

# KENWOOD

800MHz FM TRANSCEIVER

## TK-930

900MHz FM TRANSCEIVER

## TK-931

# INSTRUCTION MANUAL

KENWOOD CORPORATION

# 1. INTRODUCTION

Your two-way radio has been designed to provide dependable communications, and is simple and easy to operate.

All KENWOOD radios incorporate the latest in advanced technology, providing communications that can be counted on to keep vehicles and personal operating at peak efficiency.

This instruction manual covers the following radios.

TK-930	: 800 MHz FM TRANSCEIVER (15W)
TK-930(HD)	: 800 MHz FM TRANSCEIVER (35W)
TK-931	: 900 MHz FM TRANSCEIVER (15W)
TK-931(HD)	: 900 MHz FM TRANSCEIVER (30W)

When there are differences in operation, separate instructions will be given for each model.

## IMPORTANT

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 A QUALIFIED LICENSED OR CERTIFIED TECHNICIAN ONLY.

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## 2. SAFETY

It is important that the operator understands and is aware of hazards common to the operation of any two-way radio.

### WARNING

#### 1. EXPLOSIVE ATMOSPHERES (GASES, DUST, FUMES, etc.)

Turn off and do not operate your radio 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 radio is mounted in the trunk area.

#### 2. INJURY FROM RADIO FREQUENCY TRANSMISSIONS

Do not operate your radio when anyone is touching the antenna, or when anyone is standing within two to three feet of your antenna, to avoid the possibility of radio frequency burns or related physical injury.

#### 3. DYNAMITE BLASTING CAPS

Dynamite blasting caps may explode by the operation of two-way radio transmitters, if such operation occurs within 500 feet of the blasting caps. Turn off and do not operate your radio 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 certain they are carried in a closed metal box having a padded interior. Do not transmit during the time that caps are being placed into or removed from this container.

## 3. UNPACKING AND CHECKING EQUIPMENT

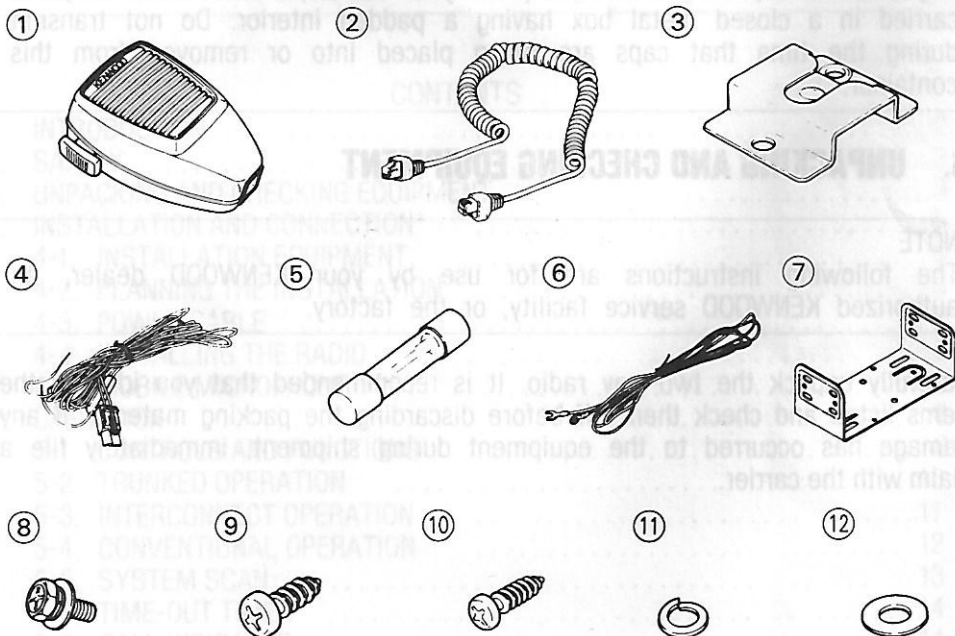
### NOTE

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

Carefully unpack the two-way radio. It is recommended that you identify the items listed and check them off before discarding the packing material. If any damage has occurred to the equipment during shipment, immediately file a claim with the carrier.

## EQUIPMENT

Two-way radio		1 ea.
① Microphone	T91-0374-×8	1 ea.
② Microphone cable	E30-2089-×8	1 ea.
③ Microphone hanger	J19-1376-×5	1 ea.
④ Power cable ass'y	E30-2076-×5	1 ea.
⑤ Spare fuse (10 A or 15 A)		1 ea.
10 A	F05-1031-×5	
15 A	F05-1531-×5	
⑥ Cable with connector	E30-2036-×5	1 ea.
⑦ Mounting bracket	J29-0418-×3	1 ea.
Mounting hardware	N99-0321-×5	1 ea.
⑧ Hex. bolt	N09-2177-×5	7 ea.
⑨ Tapping screw (Large)	N09-0335-×5	4 ea.
⑩ Tapping screw (Small)	N46-4016-46	3 ea.
⑪ Spring washer	N16-0050-46	4 ea.
⑫ Flat washer	N15-1050-46	4 ea.
Warranty card (U.S.A. only)	B46-0409-XX	1 ea.
Instruction manual	B62-0005-XX	1 copy



## 4. INSTALLATION AND CONNECTION

### WARNING

Interference with vehicular electronics -Electronic fuel injection systems, electronic antiskid braking systems, electronic cruise control systems, etc., are typical of the types of electronic devices which may be prone to malfunction due to the lack of protection from radio frequency energy which is present when transmitting. If the vehicle contains such equipment, consult the dealer for the make of vehicle and enlist his aid in determining if such electronic circuits will perform normally when the radio is transmitting.

### NOTE

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

### 4-1. INSTALLATION EQUIPMENT

#### CAUTION

Be careful to avoid damaging some vital part of the vehicle when drilling mounting holes. Always check to see how far the mounting screws will extend below the mounting surface before installing.

The following tools are required for installing this two-way radio.

- 1/4" or larger electric drill.
- Drills and circle cutters. (Sizes listed below.)

#### DRILL SIZES

- φ 4.2 mm for φ 5×16 self-tapping screws.
- φ 3.2 mm for φ 4×16 self-tapping screws.

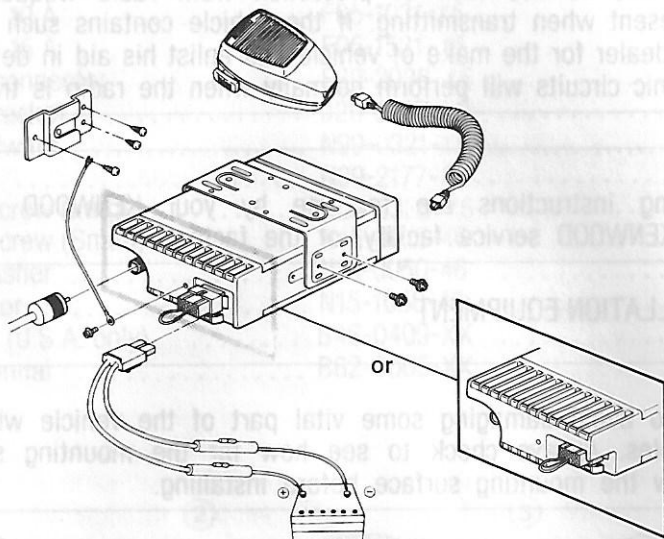
### 4-5. MOBILE MICROPHONE

Mount the microphone where it will be within reach of the operator but will not interfere with the operation of the vehicle after mounting. Connect the microphone cable to the microphone unit. Connect the microphone line to the microphone jack on the front of the radio.

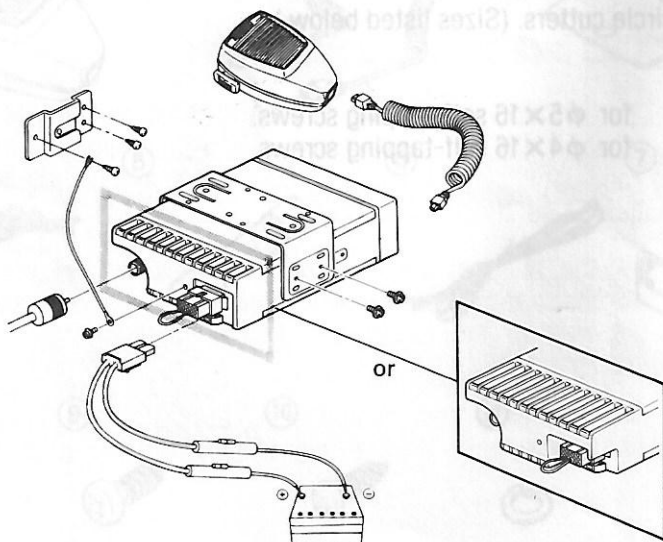
## 4-2. PLANNING THE INSTALLATION

The accompanying illustrations should help you in planning your installation. Before starting, plan your installation carefully so that it will be convenient for the operator to use, protected from water damage, easy to service, and out of the way of auto mechanics and passengers.

Ex. 1



Ex. 2





### 4-3. POWER CABLE

The power cable consists of a fused red lead, a fused black lead, and a 2-pin systems plug. To install the power cable, if an existing hole is conveniently located for passage of the power cable through the firewall, start with the plug end of the cable at the radio and run the two leads to the vehicle battery.

Drill the firewall as required and install a rubber grommet. Run the power cable leads into the engine compartment from the passenger compartment.

Connect the red fused lead to the positive (+) battery terminal or switched power source, and black lead to the negative (-) battery terminal. Always locate the fuse as close to the battery as possible. Coil up the surplus cable and secure it out of the way with a tie wrap. Be sure to leave some slack in the cables going to the radio so that it may be pulled out for servicing with the power applied.

#### CAUTION

The radio operates in 12-volt negative ground systems only! Always check the battery polarity and voltage of the vehicle before installing the radio.

### 4-4. INSTALLING THE RADIO

Mount the two-way radio so that the controls are within reach of the operator. Use the mounting bracket as a template to locate the holes, and mount the radio. Be sure to leave enough room at the rear of radio for cable connections. Before attaching the radio in the mounting bracket, connect the antenna, system plug and microphone.

#### WARNING

For passenger safety, mount the radio securely so that the unit will not break loose in the event of a collision. This is especially important in station wagons, vans and similar type installations where a loose radio could be extremely dangerous to the vehicle occupants.

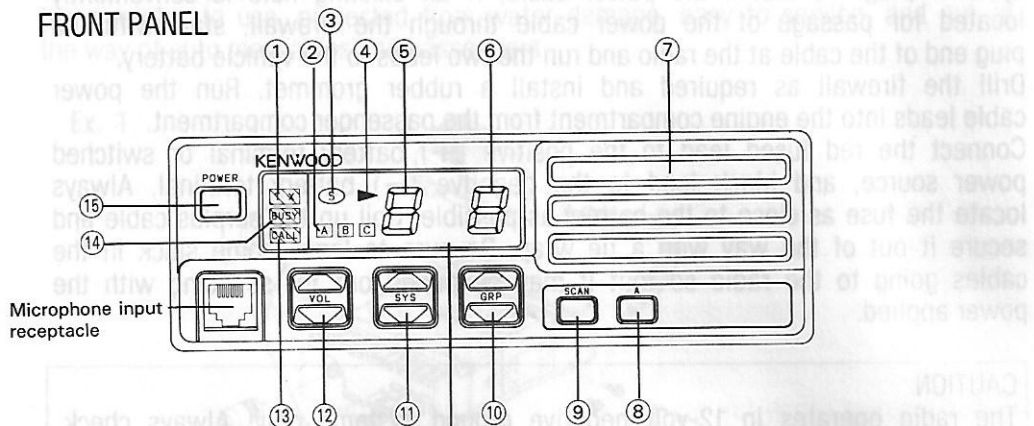
### 4-5. MOBILE MICROPHONE

Mount the microphone where it will be within reach of the operator, but will not interfere with safe operation of the vehicle. After mounting the microphone hanger, connect the microphone cable to the microphone unit. Connect the microphone plug to the microphone jack on the front of the radio.

## 5. OPERATION

### 5-1. CONTROLS AND FUNCTIONS

#### FRONT PANEL



- ①TX indicator:  
Indicates when the transmitter is keyed.
- ②Auxiliary indicator:  
Indicates when the particular function selected by the Auxiliary switch is enabled.
- ③Scan indicator:  
Indicates when the System Scan mode is enabled.
- ④Delete indicator:  
Indicates when the deleted system is present.
- ⑤System display:  
Displays the selected system number. Only programmed systems can be selected.
- ⑥Group display:  
Displays the selected group number. Only programmed groups can be selected.
- ⑦Speaker:  
Front mounted for best sound quality.
- ⑧A (Auxiliary) switch:  
Pressing this switch toggles the auxiliary function which can be programmed as Horn Alert or Scan Lockout.



⑨SCAN switch:

Pressing this switch toggles the System Scan function.

⑩GROUP up/down switch:

This switch operates like the SYSTEM switch. When the system number is changed, the GROUP display indicates the revert group number (group displayed when the system was last selected).

⑪SYSTEM up/down switch:

Pressing the upper part of the SYSTEM switch increases the selected system number by one. Pressing the lower part of this switch decreases the system number by one. Holding the switch down causes the function to repeat.

⑫VOLUME up/down switch:

Pressing the upper part of the VOLUME switch increases the volume level by one step. Pressing the lower part of this switch decreases the volume level by one step. Holding the switch down causes the function to repeat.

⑬CALL indicator:

Call indicator which can be programmed to indicate when particular calls are received. It is turned off by pressing the microphone PTT switch or any front panel switch.

⑭BUSY indicator:

Indicates when a trunked system is busy, and no repeaters are available.

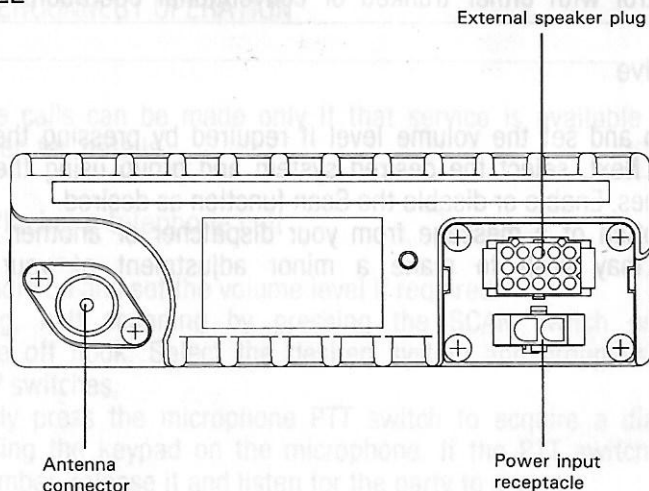
⑮POWER switch:

Press to turn the power ON and OFF.

⑯Alphanumeric display: [TK-930(HD)/931(HD) only]

When appropriate programming is carried out by the dealer's qualified service technician, the system gives alphanumeric display indications specific to the individual system and group number.

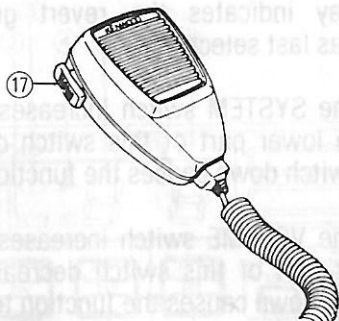
## REAR PANEL



## MICROPHONE

### ⑰ PTT (Push-To-Talk) switch:

Press this switch to transmit, and speak into the microphone.



## 5-2. TRUNKED OPERATION

### NOTE

This radio can operate on both trunked and conventional channels. Each of the selectable systems can be programmed for either type of operation. How your radio is programmed is determined by the type of repeater equipment being used in the radio system(s) you are permitted to access. Your dealer will program the radio to fit your specific needs and then tell you how each selected system operates. The main operating features of the trunked and conventional modes are summarized in the following information. There is no squelch control with either trunked or conventional operation.

### 5-2-1. To receive

Turn the radio on and set the volume level if required by pressing the VOLUME up/down switch. Next, select the desired system and group using the SYSTEM and GROUP switches. Enable or disable the Scan function as desired.

At the first reception of a message from your dispatcher or another vehicle in your fleet, you may wish to make a minor adjustment of your VOLUME up/down switch.

## 5-2-2. To transmit

Calling another station on your KENWOOD radio is very simple:

If scanning, halt scanning by pressing the SCAN switch or by taking the microphone off hook. Select the desired system and group using the SYSTEM and GROUP switches.

Press the microphone PTT switch and if a busy or intercept tone does not sound, the path is complete and speaking can begin. For best results, hold the microphone about one and one half inches from your lips, squeeze the PTT switch, and speak in your normal speaking voice.

Release the PTT switch when the message is complete and listen for a response. Press the PTT switch to talk and release it to listen. When the conversation is finished, place the microphone back on hook.

### NOTES

#### 1. BUSY TONE

The busy tone is similar to the standard telephone busy tone and it indicates that the radio system is busy. It sounds as long as the PTT switch is pressed or until the radio system is no longer busy. Repeated access attempts are being made as long as the PTT switch is pressed.

#### 2. INTERCEPT TONE

The intercept tone is a siren-like tone which indicates an out-of-range condition. Repeated access attempts are made and if all are unsuccessful, the intercept tone sounds. Once the intercept tone sounds, no more access attempts are made until the PTT switch is released and then pressed again.

## 5-3. INTERCONNECT OPERATION

### NOTE

Telephone calls can be made only if that service is available to you. Consult your dealer for details.

### 5-3-1. Placing a telephone call

Turn the radio on and set the volume level if required.

If scanning, halt scanning by pressing the SCAN switch or by taking the microphone off hook. Select the desired system and group using the SYSTEM and GROUP switches.

Momentarily press the microphone PTT switch to acquire a dial tone. Dial the number using the keypad on the microphone. If the PTT switch was pressed to dial the number, release it and listen for the party to answer.

When the party answers, press the PTT switch to talk and release it to listen.

### 5-3-2. Receiving a telephone call

Select the desired system and group using the SYSTEM and GROUP switches. Enable or disable the Scan function as desired.

When "ringing" is heard from the speaker, answer the call in the normal manner (press the PTT switch to talk and release it to listen).

### 5-4. CONVENTIONAL OPERATION

When a system programmed for conventional operation is selected, channel selection and monitoring before transmitting must be performed by the user. Each of the groups selectable in a system are actually different radio channels.

#### NOTE

Before transmitting, the channel must be monitored to make sure that it is not already in use. If the selected group is not equipped with QT, this is done by simply listening for anyone talking before transmitting. It is not necessary to take the microphone off hook to monitor the channel.

If the selected group is equipped with QT (your dealer will inform you which are), take the microphone off hook to disable the QT. Then if the channel is busy, the conversation is heard.

#### 5-4-1. To receive

Turn the radio on and set the volume level if required by pressing the VOLUME up/down switch.

Next, select the desired system and group using the SYSTEM and GROUP switches. Enable or disable the Scan function as desired.

At the first reception of a message from your dispatcher or another vehicle in your fleet, you may wish to make a minor adjustment of your VOLUME up/down switch.

#### 5-4-2. To transmit

If scanning, halt scanning by pressing the SCAN switch or by taking the microphone off hook. Select the desired system and group using the SYSTEM and GROUP switches.

Press the microphone PTT switch and begin speaking.

For best results, hold the microphone about one and one half inches from your lips, squeeze the PTT switch, and speak in your normal speaking voice. FCC regulations require that you identify the station you are calling, and your own station.

Release the PTT switch when the message is complete and listen for a response. Press the PTT switch to talk and release it to listen. When the conversation is finished, place the microphone back on hook.

### 5-4-3. Repeater talk-around

Normally, transmission between your vehicle and other stations are accomplished through radio relay facilities, which retransmit your messages from an antenna system located atop a high building, a hill or a mountain. This allows dependable communications over much longer distances than would otherwise be possible. Occasionally, a power failure or other failure at the relay may result in an interruption of service that is not the fault of your KENWOOD radio equipment. Your dealer may have provided a Talk-Around channel for use in such cases. This channel allows communication direct from your vehicle to other vehicles or to your dispatcher. In the event that calls placed normally do not result in a response from the party being called, switch to your Talk-Around channel, and make another call. Providing the distance between stations is not too great, contact may be possible.

## 5-5. SYSTEM SCAN

### 5-5-1. General

The System Scan feature is enabled by pressing the front panel SCAN switch. Scanning is occurring when there is a dash (—) in both the SYSTEM and GROUP displays. The microphone must be on hook for scanning to occur. Each programmed system is scanned in sequence unless locked out as described later. If both trunked and conventional systems are programmed, both are scanned.

If an incoming call is detected, scanning stops and the call is received. The display indicates the system on which the call was received and it usually indicates the group (refer to individual trunked and conventional descriptions which follow). Therefore, a response can usually be made without changing the selected system and group.

When scanning is halted by taking the microphone off hook or pressing the SCAN switch, the revert system and group are displayed. The revert system and group are the system and group selected when the scan mode was entered or if a call was received since the scan mode was entered, it is the system and group of the last call received.

After a message is finished, there is a short delay before scanning resumes to allow time for a response to be made. The revert system and group can be changed while scanning. Scanning halts when the SYSTEM or GROUP switch is pressed and then resumes 1 second after the switch is released.



### 5-5-2. Scanning trunked systems

When scanning trunked systems, calls are received on the same groups in each system as when not scanning. Some systems may also be programmed so that they are scanned longer when they are the revert system to ensure that no messages are missed. If you have this feature, make sure the correct revert system is selected.

When group scan is enabled (refer to "Group Scan" description which follows), calls are received on all selectable groups as long as the microphone is on hook. In addition, the display changes to whatever group the call is received on. If the microphone is off hook or group scan is not programmed, calls are received on only the revert group in that system.

### 5-5-3. Scanning conventional systems

Only the revert group (channel) is scanned in conventional systems. There is no group scan available in the conventional systems. For example, if Group 1 is the last selected group in a particular conventional system, only that group is scanned. If a group is programmed for QT and the microphone is on hook, then QT is also detected when scanning. If the microphone is off hook, scanning stops and the audio opens if anyone transmits on the channel.

### 5-5-4. Scan lockout

If the Auxiliary switch is programmed for the Scan Lockout feature, one or more programmed systems can be locked out of the scan sequence. (consult your dealer for details.)

### 5-6. TIME-OUT TIMER

This transceiver has a time-out timer which is programmed by your dealer for a time between 0.5 and 5.0 minutes for dispatch and between 1.0~10.0 minutes for interconnect. If the transmitter is keyed continuously for longer than the programmed time, the transmitter is disabled and the beep tone sounds. The timer and tone are reset by releasing the PTT switch.

### 5-7. CALL INDICATOR

The Call indicator indicates if a call was received while you were away from the vehicle. It is programmed to indicate when specific group ID's are received (trunked systems) or when a call is received on a specific group that opens the audio (conventional systems). The Call indicator is turned off by pressing any front panel switch or the microphone PTT switch.



## 5-8. HORN ALERT

If a horn alert has been installed by your dealer, this feature sounds the vehicle horn or some other type of external alert when certain calls are received. It is programmed like the Call indicator to sound when specific group ID's or calls are received.

If the Auxiliary switch is programmed to control the horn alert, the horn alert feature can be enabled or disabled with this switch. The Auxiliary indicator lights when the horn alert is enabled.

## 5-9. GROUP SCAN

Each selectable trunked system can be programmed so that only the selected group is received (no group scan) or so all selectable groups are scanned and received (group scan). If your radio has selectable groups, your dealer will tell you if you have the group scan feature. The microphone must be on hook to enable group scan.

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5-5-4. Scan lockout

If the Auxiliary switch is programmed for the Scan Lockout feature, one or more programmed systems can be locked out of the scan sequence. (consult your dealer for details)

5-8. TIME-OUT TIMER

This transceiver has a time-out timer which is programmed by your dealer for a time between 0.5 and 5.0 minutes for transmit and between 1.0 ~ 10.0 minutes for interconnect. If the transmitter is keyed continuously for longer than the programmed time, the transmitter is disabled and the beep sounds. The transmitter and tone are reset by releasing the PTT switch.

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