

KENWOOD

NXR-700/ NXR-800

**VHF DIGITAL BASE-REPEATER/ UHF DIGITAL BASE-REPEATER
INSTRUCTION MANUAL**

**BASE-REPETIDOR DIGITAL VHF / BASE-REPETIDOR DIGITAL UHF
MANUAL DE INSTRUCCIONES**

**BASE-RELAIS NUMÉRIQUE VHF/BASE-RELAIS NUMERIQUE UHF
MODE D'EMPLOI**

NXR-700 / NXR-800 INSTRUCTION MANUAL

VHF DIGITAL BASE-REPEATER / UHF DIGITAL BASE-REPEATER

THANK YOU!

We are grateful you purchased this **Kenwood** repeater. We believe this easy-to-program repeater will be highly effective in your communications system, and will keep personnel operating at peak efficiency.

Kenwood incorporates the latest in advanced technology into all of our products. As a result, we feel strongly that you will be pleased with the quality and features of this product.

PRECAUTIONS

- Do not expose the unit to rain or moisture; to prevent fire or electric shock.
- Do not open the unit under any circumstances; to avoid risk of electric shock.
- Do not expose the unit to long periods of direct sunlight, nor place it close to heating appliances.
- Do not place the unit in excessively dusty and/or humid areas, nor on unstable surfaces.
- If you detect an abnormal odor or smoke coming from the unit, disconnect the power from the unit immediately. Contact your **Kenwood** service center or dealer.

NOTICES TO THE USER

FCC WARNING

This equipment generates or uses radio frequency energy. Changes or modifications to this equipment may cause harmful interference unless the modifications are expressly approved in the instruction manual. The user could lose the authority to operate this equipment if an unauthorized change or modification is made.

- ◆ Government law prohibits the operation of unlicensed radio transmitters within the territories under government control.
- ◆ Illegal operation is punishable by fine and/or imprisonment.
- ◆ Refer service to qualified technicians only.

INFORMATION TO THE DIGITAL DEVICE USER REQUIRED BY THE FCC

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can generate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer for technical assistance.



- ◆ This repeater is intended for use as a fixed base station with the antenna located outdoors on the rooftop or on an antenna tower.
- ◆ Use only the supplied DC cord.
- ◆ Do not remove the ferrite core attached to the DC cord. Doing so may cause interference with radio communications.

UNPACKING AND CHECKING EQUIPMENT

Note: The following unpacking information is for use by your **Kenwood** dealer, an authorized **Kenwood** service center, or the factory.

Carefully unpack the repeater. We recommend that you identify the items listed in the following table before discarding the packing material. If any items are missing or have been damaged during shipment, file a claim with the carrier immediately.

Item	Part Number	Quantity
Front glass	B10-2781-XX	1
Dressed screw	N08-0563-XX	1
Bracket	J29-0725-XX	2
Flat head machine screw	N32-4008-XX	4
Handle and screw set	K01-0421-XX	1
DC cord	E30-3344-XX	1
Lead wire with connector (15 pin)	E37-1381-XX	1
Fuse (7.5 A)	F05-7521-XX	1
Instruction Manual	B62-1994-XX	1
Serial number sticker	B42-7325-XX	1

INSTALLATION

To install the handles onto the front panel of the repeater, align the handles with the holes on the front panel, then secure the handles using the supplied screws.

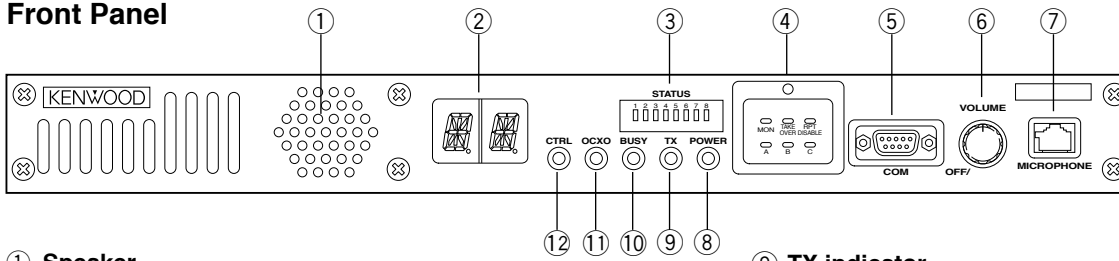
Please consult your dealer for installing the repeater and antenna.

MICROPHONE

Connect an optional KMC-30, KMC-35, or KMC-9C **Kenwood** microphone to the **MICROPHONE** jack on the front panel.

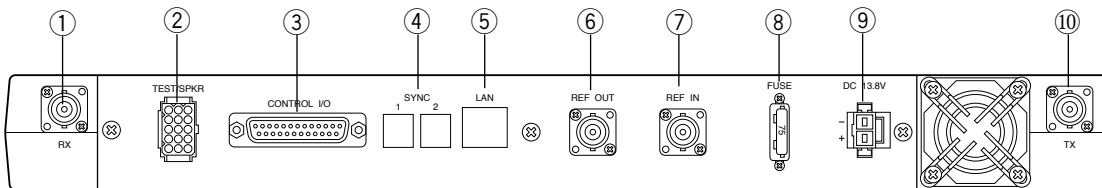
CONTROLS AND FUNCTIONS

■ Front Panel



- ① **Speaker**
- ② **CH/STATUS Display**
Two 17-segment digits display the channel number, name, or status.
- ③ **STATUS indicator**
Indicates the status of the repeater.
- ④ **Programmable Function keys**
Press these keys to activate their programmable functions.
- ⑤ **COM jack**
Connect to PC. Conform to RS-232C standard.
- ⑥ **VOLUME control**
Turn clockwise until a click sounds, to unmute the volume. Rotate to adjust the volume. Turn counterclockwise fully to mute the volume.
- ⑦ **MICROPHONE jack**
Connect a microphone to this 8-pin modular jack.
- ⑧ **POWER indicator**
Lights green when power is supplied to the **DC 13.8V** jack. Blinks when an abnormal voltage is present.
- ⑨ **TX indicator**
Lights red while transmitting.
- ⑩ **BUSY indicator**
Lights green while a signal is being received.
- ⑪ **OCXO indicator**
The OCXO indicator shows the state of the reference 10 MHz oscillator :
Lights Green when using a reference signal from an optional OCXO unit.
Lights Orange when using a reference signal from another repeater.
Lights red when no reference signal is available or when an error occurs.
Does not light when the reference signal is an internal VCXO signal.
- ⑫ **CTRL indicator**
The CTRL indicator shows the RCCH status while using Digital trunking :
Lights Green when the repeater is used as RCCH.
Blinks Green when using a non-dedicated channel, and RCCH is used as RDCH.
Does not light when using RDCH.

■ Rear Panel



- ① **RX IN jack**
Connect an RX antenna or a duplexer to this BNC receptacle.
- ② **TEST/SPKR jack**
Test input/output jack. Connect an external speaker to this jack.
- ③ **CONTROL I/O jack**
Connect a repeater controller to this DB-25 interface.
- ④ **SYNC 1/2 jack**
Connect to other repeater to use synchronous frame signal.
- ⑤ **LAN jack**
Connect to Ethernet.
- ⑥ **REF OUT jack**
Connect to another repeater within the site to supply a reference signal.
- ⑦ **REF IN jack**
Connect from another repeater within the site to receive a reference signal.
- ⑧ **FUSE**
Insert 7.5 A blade fuses into these fuse holders.
- ⑨ **DC 13.8V jack**
Connect a 13.8 V DC power supply to this jack.
- ⑩ **TX OUT jack**
Connect a TX antenna or a duplexer to this receptacle.

REPEATER OPERATION

Note:Please consult your dealer for programming the repeater. When operating the repeater using an optional OCXO unit, allow the unit to warm up for 24 hours after turning the power on.

When power is applied to the unit, the **POWER** indicator lights green. Turn the **VOLUME** control clockwise until a click sounds, to unmute the volume. Rotate to adjust the volume. Turn the **VOLUME** control counterclockwise fully to mute the volume. The **BUSY** indicator lights green while receiving a signal and the **TX** indicator lights red while transmitting.

TRANSCEIVER OPERATION

■ Receive

Adjust the volume to your desired level. You may need to

readjust the volume when you receive a message from your dispatcher or another member in your fleet.

- The **BUSY** indicator lights green while a signal is being received.

■ Transmit

- 1 Listen to the channel before transmitting, to make sure it is not being used.
- 2 Press the microphone **PTT** switch, then speak in your normal speaking voice.
 - The **TX** indicator lights red while transmitting.
- 3 When you finish speaking, release the **PTT** switch.

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TERMINAL

MIC(Modular Jack)

Pin Number	Pin Name	Description	Specification	I/O	notes
1	NC				
2	SB	Power Output	13.8V		
3	GND	GND	GND		
4	PTT	PTT Signal	Input Impeadance 100k Ω	I	
5	MICG	MIC GND	MIC GND		
6	MIC	MIC Input	600 Ω	I	
7	HOOK	Hook Detection	Input Impeadance 100k Ω	I	
8	NC				

COM (D-SUB 9Pin) CONNECTOR

Pin Number	Pin Name	Description	Specification	I/O	notes
1	CD	Carrier Detect	Conform to RS-232C standard	I	
2	RD	Receive Data	Conform to RS-232C standard	I	
3	SD	Send Data	Conform to RS-232C standard	O	
4	DTR	Data Terminal Ready	Conform to RS-232C standard	O	
5	SG	GND	GND		
6	DSR	Data Set Ready	Conform to RS-232C standard	I	
7	RTS	Request to Send	Conform to RS-232C standard	O	
8	CTS	Clear to Send	Conform to RS-232C standard	I	
9	CI	Ringer DET	Conform to RS-232C standard	I	

TEST/SPEAKER CONNECTOR

Pin Number	Pin Name	Description	Specification	I/O	notes
1	SB	Power Output	13.8V		
2	SB	Power Output	13.8V		
3	NC				
4	GND	GND	GND		
5	GND	GND	GND		
6	SPG	Speaker GND	Speaker GND		
7	RD	RX Audio Output	Load impedance 4.7k Ω	O	not De-emphasis
8	RSSI	RSSI Signal Output	Output Level 0 to 5V	O	
9	SPI	Internal Speaker Input	Short with "SPO"	I	
10	AO1	Open Collector Terminal	Allowable current value MAX 200mA	O	
11	AO2	Open Collector Terminal	Allowable current value MAX 200mA	O	
12	SPO	External Speaker Output	Output Level 3W (5% Distortion)	O	
13	AO3	Open Collector Terminal	Allowable current value MAX 200mA	O	
14	AO4	Open Collector Terminal	Allowable current value MAX 200mA	O	
15	AO5	Open Collector Terminal	Allowable current value MAX 200mA	O	

Control I/O (D-SUB 25Pin) CONNECTOR

Pin Number	Pin Name	Description	Specification	I/O	notes
1	NC				
2	NC				
3	NC				
4	AI1	Programmable Function Input 1	Input Impeadance 47k Ω	I	
5	AI2	Programmable Function Input 2	Input Impeadance 47k Ω	I	
6	AI3	Programmable Function Input 3	Input Impeadance 47k Ω	I	
7	DG	Digital GND			
8	TD	TX Audio Input	Input Impeadance 600 Ω	I	not Pre-emphasis
9	TA	TX Audio Input	Input Impeadance 600 Ω	I	Pre-emphasis
10	RD	RX Audio Output	Load impedance 4.7k Ω	O	not De-emphasis
11	RA	RX Audio Output	Load impedance 4.7k Ω	O	De-emphasis
12	RXG	RX Signal GND			
13	SPM	Speaker Mute	Input Impeadance 47k Ω	I	
14	BER CLK	For Bit Error Rate Clock	CMOS	O	
15	EMON	External Monitor Switch	Input Impeadance 47k Ω	I	
16	EPTT	External PTT Switch	Input Impeadance 47k Ω	I	
17	SC	Squelch Control	Output Level 0 or 3.3V	O	
18	BER DAT	For Bit Error Rate Data	CMOS	O	
19	TXG	TX Signal GND			
20	IO1	Programmable Function I/O 1	Input Impeadance 47k Ω	I/O	Output Level 0 to 5V
21	IO2	Programmable Function I/O 2	Input Impeadance 47k Ω	I/O	Output Level 0 to 5V
22	IO3	Programmable Function I/O 3	Input Impeadance 47k Ω	I/O	Output Level 0 to 5V
23	IO4	Programmable Function I/O 4	Input Impeadance 47k Ω	I/O	Output Level 0 to 5V
24	IO5	Programmable Function I/O 5	Input Impeadance 47k Ω	I/O	Output Level 0 to 5V
25	IO6	Programmable Function I/O 6	Input Impeadance 47k Ω	I/O	Output Level 0 to 5V

LAN(Modular Jack)

Pin Number	Pin Name	Description	Specification	I/O	notes
1	TD+	TX Signal+	Conform to IEEE802.3 standard	O	100Mbps
2	TD-	TX Signal-	Conform to IEEE802.3 standard	O	100Mbps
3	RD+	RX Signal+	Use Designated Transformer	I	100Mbps
4	NC				
5	NC				
6	RD-	RX Signal-	Use Designated Transformer	I	100Mbps
7	NC				
8	NC				

SYNC1, 2 Connector (There are two connectors)

Pin Number	Pin Name	Description	Specification	I/O	notes
1	FRMA	RS-458 Differential Signal A	Conform to RS485	I/O	
2	NC				
3	NC				
4	FRMB	RS-458 Differential Signal B	Conform to RS485	I/O	

RX ANT Impedance 50 Ω

TX ANT Impedance 50 Ω

REF IN External Reference Signal Input(10MHz). Impedance : more than 1kohm
REF OUT Reference Signal Distribution(10MHz). Load impedance more than 20ohm.

MANDATORY SAFETY INSTRUCTIONS TO INSTALLERS AND USERS


- Use only manufacturer or dealer supplied antenna.
- **Antenna Minimum Safe Distance: 60 cm (2 feet), 50% duty Cycle.**
- Antenna Gain: **0** dBd referenced to a dipole.

The Federal Communications Commission has adopted a safety standard for human exposure to RF (Radio Frequency) energy which is below the OSHA (Occupational Safety and Health Act) limits.

- **Antenna Mounting:** The antenna supplied by the manufacturer or radio dealer must not be mounted at a location such that during radio transmission, any person or persons can come closer than the above indicated minimum safe distance to the antenna, i.e. **60 cm (2 feet) , 50% duty Cycle.**
- To comply with current FCC RF Exposure limits, the antenna must be installed at or exceeding the minimum safe distance shown above, and in accordance with the requirements of the antenna manufacturer or supplier.
- Vehicle installation: The antenna can be mounted at the center of a vehicle metal roof or trunk lid, if the minimum safe distance is observed.
- Base Station Installation: The antenna should be fixed-mounted on an outdoor permanent structure. RF Exposure compliance must be addressed at the time of installation.

Antenna substitution: Do not substitute any antenna for the one supplied or recommended by the manufacturer or radio dealer.

You may be exposing person or persons to excess radio frequency radiation. You may contact your radio dealer or the manufacturer for further instructions.

**WARNING**

Maintain a separation distance from the antenna to person(s) of at least **60 cm (2 feet) , 50% duty Cycle.**

You, as the qualified end-user of this radio device must control the exposure conditions of bystanders to ensure the minimum separation distance (above) is maintained between the antenna and nearby persons for satisfying RF Exposure compliance. The operation of this transmitter must satisfy the requirements of Occupational/Controlled Exposure Environment, for work-related use, transmit only when person(s) are at least the minimum distance from the properly installed, externally mounted antenna. Transmit only when people outside the vehicle are at least the recommended minimum lateral distance away from the antenna/vehicle