◥◣ Vertex Standard

UHF FM TRANSCEIVER
VX-146
Operating Manual

CONTROLS & CONNECTORS

LED Indicator
Glows Green: Monitor on
Blinks Green: Busy Channel (or SQL off)
Glows Red: Transmit
Blinks Red: Battery Voltage is low

- CH (Channel) Selector
- VOL/PWR Knob

Antenna

Speaker

PTT Switch

MIC/SP Jack

MONITOR Key

Microphone — LCD

[BELL] Key — [SCAN] Key

[MODE] Key

Battery Pack Latch
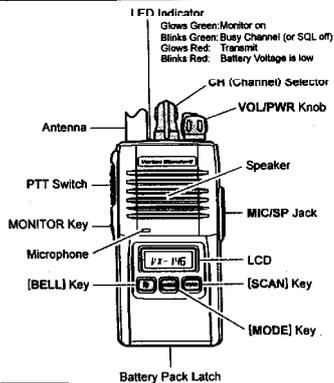
| ENGLISH |
| ESPAÑOL |
| FRANÇAIS |
| DEUTSCH |
| ITALIANO |

| List of the preloadable area			
●AUT	●BEL	●DNK	●FIN
●FRA	●DEU	●GRC	●ISL
●IRL	●ITA	●LIE	●LUX
●NLD	NOR	●PRT	●ESP
●SWE	●CHE	●GBR	

IMPORTANT NOTICE!

☐ Please read this manual carefully to become familiar with the features of this transceiver.
☐ Do not hold the transceiver so that the antenna is very close to (or touching exposed parts of) the body, especially the face of eyes, while transmitting. The transceiver will perform best if the microphone is 3 to 5 cm away from the mouth and the transceiver is vertical.
☐ Do not place the transceiver in excessively dusty, humid, or wet areas, nor on unstable surfaces.
☐ Refer service of this apparatus to qualified technicians only.

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
E C 0 4 1 U 7 6 1   0212c-BE

BATTERY PACK INSTALLATION AND REMOVAL

When using the FNB-64 Ni-Cd Battery Pack
☐ To install the battery, hold the transceiver with your hand, so your palm is over the speaker and your thumb is on the top of the Belt Clip. Insert the battery pack into the battery compartment on the back of the radio while tilting the Belt Clip outward, then close the Battery Pack Latch until it locks in place with a "Click."

Tilt the Belt Clip ⇧   Insert the Battery Pack
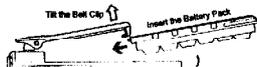
BASIC OPERATION

Preliminary Steps
☐ Install a charged battery pack onto the transceiver, as described previously.
☐ If you have a Speaker/Microphone, we recommend that it not be connected until you are familiar with the basic operation of the VX-146.

Operation Quick Start
☐ To turn the top panel's VOL/PWR knob clockwise to turn on the radio on.
☐ Turn the top panel's CH selector knob to choose the desired operating channel.
☐ Rotate the VOL/PWR knob to set the volume level. If no signal is present, press and hold the MONITOR key (the lower button on the left side) more than one second; background noise will now be heard, and you may use this to set the VOL/PWR knob for the desired audio level.
☐ Press and hold the MONITOR key more than one second (or press the MONITOR key twice) to quiet the noise and resume normal (quiet) monitoring.
☐ To transmit, press and hold the PTT switch. Speak into the microphone area of the front panel grille (upper left-hand corner of the display) in a normal voice level. To return to the Receive mode, release the PTT switch.
☐ If a Speaker/Microphone is available, remove the plastic cap and its two mounting screws from the right side of the transceiver, then insert the plug from the Speaker/Microphone into the MIC/SP jack; secure the plug using the two screws supplied with the Speaker/Microphone. Hold the speaker grille up next to your ear while receiving. To transmit, press the PTT switch on the Speaker/Microphone, just as you would on the main transceiver's body.

Note: Save the original plastic cap and its mounting screws. They should be re-installed when not using the Speaker/Microphone.

Keypad Locking
The VX-146's keypad may be locked out to prevent accidental changing of its setting.
☐ Press and hold the [BELL] key for one second to lock the keypad. In the LOCK mode, the display will show "-LOCK-" when you touch a key on the keypad.
☐ To turn the lock feature off, press and hold the [BELL] key for one second.

ADVANCED OPERATION

Scanning
The Scanning feature is used to monitor multiple channels programmed into the transceiver. While scanning, the transceiver will check each channel for the presence of a signal, and will stop on a channel if a signal is present.
☐ To activate scanning:
Press the [SCAN] key momentarily.
The scanner will search the channels according to the scan mode ("Normal Scan" or "Follow-ME Scan": determined via the MENU mode), looking for active ones; it will pause each time it finds a channel on which someone is speaking.
☐ To stop scanning:
Press the [SCAN] key momentarily.

How to Skip(Omit) a Channel during Scan Operation
When you have some very active channels, you may wish to skip them when scanning, but still have them available for manual selection.
☐ Rotate the CH knob to select the channel to be skipped during scanning.
☐ Press and hold the [SCAN] key for one second. A small "SKIP" indicator will appear to the display, indicating it is to be ignored during scanning.
☐ To re-institute the channel into the scanning loop, repeat the above two steps.
Remember that the "Skipped" channel will always be accessible via manual channel selection methods using the CH knob; the above procedure only removes a channel from the *scanning* loop.

CTCSS Operation
"CTCSS" is a selective calling system which uses a continuous, very-low-frequency tone that is filtered out so as not heard. If many stations are using the same channel frequency, CTCSS will keep your radio's receiver squelched until a CTCSS tone received matching the CTCSS tone you have selected for your radio. If CTCSS is turned off, any signal received can open your radio's squelch.
☐ Rotate the CH knob to select a channel for CTCSS operation.
☐ Press the [MODE] key twice, then press the [BELL] or [SCAN] key so that the "-CTCS" appears on the display; this activates the CTCSS.
☐ Press the [MODE] key momentarily, then select the desired CTCSS Tone number by pressing the [BELL] or [SCAN] key.
☐ Press the [MODE] key momentarily to save the new settings and activate the CTCSS.
☐ Press the MONITOR key momentarily to disable the CTCSS temporarily to listen to the (muted) signal from the other station. Press the MONITOR key again to activate the CTCSS.
☐ To disable the CTCSS operation, press the [MODE] key twice then press the [BELL] or [SCAN] key so that the "OFF" appears on the display, and press the

---

ARTS Operation
"ARTS" is a transponder feature, available when DCS is engaged, which will alert two ARTS-equipped radios when an "Out of Range" condition exists. The stations can then move to a better location to re-establish communications.
☐ Rotate the CH knob to select a channel for ARTS operation.
☐ Press the [MODE] key twice, then press the [BELL] or [SCAN] key so that the "-ARTS" appears on the display; this activates the ARTS.
☐ Press the [MODE] key momentarily, then select the desired DCS Code number by pressing the [BELL] or [SCAN] key.
☐ Press the [MODE] key momentarily to save the new settings and activate the ARTS.
☐ Every 55 seconds, your radio will transmit a "polling" call to the other station. When that station responds with its own ARTS polling signal, the display will change to "INRANGE" to confirm that the other station's polling code was received in response to yours.
☐ To exit ARTS operation and resume normal functioning of the transceiver, press the [MODE] key twice, then press the [BELL] or [SCAN] key so that the "-OFF" appears on the display, and press the [MODE] key.

Channel Programming
You may change the operating frequency (from among the eight available channel frequency) of the channel selected by the CH knob. This function may be useful if you wish to change the order in which the frequencies are selected by the CH knob.
☐ Rotate the CH knob to select the channel on which you wish change the operating frequency.
☐ Press the [MODE] key momentarily, then select the desired Channel by pressing the [BELL] or [SCAN] key.
☐ Press the [MODE] key twice to save the new settings.

MENU MODE

The MENU Mode allows certain aspects of your radio's configuration to be customized for your personal operating convenience. We do not recommend that any of the default settings be changed, however, until you are thoroughly familiar with the operation of the VX-146.
☐ Press and hold in the [MODE] key while turning the transceiver on to activate the MENU mode.
☐ Press the [BELL] or [SCAN] key to select the MENU mode you wish to view and/or modify.
☐ Once you have selected the desired MENU mode item, press the [MODE] key momentarily to modify the setting for the item.
☐ Press the [BELL] or [SCAN] key to change the setting of the item (ON to OFF, etc).
☐ Press the [MODE] key momentarily to save your new setting (Press the MONITOR key to cancel the setting).
☐ If you need to change more than one MENU mode item, repeat steps 2 - 5.
☐ Press the PTT switch to exit the MENU mode.

LAMP
Function: LCD Illumination mode
Available Values: ON/OFF
Default Setting: ON
ON: The lamp will be activated for 5 seconds when the any key on the keypad is pressed.
OFF: Disable the illumination lamp.

MONI
Function: Define the accessory pin of the MIC/SP jack of the radio.
Available Values: NOR/EXT (Default Setting: NOR)
When the radio use with the optional MH-45 Speaker/Microphone, this item set to "NOR." When the radio use with the optional VC-26 VOX Headset, this item set to "EXT."

TAG
Function: Programming an Alpha/Numeric label for the opening message.
To programming an Alpha/Numeric label:
☐ Select this Menu item.
☐ Press the [MODE] key to enable modifying the label.
☐ Press the [MODE] key again, to begin modifying of first digit of the label.
☐ Press the [BELL] or [SCAN] key to select the first digit of the desired label. When you have made your selection, press the [MODE] key momentarily to move the next character.
☐ Repeat the previous step to program the remaining letters, numbers, or symbols of the desired label. A total of eight characters may be used in the creation of the label.
☐ When you have completed the creation of the label, press the [MODE] key momentarily to save the label.
Default Setting: SELFTEST

SQL
Function: Squelch Level Setting

BATTERY PACK INSTALLATION AND REMOVAL

When using the FNB-64 Ni-Cd Battery Pack
☐ To install the battery, hold the transceiver with your hand, so your palm is over the speaker and your thumb is on the top of the Belt Clip. Insert the battery pack into the battery compartment on the back of the radio while tilting the Belt Clip outward, then close the Battery Pack Latch until it locks in place with a "Click."

Tilt the Belt Clip ⇧

Insert the Battery Pack

Close the Battery Pack Latch
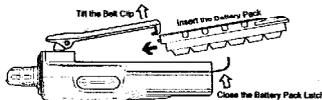
☐ To remove the battery, turn the radio off and remove any protective cases. Open the Battery Pack latch on the bottom of the radio, then slide the battery downward and out from the radio while unfolding the Belt Clip.

Caution!: Do not attempt to open any of the rechargeable Ni-Cd packs, as they could explode if accidentally short-circuited.

Low Battery Indication
☐ As the battery discharges during use, the voltage gradually becomes lower. When the battery voltage reaches 6.7 volts, substitute a freshly charged battery and recharge the depleted pack. The TX/BUSY indicator on the top of the radio will blink *red* when the battery voltage is low.
☐ Avoid recharging Ni-Cd batteries often with little use between charges, as this can degrade the charge capacity. We recommend that you carry an extra, fully-charged pack with you so the operational battery may be used until depletion (this "deep cycling" technique promotes better long-term battery capacity).

Battery Charging
☐ Install the supplied FNB-64 Ni-Cd battery pack onto the transceiver. Ensure that the transceiver is switched off.
☐ Plug the NC-77 into the AC line outlet.
☐ Connect the battery pack into the NC-77; the antenna jack should be at the left side when viewing the charger from the front.
☐ If the battery pack is inserted correctly, the RED indicator will grow. A fully-discharged pack will be charged completely in 15 hours.

When using the FBA-25 Battery Case
The **FBA-25** Battery Case allows operation of the VX-146 using six AA size Alkaline batteries.
When installing batteries, inset the (−) end first, then press in the (+) end so the battery snaps into place. Always replace six batteries at the same time.
To install the Battery Case into the transceiver, it is same manner as the Ni-Cd Battery Pack, described previously.

Note: The FBA-25 must not be used with rechargeable cells.

MICROPROCESSOR RESETTING

All transceiver settings can be reset to their factory-default states using the following power-on routines.
☐ Turn the transceiver off.
☐ Press and hold the [BELL], [SCAN], and MONITOR key while turning the radio on. A "ROM CLR" will appear on the display.
☐ Press the PTT switch to reset the transceiver (Press the MONITOR key to cancel the resetting).

CTCSS Operation
"CTCSS" is a selective calling system which uses a continuous, very-low-frequency tone that is filtered out so as not heard. If many stations are using the same channel frequency, CTCSS will keep your radio's receiver squelched until a CTCSS tone received matching the CTCSS tone you have selected for your radio. If CTCSS is turned off, any signal received can open your radio's squelch.
☐ Rotate the CH knob to select a channel for CTCSS operation.
☐ Press the [MODE] key twice, then press the [BELL] or [SCAN] key so that the "-CTCS" appears on the display; this activates the CTCSS.
☐ Press the [MODE] key momentarily, then select the desired CTCSS Tone number by pressing the [BELL] or [SCAN] key.
☐ Press the [MODE] key momentarily to save the new settings and activate the CTCSS.
☐ Press the MONITOR key momentarily to disable the CTCSS temporarily to listen to the (muted) signal from the other station. Press the MONITOR key again to activate the CTCSS.
☐ To disable the CTCSS operation, press the [MODE] key twice, then press the [BELL] or [SCAN] key so that the "-OFF" appears on the display, and press the [MODE] key again.

DCS Operation
"DCS" is similar in use to CTCSS, except DCS uses the digital codes for more reliable operation.
☐ Rotate the CH knob to select a channel for DCS operation.
☐ Press the [MODE] key twice, then press the [BELL] or [SCAN] key so that the "-DCS" appears on the display; this activates the DCS.
☐ Press the [MODE] key momentarily, then select the desired DCS Code number by pressing the [BELL] or [SCAN] key.
☐ Press the [MODE] key momentarily to save the new settings and activate the DCS.
☐ Press the MONITOR key momentarily to disable the DCS temporarily to listen to the (muted) signal from the other station. Press the MONITOR key again to activate the DCS.
☐ To disable the DCS operation, press the [MODE] key twice, then press the [BELL] or [SCAN] key so that the "-OFF" appears on the display, and press the [MODE] key again.

BELL Operation
During CTCSS or DCS operation, you may set the transceiver up such that a "-CALLED-" appears on the display you to the fact that a call is coming in.
☐ Set the transceiver up for CTCSS or DCS operation, as described previously.
☐ Press the [BELL] key momentarily to activates the BELL feature ("BELL ON" will appear on the display).
☐ When a station calls you whose transceiver is sending a CTCSS tone or DCS code which matches that set into your radio, the "-CALLED-" will appears on the display.
☐ To disable the BELL operation, press the [BELL] key momentarily ("BELL OFF" will appear on the display).

Bell Ringer Operation
If you activate the bell ringer via the MENU mode, a ringing "bell" sound alerts you to the fact that a call is coming in. Here is the procedure for activating the bell ringer.
☐ Press and hold in the [MODE] key while turning the transceiver on to activate the MENU mode.
☐ Press the [BELL] or [SCAN] key to select the MENU item ("C_BP").
☐ Press the [MODE] key momentarily to enable adjustment of the bell ringer.
☐ Press the [BELL] or [SCAN] key to set the desired number of rings of the bell. The available choices are 1, 3, 5 rings or OFF.
☐ Press the [MODE] key momentarily to save your new setting, then press the PTT switch to exit the MENU mode.
☐ When a station calls you whose transceiver is sending a CTCSS tone or DCS code which matches that set into your radio, the bell will ring in accordance to this programming.

to "EX1".

TAG
Function: Programming an Alpha/Numeric label for the opening message
To programming an Alpha/Numeric label:
☐ Select this Menu Item.
☐ Press the [MODE] key to enable modifying the label.
☐ Press the [MODE] key again, to begin modifying of first digit of the
☐ Press the [BELL] or [SCAN] key to select the first digit of the des. When you have made your selection, press the [MODE] key momentarily move the next character.
☐ Repeat the previous step to program the remaining letters, numbers, of the desired label. A total of eight characters may be used in the creation label.
☐ When you have completed the creation of the label, press the [MODE] mentarily to save the label.
Default Setting: SELFTEST

SQL
Function: Squelch Level Setting
Available Values: 0 - 12 (Default Setting: 4)
Select a setting for this Menu Item which just silences the receiver when is present. Use the lowest setting which will keep the receiver quiet between transmissions.

M_dB
Function: Microphone Input Sensitivity Setting
Available Values: −6/0/+6 dB (Default Setting: 0 dB)

C_BP
Function: Select the BELL ringer repetitions
Available Values: 1/3/5/OFF (Default Setting: 3)

S_RT
Function: Set the delay time for scanning resumption
Available Values: 2S/3S/4S/5S (Default Setting: 2S)

S_MD
Function: Select the Scan mode
Available Values: NOR/FM (Default Setting: NOR)
NOR: Activate the Normal Scan. The Normal Scan feature is used to multiple channels of the radio.
FM: Activate the Follow-Me Scan. The Follow-Me Scan feature channels assigned Priority Channel (determined via the CH knob) regular scan the other channels.

SAVE
Function: Enable/disable the Battery Saver
Available Values: ON/OFF (Default Setting: ON)

BEEP
Function: Keypad Beeper On/Off
Available Values: ON/OFF (Default Setting: ON)

TOT
Function: Set the Time-Out Timer Time
Available Values: OFF/30/60/90/120/150/180/210/240 (sec)
Default Setting: 60 (sec)
The TOT feature provides a safety switch which limits transmission to a value. This will promote battery conservation by not allowing you to sively long transmissions.

BCLO
Function: Enable/disable the (BCLO) Busy Channel Lock-out feature
Available Values: ON/OFF (Default Setting: OFF)
The BCLO feature prevents the radio's transmitter from being activated strong enough to break through the "Noise" squelch is present. On where stations using different CTCSS or DCS codes may be active, BCL you from disrupting their communications accidentally (because your muted by its own Tone Decoder).

FREQUENCY NUMBER
N° DE FRECUENCIA
NUMÉRO DE FRÉQUENCE
FREQUENZ-NUMMER
FREQUENCY NUMBER

Number	FREQUENCY
1	446.00625 MHz
2	446.01875 MHz
3	446.03125 MHz
4	446.04375 MHz
5	446.05625 MHz
6	446.06875 MHz
7	446.08125 MHz
8	446.09375 MHz

CTCSS TONE NUMBER
NÚMEROS DE SEÑALIZACIÓN CTCSS
NUMÉRO D'IDENTIFICATION DES TONS CTCSS
NUMMER DEC CTCSS-TONS
CTCSS TONE NUMBER

Tone No.	FREQUENCY	Tone No.	FREQUENCY	Tone No.	FREQUENCY	Tone No.	FREQUENCY
01	67.0 Hz	11	97.4 Hz	21	136.5 Hz	31	192.8 Hz
02	71.9 Hz	12	100.0 Hz	22	141.3 Hz	32	203.5 Hz
03	74.4 Hz	13	103.5 Hz	23	146.2 Hz	33	210.7 Hz
04	77.0 Hz	14	107.2 Hz	24	151.4 Hz	34	218.1 Hz
05	79.7 Hz	15	110.9 Hz	25	156.7 Hz	35	225.7 Hz
06	82.5 Hz	16	114.8 Hz	26	162.2 Hz	36	233.6 Hz
07	85.4 Hz	17	118.8 Hz	27	167.9 Hz	37	241.8 Hz
08	88.5 Hz	18	123.0 Hz	28	173.8 Hz	38	250.3 Hz
09	91.5 Hz	19	127.3 Hz	29	179.9 Hz	00	CTCSS
10	94.8 Hz	20	131.8 Hz	30	186.2 Hz		Off

DCS SIGNALLING NUMBER
NÚMEROS DE SEÑALIZACIÓN DCS
NUMÉRO D'IDENTIFICATION DES CODES DCS
DCS-SIGNALNUMMER
DCS SIGNALLING NUMBER

DCS No.	DCS Code	DCS No.	DCS Code	DCS No.	DCS Code	DCS No.	DCS Code	DCS No.	DCS Code	DCS No.	DCS Code
001	023	019	116	037	225	055	325	073	452	091	627
002	025	020	122	038	226	056	331	074	454	092	631
003	026	021	125	039	243	057	332	075	455	093	632
004	031	022	131	040	244	058	343	076	462	094	654
005	032	023	132	041	245	059	346	077	464	095	662
006	036	024	134	042	246	060	351	078	465	096	664
007	043	025	143	043	251	061	356	079	466	097	703
008	047	026	145	044	252	062	364	080	503	098	712
009	051	027	152	045	255	063	365	081	506	099	723
010	053	028	155	046	261	064	371	082	516	100	731
011	054	029	156	047	263	065	411	083	523	101	732
012	065	030	162	048	265	066	421	084	526	102	734
013	071	031	165	049	266	067	413	085	532	103	743
014	072	032	172	050	271	068	423	086	546	104	754
015	073	033	174	051	274	069	431	087	565	000	DCS
016	074	034	205	052	306	070	432	088	606		Off
017	114	035	212	053	311	071	445	089	612		
018	115	036	223	054	315	072	446	090	624		

VERTEX STANDARD CO., LTD.
4-8-8 Nakameguro, Meguro-Ku, Tokyo 153-8644, Japan

VERTEX STANDARD
US Headquarters
10900 Walker Street, Cypress, CA 90630, U.S.A.
International Division
8350 N.W. 52nd Terrace, Suite 201, Miami, FL 33166, U.S.A.

YAESU EUROPE B.V.
P.O. Box 75525, 1118 ZN Schiphol, The Netherlands

YAESU UK LTD.
Unit 12, Sun Valley Business Park, Winnall Close
Winchester, Hampshire, SO23 0LB, U.K.

VERTEX STANDARD HK LTD.
Unit 5, 20/F., Seaview Centre, 139-141 Hoi Bun Road,
Kwun Tong, Kowloon, Hong Kong