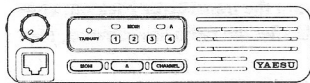


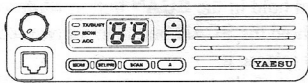
YAESU

VX-2000

OPERATING MANUAL



4 channel version



40 channel version

The VX-2000 Series are full-featured FM transceivers designed for flexible mobile and base station business communications in the VHF and UHF Land Mobile Bands. These leading-edge transceivers provide 25 Watts of transmitter power, and are available in either 4-channel or 40-channel versions.

Reliability is assured by a highly integrated surface-mount circuit design and a diecast aluminum chassis. Important channel frequency data is easily programmable by your Dealer using a personal computer and the Yaesu VPL-1 Programming Cable and CE-20 Software.

Please take a few minutes to read this manual carefully. The information presented herein will allow you to derive maximum performance from your Yaesu radio. After reading this manual, please keep it handy for quick reference, in case questions arise later.

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

VERTEX STANDARD CO., LTD.

SPECIFICATIONS

General

Frequency Range (version):	134 ~160 or 148 ~ 174 MHz (VHF versions; A/C, respectively), 400 ~ 430, 450 ~ 480 or 480 ~ 512 MHz (UHF versions; A/D/F, respectively)
No. of Channels & Spacing:	4 or 40 channels; 25 and 12.5 kHz spacing
Emission Modes:	16K0F3E, 11K0F3E
Frequency Stability:	±0.00025%
Antenna Requirements:	50 Ohms, unbalanced (SO-239 socket)
Voltage Requirements:	10.8 to 15.6 V DC, negative ground
Current Consumption (approx.):	250 mA Stby, 500 mA Rx, 6.5 A Tx
Operating Temperature Range:	-30 °C to +60 °C (-22 °F to +140 °F)
Size (WxHxD, approx.):	160 x 40 x 105 mm (6¼ x 1½ x 4¼ inches)
Weight (approx.):	0.85 kg (1.9 lbs.)

Receiver

Circuit Type:	Double-conversion Superheterodyne
Intermediate Frequencies:	17.7 MHz/450 kHz (VHF), 43.95 MHz/450 kHz (UHF)
Sensitivity (VHF/UHF):	0.2/0.25 µV for 12 dB SINAD, 0.3/0.35 µV for 20 dB NQ
Hum & Noise Ratio:	Better than 45 dB (25/30 kHz versions), Better than 40 dB (12.5 kHz versions)
Adjacent Channel Selectivity:	>70 dB (25 kHz), >60 dB (12.5 kHz)
Intermodulation Distortion:	Better than 65 dB
Spurious Rejection:	Better than 65 dB
External Audio Output Power:	5 watts into 4 Ohms with <10% THD

Transmitter

Power Output:	25/5 watts (High/Low, programmable)
Modulation Type & Deviation:	Frequency Modulation, ±5 kHz (±2.5 kHz)
Hum & Noise Ratio:	Better than 45 dB (25 kHz), Better than 40 dB (12.5 kHz)
Modulation Distortion:	Less than 5%
Spurious Emissions:	Better than 65 dB below carrier
Microphone Impedance:	600 Ohms

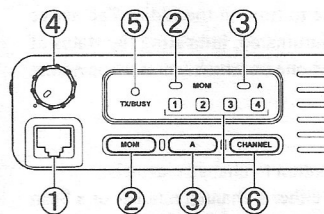
Specifications are subject to change without notice or obligation.



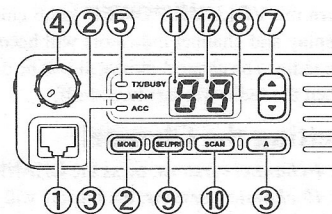
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CONTROLS & CONNECTORS

Front Panel



4 channel version



40 channel version

- 1 Microphone Jack**
Connect the microphone plug to this jack.
- 2 MONI Button & Indicator**
This button selects the "squelch" (receiver mute) mode. When the yellow indicator is off, "tone" or "coded" squelch is active. When the indicator glows steadily, only "noise squelch" is active, and any signal present on the channel will be heard. When the indicator is *blinking*, the squelch is disabled, and background noise will be heard if no signal is present.
- 3 A Button & Indicator**
This button is provided for an ACCESSORY function such as HIGH/LOW Power selection, "TALK-AROUND", or "CALL ALERT" functions. The green "A" indicator will be illuminated when this function is active.
- 4 VOLUME and POWER ON/OFF Knob**
This knob adjusts the receiver volume, and turns the radio off when turned all the way to the *left* into the click-stop.
- 5 TX/BUSY Indicator Lamp**
This lamp *blinks* red when the channel is busy, and *glows steadily* red during transmission. Do not transmit when this indicator is blinking, as a courtesy to other users of the channel.

The following item is unique to the 4-channel radio versions:

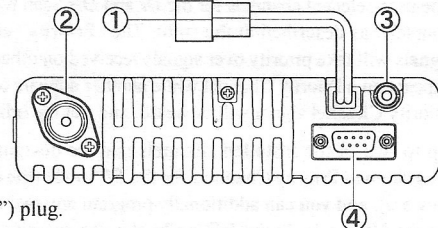
- 6 CHANNEL Numbered Indicators & Button**
Press the CHANNEL button to select the operating channel; the channel number currently in use will light up on the display panel.

The following items are unique to the 40-channel radio versions:

- 7 CHANNEL Selector Buttons (▲ and ▼)**
Push one of these keys to select the operating channel, as shown on the display.
- 8 Numeric Channel Display**
This display area shows the channel number and priority-channel/scan status.
- 9 SEL/PRI Button**
This button is used to select a channel for "Priority" monitoring, and is used together with the SCAN button to select the desired scanning mode.
- 10 SCAN Button**
This button is used to activate scanning, to select or remove channels on the scanning list, and (together with the SEL/PRI button) to select scanning mode.
- 11 P Indicator**
This small dot indicates Priority Channel status (described later).
- 12 E Indicator**
This small dot indicates Scanning on/off status (described later).

Rear (Heatsink)

- 1 13.6V DC Cable Pigtail w/Connector**
The supplied DC power cable must be affixed to this 2-pin connector.
- 2 Antenna Socket**
The (50-Ohm) coaxial feedline to the antenna must be connected here, using a type-M ("PL-259") plug.
- 3 External Speaker Jack**
An external loudspeaker may be connected to this 2-contact, 3.5-mm miniature phone jack.
- 4 DSUB 9-Pin Data Connector**
External Transmit Audio input, PTT (Push To Talk), Squelch, and Receive Audio output signals may be obtained from this connector for use with accessories such as a data transmission/reception modem, etc.



OPERATION

Power On/OFF

Turn the **VOLUME/POWER** knob clockwise to turn on the radio. The active display and channel indicators will become illuminated, indicating the status of the radio. The channel indicated will be the same one on which you were operating when the radio was last turned off.

Setting the Channel

In 4-channel versions, press the **CHANNEL** button to change channels.

In 40-channel versions, the display will show either a channel number or a Scan Mode indicator (**Sc**, **Ur**, **SP** or **UP**). If a Scan Mode indicator is displayed, press the **SCAN** button momentarily so that a channel number is displayed; then press either the **UP** (**▲**) or **DOWN** (**▼**) button to change channels.

Setting the Volume

Rotate the **VOLUME/POWER** knob clockwise to increase the volume level. If no signal is present on which to adjust the volume level, push and hold in the **MONI** button for two seconds; the yellow "**MONI**" indicator will blink, and either background noise or a voice signal will be heard. You may now adjust the **VOLUME/POWER** knob for a comfortable listening level. When you are done, press the **MONI** button momentarily to return to silent monitoring.

Transmitting

To transmit, wait until the "**TX/BUSY**" indicator is off (this indicates that the channel is not in use). Then press the **PTT** (Push-To-Talk) switch on the side of the microphone; while holding in the **PTT** switch, speak in a normal voice level across the face of the microphone. During transmission, the red "**TX/BUSY**" indicator will glow steadily. When you are done transmitting, release the **PTT** switch; the VX-2000 will revert to the "receive" mode.

The remaining instructions apply to 40-channel transceiver versions only

Special Transmitter Functions

If your VX-2000 is programmed for *Busy Channel Lock-Out*, the transmitter will not activate when the **PTT** switch is pressed unless the "**TX/BUSY**" indicator is *off* (so as to prevent interference to other users of the same channel).

If the selected channel has been programmed for *Automatic Time-Out*, you must limit the length of your transmissions. While transmitting with this feature activated, a "*beep*" will sound ten seconds before the timer expires, and then another "*beep*" sound as the timer expires: the "**TX/BUSY**" indicator will shut off, and transmission will cease. Release the **PTT** switch, listen for a moment, then press **PTT** again to resume transmission. This feature prevents interference to other users caused by a microphone which accidentally is stuck in the "transmit" position (wedged between seats of a car, etc.).

Scanning

To activate scanning on your radio, first place the microphone in its hanger. Now press the **SCAN** button momentarily. The radio will scan in one of four available Scan Modes (detailed below), and will halt when a signal is received which contains the correct code to open your squelch. Scanning will resume automatically either after a preset interval of a few seconds, or after the other station stops transmitting (depending on how your radio was programmed).

The four Scan Modes, and their corresponding displays, are:

Display	Scanning function
Sc	Scan all channels
Ur	Scan only user-selected channels
SP	Monitor one channel plus dealer-designated Priority Channel(s)
UP	Scan user-selected channels plus user-designated Priority Channel(s)

The user-selected channels for the **Ur** and **UP** Scan Modes are ones you can set up yourself, as described at the right. The "Priority" channels are those on which signals will take priority over signals received on other channels; that is, if a signal appears on a Priority Channel while another appears on a non-priority channel, the Priority Channel signal will be heard, and not the other.

Up to two of the installed channels may be designated by your Dealer as pre-programmed Priority Channels for the **SP** mode (the radio will not indicate which they are), and you can additionally program any two channels as "User Priorities" for the **UP** mode. In the **SP** mode, the non-priority channel will be the last one displayed.

When a Scan Mode is displayed, you can select another by pressing the **SEL/PRI** button repeatedly (the display will cycle through the above selections). Note that the radio will not scan if the microphone is not in its hanger.

USER-PROGRAMMABLE CHANNEL SELECTIONS

You can program a list of channels to be scanned, and up to two channels to be monitored on a "priority" basis. Your selections will be maintained in memory until you change or delete them.

Setting of these channels involves two small "Dot" indicators at the top of the channel display field. The Dot to the left of the *first* digit is the "**P**" (Priority) indicator, while the Dot to the left of the *second* digit is the "**E**" (Enable for Scanning) indicator.

To create or modify the Scan and Priority selections, first turn the radio off. Now press and hold in the **SCAN** button while you turn the transceiver back on; continue to hold the **SCAN** button in for two seconds after the radio has come on, then you may release it.

Now press the **UP** (**▲**) or **DOWN** (**▼**) button repeatedly, and note whether or not the "**E**" (right dot) or "**P**" (left) dots appear on any of your channels. If a dot appears by any channel, it means that it has been designated as either a Scan-Enabled or Priority channel, respectively.

To enable or disable a channel from the User Scan list, press the **SEL/PRI** button momentarily. The "**E**" dot will appear or disappear, as appropriate.

To change the Priority Channels, first cancel *both* by selecting *either*, and then pressing the **SEL/PRI** button momentarily. Now select the channel you wish to designate as the 1st Priority Channel, and hold in the **SEL/PRI** button for 2 seconds, until a beep sounds and the "**P**" indicator *blinks*. If you wish to designate a 2nd Priority Channel, move to that channel, and again hold in the **SEL/PRI** button for 2 seconds; this time, the "**P**" indicator will glow, but will not blink.

If you have deleted a channel from Priority status, you must re-enable it for *scanning* if you want it to be included on your Scan List. Press the **SEL/PRI** button momentarily to do this.

Coded Squelch - the MONI Button

Your transceiver may be programmed so that when the microphone is removed from its hanger, coded squelch is defeated, and you can hear any signal on the channel (the yellow "**MONI**" indicator will be lit). You can get the same result, without lifting the microphone, by pressing the **MONI** button momentarily. To avoid listening to unnecessary chatter, keep the microphone in its hanger, and press the **MONI** button when necessary to turn the yellow indicator off (unless you want to listen to other calls on the channel).

Holding the **MONI** button in for two seconds defeats both the coded squelch and noise squelch, so background noise can be heard (the "**MONI**" indicator will *blink* in this case). Press the **MONI** button momentarily to return the yellow indicator to its previous state (either off or steadily on).

OPTIONAL ACCESSORIES

CE-20	Programming Software (for IBM PC/compatibles only)
VPL-1	Programming Cable
T9101411	Radio-to-Radio Cloning Connection Cable
FP-1025A	Heavy-Duty (20A) AC Power Supply
MD-11A8J	Desktop Microphone
MH-600D	DTMF Back-lit Microphone w/Autodial
MLS-100	External Loudspeaker
LF-1	DC Line Filter
VTM-20	VX-Trunk II Trunking Mobile Logic Board
F2D-4A/B	2-Tone Decoder Unit
FTE-18	ANI Unit

NOTICE

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

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