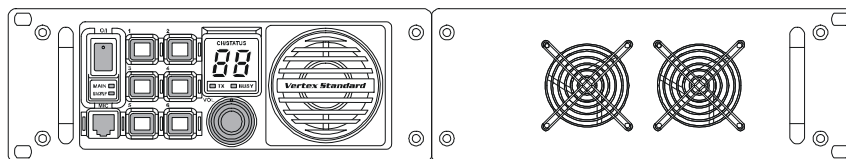


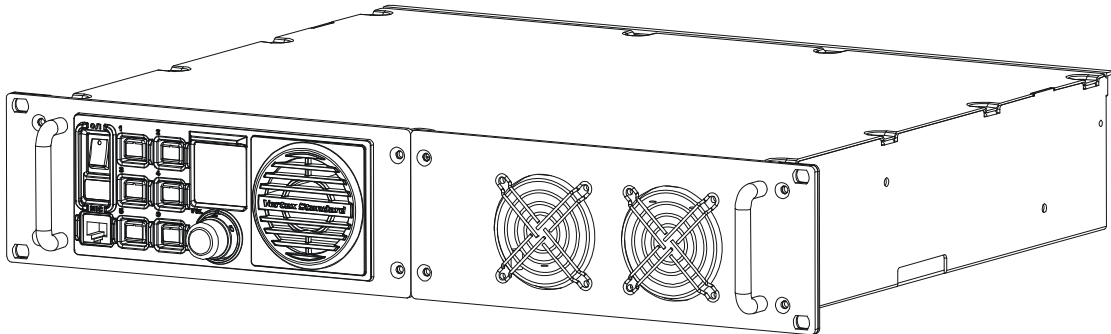


**RACK MOUNT REPEATER**  
**VXR-9000V-H**  
**VXR-9000U-H**  
**OPERATING MANUAL**



**VERTEX STANDARD CO., LTD.**





The **VXR-9000x-H** is commercial-grade 100-watt FM repeater designed to provide reliable two-way full-duplex communications over a wide range of environmental conditions.

Designed to mount in a standard 19-inch rack, the **VXR-9000x-H** is crafted using the latest computer-aided design and manufacturing processes, to ensure a high level of reliability to users. Important channel frequency data is stored in EEPROM, and is easily programmable by a Servicing Technician or Dealer using an IBM compatible personal computer and the **VPL-1** Programming Cable and **CE60** Software.

Please take a few minutes to read this manual carefully. The information presented here will allow you to derive maximum performance from your **VXR-9000x-H**. After reading it, keep this manual handy for quick reference, in case questions arise later on.

**Important Note:** Internal service work, programming, and accessory installations should only be performed by your authorized Vertex Standard Dealer. Dangerous conditions and/or possibly illegal operation may result from improper setup, programming, or internal modifications.

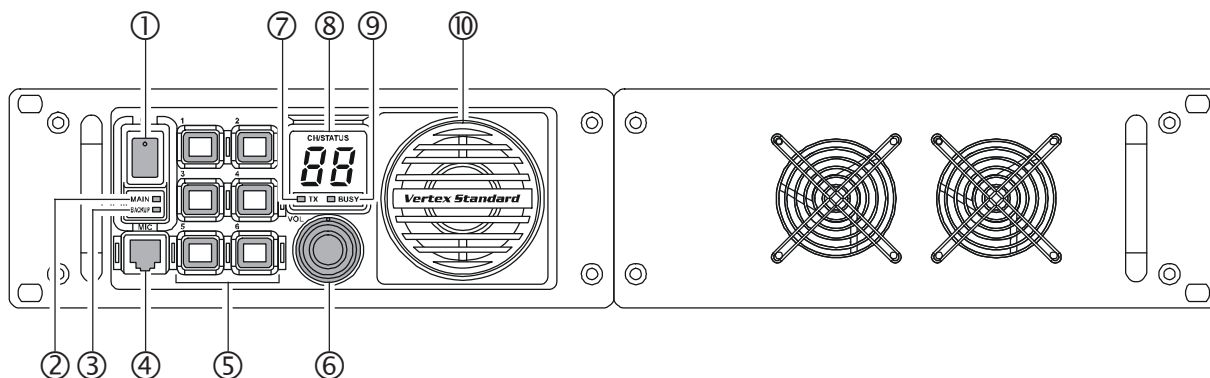
## SAFETY / WARNING INFORMATION

The antenna(s) used for this transmitter must be fixed-mounted on outdoor permanent structures with a separation distance of at least 1.98 m (**VXR-9000V-H**) or 1.62 m (**VXR-9000U-H**) from all persons during normal operation and must not exceed an antenna gain of 0 dBd. This device must be restricted to work related operations in an Occupational/Controlled RF exposure Environment, not exceeding a maximum transmitting duty factor of 50%. The antenna(s) used with this device must satisfy the antenna co-location requirements of 47 C.F.R. 1.1307(b)(3).

## NOTICE!

- Do not modify this repeater for any reason.  
Refer service of this repeater to qualified technicians only.
- When the repeater become abnormal, such as the overheating, smoke smell of burning, etc., turn the main power switch off and disconnect the Main Power Source connector from the rear of the **VXR-9000x-H** immediately. Also disconnect any backup power source you may have connected to the rear of the **VXR-9000x-H**.
- Do not place any combustible material near the repeater.
- Do not spray any liquid over the repeater.
- Ensure that the power and antenna connections are securely made, using cables with excess capacity for the power being utilized.

# FRONT PANEL CONTROLS & CONNECTORS



## ① POWER (O/I) Switch

This is the main power switch for the repeater.

## ② Power Indicator (MAIN)

This LED glows green when the main power source is used.

## ③ Power Indicator (BACKUP)

This LED glows red when the backup power source is used.

## ④ MIC Jack

Connect the microphone plug to this jack. This jack is also used for writing and reading channel frequency or other configurations via the COM Port of the PC on which the clone editor (**CE60**) is running.

## ⑤ Programmable Function (PF) Key

Six pushbuttons on the front panel are programmable function (PF) keys, each with an orange indicator inside. Each key can be programmed with two functions, one for a "long" press and one for a "momentary" press. The PF key functions may be customized, via programming by your VERTEX STANDARD dealer, to meet your communications network requirements. Note that some functions may require the purchase of optional internal accessories.

## ⑥ VOL Knob

This control knob adjusts the output level of the front speaker and external speaker jack on the back panel.

## ⑦ TX Indicator

This LED glows red when the repeater is transmitting.

## ⑧ Numeric Display

This display consists of two 7-segment LEDs, indicating the channel number during normal operation. If an abnormal condition arises, an error code will be displayed:

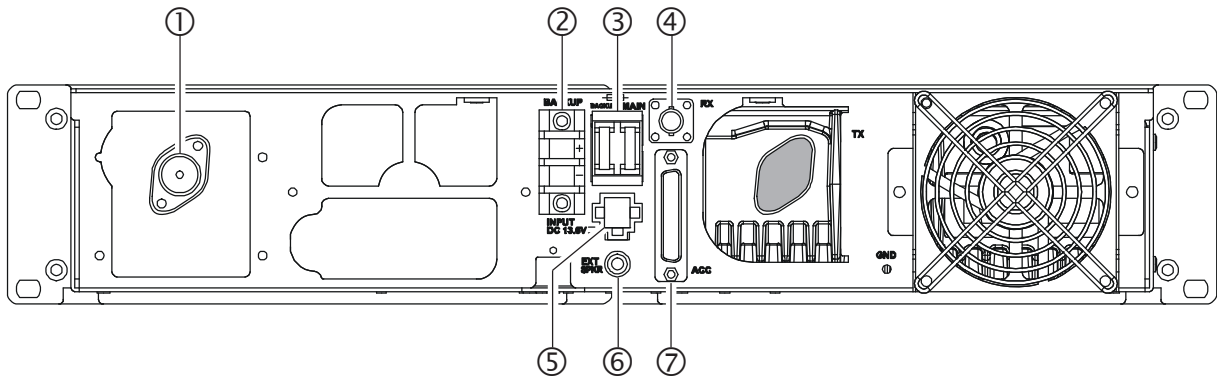
DISPLAY	DESCRIPTION
<b>01 - 32</b>	Channel Number
<b>PC</b>	Clone Active
<b>UL</b>	PLL Unlock
<b>HI</b>	High temperature in PA Unit
<b>SC</b>	Scan Active
<b>LC</b>	Front Panel Keys are Locked
<b>E1</b>	PTT key is Disabled
<b>E2</b>	Cooling Fan is Disabled
<b>E5</b>	Low Voltage in Backup Battery
<b>E7</b>	PA Unit Abnormality
<b>E3, E4, E6, E9</b>	Contact your Dealer

## ⑨ BUSY Indicator

This LED glows green when the receiving channel is busy.

## ⑩ Speaker

The internal speaker is located here.



## ① TX Antenna Jack

This N-type coaxial jack provides the transmitter output signal, for connection to the transmitting antenna, or the "TX" jack on the duplexer. The output impedance requirement is 50 Ohms.

## ② Backup Power Source Terminals

If available, a backup 13.6 Volt power source, such as a rechargeable battery, may be connected here. When the Battery Charge switch (located on the 100W PA Unit) is set to "ON," a "trickle" charge current is present here while the repeater is operating from the "Main Power Source."

## ③ Circuit Protection Fuse

Two 40-Amp blade fuses, for the "Main" and "Backup" power sources, are installed here.

## ④ RX Antenna Jack

This BNC-type coaxial jack accepts the receiver input signal, for connection to the receiving antenna, or the "RX" jack on the duplexer. The input impedance requirement is 50 Ohms.

## ⑤ Main Power Source Connector

The primary DC power source should be connected here. The power requirements are 13.6 V DC at 30 Amps, continuous duty.

## ⑥ External Speaker Jack

This 3.5-mm, 2-pin jack provides variable audio output for an external speaker. The audio output impedance at this jack is 4 to 16 Ohms, and the level varies according to the setting of the front panel's **VOL** knob.

## ⑦ DSUB 25-pin Accessory Connector

This DB-25F connector allows the repeater to be remote-controlled by an external controller. Analog I/O signals, such as TX Audio In, Discriminator Output, RSSI, etc. are available. Moreover, the **VXR-9000x-H** provides eight ports that can be programmed for various input or output signals, or for control functions. Each port may be programmed as to its function, its status (input or output), and its logic (for output ports only).

## Antenna Considerations

Repeater operation requires two antennas, one for receiving and one for transmitting, so that the receiving antenna does not absorb energy from the transmitting antenna. There are a number of ways to do this, depending on the TX/RX frequency separation, and on the locations available for antenna mounting.

Regardless of the above choice, it is of paramount importance that the antenna(s) be mounted as high and in the clear as possible, preferably within line-of-sight to all repeater users. Furthermore, losses in the feedline(s) must be minimized, so the feedline(s) should be high quality, and as short as possible. If a long feedline is necessary, use coaxial "hardline" cable to reduce losses.

Repeater antennas should have an impedance of 50  $\Omega$  at the operating frequency. When separate receive and transmit antennas are used, high-Q narrow-band types may serve to minimize interaction.

**NEVER TRANSMIT WITHOUT HAVING A TRANSMIT ANTENNA CONNECTED TO THE TX ANTENNA JACK OF THE REPEATER.**

## Equipment Location

The **VXR-9000x-H** must be installed in a 19-inch Mounting Rack, which will allow for free air flow around the heat sink of the 100 W PA Unit at all times. In warm climates, the repeater should not be sealed in a small, closed room without air conditioning.

While the operating temperature range of the **VXR-9000x-H** is quite broad, the best location is one in which the air temperature does not approach the extremes of the specified range, and one that does not change rapidly.

Protect the **VXR-9000x-H** (Mounting Rack) from wind and rain, and extremes in temperature or humidity that may shorten the useful life of the equipment. Try to locate the **VXR-9000x-H** (Mounting Rack) in an environment that is also comfortable for service personnel, if possible.

## Power Supply

Operation of the **VXR-9000x-H** requires a power source capable of providing at least 30 Amps continuously at 13.6 Volts DC. Please prepare the regulated power supply which satisfies the above voltage and current specifications.

Use the DC power cable (VXSTD P/N: T9207279) supplied with your repeater for making power connections to the power supply. Connect the RED power cable lead to the POSITIVE (+) power supply terminal, and connect the BLACK power cable lead to the NEGATIVE (-) power supply terminal.

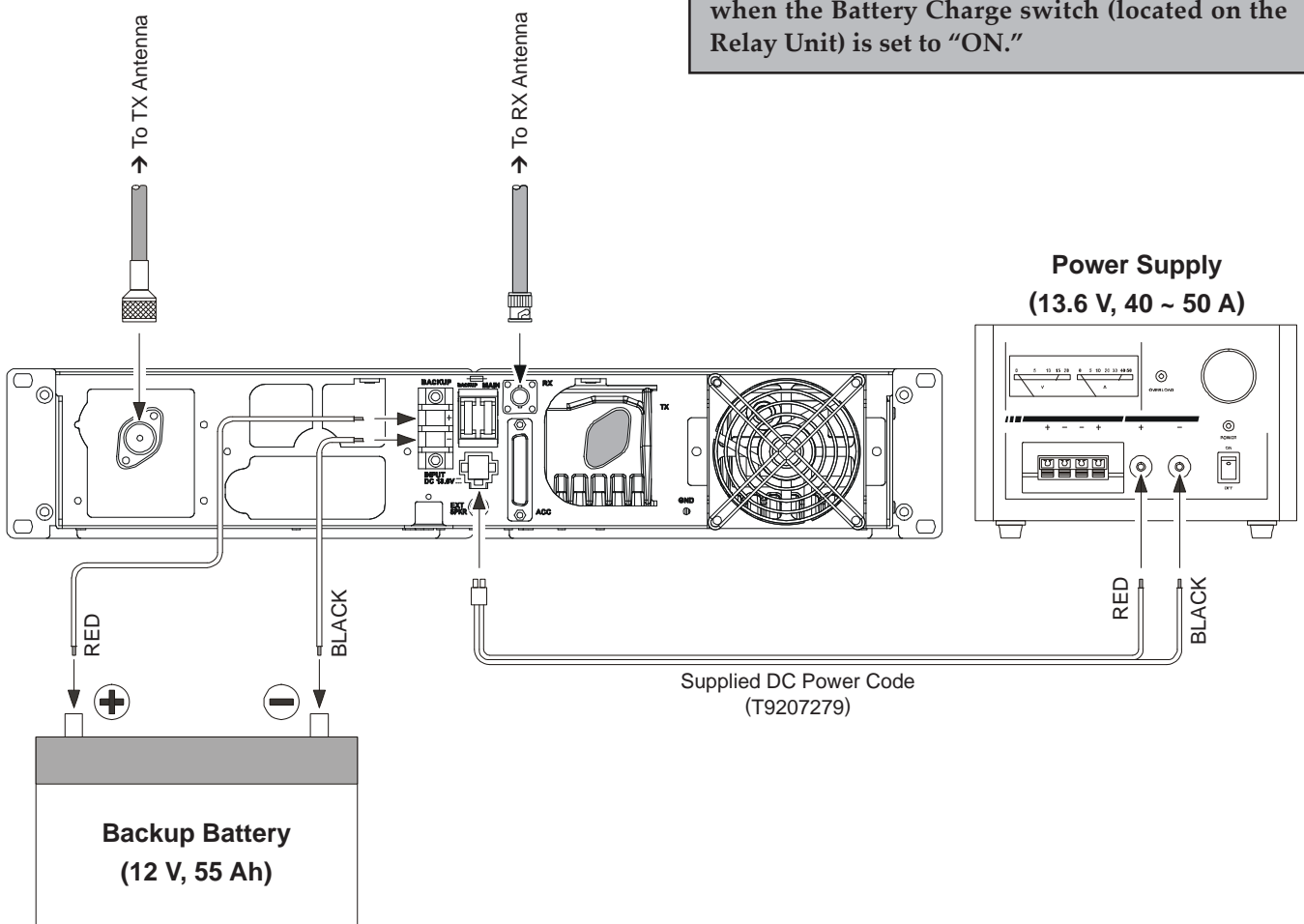
## Backup Power Supply

For uninterrupted operation during power failures, a 12-volt rechargeable type battery (55-Ah or more recommended) may be connected to the **BACKUP** terminal posts on the rear panel. While the repeater is operating from the Main Power Source a slight charging current will maintain battery charge. In the event of an unexpected interruption of the Main Power Source, the automatic power control circuit will automatically switch the repeater to the backup battery, and operation will not be interrupted.

After prolonged operation from the battery, (Backup Power Source), it should be disconnected from the repeater and recharged separately before re-connecting, as the trickle charge is not sufficient for recharging a completely discharged battery.

Never reapply the Main Power Source to the repeater with a discharged battery connected as backup, as the DC startup current can damage the repeater and battery.

Never short the "Backup Power Source" Terminals, when the Battery Charge switch (located on the Relay Unit) is set to "ON."



TYPICALLY SETUP

# *NOTE*

---





## *NOTE*

---

Part 15.21: Changes or modifications to this device not expressly approved by Vertex Standard could void the user's authorization to operate this device.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.



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

Copyright 2011  
VERTEX STANDARD CO., LTD.  
All rights reserved.

No portion of this manual may be  
reproduced without the permission of  
VERTEX STANDARD CO., LTD.



E A E 2 1 N 1 0 0

Printed in Japan