

YAESU

OPERATING MANUAL

FT-80C

YAESU MUSEN CO., LTD.

C.P.O. BOX 1500

TOKYO, JAPAN

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FT-80C

HF ALL MODE TRANSCEIVER



The FT-80C is a compact, SSB/CW/AM and (optionally) FM transceiver providing 100 watts of transmitter power output on all frequencies between 1.8 and 30 MHz.

Convenient features include twenty channels which store mode, simplex or split frequencies and scanning status, and a clarifier. A wideband AM IF filter is included as standard. A switchable 20dB receiver attenuator and noise blanker are provided to optimize reception under varying conditions.

The transmitter power amplifier is enclosed in its own diecast aluminum heatsink chamber inside the transceiver, with forced-air cooling by an internal fan allowing full power FM and AFSK operation when used with a heavy duty power supply. Optional accessories include your choice of the MD-1B8 Desktop Scanning Microphone or the MH-1B8 Handy Scanning Microphone, the microprocessor controlled FC-1000 Automatic Antenna Tuner or FL-7000 500-watt Automatic Solid State Linear Amplifier, and a TCXO (Temperature Compensated Crystal Oscillator) for added frequency stability.

Special power supplies for the FT-80C include the FP-757HD Heavy Duty Series-Regulator Power Supply with forced-air cooling and automatic thermal fan control, or the FP-700 standard power supply for low power and light-duty applications. Both power supplies can be wired for 100/110/117/200/220 or 234 VAC.

1. SPECIFICATIONS

TRANSMITTER

Emission types

LSB, USB (J3E); CW (A1A); AM (A3E)
and optionally FM (F3E)

Power output (+20/-10%)

SSB, CW & FM*: 100W PEP/DC,
AM: 25W Carrier

SSB Carrier suppression

better than 40dB below peak output

Unwanted sideband suppression (SSB)

better than 50dB (1 kHz tone)

Spurious radiation

Harmonic: better than -46dB (within 1.8-
2.5, 3-3.5, 5.5-8, 10-15 and 18-30 MHz)
Non-Harmonic: better than -40dB

Audio response

less than -6dB from 400 to 2600Hz

3rd order intermodulation distortion

better than -25dB (@100W PEP)

Modulation systems

SSB/CW: active balanced modulator
AM: early stage (low level)
FM*: variable reactance

Maximum FM* deviation

±2.5 kHz

Microphone impedance

500 to 600 ohms

RECEIVER

Circuit type

CW, SSB, AM: double conversion
FM*: triple conversion

Clarifier range

±9.975 kHz

Sensitivity (for 10dB S+N/N, exc FM)

SSB/CW: 0.5uV

AM: 2uV

FM*: 0.7uV for 12dB SINAD (above 28MHz)

Squelch sensitivity

SSB/CW/AM: 2.0uV above 1.5 MHz,
4.0uV within 0.5-1.5 MHz
FM*: 0.32uV

Intermediate frequencies

47.055MHz, 8.215MHz, 455kHz(FM-only*)

Image rejection

better than 70dB within 1.5-30MHz

IF rejection

better than 60dB within 1.5-30MHz

Selectivity (-6/-60dB)

SSB, CW(W), AM(N): 2.2/5 kHz

CW(N): 500 Hz/1.8 kHz

AM(W): 6/14 kHz; FM(6/50dB)*: 8/19kHz

Maximum audio power output

at least 1.5W into 8 ohms w/10% THD

Audio output impedance

4 to 8 ohms

* FM operation requires optional unit.

GENERAL

Frequency range

1.5-29.999975 MHz, except 7.6-9 MHz and
23.527 ±50 kHz

Number of channels

20

Channel steps

SSB & CW: 25 Hz

AM: 1 kHz

FM*: 5 kHz

Frequency stability (0° to +40°C)

SSB, CW, AM: ±200 Hz

FM: ±300 Hz

Frequency accuracy

SSB, CW, AM: ±200 Hz

FM: ±300 Hz

Antenna impedance (nominal)

50 ohms, unbalanced

Supply voltage

13.5 V DC ±10% (neg. ground)

Maximum current consumption

19A (typical, @100W output)

Dimensions (WHD)

238 x 93 x 238mm (without knobs)

Weight (approx)

3.5 kg (7.72 lb)

Specifications may be subject to change
without notice or obligation.

ACCESSORIES

Supplied

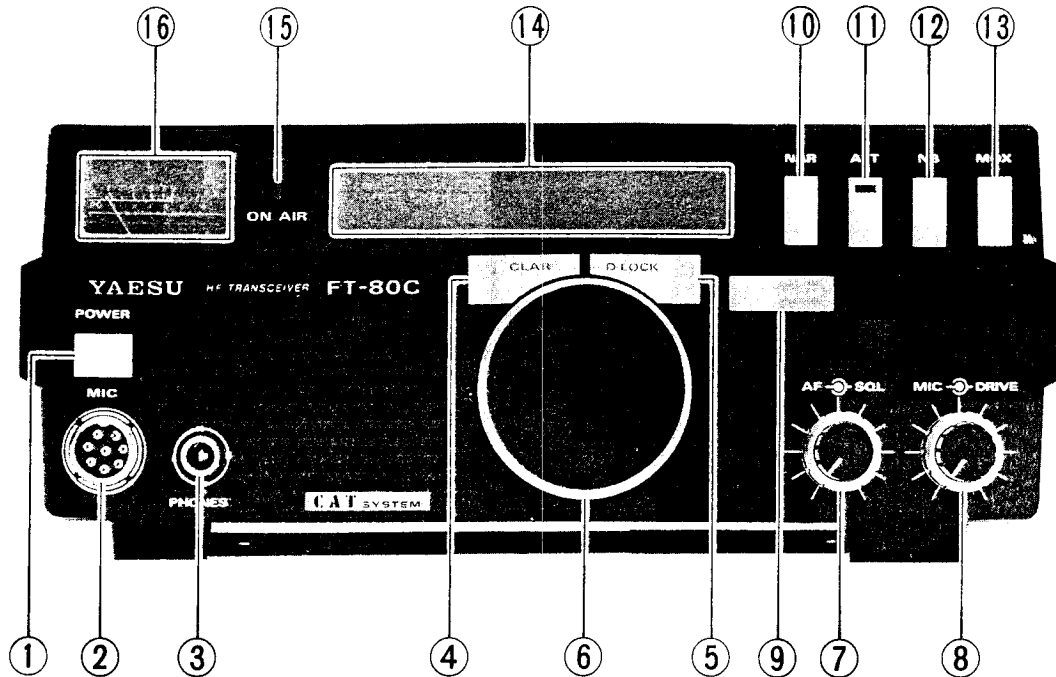
	<u>Part No.</u>
DC Power Cord (w/o fuse)	T9014900
20A Fuses (2 supplied)	Q0000009

Options

<u>Model</u>	<u>Part No.</u>
MD-1B8 Desktop Scanning Mic.	D1000039
MH-1B8 Hand Scanning Mic.	D1000040
MMB-38 Mobile Bracket	D6000032
FP-757HD Heavy Duty Power Supply	
FP-700 Standard Duty Power Supply	
YA-30 Broadband Dipole Antenna	
FC-1000 Automatic Antenna Tuner (100W)	
FL-7000 500W Automatic Linear Amplifier	
SP-767 Base Station Loudspeaker	
SP-767P Base Loudspeaker w/Phone Patch	
SP-55 Mobile Loudspeaker	

2. CONTROLS AND CONNECTORS

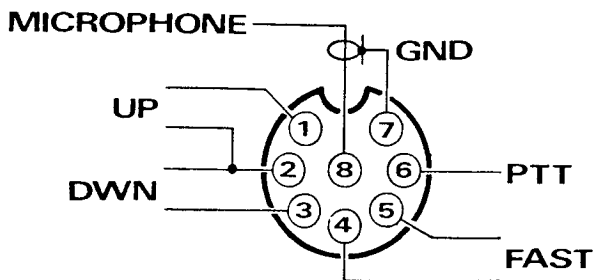
FRONT PANEL CONTROLS



(1) POWER

This pushbutton switch turns the transceiver on and off.

(2) MICrophone



This 8-pin connector accepts the plug of the MD-1B8 Desktop Mic or MH-1B8 Hand Mic. Scanning control lines from these microphones allow pushbutton fast and slow channel selection and scanning from the microphone.

(3) PHONES

Any type of headphones with 4-16 ohms impedance may be connected to this jack. Inserting the plug disables the loudspeaker.

(4) CLAR (Clarifier)

Press this button while receiving to fine tune around the channel frequency. While the CLAR function is active, the channel selector knob tunes the receiver (up to ± 10 kHz) without affecting the transmit frequency. Press this button again to turn off the clarifier.

(5) D LOCK

This button disables the channel selector knob and microphone UP/DWN buttons to prevent accidental frequency changes. "LOCK" is shown on the display when active. Press this button again to re-enable tuning.

(6) Channel Selector Knob

This knob selects the operating channel, and also provides fine tuning when the CLAR function is active.

(7) AF/SQL

The inner AF control adjusts receiver volume.

The outer squelch control sets the threshold level of incoming signals or noise at which receiver audio is muted. Clockwise rotation increases the threshold level, causing the receiver not to respond to background noise or weaker signals.

(8) MIC/DRIVE

The inner MICrophone control adjusts the transmit audio gain for SSB and AM transmission (for FM, gain is preset internally). This adjusts output power in SSB modes, and modulation level in the AM mode. It is disabled for FM and CW.

The outer DRIVE control adjusts the carrier power output level for CW, AM and FM transmission. This control is disabled during SSB transmission.

(9) ◀MODE▶

Press either side of this see-saw button to select the receiving mode: LSB, USB, CW, AM and FM. The mode is indicated on the display above the receiving frequency (in the above order). Press the left side to select a mode left of the present one displayed, or the right side to select a mode to the right (FM operation requires the optional FM Unit). The transmitting mode is not affected by this button.

(10) NAR (Narrow) Button

This button selects narrow IF filters when operating in the CW or AM modes. "NAR" is displayed above the rightmost frequency digit when a narrow filter is selected.

(11) ATT Button & Indicator Lamp

Places a 20dB attenuator in the receiver front end circuit, to avoid overload when listening to very strong signals by reducing the sensitivity of the receiver. The indicator on the button glows green when the attenuator is on.

(12) NB (Noise Blanker) Button

Activates the noise blanker for SSB, CW and AM reception.

(13) MOX Button

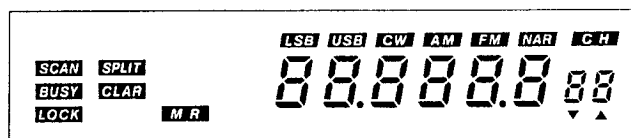
Manually switches the transmitter on and off. This button **MUST** be in the OUT position to receive.

(14) Display

All of the segments of the display are shown in the diagram below. To the left of the operating frequency, the display indicators signify as follows:

- SCAN - scanning is active (blinks when actually scanning)
- BUSY - the squelch is open
- LOCK - tuning knob locked
- SPLIT - split frequency channel selected
- CLAR - clarifier active
- MR - memory retention is operating correctly

The digital frequency display indicates the operating frequency with 100 Hz resolution. The number of the active channel (00 thru 19) is displayed to the right of the frequency (with 'CH' above).



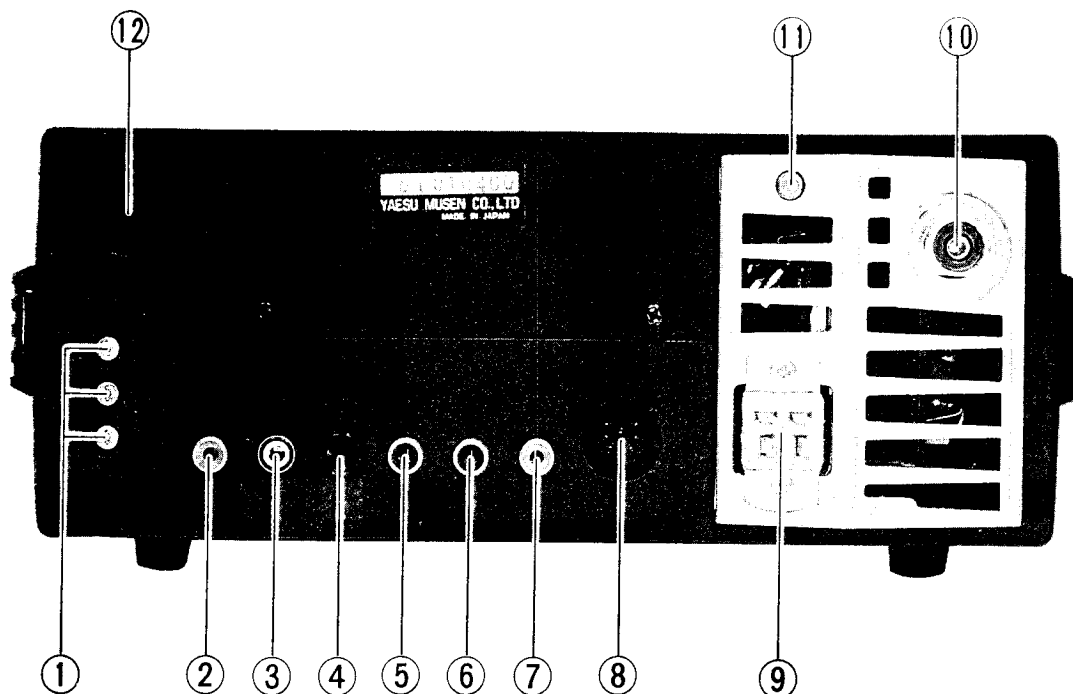
(15) ON AIR Indicator Lamp

This lamp glows red when transmitting.

(16) Meter

The meter shows relative signal strength in S-units on the uppermost scale when receiving, and relative power output (PO), when transmitting.

REAR PANEL CONTROLS & CONNECTORS



(1) CAR ADJ Potentiometers

These (recessed) trimmers are aligned at the factory and should not be adjusted except by qualified service personnel without proper test equipment.

(2) +13.5V

This phono jack provides 13.5V DC at up to 200 mA for powering accessories. The center contact is positive.

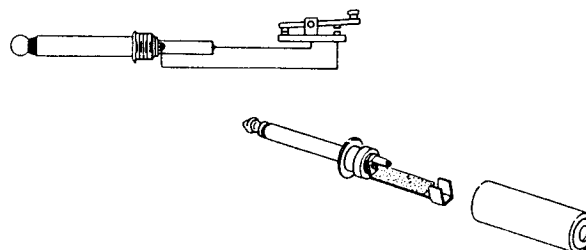
Note: Repairs to damage caused by exceeding the current capabilities of the accessory DC jack may not be covered by the warranty.

(3) EXT SP (External Speaker)

This 1/8-inch 2-conductor mini phone jack provides amplified receiver output to drive an external 4- to 8-ohm loudspeaker.

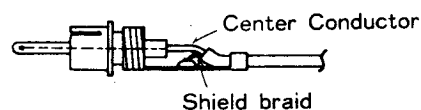
(4) KEY

This 1/4-inch 2-conductor phone jack accepts a CW key or external electronic keyer. Open circuit voltage is +13V DC and closed circuit current is 0.7 to 1 mA.



(5) AF OUT

This phono jack provides constant low-level receiver audio, unaffected by the AF gain control, for tape recording, digital demodulators capable of high impedance input or an external audio amplifier. Output level is approximately 50mV peak at 600 kilohms.



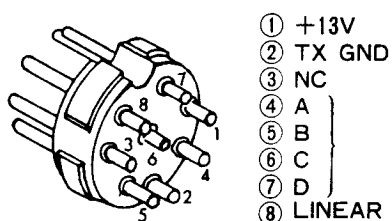
(6) EXT ALC

This phono jack accepts automatic level control voltage for the transmitter from a linear amplifier. The applied voltage should be between 0 and -5V DC, referenced to the outer contact (chassis ground).

(7) PTT Jack

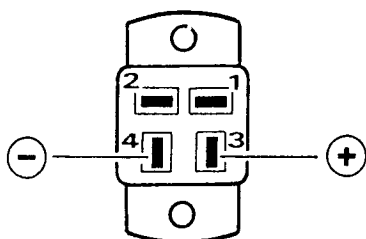
This phono jack provides access to the PTT line, for external receive/transmit switching. Connecting the inner contact to the outer contact (chassis ground) activates the transmitter. Open circuit voltage is about 13V, and closed circuit current is about 1 mA.

(8) BAND DATA



This 8-pin DIN connector provides parallel TTL-level bandswitching signals for the FC-1000 Antenna Tuner or the FL-7000 Linear Amplifier.

(9) DC 13.5V



This 4-pin connector accepts 12 to 15V DC at 20 amperes (transmit), to power the transceiver.

CAUTION: AC voltage or DC outside of this range may damage the transceiver.

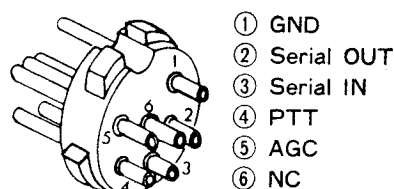
(10) ANT Coaxial Jack

This type-M (SO-239) jack is for the antenna system, antenna tuner or linear amplifier input. Impedance requirement is 50 ohms, unbalanced. Use only a properly mating type-M (PL-259) plug and 50- or 52-ohm coaxial cable.

(11) GND

For best performance and safety, connect this terminal to a good earth ground through the shortest path possible.

(12) CAT



This 6-pin DIN jack provides access to the serial data lines from the microcomputer and A/D converter, for control of the transceiver from an external computer.

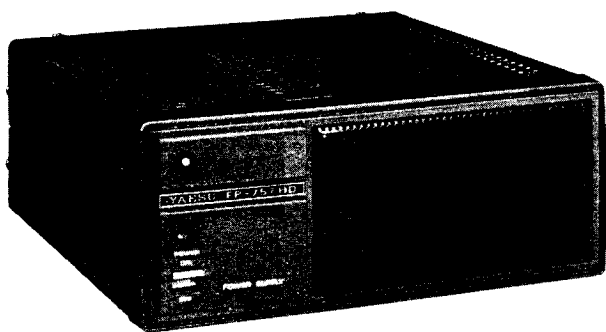
3. INSTALLATION

Preliminary Inspection

When you open the packing carton, inspect the transceiver carefully for any signs of damage. Check that all exposed controls and switches move freely, and that the cabinet has no dents or scratches. If you notice any damage, document it completely and contact the shipping company immediately. Save the packing materials for possible future use.

Base Station Installation

The FT-80C requires a power source of 12 to 15 volts DC, capable of up to 20 amperes peak. For base station installations, Yaesu offers several AC power supplies which may be used with AC line voltages of 100, 110, 117, 200, 220 or 234 VAC. However, before connecting any power supply to the transceiver or AC line, make sure that the supply is properly wired for the local line voltage, and that the correct fuse is installed.



FP-757HD

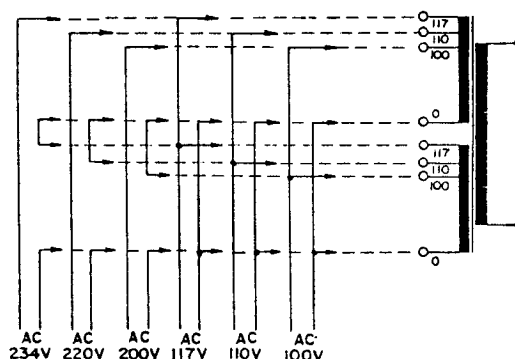
The FP-757HD is a heavy duty series regulated power supply capable of full power transmissions for up to 30 minutes at a time (50% duty cycle is recommended for continuous operation). Forced-air cooling is provided over an extra large internal heatsink. The FP-757HD requires a 6-amp fuse for 100, 110 or 117 VAC, or a 3-amp fuse for 200, 220 or 234 VAC. Power transformer primary connections for the different line voltages are shown at the right.

The FP-700 power series regulated supply may be used for light duty operation (CW, SSB or reduced power AM or FM). AC voltages, fuse requirements and power transformer wiring are the same as for the FP-757HD described above and shown in the diagram below, but the plastic sleeve on the supply DC cable must be cut to allow connection to the speaker in the power supply.

NEVER CONNECT AC, OR DC ABOVE 15V, DIRECTLY TO THE FT-80C.

Make certain that the POWER switch on the front panel of the FT-80C is OFF (out) before connecting power to the transceiver, and double check to make sure that the polarity of the connections is correct before switching the transceiver on.

Power Transformer Primary Connections



NOTICE

THE FOLLOWING ABUSES MAY CAUSE DAMAGE TO THE EQUIPMENT WHICH IS NOT COVERED UNDER WARRANTY:

- (1) CONNECTION OF AC VOLTAGE OR IMPROPER DC VOLTAGE DIRECTLY TO THE TRANSCEIVER.
- (2) INCORRECT (REVERSED) POLARITY POWER CONNECTION.
- (3) USE OF AN IMPROPER FUSE IN THE POWER SUPPLY.

Equipment Location and Grounding

In all base station installations, the GND terminal on the rear panel of the transceiver should be connected by a heavy braided cable to a good earth ground. Best performance on all frequencies may require that the grounding cable be less than 10 feet (3 meters) long. All station equipment should have its own grounding cable (independent of signal or control cables), connected to a common point on the ground bus close to the transceiver or linear amplifier (if used). See the diagram below.

Locate the transceiver so that air can flow freely into the air intake on the left side, and out the rear. Avoid placing the transceiver on top of another heat generating device such as a linear amplifier.

Antenna Considerations

The FT-80C is designed for use with any antenna system having a 50-ohm resistive impedance at the operating frequency. Automatic final protection (AFP) circuitry is included to protect the final transistors by automatically reducing power output when an impedance mismatch (high SWR) is present. With an SWR of 3:1 for example, about 75% of full power output is available.

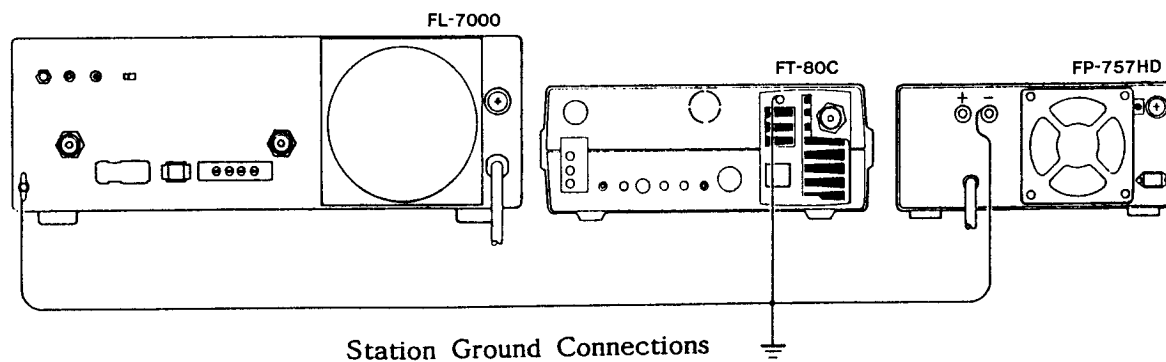
Despite this protection, the transmitter should never be activated unless an antenna or dummy load is connected to the ANT jack. Use 50-ohm coaxial cable with a proper

(type-M, PL-259) plug to connect the transceiver to the antenna or load, and if SWR is too high to permit the desired performance, connect an antenna tuner such as the automatic FC-1000 between the transceiver and the antenna. See page 11 for interconnection information.

Receiver Front End Protection

The receiver front end in FT-80C includes a surge suppressor and a lamp fuse to protect the sensitive receiver circuitry from high voltage pulses (EMP) at the antenna terminal, and a choke to bypass DC overload. Several thousands of volts can develop naturally when dry wind or electrical storms create an electrostatic charge on the antenna elements, and this is delivered to the antenna jack if the antenna is connected to the transceiver. In such a case, the lamp fuse may burn out (even if the transceiver is turned off at the time). The only sure way to avoid this condition is to disconnect the antenna from the transceiver whenever the weather is likely to create high voltage on the antenna (the feedline should be grounded to allow the charge to dissipate).

If the receiver is found to have suddenly lost sensitivity, inspect the filament of the lamp fuse (F1001 on the MAIN Unit). If it is open, determine the cause of the overvoltage; eg., was the antenna left connected during an electrical storm or dry windy weather since you last used the equipment? To obtain replacement lamp fuses, ask your local Yaesu



dealer for Yaesu part no. Q1000010, BQ041-22803A; or substitute any 8V 100mA pilot lamp. Do not jumper across the lamp fuse terminals however, as this will defeat the protection and could result in serious damage.

Mobile Power Connection

(Negative Ground vehicles only)

The DC power cable for mobile installation is supplied with the transceiver. Please review the NOTICE on page 8 before connecting power. The DC cable should be connected directly to the vehicle battery, rather than to the ignition or accessory circuitry. Route the cable as far away from ignition cables as possible, and then cut off any extra cable in order to minimize voltage drop losses.

- (1) Do not connect the cable to the transceiver until after the proper connections are made to the battery; the RED cable lead to the POSITIVE battery terminal, and BLACK lead to the NEGATIVE terminal. Make sure the battery terminal connections are tight, and remember to check them periodically for signs of loosening or corrosion.
- (2) Measure the voltage across the battery terminals with the engine running fast enough to show a charge. If above 15 volts, the automobile voltage regulator must be adjusted to reduce the charging voltage before proceeding.
- (3) Make sure the POWER switch on the transceiver is OFF, and connect the DC cable to the transceiver. The plug pin connections are shown on page 7.

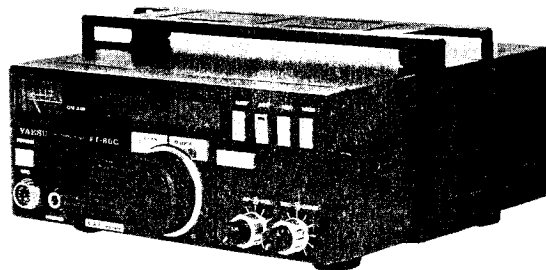
The positive RED wire must include a 20 amp fuse, installed in the supplied cable.

Always check to ensure the POWER switch is OFF before starting the engine.

Mobile Mounting

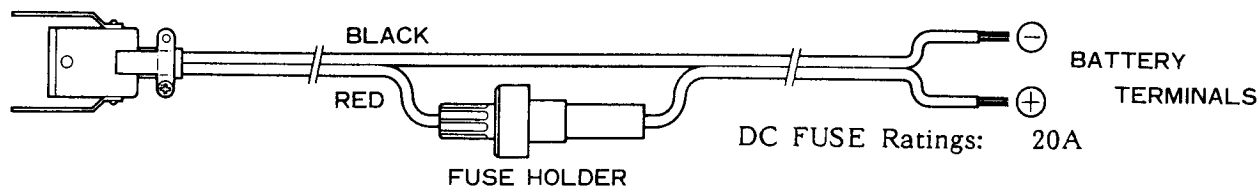
The optional MMB-38 Mobile Mounting Bracket for the FT-80C allows quick insertion and removal of the transceiver from the vehicle. Complete instructions are provided with the bracket, which may be installed either above or underneath the transceiver as shown here.

Mobile Installations



Mobile Antenna Installation

Please review the base station antenna information on the previous page. An antenna tuner such as the FC-1000 is particularly desirable in a mobile station, where the short antenna elements have very narrow bandwidth. Make sure that the shield of the antenna coax is firmly grounded to the car body at the antenna feedpoint.



Interconnections

Linear Amplifiers

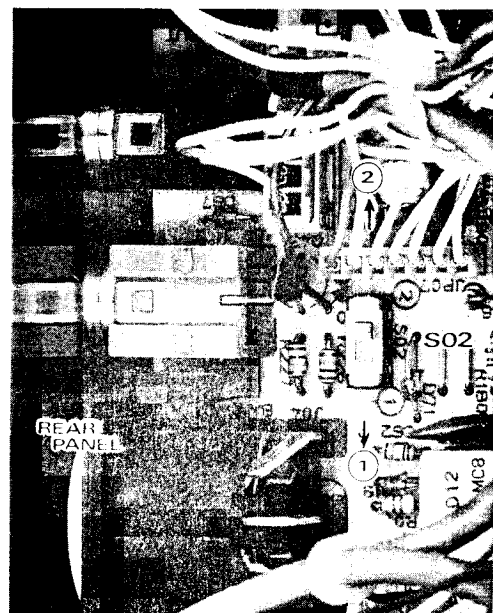
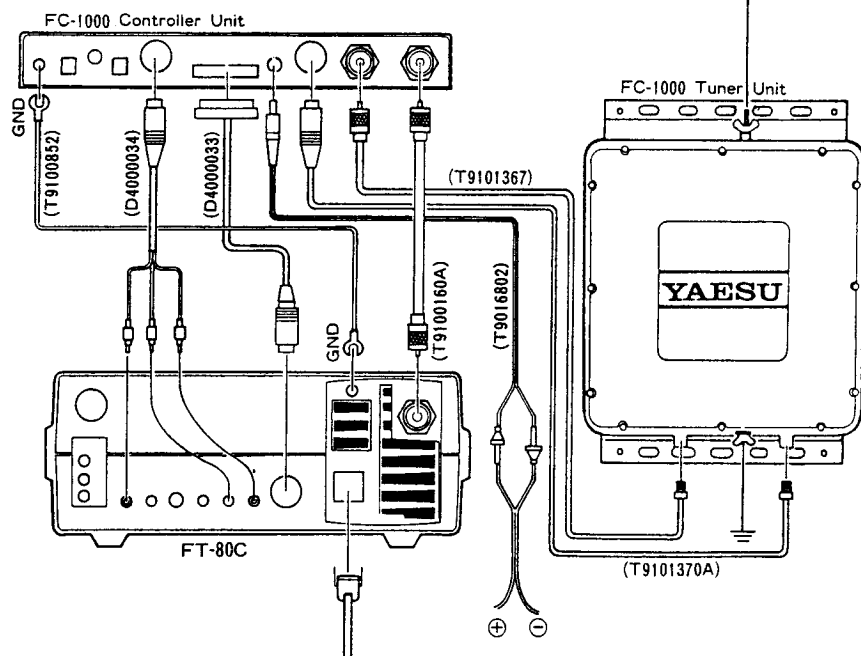
The FT-80C includes a high voltage (150V) transistor switch capable of handling up to 1.5 amperes DC, to control transmit/receive switching of a linear amplifier via pin 2 of the BAND DATA jack. However, make certain that the t/r switching requirements of your linear amplifier do not exceed these limits, and that the linear switching voltage is +DC, and not -DC or AC. Yaesu offers the optional FRB-757 Relay Box for t/r switching of linears that require negative or AC switching, or higher voltage or current switching. The FRB-757 installs between the relay jack on the amplifier and the PTT jack on the transceiver, and is capable of switching up to 250V AC or DC, at up to 2.5A.

If you are installing the FT-80C with the FL-7000 Auto-Tune Linear Amplifier, set internal switch S02 to position 1 as diagrammed below.

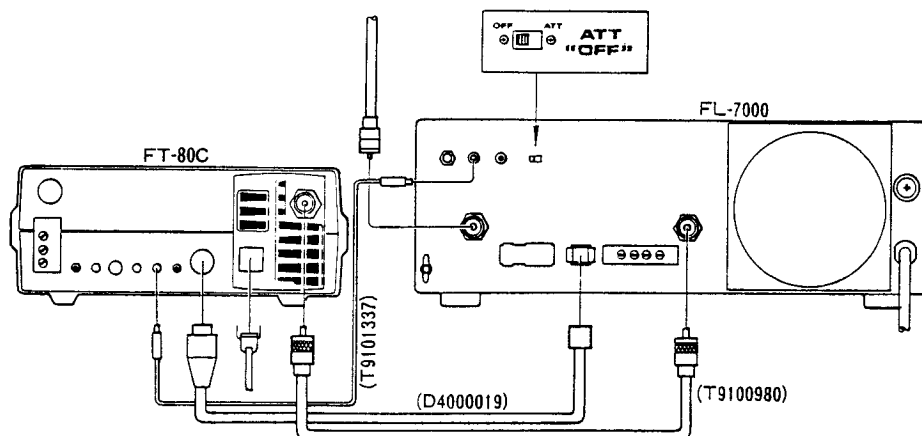
Memory Backup

The channel memories of the FT-80C are retained by an internal lithium cell for five years or longer. The backup circuit is turned on at the factory, so it is not necessary to do anything unless the battery runs down, in which case memories will be lost when the transceiver is turned off and power removed. If this occurs, contact your Yaesu dealer for replacement of the lithium battery and reprogramming of the channels.

FT-80C & FC-1000 INTERCONNECTIONS



FT-80C & FL-7000 INTERCONNECTIONS



4. OPERATION

BASIC RECEPTION

Before plugging the power supply into the wall outlet (in base installation), ensure that the power supply is wired for your AC line voltage. Make certain that the proper fuse is installed, and that the power supply is properly connected to the transceiver as described in the Installation section. Also make sure the antenna and ground are connected.

Connect a microphone, if desired, to the MIC jack. For CW operation, connect a CW key (or external keyer) as shown on page 6 to the KEY jack on the rear panel.

Preset the POWER switch off, and all push-buttons to the undepressed position. Set the knobs all fully counterclockwise.

Confirm that the MOX button is OFF (undepressed (out) position), and then switch on the power supply, followed by the transceiver POWER switch. The meter and display will light, with the display indicating the current channel frequency, mode and channel number.

Channel Selection

Turn the Channel Selector Knob to select the desired operating channel. You can also use the UP or DWN keys on the microphone.

NOTE: Channel selection is deactivated when the D LOCK (dial lock) function is active. When active, 'LOCK' appears on the display. Press the D LOCK button to toggle the lock on and off.

Mode Selection

From the LSB mode, just press the right side of the MODE button (repeatedly, if necessary) to select the desired receiving mode. From other modes, you may need to press the other side of the MODE button until the mode you want is displayed.

Because the tuning steps are larger in AM and FM modes than in CW and SSB, least significant frequency digits are zeroed when switching from CW or SSB to AM (1 kHz steps) or FM (5 kHz steps). 25 Hz fine steps are still available in all modes with the CLARifier, described later.

Turn the AF gain control clockwise for comfortable receiver volume.

SSB Reception

The ATT and NB switches and the SQL control are provided to reduce or eliminate the various types of noise and interference that can obstruct comfortable reception. Operation is first described for SSB (USB or LSB) reception, with variations for other modes described later.

Press the MODE button to select USB or LSB mode.

Attenuator

On a clear frequency, check for any S-meter reading on the background noise level (hiss or crackle). If the S-meter deflects above 3, turn on the attenuator (press ATT: its indicator will glow green). This improves receiver performance in the presence of strong signals or high noise levels.

The attenuator may often be needed on frequencies below 10 MHz, particularly if you are using a large antenna or your station is in a noisy environment (city).

Noise Blanker

Pulse-type noise, either short duration types such as from ignition systems and electric motors and switches, or long duration over-the-horizon radar ("woodpecker") signals, can be reduced or removed by pressing the NB button. However, when noise blanking is not required the NB button should be off (out), to minimize distortion introduced by the blanking process.

Squelch (All Mode)

When waiting for a scheduled call on a fairly uncrowded band the squelch can be activated to silence the receiver until the call. Just tune to the scheduled frequency and turn the SQL control clockwise until the receiver is quiet. Two other things happen when the squelch is closed: the S-meter reading drops to zero (if it wasn't already), and "BUSY" disappears from the display.

Of course using the squelch to wait for a signal to appear only works if the expected signal is strong enough to overcome the squelch threshold set by the SQL control. If the expected signal will be weak, or when operating in modes other than FM and not scanning, the SQL control should be set fully counterclockwise.

Note: Whenever using the squelch feature, make sure to set the ATTenuator switch as described previously before adjusting the SQL control, as the squelch threshold is affected by the ATT setting.

CW Reception

In addition to the ATT, NB and SQL controls described for SSB, the FT-80C CW NAR (narrow) mode activates an (optional) 500 Hz IF crystal filter to enhance reception. Use the CW (wide) mode to tune in the desired signal for about a 700 Hz pitch, and then press the NAR switch.

The CW (wide) mode provides the same IF bandwidth as for SSB, allowing you to hear signals up to about 1 kHz away while tuning around the band. Noise and interference are greater than for CW NAR, but the wider bandwidth makes tuning easier.

Hint: when you make contact with another station on CW, press the CLAR button after he responds to you if you need to retune, then press the D LOCK button to avoid accidental frequency change, and finally the NAR button to select the narrow filter.

AM Reception

The FT-80C includes a 6 kHz (wide AM) filter for good fidelity during reception of mediumwave and shortwave AM broadcasts. Pressing the NAR switch reduces the bandwidth to the same as SSB, but fidelity is reduced.

When interference or noise is severe, ECSS (Exalted Carrier Selectable Sideband) reception may be preferable over the AM mode for receiving AM signals. This special technique allows you to select either the upper or lower sideband of an AM signal using USB or LSB modes; eliminating interference that may be present on the other sideband due to a nearby signal while still getting about twice the audio bandwidth (fidelity) of the AM narrow mode.

To use ECSS, first tune in the station using the AM mode (shortwave broadcasters generally transmit on precise multiples of 5 kHz), and then select either USB or LSB, whichever gives best reception. Now press CLAR to activate the clarifier and carefully fine tune for zero beat (most natural voice/music pitch), and push D LOCK so you don't lose the frequency.

Hint: Zero beating an AM signal in ECSS reception requires very precise setting of the tuning knob. Some practice with stronger signals first will make tuning the weak ones easier. Coarse tuning is useless for ECSS.

When receiving AM signals in either AM or ECSS mode, the noise blanker should be off unless it is really needed. Its effectiveness will vary depending on the signal strength of the received signal and those on adjacent channels; being most effective when the signals are weak and noise pulses are strong.

FM Reception

The FT-80C requires the optional FM Unit (circuit board) for FM operation.

The MIC gain control and noise blanker (NB) switch are disabled for FM operation. However, the ATT and SQL settings are especially

important. For weak signal work, set the SQL control only after you have finished tuning. The FT-80C FM Unit is designed for ± 5 kHz deviation, as is most common in 2-way FM communications.

RTTY and Packet Reception

An external TU (terminal unit) or TNC (terminal node controller) is required for RTTY or packet operation, respectively. Receiver audio is best obtained from the AF OUT jack on the rear panel, as the level of the signal at this jack is not affected by the AF gain control. However, your TU or TNC must be capable of high impedance input (50mVp-p @10 kilohms) to use this signal. Otherwise, low impedance output is available from the EXT SP jack, but this is affected by the AF gain control, and using this jack disables the internal speaker. Select either the LSB or USB mode for operation, and see your TU or TNC manual for further details.

TRANSMITTER OPERATION

The solid state transmitter in the FT-80C requires no adjustment other than setting the desired output level. The maximum power output is determined by the mode and the capability of the power supply (in AM, FM and RTTY, power should be restricted to avoid overheating the power supply if you plan to make long transmissions). Also, there are certain precautions to be observed at all times when transmitting to avoid possible damage to the transceiver, and to assure a clean signal.

Never transmit without having a dummy load or antenna tuned to the operating frequency connected to the transceiver (or linear amplifier, if used). If you have doubts about the suitability of your antenna on a certain frequency, check the SWR (Standing Wave Ratio) first using an external SWR meter. The transmitter includes protection circuits that reduce the output power if SWR is high. For example, with an SWR of 3:1 only about 75% of full power is available, but very high SWRs can cause poor performance due to feedline radiation and RF feedback in the

shack. If using the FC-757AT Automatic Antenna Tuner or FL-7000 Linear Amplifier, SWR is calculated and displayed automatically. See the Tuner or Amplifier manual for complete details. Otherwise, use an external SWR meter such as the Yaesu YS-60, connected between the transceiver and antenna feedline.

Avoid changing channels during transmission. First return to receive, then select a new channel, and remember to listen for at least a minute or two to make sure the new channel is not already occupied; or ask if the channel is occupied and then listen for a response.

When using a light- or medium duty power supply such as the FP-700, do not attempt to transmit FM, AM or RTTY at full output power. Although the transceiver is capable of this, some power supplies are not, and they may rapidly overheat and be seriously damaged. In any mode, feel the supply occasionally and reduce power or stop transmitting for a while if it feels hot.

Never start transmitting without first listening for a minute to make sure the channel is clear, and then identify yourself at the start of transmission. This prevents accidental interference to other stations.

SSB Transmission

With a microphone connected to the MIC jack on the front panel, preset the MIC gain control to 12 o'clock.

To activate the transmitter, close the PTT switch on the microphone, and adjust the MIC gain control while speaking into the microphone so that the meter deflects up to about 6 on the PO scale on voice peaks. This will result in full power output; reduce the MIC gain to reduce power.

Clarifier (Receiver Offset)

The CLAR button can be pressed while receiving to allow fine tuning of the received signal without affecting the transmit frequency. CLAR is displayed to the left of the operating frequency when this feature is activated.

While the clarifier is on tuning affects only the receiver: the transmitting frequency remains the same as before the clarifier was activated, and is displayed when transmitting.

The FT-80C incorporates a special 'clarifier memory', which allows you to listen on the transmit frequency by switching off the clarifier. As long as you don't touch the tuning knob, pressing CLAR again returns you to the same (offset) receive frequency.

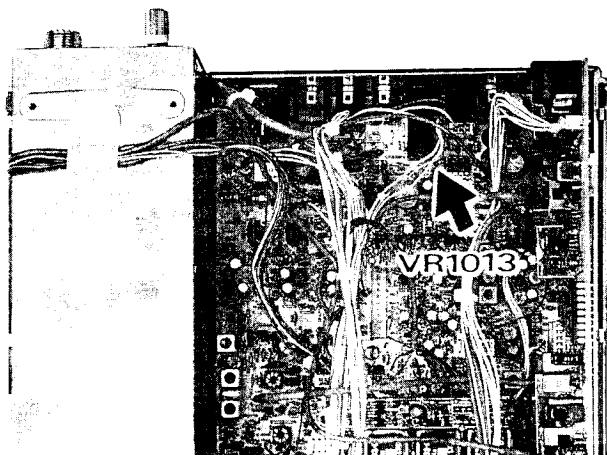
When the contact is finished, remember to switch off the clarifier.

CW Transmission

The FT-80C offers semi break-in operation for both simplex and split-frequency operation. Connect your key or external electronic keyer to the KEY jack on the rear panel. Close the key to activate the transmitter, and adjust the DRIVE control for the power output desired (100W output = "8" on the PO meter scale). After making contact with another station, reduce power with the DRIVE control as much as possible without losing contact.

You should be able to hear the sidetone from the loudspeaker (or headphones) when you close the key. The sidetone volume control (inside the hole near the rear of the bottom cover) can be adjusted for comfortable sidetone volume.

If you need to change the delay time between release of your key and receiver reactivation, adjust VR1013 inside the top cover at the location shown below.



FM Transmission (requires optional Unit)

For FM transmission, just close the PTT switch to transmit. The MIC gain control is disabled for FM, as the gain of the microphone amplifier is preset internally for ± 2.5 kHz deviation, and requires no further adjustment. RF power output is adjusted by the DRIVE control. For full power output (using the FP-757HD power supply), adjust the DRIVE so the meter deflects to "8" on the PO scale. When contact is established, reduce the DRIVE.

CAUTION

When the FT-80C is used with the FP-757HD power supply, full power FM, AM or RTTY transmissions must be limited to 30 minutes maximum.

When the FP-700 or other light-duty supply is used, transmitter power in the above modes must be limited to half ("4" on the PO scale) at all times, to avoid overheating and subsequent damage to the supply.

Regardless of the power source or mode, we recommend reducing power from the maximum levels mentioned above whenever transmitting for more than 10 minutes, or if the ambient air temperature is very hot or the power supply feels hot.

AM Transmission

AM carrier power must be limited to 25 watts or less ("4" on the PO scale) when transmitting with the FT-80C. When the power of the modulating sidebands is added to the carrier power, actual PEP output is 100 watts, although this does not show on the meter.

To adjust the FT-80C for AM transmission;

- (1) Set the MIC gain fully counterclockwise.
- (2) Make sure the channel is clear, and then close the PTT switch on the microphone and advance the DRIVE for a meter deflection of "4" on the PO scale.

(3) Speak into the microphone and advance the MIC gain control until slight movement of the meter occurs on voice peaks. PEP output is now 100 watts. Do not advance the MIC gain further, or over-modulation (and distortion) may result.

(4) Use the DRIVE control to reduce power once contact has been established.

Unless using a heavy duty power supply, keep transmissions short, and stop transmitting if the power supply becomes hot.

RTTY, HF Packet & SSTV Transmission

Transmission of narrowband FSK (RTTY, SSTV and Bell 103 HF packet) requires input of equal level audio tones (AFSK) at pin 8 of the MIC jack, using the LSB or USB mode of the transceiver.

The PTT jack on the rear panel may be used for external transmit/receive control. Of course manual transmit/receive control is also possible with the MOX button.

Note that the displayed frequency is the (suppressed) carrier frequency, so your actual transmitted MARK and SPACE frequencies will be displaced from the display by the audio frequencies of the input tones.

Use the MIC gain control to adjust power output: "8" on the PO scale indicates full power. Reduce output by turning the MIC gain counterclockwise while observing the PO meter or on an external wattmeter.

As mentioned previously, the FT-80C is capable of full power AFSK for limited periods when used with a heavy duty power supply. Restrict transmissions to 30 minutes with the FP-757HD. If using the FP-700, restrict power output to "4" on the PO scale. If the air temperature is high or at high altitudes, cooling efficiency is decreased and so power output should be reduced accordingly. Also, it is a good practice to back off on the power whenever making a long transmission, and even then supply temperature should be closely monitored.

After transmitting, if the cooling fan is on, don't turn the POWER switch off until the set has had a few minutes to cool and the fan to switch off.

SCANNING

When the squelch is adjusted to silence the receiver, the channels can be scanned automatically. Signals that are strong enough to open the squelch will cause scanner to pause for five seconds.

The ATT switch should be set for the desired sensitivity before adjusting the squelch, as it affects squelch sensitivity.

The DWN and UP buttons on the microphone are used to activate and deactivate the scanner. A small arrowhead appears on the display just beneath the memory number to indicate scanning direction.

To scan:

- (1) Set the SQL control to the point where background noise is just silenced.
- (2) Press the DWN or UP button on the microphone to start the scanner: "SCAN" is displayed blinking.

Scanning will pause for five seconds on any channel having a signal strong enough to open the squelch, and will resume again if the signal drops out.

To stop scanning press the microphone DWN or UP buttons or the PTT switch momentarily.