

OPERATING MANUAL

Congratulations!

You now have at your fingertips a valuable communications tool – a Yaesu two-way radio! Rugged, reliable and easy to use, your Yaesu radio will keep you in touch for years to come, with negligible maintenance.

Please take a few minutes to read this manual carefully. The information presented here will allow you to derive maximum performance from your radio.

After reading it, keep the manual handy for quick reference, in case questions arise later on.

We're glad you joined the Yaesu team. Call on us any time, because our business is communications. Let us help you get your message across.

NOTICE

There are no user-serviceable points inside this transceiver. All service jobs must be referred to your Authorized Service Center or Network Administrator.

Features

The VX-4000 Series are rugged basic-featured FM transceivers designed for flexible mobile and base station business communications in the 50-watts VHF and 40-watts UHF

A highly integrated surface mount circuit design and a die-cast aluminum chassis assure reliability. Selectable power output of LOW(5 – 25 watts) or High (VHF:50watts, UHF:40watts) without the need of forced air cooling is possible due to the large heatsink surface area of the compartmentalized one-piece diecast chassis.

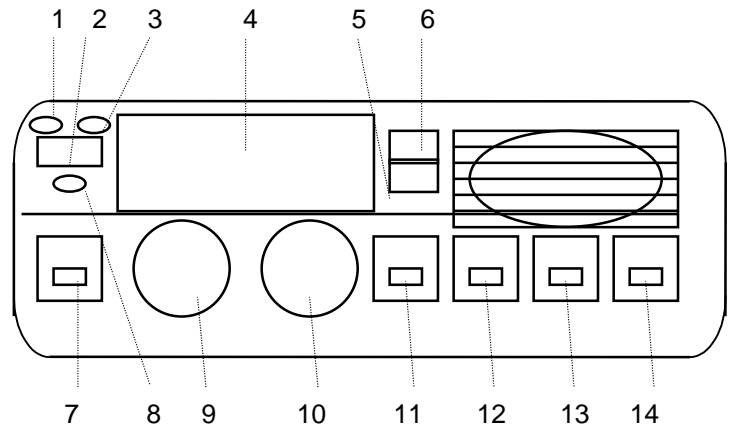
The 250-channels memories can each be programmed with a 8-character channel name.

A 39-tone programmable CTCSS encoder/decoder is built in as standard.

A 104 standard digital codes programmable DCS encoder/decoder is built in as standard.

Important channel frequency data is stored in EEPROM and flash memory on the CPU, and is easily programmable by dealers using a personal computer and the Yaesu **CT-71** Programming Cable and **CE-35** Software.

Front panel



CONTROL & CONNECTORS

1 TX Indicator

This lamp glows red when the radio is transmitting.

2 POWER Button

Turn the radio on or off.

(Press and hold in this button for 1.5 second.)

3 BUSY Indicator

This lamp glows green when the channel is busy.

4 Liquid Crystal Display

The display include an 8-character alpha-numeric section showing channel and group names, status and identity information, and error messages. Additional indicators on the display show priority channel assignments and scan include / exclude selection.

5 UP

Pressing this button changes the current group (and displayed group number or name). Holding this button for more than 1/2 second causes the function to repeat.

6 DOWN

Pressing this button changes the current group (and displayed group number or name). Holding this button for more than 1/2 second causes the function to repeat.

7 Programmable Function Button

This button can be set up for special applications, such as high/low power selection, monitor, dimmer, talk-around, and call alert function, as determined by your network requirements and programmed by your Yaesu dealer.

The default function is set as **Dimmer** Button.

8 HOME Indicator

This lamp glows orange when incorrect position at the setting of CE-35.

9 VOLUME Knob

This knob adjusts the receiver volume.

10 CHANNEL Selector Knob

This knob select the operating channel.

11 Programmable Function Button

The default function is set as **MONI** Button.

12 Programmable Function Button

The default function is set as **Low Power** Button.

13 Programmable Function Button

The default function is set as no function Button.

14 Programmable Function Button

The default function is set as no function Button.

19 Microphone Jack

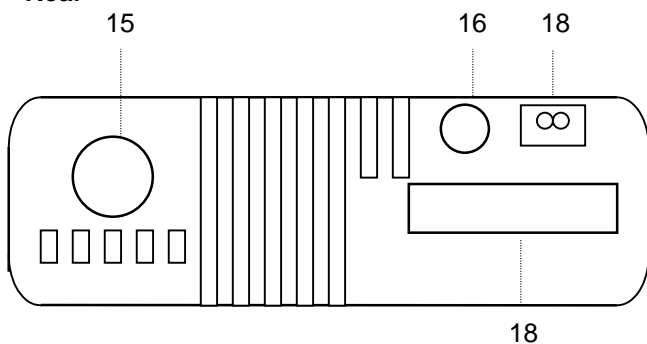
Connect the microphone plug to this jack.

Basic Operation of the Transceiver

Important! –Before turning on the radio the first time, confirm that the power connections have been made correctly and that a proper antenna is connected to the antenna jack.

Push the POWER switch turn on the radio. The display will become illuminated. The radio will start up on the last channel used prior to shutdown during the previous operating session.

Rear



15 Antenna Socket

The 50-ohm coaxial feedline to the antenna must be connected here using a type-M (PL-259) plug.

16 EXT SP (External Speaker)

An external loudspeaker may be connected to this 2-contact, 3.5-mm mini-phone jack.

Caution: Do not connect this line to ground, and be certain that the speaker has adequate capability to handle the audio output from the radio.

17 13.8V DC Cable w/Connector

The supplied DC power cable must be connected to this 2-pin connector. Use only the supplied fused cable, extended if necessary, for power connection.

18 DSUB 25-Pin Accessory Connector

External TX audio line input, PTT, Squelch, and external RX audio line output signal may be obtained from this connector for use with accessories such as data transmission/reception modems, etc.

Transmitting

To transmit, wait until the “BUSY” indicator is off (the channel is not in use), and press the PTT (Push-To-Talk) switch on the side of the microphone (the “TX” lamp will glow red). While holding in the PTT switch, speak across the face of the microphone in a clear, normal voice level, and then release the PTT switch to receive.

Automatic Time-Out Timer

If the selected channel has been programmed for automatic time-out, you must limit the length of each transmission. While transmitting, a beep will sound five seconds before time-out. Another beep will sound just before the deadline; the “TX” indicator will disappear and transmission will cease soon thereafter. To resume transmitting, you must release the PTT and wait for the “penalty timer” to expire (if you press the PTT before this timer expires, the timer restarts, and you will have to wait another “penalty” period).

Scanning Operation

With the microphone in its hanger, press the SCAN button momentarily to activate scanning. Typically, “DSC” will initially appear on the display, indicating Dealer Channel Scan as the scanning mode. If you wish to change to one of the modes described in the list above, press the SEL button repeatedly until that mode appears on the display.

If you pick up the microphone while no signal is being received, operation will shift to a particular channel. Which channel that will be depends on which of the following options the dealer has programmed for off-hook channel selection:

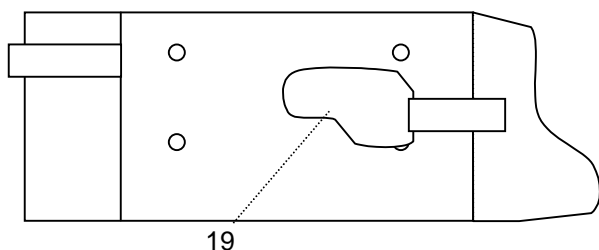
Scan Start Channel

Lifting the microphone causes operation to revert to the group and channel last selected before scanning started or resumed.

Priority Revert

Lifting the microphone activates the Priority 1 channel in the current group. If no channel is assigned level 1 priority, operation will be on the Priority 2 channel. If no

Side



priority channels have been assigned, operation reverts to the Scan Start Channel.

Last Busy

Lifting the microphone causes operation to revert to the group and channel where activity was last detected. If no activity was detected since turning on the radio, operation reverts to the Scan Start Channel.

Voting scan

The radio can be programmed for Voting Scan, whereby the radio will lock onto the strongest signal in a pre-programmed set of channels. The radio is used as normal, with the exception that transmission is not allowed when the unit is out of range of the nearest repeater. Consult your Yaesu dealer for more information regarding this function.

Programmable Function Button

Low Power

With this feature enable, a button toggles between high and low transmitter power, as programmed by the dealer.

MONI

This function is monitoring for the current channel.

SCN

This function is start and stop the scanning.

HA

Horn Alert function On and Off.

Call/Reset

When this feature is programmed and a selective call has been received, momentarily press the button to reset the flashing indicator and mute the receiver, otherwise press the button to sent your radio's identification code (ANI) to the dispatcher.

Talk Around

The feature causes a button to select simplex operation on semi-duplex channels: the transmit frequency becomes the same as the receive frequency (regardless of any programmed offset for the channel).

Note: This feature has no effect on simplex channels. After pressing the button, "TA" is displayed on LCD.

Encryption

When the Voice Scrambler feature is enabled, pressing a button toggles the Scrambler on and off.

Alarm Function

When the "alarm" function is enabled, pressing a button causes the radio to revert to a specially designated channel, and causes the special "alarm" identifier code to be transmitted automatically.

Note: This feature is only available as a "Secondary" accessory to prevent accidental activation.

Fuse Replacement

If a fuse is blown, before replacing, see if you can determine if it was caused by something outside of the radio (perhaps a short circuit due to a worn cable or pigtail near the radio). Contact your Yaesu dealer at once if you do not find the cause. Replace fuses only with the same type installed.

This is device complies with Part 15 of the FCC rules. Operation is subject to the condition that this device does not cause harmful interference.

Specifications

General

Frequency Range:	134-160MHz(VHF TYPE A) 148-174MHz(VHF TYPE C) 400-430MHz(UHF TYPE A) 450-480MHz(UHF TYPE D) 480-512MHz(UHF TYPE F)
Number of Channels & Spacing:	MAX 250 channels 25kHz, 12.5kHz
Modes of Emission:	16K0F3E, 11K0F3E
Frequency Stability:	2.5ppm(-30 to +60°C)
Antenna Requirements:	50 ohms
Voltage Requirements:	Unbalanced (SO-239 socket) 13.8V ±15% DC Negative ground
Current Consumption (approx.):	RX: 1.4A TX: 12A(VHF 50W/UHF 60W)
Operating Temperature Range:	-30°C to 60°C (-22°F to 140°F)

Receiver

Receiver Circuit Type:	Double-Conversion Superheterodine
Intermediate Frequencies:	43.95MHz, 450kHz
Sensitivity:	0.2µV 12dB SINAD (VHF) 0.25µV 12dB SINAD (UHF)s
Hum & Noise Ratio:	Better than 45 dB (25kHz/step) Better than 40 dB (12.5kHz/step)
Adjacent Channel Selectivity:	>80dB (25-kHz/step VHF) >78dB (25-kHz/step UHF) >65dB (12.5-kHz/step)
Intermodulation Distortion:	Better than 78dB
Spurious Rejection:	Better than 85dB
Conducted Spurious Emission:	<-57dBm
Selectivity -6dB:	>12kHz
-60dB:	<30kHz
External Audio Output Power:	12 watts into 4 ohms with < 5% THD

Transmitter

Output Power:	50watts(UHF) 40watts (UHF) 5watts (low programmable)
Modulation Type/Deviation:	Frequency Modulation ±5kHz(±2.5kHz)
Hum & Noise Ratio:	Better than 45 dB (25kHz/step) Better than 40 dB (12.5kHz/step)
Modulation Distortion:	Less than 5% at 1kHz
Spurious Emission:	Better than 65dB(below carrier)
Microphone Impedance:	600ohms
Microphone Sensitivity:	-48dBm (3.0 mV)

Physical

Size (WHD,approx.):	178mm x 60mm x 195 mm
Weight (approx.):	2.2kg

Specifications subject to change without notice or obligation.

Optional Accessories

Accessories

MH-25B7A	Hand Microphone
MH-43A7	Hand Microphone (Noise Canceling)
MH-43B7	DTMF Keypad Mic
MLS-100	External Loudspeaker
FP-1025A	AC Power Supply
CT-71	PC Programming Cable (CT-29 + CT-70)
F2D-9	2-Tone / DTMF
LF-1	DC Line Filter
VTM-20	VX-Trunk II Trunking Mobile Logic Board
CE-35	Programming Software (IBM PC/compatibles only)