

**APPENDIX J:   MANUAL**

Please refer to the following pages.



**KENWOOD**

# INSTRUCTION MANUAL

VHF FM TRANSCEIVER

## TK-7100

UHF FM TRANSCEIVER

## TK-8100

KENWOOD CORPORATION



## THANK YOU!

We are grateful you chose **KENWOOD** for your personal mobile 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

The models listed below are covered by this manual:

- **TK-7100:** VHF FM Transceiver
- **TK-8100:** UHF FM Transceiver

## PRECAUTIONS

Please observe the following precautions to prevent fire, personal injury, and transceiver damage.

- 
- Do not attempt to configure the transceiver while driving; it is too dangerous.
  - Do not modify the transceiver for any reason.
  - Do not expose the transceiver to long periods of direct sunlight, nor place it near heating appliances.
  - Do not place the transceiver in excessively dusty, humid, or wet areas, nor on unstable surfaces.
  - If an abnormal odor or smoke is detected coming from the transceiver, turn OFF the power immediately. Contact your **KENWOOD** dealer.
- 

## NOTICES TO THE USER

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

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



- ◆ **EXPLOSIVE ATMOSPHERES (GASES, DUST, FUMES, etc.)**  
Turn OFF your transceiver while taking on fuel or while parked in gasoline service stations. Do not carry spare fuel containers in the trunk of your vehicle if your transceiver is mounted in the trunk area.
- ◆ **INJURY FROM RADIO FREQUENCY TRANSMISSIONS**  
Do not operate your transceiver when somebody is either touching the antenna or standing within two to three feet of it, to avoid the possibility of radio frequency burns or related physical injury.
- ◆ **DYNAMITE BLASTING CAPS**  
Operating the transceiver within 500 feet (150 m) of dynamite blasting caps may cause them to explode. Turn OFF your transceiver when in an area where blasting is in progress, or where "TURN OFF TWO-WAY RADIO" signs have been posted. If you are transporting blasting caps in your vehicle, make sure they are carried in a closed metal box with a padded interior. Do not transmit while the caps are being placed into or removed from the container.

**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

<b>UNPACKING AND CHECKING EQUIPMENT .....</b>	<b>1</b>
<b>SUPPLIED ACCESSORIES .....</b>	<b>1</b>
<b>PREPARATION .....</b>	<b>2</b>
<b>TOOLS REQUIRED .....</b>	<b>2</b>
<b>POWER CABLE CONNECTION .....</b>	<b>2</b>
<b>INSTALLING THE TRANSCEIVER .....</b>	<b>3</b>
<b>ORIENTATION .....</b>	<b>4</b>
<b>FRONT PANEL .....</b>	<b>4</b>
<b>DISPLAY .....</b>	<b>5</b>
<b>REAR PANEL .....</b>	<b>5</b>
<b>BASIC OPERATIONS .....</b>	<b>6</b>
<b>SWITCHING POWER ON/ OFF .....</b>	<b>6</b>
<b>ADJUSTING THE VOLUME .....</b>	<b>6</b>
<b>SELECTING A CHANNEL .....</b>	<b>6</b>
<b>TRANSMITTING .....</b>	<b>6</b>
<b>RECEIVING .....</b>	<b>6</b>
<b>SCAN .....</b>	<b>7</b>
<b>TEMPORARY DELETE .....</b>	<b>7</b>
<b>REVERT CHANNEL .....</b>	<b>7</b>
<b>DTMF CALLS .....</b>	<b>8</b>
<b>MANUAL DIALLING .....</b>	<b>8</b>
<b>STORING DTMF NUMBERS .....</b>	<b>8</b>
<b>DIALLING STORED DTMF NUMBERS .....</b>	<b>8</b>
<b>CLEARING STORED DTMF NUMBERS .....</b>	<b>8</b>
<b>REDIALLING .....</b>	<b>8</b>
<b>CODE SQUELCH (ID CODE) .....</b>	<b>9</b>
<b>RECEIVING .....</b>	<b>9</b>
<b>TRANSMITTING .....</b>	<b>9</b>
<b>ADVANCED OPERATIONS .....</b>	<b>10</b>
<b>TIME-OUT TIMER (TOT) .....</b>	<b>10</b>
<b>BUSY CHANNEL LOCKOUT (BCL) .....</b>	<b>10</b>
<b>TALK-AROUND .....</b>	<b>10</b>
<b>MONITOR .....</b>	<b>10</b>
<b>EMERGENCY OPERATION .....</b>	<b>11</b>
<b>KEY LOCK .....</b>	<b>11</b>
<b>BEGINNING/ END OF TRANSMISSION ID SIGNAL .....</b>	<b>11</b>

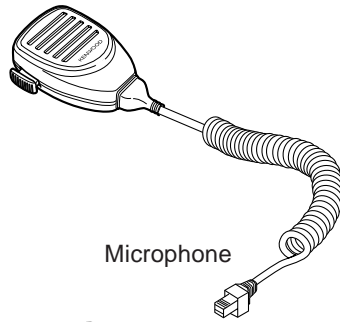
## UNPACKING AND CHECKING EQUIPMENT

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

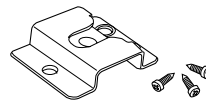
Carefully unpack the transceiver. We recommend that you identify the items listed in the following table before discarding the packing material. If any items are missing or have been damaged during shipment, file a claim with the carrier immediately.

### SUPPLIED ACCESSORIES

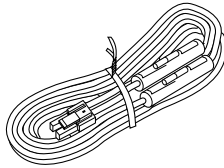
Item	Part Number	Quantity
Microphone (K type only)	T91-0624-XX	1
Microphone holder (K type only)	J19-1584-XX	1
DC power cable	E30-3339-XX	1
• Fuse	F51-	2
Mounting bracket	J29-0662-XX	1
Screw set:		
• Self-tapping screw (4 pieces)		
• Hex-headed screw with washer (4 pieces)	N99-0395-XX	1
• Spring washer (4 pieces)		
• Flat washer (4 pieces)		
Instruction manual	B62-1596-XX	1



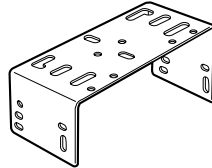
Microphone



Microphone holder



DC power cable  
with fuses



Mounting bracket



Screw set

1

## PREPARATION

### WARNING

Various electronic equipment in your vehicle may malfunction if they are not properly protected from the radio frequency energy which is present while transmitting. Electronic fuel injection, anti-skid braking, and cruise control systems are typical examples of equipment that may malfunction. If your vehicle contains such equipment, consult the dealer for the make of vehicle and enlist his/her aid in determining if they will perform normally while transmitting.

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

### TOOLS REQUIRED

**Note:** Before installing the transceiver, always check how far the mounting screws will extend below the mounting surface. When drilling mounting holes, be careful not to damage vehicle wiring or parts.

The following tools are required for installing the transceiver:

- 6 mm (1/4 inch) or larger electric drill
- 4.2 mm (5/32 inch) drill bit for the self-tapping screws
- Circle cutters

### POWER CABLE CONNECTION

### CAUTION

The transceiver operates in **12 V** negative ground systems only! Check the battery polarity and voltage of the vehicle before installing the transceiver.

- 1 Check for an existing hole, conveniently located in the firewall, where the power cable can be passed through.
  - If no hole exists, use a circle cutter to drill the firewall, then install a rubber grommet.
- 2 Run the two power cable leads through the firewall and into the engine compartment, from the passenger compartment.
- 3 Connect the red lead to the positive (+) battery terminal and the black lead to the negative (-) battery terminal.
  - Locate the fuse as close to the battery as possible.
- 4 Coil and secure the surplus cable with a retaining band.
  - Be sure to leave enough slack in the cables so the transceiver can be removed for servicing while keeping the power applied.



## INSTALLING THE TRANSCEIVER



### WARNING

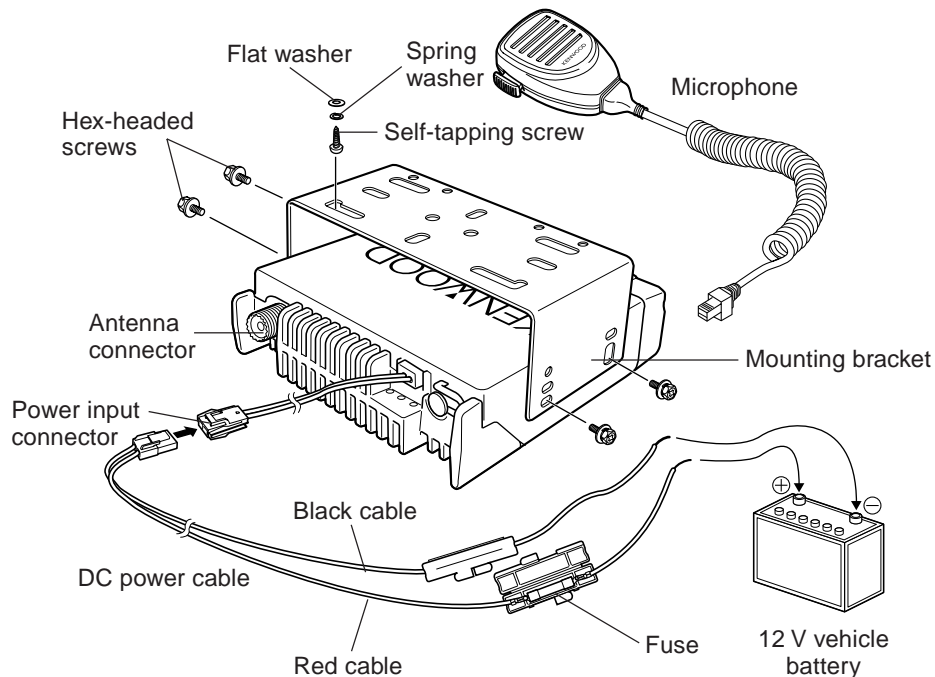
For passenger safety, install the transceiver securely, using the supplied mounting bracket, so the transceiver will not break loose in the event of a collision.

- 1 Mark the position of the holes in the dash by using the mounting bracket as a template. Drill the holes, then attach the mounting bracket using the supplied self-tapping screws.
  - Be sure to mount the transceiver in a location where the controls are within easy reach of the user and where there is sufficient space at the rear of the transceiver for cable connections.
- 2 Connect the antenna and the supplied power cable to the transceiver.
- 3 Slide the transceiver into the mounting bracket and secure it using the supplied hex-headed screws.
- 4 Mount the microphone hanger in a location where it will be within easy reach of the user.
  - The microphone and microphone cable should be mounted in a place where they will not interfere with the safe operation of the vehicle.



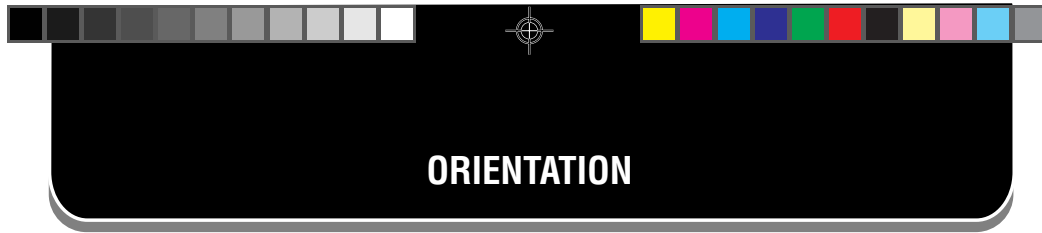
### CAUTION

When replacing the fuse in the DC power cable, be sure to replace it with a fuse of the same value. Never replace a fuse with a fuse that has a higher value.









3





## ORIENTATION

### FRONT PANEL






- ①  (Power) switch  
Press to switch the transceiver ON. Press and hold for approximately 1 second to switch the transceiver OFF.
- ②  key  
Press to increase the volume level.
- ③  key  
Press to decrease the volume level.
- ④  key  
PF (Programmable Function) key. The default setting of this key is None (no function). The programmable functions available for this key are listed below.
- ⑤  key  
PF (Programmable Function) key. The default setting of this key is Monitor (page 10). Other programmable functions available for this key are listed below.
- ⑥ **1/ 2/ 3/ 4** keys  
Press to select a channel from 1 to 4.
- ⑦  Microphone jack  
Insert the microphone plug into this jack (the microphone is an optional accessory).
- ⑧ **Speaker**  
Internal speaker.
- ⑨ **PTT switch**  
Press this switch, then speak into the microphone to call a station.

### Auxiliary Programmable Functions:

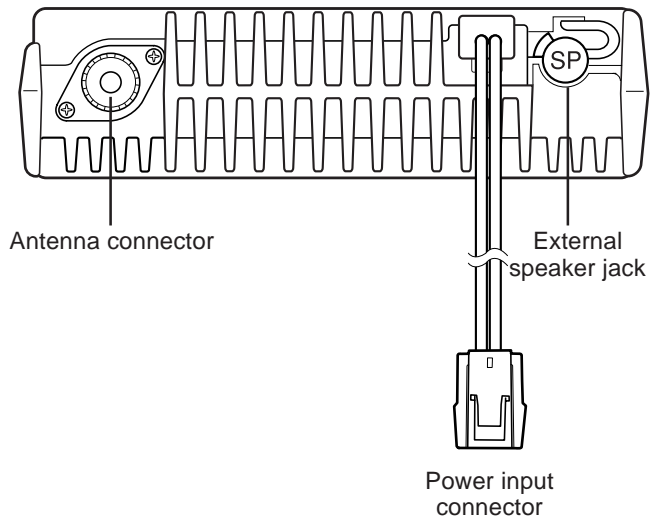
- Emergency
- Key Lock
- Monitor
- None (no function)
- Scan On/ Off
- Talk Around
- Temporary Delete



## DISPLAY

Indicator	Description
	Lights while transmitting.
	Lights when a signal is detected on the currently selected channel.
	Lights while the function programmed onto its corresponding key is activated.
	Lights while the function programmed onto its corresponding key is activated.
	Lights to display the currently selected channel (1 ~ 4).

## REAR PANEL







## BASIC OPERATIONS

### SWITCHING POWER ON/ OFF

Press the  switch to switch the transceiver ON.

Press and hold the  switch for approximately 1 second to switch the transceiver OFF.

### ADJUSTING THE VOLUME

Press the  key to increase the volume and the  key to decrease the volume.

### SELECTING A CHANNEL

Select your desired channel by pressing a key from **1** to **4**.

### TRANSMITTING

---

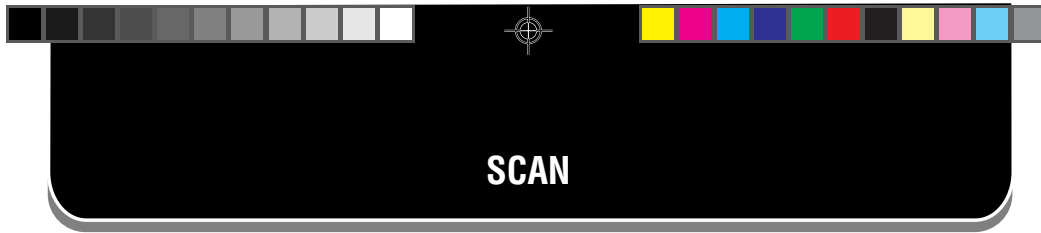
**Note:** Before transmitting, first monitor the channel to make sure it is not already in use.

---

- 1 Select your desired channel by pressing a channel key (**1** ~ **4**).
  - If the channel is busy, wait until it becomes free.
- 2 Press the microphone **PTT** switch and speak into the microphone. Release the **PTT** switch when you have finished speaking.
  - For best sound quality at the receiving station, hold the microphone approximately 1.5 inches (3 ~ 4 cm) from your mouth.

### RECEIVING

- 1 Select your desired channel by pressing a channel key (**1** ~ **4**).
- 2 When you hear a signal, readjust the volume level if necessary.
- 3 Respond to the call as described in step 2 of "TRANSMITTING", above.



To activate the Scan function, press the key programmed as **Scan On/ Off**.

- The indicator next to the programmed key flashes (“▷◻◻” or “◻◻”).

When a signal is detected on a channel, the Scan indicator stops flashing. At this time, both the Scan indicator and the Busy indicator light.

When the signal is no longer present, Scan resumes and the Scan indicator flashes again.

To stop scanning, press the **Scan On/ Off** key again.

- The transceiver returns to the channel that was selected before Scan started.

### TEMPORARY DELETE

Depending on how your transceiver has been set up, a key may have been programmed with the **Temporary Delete** function. If so, press and hold that programmed key for approximately 1 second to temporarily remove undesired channels from the scanning sequence. This allows you to scan only those channels which you desire. After switching the Scan function OFF, or switching the transceiver OFF and then ON again, the Scan settings return to normal.

---

**Note:** In order for Scan to function, there must be at least 2 channels added to the scanning sequence. If there are less channels than this, Scan does not operate.

---

### REVERT CHANNEL

During Scan, pressing the **PTT** switch to transmit will cause the transceiver to select the revert channel. Your dealer programs the Revert channel for your transceiver. Consult your dealer for details.



## DTMF CALLS

**Note:** To make DTMF calls, you must have an optional microphone with a DTMF keypad.

### MANUAL DIALLING

Press and hold the **PTT** switch, then enter the digits on the microphone keypad.

- You can enter the digits **0 ~ 9, A ~ D, \***, and **#**. (**A ~ D** may be disabled by your dealer.)
- If programmed by your dealer, you do not need to continuously hold the **PTT** switch; the transceiver will remain in the transmit state for 2 seconds after releasing each key.
- While transmitting DTMF tones, the microphone is muted.

### STORING DTMF NUMBERS

If Auto Dialling has been activated by your dealer, you can store DTMF numbers (16 digits maximum) in each of the 9 Auto Dial memory locations (1 ~ 9).

- 1 Press the microphone **#** key.
- 2 Enter the desired digits on the microphone keypad.
  - You can enter the digits **0 ~ 9, A ~ D, \***, and **#**.
  - When entering **#**, you must first press the **PTT** switch.
  - To cancel, press any key on the transceiver front panel, other than the **⏻** switch.
- 3 Press the microphone **#** key, then enter a memory location number (1 ~ 9).
  - If no key is pressed within 10 seconds, the transceiver will return to normal operation.

### DIALLING STORED DTMF NUMBERS

- 1 Press the microphone **\*** key.
- 2 Enter the desired memory location number (1 ~ 9).
- 3 Press the **PTT** switch.
  - If programmed by your dealer, no DTMF tone will sound when **"D"** is transmitted. **"D"** is used for a pause time. The pause duration is programmed by your dealer.

### CLEARING STORED DTMF NUMBERS

- 1 Press the microphone **#** key twice.
  - To cancel the process, press any key other than **1 ~ 9**.
- 2 Enter the desired memory location number (1 ~ 9).

### REDIALLING

- 1 Press the microphone **\*** key, then press the **0** key.
- 2 Press the **PTT** switch.

**Note:** Switching the transceiver power OFF clears the redial memory.



## CODE SQUELCH (ID CODE)

Code Squelch is enabled or disabled by your dealer. This function turns the transceiver squelch OFF only when it receives the DTMF code that has been set up in your transceiver. Transceivers that do not transmit the correct code will not be heard. Consequently, you can communicate with a specific party without listening to other parties using the same channel.

Your dealer may also activate Group Call for your transceiver. This is useful when you want to send information to a number of units in a fleet. Ask your dealer for details.

### RECEIVING

When you receive a signal containing the correct code, Code Squelch turns OFF and you will hear the call.

- To mute the speaker after Code Squelch turns OFF, press the key programmed as **Monitor**.
- Your dealer can program Code Squelch to automatically turn back ON after a specific time period elapses.
- If Transpond is programmed, an acknowledgment signal is returned to the calling station. Transpond does not function when you are called with a Group code. Transpond can send an alert tone or a transceiver ID code.
- If Call Alert is programmed, an alert tone will sound when the correct code is received.

### TRANSMITTING

- 1 Press and hold the **PTT** switch.
- 2 Enter the code of the transceiver you want to call or enter a Group code on the microphone keypad.
  - If desired, you can send codes the same way you make DTMF calls {page 8}.
- 3 Use the transceiver the same as in a regular call; press the **PTT** switch to transmit and release it to receive.
  - The called transceiver's Code Squelch will turn OFF while you are transmitting. After you stop transmitting, the Code Squelch will turn back ON after a pre-set time period elapses. This time period is programmed by your dealer.
  - When you release the **PTT** switch, Code Squelch turns OFF. If no signal is received for a pre-determined time, Code Squelch turns back ON.
  - Pressing the key programmed as **Monitor** at any time will turn the Code Squelch back ON.



## ADVANCED OPERATIONS

### TIME-OUT TIMER (TOT)

The purpose of the Time-out Timer is to prevent any caller from using a channel for an extended period of time. If you continuously transmit for a period of time that exceeds the programmed time, the transceiver will stop transmitting and an alert tone will sound. To stop the tone, release the **PTT** switch.

Your dealer can program a warning function to alert you before the TOT expires. Continuously transmitting for the time specified by your dealer will cause the warning tone to sound.

### BUSY CHANNEL LOCKOUT (BCL)

The Busy Channel Lockout feature is activated or deactivated by your dealer.

When activated, BCL prevents you from interfering with other parties who may be using the same channel that you selected. Pressing the **PTT** switch while the channel is in use will cause your transceiver to emit an alert tone and transmission will be inhibited (you cannot transmit). Release the **PTT** switch to stop the tone and return to receive mode.

### TALK AROUND

You may occasionally experience an interruption in service (due to a power failure, etc.). During such an occurrence, you can continue communication by using the Talk Around feature, if it has been programmed by your dealer. Talk Around allows you to communicate directly with other transceivers, without the use of a repeater. However, if the station you want to contact is too far away, or there are geographical obstacles in the way, you may not be able to contact the station.

Toggle Talk Around ON and OFF by pressing the key programmed as **Talk Around**.

- The indicator corresponding to the **Talk Around** key lights while the Talk Around function is ON.
- When using Talk Around, the “receive” frequency is used for both transmission and reception, and the QT/DQT “decode” signalling is used for both encoding and decoding.

### MONITOR

Press the key programmed as **Monitor** to turn the transceiver signalling OFF. While signalling is OFF, you can hear all signals received on your current channel. With signalling ON, you can hear only signals that match the signalling programmed in your transceiver. Press the **Monitor** key again to return to normal operation.

Press and hold the key programmed as **Monitor** for 2 seconds to listen to weak signals that you cannot hear during normal operation, and to adjust the volume when no signals are present on your selected channel. Press the **Monitor** key again to return to normal operation.



## EMERGENCY OPERATION

Press and hold the key programmed as **Emergency** to enter Emergency Mode.

- The transceiver will beep unless your dealer has activated “Secret” Emergency Mode.
- The channel will switch to the pre-programmed emergency channel.

While in “Secret” Emergency Mode, the Busy indicator lights every 10 seconds. When your signal has been acknowledged, the Busy indicator will light 2 times every 10 seconds.

When the transceiver receives an Emergency Reset code, it will return to normal operation. Or, if you press and hold the **Emergency** key for more than 10 seconds, you can return the transceiver to normal operation.

If enabled by your dealer, the transceiver can remain in Emergency Mode even while the transceiver power is OFF.

## KEY LOCK

Press the key programmed as **Key Lock** to lock the keys of the transceiver. Locking the transceiver keys prevents you from accidentally changing the channel and channel settings. While key lock is active, you can still use the microphone PTT switch, the  $\Phi$  (power) switch, and the Emergency, Monitor,  $\blacktriangle$ , and  $\blacktriangledown$  keys.

Press the **Key Lock** key again to turn this function OFF.

## BEGINNING/ END OF TRANSMISSION ID SIGNAL

Your dealer can enable or disable the Beginning/ End of Transmission identification signals. These signals are used to access and release some repeaters and telephone systems.

A Beginning of Transmission ID Signal is sent when you press the **PTT** switch.

An End of Transmission ID Signal is sent when you release the **PTT** switch.





KENWOOD



## **MANDATORY SAFETY INSTRUCTIONS TO INSTALLERS AND USERS**

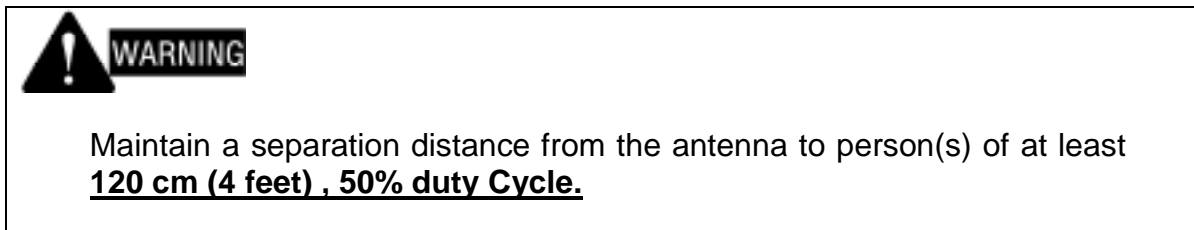
- Use only manufacturer or dealer supplied antenna.
- **Antenna Minimum Safe Distance: 120 cm (4 feet), 50% duty Cycle.**
- Antenna Gain: **0** dBd referenced to a dipole.

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. **120 cm (4 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.



“This transmitter is authorized to operate with a maximum duty factor of 50%, in typical push-to-talk mode, for satisfying FCC RF exposure compliance requirements.”

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 the antenna/vehicle