



KN9 P150

Owner's Manual

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BUSY CHANNEL LOCKOUT

The Busy Channel Lockout feature applies only to those channels programmed with a receive Channel Guard value. When carrier activity is detected on the channel selected, the radio checks the receive Channel Guard value. If the proper Channel Guard value is present, the radio can transmit on that channel.

If the radio detects an incorrect value or carrier activity only, the transmitter is disabled. If an attempt is made to transmit, an alert tone will be generated and the display will show the word **BUSY** until the channel becomes available or the PTT switch is released.

Channels not programmed with a receive Channel Guard value can be used to transmit regardless of carrier activity.

ANI ENCODING (Analog Mode Only)

ANI encoding (Automatic Numeric Identification), if enabled, transmits a sequence of DTMF tones each time you press the PTT switch. You will hear a sidetone. Your dealer can program the ANI number to be sent.

TIME-OUT TIMER

The transmit Time-Out Timer limits the duration of calls and guards against accidentally locking on the transmitter and tying up the radio system. Your dealer can program the duration of the Time-Out Timer (15–225 seconds, or disabled).

BUSY CHANNEL

If the radio has been programmed for Busy Channel operation, it will operate in one of the following Modes:

- Busy Channel Indication
- Busy Channel Lockout

BUSY CHANNEL INDICATION

The yellow Busy Channel Indicator glows if there is carrier activity on the selected channel. If the selected channel is a Channel Guard channel and the proper Channel Guard value is not detected, the Busy Channel Indicator remains on for the duration of the carrier activity and no message is heard. During Scan and Priority Scan operation, the Busy Channel Indicator glows when activity is detected on any channel on the Scan List.

When scanning or priority scanning Channel Guard channels and activity has been detected, the Busy Channel Indicator glows for the time period necessary to determine if the proper Channel Guard value has been received. This will cause the Busy Channel Indicator to flash at various rates.

INTRODUCTION

CONGRATULATIONS, you now own a BK Radio KNG P150 APCO Project 25 digital radio. To meet backwards compatibility as defined by the APCO Project 25 standard, the KNG digital portable radio provides users the ability to interoperate with narrow or wide band analog channels as well as digital systems. Please take a moment to read the information in this manual so you can get optimum performance from your new radio.

FCC REQUIREMENTS

Your radio must be properly licensed by the Federal Communications Commission prior to use. Your BK Radio dealer can assist you in meeting these requirements. Your dealer will program each radio with your authorized frequencies, signaling codes, etc., and will be there to meet your communications needs as your system expands.

SAFETY PRECAUTIONS



- Do not operate the transmitter in close proximity to blasting caps.
- Do not operate the radio in an explosive atmosphere (petroleum fuels, solvents, dust, etc.) unless your radio is an intrinsically safe model designed for such use.

RF ENERGY EXPOSURE AWARENESS AND CONTROL INFORMATION, AND OPERATIONAL INSTRUCTIONS FOR FCC OCCUPATIONAL USE REQUIREMENTS

BEFORE USING YOUR PORTABLE 2-WAY RADIO, READ THIS IMPORTANT RF ENERGY AWARENESS AND CONTROL INFORMATION AND OPERATIONAL INSTRUCTIONS TO ENSURE COMPLIANCE WITH THE FCC'S RF EXPOSURE GUIDELINES.

NOTICE: This radio is intended for use in occupational/controlled conditions, where users have full knowledge of their exposure and can exercise control over their exposure to meet FCC limits. This radio device is NOT authorized for general population, consumer, or any other use.

This 2-way radio uses electromagnetic energy in the radio frequency (RF) spectrum to provide communications between two or more users over a distance. It uses radio frequency (RF) energy or radio waves to send and receive calls. RF energy is one form of electromagnetic energy; other forms include electric power, radar, sunlight and x-rays. RF energy, however, should not be confused with these other forms of electromagnetic energy, which when used improperly can cause biological damage. Very high levels of x-rays, for example, can damage tissues and genetic material. The energy levels associated with radio waves from portable 2-way radios, when properly used, are not great enough to cause biological damage.

Experts in science, engineering, medicine, health and industry work with organizations to develop standards for exposure to RF energy. These standards provide recommended levels of RF exposure for both workers and the general public. These recommended RF exposure levels include substantial margins of protection. All 2-way radios marketed in North America are designed, manufactured and tested to ensure they meet government established RF exposure levels. In addition, manufacturers also recommend specific operating instructions to users of 2-way radios.

These instructions are important because they inform users about RF energy exposure and provide simple procedures on how to control it. Please refer to the following WEBSITES for more information on what RF energy exposure is and how to control your exposure to assure compliance with established RF exposure limits.

<http://www.fcc.gov/oet/rfsafety/rf-faqs.html>

<http://www.osha.gov/SLTC/radiofrequencyradiation/index.html>

OTHER OPERATIONAL FEATURES

The BK Radio KNR Series is based on a microprocessor core that allows extra features and operational characteristics to be programmed into the radio. Your dealer can help define the best operational settings for your system and program them into the radio.

SCAN DELAY

Scan delay lets the radio receive a response to a transmission before scanning the other channels for activity. If you find that your scanner is restarting before message replies are received, you can ask your dealer to increase the scan delay time (0–7.5 seconds).

This timer is also used to allow for Talkback Scan, Mixed Mode Talkback, and Unit-To-Unit Callback.

HI/LO POWER

Each channel in the radio can be individually programmed to always transmit in Low-Power Mode, regardless of the position of the radio's switch (or menu setting). If the programming for the channel allows high-power transmissions, the power level can be selected with a switch or the keypad menu.

DTMF ENCODING (Analog Mode Only)

Keypad-equipped radios can be programmed to enable DTMF (Dual Tone Multiple Frequency) encoding. To send DTMF tones (similar to the tones used by a standard push-button telephone):

1. Press and hold the PTT switch.
2. Press any of the keys on the keypad.

You will hear a sidetone.

EMERGENCY CALL

Note: Emergency operation only applies to channels programmed for Digital or Mixed Mode transmissions.

To place an emergency group call, press and hold the emergency button until the radio beeps and the display flashes. All scanning and priority scanning functions will be disabled. If the radio is in Unit-To-Unit Mode, that mode will be exited and the radio will be placed in Emergency Mode. Each subsequent press of PTT will cause the radio to transmit on the knob-selected channel with the emergency bit set, indicating an emergency condition. If the Channel Selector is changed, the Emergency Mode will follow to the newly selected channel. Cycle power to return the radio to normal operation.

On channels programmed for analog transmissions, pressing PTT in Emergency Mode will result in a normal analog transmission.

FEDERAL COMMUNICATIONS COMMISSION REGULATIONS

The FCC rules require manufacturers to comply with the FCC RF energy exposure limits for portable 2-way radios before they can be marketed in the U.S. When 2-way radios are used as a consequence of employment, the FCC requires users to be fully aware of and able to control their exposure to meet occupational requirements. Exposure awareness can be facilitated by the use of a product label directing users to specific user awareness information. Your BK Radio 2-way radio has a RF exposure product label. Also, your BK Radio owner's and service manuals include information and operating instructions required to control your RF exposure and to satisfy compliance requirements.

COMPLIANCE WITH RF EXPOSURE STANDARDS

Your BK Radio 2-way radio is designed and tested to comply with a number of national and international standards and guidelines (listed below) for human exposure to radio frequency electromagnetic energy. This radio complies with the IEEE and ICNIRP exposure limits for occupational/controlled RF exposure environment at operating duty factors of up to 50% transmitting and is authorized by the FCC for occupational use only. In terms of measuring RF energy for compliance with the FCC exposure guidelines, your radio radiates measurable RF energy only while it is transmitting (during talking), not when it is receiving (listening) or in Standby Mode. Note: The approved batteries supplied with this radio are rated for a 5-5-90 duty factor (5% talk-5% listen - 90% standby), even though this radio complies with the FCC occupational RF exposure limits and may operate at duty factors of up to 50% talk.

Your BK Radio 2-way radio complies with the following RF energy exposure standards and guidelines:

- United States Federal Communications Commission, Code of Federal Regulations; 47 CFR §§ 1.1307, 1.1310, 2.1091 and 2.1093
- American National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers (IEEE) C95.1-1992
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-1999 Edition

INDUSTRY CANADA COMPLIANCE

This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 Canada.

RF EXPOSURE COMPLIANCE AND CONTROL GUIDELINES AND OPERATING INSTRUCTIONS

To control your exposure and ensure compliance with the occupational/controlled environment exposure limits always adhere to the following procedures.

Guidelines:

- Do not remove the RF Exposure Label from the device.
- User awareness instructions must accompany device when transferred to other users.
- Do not use this device if the operational requirements described herein are not met.

Operating Instructions:

- Transmit no more than the rated duty factor of 50% of the time. To transmit (talk), push the Push-To-Talk (PTT) button. To receive calls, release the PTT button. Transmitting 50% of the time, or less, is important because this radio generates measurable RF energy exposure only when transmitting (in terms of measuring for standards compliance).
- Hold the radio in a vertical position in front of face with the microphone (and the other parts of the radio, including the antenna) at least one inch (2.5 cm) away from the nose. Keeping the radio at the proper distance is important because RF exposures decrease with distance from the antenna. Antenna should be kept away from eyes.
- When worn on the body, always place the radio in a BK Radio approved clip, holder, holster, case, or body harness for this product. Using approved body-worn accessories is important because the use of BK Radio or other manufacturer's non-approved accessories may result in exposure levels which exceed the FCC's occupational/controlled environment RF exposure limits.
- If you are not using a body-worn accessory and are not using the radio in the intended use position in front of the face, then ensure the antenna and the radio are kept at least one inch (2.5 cm) from the body when transmitting. Keeping the radio at the proper distance is important because RF exposures decrease with increasing distance from the antenna.
- Use only BK Radio approved supplied or replacement antennas, batteries, and accessories. Use of non-BK Radio approved antennas, batteries, and accessories may exceed the FCC RF exposure guidelines.
- For a list of BK Radio approved accessories visit the following website : <http://www.relm.com>.

CONTACT INFORMATION

For additional information on exposure requirements or other information, visit website <http://www.relm.com>.

RECEIVING A UNIT-TO-UNIT CALL

When a Unit-To-Unit call is received while the radio is in normal Operating Mode, the radio will beep twice. The display will show the ID of the calling unit. If the ID matches one of the Call List IDs, the associated label will be displayed along with the RX and phone icons. Otherwise the numeric ID will be displayed along with the RX and phone icons. The calling unit's ID will be displayed for the duration of the reception, and once the signal goes away, for a programmed hold time. When the hold time expires, the display will return to the normal Operating Mode display, but the phone icon will flash until the **U2U** button is pressed, putting the radio in Unit-To-Unit Mode, displaying the last active ID.

UNIT-TO-UNIT CALLBACK

If Unit-To-Unit callback is enabled, and a Unit-To-Unit call is received on the Ready-to-Transmit (RTX) channel, the user may press PTT before the hold time expires, causing the radio to enter Unit-To-Unit Mode and transmit using the received ID as the destination ID. If the callback timer expires before PTT is pressed, the radio will return to normal Operating Mode, but the phone icon will flash until Unit-to-Unit Mode is entered, bringing up the last active ID.

The callback timer can be cleared by making the held channel invalid. For instance, if a scan channel is being held, turn scan off.

If the RTX channel's Digital Squelch Mode is set to 'normal', the radio performs as when the Squelch Mode is 'selective', except all individual calls will be received when the incoming NAC matches the channel's programmed receive NAC, not just individual calls addressed to the unit. Individual calls not addressed to the unit will be indistinguishable from group calls. Only the channel label will be displayed, not the ID of the calling unit.

If Unit-To-Unit Mode is entered when the RTX channel is programmed for analog-only transmissions, pressing PTT will cause the radio to beep until PTT is released. **The user must select a channel capable of digital transmissions before placing a Unit-To-Unit call.** If the RTX channel is programmed for Mixed Mode transmit, transmissions will be made as digital Unit-To-Unit calls while the radio is in Unit-To-Unit Mode, regardless of the position of the 'TX Digital' switch.

INITIATING A UNIT-TO-UNIT CALL

To initiate a Unit-To-Unit call, press the **U2U** button to enter Unit-To-Unit Mode. The label of the last active (called or received) ID will appear on the display.

If the last active ID was a Call List ID, its label will be displayed along with the phone icon, otherwise the numeric ID will be displayed along with the phone icon. If a label is displayed, press and hold **[#]** to view the corresponding numeric ID.

To place a call to the displayed unit, press PTT. To choose another unit, use the keypad to enter the desired call list entry (0 - 9), or press down arrow repeatedly to cycle through all call list entries, or press **[#]** to manually key in a new ID (up to 7 digits). To re-select the 'last active' ID, press the **U2U** button. Once the new unit ID is selected or entered, press PTT to place the call.

To exit Unit-To-Unit Mode, press and hold the U2U button.

BASIC OPERATION

RECEIVE

1. Turn power on by turning the Volume knob clockwise. A beep sounds, indicating the radio is operational. The LCD display, if installed, shows the current channel.
2. Select a channel by turning the 16-position Channel Selector knob.
3. Adjust squelch and volume by pressing and releasing the MONITOR button. You will hear noise. Set the volume to a comfortable level. Then press the MONITOR button again to turn monitor mode off.

TRANSMIT

1. Press the PTT (Push-To-Talk) switch. When the transmitter is on, the red Transmit Indicator glows and **TX** appears in the display.
2. Talk in a normal voice with the microphone one to two inches from your mouth.
3. Release the PTT switch to stop transmitting.

If the Transmit Indicator does not glow when you press the PTT switch, the battery pack may need to be charged. If so, the display will indicate **LOBATT**, and the yellow Low-Battery Indicator will flash. If the Transmit Indicator does not glow and a tone sounds, you are on a receive-only channel or the channel is busy (if Busy Channel lockout is enabled). Select an authorized transmit channel.

If the length of your message exceeds the preset Time-Out Timer setting, the transmitter automatically shuts off and a tone sounds. To continue transmission, release the PTT switch, and then press it again and continue talking.

MIXED MODE OPERATION

The receiver and transmitter are capable of operating in analog wide-band (25 kHz channel spacing), analog narrow-band (12.5 kHz channel spacing) and APCO Project 25 Digital Mode.

Each channel's Receive and Transmit Mode can be set independently as follows:

Mode	RX	TX
Analog	Receive qualified analog signals only	Transmit analog signals only
Digital	Receive qualified digital signals only	Transmit digital signals only
Mixed	Automatically receive qualified analog or digital signals	Transmit analog or digital signal, depending on the status of 'TX Digital' soft switch.

Digital receptions and transmissions will be indicated by illuminating the 'D' annunciator in addition to the 'RX' or 'TX' annunciator.

MIXED MODE TALKBACK

If Mixed Mode Talkback is enabled, transmissions initiated while hold time remains will be in the same mode as the received signal, if the signal was received on the Ready to Transmit (RTX) channel. Depending on programming, the RTX channel can be the main channel, a held scan or priority channel if Talkback Scan is enabled, or the Priority 1 channel if TX on PR1 is enabled. TX Mode on the RTX channel must be set to **MIXED**.

While hold time after a reception remains, transmissions will be in the same mode as the received signal, regardless of the status of the 'TX Digital' soft switch. As in Talkback Scan, the RTX channel and receive annunciators will be displayed for the duration of the timer.

The talkback timer can be cleared by making the held channel invalid. For instance, if a scan channel is being held, turn scan off.

UNIT-TO-UNIT CALL

P25 Unit IDs allow for Unit-To-Unit calls when the radio is operating in Digital Mode. To view the radio's ID, press and hold the **U2U** button while not in Unit-To-Unit Mode. (Unit-To-Unit Mode is indicated by a phone icon in the upper right corner of the display). Channels programmed for analog only operation will not be able to transmit or receive Unit-To-Unit calls.

UNIT-TO-UNIT MODE

When the radio is in Unit-To-Unit Mode, all scanning functions will be disabled. The radio will receive and transmit on the Ready-to-Transmit (RTX) channel only. Depending on programming, the RTX channel can be the main channel, a held scan or priority channel if Talkback Scan is enabled, or the Priority 1 channel if TX on PR1 is enabled. To alert the user that the radio is in Unit-To-Unit Mode, a beep will periodically sound until the unit is returned to normal Operating Mode.

If the RTX channel's Digital Squelch Mode is set to 'selective', the radio will accept group calls, correctly addressed Unit-To-Unit calls, and if RX Mode is set to mixed, analog signals.

When a correctly addressed Unit-To-Unit call is received, the radio will beep twice. If the calling unit's ID matches one of the Call List IDs, the associated label will be displayed along with the RX and phone icon. Otherwise, the numeric ID will be displayed along with the RX and phone icon.

If the calling unit is not the same unit displayed before the call was received, the calling unit's ID will be displayed for the duration of the reception. The previously displayed ID will remain the default transmit ID, but the interrupting ID will be captured as 'last active'. To speak to the interrupting caller, press the **U2U** button to make the last active ID the new default transmit ID.

When a group call (or, if allowed, an analog signal) is received, the radio will display the RTX channel's label for the duration of the reception.

PRIORITY SCAN

Priority Scan enables the radio to receive on any channel while monitoring for a message on the designated priority channel(s). The radio samples each priority channel at a preset rate (.25-2.0 seconds) regardless of activity on any other channel. Priority Scan operates only while the radio is not transmitting and can be used in combination with scan operation.

Priority Scan is enabled, the display flashes **SCN**. If a message is received on a priority channel, the Priority Indicator lights, and the radio receiver locks onto that channel for the duration of the transmission, unless a higher priority channel interrupts.

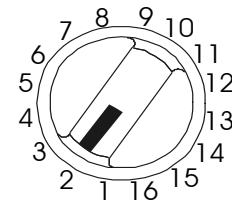
Priority Scan can be used in combination with Channel Guard. If a message is received on a priority channel, the radio receiver locks on to the priority channel and checks to see if the proper Channel Guard value is present. If the signal contains the proper Channel Guard value, the radio receives the message. Otherwise, the radio will re-check the channel every 4 seconds, until the activity on the channel ceases.

DUAL PRIORITY SCAN

In each group, up to two of the 16 channels can be designated as priority channels. These two, PR1 and PR2, are periodically tested for activity, even if a different transmission is being listened to. Activity on PR2 preempts activity on any of the non-priority channels. Receptions on PR1 have priority over any other channel in the group, including PR2.

Either priority channel can be programmed as a fixed channel, tied to the Channel Selector knob, or programmed OFF. If the radio is programmed to transmit on the first priority channel, transmissions will occur on PR1 when operating in Priority Scan Mode.

CHANNEL GROUPS



Radios are separated into groups of 16 channels each. Each group of 16 channels can be programmed to have an "individual personality" with its own set of operational features.

SELECT A GROUP/CHANNEL

Knob positions 1–16 select channels in the group selected by the keypad:

1. Press the **GRP** button to display the current group number.
2. Press a number key for the new group number. Only valid group entries will be accepted.

When changing groups, invalid entries will not be accepted, and the radio remains in the previously selected group.

3. Press the **GRP** button again. The radio returns to normal operation for the new group, and the selected channel is displayed. All selected scanning and priority functions affect only the channels in the group you are operating in.

SCAN OPERATION

The display indicates scan operation by flashing the **SCN** annunciator.

Scan operates only while the radio is not transmitting. The radio checks for signals on channels in the preset Scan List, as well as the channel selected by the Channel Selector knob.

When a signal is detected, scanning stops and the message is received. The received channel is shown in place of the transmit channel.

Once the signal ends, the radio continues to monitor the channel for the preset scan delay time before it resumes scanning.

SCAN CHANNEL GUARD CHANNELS

When a signal is detected, scanning stops while the radio checks for the proper Channel Guard value. If the signal contains the proper Channel Guard value, the radio receives the message. Otherwise, the radio resumes scanning immediately.

NUISANCE CHANNEL DELETE

If your radio is programmed for Nuisance Channel Delete and Channel Scan is assigned to a top toggle switch, a Nuisance Channel can be temporarily removed from the Scan List by sliding the switch down momentarily and then back up.

If Channel Scan is assigned to a button, a long press of the button will temporarily delete the nuisance channel.

TRANSMIT WITH SCAN ON

When scan is enabled, the radio transmits on the channel selected by the Channel Selector knob unless Talkback Scan is enabled or Priority Scan is enabled (see Priority Scan operation).

1. Select a transmit channel by turning the Channel Selector knob.
2. Press and hold the PTT switch and talk in a normal voice.

When the PTT switch is released, the radio continues to monitor the selected channel for the preset scan delay time before it resumes scanning.

TALKBACK SCAN

If your radio is programmed for Talkback Scan, press PTT while a channel is active or while scan delay time remains. You will be responding on the transmit frequency of the received channel.

Talkback Scan will not work if Priority Scan is also on and your radio is programmed to always transmit on the Priority 1 channel.

GROUP SCAN

Channels on each "Channel Scan List" in groups on the "Group Scan List" are scanned sequentially. The selected group is always scanned when Group Scan is enabled, even if that group is not on the Group Scan List.