

OPERATING MANUAL FT-ONE

YAESU MUSEN CO., LTD.

C.P.O. BOX 1500
TOKYO, JAPAN

FT-ONE GENERAL COVERAGE ALL MODE SOLID STATE TRANCEIVER



GENERAL DESCRIPTION

The FT-ONE presents substantial breakthroughs in the top of the line HF transceiver field. From the standpoints of operating control, circuit design and layout, performance, size and weight; the Yaesu engineering staff has stretched the very limits of the state-of-the-art for tomorrow's Amateur needs with the reliability normally reserved for the Commercial industry.

The front control panel of the FT-ONE sports both dual metering and dual digital displays along with twelve separate LED status indicators, showing at a glance exactly what the transceiver operating conditions are at all times. 24 keys, including a numerical keyboard, allow complete frequency control; including split frequency operation, scanning and 10 VFOs operable over the entire frequency range with one finger. Multiple tuning rates down to 10Hz per steps are also key selectable. Automatic Mic Gain Control (AMGC) is provided to eliminate background noise on transmit, and is adjustable from the front panel along with noise blanker threshold, Notch/APF frequency, IF Shift and Width, RF speech processor compression level, SWR meter adjustments, FM Squelch, keyer speed, VOX gain and delay, and PIN attenuator, as well as the usual controls (except for Plate and Tune controls, since it is all solid state; a preselector, since RF tuning is microprocessor controlled; and a bandswitch, since it has just one band—30 MHz wide).

Glass epoxy plug-in circuit cards with spacious component layouts and easy access are used throughout the standard FT-ONE, so that many of the alignment procedures can be performed without removing anything but the top cover.

The built-in AC power supply for the FT-ONE is a lightweight highly stable supply that operates on any standard line voltage between 100 and 234 VAC. The RF circuit design incorporates a PIN diode attenuator system which is either manually controlled or automatically actuated in the presence of strong signals on receive, and which is automatically controlled by the microprocessor CPU to guarantee constant transmitter power output on all frequencies. A pair of bipolar power transistors is used as an extremely high level (+40 dBm output intercept point) RF amplifier in receive, doubling as an RF output predriver in transmit. 6 VCOs are used to ensure clean Local Oscillator signals to the Schottky diode ring mixer module. From the solid-state finals 100-watts of RF pass through a 3-section low-pass filter selected by the CPU. Full break-in (QSK) CW operation is a standard feature, even for cross band split frequency operation. A total of 22-poles of crystal filtering is used in the standard receiver IF scheme, with provision for optional narrow bandwidth CW 8-pole filters in the earlier stages and 6-pole filters in the later filter stages, allowing 14-poles of filtering as standard for SSB, and a completely separate 14-poles of narrow filtering for CW. The operator can control the IF passband width and center frequency (shift), as well as audio frequency notch and peak filters. An IF noise blanker, RF speech processor and cooling fan are standard inclusions, while a built-in CMOS keyer and an internal FM unit are available as options.

It is important that the operator study this manual carefully in order to derive full performance and maximum enjoyment from the FT-ONE.

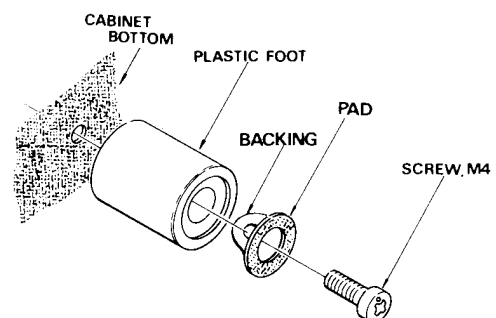
ACCESSORIES

(supplied as standard)

AC POWER CORD			1
2 wire, 2 prong plug (DC-546-007)		T9013280	
3 wire, 3 prong UL plug (UC-904-016)		T9013282	
3 wire, 3 prong Australian plug (SC-411-001)		T9013283	
3 wire, 2 prong EU plug (YFC-14K)		T9013285	
(Cord Band)		S3000023	
FUSE			
10A	(100–117 VAC)	Q0000007	1
5A	(200–234 VAC)	Q0000005	(1)
0.5A	(Backup)	Q0000001	1
DUMMY PLUG		C3001120	1
RX JUMPER CABLE		C3001119	1
EXTENDER FOOT		R3054620	2
PAD		R3054630	2

BOTTOM PANEL FEET

The feet on the bottom panel may be changed, if it is desired to change the viewing angle for the FT-ONE. In the accessory kit for your FT-ONE there are two extender feet with mounting pads. These may be installed either in front or in back, according to the requirements of your station.



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)

Microphone impedance:

Low Impedance (500 to 600 ohms)

RECEIVER

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 μV, ** better than 5.0 μV

CW(N)

(with optional XF-8.9KCN filter installed)

* better than 0.2 μV, ** better than 2.5 μV

CW(M)/FSK(N)

(with optional XF-8.9KC filter installed)

* better than 0.25 μV, ** better than 3.0 μV

AM

* better than 2.0 μV, ** better than 30 μV

AM

(with optional XF-8.9KA filter installed)

* better than 3.0 μV, ** better than 50 μV

FM

(with optional FM unit installed)

better than 20 dB of Quieting from 1.8 to 29.99 MHz

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 1.2 kHz

AM* 6 kHz 10 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.

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RF attenuator performance:

from 0 dB to 25 dB attenuation, continuously adjustable

Dynamic range: (at maximum sensitivity)

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

POWER REQUIREMENTS**Voltage:**

AC: 100 to 120V, or 200 to 234V;
50 to 60 Hz
DC: 13.5V ±10%, negative ground

Power consumption:	AC	DC
Receive	90 VA	2.7 A
Transmit (100W output)	560 VA	20 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 17 kg.

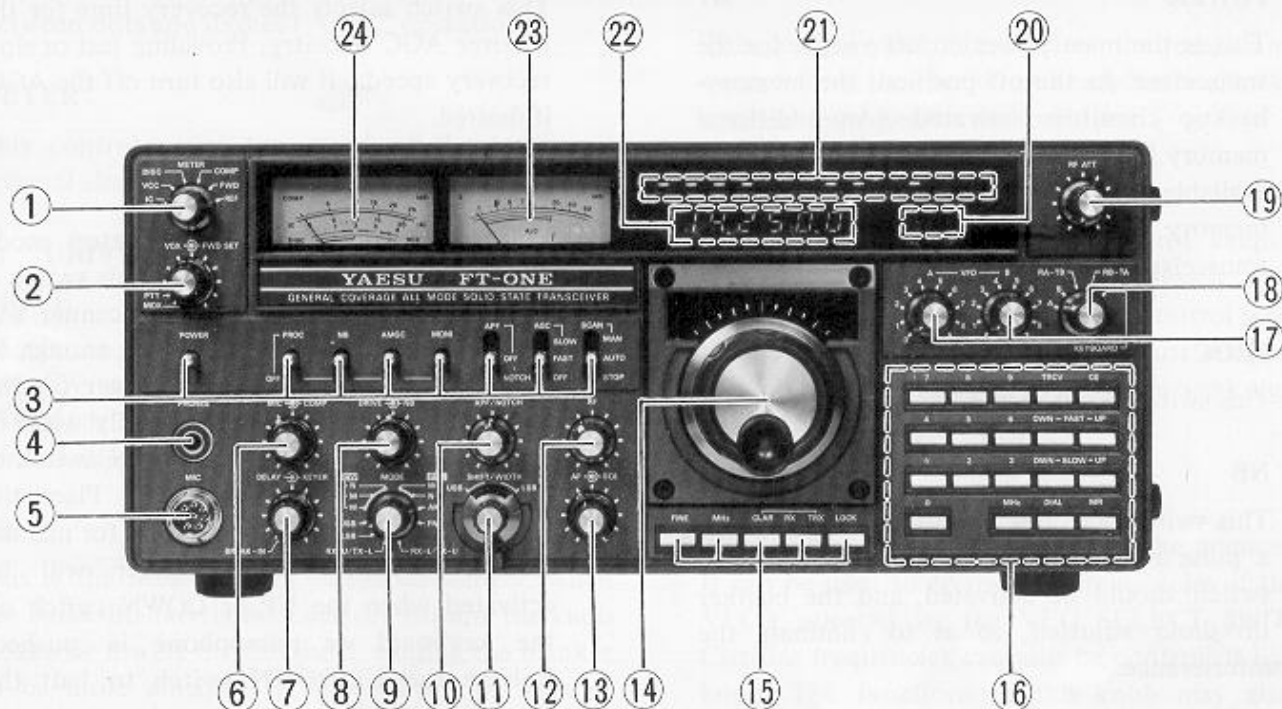
Specifications subject to change without notice or obligation

SEMICONDUCTORS

Transistors:		2SK61GR	1	SN74S11	1	FC52M-5	2
2SA719Q	1	2SK125	1	SN74LS26N	1	MV-104	2
2SA719R	8	2SK206-3	2	SN74S113	1	Schottky Barrier Diodes:	
2SA733AP	4	3SK73GR	20	SN74LS196N	2	1SS97	5
2SA733AQ	24	3SK74L	2	SN74LS390N	1	PIN Diodes:	
2SB536K	2	JF1033B	2	SN76514N	1	1SV80	3
2SB772Q	1	JF1033S	1	TA7060P	2	Zener Diodes:	
2SB774	9			TBP18SA030N			
2SC535B	3	ICs:		-0376	1	RD3.3EB2	1
2SC732TMBL	6	AN6552	3	-0378	1	RD4.7EB2	1
2SC732TMGR	1	HD10551P	1	-0379	1	RD5.1EB2	2
2SC945AP	63	MB8718M	2	-0380	1	RD5.6EB3	11
2SC945AQ	24	MC1496CP	2	MC7908H	1	RD6.2EB3	2
2SC945P	2	MC3403P	3	μPC2002H	1	RD8.2EB3	2
2SC1317R	24	MC4044P	2	μPC7808H	1	RD9.1EB2	13
2SC1589	2	MC14001BCP	2	μPC78L05	2	RD10EB1	1
2SC1815Y	1	MC14011BCP	2	μPC78L08	4	RD12EB2	1
2SC1923-O	15	MC14012BCP	1	8044	1	YZ-003	2
2SC1959Y	5	MC14013BCP	1	Photo-Interrupters:		Light Emitting Diodes:	
2SC2002L	1	MC14066BCP	5	ON1105	2	LN410YP	12
2SC2026	3	MC14069UBCP	3	Silicon Diodes:		LED Displays:	
2SC2290	2	MC14071BCP	1	10D10	4	5082-7415	1
2SC2395	2	MC14081BCP	4	1SS53	226	5082-7623	6
2SC2407	3	MC14510BCP	1	V06B	13		
2SC2562Y	1	MC14518B	1	S2VB10	1		
2SD288K	2	MC14538BCP	1	Germanium Diodes:			
2SD882Q	2	MN1201A	3	1N60	21		
2N4427	2	MN1203	2	Varactor Diodes:			
MPS-A13	1	MN9005	1	1S1658	1		
		ND487C2-3R	1	1T25	11		
FETs:		(Ring Module)					
2SK19TMGR	4	SN16913P	5				
2SK19TMY	2	SN7406N	1				

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FRONT PANEL CONTROLS AND SWITCHES



This transceiver has been specifically designed for ease of operation. However, the operator may not be familiar with the functions of some of the controls, and improper adjustment may degrade transceiver performance. Therefore, be certain that you understand the functions of all controls and switches before operating the FT-ONE.

1) METER

This switch selects METER 1 indication of various functions to monitor transceiver operating conditions.

IC: This position indicates the current drain of the final transistors during transmission.

VCC: In this position, METER 1 will show the DC source voltage of the transceiver (during both transmit and receive).

DISC: In the FM mode, the meter indicates any tuning error in the receiving frequency. Adjust the receiver frequency so that the meter indicator is at the center of the scale.

COMP: While in this position, the meter shows the compression level of the built-in speech processor.

FWD: This position monitors relative forward power output.

To measure SWR (Standing wave ratio), set the meter indication level to full scale during transmission.

REF: After full-scale adjustment in the FWD position has been made, the meter will indicate the reflected power (SWR) in this switch position.

2) VOX/FWD SET

VOX

This control is used to set the sensitivity of the VOX (voice operated TX/RX switching). Clockwise rotation of the VOX control increases the sensitivity of the circuit. In the MOX position, the transmitter is activated until the control is rotated out of the click-stop. The PTT position provides push-to-talk operation from a footswitch or the microphone PTT switch. A jack is provided on the rear panel for footswitch input.

During CW operation, the sidetone will cause the VOX circuitry to be activated, providing semi-break-in operation. The VOX and DELAY controls should be set for the appropriate switching hang time.

FWD SET

This control is used for full-scale adjustment of METER 1 (METER switch in FWD position) for SWR measurement.

3) LEVER SWITCHES

a) POWER

This is the main power on/off switch for the transceiver. In the off position, the memory-backup circuit is activated. (An additional memory backup unit for power outages is an available option. This unit protects the memory whenever the supply voltage to the transceiver is cut off.)

b) PROC

This switch activates the RF speech processor.

c) NB

This switch activates the noise blanker. When a pulse noise interferes with reception, this switch should be activated, and the blanker threshold adjusted, so as to eliminate the interference.

d) AMGC

The Automatic Microphone Gain Control switch enables a microphone gain threshold circuit which requires a minimum input level from the microphone before the microphone amplifier is activated. The AMGC feature is useful in a noisy environment, as background noise such as that generated by an amplifier fan will be eliminated in gaps between words and sentences. This circuit may be thought of as a "microphone squelch" system.

e) MONI

This switch allows you to monitor the speech signal from the microphone, such as for tape recording purposes. On CW, the MONI switch activates the CW sidetone. See the section on operation regarding CW sidetone operation.

f) APF/NOTCH

This switch activates an audio filter for enhanced reception. In the APF (Audio Peak Filter) mode, very narrow audio bandwidth is provided, for single-signal CW reception. In the NOTCH position, an audio notch may be placed on an interfering carrier. The center frequency of the peak or notch is varied by means of the APF/NOTCH potentiometer on the front panel.

g) AGC

This switch selects the recovery time for the receiver AGC circuitry. Providing fast or slow recovery speeds, it will also turn off the AGC, if desired.

h) SCAN

This switch selects the desired stop mode during scanner operation. When this switch is placed in the AUTO mode, the scanner will halt on any signal which is strong enough to engage AGC action (S1 or stronger on the S-meter). To stop the scan manually while in the AUTO mode, place the SCAN switch in the STOP position momentarily. Place the SCAN switch in the MAN position for manual scanner operation; the scanner will be activated when the UP or DOWN switch on the keyboard or microphone is pushed. Release the UP/DOWN switch to halt the scan.

4) PHONES

This is a standard two conductor jack for output to headphones. The impedance of the headphones should be 4 to 8 ohms. Insertion of a plug into this jack will automatically disconnect the internal speaker.

5) MIC

This eight-pin connector accepts the microphone audio input, as well as the push-to-talk (PTT) and scanning control lines. The nominal microphone impedance is 600 ohms.

6) MIC/COMP

MIC

This control adjusts the gain of the microphone amplifier for SSB and AM operation. Clockwise rotation increases the gain.

COMP

This controls the compression level of the RF speech processor.

7) DELAY/KEYER

DELAY

This control adjusts the hang time of the VOX circuitry for SSB voice or CW semi-break-in operation. When rotated fully counterclockwise into the

click-stop, the transceiver will provide full CW break-in operation in which the receiver recovers between dots and dashes ("QSK" operation).

KEYER

This control varies the speed of the (optional) internal electronic keyer module, when installed.

8) DRIVE/NB

DRIVE

This is the output carrier level control for the AM, FM, CW and FSK modes. While operating on the SSB mode with the RF speech processor on, this control adjusts the drive level.

NB

This is the noise blanker threshold control. When the Noise Blanker is switched on, turning the knob clockwise lowers the threshold, causing the blanker to be more sensitive to lower levels of impulse noise.

9) MODE

This switch has eleven positions for selection of the operating mode desired: LSB, USB, CW(N), CW(M), CW(W), FSK(W), FSK(N), AM, FM, and RX-U/TX-L (receive USB; transmit LSB), RX-L/TX-U (receive LSB; transmit USB).

10) APF/NOTCH

The APF/NOTCH control varies the APF/NOTCH filtering center frequency to anywhere within the 300 Hz – 1500 Hz frequency range.

11) SHIFT/WIDTH

The SHIFT and WIDTH controls are mounted on concentric shafts. The WIDTH control varies the center frequency of the third IF across the pass-band of the second bank of crystal filters in the IF, the first bank presenting a fixed boundary. The SHIFT control then varies the selected IF passband for optimum interference rejection. The controls are slaved with moderate friction between them for fingertip adjustment of the IF shift feature.

12) RF GAIN

This control varies the gain of the receiver RF and IF amplifiers. For full S-meter operation and maximum receiver sensitivity, this control should be set fully clockwise.

13) AF/SQL

AF

This control varies the level of the receiver audio output from the speaker or headphones. Clockwise rotation increases the audio output.

SQL

In the FM mode, the SQL control keeps the receiver silent until a signal is present on the receiving frequency. Normally, this control is set to the point where the receiver noise just disappears, so as to provide maximum response to weak signals. (FM unit optional).

14) TUNING KNOB

This is the main tuning knob of the transceiver. It can be used to control the frequencies of the 10 VFO's selected by the VFO SELECT SWITCH. Clarifier frequencies can also be controlled by this knob. The functions of this knob may also be controlled from the keyboard. Continuous rotation will vary the transceiver frequency from 150 kHz to 30 MHz. The frequency variations per rotation may be selected from 2 kHz, 20 kHz or 10 MHz by the FINE and MHz pushbuttons.

15) PUSHBUTTON SWITCHES

a) FINE

This switch allows precise zeroing-in on a signal. When this switch is pushed, frequency changes via the tuning knob can be made in 10 Hz steps at 2 kHz per turn (verses 100 Hz at 20 kHz per turn normally). Press this switch again to return the frequency steps to 100 Hz.

b) MHz

Press this switch while simultaneously rotating the tuning knob, and the operating frequency digits to the left of the decimal point will change in 1 MHz steps continuously from 0 – 29 MHz, while the digits to the right of the decimal point will remain unchanged.

PER TURN PUSH SW	2 kHz	20kHz	10MHz
FINE			
MHz			

c) CLAR

This switch activates the clarifier, allowing up to ± 9.9 kHz offset in frequency. The frequency offset is shown on the sub-digital display. Press this button again to turn the clarifier off.

The clarifier frequency steps are normally 100 Hz when the FINE TUNING feature is not activated. If precise tuning is desired, press the FINE button to tune in frequency steps of 10 Hz.

d) RX-TRX

While the clarifier function is activated, press this button once to activate the clarifier function for both transmit and receive frequency offset. If the button is pushed again, the clarifier function will return to receiver offset only.

e) LOCK

Press this button to disable frequency changes via the tuning knob, thus preventing inadvertent frequency changes. Press this button a second time to release the lock.

While the VFO is locked, frequency entry from the keyboard is still possible.

16) KEYBOARD

This keyboard allows you to control the operating frequency, scanning and VFO selection (refer to the "OPERATION" section for details).

17) A-VFO-B

These selectors allow you to select one of the VFO channels. Both selectors are used when you operate on different frequencies for transmit and receive. VFO A or VFO B can be selected through the VFO SELECT SWITCH, or their functions can be alternatively controlled via the keyboard.

Frequencies stored in the same numbered channels of VFO A and VFO B are the same.

18) VFO SELECT SWITCH

This switch selects the desired VFO mode (VFO A, VFO B or KEYBOARD), providing either split operation or simplex operation. VFO channels and VFO modes can, alternatively, be selected through the keyboard.

A

This position allows you to operate on the frequency selected by VFO CH SELECTOR A for both transmit and receive.

B

This position allows you to operate on the frequency selected by VFO CH SELECTOR B for both transmit and receive.

RA-TB

This position provides operation on the frequency selected by VFO CH SELECTOR A for receive and VFO CH SELECTOR B for transmit.

RB-TA

This position provides operation on a frequency selected by VFO CH SELECTOR B for receive and VFO CH SELECTOR A for transmit.

KEYBOARD

When the VFO SELECT SWITCH is in the KEYBOARD position, the VFO mode and channel selections are controlled entirely via the keyboard.

19) RF ATT

This control adjusts the attenuation provided by the receiver front end PIN diode attenuator. This control may be used for tailoring the noise figure of the receiver to the level of band noise present on the operating frequency. The attenuator may also be used to minimize intermodulation problems caused by extremely strong local signals.

20) DIGITAL DISPLAY II

This miniature LED display indicates the VFO channel selected, as well as the clarifier frequency offset (when activated). When a minus sign (–) appears, the clarifier frequency is lower than the original operating frequency.

21) INDICATORS

These indicators provide quick verification of the various operating functions. When a particular LED is illuminated, the respective function is in operation.

PROC

This LED lights up when the RF speech processor is turned on.

NB

This LED indicates that the noise blanker is in operation.

AMGC

When the AMGC (automatic microphone gain control) circuit is activated, this LED turns on.

MONI

This LED lights up when the SSB voice monitor and CW sidetone are activated.

APF

When the APF/NOTCH switch is placed in the APF position, this LED indicates that the audio peak filter is activated.

NOTCH

When the APF/NOTCH switch is placed in the NOTCH position, this LED indicates that the audio notch filter is activated.

A. SCAN

When the SCAN switch is set to the automatic scanning position, this LED lights up.

RX

When the receiver clarifier is activated, this LED lights up.

TRX

When the receive/transmit clarifier is activated, this LED lights up.

D. LOCK

This LED turns on when frequency entry via the tuning knob is disabled (dial lock on).

TRCV

With the VFO SELECT SWITCH in the KEYBOARD position, the TRCV LED lights up whenever the transceive mode is selected through the keyboard. During split frequency operation, this LED turns off.

TX. DIS

This LED lights up when the transmit frequency is outside the amateur bands. As long as this LED is illuminated, the transmitter is disabled.

22) DIGITAL DISPLAY 1

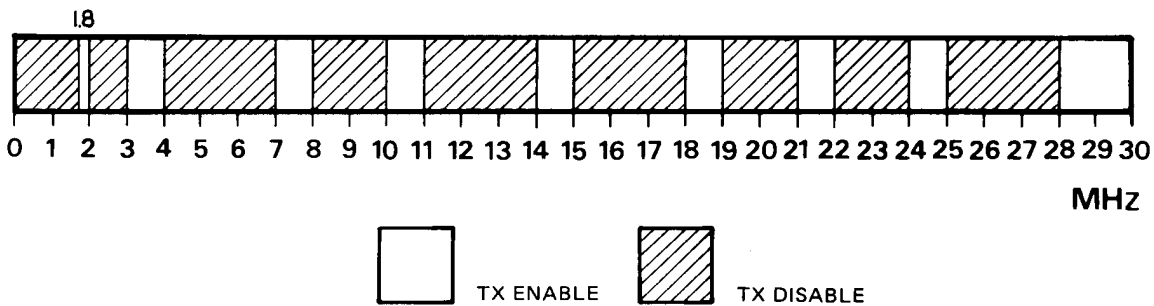
This LED digital display shows the operating frequency, providing resolution to 100 Hz.

23) METER 2

This meter indicates the signal strength at the receiver (S-meter) and the ALC level for the transmitter.

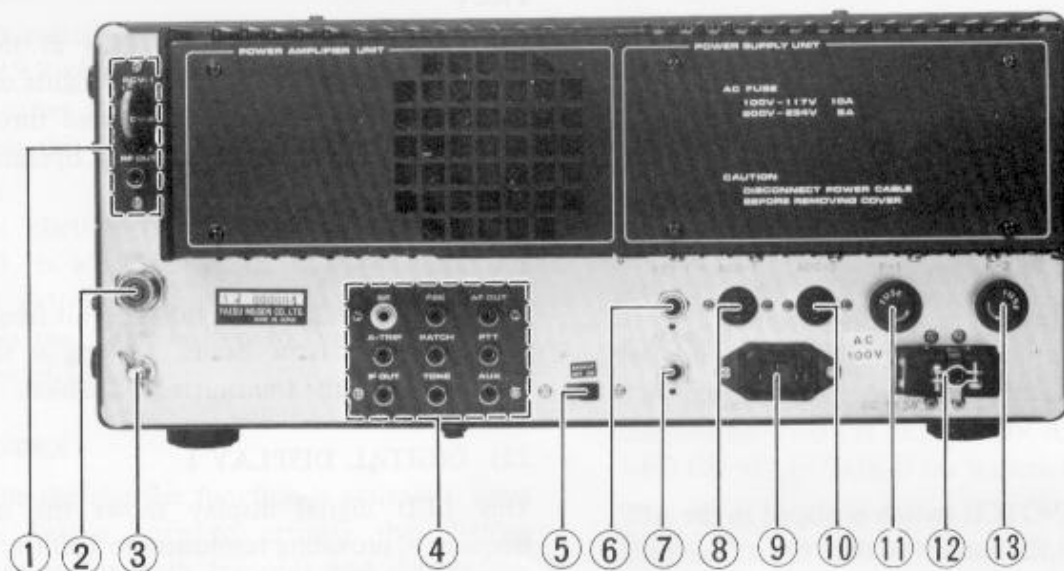
24) METER 1

This meter informs you of the operating condition selected by the METER switch.



STANDARD MODEL

REAR PANEL CONNECTIONS



1) PIN JACK BOARD B

RCV-1

This jack allows connection of an external receiver to the main station antenna. This jack is connected to the antenna in the receive mode only. When an external receiver is not used, this jack is jumpered to the RCV-2 jack. See the "INSTALLATION" section for further details regarding proper connections to these jacks.

RCV-2

This jack is used for input of a receive-only antenna, with the transmitter being connected to the main station antenna through the ANT jack.

RF OUT

This jack provides transmitter output at a level of -6 dBm (0.1 V rms) at 50 ohms for use with a transverter, etc.

2) ANT

This is a standard UHF type female jack for connection to the antenna.

3) GROUND

A good ground connection to this point is important for top transceiver performance and safety.

4) PIN JACK BOARD A

SP

This is a miniature phone jack for connection to an external speaker. Insertion of a plug into this jack automatically disconnects the internal speaker.

FSK

This jack provides input for the FSK keying lead from your FSK terminal. The standard shift of 170 Hz is used.

AF OUT

This is an audio output jack, providing 400 mV at 50K ohms of audio output for recording purposes. This jack is not disabled by insertion of a headphone or speaker plug into their respective jacks, and the output level remains the same regardless of the volume control setting.

A-TRIP

This jack provides the input for an anti-trip signal from an external receiver, if used. When an AF signal is applied from an external receiver, the anti-trip device protects the VOX relay from being activated by the external receiver's speaker.

PATCH

This is an auxiliary microphone input jack for use with a phone patch, etc.

PTT

This jack provides external PTT control. A foot switch or similar external switch may be connected at this point to close the transceiver PTT line.

IF OUT

This jack provides narrow-band IF output from the transceiver for the monitoring of IF signal waveforms.

TONE

This jack provides a sidetone signal for CW operation. When an external receiver is used, connect the output to the audio amplifier in the external receiver to hear your sidetone from the external receiver's speaker.

AUX

This jack provides a special clocking signal when certain YAESU external accessories are connected. This jack must not be used other than for the special YAESU accessories.

5) BU

This switch activates the memory backup circuit, which preserves the memory when the transceiver power switch is off. Also, when the FT-ONE is equipped with the optional RAM board, the memory will be preserved during power cuts or transceiver transportation (when the FT-ONE is disconnected from its power source).

6) KEY-1

Two-conductor jack for a CW key or external keyer.

7) KEY-2

When the optional internal electronic keyer unit is installed, connect a three-conductor phone plug from the keyer paddles to this jack.

8) ACC-1

This is a 7-pin DIN jack for connection to a linear amplifier or other station equipment. Included are make-and-break relay connections, as well as the external ALC line.

9) AC

Connect the AC power cable to this jack to provide operation from an AC power line. NEVER connect DC power to this jack.

10) ACC-2

This 8-pin DIN type jack allows connection of a transverter or other accessories.

11) F-1

This is the fuse holder for the built-in memory backup power supply. Be certain to use a fuse of 0.5 amp rating.

12) DC 13.5V

For DC operation only, the DC cable should be connected at this point.

Never connect AC power to this jack. Failure to observe this simple precaution will void any and all warranties on this equipment. During AC operation with the built-in power supply, insert the DC dummy plug into this jack.

13) F-2

A properly rated fuse for the AC line should be inserted in this fuse holder. For 100/110/120 VAC, use only a 10 amp fuse, and for 200/220/234 VAC, use only a 5 amp fuse.

MICROPHONES

The Yaesu microphones, models YM-34 through the YM-38, can be used with the FT-ONE. These microphones are available from your Yaesu dealer.



YM-34

YM-38



YM-35

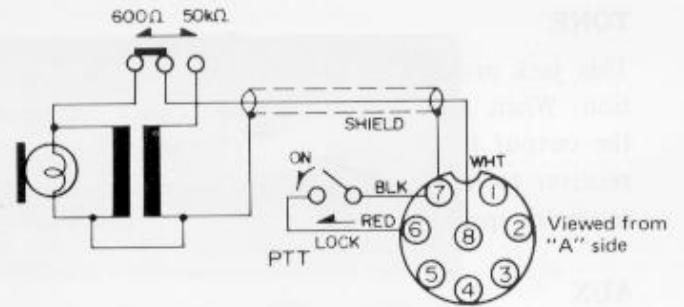
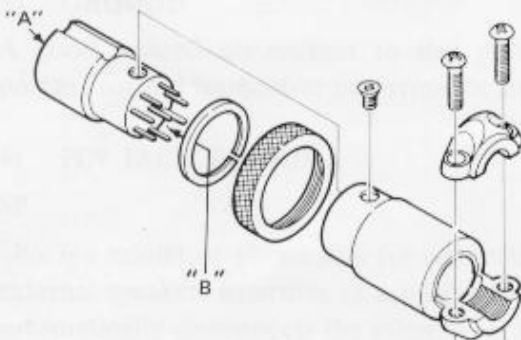
YM-36



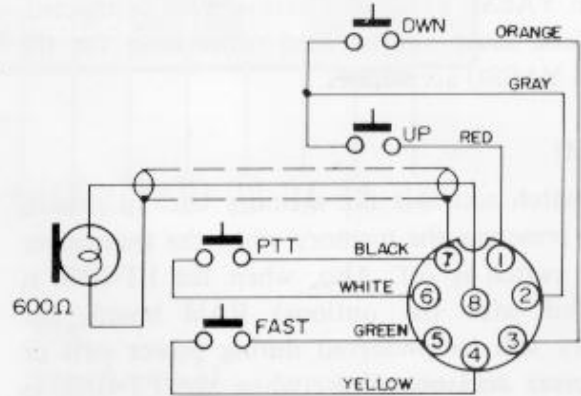
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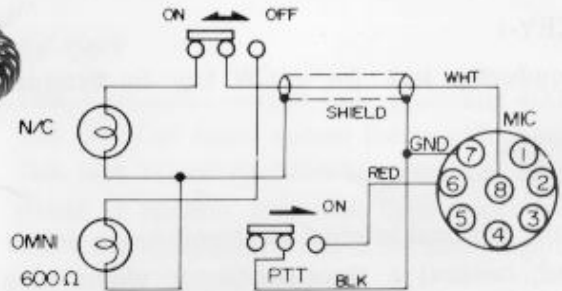
YM-37



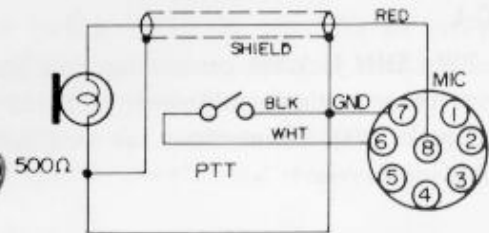
YM-34 MICROPHONE CONNECTIONS



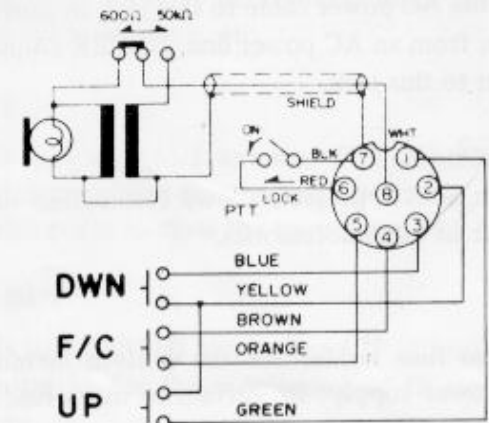
YM-35 MICROPHONE CONNECTIONS



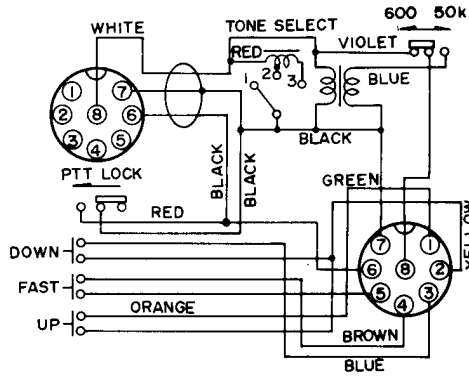
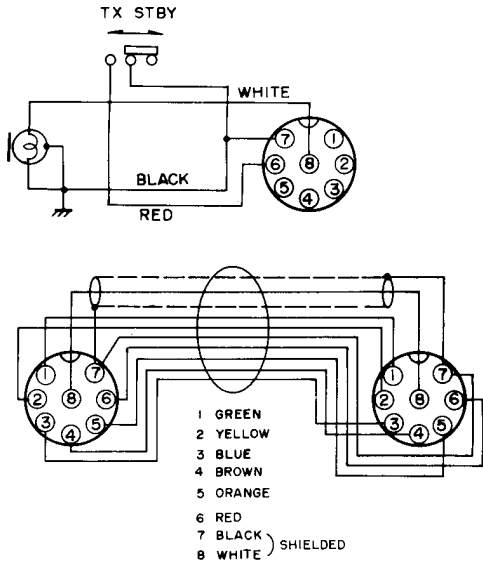
YM-36 MICROPHONE CONNECTIONS



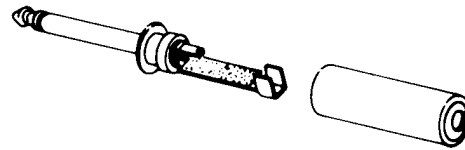
YM-37 MICROPHONE CONNECTIONS



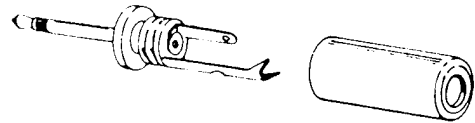
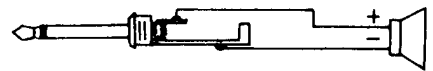
YM-38 MICROPHONE CONNECTIONS



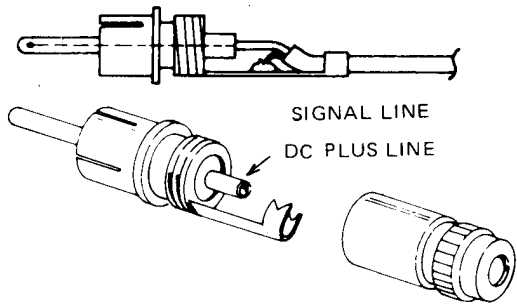
MD-1B8 MICROPHONE CONNECTIONS



Headphone connections

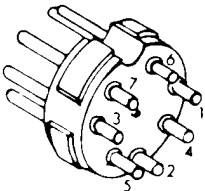


External speaker connections



Pin plug

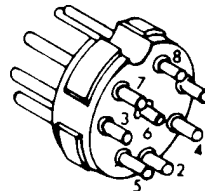
- PIN No.
1. ALC
 2. RY COM.
 3. RY N.O. (Normally open)
 4. LNR GND (*1)
 5. RY N.C. (Normally closed)
 6. FLN-1
 7. FLN-2 (*2, *3)
 - Shell GND



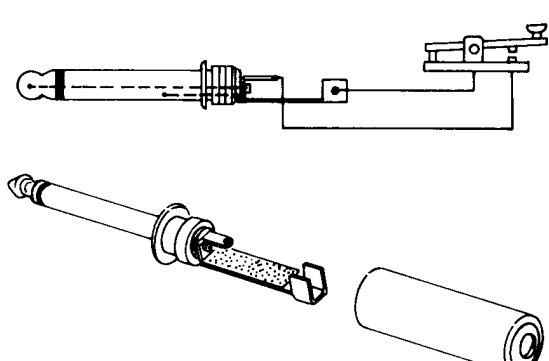
ACC-1

- *1. Connect to ground, except when using full break-in linear amplifier such as ALPHA 78.
- *2. Normally jumpered internally.
- *3. Remove internal jumper and connect to linear only when using a full break-in linear amplifier.

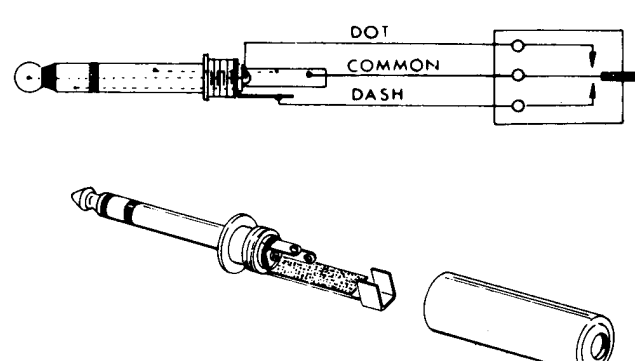
- PIN No.
1. TX GND
 2. +13.5V
 3. RX GND
 4. CONTROL
 5. +13.5V
 6. +8V (PS-2)
 7. AGC
 8. ALC
 - Shell GND



ACC-2

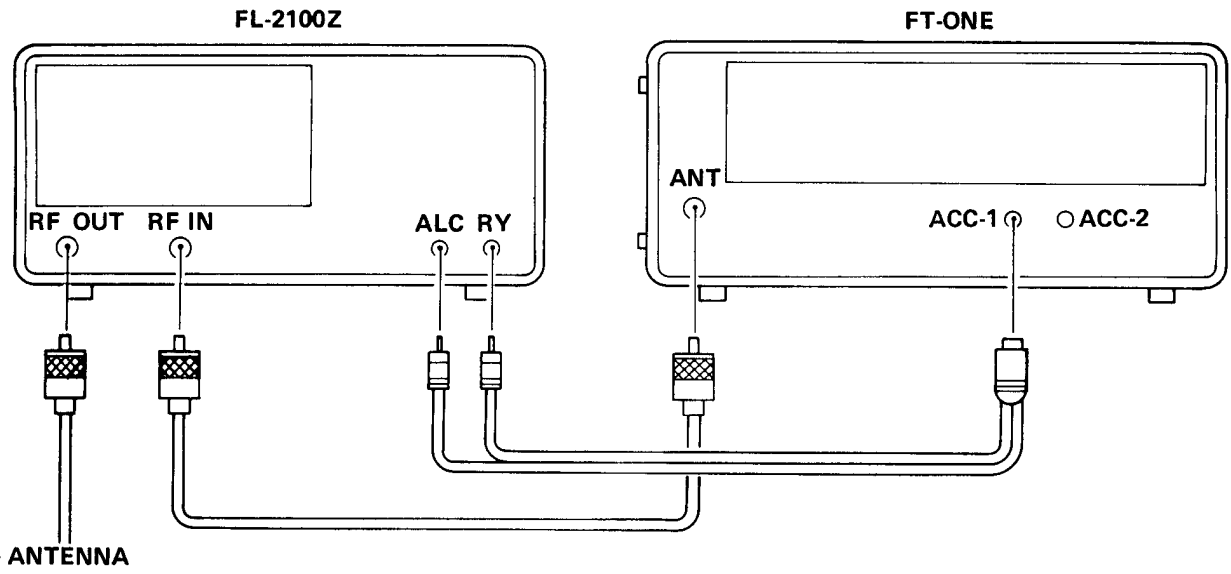


KEY-1 Plug

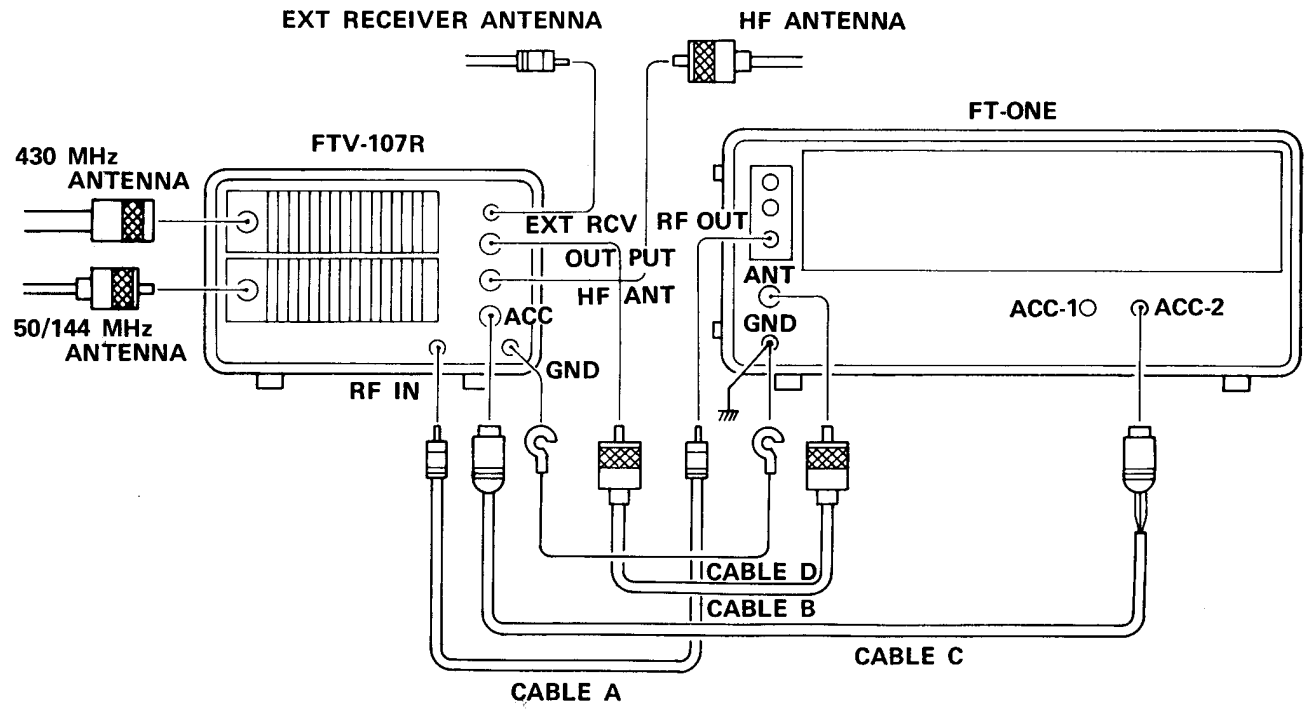


KEY-2 Plug

INTERCONNECTIONS



Downloaded by
RadioAmateur.EU

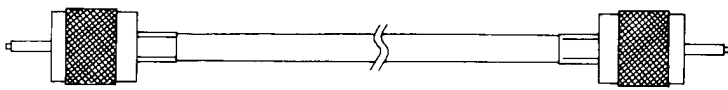


INTERCONNECTION CABLE INFORMATION

(THESE CABLES ARE AVAILABLE AS OPTIONS)

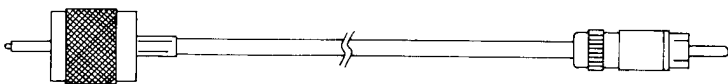
FL-2100Z
FC-107
FC-707

FT-ONE (ANT)



External Receiver
Antenna terminal

FT-ONE (RCV-1)

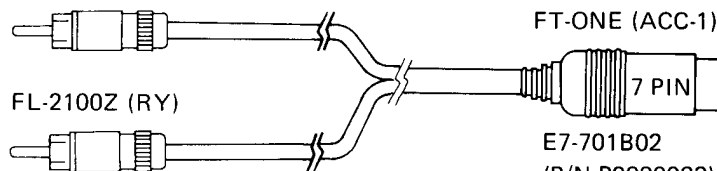


FL-2100Z (ALC)

FL-2100Z (RY)

FT-ONE (ACC-1)

E7-701B02
(P/N P0090033)



1. ALC inner conductor
2. RY outer conductor
3. RY inner conductor
4. LNR GND
5. -
6. -
7. -

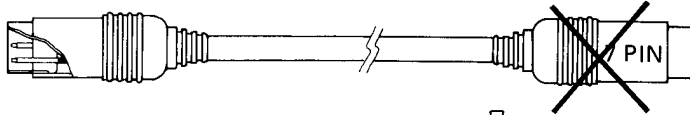
Shell GND ALC outer conductor

(for Pin locations see page 13)

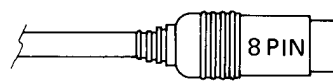
FTV-107R

FTV-107R Supplied Cable C

FT-107M



FT-ONE (ACC-2)



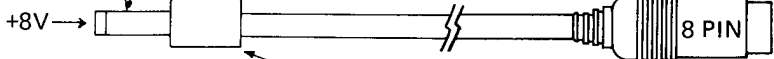
E8-701B-02
(P/N P0090160)

- FT-107M**
1. CONTROL (BLK)
 2. +13.5V (WHT)
 3. +8V (YEL)
 4. CONTROL
 5. +13.5V
 6. TX GND (RED)
 7. RX GND (GRN)
- Shell GND (BLU)

- FT-ONE**
1. TX GND (RED)
 2. 13.5V (WHT)
 3. RX GND (GRN)
 4. X-VER 13.5V (BLK) (CONTROL)
 5. 13.5V
 6. 8V (PS-2) (YEL)
 7. AGC
 8. ALC
- Shell GND (BLU)

FC-107/FC-707

FT-ONE (ACC-2)



FC-107/FC-707
Meter illumination
and
FC-707 Relay control

P-200
(P/N P1090139)

1. -
 2. -
 3. -
 4. -
 5. -
 6. 8V
 7. -
 8. -
- Shell GND

INSTALLATION

This transceiver is designed to be a single-unit station for fixed, portable, or mobile operation. Consequently, power supply connections allowing operation from a variety of supply voltages are available. The built-in AC power supply accepts 6 AC line voltages, from 100 to 234 VAC. If your local line voltage does not match that of the FT-ONE, change the jumper wire connections accordingly. This system provides the flexibility required for changing locations or for quick moves from fixed to mobile operation.

PRELIMINARY INSPECTION

Upon opening the packing carton, immediately give the transceiver a thorough visual inspection. Check to see that the controls and switches are all working freely, and inspect the cabinet for any signs of damage. If any damage has been sustained, contact the shipping company immediately, and document the damage completely. Save the packing carton and foam packing material for possible use at a later date.

BASE STATION INSTALLATION

The FT-ONE is designed for use in all parts of the world. Therefore, the supply voltage wiring for the transceiver delivered may be for a voltage different than the operator's local line voltage. Within the FT-ONE are two pre-adjusted power supplies, one main supply for the transceiver operating voltages, and one small memory back-up supply. From the factory, these supplies are both wired to operate from a line voltage of 117 VAC. By making some simple wiring changes to these supplies, the FT-ONE may be operated from other line voltages between 100 and 234 VAC.

Make sure that your local line voltage is the same as the supply voltage marked on the back of the transceiver. If it is not, jumper wire connections in the AC power supply unit and on the back-up supply transformer must be changed.

THIS INSPECTION PROCEDURE MENTIONED ABOVE MUST BE MADE BEFORE CONNECTING THE AC POWER CORD TO THE POWER OUTLET.

For base station installation, an important consideration is adequate air circulation around the rear heatsink. Do not place books or papers on or around the cabinet, and do not place the FT-ONE on top of another heat generating device such as a linear amplifier. Avoid heat ducts and window locations which are exposed to direct sunlight, and you will keep your transceiver running at full performance for a lifetime.

Be certain to ground the transceiver with a heavy, braided cable of the shortest length possible. Cold water pipes in newer houses are generally not satisfactory as grounding posts; it is better to use earth rods with the braided wire securely connected to the ground system.

RECEIVE ANTENNA/EXTERNAL RECEIVER CONSIDERATIONS

The rear panel RCV-1 and RCV-2 jacks are normally jumpered for everyday operation. However, there may be a need to use an external receiver and/or a separate receiving antenna (as, for example, on 160 meters). The following section will describe the proper interconnections.

When using a separate receive antenna, an external relay must be used to disconnect the receive antenna during transmission. If full break-in operation is to be used, the relay must be quite small so as not to have excessive throw time. Use the 13.5 V line provided at pin 2 and TX GND at pin 1 of the ACC-2 jack to control this relay.

If a separate receive antenna is always in use, simply unplug the jumper between the RCV-1 and RCV-2 jacks, and connect the external receive antenna to the RCV-2 jack (via the relay described above). The transmitter will be connected to the main station antenna via the ANT jack. Note also that the main station antenna will be connected to the RCV-1 jack when configured in this manner; this allows the FT-ONE operator to monitor on the receive-only antenna, while a spotting operator (on the external receiver) can be using the main antenna. This allows great versatility as several azimuthal directions or signal arrival angles may be covered using separate antennas.

LINEAR AMPLIFIER CONNECTIONS

Rear panel connections are provided for a variety of linear amplifiers.

Amplifiers not equipped for full CW break-in may be connected in the traditional manner. Referring to the diagram of the ACC-1 jack, page 13, note that pin 3 is the normally open relay line, which closes to pin 2 on transmit. If your relay requirements are different, that is, normally closed (open on transmit), use pin 5 and pin 2.

The ALC line from your amplifier may be connected to pin 1 of the ACC-1 jack. At full output, approximately -0.60 V of ALC feedback voltage will ensure proper operation.

When using the optional keyer unit for the FT-ONE, the keyer output lead is brought out to the rear apron for routing to the sequencer input on amplifiers equipped for full break-in. If you are using such an amplifier, you may pick up the lead at pins 6 and 7 on the ACC-1 jack. If you are using an external keyer or an amplifier not requiring key input to the amplifier, these pins must remain jumpered to allow the CW key signal to be fed to the FT-ONE transmitter.

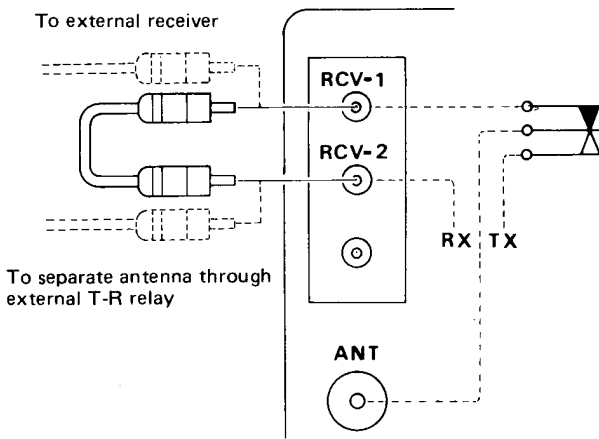
MOBILE INSTALLATION

The FT-ONE is designed for operation from various AC voltages and 13.5 volts DC (negative ground). For mobile operation at 13.5 volts DC, a 20 amp maximum current is required on the RF peak. As such, it provides exceptional performance as a mobile station.

DC cables are available from your Yaesu dealer.

For under-dash mounting, a special mobile mounting bracket is available, and this may also be obtained from your dealer.

The FT-ONE should be located away from heater ducts with a minimum of two inches of air space on the rear side, in order to allow proper air flow around the heatsink.



If you only use the separate receive antenna occasionally, some external provision must be made for reconnecting the jumper between the RCV-1 and RCV-2 jacks when you wish to receive with the FT-ONE on the main station antenna. A simple external switch will easily accomplish this.

When using an external receiver, a "Y" connector must be connected to the RCV-1 jack in order to use the main station antenna for both the FT-ONE and the spotting receiver. One side of the "Y" is connected to the external receiver's antenna jack, and the other side is connected to the FT-ONE RCV-2 jack. If, on the other hand, both the FT-ONE operator and the spotting operator wish to use the separate receive antenna, the "Y" output should be switched externally from the RCV-1 jack to the receive antenna line.

Be certain to use 50 ohm cables for the above interconnections, so as to minimize loss on the received signal. As with any complex switching arrangement in an advanced amateur station, be absolutely certain that the switching connections prevent transmitter energy from being applied to the FT-ONE receiver input line.

WARNING

Our warranty does not cover damage caused by the omission of the required switching circuitry on the RCV-2 line, nor damage caused by feeding improper RF energy to the receiver input line in other ways.

The optional DC cable comes equipped with a 20 amp fuse in the positive line. Use only a 20 amp fuse in this socket.

When making battery connections, be absolutely certain to observe the proper polarity of the supply voltage. Connect the RED cable lead to the POSITIVE battery terminal. Reversed connections could cause permanent damage to the transceiver.

CAUTION

OUR WARRANTY DOES NOT COVER DAMAGE CAUSED BY IMPROPER SUPPLY CONNECTIONS OR DAMAGE CAUSED BY THE USE OF AN IMPROPER FUSE.

It is recommended that the power connections be made directly to the battery, rather than the ignition switch, etc. The battery provides considerable filtering action against ignition noise, while connection to the ignition switch can place the power line in a noisy circuit. Keep the power cable as short as possible, and keep the leads away from ignition cables.

WARNING

PERMANENT DAMAGE WILL OCCUR IF REVERSED POLARITY SUPPLY VOLTAGE IS APPLIED TO THIS TRANSCEIVER. OUR WARRANTY DOES NOT COVER DAMAGE CAUSED BY REVERSED SUPPLY POLARITY.

Before connecting the DC power cable to the transceiver, check the battery voltage with the engine running (battery charging). If the voltage exceeds 15 volts DC, the vehicle voltage regulator should be adjusted, so as to limit the maximum charging voltage to less than 15 volts DC. Do not

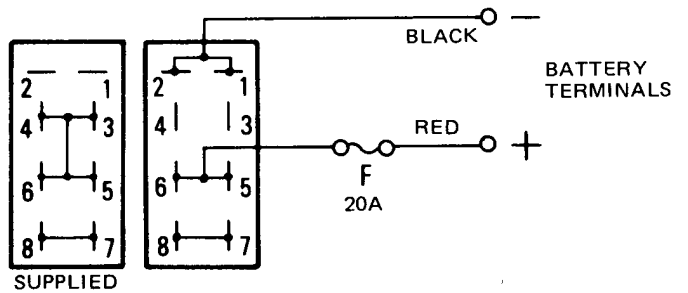
operate the transceiver while the ignition is turned off, as the vehicle's battery capacity is not sufficient for external high current drain. Operation under such conditions will discharge the battery. Also, the transceiver should always be turned off when the car is started, to prevent voltage transients from possibly causing damage to the transceiver.

FT-ONE DC Cable Installation and Connection

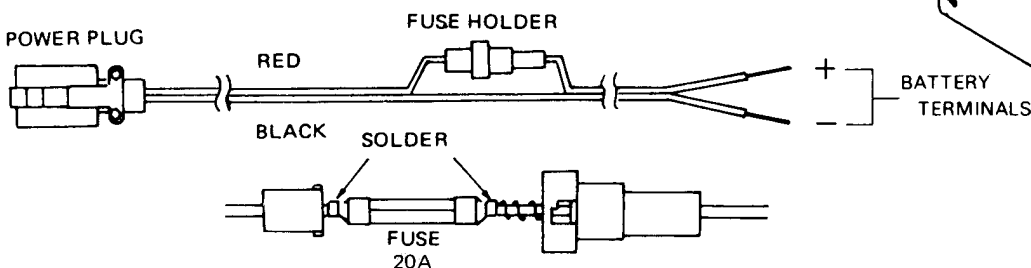
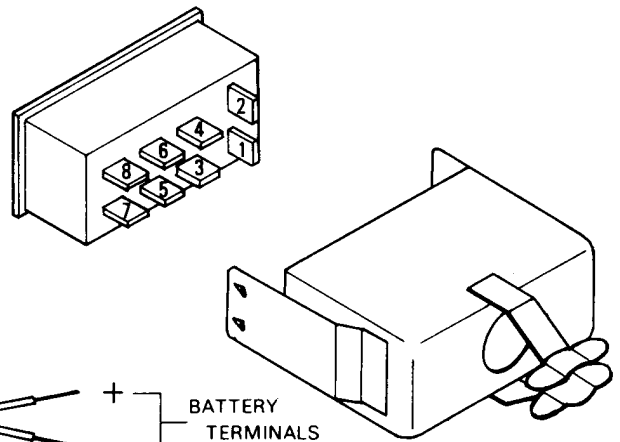
The DC cable is intended for connecting the FT-ONE to a 13.5 VDC supply, such as an automobile battery in a charging circuit.

INSTALLATION

1. Disconnect the AC power connector and also the DC dummy plug from the rear panel.
2. Connect the red lead of the DC cable to the positive terminal of the DC supply, and the black lead to the negative terminal.
Connect the DC cable plug to the DC power jack on the rear panel of the FT-ONE.



DUMMY PLUG CONNECTIONS
(FOR AC POWER SUPPLY OPERATION)



DC POWER CORD/DUMMY PLUG CONNECTIONS

MOBILE ANTENNA CONSIDERATIONS

The FT-ONE is designed to operate into a 50 ohm non-reactive antenna load. While minor deviations from this figure are of no consequence, the automatic final protection (AFP) circuitry will reduce the power output if high SWR conditions are encountered.

However, your FT-ONE's AFP circuitry and final amplifier components are tolerant of the minor SWR conditions present in most amateur installations. The power output of the transceiver will be 90 % of the full rated power when the SWR is 2:1.

In some newly designed vehicles, an electronic fuel injection system is employed, rather than a mechanical carburetor. If your car is one of these newer models, we recommend that you install your transceiver as far away from the injection system as possible, as high SWR conditions may result in interference to the injection system. If you observe any evidence of RF interference problems, we strongly recommend that you contact your vehicle's manufacturer for assistance.

The Yaesu RSL series of mobile antennas is available from your Yaesu dealer for mobile installations.

MICROPHONE INFORMATION

The eight pin microphone jack includes provision for external scanning, as well as microphone and PTT input. The Yaesu models YM-34, YM-35, YM-36, YM-37, YM-38 and MD-1B8 will provide excellent performance with your FT-ONE. See your Yaesu dealer.

If you use a non-Yaesu microphone, be certain to connect the microphone plug correctly. The nominal microphone impedance is 600 ohms.

PRIMARY VOLTAGE CHANGE INFORMATION

The FT-ONE AC power supply is designed to operate from any line voltage between 100 – 120 volts AC or 200 – 240 volts AC. If the voltage range of your FT-ONE does not match your local line voltage, the following modification should

be performed before you plug the power cable into the wall outlet.

1. Remove the 8 screws securing the bottom cover, and loosen the two carrying handle mounting screws. Remove the bottom cover. (Figure 1)
2. On the bottom side of the main chassis, two-pin and four-pin nylon connectors are held by connector holders located at the transformer. Disconnect these connectors.
3. Now unsolder the wires on the transformer, and reconnect them as shown in Fig. 6. Remove the 6 screws affixing the rear plastic cover to the regulator and final amplifier heatsinks. (Figure 2)
4. Referring to Figures 2 and 3, remove the screws marked "A" and "B", located on the regulator heatsink. Now carefully pull the regulator unit backward. Do **not** attempt to separate the unit completely from the main chassis—just provide enough space to remove the regulator cover.
5. Unscrew the 9 "C" screws securing the regulator unit cover, and remove the cover from the unit, as shown in Figure 3.
6. On the terminal block in the unit, change the jumper wire connection(s) so the regulator primary voltage meets that of your local line voltage. Figure 4 shows the primary voltage for 100 – 120 volts, and Figure 5 shows the primary voltage for 200 – 240 volts.
7. Now replace the regulator case, re-install the unit, connect the power connectors, and replace the bottom cover and heatsink cover.
8. After this modification is complete, replace the power fuse in the fuse holder with a fuse of the proper rating. For 100 – 120 volt use, replace with a 10 amp fuse. For 200 – 240

volt use, install a 5 amp fuse. To prevent any future confusion, cross out the voltage marked on the label applied to the regulator unit, and write down the correct primary voltage, as per the modification you performed.

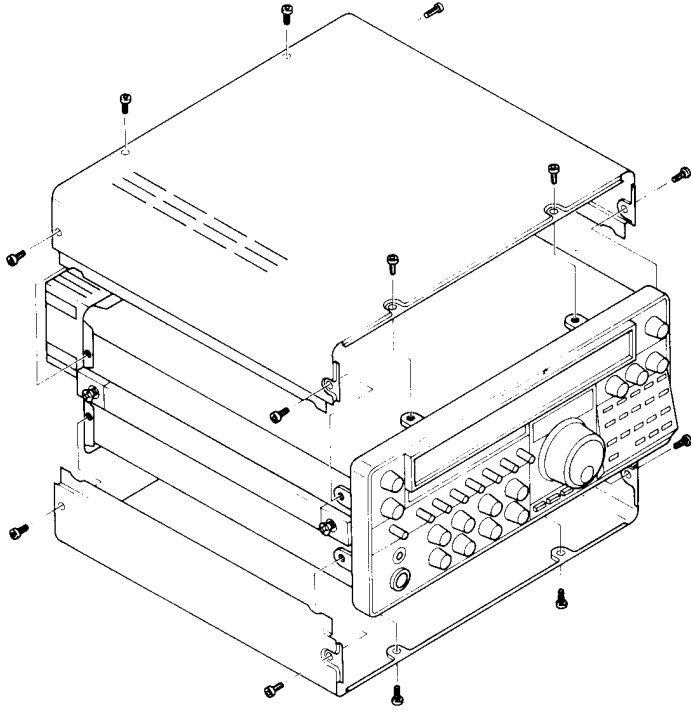
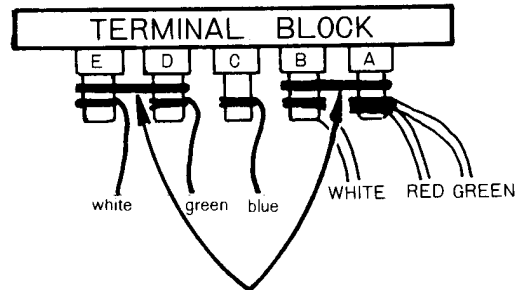
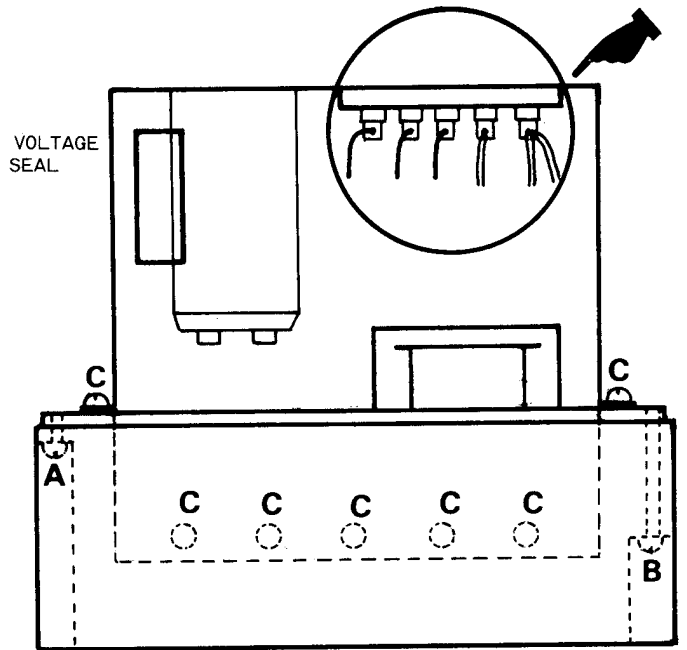
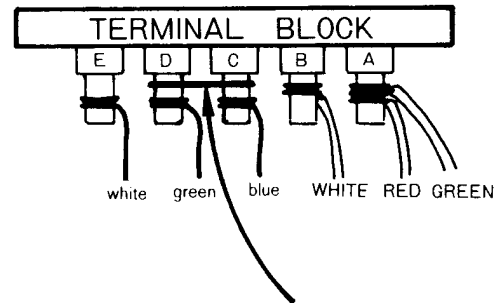


Figure 1



Jumpered for 100-120 VAC operation

Figure 4



Jumpered for 200-240 VAC operation

Figure 5

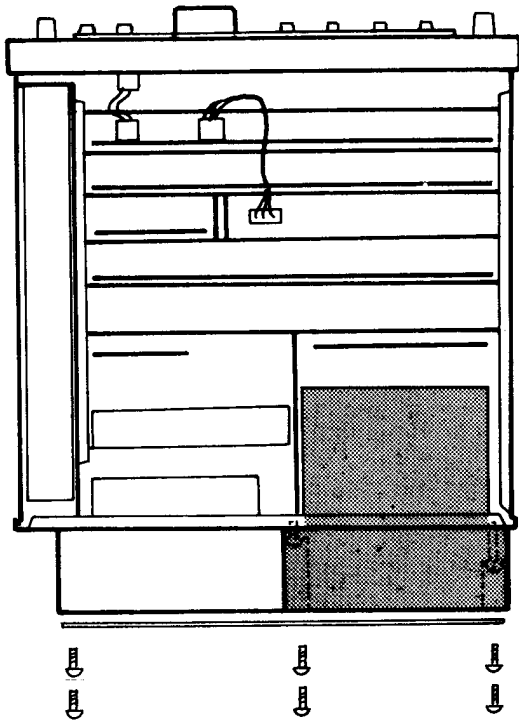
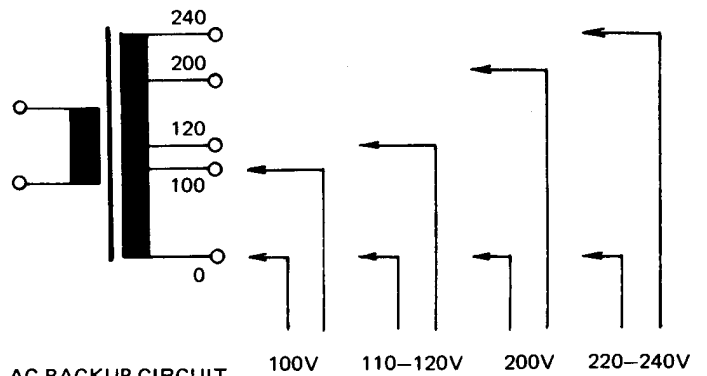


Figure 2 (TOP VIEW)



AC BACKUP CIRCUIT
POWER TRANSFORMER
PRIMARY CONNECTIONS

Figure 6

OPERATION

The tuning procedure for this transceiver is not complicated. However, some functions are unique to the FT-ONE, and are not contained in other transceivers. Therefore, to obtain maximum performance, set up your transceiver for operation according to the following procedures.

Before inserting the AC plug into the wall outlet, the following procedure must be performed.

1. Connect a proper antenna or a dummy load, having an impedance of 50 ohms, to the ANT jack on the rear panel.
2. To the front panel microphone jack connect a 600 ohm impedance microphone (if desired), or for CW operation a manual key or external keyer may be connected to the KEY-1 jack. If the optional electronic keyer unit is installed, a keyer paddle may be connected to the KEY-2 jack.

For detailed pin connections to the microphone plug or keyjack, refer to the diagrams on pages 12. and 13. Your Yaesu dealer can provide a suitable microphone for your requirements.

3. If desired, headphones may be connected to the PHONES jack on the front panel. The impedance of the headphones should be 4 – 8 ohms.
4. Before inserting the AC plug from the transceiver into the wall outlet, ensure that the transceiver power switch is off and be certain your FT-ONE AC voltage requirements match your local line voltage. Check that the DC dummy plug is installed in the rear panel DC 13.5 V jack (for AC operation).

BASIC RECEIVER OPERATION

1. Preset the controls and switches as follows:

METER VCC
VOX PTT
POWER OFF
NB OFF
APF/NOTCH OFF
AGC FST
SCAN MAN

MODE Desired mode
SHIFT Center position
WIDTH Center position
RF Fully clockwise
AF Fully counterclockwise
SQL Fully counterclockwise
VFO A 0
VFO B 0
VFO SELECT A
RF ATT. Fully counterclockwise

2. Turn the POWER switch ON. The meter lamp and digital display will become illuminated. The meter needle should deflect to within the VCC range at the right side of the meter scale, and the digital display should indicate a frequency of "0.000.0" MHz.
3. Tune the VFO to your desired frequency. To change the MHz range quickly, press and hold the MHz switch below the VFO KNOB while simultaneously rotating the VFO KNOB. Instructions for frequency entry from the keyboard are contained in a later section of this manual.
4. Adjust the AF gain control for a comfortable listening level. There are no "preselector" or tuning controls for peaking the receive signal since the receiver RF bandpass filters are selected automatically to correspond to the operating frequency.
5. When pulse-type noise is encountered, turn the NB switch ON. Now rotate the NB control to an effective point. If strong signals are present ± 10 kHz around the receiving frequency, excessive clockwise rotation may result in intermodulation. The best setting of the noise blanker is the point at which the noise pulses just disappear to allow copying of the signal.
6. If the incoming signal is drifting, or is on a slightly different frequency, the RX CLARIFIER may be used to offset the receive frequency up to ± 10 kHz from the transmit frequency. With the CLARIFIER switched on, pushing the TRX switch will offset both transmit and receive frequencies together. Push the TRX switch again to return to the RX clarifier function.

During clarifier operation, the sub-digital display will indicate the offset frequency from the dial frequency, providing indication of the exact operating frequency.

The rate of the CLARIFIER frequency adjustment also corresponds to the position of the FINE switch, in either 100 Hz or 10 Hz steps. If precise frequency offset tuning is desired, such as during CW operation, press the FINE switch for 10 Hz steps. Please note that the sub-digital display will continue to show 100 Hz resolution.

7. AGC time constant selection is accomplished by setting the AGC switch for the desired recovery time, slow or fast. The AGC system can be disabled by setting this switch to OFF.
8. For operation under conditions of extremely strong signals or high band noise, the RF ATT may be used to reduce the signal levels applied to the front end of the receiver. The RF ATT control is very useful for tailoring the receiver noise figure for the band in use; for operation on 7 MHz, for example, the operator may find the high level of band noise objectionable, and rotation of the RF ATT control to the 10–11 o'clock position will achieve the dual purpose of selecting a more appropriate noise figure and also reducing the level of signals applied to the front end.

The RF GAIN control may also be used to reduce the gain of the RF and IF stages. However, in most cases, it is preferable to use the RF Attenuator control, leaving the RF GAIN fully clockwise, thereby biasing the IF transistors for full output for best distortion characteristics.

SHIFT/WIDTH CONTROL OPERATION

The variable bandwidth and IF shift features allow the setting of intermediate bandwidths and optimum filter passbands for improved reception under difficult conditions.

Normally, the SHIFT and WIDTH controls, which are mounted on concentric shafts, should be aligned so that the black zone on the inner dial is fully within the cutout area of the outer control. In this position, on SSB, the skirts of the cascaded 2.4 kHz crystal filters are aligned.

If high-pitched interference caused by an adjacent SSB station interferes with the station you are attempting to hear, simply narrow the bandwidth by holding the center shaft and rotating the paddle of the outer control. The narrower bandwidth having been set, the paddle may be rotated to align the passband for optimum reception and interference reduction.

The above procedure may also be used to program an intermediate CW bandwidth. For example, if the optional 500 Hz CW filter is installed, but a slightly narrower bandwidth is desired, offset the two controls slightly from the centered position. The paddle control may then be rotated to set the center frequency of the new passband.

In the FSK mode, under some conditions, the 500 Hz passband presented by the FSK-N (when the XF8.9KC is installed) may be too narrow. Use the WIDTH and SHIFT controls and the FSK-W filter to set a bandwidth of, for example, 850 Hz for easy tuning.

It should be noted that it makes no difference, from a bandwidth standpoint, whether the WIDTH control is turned to the left or right relative to the SHIFT control when setting intermediate bandwidths. However, ease of access to the paddle will usually dictate to the operator which direction provides the most convenience.

	SHIFT WIDTH	MODE (LSB/FSK)	MODE (USB/CW)
A			
B			
C			
D			
E			
F			
G			
H			

AUDIO FILTER OPERATION

The audio peak and notch filter may be used to advantage under special circumstances of heavy interference.

- 1) To activate the audio peak filter, set the APF/NOTCH switch to APF. Now adjust the APF control to zero the passband of the audio filter on the incoming CW signal (the passband is much too narrow for SSB use). The operator will notice that the APF will dramatically improve the adjacent channel rejection under extremely crowded conditions.
- 2) The notch filter is quite critical in its adjustment, owing to the tremendous notch depth.

Because this is an audio notch, do not attempt to use the S-meter for adjustment. First, set the APF/NOTCH switch to APF, and peak the response on the offending carrier or CW signal. Now switch to NOTCH, and make any very slight adjustment necessary to minimize the interference. The notch depth is typically greater than 40 dB allowing effective notching along with minimal disturbance to the desired station, be it an SSB or CW signal.

SCANNER OPERATION

Both manual and automatic scanning features are available on the FT-ONE. The scanner may be activated either via the UP/DOWN controls on the keyboard, or via scanning controls on the optional scanning microphones, models YM-35, YM-38 and MD-1B8.

To activate the manual scanner, press either the SLOW DOWN or SLOW UP keys on the keyboard. Scanning will now occur in the direction selected in 10 Hz steps. The FAST DOWN and FAST UP controls, on the other hand, scan in 100 kHz steps, for quick frequency changes. Release the key to halt the scan. If an optional scanning microphone is used, press the FAST button along with either the UP or DOWN button to select fast scanning.

The automatic scanner is activated by setting the SCAN lever switch to AUTO. Now, press the SLOW UP or SLOW DOWN key to activate the scan. The FT-ONE will continue to scan until a signal strong enough to move the S-meter slightly is received; the scanner will stop and hold on that frequency. The RF GAIN control may be used to set the threshold for halting the auto scan if you want the scanner to stop only on stronger signals. The auto scan may be halted manually by flipping the SCAN lever switch to STOP momentarily.

CLARIFIER SCANNING OPERATION

To scan using the clarifier only, push the CLAR button, then activate the scanning controls as in the previous section. The transceive frequency may also be varied using the clarifier, by pressing the TRX button as described previously. Only manual scanning can be performed using the clarifier, and the scanning range will be the normal ± 9.9 kHz.

TRANSMITTER OPERATION

Some of the FT-ONE transmit functions may not be familiar to the operator, as the transmitter is controlled by a 4-bit CPU allowing some complex operations. Before using the transmitter, you should fully understand the functions of the controls and switches, as misuse may result in damage to the transceiver.

While transmitting, it is important that you always have a dummy load or matched antenna connected to the antenna jack. The automatic final protection unit will restrict transmitting power if an improper load is connected.

Do not transmit at full power (e.g., key-down CW, FSK) for more than 30 seconds. If you have keyed down for a 30 second period, we recommend two minutes of standby operation to allow the final transistors to recover to their normal operating temperature.

In cases of accidental short or open conditions of the load (antenna), the AFP (Automatic Final Protection) circuitry protects the final transistors, by reducing the transmitter gain to prevent over-dissipation problems. Furthermore, when the antenna SWR is high, the AFP circuit reduces the output power according to various antenna matching conditions. However, the AFP circuit is intended only for accidental occasions, so we recommend that you adjust your antenna to be as close to 50 ohms resistive impedance as possible to avoid undue stress on the final transistors.

The following paragraphs describe transmitter operation. If these guidelines are followed, the FT-ONE will provide many years of trouble-free operation.

PRELIMINARY CHECKS

1. Preset the controls and switches as follows:

VOX PTT
FWD Center position
PROC OFF
AMGC OFF
MONI OFF

SCAN MAN
MIC Fully counterclockwise
COMP Fully counterclockwise
DRIVE Fully counterclockwise
MODE FSK
VFO A 0
VFO B 0
VFO SELECT A

2. Set the transceiver to your desired frequency, and listen to ensure that your transmission will not interfere with other stations. (The display shows your true carrier frequency.)
3. Rotate the VOX control counterclockwise into the click-stop, which is the MOX position (manual transmit). Check to see that the TX DIS indicator is not illuminated, as this condition would indicate out-of-band operation. If the LED does come on, reset your frequency inside an amateur band.
4. Advance the DRIVE control so that the IC reading on METER 1 reaches 10 amperes.
5. Set the METER switch to FWD, and adjust the FWD SET control so that the METER 1 needle is aligned with the FWD SET position on the right side of the meter scale.
6. Set the METER switch to REF. The meter needle should be within the REF scale area for full power operation. The REF area covers SWR readings of up to 2:1. When the SWR reading is 2:1, the APF circuitry reduces the power output to about 90% of the full rated power. Normally, we recommend the use of an antenna having an SWR of less than 2:1 so the transmitter provides the full rated output. If the meter needle rests above the REF area, remedial work on your antenna system may be in order. Alternatively, an antenna tuner may be used with your antenna to present a 50 ohm load to your transceiver.
7. For the above test procedure, please be sure to check that the frequency is clear before transmitting. Also, use the minimum power necessary to obtain a full scale reading on the FWD SET step. If less than 10 amps of IC will

provide this reading, by all means, use the lower power level. This SWR check is not normally required routinely unless changes are made to the antenna system.

SSB OPERATION

1) Connect your microphone to the front panel MIC jack. If desired, a footswitch may be connected to the rear apron PTT jack.

2) Preset the controls and switches as follows:

MODE LSB, USB, RX-U/TX-L, or
RX-L/TX-U

METER IC

MIC Center position

3) Close the PTT switch, and speak into the microphone in a normal voice. Adjust the MIC GAIN control so that the ALC meter needle does not go beyond the ALC range of METER 2. The IC meter should read approximately 5 amps on voice peaks, corresponding to about 1/3 to 1/2 of the full-power single-tone meter reading.

4) Now adjust the RF speech processor. Place the PROC switch up to turn the processor on. Do not change the MIC GAIN setting made in step (3). Preset the COMP control to the 12 o'clock position, and speak into the microphone in a normal voice. Adjust the DRIVE control so that the METER 2 (ALC) needle stays at the left side of the scale. Now adjust the COMP control with the METER switch set to the COMP position; the correct setting is one which causes deflection of the needle between 5 and 10 on the COMP scale.

While some initial adjustment of the MIC GAIN, COMP, and DRIVE controls may be required, the optimum setting will soon become clear to the operator. A monitorscope is particularly helpful in adjusting the speech processor. It is important, though, that the transmitter not be overdriven; when speaking into the microphone with a long syllable (such as the word "four"), do not advance the DRIVE control past the point where the IC or forward power reading ceases to increase as the control is advanced.

5. If desired, the AMGC circuit may be activated. This circuit acts as a "microphone squelch" that has a threshold point that activates a gate circuit to pass a speech signal to the transmitter. This feature prevents background noises such as a TV in the operating room or fan noise from a linear amplifier, etc., from going out over the air.

Proper threshold setting and AMGC delay may be adjusted by VR₄₀₀₁ and VR₄₀₀₂ under the top cover.

6. To set the VOX circuitry, advance the VOX gain control on the front panel so your voice activates the transmitter. The DELAY control will allow you to set the VOX time constant for the desired hang time after you have finished speaking. The ANTI-TRIP control, VR₄₀₀₃, under the top cover, may be adjusted as necessary to prevent the speaker output from activating the VOX. Do not use more VOX gain or ANTI-TRIP than necessary.

CW OPERATION

1) The FT-ONE has two jacks on the rear panel for key input. When using a straight key, semi-automatic key, or external electronic keyer, the key lead should be routed through the two-conductor KEY-1 phone jack. When using the optional internal keyer board, connect your paddle through the three-conductor KEY-2 stereo phone jack. The keyer speed control is located on the front panel, concentric with the DELAY control.

2) Please note that the key-up voltage is 8 volts, while the key-down current is 800 μ A. If you experience difficulty in achieving proper electronic keyer operation through the KEY-1 jack, check to be certain that the keying transistor (if used) pulls completely to ground on make. Some transistors designed for switching high voltages do not accomplish this.

3) Three MODE switch positions are available during CW operation. The XF8.9KC provides a 600 Hz bandwidth for the CW-M position, while the XF8.9KCN provides a 300 Hz bandwidth for the CW-N position. In addition, the

XF10.7KC 600 Hz filter is available for the third IF, providing exceptional skirt selectivity. The CW-W position utilizes the standard 2.4 kHz cascaded filters. The IF gain is balanced between these three modes, so as to counteract the added insertion loss of the narrower 8 pole filters. The XF8.9KC, XF8.9KCN, and XF10.7KC are all optional, available from your Yaesu dealer. They are highly recommended for superlative CW performance.

- 4) With the MODE switch set to one of the CW positions, set the VOX control to the MOX position. Close the key, and adjust the DRIVE control for the desired power input reading as indicated on the IC meter. The maximum IC reading for full power will be approximately 17 amps.
- 5) For full CW break-in operation, rotate the DELAY control fully counterclockwise into the click-stop. Between each dot and dash, the receiver recovers, allowing you to monitor your frequency. This is particularly useful during pile-ups or net operation. Do not attempt to use a linear amplifier not equipped for full break-in with the DELAY control set up for that mode; damage to the amplifier components may occur. Use the semi-break-in feature, with the relay hang time controlled by the DELAY control. See the Installation section for details of the proper interconnections.
- 6) To activate the CW sidetone switch the MONI lever on. The frequency of the sidetone oscillator may be set to your desired pitch by adjusting the SIDETONE PITCH control, VR₄₀₀₄. The AF SIDETONE VOLUME may be adjusted through VR₄₀₀₅. These potentiometers are located under the top cover.

CW SPOT USING SIDETONE REFERENCE

The CW pitch potentiometer, VR₄₀₀₄, may be used to align the CW sidetone for CW spotting purposes. The correct alignment procedure will be shown, then the operation technique outlined.

- 1) Connect a receiver or transceiver equipped with a crystal calibrator to the FT-ONE RCV-2 jack. When using a transceiver such as the FT-901DM, connect the cable from the FT-901DM RCV ANT jack to the FT-ONE RCV-2 jack. Remove the top cover of the FT-ONE.
- 2) Connect a dummy load to the FT-ONE ANT jack. Set the MODE switch to CW.
- 3) Set the FT-ONE to 14.100 MHz, and likewise set the external receiver to 14.100 MHz. Switch on the crystal calibrator.
- 4) Align both the FT-ONE and the external receiver so that a comfortable beat note (approximately 700 Hz) is obtained. Zero the two beat notes so that the two receivers are precisely tuned to the same frequency.
- 5) Set the MONI switch to ON to activate the CW sidetone. Set the DRIVE control fully counterclockwise, and set the VOX control to the MOX position.
- 6) Key the transmitter, and adjust the gain controls on the external receiver so that it is not overloaded. Noting the beat note of the transmitted signal from the FT-ONE, adjust VR₄₀₀₄ so that the sidetone beat note is exactly the same as that produced by the transmitter. The sidetone now becomes a reference spotting signal during CW operation.

Operation

- 1) Let us say that DX1DX is operating on 14.002 MHz, working stations around his frequency. Locate the station working DX1DX, and close your key while in the receive mode. Align the sidetone beat note with that of the station working DX2DX; you will now be zero beat with that station.

- 2) Switch the receive clarifier on, and return to DX1DX's frequency. When you call DX1DX, you will be precisely on the same frequency as the previous station, giving you a better change of working DX1DX.
- 3) If DX1DX is tuning around his frequency, working several stations in one spot then moving 1 kHz or so, use the split VFO technique. Put DX1DX into VFO-A, channel 1. Now use VFO-B, channel 2 for zeroing in on the station working DX1DX. As the DX station moves around, you can follow his listening frequency with VFO-B, while keeping VFO-A locked on his transmitting frequency.

FSK OPERATION

The FT-ONE contains an FSK shift circuit, providing 170 Hz shift during teletype operation.

- 1) Connect the keying lead from your terminal unit to the rear panel FSK jack.
- 2) Depending on the impedance required by your T.U. on receive, the audio lead may be connected either to the AF OUT jack or the SP jack on the rear panel of the transceiver.
- 3) Two FSK modes are provided. The FSK-W position uses the standard cascaded 2.4 kHz filters, while the FSK-N uses the same filter as used in the CW-M position (600 Hz). If you find the 600 Hz bandwidth too narrow for your application, set the MODE switch to FSK-W, and adjust the WIDTH and SHIFT controls for an intermediate bandwidth of appropriate center frequency.
- 4) Set the VOX control to MOX. Advance the DRIVE control for a reading of 10 amps or less on the IC meter. Do not operate the FT-ONE at the same power levels as stipulated previously for SSB and CW operation.

AM OPERATION

- 1) An optional 6 kHz AM filter, the XF8.9KA, is available from your Yaesu dealer. If this filter is not installed, the received bandwidth on AM will be 2.4 kHz.
- 2) Set the MODE switch to AM, and the METER switch to IC. Rotate the MIC GAIN and DRIVE controls fully counterclockwise.
- 3) Close the microphone PTT switch, and advance the DRIVE control until the IC meter reaches a reading of 5 amps.
- 4) Advance the MIC GAIN control while speaking into the microphone in a normal voice. The METER 2 (ALC) reading should not go out of the ALC range. Do not advance the MIC GAIN control too far, or spurious responses may result. If the IC meter deflects downward during voice peaks, the DRIVE control may be advanced too far.
- 5) In the AM mode, the RF speech processor and the variable IF bandwidth features are disabled.

FM OPERATION

The FT-ONE can operate in the FM mode if an optional FM unit is installed. The FM mode may be used for operation on the 10 meter band through a repeater. Also, when you use a transverter with the FT-ONE, you can enjoy FM operation on the VHF and UHF bands.

- 1) Set the MODE switch to FM, and the METER switch to IC. Set the DRIVE control fully counterclockwise.
- 2) Depress the microphone PTT switch, and advance the DRIVE control until the reading on the IC meter reaches 10A. During FM operation, we recommend that you periodically check the IC meter to be sure the IC reading does not exceed 10A.
- 3) Speak into the microphone. While in the FM mode the microphone gain is preset by a potentiometer in the FM unit, so the MIC gain

control is inoperative. In the FM mode the RF speech processor and WIDTH/SHIFT controls are also disabled.

- 4) The receiver squelch control, concentric with the AF GAIN control, may be used to silence the receiver during standby periods when no signals are being received. While listening on an unoccupied frequency, advance the SQL control until the background noise is just silenced. Do not go beyond this threshold point too far, or the receiver will not respond to weak signals.

SSTV OPERATION

Slow-scan television operation is easily accomplished using the FT-ONE. Proper adjustment involves techniques outlined previously for SSB and FSK operation.

- 1) Set the MODE switch to USB or LSB, per the band in use. Connect the audio output from your SSTV generator into the rear panel PATCH jack, and connect the audio input for the SSTV decoder to the SP or AF OUT jack, depending on the impedance requirement of your terminal.
- 2) Receive operation is identical to that for SSB operation. Use the receive clarifier, as needed, for minor receive frequency adjustments without changing the transmitter frequency.
- 3) To transmit, leave the microphone gain control in the same position as for SSB operation. Close the PTT switch, and adjust the output level from your SSTV generator such that the ALC meter needle stays within the ALC range. Now adjust the DRIVE control so that the IC meter reading is 10 amps or less. Check the IC reading periodically to ensure that this level is not exceeded.

KEYBOARD OPERATION

The front panel keyboard may be used in conjunction with the main tuning knob for quick band changes or programming of individual operating frequencies. Alternatively, the keyboard may be used for complete channel selection and split frequencies. Alternatively, the keyboard alone may be used for complete channel selection and split experimentation should be made in order to determine the most efficient use of the FT-ONE's microcomputer circuitry to suit your particular requirements.

ERROR MODE

If an invalid entry is made by the operator, the letter "E" will appear after the decimal point, indicating that an error has been made. Simply press the "CE" (Clear Entry) key to return to the previous operating frequency.

KEYBOARD VFO CHANNEL SELECTION

To select a desired VFO channel while programming from the keyboard, set the VFO SELECT switch to KEYBOARD. When the switch is in the KEYBOARD position, all VFO channel selections can be made through the keyboard, instead of through the VFO A and VFO B channel selectors.

To select a desired VFO channel, press a VFO number between 0 - 9, and then "MR". The appropriate VFO is recalled, providing operation on that frequency. You can then change the frequency via either the Tuning Knob or the keyboard.

KEYBOARD FREQUENCY ENTRY

The FT-ONE built-in keyboard allows you to enter any frequency with resolution of 100 Hz. To enter a frequency, set the VFO SELECT switch to KEYBOARD position. Press the VFO number desired and then press "MR". The channel is now available for frequency entry (You may also select the VFO channel with VFO switches and the VFO SELECT switch in a VFO position). The first one or two digits of the operating frequency

to the left of the left-hand decimal point (MHz), and the four digits to the right of this decimal point are entered independently. The "MHz" key on the keyboard is used to enter digit(s) to the left of the decimal point, and the "DIAL" key is for the last four digits.

- 1) To enter "21.285.0" MHz, press "21" on the keyboard. The display will show "2.1" on the right side of the display. Now press the "MHz" key, and the digital display will show "21.XXX.X" MHz. The last four digits remain from the last set frequency.
- 2) Press "2850" and "DIAL" and the last four digits are entered over the previous digits. The digital display now shows "21.285.0" MHz. Also, you can shift the frequency from 21.285.0 MHz by rotating the VFO dial.

Let's try another example: for operation on 21.325.5 MHz, press "3255" and "DIAL". In this case, it was not necessary to enter "21" and "MHz" because 21 MHz was set previously, and is already displayed.

Let us say that you are operating on 21.325.5 MHz, as just programmed, and wish to check 14.225 MHz without losing the original operating frequency. Rotate the VFO-A selector to another position. Now push the "14" and "MHz" keys, followed by "2250" and "DIAL." To return to 21.325.5 MHz, just rotate the VFO-A selector to the original channel. Note that the main dial can be rotated to select a new frequency at any time, as these frequencies are stored in VFO access slots, not fixed frequency memories.

Remember you must enter all four digits of the frequency to the right of the MHz decimal point when changing kHz from the keyboard.

Note also that the VFO SELECT switch may be set to VFO-B, and the VFO-B switch rotated among channels 0, 1, and 2; the frequencies will be observed to be the same as when called up via the VFO-A access route or via the keyboard recall method, thus demonstrating further the independence of the ten synthesized variable frequency oscillators.

SPLIT FREQUENCY OPERATION

Split frequency operation may be accomplished by means of the A-B VFO selector switches or via the keyboard. As the applications requiring split frequency may best be addressed by using a particular technique, practical operating examples will be provided.

Split Operation Via VFO SELECT Switch (VFO-A and VFO-B)

- 1) The VFO SELECT switch has four positions of chief interest for split frequency operation. These are the "A" "B" "RA-TB" and "RB-TA" positions. The "RA-TB" position selects receive on VFO-A, with transmit on VFO-B, while the "RB-TA" position selects receive on VFO-B with transmit on VFO-A.
- 2) Let us say that you are working 7 MHz SSB. You have located DX1DX on 7.098 MHz using VFO-A, channel 1. DX1DX is listening for calls on 7.205 MHz. Set the VFO-B channel selector to channel 2, and set the VFO SELECT switch to VFO-B for a moment.

Now program in 7.205 MHz into channel 2 by pressing "7" "MHz" "2050" and "DIAL" in that order. Now set the VFO SELECT switch to the "RA-TB" position. You will be receiving on 7.098 MHz, and transmitting on 7.205 MHz. If DX1DX begins to drift, simply follow his signal using the main tuning dial. If DX1DX calls out 7.208 MHz as a new listening frequency, set the VFO SELECT switch to VFO-B for a moment, and set the new frequency using either the main tuning knob or the keyboard. Note that easy spotting of the 7.205 MHz pile-up on DX1DX may be performed by checking VFO-B in this manner.

- 3) Let us use the further example of DX2DX transmitting on 14.195 MHz, listening up the band. Some observation indicates that DX2DX listens first on 14.205 MHz, then tunes up the band in 3 kHz increments up to 14.214 MHz, at which point he reverts to 14.205 MHz. Let us use VFO channels 1 through 5 to cover this application.

First, rotate the VFO SELECT switch to VFO-A, and store 14.195 MHz in VFO-1. Now set the VFO-B selector to VFO-2, and the VFO SELECT switch to VFO-B. Program 14.205 MHz into VFO-2. In like fashion, program 14.208 MHz into VFO-3, 14.211 MHz into VFO-4, and 14.214 MHz into VFO-5.

When DX2DX comes back to a station, quickly rotate the VFO-B selector until you hear the station responding to the DX2DX call; we find that station on 14.208 MHz. From previous observation, we know DX2DX will listen next on 14.211 MHz, so advance the VFO-B selector to VFO-4, and set the VFO SELECT switch to the "RA-TB" position.

If DX2DX does not respond to your call on 14.211 MHz, check VFO-B on receive briefly to confirm that you are precisely tuned on the station successfully working DX2DX; if not, rotate the main tuning dial slightly to ensure that, on the next pass, you will be transmitting on precisely the same frequency as the last station successfully to work DX2DX in that slot. It can be seen that this bank of independent VFOs provides tremendous flexibility in an otherwise complex operating situation.

Split Operation Using Keyboard

The keyboard TRCV key is used to initialize the microprocessor either for transceive operation on a particular VFO or for split operation using two VFOs. The following practical operating examples will illustrate the versatility available to the operator.

- 1) Having operated using the normal VFO-A or VFO-B technique, now set the VFO SELECT switch to KEYBOARD. The operator will note that the TRCV LED is now illuminated.
- 2) Let us say that a spotting operator has found DX3DX on 7.098 MHz, listening for calls on 7.205 MHz. We will use VFO 1 for transmit, and VFO 2 for receive.
 - 3) To set the transmit frequency, push "1" and "MR" to call up VFO-1. Now key in "7" "MHz" "2050" and "DIAL" in that order.
 - 4) Now call up the receive frequency by pushing "2" "MR" "7" "MHz" "0980" and "DIAL" in that order.
 - 5) Now push "1" "MR" and "TRCV" to establish 7.205 MHz as the transmit frequency. Note that the TRCV LED has gone out.
 - 6) Now press "2" and "MR" to recall 7.098 MHz as the receive frequency. When you close the PTT switch, the display will indicate 7.205 MHz, as programmed.
 - 7) To change receive frequencies, simply rotate the main tuning dial. Should DX3DX suddenly call out 7.230 MHz as his listening frequency, press "1" and "MR" followed by "2300" and "DIAL" to program the new frequency. Now just press "2" and "MR" to return to your previous listening frequency.
 - 8) Now let us say that DX3DX does not respond, and you wish to call CQ DX on 7.285 MHz, listening for calls on 7.055 MHz and 7.285 MHz, without disturbing VFOs 1 and 2. We will use VFO slots 3 and 4 for this situation. First set the transmit frequency by pushing "3" "MR" "7" "MHz" "2850" and "DIAL" in that order.
 - 9) Now program the receive frequency: push "4" "MR" "7" "MHz" "0550" and "DIAL" in that order.
 - 10) Now push "3" and "MR" followed by "TRCV" and "TRCV" a second time. The TRCV LED will come on, then go off with the second push of the TRCV key. This erases VFO-1 as the transmit VFO, replacing it with VFO-3. Now press "4" and "MR" to receive on 7.055 MHz.
 - 11) To check 7.285 MHz for calls, simply press "3" and "MR". If a station calls you, just close the PTT switch, as 7.285 MHz is already programmed as your transmit frequency. To

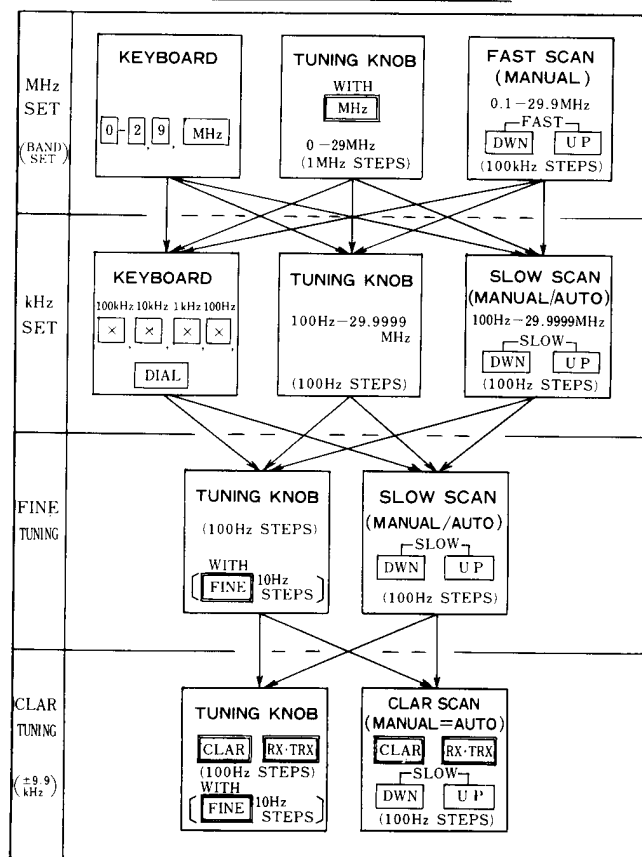
recheck DX3DX on 7.098 MHz, push "2" and "MR". If you wish to call DX3DX, push "1" "MR" "TRCV" "TRCV" followed by "2" and "MR". It can be seen that this method is identical in objective to using the VFO-A and VFO-B knobs; in this case, though, all control commands are being made by the keyboard.

MEMORY BACKUP INFORMATION

The memory backup protection feature is activated by turning on the BU switch located on the rear panel. This will preserve the memory information while the transceiver power switch is off, so long as line voltage is connected to the transceiver. However, if the voltage to the transceiver is cut off, the memory will be lost.

An optional RAM Unit and three AA size penlight battery cells can be used to provide the necessary backup power for power cuts. If your power situation is poor, or if you wish to retain memory when the transceiver is disconnected from the line, the RAM unit will ensure memory backup. Ask your dealer for the optional RAM unit.

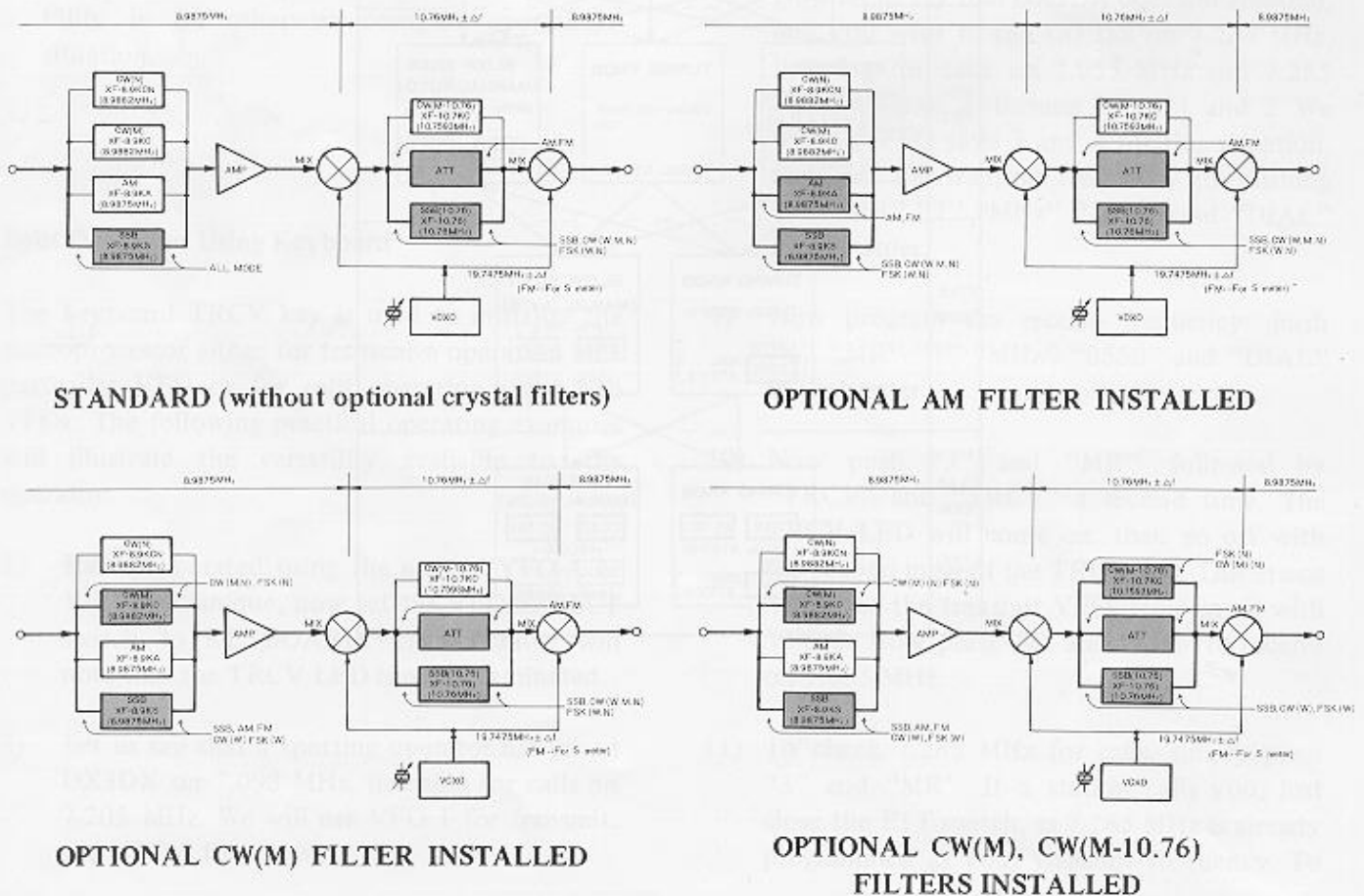
FREQUENCY SELECTION

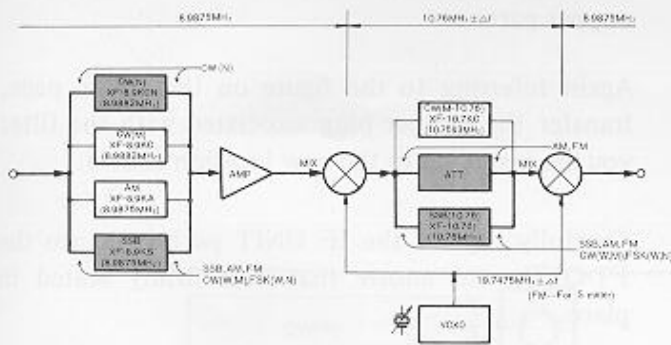


CRYSTAL FILTER INFORMATION

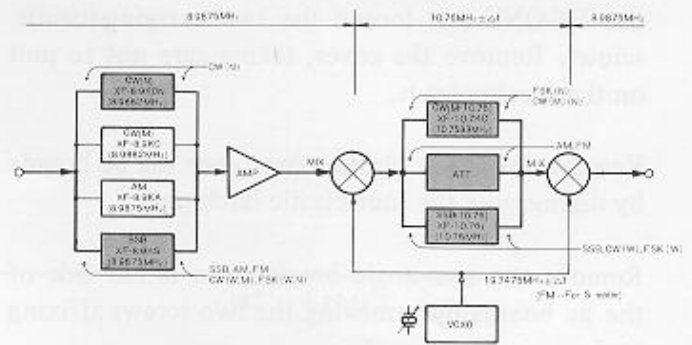
	IDENT. NUMBER	YAESU PART NUMBER	CENTER FREQUENCY	BANDWIDTH	INSERT LOSS	POLES
		KIT NUMBER				
SSB FILTER	XF-8.9KS	H1102040	8.9875 MHz	More than 2.7 kHz -6 dB Less than 4.5 kHz -60 dB	Less than 4 dB	8
		-				
SSB FILTER (10.76)	XF-10.7KS	H1102042	10.76 MHz	2.8 kHz -6 dB 7.0 kHz -60 dB	3 dB	6
		-				
OPTIONAL AM FILTER	XF-8.9KA	H1102039	8.9875 MHz	6 kHz -6 dB 10 kHz -60 dB	3 dB	8
		D2000020				
OPTIONAL CW(M) FILTER	XF-8.9KC	H1102038	8.9882 MHz	600 Hz -6 dB 1.2 kHz -60 dB	7 dB	8
		D2000019				
OPTIONAL CW(N) FILTER	XF-8.9KCN	H1102037	8.9882 MHz	300 Hz -6 dB 900 Hz -60 dB	11 dB	8
		D2000018				
OPTIONAL CW(M-10.76) FILTER	XF-10.7KC	H1102041A	10.7593 MHz	800 Hz -6 dB 2.4 kHz -60 dB	6.5 dB	6
		D2000021				
PROC FILTER	XF-8.9KP	H1102035	8.9875 MHz	2.7 kHz -6 dB 5.4 kHz -60 dB	3 dB	6
		-				
NB FILTER	XF-8.9JF	H1102036A	8.9875 MHz	20 kHz -6 dB 50 kHz -40 dB	3 dB	4
		-				
1st IF FILTER	XF-73KX	H1102043	73.115 MHz	20 kHz -6 dB 70 kHz -50 dB	4 dB	4
		-				

IF FILTER CIRCUIT RECEIVE SIGNAL PATHS

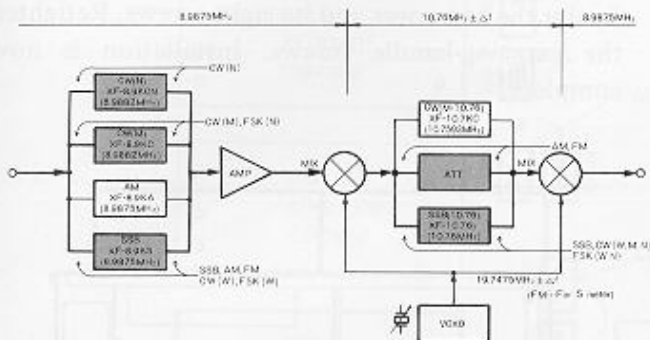




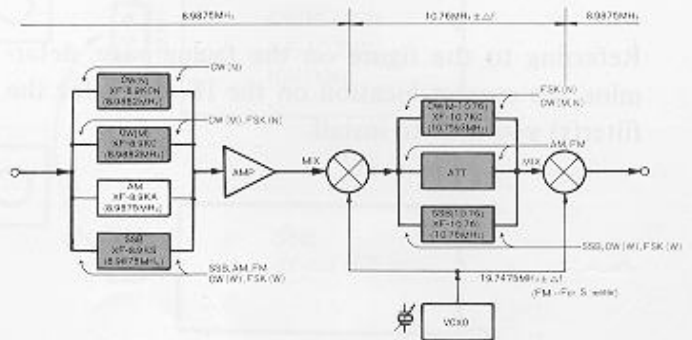
OPTIONAL CW(N) FILTER INSTALLED



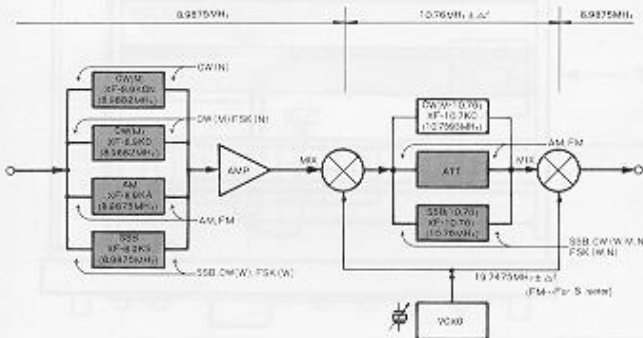
OPTIONAL CW(N), CW(M-10.76) FILTERS INSTALLED



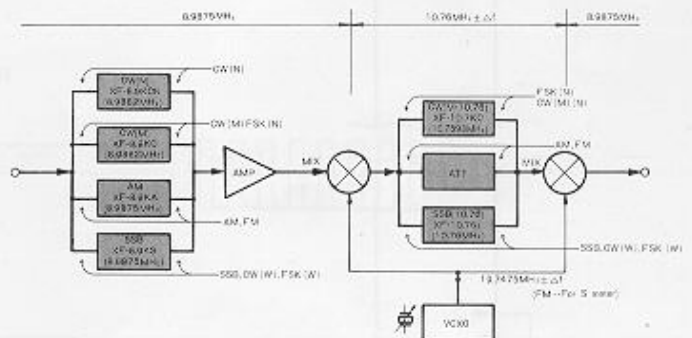
OPTIONAL CW(M), CW(N) FILTERS INSTALLED



OPTIONAL CW(M), CW(N), CW(M-10.76) FILTERS INSTALLED



OPTIONAL AM CW(M), CW(N), FILTERS INSTALLED



ALL OPTIONAL FILTERS INSTALLED

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OPTIONAL CRYSTAL FILTER INSTALLATION

Remove the eight screws affixing the top cover of the FT-ONE and loosen the two carrying-handle screws. Remove the cover, taking care not to pull on the speaker leads.

Remove the black plastic cover over the pc boards by disengaging the four plastic latch pins.

Remove the two angle brackets on either side of the pc boards by removing the two screws affixing each.

Lift the pc board ejector levers on the edges of the IF UNIT and remove the IF UNIT pc board.

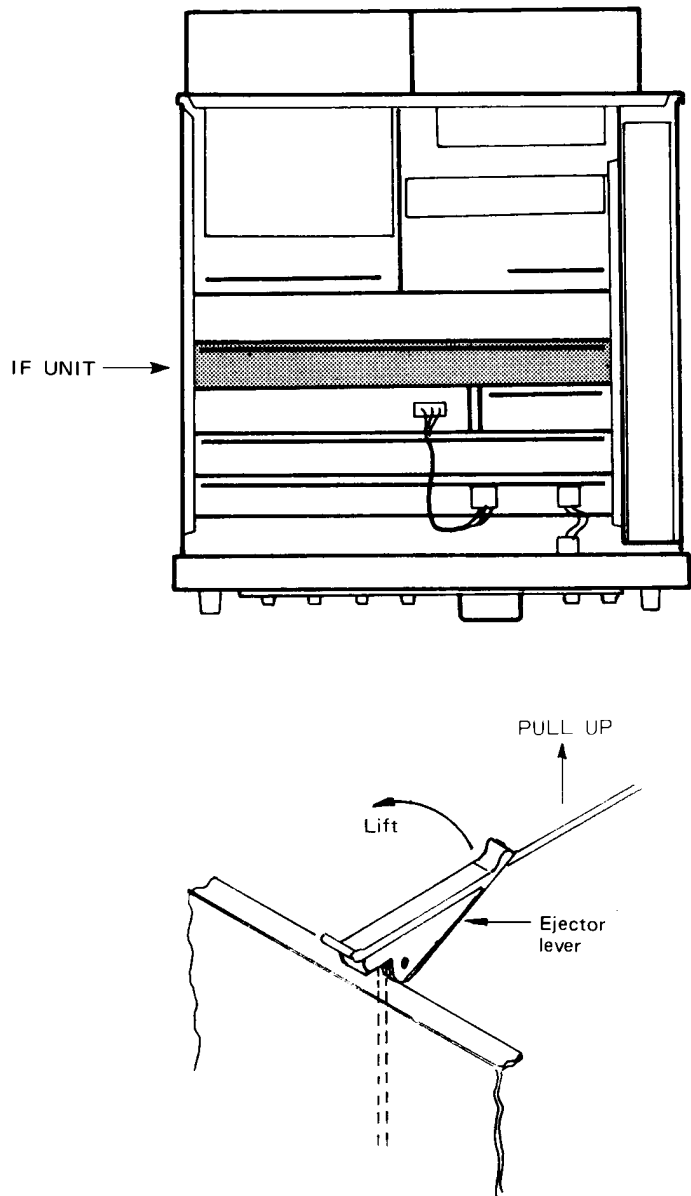
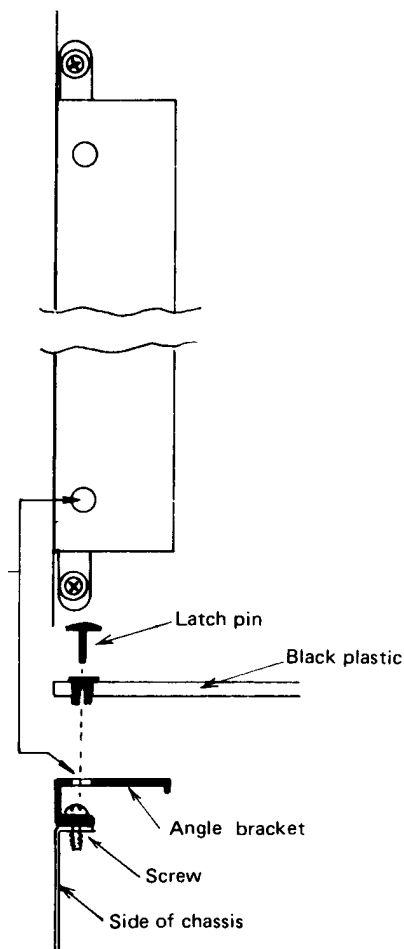
Referring to the figure on the facing page, determine the correct location on the IF UNIT for the filter(s) you wish to install.

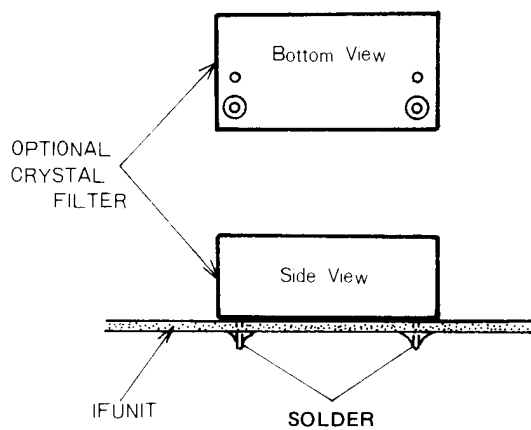
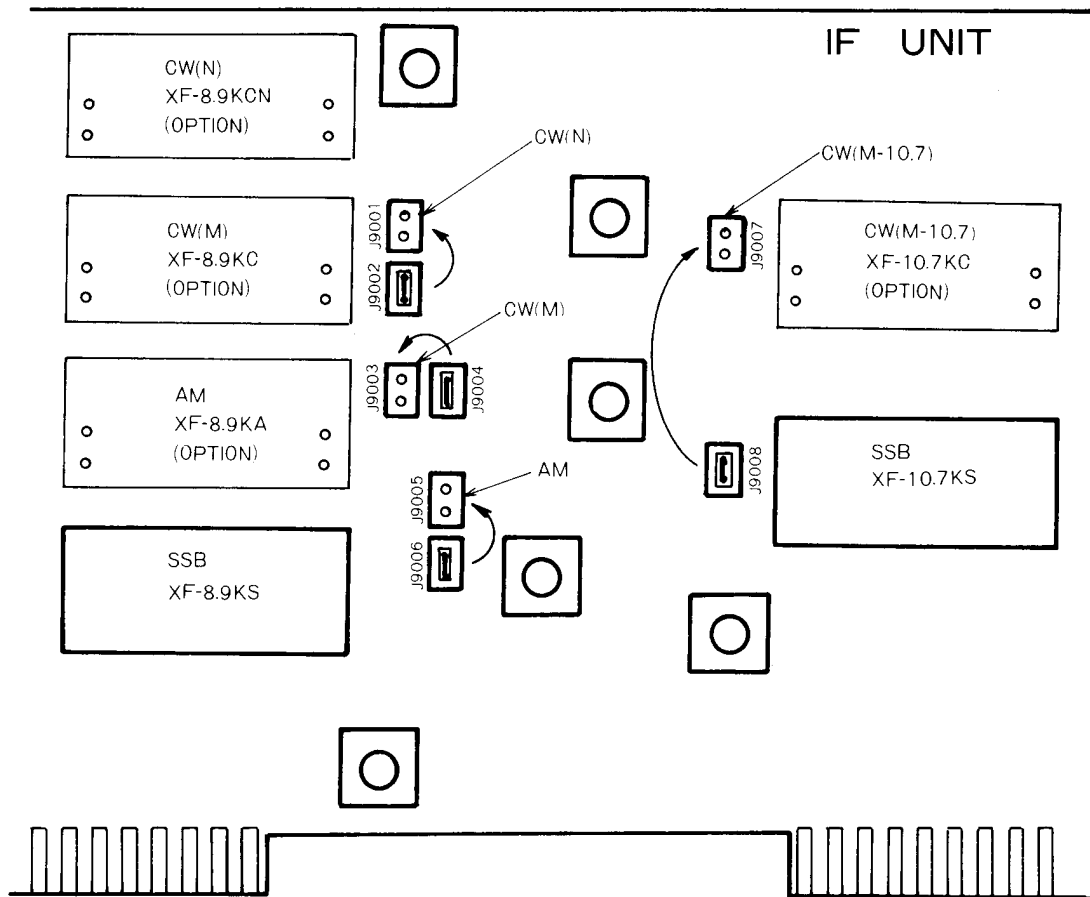
Install the filter and solder the four leads to the copper pattern.

Again referring to the figure on the facing page, transfer the jumper plug associated with the filter you are installing to the new location shown.

Carefully replace the IF UNIT pc board into the FT-ONE, and ensure that it is firmly seated in place.

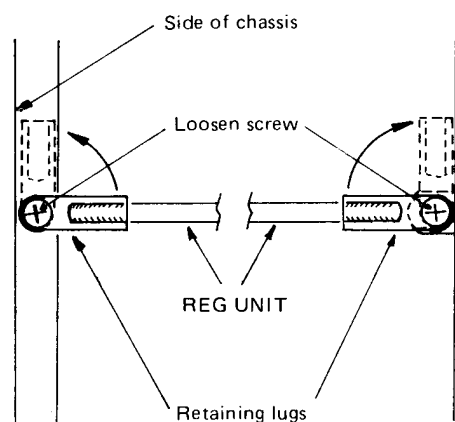
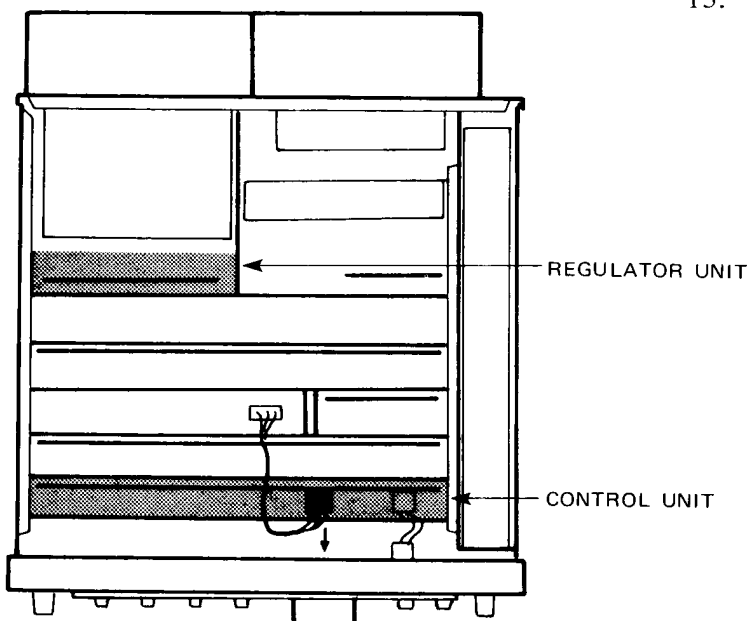
Replace the two angle brackets and their four screws, then replace the black plastic cover and finally the top cover and its eight screws. Retighten the carrying-handle screws. Installation is now complete.

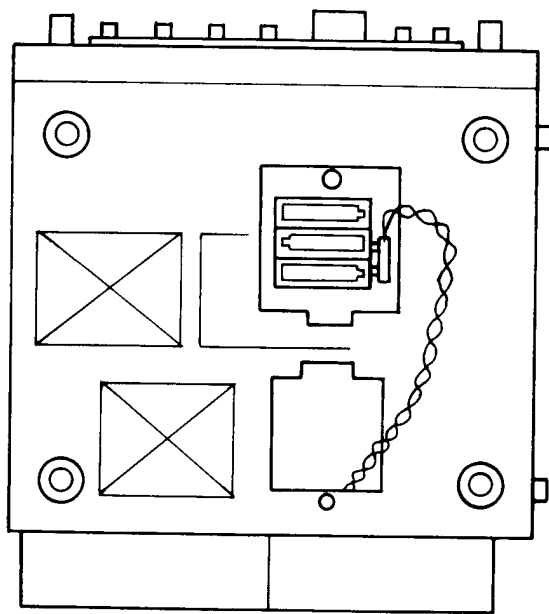
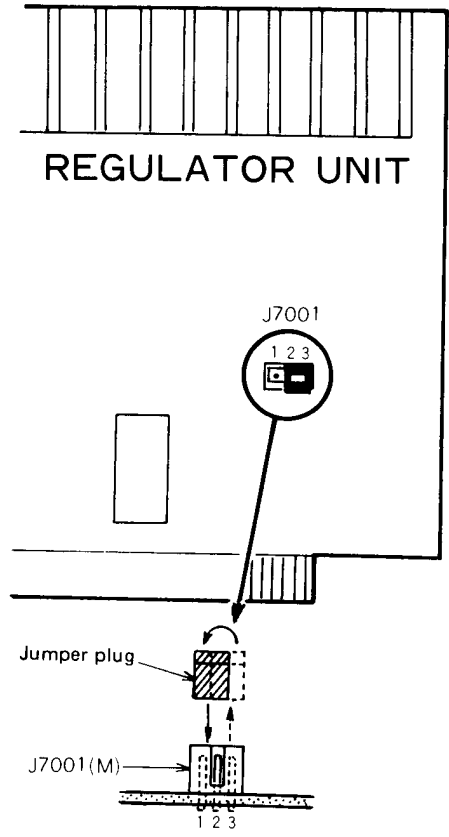
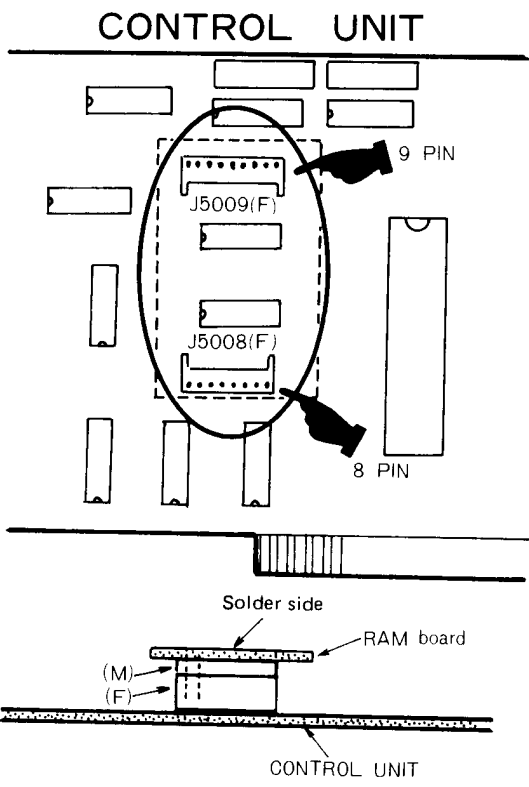




RAM BOARD UNIT INSTALLATION

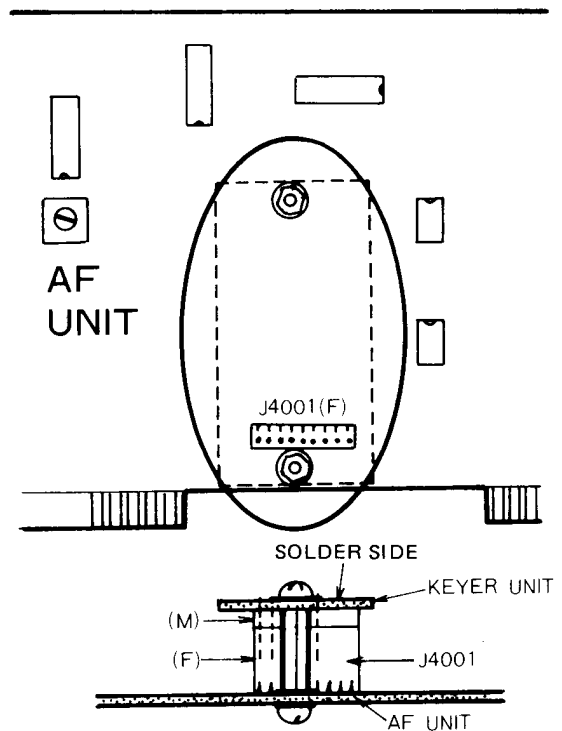
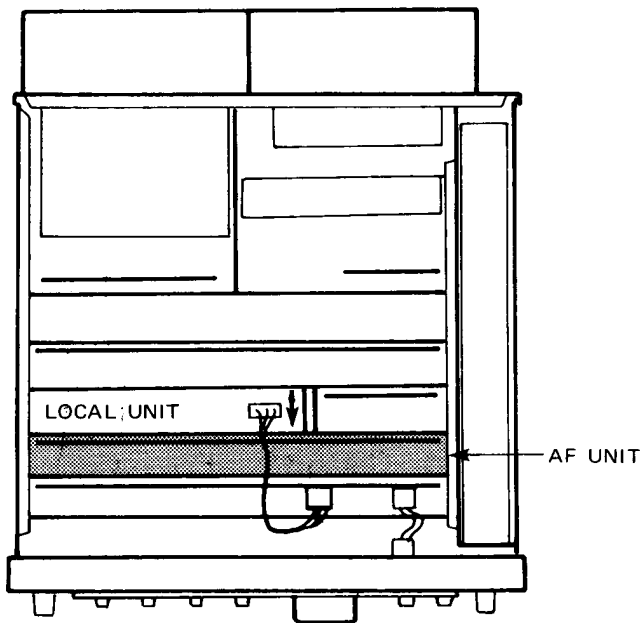
1. Remove the eight screws affixing the top cover of the FT-ONE and loosen the two carrying-handle screws. Remove the cover, taking care not to pull on the speaker leads.
2. Referring to the left-hand figure on page 34, remove the black plastic cover over the boards by disengaging the four plastic latch pins.
3. Remove the two angle brackets on either side of the pc boards by removing the two screws affixing each.
4. Gently lift the CONTROL UNIT board out of its connector by lifting the board ejector levers on either end of the board, and disconnect the two plastic cable connectors from the CONTROL UNIT (one of the cables leads to the pc board inside the front panel, and the other to the LOCAL UNIT). It is not necessary to disconnect both ends of these cables.
5. Insert the RAM BOARD connecting pins into connectors $J_{5008(F)}$ and $J_{5009(F)}$ on the CONTROL UNIT board (figure, facing page).
6. Replace the CONTROL UNIT board while reconnecting the two cables back into their original positions.
7. Referring to the figures below, loosen the two screws securing the retaining lugs on either side of the top edge of the REGULATOR UNIT, rotate the lugs 90° and remove the REGULATOR UNIT pc board.
8. Locate the small plastic 2-conductor plug that is connected to pins 2 and 3 of J_{7001} , and move this jumper plug to pins 1 and 2 (figure, facing page).
9. Replace the REGULATOR UNIT pc board, rotate the retaining lugs back over the edge of the board, and tighten the two screws.
10. Replace the two angle brackets and their four screws, then replace the black plastic cover and finally the top cover and its eight screws. Retighten the carrying-handle screws.
11. Now lay the FT-ONE upside down on the workbench.
12. Disengage the plastic latch pin on the small access cover on the bottom of the FT-ONE, and install three AA size penlight battery cells in the battery clip on the inside of the cover. One set of batteries should last more than one year, but we recommend that they be replaced at least once a year to avoid leakage.
13. Replace the access panel and depress the latch pin. Installation is now complete.





KEYER UNIT INSTALLATION

1. Remove the eight screws affixing the top cover of the FT-ONE and loosen the two carrying-handle screws. Remove the cover, taking care not to pull on the speaker leads.
2. Referring to the left-hand figure on page 34, remove the black plastic cover over the pc boards by disengaging the four plastic latch pins.
3. Remove the two angle brackets on either side of the pc boards by removing the two screws affixing each.
4. Disconnect the cable connector (on the cable that connects from the LOCAL UNIT to the CONTROL UNIT) from the LOCAL UNIT. It is not necessary to disconnect this cable from the CONTROL UNIT (see below).
5. Lift the pc board ejector levers on the edges of the AF UNIT and remove the AF UNIT.
6. Plug the KEYER UNIT into connector J4001 (F), and then fasten the KEYER UNIT to the AF UNIT mounting posts with the two screws provided (see drawings below).
7. Replace the AF UNIT pc board into the FT-ONE.
8. Replace the two angle brackets and their four screws, then replace the black plastic cover and finally the top cover and its eight screws. Retighten the carrying-handle screws. Installation is now complete.



FM UNIT INSTALLATION

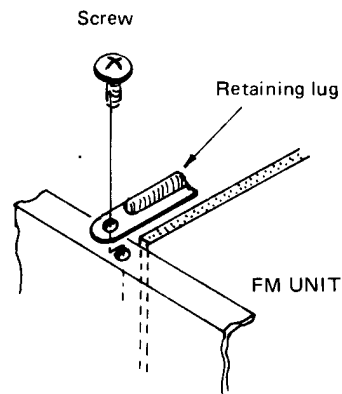
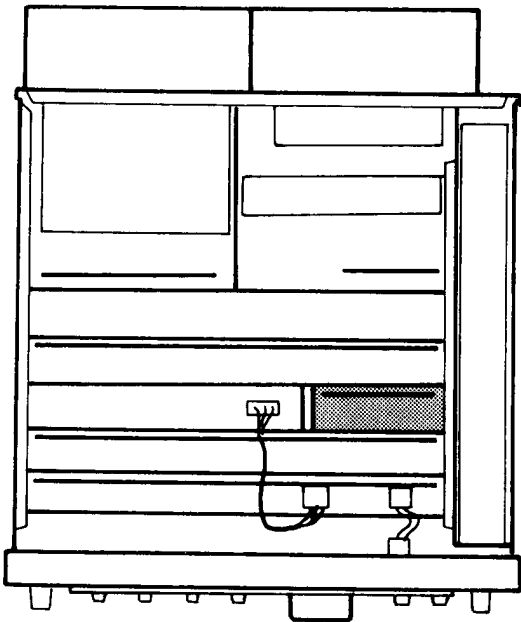
Remove the eight screws affixing the top cover of the FT-ONE and loosen the two carrying-handle screws. Remove the cover, taking care not to pull on the speaker leads.

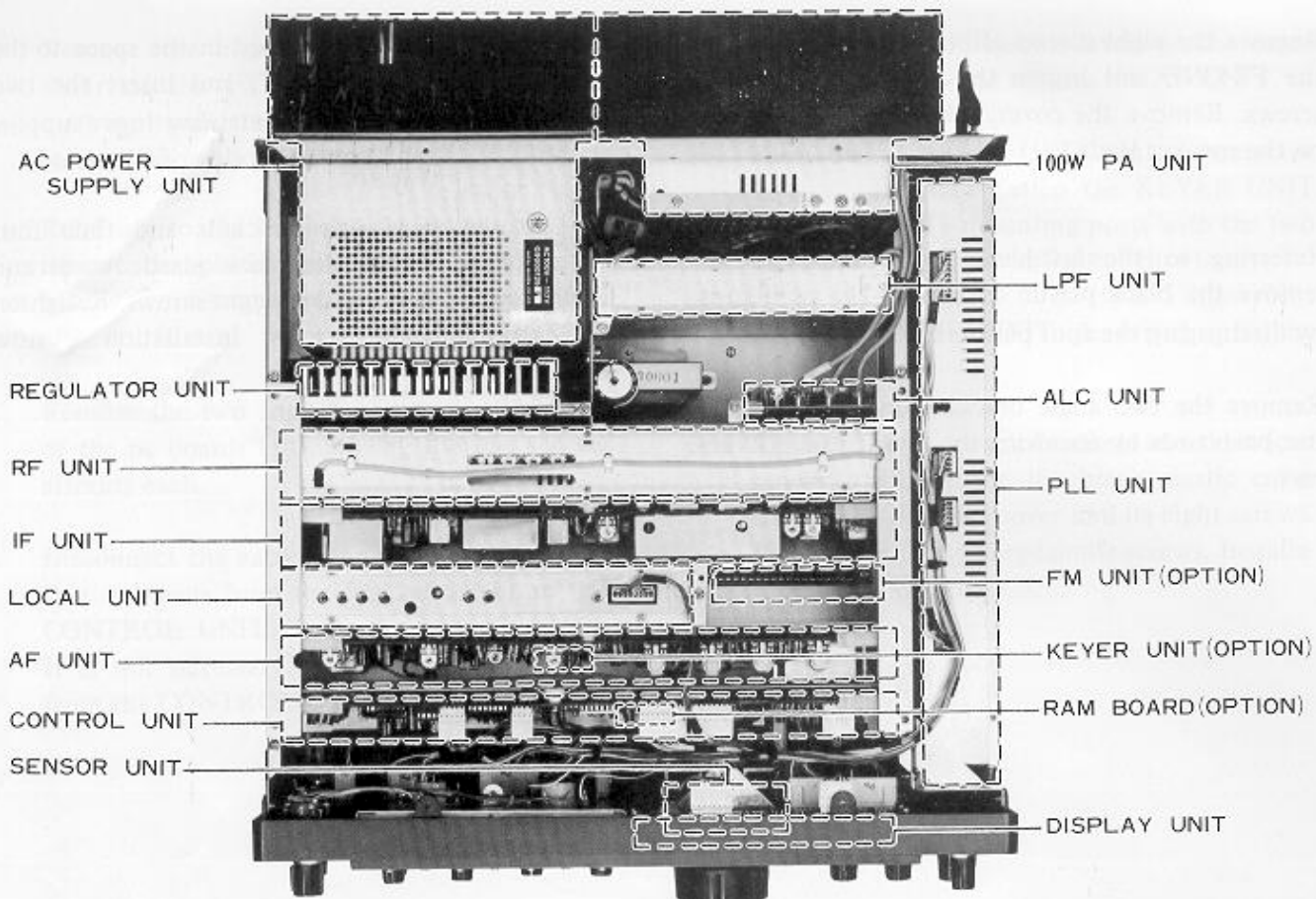
Referring to the left-hand figure on page 34, remove the black plastic cover over the pc boards by disengaging the four plastic latch pins.

Remove the two angle brackets on either side of the pc boards by removing the two screws affixing each.

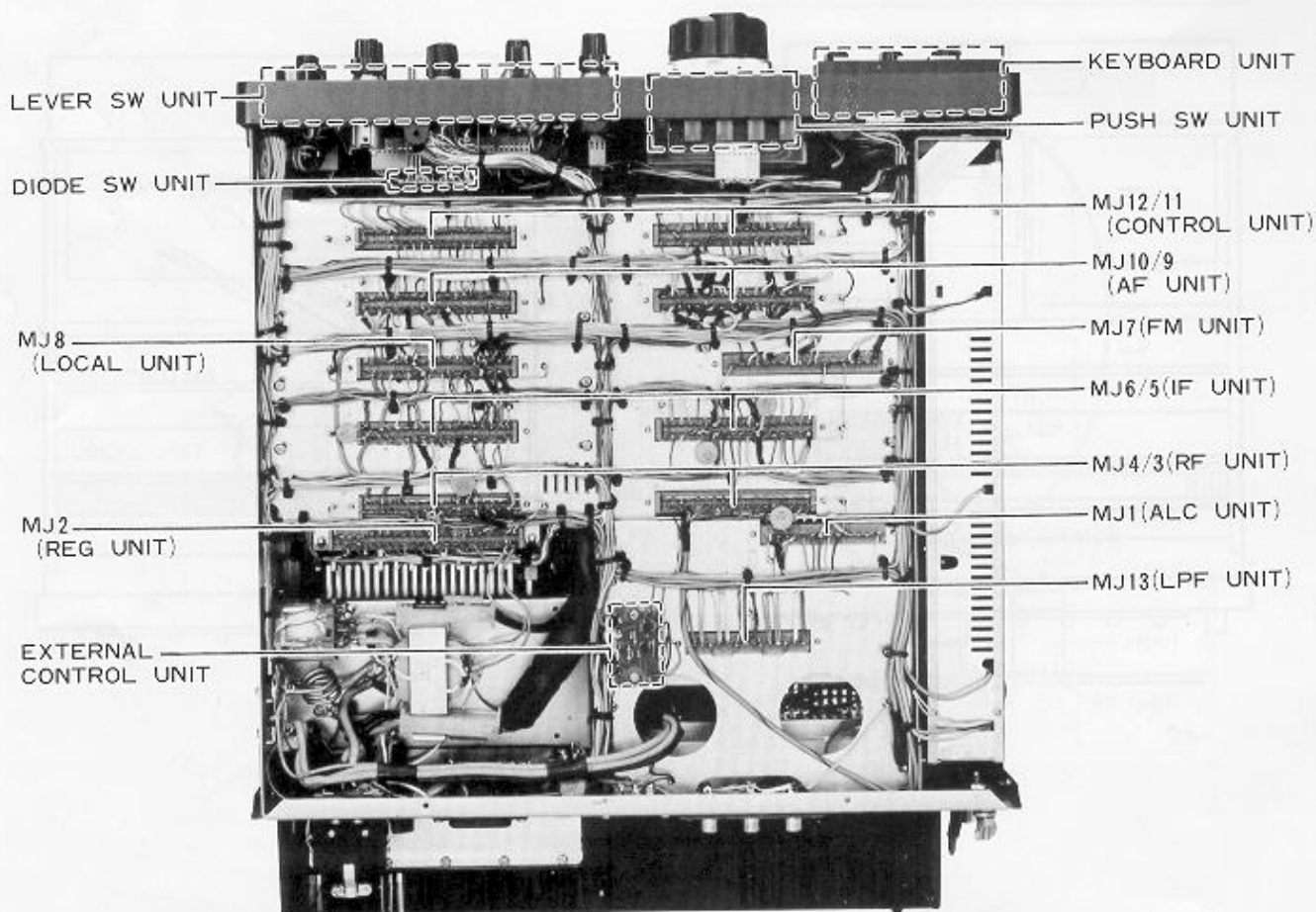
Install the FM UNIT pc board in the space to the right of the LOCAL UNIT, and insert the two screws into the pc board retaining lugs (supplied with the FM UNIT) on either side of the board.

Replace the two angle brackets and their four screws, then replace the black plastic cover and finally the top cover and its eight screws. Retighten the carrying-handle screws. Installation is now complete.





TOP VIEW



BOTTOM VIEW

FT-ONE FREQUENCY RELATIONSHIPS

TECHNICAL NOTES

