

vertex[®]

VX-500

Service Manual

**VHF Hand-Held Portable
Land Mobile Transceiver**



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This manual provides the technical information necessary for servicing the VX-500 VHF hand-held transceiver. A reprint of the CE-6 Channel Editor software instructions and the Operating Manual is included for easy reference.

Servicing this equipment requires expertise in handling surface-mount chip components. Attempts by non-qualified persons to service this equipment may result in permanent damage not covered by the warranty, and may be illegal in some countries.

Two PCB layout diagrams are provided for each double-sided board in this transceiver. Each side of the board is referred to by the type of the majority of components installed on that side ("lead" or "chip-only"). In

most cases one side has only chip components, and the other has either a mixture of both chip and lead components (trimmers, coils, electrolytic capacitors, ICs, etc.), or lead components only.

While we believe the information in this manual to be correct, Yaesu Musen assumes no liability for damage that may occur as a result of typographical or other errors that may be present. Your cooperation in pointing out any inconsistencies in the technical information would be appreciated.

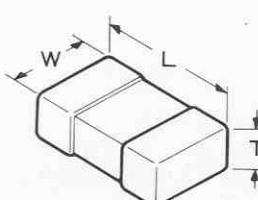
Yaesu Musen reserves the right to make changes in this transceiver in the interest of technological improvements, without notification to the owners.

Chip Component Information

Chip Component Information

The diagrams below indicate some of the distinguishing features of common chip components.

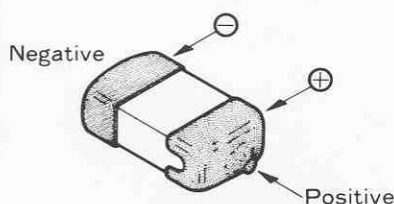
Ceramic Capacitors



(Unit : mm)

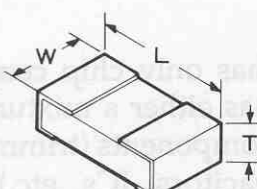
Type	L	W	T
3216	3.2	1.6	0.45~0.60
2125	2.0	1.25	0.35~0.50
1608	1.6	0.8	0.65~0.95

Tantalum Capacitors



Polarized. Unmarked
(determine value from layout
and Parts List)

Resistors



Type	L	W	T
1/10	2.0	1.25	0.45
1/16	1.6	0.8	0.45

Indicated Letters

1 2 3 4
5 6 7 8
9 0 .

Type RMC 1/10W,1/16W

Marking* 100,222,473.....

473		
Ten unit	One unit	Multiplier code
0	0	10^0
1	1	10^1
2	2	10^2
3	3	10^3
4	4	10^4
5	5	10^5
6	6	10^6
7	7	10^7
8	8	10^8
9	9	10^9

Examples :

$$100 = 10\Omega$$

$$222 = 2.2k\Omega$$

$$473 = 47k\Omega$$

Chip Component Information

Replacing Chip Components

Chip components are installed at the factory by a series of robots. The first one places a spot of adhesive resin at the location where each part is to be installed, and later robots handle and place parts using vacuum suction.

For single-sided boards, solder paste is applied and the board is then baked to harden the resin and flow the solder. For double-sided boards, no solder paste is applied, but the board is baked (or exposed to ultra-violet) to cure the resin before dip soldering.

In our laboratories and service shops, small quantities of chip components are mounted manually by applying a spot of resin, placing with tweezers, and then soldering by very small dual streams of hot air (without physical contact during soldering). We remove parts by first removing solder using a vacuum suction iron, which applies a light, steady vacuum at the iron tip, and then breaking the adhesive with tweezers.

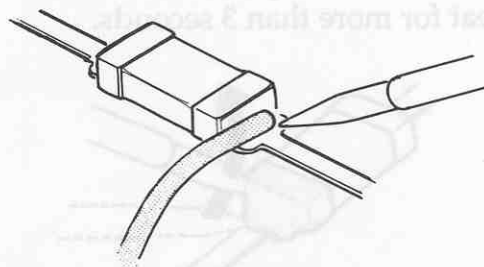
The special vacuum soldering/desoldering equipment is recommended if you expect to do a lot of chip replacements. Otherwise, it is usually possible to remove and replace chip components with only a tapered, temperature-controlled soldering iron, a set of tweezers and braided copper solder wick. Soldering iron temperature should be less than 280 °C (536 °F).

Precautions for Chip Replacement

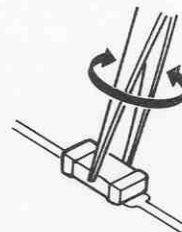
- ✗ Do not disconnect a chip forcefully, or the foil pattern may peel off the board.
- ✗ Never re-use a chip component. Dispose of all removed chip components immediately to avoid mixing with new parts.
- ✗ Limit soldering time to 3 seconds or less to avoid damaging the component and board.

Removing Chip Components

- Remove the solder at each joint, one joint at a time, using solder wick whetted with non-acidic flux as shown below. Avoid applying pressure, and do not attempt to remove the tinning from the chip's electrode.



- Grasp the chip on both sides with tweezers, and gently twist the tweezers back and forth (to break the adhesive bond) while alternately heating each electrode. Be careful to avoid peeling the foil traces from the board. Dispose of the chip when removed.



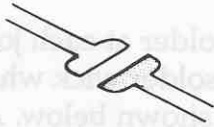
- After removing the chip, use the copper braid and soldering iron to which away any excess solder and smooth the land for installation of the replacement part.

Chip Component Information

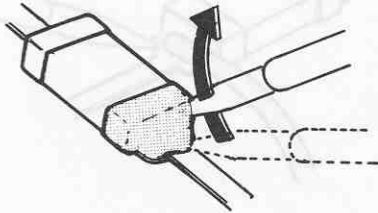
Installing a Replacement Chip

As the value of some chip components is not indicated on the body of the chip, be careful to get the right part for replacement.

- ☐ Apply a small amount of solder to the land on one side where the chip is to be installed. Avoid using too much solder, which may cause bridging (shorting to other parts).



- ☐ Hold the chip with tweezers in the desired position, and apply the soldering iron with a motion line that is indicated by the arrow in the diagram below. Do not apply heat for more than 3 seconds.



- ☐ Remove the tweezers and solder the electrode on the other side in the manner just described.



Operating Manual Reprint

The VX-500 is a frequency-synthesized, microprocessor-controlled FM hand-portable transceiver providing up to five watts of power output on up to 32 channels in the 134 ~ 174 MHz band. Designed specifically for commercial and professional applications, the VX-500 is housed in high-strength die-cast aluminum alloy, sealed to MIL-810 C, D & E intrinsically safe (I/S) and weather-tight specifications*.

User-selectable features include a four-mode display with channel name or number, upright or inverted for easy viewing when on belt; selective channel scanning, adjustable-pause priority scanning, and transmitter power output.

Other user-selectable features include push-button display illumination, 2-tone decoder enable/disable (when optional F2D-5 Unit installed) and manual squelch override. The VX-500 is easily programmed by your dealer using the Yaesu VPL-1 Cable or FRB-2 Service Kit with an IBM PC-compatible computer and CE-6 Programming Software.

Please read this manual carefully to become familiar with the features of the VX-500.

* approval pending

Controls & Connectors

Top Panel

(1) VOL (OFF) Control

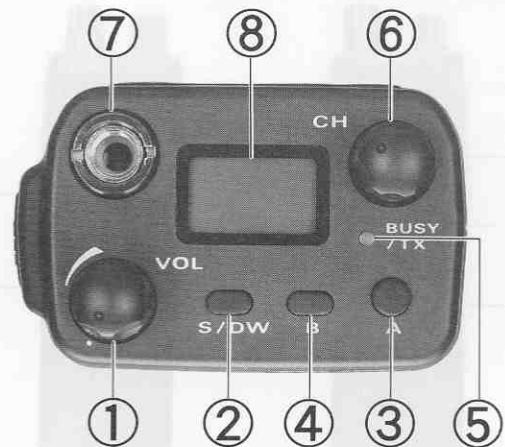
This control adjusts the volume of the receiver, and turns the radio off when rotated fully counterclockwise to the click-stop

(2) S/DW Button (Scan/Dual Watch)

Momentarily (< 1sec.) pressing this button turns the channel scanner on and off. Pressing and holding (> 1 sec.) button activates the Dual Watch feature (explained later).

(3) A Button

Momentarily (<1 sec.) depressing this activates functions as programmed by your dealer and determined by your system requirements (See the *Pre-Programmed Functions* section). Pressing and holding (>1 sec.) this button causes the selected channel to be assigned as the Priority Channel for use with



Priority Scanning and Dual Watch functions (explained later).

(4) B Button

Momentarily (< 1 sec.) pressing this button also activates an assigned function (programmed by your dealer). Pressing and holding (> 1 sec.) this *inverts* the LCD display to either front-ward or rear-ward facing read-out (the rear-ward display is convenient for viewing when wearing the transceiver on your belt).

(5) BUSY/TX Indicator

This lamp glows green when a signal is being received (or the squelch is opened by pressing the **MON RES** switch) and red when transmitting. To avoid interference, do not transmit if this is green.

(6) CH Rotary Selector

This rotary switch selects the operating channel. If a channel is selected that is not available for operation, "....." is displayed, accompanied by a rapid warning beeper (2 beeps/sec.).

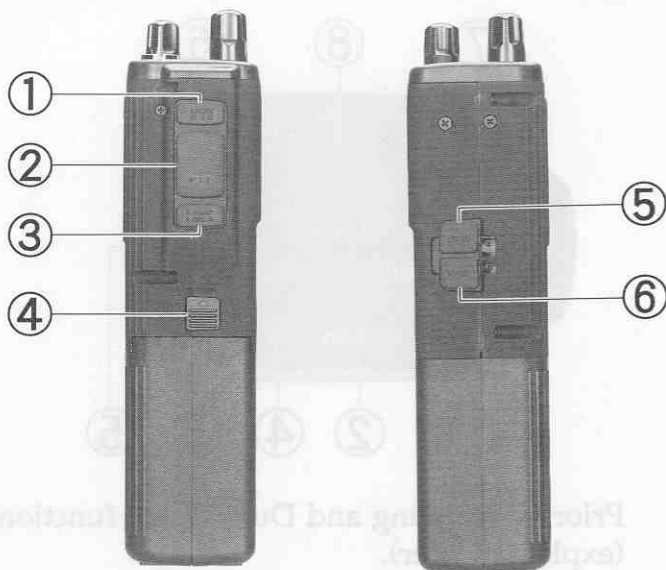
(7) Antenna Jack

This threaded-type jack accepts the supplied flexible antenna. Any other antenna types used here must be designed for the programmed operating frequencies.

(8) LCD Liquid Crystal Display

In addition the channel number name, the display includes some operating status symbols, indicated in the diagram on the following page.

Operating Manual Reprint



Side Panel Controls & Connectors

Side Panel Buttons & Connectors

(1) MON RES (Monitor/Reset)

Momentarily (< 1 sec.) pressing this button disables the tone squelch, and permits monitoring all stations transmitting on the selected channel while still keeping your receiver quiet from noise ("MO" will appear at the top right of the LCD). Press it again to only hear calls within your network.

Pressing and holding (>1 sec.) toggles the tone and noise squelch override, allowing all stations (and noise) on the channel to be heard. This may be used to hear weak stations whose signals would not normally open the squelch to be heard. Do this to pre-adjust the **VOL**ume control before receiving calls.

(With Selective Calling Option)

When the two-tone sequential decoder unit (F2D-5) is installed, and a selective call has been received, the "CALL" indicator comes on. Momentarily pressing this button will reset

the CALL function on the current channel and silence the receiver, otherwise press and hold to reset the CALL function on ALL channels.

(2) PTT (Push-To-Talk)

Hold this button in while transmitting (the **BUSY/TX** indicator glows red).

(3) LAMP/LOCK

Press this button momentarily (<1 sec.) to illuminate the display for five seconds. Pressing and holding (>1 sec.) the button locks top-panel push-buttons (**S/DW**, **B**, **A**, and the DTMF keypad (optional), this can be enabled to prevent radio settings from being inadvertently disturbed.

(4) Battery Release

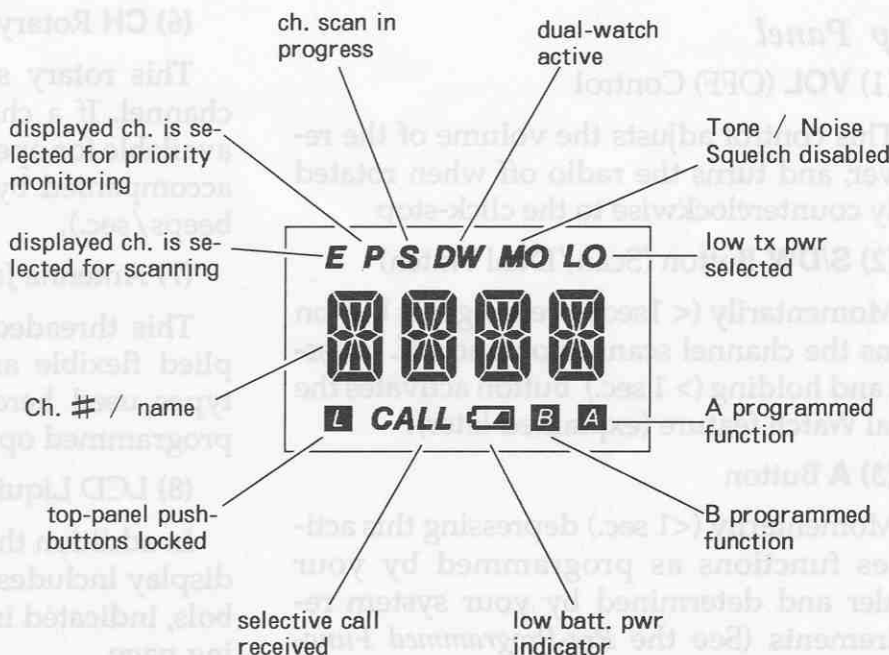
Slide this button in the direction of the arrow (upward) for battery removal.

(5) EAR Jack

This provides audio output for an earphone or the optional MH-30A2B External Speaker/Microphone here. The internal speaker is disabled when a plug is inserted into this jack.

(6) MIC Jack

Connect the optional MH-30A2B External Speaker/Microphone here, the internal microphone is disabled when this jack is used.

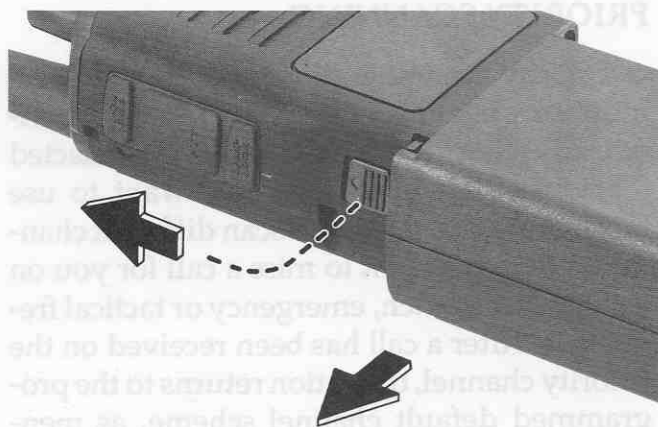


LCD Indications

Preliminaries

If the transceiver has not been used since leaving the factory, fully charge the battery using CD-1 unit (with PA-14B or C) before using it.

Mount the battery on the transceiver as described and shown in the photo below. Also, install the antenna on the jack on top of the transceiver by screwing the connector into the jack until it is finger-tight.



Battery Removal & Replacement

- ☐ Make sure that the **VOL** control is set into the OFF click-stop, and remove the protective soft or hard case, if used.
- ☐ Grasp the transceiver with your left hand, so your palm is over the speaker and your thumb is on the Battery Release Button.
- ☐ Move the button in the direction indicated by the arrowhead, while using your right hand to slide the battery pack toward the side with the button. The battery pack should slide smoothly out of its track.
- ☐ To replace the Ni-Cd pack, repeat the second and third steps above, simply sliding the battery case in the other direction after aligning the shorter side of the battery pack with the track below the Battery Release Button.

Preliminary Steps

Before operating the transceiver for the first time:

- ☐ Charge the battery pack and connect the supplied helical rubber flex antenna to the antenna jack on the top of the transceiver. *Never operate the transceiver without an antenna connected.*

- ☐ If you have a external Speaker/Mic, we suggest you do not connect it until you are familiar with basic operation.
- ☐ Before proceeding, please review the Top & Side Panel Controls outline, if you have not already, to familiarize yourself with the functions of the controls.

Basic Operation

Switch on the transceiver by rotating the **VOL** control clockwise out of the click-stop (a momentary beep will sound). For now, adjust the control to about mid-position (12-o'clock), later you can adjust the level to suit the operating environment.

Rotate the **CH** knob to select a channel for operation, the LCD will show the currently selected channel. A stopper may be inserted to prevent rotating the **CH** knob to un-programmed channels, however, if "... .." is displayed, along with a rapid beeping tone, the selected channel position is not available for operation.

To transmit, wait until the channel is clear (**BUSY/TX** LED off), then squeeze the **PTT** switch on the side of the transceiver and then speaking across the face of the radio. A clear normal voice will provide the best quality transmission. For maximum battery life, select low power output (covered later) whenever possible. During transmission the **BUSY/TX** indicator glows red. Release the **PTT** switch to receive.

To receive weak stations better, try positioning the radio as high and far away from your body as possible, or disable the squelch momentarily by holding the **MON RES** button

Low Battery Power Indication

When the rechargeable NiCd battery pack voltage reaches a low level, the "⏻" indicator appears at the lower right corner of the LCD, accompanied by a slow audible beeper (1-beep/2 secs). Immediately remove the NiCd pack and install a freshly charged battery pack, or insert the radio into the charging stand for a complete recharge cycle. If you plan to operate your radio for extended periods of time, you may want to keep a spare, fully-charged pack handy.

Operating Manual Reprint

on the side of the radio for > 1 sec. (until the *second* low/high beep sounds). With the squelch disabled, the **BUSY/TX** indicator will glow green and channel noise and weak stations can be heard. To quiet the radio again, press the **MON RES** button again momentarily.

When finished with operation, be certain to turn the **VOL** control to the "OFF" position to conserve battery life.

Scanning

Scanning allows you to sequentially check for calls on all or only those channels you select. To start scanning, press the **S/DW** button momentarily. A beep will sound and the display will clear and show "SCAN". Scanning will pause when a signal is received, at which time the channel number (or alphanumeric tag) will be displayed. A small "S" will be displayed above the channel, indicating the scanner is still active, but paused.

During this pause, you can press the **PTT** switch and talk to the station. Otherwise, scanning will resume a few seconds after the signal is no longer present. While scanning, if you momentarily press the **PTT** switch, operation automatically shifts to a default channel. This default channel can be set to the priority channel (both "P" and "S/DW" are displayed), last-busy channel, or home channel, *depending on how your radio was programmed*.

To stop scanning, simply press **S/DW** momentarily again. Operation will return to the channel that was last selected when scanning was activated.

If enabled by your dealer, you may select only the channels you want to scan, and have others skipped-over by performing the following routine.

- ☐ Turn the radio OFF, then depress the **S/DW** button while turning the radio back ON again. "PRG" will momentarily appear on the display, after which it will revert to the currently selected channel (this indicates you are in the PROGRAM mode). If user-access is inhibited "INH" will appear briefly.
- ☐ Use the **CH** knob to select a channel, then press the **S/DW** button to enable the chan-

nel for scanning ("E" will appear in the upper left corner of the LCD). Repeat this process for each channel you want the scanner to check.

- ☐ To remove a channel from those to be scanned, press **S/DW** again, so that "E" no longer appears in the display.
- ☐ After you have enabled all the channels you want to scan, turn the radio off, then on again to return to normal operation.

PRIORITY SCANNING

Priority scanning allows you to scan and monitor channels while the receiver periodically checks for calls on a pre-selected ("priority") channel. You may want to use this feature if you want to scan different channels, but don't want to miss a call for you on a primary dispatch, emergency or tactical frequency. After a call has been received on the priority channel, operation returns to the programmed default channel scheme, as mentioned before. Only *one channel at a time* can be selected as the priority channel.

- ☐ To set the currently displayed channel as the priority channel, just press and hold the **A** button for 1 sec. A small "P" will now appear at the top left corner of the display whenever this channel is selected, along with an accompanying "beep".

When a priority channel has been selected, the scanner will check the priority channel regularly as you scan the other channels. If a signal appears on the priority channel, the scanner will pause and operation will jump to the priority channel. Otherwise, the scanner will pause on active non-priority signals as previously described.

If a call comes in on a non-priority channel that you need to respond to, just press the **PTT** switch while the scanner is paused on that channel. As long as no call comes in on the priority channel, you can send and receive on the other channel: scanning will resume when you finish and the channel clears.

DUAL WATCH

If you need to operate on a non-priority channel while still checking for calls on the priority channel, the Dual Watch feature let's

you to do this without using the scanner. When enabled, operation on any selected non-priority remains normal as before, however, when a signal is received on the priority channel or when you press the **PTT** switch, operation immediately shifts to the priority channel. The rate at which the Dual Watch feature samples the priority channel can be programmed by your dealer.

- ☐ To begin Dual Watch operation, first assign a priority channel as described before, then select the non-priority channel you wish to operate on.
- ☐ Press and hold the **S/DW** button until the second beep sounds, "**DW**" (but not "**S**") will appear at the top of the display.
- ☐ To manually shift to the priority channel, press the **PTT** switch. At this time you may transmit, otherwise, if no signal is received within 5 seconds, operation will revert back to the other selected Dual Watch channel.
- ☐ To turn off the Dual Watch Feature, press and hold the **S/DW** button again ("**DW**" will disappear in the display).

Pre-Programmed Functions

The function selected by momentarily (<1 sec.) pressing the **A** or **B** button can be customized by dealer programming and your network requirements. A brief explanation of available functions is provided below. However, contact your dealer for details on their use and operation.

Low Transmit Power

This reduces the power output of your radio to approximately one watt to conserve battery life, and when full power is not needed to maintain reliable communications. "**LO**" will be displayed at the upper right corner when enabled.

Alpha Tag

This displays an alpha-numeric channel name, usually describing the channel, rather than merely displaying a channel number. These may be programmed to assist the user in recognizing the channel by name, rather than by memorizing channel numbers and their assignments.

Talk Around

This feature enables 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.

Channel Group Selection

The 32 available channels in the VX-500 can be organized into 2 groups with up to 16 channels in each. Pressing this button lets you select a group for operation. Channels within each group are selected using the rotary dial.

Optional Accessory

Voice Encryption (FVP-22) : When installed, pressing this button will turn on the optional voice encryption unit for privacy during communications.

EEPROM Programming Software Instructions

To program the Yaesu VX-500 transceiver, you need the VPL-1 Programming Cable or FRB-2 Service Kit, with CE-6 programming diskette and an IBM PC®/PC-compatible computer with:

- at least 128k RAM,
- PCDOS® or MSDOS® 2.0 or later,
- one 5-1/4" (360k or 1.2MB) floppy drive,
- a monochrome or color monitor,
- one Async port (COM1 or 2) with 25-pin connector (or suitable adapter).

Of course you also need a printer if you want to get hard copy of the data.

Important!

Do not work directly with the Yaesu programming diskette! Make a copy of it and use the copy when programming the transceiver, since you will be storing data on it. Keep the original in a safe place in case you need to make a copy later.

The manuals that came with your computer should explain how to make a copy of the diskette, using DOS COPY commands. If you want to be able to boot the computer from your programming diskette copy, use the FORMAT command with /S parameter (on a blank diskette) to make a system disk, and then copy files from the original Yaesu diskette.

The Yaesu programming diskette contains the following files:

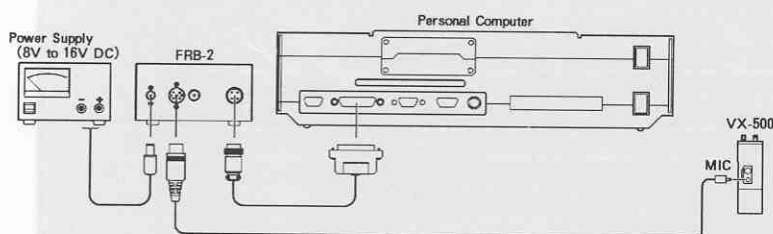
- CE6.EXE – The EEPROM programming program
- CE6.HLP – Help file used by the main program

You can use the software to create and edit files without having to connect the computer to the transceiver. However, before connecting a transceiver for programming or cloning, turn off your computer and the transceiver, and connect the Programming Cable to the computer and the transceiver as shown below. Next restart the computer. Turning off the equipment during interconnection avoids possible damage to the electronics.

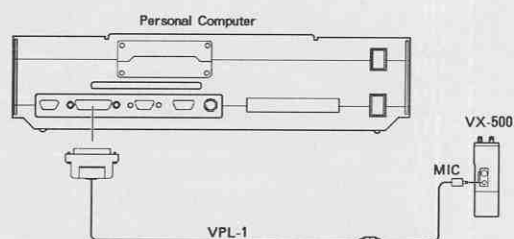
When ready to run the program (after booting DOS), place your *copy* of the Yaesu diskette (not the original!) in drive A, and log onto this drive (type "A:."). Then type "CE6." to start the program. You should be greeted briefly by an introductory screen, followed by a screen allowing you to toggle the COM port used (COM1 or COM2) and continue on to the channel editor, shown below.

Current serial port setting: COM 1

[SPACE]-> Toggle Other key-> Continue



FRB-2 Programming Interconnections



VPL-1 Programming Interconnections

EEPROM Programming Software Instructions

The Main Programming Screen

The main screen consists of four major sections: Common Data Items, Key Help, Channel Data, and, along the bottom of the screen, Function Key Selections. These are described in a bit more detail next.

Main Screen Common Data Items

At the upper left are the Edit:, Step:, Power-on Display:, and A & B Btn: items, which are "Common" Data items that you may need to refer to when making entries in the Channel Data (see below).

```
EEPROM DATA EDITOR <CE-6> v2.01
Edit: noname.ch   A Btn: Chg Group
Step: 5.0,6.25kHz B Btn: High/Low
Power-on Display: Ch Number
```

In this program, "Common" refers to global nature of these parameters: they are not channel-specific, but apply to programming and the operation of the transceiver on any and all channels.

The Edit entry is the name of the current data file being edited, if any. If no file has been read (via the F3, Disk Load function) or saved

(via the F4, Disk Save function), "noname.ch" is displayed here.

Step is the channel frequency multiple (all channel frequencies entered must be whole multiples of the indicated step size).

Power-On Display indicates what will be viewed on the top panel LCD when the transceiver is first powered on.

The A & B Btn settings indicates the functions currently selected for the top-mounted key-buttons on the transceiver panel.

Common Data cannot be changed from this screen.

Key Help Box

The KEY HELP box at the upper right indicates the keys that can be used to edit data at any given moment.

```
KEY HELP
[SPACE] Set/Clear Priority Channel
2-Tone Decoder/Burst in COMMON data
```

The contents of this box *change according to the location of the cursor* in the Channel Data table, so observe this box while becoming fa-

```
EEPROM DATA EDITOR <CE-6> v2.01
Edit: noname.ch   A Btn: Chg Group
Step: 5.0,6.25kHz B Btn: High/Low
Power-on Display: Ch Number
```

```
KEY HELP
[SPACE] Set/Clear Priority Channel
2-Tone Decoder/Burst in COMMON data
```

VX500-V

Current Port: COM1

Ch/Pri	Ch	Name	Rx Freq.	Decoders	CTCSS	DCS	Scan	Pwr	Save	Tx Freq.	Encoders	CTCSS	DCS	BTLO	Pwr	TOT
[off]	1	CH01	150.00000	off	off	stop	off	150.00000	off	off	off	off	off	off	Hi	off
1-01																
1-02																
1-03																
1-04																
1-05																
1-06																
1-07																
1-08																
1-09																
1-10																
1-11																
1-12																
1-13																
1-14																
1-15																
1-16																

F1 Help F2 Common F3 Load F4 Save F5 Read F6 Write F7 Print F8 Quit F9 V/Uhf

CE-6 Channel Data Items

EEPROM Programming Software Instructions

miliar with the editor. For example, when the program first starts, the cursor is in the "Ch/Pri Ch" (Priority Channel) field, indicating the currently selected Priority Channel and "[]" surrounds the Pri. Ch. number in the first column of the Ch. Data table.

You can press the F1 Help key for more detailed information on the functions of particular keys in the current cursor field. Of course you can always use the cursor keys to select another field (unless in the middle of entering new field data).

Channel Data Table

The largest section of the screen is the Channel Data table, shown at the bottom of the previous page. Press the up, down, left and right arrow keys on the PC's keyboard to move the cursor around the table (you may have to press the Num Lock key to switch the keypad from numeric to cursor movement mode if your keyboard does not have separate cursor keys). Each line in the editing table represents one channel, with the columns indicating the current setting of each parameter that can be set for that channel. Hyphens indicate that a parameter is not currently being used. If all of the fields on a line are hyphens, the channel is currently hidden from use.

Function Key Selections

The main features of the program are indicated along the bottom of the screen, and are accessible by pressing the corresponding function keys (F1 to F9) on your keyboard (see bottom of page). You will always return to this screen after completing one of the actions listed, and can then edit channel data, select another feature, or quit. When finished with the program, always use the Quit selection (F8, and then Y). Don't turn off the power switch or disconnect the cables to the transceiver until after the program has exited.

Setting the Transceiver for Programming

Before data can be up- or down-loaded from the EEPROM in the VX-500, the programming cable must be properly connected from the computer, and *the transceiver must first be initialized for data transfer*. This is done by turning the radio off, then pressing and holding the **MON** and **PTT** switch while turning the transceiver back on again. While in this mode, "PTT" is displayed in the top-panel LCD.

- ☐ To read data from the transceiver, press F5 and follow the instructional prompts. You will need to press the **PTT** key on the radio, "SEND" appears in the LCD during data transfer.
- ☐ To send data to the transceiver, press F6 and follow the instructional prompts. You will need to press the **MON** key on the radio, "LPT" appears in the LCD during data transfer.

After transferring data, turn the transceiver off then on again to return to normal operation.

What to do First

Reading Data from the Transceiver

If you have a transceiver connected to the computer, we recommend that you up-load the data from the transceiver and save it to disk before doing anything else (see the box above). Press the F5 key (Read) to do this, and follow the prompts. If an error message is displayed when attempting to up-load the data, check all connections and power supplies carefully. After up-loading the data from the transceiver, save it to disk right away as described below under "Saving Data to Disk".

1-16

F1 Help F2 Common F3 Load F4 Save F5 Read F6 Write F7 Print F8 Quit F9 V/Uhf

Programming Function Key Selections

EEPROM Programming Software Instructions

Loading Data from Disk

If no transceiver is connected to the computer and you just want to view or edit data files already on the disk, press F3 (Load). A window will appear, and you will be asked for the name of the file to load, which *must* be the name of a channel data file already on the disk.

There are no such files provided on the original diskette (you must first download data from the transceiver, and save it). To see a list of all existing files, type ".|" (period and Enter), and then type the name of the file you want to load.

If an error message appears during loading, either no file could be found on the disk with that name, or the file data was corrupted since it was last stored. If the data was corrupted you will have to build a new file from scratch, or enter another file name. Erase any corrupted files from the disk to avoid confusion. Just enter `DEL filename.ext|` from the DOS prompt (substituting the name of your file for "filename.ext").

Editing Channel Data

After loading data from a transceiver or a data file, you are ready to edit it. Just move the cursor from one field to another using the cursor keys, and enter the new data desired. Refer to the Key Help box for keys functions in each field, and press F1 for additional help on each field, as needed.

The Decoder and Encoder field will allow you to choose tone or code frequencies from a selection window, as shown below (for the CTCSS selections).

Tone Select			
67.0	69.3	71.9	74.4
77.0	79.7	82.5	85.4
88.5	91.5	94.8	97.4
100.0	103.5	107.2	110.9
114.8	118.8	123.0	127.3
131.8	136.5	141.3	146.2
151.4	156.7	162.2	167.9
173.8	179.9	186.2	192.8
203.5	210.7	218.1	225.7
233.6	241.8	250.3	

When you have entered all of the channel data desired, we recommend that you first save it to disk before down-loading to a transceiver.

Saving Data to Disk

You can save data to a disk file at any time by pressing the F4 (Save) function key. A file list window like that illustrated for Disk Load will appear. Remember that you *must* save a file if you have just edited Channel Data or Common Data and want to use it again later, but we also suggest you do this whenever you have up-loaded data from a transceiver (so you can restore it if a problem develops later). You will be asked for a file name to save to. This can be any valid DOS file name: we recommend you choose a name that you will be able to recognize easily later. Be careful not to select a name that already exists. If you need to see what files are on the disk, just enter a period (.).

Sending Data to the Transceiver

After editing data and saving it to a file on disk, you can download it to a transceiver, if connected. If the cables are not connected, however, you should press F8 (Quit) after making sure you have saved any edited data to a file, and then turn off the computer to connect the Connection Cable and Transceiver. Then turn the computer back on, restart the program, reload the saved file from disk (function key F3), and then press function key F6 (Write) and follow the prompts on the screen.

Pressing the space bar then starts the download. If an error message is displayed when attempting to download, check your cables, Connection Box and power supplies carefully. Any key returns you to the Main Menu where you can try again, if necessary. To program another radio with the same data, you can change the cable connection without having to turn off the computer and restart the program.

EEPROM Programming Software Instructions

Editing Changeable Common Data

"Common" data here means those parameters which affect all channels in the transceiver. Those parameters which can be reprogrammed without modifying the circuitry are shown on the first submenu, accessed by pressing F2 (shown below):

Use the Space bar to toggle parameters on and off, or with the Backspace key to step through numeric selections (numbers are not entered directly). Press the F1 (Help) function key for detailed help on all modifiable Common Data selection. Press F8 or Esc when done to return to the Main Menu, and remember to save any changes to disk.

Viewing Hardware Environment Data

Environment Data (most of which cannot be changed without changing the hardware), can be viewed by entering the second submenu from the Common Data submenu, by pressing F2 again from the submenu. These parameters are stored in EEPROM along with the changeable parameters, but, with exception of the hardware-independent Scan Speed and Local Offset, they *must also match the circuitry of the transceiver(s) being pro-*

grammed. This means you have to be careful, whenever editing Channel or Common data, to begin with data that will match the target transceiver(s) version. To change the Environment parameters, you must start/restart the program using the "/P" switch ("CE6/P↵").

HARDWARE ENVIRONMENT

Prescaling:	1/64
Channel Step:	5.0, 6.25kHz
IF:	21.6 MHz
Local Offset:	Lower
Default Split:	0.00 MHz
Scan Speed:	150ms
Power Save Timer:	300ms

Default VHF Hardware Environment Settings

Changing Transceiver Band Version

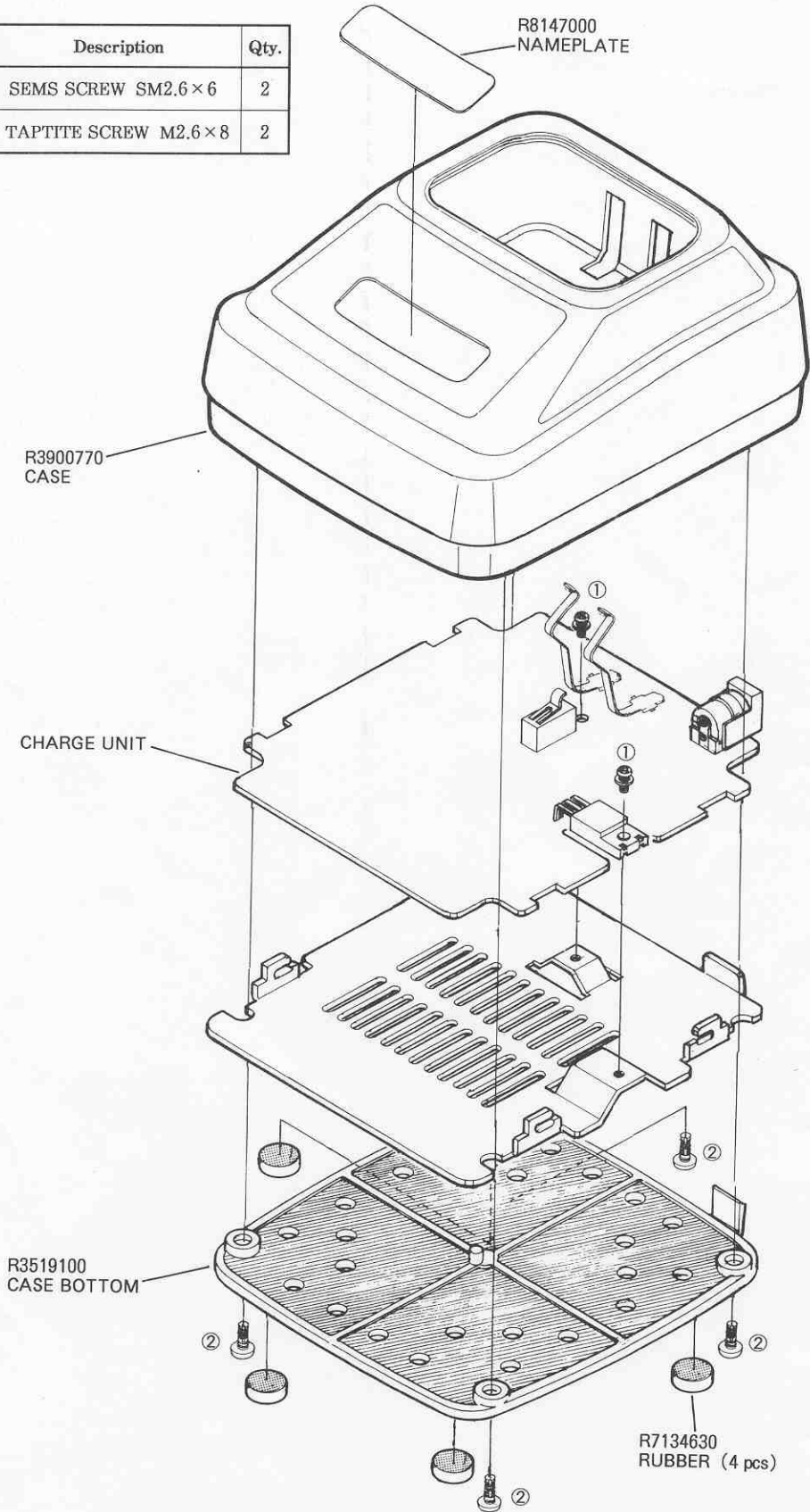
When switching between VHF & UHF transceiver versions, you can easily toggle respective Hardware Environment settings (i.e., Prescaling ratio, IF, Channel Step, etc.) needed for the next radio without having to re-load its EEPROM. Simply press the F9 V/UHF key, a brief message will prompt you to save the current data before continuing (shown at top of next page).

		Current Port: COM1	
EDIT COMMON DATA			
Channel Scan:	Enabled	Tx Time-Out:	Enabled
Scan-Stop Resume:	5s timer	Tx Time-Out Time:	1 min
User Scan Program:	Disabled	Time-Out Resume:	0 sec
		Squelch Tail Elim.:	Disabled
Dual Watch:	Enabled		
Power-On Dual Watch:	Disabled	A Button:	Chg Group
Dual Watch Speed:	Fast	B Button:	High/Low
Channel after PTT:	Home	DTMF SelCall/Ch Name:	Ch Name
Monitor:	Enabled	Power-on Display:	Ch Number
Beep:	Enabled	2-Tone Decoder:	Group 1,2,3
Lighting Lock:	Disabled		
Power Save:	600ms/300ms		

Changeable Common Data Items

Exploded View

No.	YAESU P/N	Description	Qty.
①	U02206001	SEMS SCREW SM2.6×6	2
②	U23206001	TAPTITE SCREW M2.6×8	2



Non-designated parts are available only as part of a designated assembly.

YAESU

Performance without compromise

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