

National Incident Radio Support Cache Basic Radio Operation Training NIFC – NIICD – NIRSC



INTRODUCTION

This training relates to NIFC National Incident Radio Support Cache (NIRSC) radio equipment and systems. A system that is not a NIFC-NIRSC system may work differently. As the BK DPH radio is the primary NIFC-NIRSC incident handheld radio, it will be featured throughout this training presentation.

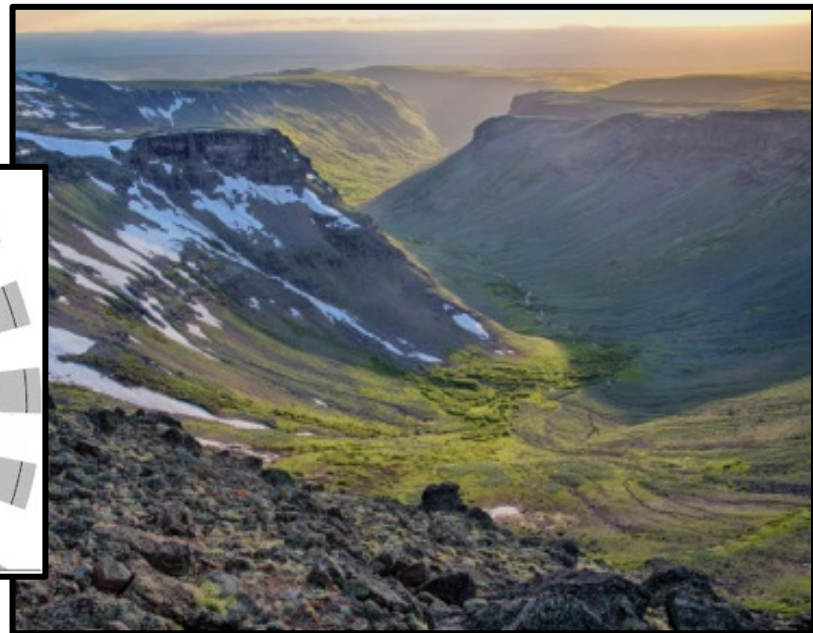
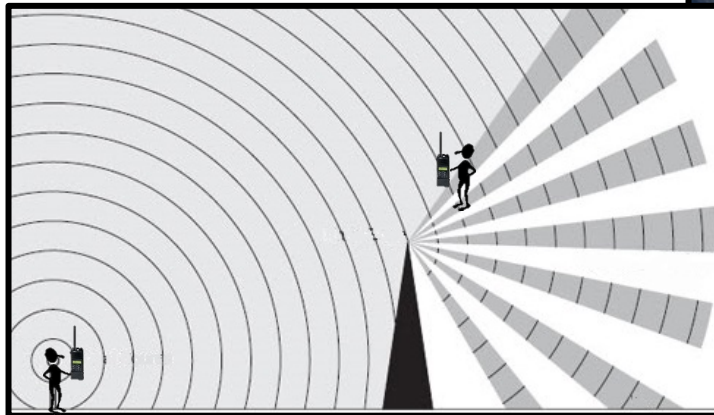
It is the responsibility of each user to understand the radio system and how to use it effectively and efficiently.

**YOUR HEALTH AND SAFETY
AND THAT OF OTHERS MAY
DEPEND ON IT.**



RADIO THEORY BASICS – How does radio work?

Radio waves are a type of electromagnetic radiation, the same as light waves, so they can be thought of in a similar way. If you want light to reach a certain object, a light source needs to be in that object’s “line of sight” with nothing blocking its path. Radio waves are the same. In order to communicate with a certain radio, you need to be in that radio’s general line of sight.



RADIO THEORY BASICS – How does radio work?

When you have line of sight between two radios and enough power to cover the distance, those radios should be able to speak directly to one another on a simplex channel without the use of intermediary equipment. Simplex channels use the same frequency to transmit and receive and are also known as direct or car-to-car channels.

Air-to-Ground and Tactical channels are examples of simplex channels.



RADIO THEORY BASICS – ICS-205 Incident Radio Comm Plan

INCIDENT RADIO COMMUNICATIONS PLAN			Simplex Channels						EXAMPLE
Ch	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq Nor/W	RX Tone/NAC	TX Freq Nor/W	Tx Tone/NAC	Mode A/D/M	Remarks
1	Tactical	TAC 1	Division A	168.1xxx N	141.3	168.1xxx N	141.3	A	
2	Tactical	TAC 2	Division B	168.3xxx N	141.3	168.3xxx N	141.3	A	
3	Tactical	TAC 3	Division C	168.8xxx N	141.3	168.8xxx N	141.3	A	
4	Tactical	TAC 4	Division D	168.6xxx N	141.3	168.6xxx N	141.3	A	
5	Tactical	TAC 5	Division X	168.3xxx N	141.3	168.3xxx N	141.3	A	
6	Tactical	TAC 6	Division Y	168.4xxx N	141.3	168.4xxx N	141.3	A	
7	Command	CMD 7	Bugs Butte	168.7xxx N	141.3	170.7xxx N	141.3	A	ICP to Fire Line
8	Command	CMD 8	Mount Daffy	168.3xxx N	141.3	170.9xxx N	141.3	A	Northern Fire Line to ICP
9	Command	CMD 9	Sylvester Pk	167.1xxx N	141.3	169.2xxx N	141.3	A	Southern Fire Line to ICP
10	Open	OPEN	Unassigned	162 4000 N	No Tone		No Tone	A	NOAA weather
11	Air to Ground	A/G PRI	All Divisions	167.6xxx N	No Tone	167.6xxx N	No Tone	A	Primary Air to Ground
12	Air to Ground	A/G SEC	All Divisions	166.1xxx N	No Tone	166.1xxx N	No Tone	A	Secondary Air to Ground
13	Logistics	CAMP NET	ICP Logistics	168.5xxx N	141.3	168.5xxx N	141.3	A	
14	Logistics	TRAFFIC	Road Control	163.2xxx N	141.3	163.2xxx N	141.3	A	Travel on Forest Rd 220
15	Forest Net	TREE	Mutual Aid	171.8xxx N	103.5	169.2xxx N	146.2	A	Contact ICP in case of emergency on FR 220
16	Air to Ground	AIR GUARD	Emergency	168.6250 N	No Tone	168.6250 N	110.9	A	Emergency aircraft contact

TX and RX frequencies are the same

Prepared By (Communications Only) _____ Incident Location _____
 County _____ State _____ Latitude _____ Longitude _____

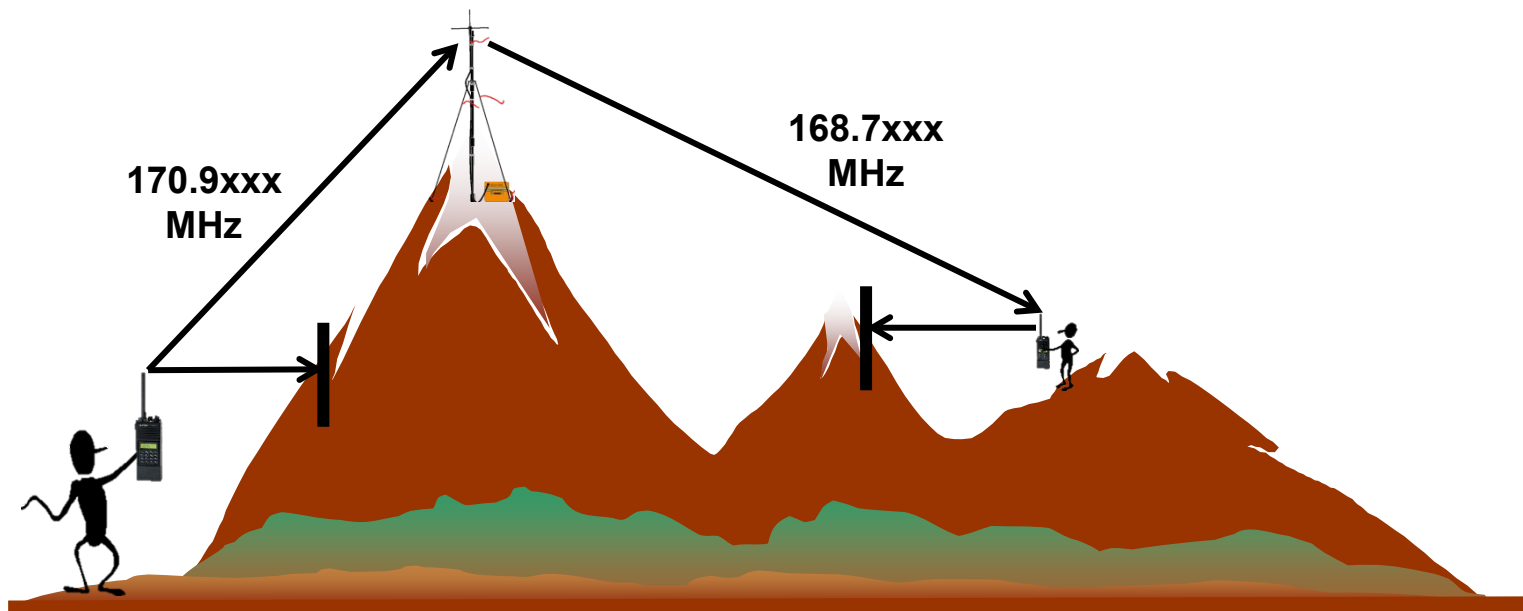
Mode refers to either "A" or "D" indicating analog or digital (e.g. Project 25) or "M" indicating mixed mode. All channels are shown as if programmed in a portable radio.

NIFC-NIICD-NIRSC Basic Radio Operation Training

RADIO THEORY BASICS –

Repeaters

- When two radios are not able to talk directly to one another due to distance or terrain, a repeater is needed.
- A repeater is a radio which is used to increase the range and coverage of mobile and handheld units. It is usually located on higher terrain such as a mountain top.
- Repeaters receive on one frequency and simultaneously re-broadcast (repeat) the signal on a different frequency.
- They extend your “line of sight”.
- “Command” channels are repeater channels.



RADIO THEORY BASICS – ICS-205 Incident Radio Comm Plan

INCIDENT RADIO COMMUNICATIONS PLAN		Repeater Channels							Date/Time
Ch #	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq Nor/W	RX Tone/NAC	TX Freq Nor/W	TX Tone/NAC	Mode A, D or M	Remarks
1	Tactical	TAC 1	Division A	168.1xxx N	141.3	168.1xxx N	141.3	A	
2	Tactical	TAC 2	Division B	168.3xxx N	141.3	168.3xxx N	141.3	A	
3	Tactical	TAC 3	Division C	168.8xxx N	141.3	168.8xxx N	141.3	A	
4	Tactical	TAC 4	Division D	168.6xxx N	141.3	168.6xxx N	141.3	A	
5	Tactical	TAC 5	Division X	168.3xxx N	141.3	168.3xxx N	141.3	A	
6	Tactical	TAC 6	Division Y	168.4xxx N	141.3	168.4xxx N	141.3	A	
7	Command	CMD 7	Bugs Butte	168.7xxx N	141.3	170.7xxx N	141.3	A	ICP to Fire Line
8	Command	CMD 8	Mount Daffy	168.3xxx N	141.3	170.9xxx N	141.3	A	Northern Fire Line to ICP
9	Command	CMD 9	Sylvester Pk	167.1xxx N	141.3	169.2xxx N	141.3	A	Southern Fire Line to ICP
10	Open	OPEN	Unassigned	162.400 N	No Tone		No Tone	A	NOAA weather
11	Air to Ground	A/G PRI	All Divisions	167.6xxx N	No Tone	167.6xxx N	No Tone		
12	Air to Ground	A/G SEC	All Divisions	166.1xxx N	No Tone	166.1xxx N	No Tone		
13	Logistics	CAMP NET	ICP Logistics	168.5xxx N	141.3	168.5xxx N	141.3		
14	Logistics	TRAFFIC	Road Control	162.2xxx N	141.3	162.2xxx N	141.3	A	Travel on Forest Rd 220
15	Forest Net	TREE	Mutual Aid	171.8xxx N	103.5	169.2xxx N	146.2	A	Contact ICP in case of emergency on FR 220
16	Air to Ground	AIR GUARD	Emergency	168.6250 N	No Tone	168.6250 N	110.9	A	Emergency aircraft contact
Prepared By (Communications Unit)					Incident Location				
COML					County	State	Latitude	Longitude	

EXAMPLE

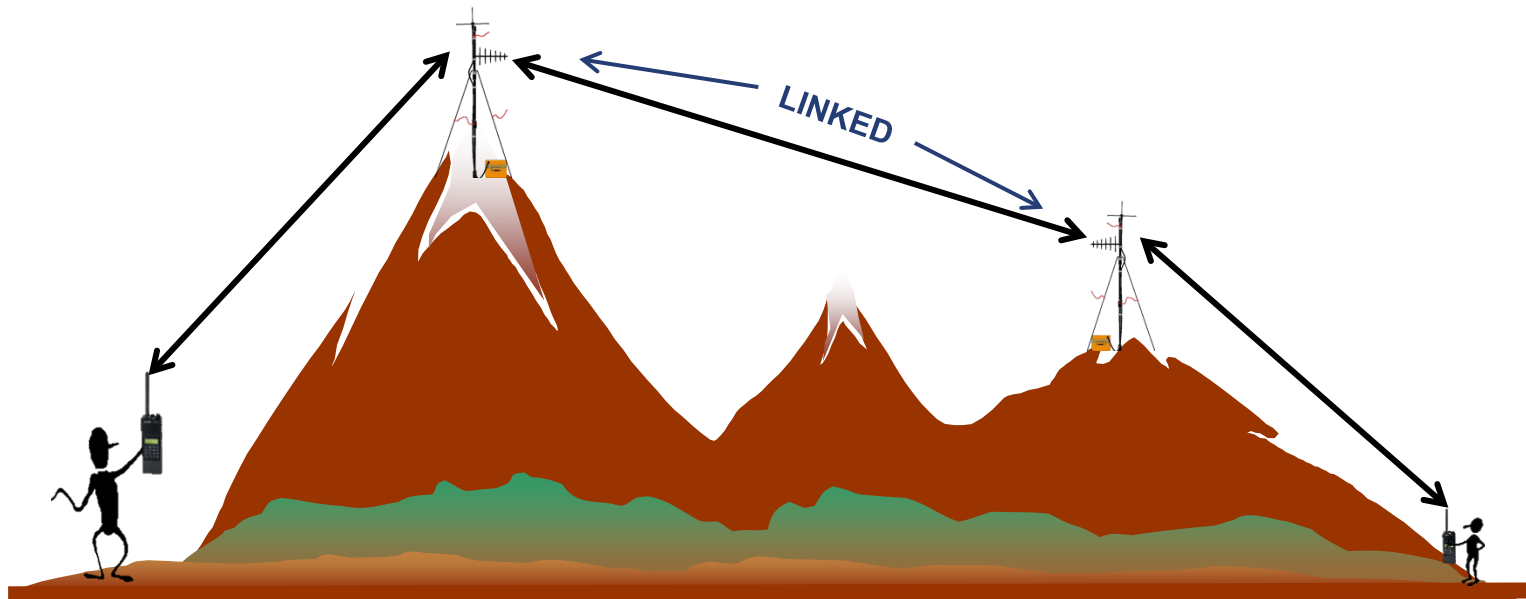
TX and RX frequencies are different

Mode refers to either "A" or "D" indicating analog or digital (e.g. Project 25) or "M" indicating mixed mode. All channels are shown as if programmed in a portable radio.

TX = Transmit RX = Receive

RADIO THEORY BASICS – Repeaters

NOTE: NIFC-NIRSC repeaters are designed so that they are able to be linked together. If you key up one repeater, all repeaters in the system will be keyed. Use the repeater that works best for the area in which you will be working.



RADIO THEORY BASICS – Cloning & Programming

- NIFC-NIRSC DPH and KNG2 radios are keypad-programmable. If you do not have the training to do so, it is better to have your radio programmed by someone who does. Better still, have your radio “cloned” from a radio that has already been programmed. You can always find able programmers willing to help in the Communications Unit.
- You can also find help here: <https://www.nwccg.gov/publications/training-courses/rt-130/communications>
- Clone - copies the programming (frequencies, tones, names, etc.) from the current group of the master radio to the current group of the radio receiving the clone.
- **Make sure you always have the latest programming/clone to match the current ICS-205 Incident Communications Plan.**
- **PROGRAM YOUR RADIO WITH AUTHORIZED FREQUENCIES ONLY.**



RADIO THEORY BASICS – Air Guard

- All aircraft operating on federal incidents are required to have a radio devoted exclusively to the continuous monitoring of the AIR GUARD frequency: 168.6250, with a TX tone of 110.9 Hz.
- AIR GUARD is an emergency aviation communications channel. It must be used only for:
 - Emergency air-to-ground communications
 - Emergency air-to-air communications
 - Initial call, recall, and re-direction of aircraft when no other contact frequency is available
- AIR GUARD is not to be used for tactical communications, local dispatching, administrative, flight-following or logistical use.
- **All Incident Radio Communications Plans (Form ICS-205) on federal incidents should have AIR GUARD programmed in the last available channel on the channel knob of all portable radios. If you are in an emergency situation and need to reach aircraft, you can quickly turn your radio to this channel to make emergency contact.**



RADIO THEORY BASICS – ICS-205 Incident Radio Comm Plan

INCIDENT RADIO COMMUNICATIONS PLAN		Air Guard							EXAMPLE
Ch #	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq Nor/W	RX Tone/NAC	TX Freq Nor/W	Tx Tone/NAC	Mode A, D or M	Remarks
1	Tactical	TAC 1	Division A	168.1xxx N	141.3	168.1xxx N	141.3	A	
2	Tactical	TAC 2	Division B	168.3xxx N	141.3	168.3xxx N	141.3	A	
3	Tactical	TAC 3	Division C	168.8xxx N	141.3	168.8xxx N	141.3	A	
4	Tactical	TAC 4	Division D	168.6xxx N	141.3	168.6xxx N	141.3	A	
5	Tactical	TAC 5	Division X	168.3xxx N	141.3	168.3xxx N	141.3	A	
6	Tactical	TAC 6	Division Y	168.4xxx N	141.3	168.4xxx N	141.3	A	
7	Command	CMD 7	Bugs Butte	168.7xxx N	141.3	170.7xxx N	141.3	A	ICP to Fire Line
8	Command	CMD 8	Mount Daffy	168.3xxx N	141.3	170.9xxx N	141.3	A	Northern Fire Line to ICP
9	Command	CMD 9	Sylvester Pk	167.1xxx N	141.3	169.2xxx N	141.3	A	Southern Fire Line to ICP
10	Open	OPEN	Unassigned	162.4000 N	No Tone		No Tone	A	NOAA weather
11	Air to Ground	A/G PRI	All Divisions	167.6xxx N	No Tone	167.6xxx N	No Tone	A	Primary Air to Ground
12	Air to Ground	A/G SEC	All Divisions	166.1xxx N	No Tone	166.1xxx N	No Tone	A	Secondary Air to Ground
13	Logistics	CAMP NET	ICP Logistics	168.5xxx N	141.3	168.5xxx N	141.3	A	
14	Logistics	TRAFFIC	Road Control	163.2xxx N	141.3	163.2xxx N	141.3	A	Travel on Forest Rd 220
15	Forest Net	TREE	Mutual Aid	171.8xxx N	103.5	169.2xxx N	146.2	A	Contact ICP in case of emergency on FR 220
16	Air to Ground	AIR GUARD	Emergency	168.6250 N	No Tone	168.6250 N	110.9	A	Emergency aircraft contact

Prepared By: (Communications Only)

Incident Location

COML

County State Latitude Longitude

Mode refers to either "A" or "D" indicating analog or digital (e.g. Project 25) or "M" indicating mixed mode. All channels are shown as if programmed in a portable radio.

KNOW YOUR RADIO

BK KNG2 radio

- Slides 13 – 19



BK DPH radio

- Slides 20 – 36



KNOW YOUR RADIO- BK KNG2 Handheld

Indicates simplex channel – if not present, it is a repeater channel

H – TX High Power
L – TX Low Power

Indicates scan is on

These buttons select the options on the screen.

To find more options, select MENU.

Channel Selector Knob

ON/OFF Volume Knob

Scan Switch

Priority Scan Switch

Antenna

Programming, Cloning, and Accessory Jack

Indicator Light: RX - Busy Channel Transmit

Internal Speaker & Mic

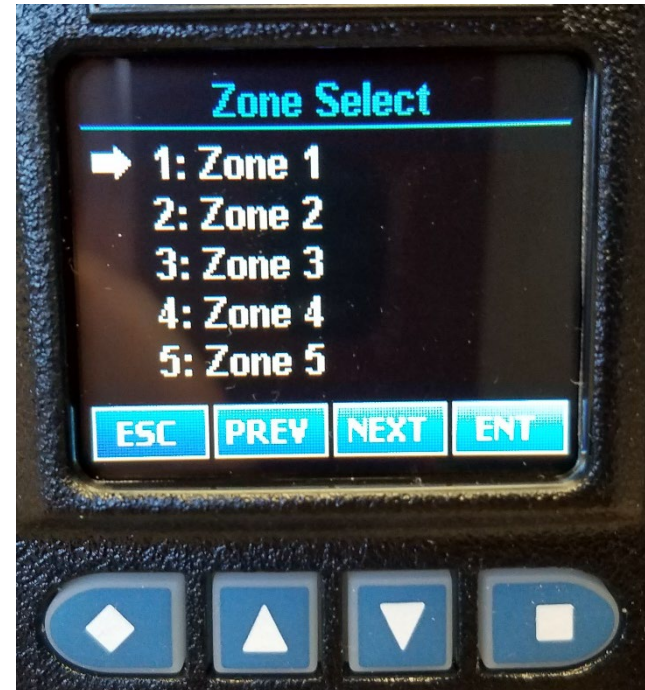
PTT Push-to-Talk

Monitor Button

Menu Access & Entry Keypad - used to access key features that have been programmed into the radio

KNOW YOUR RADIO – KNG2 Changing Channel Zones

The channels in your radio are organized into groups or zones. In the BK KNG2 radios, there are 16 channels per zone.



Zones are selected and changed through the menu screen. Push the Zone button and you will be given a list of zones from which to select.

KNOW YOUR RADIO – KNG2 Channel Guard Tones

- Code guard (CG) tones are known by many names: channel guard tones, Private Line (PL) tones, CTCSS tones . . . They are sub-audible signals that are transmitted along with the transmit frequency to perform special functions like accessing specific repeaters, or to protect a channel or system from outside interference. They act like a key; you need to use the correct key to activate the radio.
- On an incident, all repeaters will use the same tone for transmit and receive and will not operate unless the proper tone is transmitted by your radio and received by the repeater.
- **On an incident, this tone should be programmed into the channel.**
- See the ICS-205 Incident Radio Communications Plan for correct programming on an incident.



KNOW YOUR RADIO – ICS-205 Incident Radio Comm Plan

INCIDENT RADIO COMMUNICATIONS PLAN										Time Day Shift
Channel Guard Tones										
Ch #	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq Nor/W	RX Tone/NAC	TX Freq Nor/W	TX Tone/NAC	Mode A, D or M		
1	Tactical	TAC 1	Division A	168.1xxx N	141.3	168.1xxx N	141.3	A		
2	Tactical	TAC 2	Division B	168.3xxx N	141.3	168.3xxx N	141.3	A		
3	Tactical	TAC 3	Division C	168.8xxx N	141.3	168.8xxx N	141.3	A		
4	Tactical	TAC 4	Division D	168.6xxx N	141.3	168.6xxx N	141.3	A		
5	Tactical	TAC 5	Division X	168.3xxx N	141.3	168.3xxx N	141.3	A		
6	Tactical	TAC 6			141.3	168.4xxx N	141.3			
7	Command	CMD 7	Bugs Bute	168.7xxx N	141.3	170.7xxx N	141.3	A		ICP to Fire Line
8	Command	CMD 8	Mount Daffy	168.3xxx N	141.3	170.9xxx N	141.3	A		Northern Fire Line to ICP
9	Command	CMD 9	Sylvester Pk	167.1xxx N	141.3	169.2xxx N	141.3	A		Southern Fire Line to ICP
10	Open	OPEN	Unassigned	162.4000 N	No Tone		No Tone	A		NOAA weather
11	Air to Ground	A/G PRI	All Divisions	167.6xxx N	No Tone	167.6xxx N	No Tone	A		Primary Air to Ground
12	Air to Ground	A/G SEC	All Divisions	166.1xxx N	No Tone	166.1xxx N	No Tone	A		Secondary Air to Ground
13	Logistics	CAMP NET	ICP Logistics	168.5xxx N	141.3	168.5xxx N	141.3	A		
14	Logistics	TRAFFIC	Road Control	163.2xxx N	141.3	163.2xxx N	141.3	A		Travel on Forest Rd 220
15	Forest Net	TREE	Mutual Aid	171.8xxx N	103.5	169.2xxx N	146.2	A		Contact ICP in case of emergency on FR 220
16	Air to Ground	AIR GUARD	Emergency	168.6250 N	No Tone	168.6250 N	110.9	A		Emergency aircraft contact
Prepared By (Communications Unit)					Incident Location					
COML					County	State	Latitude	Longitude		

EXAMPLE

RX Tones →

← **TX Tones**

Mode refers to either "A" or "D" indicating analog or digital (e.g. Project 25) or "M" indicating mixed mode. All channels are shown as if programmed in a portable radio.

KNOW YOUR RADIO – The Mysteries of SQUELCH

- The SQUELCH circuitry in a radio is designed to keep the radio quiet unless there is a *proper* signal present.
- When a signal of a certain strength and property is detected, the squelch opens (i.e. turns on the audio). High ambient noise levels may provide enough signal to open the squelch (e.g. power lines, fluorescent lights).
- If adjusted too tightly, valid signals may not be strong enough to open the squelch. If adjusted too loosely, ambient noise will become annoying audio. Levels are user-adjustable.
- Open squelch can be used to hear a very weak signal.
 - To fully open squelch on a KNG2, press and hold the Monitor button until you hear static (below the PTT – scan must be turned off).
 - (NOTE: pushing the Monitor button once will turn off the receive tone for all channels. You'll hear all traffic on that frequency whether from a legit incident source or not.)
 - The squelch level is otherwise adjusted through the menu.



Monitor On



RX CG Off

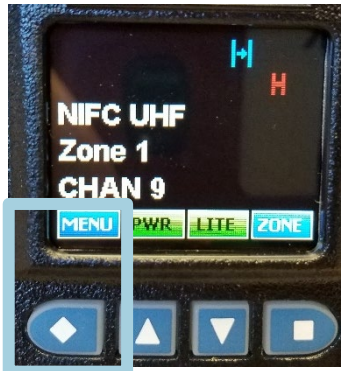
KNOW YOUR RADIO -

Scanning

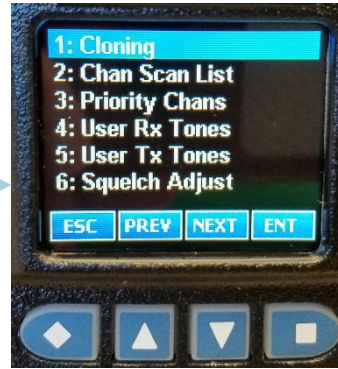
- The Scan function allows the user to monitor several channels at one time in addition to the current selected channel. Scan operates only when the radio is not transmitting. When a scanned signal is detected, the radio stops scanning, locks onto that channel, and receives the message.
- The received channel will be shown on the display if different from the current transmit channel. Once the signal ends, the radio continues to monitor that channel during a certain scan delay time before it resumes scanning.
- To respond to a message received on a scanned channel other than the selected transmit channel, you must first turn the channel knob to that channel.
- NOTE: Scanning takes more power and drains batteries more quickly.
- PRIORITY SCAN – this can be programmed to work many ways. Contact your Comm Unit for more info. Until then it suggested that you leave Priority Scan off.



KNOW YOUR RADIO – KNG2 Scanning



You can set up your scan list through the menu.



Toggle the channels you want to add to the scan list.

Move the Scan Switch to On and the radio will begin scanning the channels in your scan list.



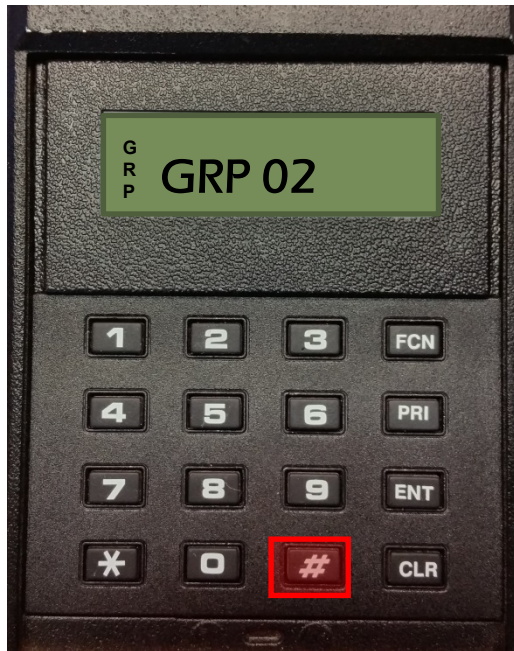
NOTE: To avoid the possibility of missing calls because of increased radio traffic and to avoid rapid battery depletion, NIFC-NIRSC recommends scanning no more than three channels.

KNOW YOUR RADIO- BK DPH Handheld



KNOW YOUR RADIO – Changing Channel Groups

The channels in your radio are organized into groups or zones. In the BK DPH radios, there are 16 channels in a group and 25 groups.



- Press the # key on the keypad to display the current group number.
- Press the new number for the desired group (up to two digits).
- Press the ENT key or wait five seconds. The radio returns to normal operation in the new group and the selected channel is displayed.
- NOTE: When changing groups, invalid entries will not be accepted and the radio will remain in the previously selected group.

KNOW YOUR RADIO – Channel Guard Tones

- Code guard (CG) tones are known by many names: channel guard tones, Private Line (PL) tones, CTCSS tones . . . They are sub-audible signals that are transmitted along with the transmit frequency to perform special functions like accessing specific repeaters, or to protect a channel or system from outside interference. They act like a key; you need to use the correct key to activate the radio.
- On an incident, all repeaters will use the same tone for transmit and receive and will not operate unless the proper tone is transmitted by your radio and received by the repeater.
- **If the incident has a tone assigned, the squelch knob on BK DPH radios should be set fully counterclockwise to the CG squelch position (the knob will click as if in the “off” position) so that the radio’s receiver will only open if it receives the correct code guard. This protects your radio from receiving non-incident-related traffic and interference.**
- See the ICS-205 Incident Radio Communications Plan for correct programming on an incident.



KNOW YOUR RADIO – ICS-205 Incident Radio Comm Plan

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Prepared By (Communications Unit)					Incident Location					
COML					County	State	Latitude	Longitude		

RX Tones →

← TX Tones

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KNOW YOUR RADIO – The Mysteries of SQUELCH

- The SQUELCH circuitry in a radio is designed to keep the radio quiet unless there is a *proper* signal present.
- When a signal of a certain strength and property is detected, the squelch opens (i.e. turns on the audio). High ambient noise levels may provide enough signal to open the squelch (e.g. power lines, fluorescent lights).
- If adjusted too tightly, valid signals may not be strong enough to open the squelch. If adjusted too loosely, ambient noise will become annoying audio. Levels are user-adjustable.
- There may also be times you will want to fully open the squelch:
 - Open squelch is used to set the listening volume level.
(to be demonstrated on a later slide)
 - Open squelch can also be used to hear a very weak signal (monitor).



KNOW YOUR RADIO – BK DPH Squelch Adjustment

- Adjust squelch and volume by turning the squelch knob clockwise until you hear noise.
- Set the volume to a comfortable level, then turn the squelch knob counterclockwise until the noise stops. This is called the Threshold Squelch setting.
- Or, turn the squelch knob all the way counterclockwise until you hear a click (“off” or detent) to set the radio to CG Squelch operation.



- The radio will then only receive traffic that is transmitting the proper code guard (CG).
- **As previously mentioned, NIFC-NIRSC systems will have an assigned CG on TX and RX; radios should always be set to the CG Squelch mode unless you need to monitor.**

KNOW YOUR RADIO -

Scanning

- The Scan function allows the user to monitor several channels at one time in addition to the current selected channel. Scan operates only when the radio is not transmitting. When a scanned signal is detected, the radio stops scanning, locks onto that channel, and receives the message.
- The received channel will be shown on the display if different from the current transmit channel. Once the signal ends, the radio continues to monitor that channel during a certain scan delay time before it resumes scanning.
- To respond to a message received on a scanned channel other than the selected transmit channel, you must first turn the channel knob to that channel.



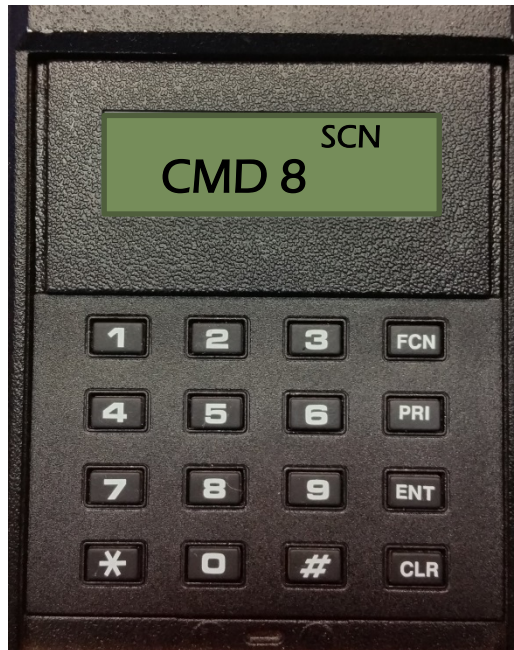
Scan
Switch

KNOW YOUR RADIO – BK DPH Scanning



TO ENABLE SCAN

- Flip up the switch labeled SCAN.
- The LCD display will indicate that SCAN is active by flashing SCN on the display.



TO DISABLE SCAN

- Flip down the switch labeled SCAN.
- The LCD display will indicate that SCAN is disabled by displaying SCN as steady letters – not flashing – if on a scanned channel, or blank if on an unscanned channel.

KNOW YOUR RADIO – BK DPH - Edit the Scan List

ADD Channels to Scan



- To add a channel to the scan list, first be sure SCAN is turned OFF.
- Turn the channel selector knob to the desired channel to be scanned.
- Press the ENT button.
- The radio will beep and you will see SCN in the display above the channel label.
- To add more channels to the scan list, repeat the previous steps.
- You can see which channels are in the scan list by scrolling through the channels and looking for SCN to appear on the display.

**To avoid the possibility of missing calls because of increased radio traffic and to avoid rapid battery depletion, NIFC-NIRSC recommends scanning no more than three channels.*

KNOW YOUR RADIO – BK DPH - Edit the Scan List

DELETE Channels from Scan



- To delete a channel from the scan list, first be sure that SCAN is turned OFF.
- Turn the channel selector knob to the desired channel to be deleted from the scan list. SCN indicates the channel is in the scan list.
- Press the CLR button.
- The radio will beep and you will see the SCN above the channel label disappear.
- To delete more channels from the scan list, repeat the previous steps.

KNOW YOUR RADIO – BK DPH Priority Scanning

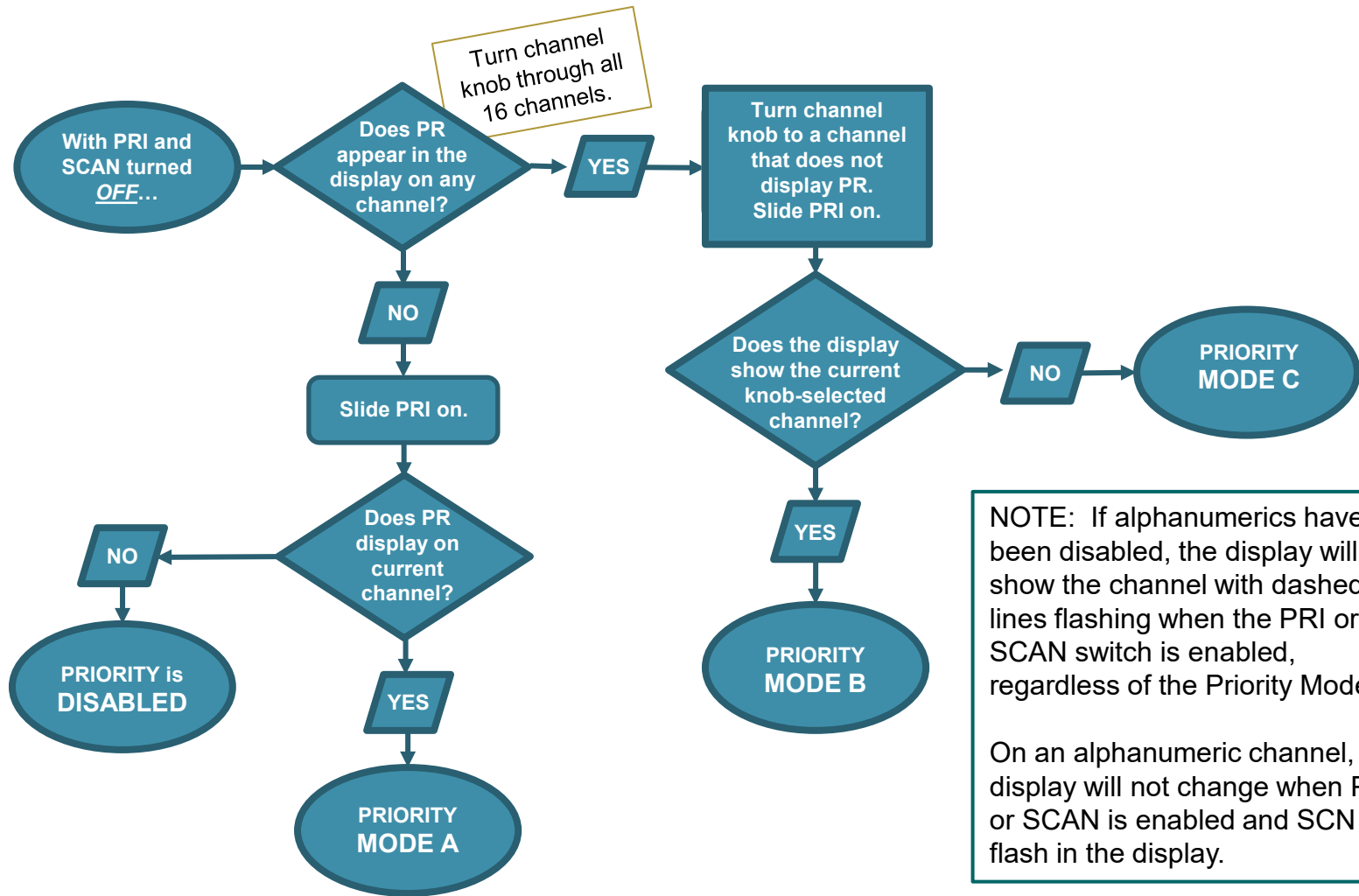
- When enabled, the Priority Scan function enables the radio to receive on any channel while monitoring for a message on the designated priority channel. When a proper signal is received on the priority channel, the radio locks onto that channel and the message is received.
- NIFC-NIRSC radios are programmed with Priority Scan disabled. However, when your radio is programmed or cloned on an incident it may be in any of the following modes (group-specific):
 - **Mode A**
 - The priority channel follows the transmit channel selected by the channel knob selection.
 - **Mode B**
 - The priority channel is preset and may be user-selectable .
 - **Mode C**
 - The priority channel is preset and may be user-selectable.
 - The radio **ALWAYS** transmits on the priority channel when Priority Scan is enabled

The following slide will help you determine the mode with which your radio is programmed.

Priority
Scan
Switch



KNOW YOUR RADIO – Which Priority Scanning Mode?

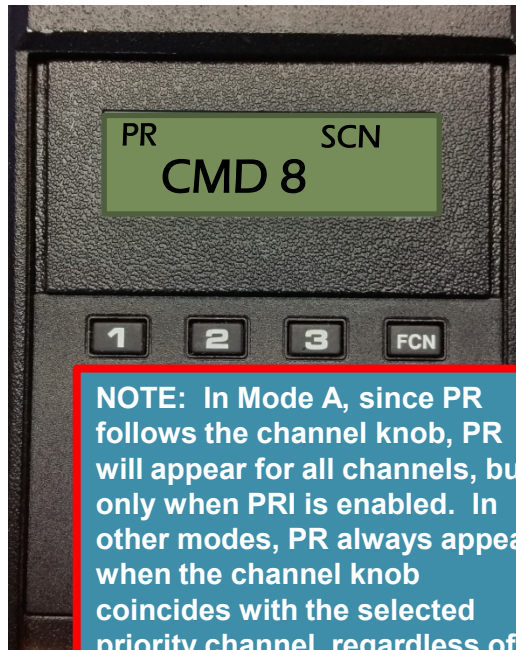


KNOW YOUR RADIO – Priority Scanning



TO ENABLE PRIORITY SCAN

- Flip up the switch labeled PRI.
- The LCD display will indicate that PRI is active by flashing SCN on the display, just as it does for regular scan.



NOTE: In Mode A, since PR follows the channel knob, PR will appear for all channels, but only when PRI is enabled. In other modes, PR always appears when the channel knob coincides with the selected priority channel, regardless of whether PRI is enabled or not.

TO DISABLE PRIORITY SCAN

- Flip down the switch labeled PRI.
- The LCD display will indicate that PRI is disabled by displaying SCN as steady letters – not flashing – if on a scanned channel, or blank if on an unscanned channel. Note: If scan is turned on, flashing will continue.

KNOW YOUR RADIO – BK DPH Function Key

FCN The Function Key



GOOD feature – Pressing *and holding* the FCN key will “lock” the keypad. Press and hold again to “unlock”. This prevents the radio from changing groups, functions, etc., if you accidentally bump the keypad. If you press the keypad and it beeps and reads “LOCKED”, this is what happened.

BAD feature (for our purposes anyway) – Pressing the FCN just once will put you into the function menu. Continuing to press FCN will step you through the menu. Pressing PRI will toggle the displayed function on and off. *The function flashes when enabled.* If you accidentally hit FCN and find yourself in this menu, either hit the ENT button to escape or wait 5 seconds and the radio will return to normal.

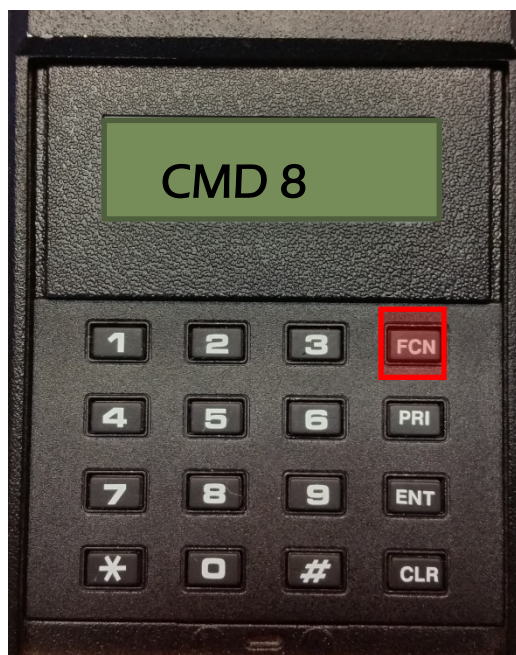
**All functions are disabled in NIFC-NIRSC radios, but may be active in radios that are not NIFC-NIRSC radios or those that have been reprogrammed. More information on following slide . . .*

KNOW YOUR RADIO – BK DPH Function Key

FCN
The Function Key

COMMON FUNCTIONS IN THE FUNCTION MENU

TRN DIR* – Transmit Direct – this puts the radio into repeater talk-around mode. This changes repeater channels to simplex channels by using the repeater channel's receive frequency for both transmit and receive. If this is toggled on, you will NOT be able to talk through the repeater and only users *within range of you* will hear you. When this function is activated, there are no visual indicators on the display.



RX 170.9xxx MHz
TX 168.7xxx MHz

DO NOT ENABLE TRN DIR*

RX 168.7xxx MHz
TX 168.7xxx MHz

RX 168.7xxx MHz
TX 170.9xxx MHz

Radio in repeater
talk-around mode.

**All functions are disabled in NIFC-NIRSC radios, but may be active in radios that are not NIFC-NIRSC radios or those that have been reprogrammed. More information on following slide . . .*

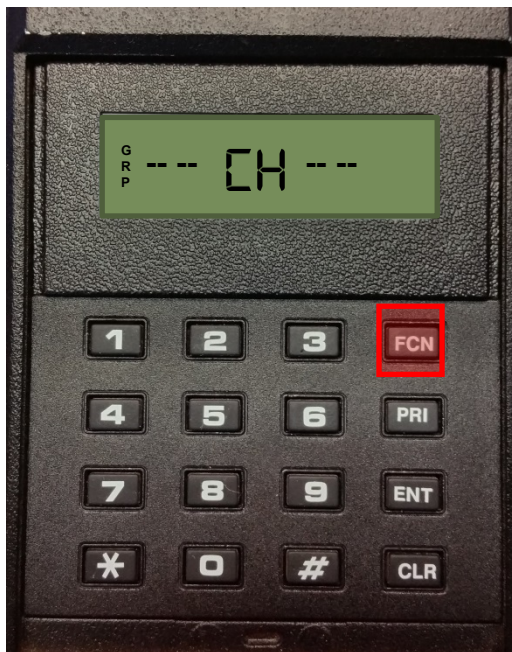
KNOW YOUR RADIO – BK DPH Function Key

COMMON FUNCTIONS IN THE FUNCTION MENU

FCN
The Function Key

GRP SCN* – Group Scan – causes the radio to scan all channels, group by group, that are programmed into the radio's various group scan lists, as well as the current group. When group scan is enabled, priority scan is disabled. This feature also causes a more rapid battery depletion. Regardless of the channel you are on, the display will read as on left if this function is activated.

DO NOT ENABLE GRP SCN*



**All functions are disabled in NIFC-NIRSC radios, but may be active in radios that are not NIFC-NIRSC radios or those that have been reprogrammed. More information on following slide . . .*

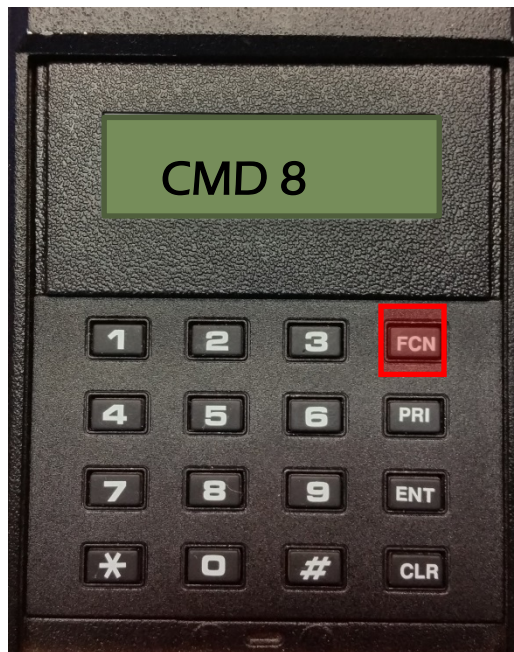
KNOW YOUR RADIO – BK DPH Function Key

COMMON FUNCTIONS IN THE FUNCTION MENU

FCN
The Function Key

TX DIG* – Transmit Digital – causes the radio to transmit in digital mode. NIFC-NIRSC systems are not set up in digital mode; the repeaters and other radios will not recognize the signal if your radio has this enabled. When this function is activated, there are no visual indicators on the display.

DO NOT ENABLE TX DIG*



**All functions are disabled in NIFC-NIRSC radios but may be active in radios that are not NIFC-NIRSC radios or those that have been reprogrammed.*

KEY THINGS –

Basic Elements for Radio Communications

- Radios must be powered on and operating on the same channel to hear one another.
- Be sure you always have the most current clone or programming.
 - The Comm Plan may change from one shift to the next, creating the need for a re-clone.
- Antennas must be present and properly oriented for best coverage:
 - As vertical as possible
 - Not blocked by the body or other obstacles
 - If you are using a handheld radio inside a vehicle, most of its signal will be blocked. It is best to use an external, mag-mount antenna.
- Batteries must be good. Be sure to change them each shift.
- Units must be in “line of sight” and within a practical range of one another.
- Use a repeater if “line of sight” to the other unit is blocked.



KEY THINGS – Knowledge is Power

- Know which repeaters cover the area in which you will be traveling/working.
- Know which radio channels access the repeaters.
- Know the simplex channels and what they're used for (tactical, air-to-ground, etc.). Will you need to use them where you are heading; e.g. checking in with a Division?
- If limited or no radio coverage, do you have an alternative form of communications?
 - Cell phone
 - Satellite phone
 - Human repeater
- For extended work in areas with no coverage, contact your Communications Unit Leader or Communications Technician for possible solutions.



KEY THINGS – Check your Equipment

- **Is your radio working?**
 - Call someone before departing... be sure you get a response.
 - Are you using fresh batteries?
 - Do you have extra batteries? You should have at least two sets: one in the radio and one spare.
 - Perform a quick check when you arrive at your work area to be sure you have good comms from that location.
- **Is the radio system operational?**



**Report any problems with the
radio system or portable radios
to the Communications Unit.**



KEY THINGS –

Proper Radio Protocol

- **Listen first – you don't want to “walk” on someone else's traffic. Do not interrupt unless you have an emergency.**
- **When initiating a call, use a to/from format and identify the channel you are using. This way, whoever you are calling knows on which channel to answer back. EXAMPLE: “Communications, Medic Matt on Command.”**
- **Know what you're going to say before you press the PTT. Remember, PTT stands for push-to-talk, not push-to-think.**
- **Key the mic, pause, then speak. A pause allows the radio system components to link properly.**
- **Hold the mic within a few inches of your mouth with your antenna aligned vertically.**
- **Use a normal voice; don't whisper or shout.**
- **Speak slowly and distinctly; enunciate, don't mumble.**
- **Unkey the mic and wait for a response. If you do not receive a response within 10-15 seconds, repeat your call.**
- **Confirm that relayed information is received and understood.**



KEY THINGS – Learning the Lingo



RADIO CHECK – What is my signal strength?
Can you hear me?

LOUD & CLEAR (or “5-by-5”) – A response to “radio check” meaning your transmission is readable.

GO AHEAD – Said if another party calls you and you are ready to receive their transmission.

STAND BY – You acknowledge the other party’s call but are unable to respond immediately.

COPY – You understood the transmission.

SAY AGAIN – You are requesting the other party re-transmit their message.

NEGATIVE – Same as “no”, but easier to understand over the radio.

AFFIRMATIVE – Same as “yes”, but easier to understand over the radio.

REPEAT – Used before you repeat something. Example: “There are cattle on the 409 road. Repeat, there are cattle on the 409 road.”

BREAK – Radios have time-out timers, so during long transmissions you need to unkey your radio every 1-2 minutes to reset, say “Break”, and then rekey to resume your message.

****USE PLAIN ENGLISH - DO NOT USE 10-CODES****

**THANKS, AND
REMEMBER ...**

