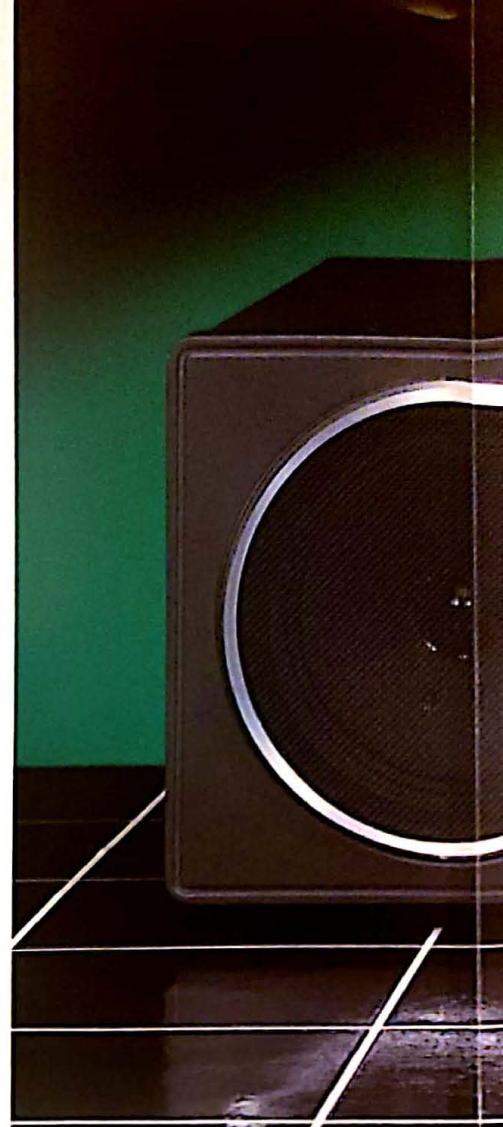


front panel or optional microphone, stepping or step scanning in 5kHz steps, front panel digital keypad programming, and stepping in 500kHz steps.

CPU Controlled Memory System

Twelve memory channels are provided, each of which stores the operating mode and source VFO data along with frequency. Each VFO and each memory can be tuned independently, without affecting the contents of the other VFO or memories. A memory checking function is provided to display the contents of all memories, even while transmitting, without disturbing operations in progress.

When operating on a memory channel, the digital sub display continues to show the kHz digits of the frequency of the last VFO used, while the main display shows the operating frequency with resolution to 10 or 100Hz (selectable). The sub display indicates frequency change by scrolling sideways, with a scrolling cursor providing resolution to 1kHz. Frequency accuracy is a remarkable ± 3 parts per million due to the careful design of the reference and PLL circuits. The microprocessor software maintains the same display (carrier) frequency when modes are changed.



ALL MOD



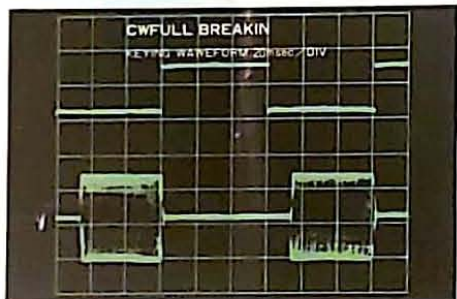
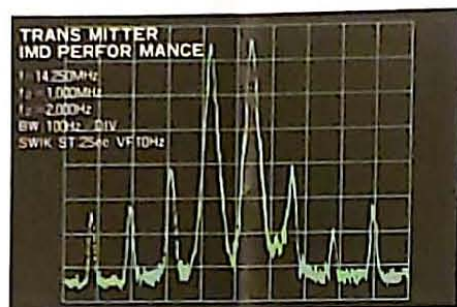
The transmitter section of the FT-980 operates through each multiple of 500kHz that includes an amateur band. Yaesu's AMGC circuit is included, to block ambient noise from voice transmissions; and the ALC meter peak hold system makes ALC adjustment easy. Two meters on the front panel allow simultaneous observation of both the forward and reverse SWR indications, or ALC and either compression (of the RF speech processor), final current or voltage, or output power in watts. An FM discriminator center tuning meter function is included for FM reception, and an exceptional IF transmitter monitor circuit is included for all modes.



THE HF COMPUTER AIDED TRANSMITTER



Using push-pull MRF422 final transistors, each rated at 280 watts each, the transmitter can operate along at 100 watts output. With 24V AC applied to the finals, transmitter third-order IMD is typically better than -40dB at 14MHz, 100W out). Of course full channel and SWR protection is provided, with a cooling fan as standard and typical SWR turn-down of 75% of full power at 1:1 SWR.



Full break-in QSK is provided for CW operation, as is a CW calibrating (spotting) function for simple zero beating with other stations. CW sidetone frequency and FSK shift frequency can both be selected from the rear panel.

Full clarifier functions permit independent receiver and/or transmitter offset tuning from the VFO or memory frequency by up to ± 10 kHz, and clarified frequencies can be transferred directly to a memory. Split-frequency operation between a memory and either amateur or general coverage VFOs is possible, even for cross-band splits (except cross-band QSK). Using the two displays, both frequencies can be displayed simultaneously, or one frequency and the actual offset (difference) frequency can be displayed.

Programmable Bands

Using the TAB function, the operator can program via the front panel keypad his own tuning limits; for instance, to limit his scanning to the appropriate subband for his governmental or license class restrictions. Two such systems are available, one for each VFO, and the programmed limits for each VFO are stored in RAM and reset or deactivated from the keypad. This system is ideal for shortwave DX listening, along with the 5kHz step function on the general coverage VFO; while on the ham VFO, band limits can be programmed crossband, covering the upper portion of one band and the lower portion of another.

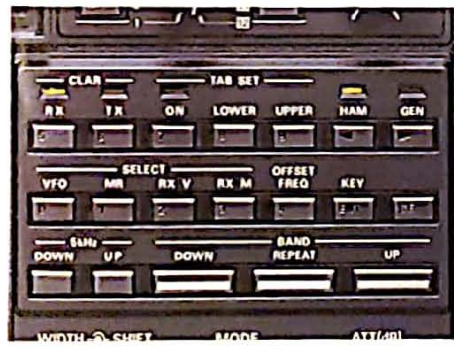
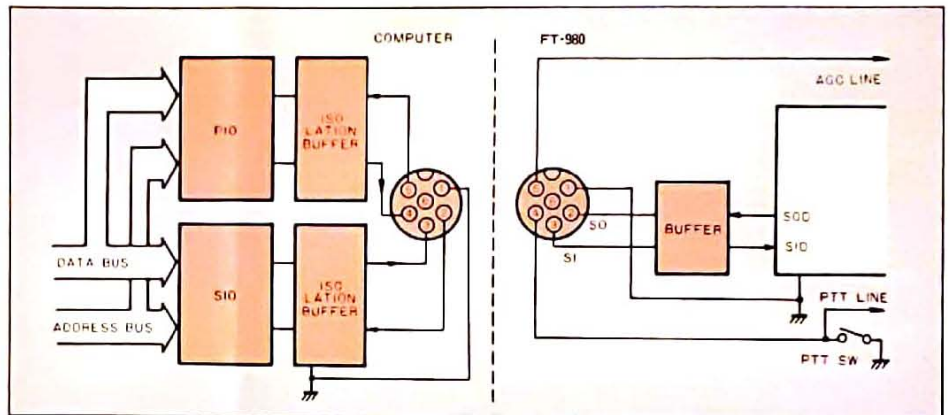
The CAT Interface System

Now being introduced in the FT-980, Yaesu's Computer Aided Transceiver system is specially designed to provide for external microcomputer control of the FT-980 and other future Yaesu transceivers. Externally controllable functions include mode selection, IF passband control and frequency selection and storage functions. The number of compatible computer systems is increasing all the time as we develop new interfaces, and transceiver handling software is being made available through our dealers now.

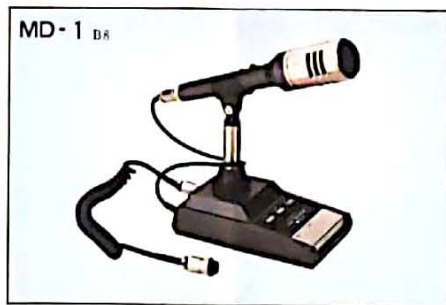
Compatible computer systems now include:
 NEC-PC
 Apple II



RECEIVER



OPTIONS



Other features included in the FT-980 are front panel controls for receiver AGC, tone, FM squelch, special "write" button for programming the four protected memory channels, display dim and dial lock buttons, and electronic keyer speed control for the optional internal electronic CMOS keyer. On the rear panel, special provisions are provided for connection of a linear amplifier designed for QSK, and for an external microcomputer interface (for all frequency control, mode and IF bandwidth functions), as well as connections for remote control of other devices, such as a transverter.

SPECIFICATIONS

GENERAL

Voltage:
AC: 100 to 120 V, or 200 to 234 V;
50 to 60 Hz

Power consumption:
Receiver 72 VA
Transmit (100 W output) 530 VA

Dimensions (WHD):
approximately 370 mm x 157 mm x
350 mm; 380 mm x 165 mm x 465 mm
with all feet, knobs and heatsink

Weight:
approximately 17 kg.

TRANSMITTER

Frequency range:
160 m band 1.5 to 1.99999 MHz
80 m band 3.5 to 3.99999 MHz
40 m band 7.0 to 7.49999 MHz
30 m band 10.0 to 10.49999 MHz
20 m band 14.0 to 14.49999 MHz
17 m band 18.0 to 18.49999 MHz
15 m band 21.0 to 21.49999 MHz
12 m band 24.5 to 24.99999 MHz
10 m band 28.0 to 29.99999 MHz

Tuning steps:
10 Hz, 5 kHz and 500 kHz (band step)

Emission types:
LSB, USB (A3J/J3E*), CW (A1/A1A*),
AM (A3/A3E*), AFSK (F1/J1B*), FM
(F3/G3E*)
* NEW emission designation per WARC
'79

Power output: (all bands)
SSB, CW 100 W (PEP)
AM 25 W
FM, FSK 50 W

Carrier suppression:
better than 50 dB below peak output

Unwanted side band suppression:
better than 50 dB below peak output
(1 kHz tone)

Spurious radiation:
better than 50 dB below peak output

Audio response:
better than -6dB from 250 Hz to 2750
Hz

3rd order intermodulation distortion:
better than -40 dB below peak output
(14 MHz, 100 W)

Frequency accuracy:
better than ± 3 ppm from 0-40°C

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

Maximum FM deviation:
 ± 5 kHz

AFSK shift frequencies:
170, 425, 850 Hz

Output impedance:
50 ohms (nominal), unbalanced

Microphone impedance:
Low (500 to 600 ohms)

RECEIVER

Frequency range:
150 kHz to 29.9999 MHz (continuous)

Circuit type:
Triple conversion superheterodyne

Clarifier range:
 ± 10 kHz

Sensitivity:
(CW, SSB, and AM figures measured for
10 dB S + N/N)
* 2 to 30 MHz
** 150 kHz to 2 MHz

SSB/FSK/CW (W: w/out options)
* better than 0.25 μ V,
** better than 4.0 μ V

CW(N)
(with optional XF-455.8MCN 300 Hz
filter installed)
* better than 0.1 μ V,
** better than 1.6 μ V

CW(W)
(with optional XF-8.9HC filter instal-
led)
* better than 0.16 μ V,
** better than 2.6 μ V

AM(W)
* better than 1.4 μ V,
** better than 22 μ V

AM(W)
(with optional XF-8.9GA filter instal-
led)
* better than 1.25 μ V,
** better than 20 μ V

AM(N)
* better than 1.0 μ V,
** better than 16 μ V

FM
better than 0.6 μ V for 12 dB SINAD

Intermediate frequencies:
1st IF: 47.055 MHz
2nd IF: 8.9875 MHz
3rd IF: 455 kHz
FM IF: 455 kHz

Image rejection:
better than 70 dB

IF rejection:
better than 70 dB for all frequencies

Selectivity (adjusted for maximum IF
width):

	-6 dB	-60 dB
SSB, CW(W), FSK(W)	2.4 kHz	4.2 kHz
CW(N)*	300 Hz	600 Hz
CW(W)*	600 Hz	1.2 kHz
AM(W)	6 kHz	17 kHz
AM(W)*	5 kHz	12 kHz

AM(N) 3 kHz 9 kHz
FM 12 kHz 24 kHz

* with optional filter installed
NOTE: These figures apply as maxi-
mum bandwidths with Width
control set to maximum.

Dynamic range: (at maximum sensitivity)
Better than 95 dB with optional 300 Hz
CW(N) filter

Audio peak filter range:
350-1400 Hz

IF notch filter range (demodulated):
500-2700 Hz

Audio output power:
3 watts minimum (into 4 ohms, with
less than 10% THD)

Audio output impedance:
4 to 16 ohms

FROM:

STAMP
HERE

TO:

YAESU MUSEN CO., LTD.
C.P.O. BOX 1500,
TOKYO, JAPAN



YAESU ELECTRONIC CORPORATION
P.O. BOX 49,
PARAMOUNT, CALIFORNIA 90723