KENWOOD

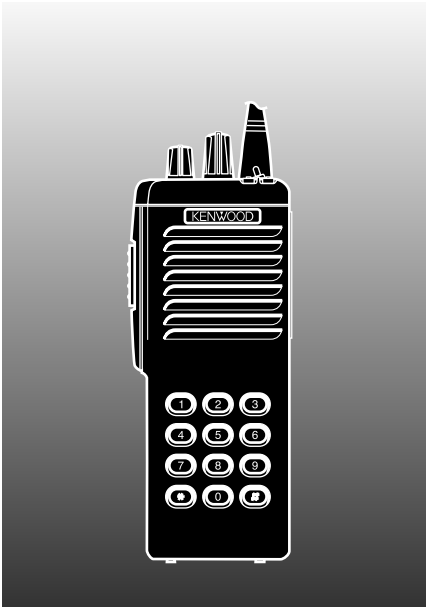
INSTRUCTION MANUAL

VHF FM TRANSCEIVER

TK-290

UHF FM TRANSCEIVER

TK-390



KENWOOD CORPORATION

09 08 07 06 05 04 03

THANK YOU!

We are grateful you chose **KENWOOD** for your land mobile radio applications. We believe this easy-to-use transceiver will provide dependable communications to keep personnel operating at peak efficiency.

KENWOOD transceivers incorporate the latest in advanced technology. As a result, we feel strongly that you will be pleased with the quality and features of this product.

MODELS COVERED BY THIS MANUAL

TK-290: VHF FM Transceiver

TK-390: UHF FM Transceiver

NOTICES TO THE USER

WARNING:

- *GOVERNMENT LAW PROHIBITS THE OPERATION OF UNLICENSED RADIO TRANSMITTERS WITHIN THE TERRITORIES UNDER GOVERNMENT CONTROL.*
- *ILLEGAL OPERATION IS PUNISHABLE BY FINE OR IMPRISONMENT OR BOTH.*
- *REFER SERVICE TO QUALIFIED TECHNICIANS ONLY.*
- *DO NOT OPERATE YOUR TRANSCEIVER IN EXPLOSIVE ATMOSPHERES (GASES, DUST, FUMES, ETC.).*
- *TURN OFF YOUR TRANSCEIVER WHILE TAKING ON FUEL, OR WHILE PARKED IN GASOLINE SERVICE STATIONS.*

SAFETY: It is important that the operator is aware of, and understands, hazards common to the operation of any transceiver.

ATTENTION (U.S.A. Only):

The RBRC Recycle seal found on **KENWOOD** *nickel-cadmium (Ni-Cd) battery packs indicates* **KENWOOD***'s voluntary participation in an industry program to collect and recycle Ni-Cd batteries after their operating life has expired. The RBRC program is an alternative to disposing Ni-Cd batteries with your regular refuse or in municipal waste streams, which is illegal in some areas.*

For information on Ni-Cd battery recycling in your area, call (toll free) 1-800-8-BATTERY (1-800-822-8837).

KENWOOD*'s involvement in this program is part of our commitment to preserve our environment and conserve our natural resources.*

One or more of the following statements may be applicable:

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.

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.*

CONTENTS

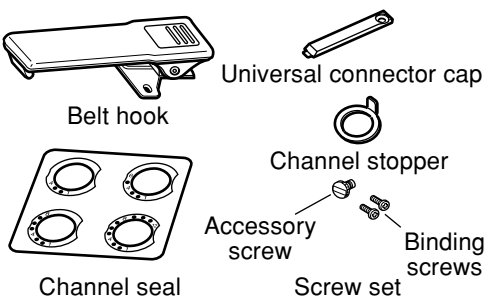
UNPACKING AND CHECKING EQUIPMENT

Note: *The following unpacking instructions are for use by your* ***KENWOOD*** *dealer, an authorized* ***KENWOOD*** *service facility, or the factory.*

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

■ Supplied Accessories

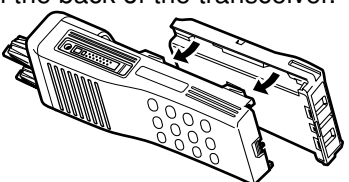
Item	Part Number	Quantity
Belt hook	J29-0651-XX	1
Universal connector cap	B09-0363-XX	1
Channel seal	B03-0594-XX	1
Channel stopper	D32-0421-XX	1
Screw set	N99-2004-XX	1
Warranty card	—	1
Instruction manual	B62-0816-XX	1



INSTALLING THE NiCd BATTERY PACK (OPTIONAL)

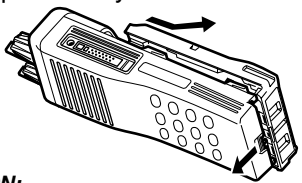
The battery pack is not charged at the factory. Charge the pack before use. Repeat the charge/discharge cycles two or three times after purchase or extended storage (greater than 2 months) to bring the battery pack to its normal operating capacity.

1 Match the four grooves of the battery pack with the corresponding guides on the back of the transceiver.



2 Slide the battery pack along the back of the transceiver until the release latch on the base of the transceiver locks.

3 To remove the battery pack, push down on the release latch and slide the pack away from the transceiver.



CAUTION:

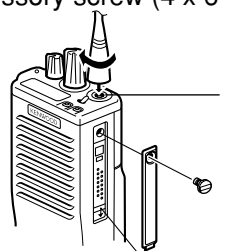
- *DO NOT RECHARGE THE BATTERY PACK IF IT IS ALREADY FULLY CHARGED. DOING THIS WILL OVERCHARGE THE BATTERY PACK WHICH MAY SHORTEN ITS LIFE OR DAMAGE IT.*
- *AFTER RECHARGING THE BATTERY PACK, DISCONNECT IT FROM THE CHARGER. IF, HAVING RECHARGED THE BATTERY, THE POWER TO THE CHARGER IS TURNED OFF AND THEN BACK ON WHILE THE PACK IS STILL CONNECTED, RECHARGING WILL START AGAIN AND THE BATTERY WILL BECOME OVERCHARGED.*
- *DO NOT SHORT THE BATTERY PACK TERMINALS OR DISPOSE OF THE BATTERY BY FIRE. NEVER ATTEMPT TO REMOVE THE CASE FROM THE BATTERY PACK.*

INSTALLING THE ANTENNA (OPTIONAL)

Screw the antenna into the connector on the top of the transceiver by holding the antenna at its base and turning it clockwise until secure.

INSTALLING THE CAP OVER THE UNIVERSAL CONNECTOR

When a speaker/microphone is not being used, install the cap over the universal connector using the supplied accessory screw (4 x 6 mm).



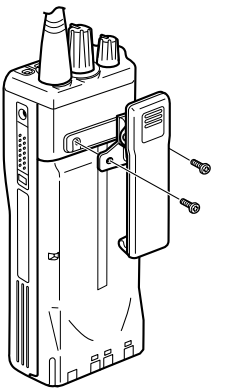
The antenna connector of the transceiver is an SMA male type connector.

Note: *To keep the transceiver water resistant, you must cover the universal connector with the cap or the speaker/microphone connector.*

INSTALLING THE BELT HOOK

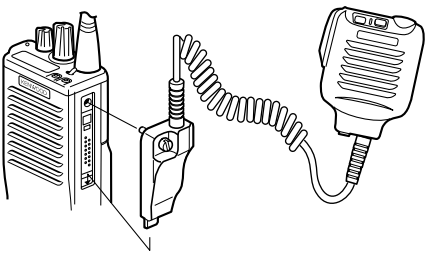
If necessary, attach the belt hook using the two binding screws (3 x 6 mm) which are supplied in the screw set.

Note: *If the belt hook is not installed, its mounting location may get hot during continuous transmission or when left sitting in a hot environment.*



INSTALLING THE SPEAKER/ MICROPHONE (OPTIONAL)

1 Insert the guide of the speaker/ microphone connector into the groove on the transceiver universal connector.

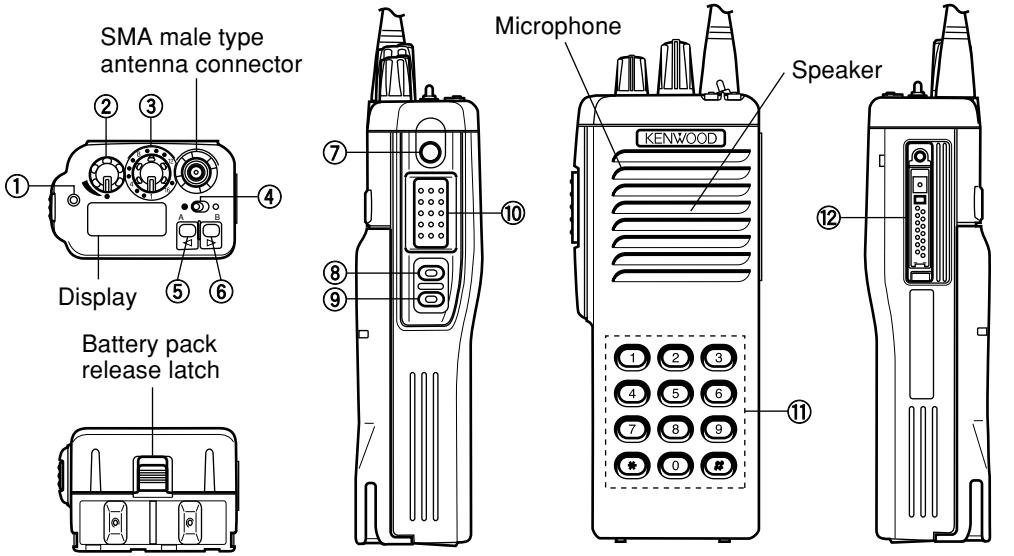


A speaker/microphone with an antenna connector is also available.

2 Secure the connector in place using the attached screw.

Note: *The speaker/microphone PF keys can be programmed with the functions listed in the table on page 8.*

GETTING ACQUAINTED



■ Key Descriptions

① **TX/Busy/Battery low indicator**
Lights red while transmitting.
Lights green while receiving.
Flashes red when the battery power is low while transmitting; replace or recharge the battery.

Note: *This indicator can be disabled by your dealer {page 16}.*

② **Power switch/Volume control**
Turn clockwise to switch ON the transceiver. Turn counterclockwise, until a click sounds, to switch OFF the transceiver. Rotate to adjust the volume level.

③ **Selector**
Rotate this control to activate its programmable function {page 8}.

④ **Toggle switch**
Switch the toggle position to activate its programmable function {page 8}.

⑤ **Top 1**
⑥ **Top 2**
⑦ **Orange**
⑧ **Side 1**
⑨ **Side 2**

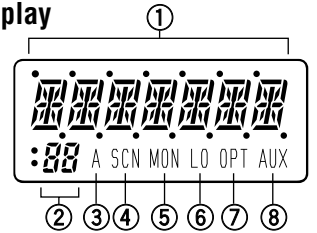
Press these PF (programmable function) keys to activate their programmable functions {page 8}.

⑩ **PTT (Push-To-Talk) switch**
Press this switch, then speak into the microphone to call a station.

⑪ **DTMF keypad (keypad models only)**
Press the keys on the telephone keypad to send DTMF tones.

⑫ **Universal connector**
Connect the external speaker/microphone (optional) here. Otherwise, keep the supplied cover in place.

■ Display



① **Alphanumeric display**
Displays the operating group or channel number, or the group or channel name. When making a DTMF or 2 Tone call, the display will alternate between CALL and the channel. Also displays various menu functions.

② **7 Segment display**
Displays the operating group or channel number. Also displays tA (Talk Around), P1 (Priority1), P2 (Priority2), PP (Priority1 and Priority2), or HC (Home Channel); depending on the function being used.

③ **A (Add) indicator**
Appears when a channel is added to the scanning sequence.

④ **SCN (Scan) indicator**
Appears when Scan mode is active.

⑤ **MON (Monitor) indicator**
Appears when the monitor function is active.

⑥ **LO (Low) indicator**
Appears when low power is selected.

⑦ **OPT indicator**
Appears when Operator Selectable Tone is enabled.

⑧ **AUX (Auxiliary) indicator**
Appears when Aux is ON. Appears and blinks when the optional scrambler board is enabled.

Note: *The alphanumeric and 7 segment displays can be inverted if a PF key or the toggle switch is programmed with* ***Invert Display*** *{page 8}.*

PROGRAMMABLE FUNCTIONS

Function Name	Selector (③)	Toggle Switch (④)	PF Keys (⑤, ⑥, ⑦, ⑧, ⑨)	Speaker/ Microphone PF Keys
Aux [1]		✓	✓	✓
Channel Down			✓	✓
Channel Name			✓	✓
Channel Select	✓			
Channel Up			✓	✓
Delete/Add			✓	✓
Emergency Call [2]			✓	✓
Group Down			✓	✓
Group Scan		✓		
Group Select	✓	✓		
Group Up			✓	✓
Home Channel			✓	✓
Invert Display		✓	✓	✓
Key Lock		✓	✓	✓
Lamp			✓	✓
Low Power		✓	✓	✓
Monitor		✓	✓	✓
Monitor Momentary			✓	✓

Function Name	Selector (③)	Toggle Switch (④)	PF Keys (⑤, ⑥, ⑦, ⑧, ⑨)	Speaker/ Microphone PF Keys
No Function		✓	✓	✓
Operator Selectable Tone			✓	✓
Operator Selectable Priority1			✓	
Operator Selectable Priority2			✓	
Scan		✓	✓	✓
Scrambler [3]		✓	✓	✓
Shift		✓	✓	
SP Attenuation				✓
Squelch Level			✓	✓
Squelch OFF		✓	✓	✓
Squelch Momentary			✓	✓
Talk Around		✓	✓	✓

[1] This function can be selected when the scrambler board has not been installed.
[2] This function can be selected when the ANI board has been installed.
[3] This function can be selected when the scrambler board has been installed.

Please contact your dealer for details on these functions.

Note:

- *To program 2 functions onto each PF key and the toggle switch, "Shift" must first be programmed.*
- *Programming the same function onto both a PF key and the toggle switch will cause an error to occur on the PF key.*

BASIC OPERATIONS

■ Switching Power ON/OFF

To switch ON the transceiver, turn the **Power** switch/**Volume** control clockwise until it clicks.

To switch OFF the transceiver, turn the **Power** switch/**Volume** control counterclockwise until it clicks.

If the Radio Password function is programmed {page 16}, LOCKED will appear on the display when the power is turned ON. To unlock the transceiver, enter the password, then press the **#** key. If the wrong password is entered, an error tone will sound, and the transceiver will remain locked. The password can be a maximum of 6 digits. (This function is available on keypad models only.)

■ Adjusting the Volume

Turn the **Power** switch/**Volume** control to adjust the volume. Clockwise increases the volume, and counterclockwise decreases it.

■ Selecting a Group

Turn the **Selector**, press the **Group Up** and **Group Down** keys, or use the toggle switch to select a group.

- Use the **Selector**, PF keys, or toggle switch, depending on which one is programmed with the group functions.

■ Selecting a Channel

Turn the **Selector** or press the **Channel Up** and **Channel Down** keys to select a channel.

- Use the **Selector** or PF keys, depending on which one is programmed with the channel functions.

■ Adjusting the Squelch

1. Press the key programmed as **Squelch Level**.
2. Press the keys programmed as **Group Up** and **Group Down** or **Channel Up** and **Channel Down** to adjust the squelch level.

■ Making a Call

1. Select the desired group and channel {page 10}.
2. Use the key or switch programmed as **Monitor** to check whether or not the channel is free.
   - If the channel is busy, wait until it becomes free.
3. Press and hold the **PTT** switch, then speak into the microphone in your normal voice.
   - For best results, hold the transceiver approximately 3 to 4 cm (1 1/2 inches) from your lips.
4. Release the **PTT** switch to receive.

KEY LOCK

Use the key or switch programmed as **Key Lock** to activate the Key Lock function. When activated, only the **PTT** and toggle switch, the **Selector**, and the keys programmed as **Emergency Call**, **Monitor**, **Monitor Momentary**, **SP Attenuation, Squelch OFF**, **Squelch Momentary**, and **Lamp** can be used.

TIME-OUT TIMER (TOT)

The TOT is used to automatically inhibit transmission after a specified time elapses. If the **PTT** switch is held down for longer than the programmed time, the transceiver will stop transmitting and a warning tone will sound. To stop the warning tone, release the **PTT** switch.

Note: *TOT settings can be programmed by your dealer {page 16}.*

SCANNING

Note: *The Scan function can be used with a minimum of two channels.*

Scan is used to monitor signals on the transceiver channels. When scanning, the transceiver checks each channel for a signal, and stops on a channel if one is present.

Use the key or switch programmed as **Scan**.

- "SCAN" or the revert group/channel number (depending on which one is programmed by your dealer), and the SCN icon will appear on the display.
- A confirmation tone will sound.

To quit scanning, use the **Scan** key or switch again.

- Two confirmation tones will sound.

■ Priority Scan

For Priority Scan to function, the Priority1 or Priority2 channel must be programmed.

- If only one of the priority channels are programmed, the transceiver will automatically change to that priority channel when a signal is received on it. This change occurs even if a signal is being received on another channel.
- If both priority channels are programmed, Priority1 is the high priority and Priority2 is the low priority. If a signal is being received on the Priority1 channel, the transceiver will change to that channel, even if a signal is being received on the Priority2 channel.

DTMF CALLING

Note: *This function can only be used by transceivers with DTMF keypads.*

■ Manual Dialing

To dial a number manually:

1 Press and hold the **PTT** switch.

- If Keypad Auto PTT is enabled {page 16}, you do not need to press the **PTT** switch.

2 Press the desired DTMF keys.

■ Redialing

A maximum of 16 digits can be redialed. The last number dialed, either manually or automatically, will be redialed.

To redial a number:

1 Press the ∗ key.
- An “A” will appear on the display.

2 Press the **0** key.
- The transceiver will redial the last number, and the digits will appear on the display.

Note: *If the transceiver power is switched OFF, the redial memory will be erased.*

■ Auto Dialing

Note: *Auto dialing is either enabled or disabled by your dealer {page 16}.*

Store:

To store a number in memory:

1 Press the **#** key.
- A “D” will appear on the display.

2 Press the desired DTMF keys to enter a maximum of 16 digits.
- Press and hold the **PTT** switch, then press **2**, **5**, **8**, **0**, ∗ , or **#** to enter A, B, C, D, ∗ , or # (consecutively).

3 Press the **#** key.

4 Select the desired memory channel by pressing a DTMF key (**1** ~ **9**).
- The entered number will be stored in the memory channel selected.

Confirm:

To confirm a stored number:

1 Press the **#** key.
- A “D” will appear on the display.

2 Press the ∗ key.
- “D-” will appear on the display.

3 Press the memory channel key (**1** ~ **9**) with the stored number you want to confirm.
- The stored digits will appear on the display, and the DTMF tones will sound.

Send:

To send a stored number:

1 Press the ∗ key.
- An “A” will appear on the display.

2 Press the memory channel key (**1** ~ **9**) with the stored number you want to send.
- The transceiver will begin the transmission, and the digits will appear on the display.

Clear:

To erase a stored number from memory:

1 Press the **#** key.
- A “D” will appear on the display.

2 Press the **#** key again.
- “D-CLR” will appear on the display.

3 Press the memory channel key (**1** ~ **9**) with the stored number you want to erase.

DEALER PROGRAMMABLE OPTIONS

The following list of functions can be enabled or disabled by your dealer:

CHANNEL
Group Name
Receive Frequency
Transmit Frequency
QT/DQT Decode
QT/DQT Encode
Channel Name
Option Signaling
TX Power
Wide/Narrow
Scan Delete/Add
PTT ID
Busy Channel Lockout (BCL)
Beat Shift
Voice Scrambler

Priority1 Channel
Priority2 Channel
Home Channel
Emergency Channel
EDIT
Scan Information
Priority1
Priority2
Look Back Time A
Look Back Time B
Revert Channel
Dropout Delay Time
Dwell Time
Group Scan

Priority Channel Quick Scan
Priority1 Temp. D/A
Priority2 Temp. D/A
Temp. D/A Key Hold Time
Revert Channel Display
Optional Features
Channel Text Size
Group Text Size
Power ON Tone
Control Tone
Warning Tone
Alert Tone
Minimum Volume
Squelch Level
BCL Override
Selective Call Alert LED
Radio Password
Data Password

Battery Warning
Busy LED
TX LED
7 Segment LCD Display
Invert Display
Emergency Channel Display
Clear to Transpond
External Speaker
Noise Cancel Mic
Mode: Self Programming/Panel Test/ Clone/Main Programming
ID: ID Format/Speed/PTT ID/Dial ID/ Connect ID/Disconnect ID
Operator Selectable Tone: OST Back Up/ Direct OST/OST Name
Group Features
Time-out Timer (TOT)
TOT Pre-Alert

TOT Rekey Time
TOT Reset Time
Group Delete/Add
Battery Save
Signaling
2-Tone (1, 2, and 3)
Decoder Call Format (1 and 2)
Decoder Call Type (1 and 2)
Tones (A, B, and C)
Alert Tone/Transpond
Auto Reset
DTMF
DTMF Speed (Encode)
First Digit Time (Encode)
First Digit Delay (Encode)

* and # Tone (Encode)
DTMF Side Tone (Encode)
DTMF Hold Time (Encode)
Keypad Auto PTT (Encode)
Manual Dial (Encode)
Auto Dial (Encode)
Auto Dial Programming (Encode)
Auto Dial Memory (Encode)
Alert Tone/Transpond (Decode)
Primary Code (Decode)
Secondary Code (Decode)
Auto Reset (Decode)
Dead Beat Disable (Decode)
Embedded Message (64 characters maximum)

Please contact your dealer for details on these functions.

AUDIBLE USER FEEDBACK TONES

The transceiver outputs various tones to indicate the transceiver operating status.

- Power ON Tone
- Key Operation Tone
- End of Operation Tone
- Operation Error Tone
- Sequence Error Tone
- Transmission Inhibit Tone
- Time-out Timer Warning Tone
- Selective Call Alert Tone
- Call Alert (Transpond)
- Dead Beat Disable Tone
- Password Agreement Tone

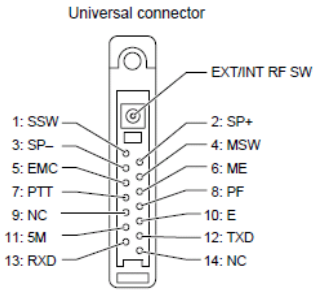
Please contact your dealer for details on these functions.

Terminal Descriptions

Universal connector

NO.	Name	Description
1	SSW	EXT/INT SP switch input
2	SP+	BTL output + for external speaker
3	SP-	BTL output - for external speaker
4	MSW	EXT/INT MIC switch input
5	EMC	External microphone input
6	ME	External microphone earth
7	PTT	PTT input
8	PF	Programmable function key input
9	NC	Non connect
10	EMC	Earth
11	5M	5V output
12	TXD	Serial data output
13	RXD	Serial data input
14	NX	Non connect
15	EXT OUT	External RF output
		This terminal has a built in EXIT/INT
		Non connect: INT ANT connect:EXT

- **Universal connector**



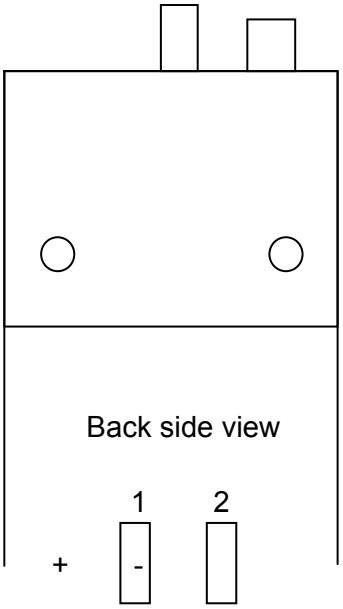
Antenna Terminal

50 Ω impedance

Battery Terminal

The battery terminal uses a spring plate.
The negative terminal connects to the chassis ground.
The battery is mounted on the rear and upper side of the transceiver using a sliding mounting method.

1	+
2	-



RADIO FREQUENCY ENERGY SAFETY INFORMATION

This **KENWOOD** transceiver has been tested and complies with the standards listed below, in regards to Radio Frequency (RF) energy and electromagnetic energy (EME) generated by the transceiver.

- FCC RF exposure limits for *Occupational Use Only*. RF Exposure limits adopted by the FCC are generally based on recommendations from the National Council on Radiation Protection and Measurements, & the American National Standards Institute.
- FCC OET Bulletin 65 Edition 97-01 Supplement C
- American National Standards Institute (C95.1 – 1992)
- American National Standards Institute (C95.3 – 1992)

WARNING

This **KENWOOD** transceiver generates RF EME while transmitting. RF EME (Radio Frequency Electric & Magnetic Energy) has the potential to cause slight thermal, or heating effects to any part of your body less than the recommended distance from this radio transmitter's antenna. RF energy exposure is determined primarily by the distance to and the power of the transmitting device. In general, RF exposure is minimized when the lowest possible power is used or transmission time is kept to the minimum required for consistent communications, and the greatest distance possible from the antenna to the body is maintained. The transceiver has been designed for and is classified for *Occupational Use Only*. Occupational/ controlled exposure limits are applicable to situations in which persons are exposed to RF energy as a consequence of their employment, and such persons have been made aware of the potential for exposure and can exercise control over their exposure. This means you can use the transceiver only if you are aware of the potential hazards of operating a transceiver and are familiar in ways to minimize these hazards. This transceiver is not intended for use by the general public in uncontrolled environments. Uncontrolled environment exposure limits are applicable to situations in which the general public may be exposed to RF energy, or in which the persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

The following list provides you with the information required to ensure that you are aware of RF exposure and of how to operate this transceiver so that the FCC RF exposure limitations are not exceeded.

- While transmitting (holding the **PTT** switch or speaking with **VOX** enabled), always keep the antenna and the radio at least 3 cm (1 3/16 inches) from your body or face, as well as from any bystanders. A LED on the top of the radio shows red when the transmitter is operating in both **PTT** and **VOX** modes.
- Do not transmit for more than 50% of the total transceiver use time; transmitting over 50% of the total use time may exceed the limits in accordance to the FCC RF exposure requirements. Nominal transceiver operation is 5% transmission time, 5% reception time, and 90% stand-by time.
- Use only the specified antenna for this transceiver; this may be either the antenna provided with the transceiver or another antenna authorized by **KENWOOD**.

Use only **KENWOOD** authorized accessories (antennas, battery packs, belt clips, Speaker/ Mics or headsets etc.): When worn on the body, always place the radio in a **KENWOOD** recommended clip or carrying case meant for this product. The use of other than recommended or approved body- worn accessories may result in RF exposure levels which exceed the FCC's occupational/ controlled environment RF exposure limits.

CAUTION

To ensure that your exposure to RF EME is within the FCC limits for occupational use, you must observe and adhere to the above points.

Electromagnetic Interference Compatibility

Electronic devices are susceptible to electromagnetic interference (EMI) if they are not adequately shielded or designed for electromagnetic compatibility. Because this transceiver generates RF energy, it can cause interference to such equipment.

- Turn OFF your transceiver where signs are posted to do so. Hospitals and health care facilities use equipment that is sensitive to electromagnetic radiation.
- Turn OFF your transceiver while on board an aircraft when so instructed. Use of the transceiver must be in accordance with airline regulations and/or crew instructions.