

MM101030V4  
*Operator's Manual*

**Panther 300M  
Mobile Radio**



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CRITICAL RADIO SYSTEMS



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## **SAFETY INFORMATION**

### **RADIO OPERATOR WARNING**



**Do not transmit with** this radio and antenna when persons are within the **MPE Radius\*** of the antenna [see “Determining MPE Radius” in this section], unless such persons (such as the driver or radio operator) are isolated from the antenna field by a grounded metallic barrier (such as the user’s vehicle rooftop). **MPE Radius** is the minimum distance from the antenna axis that persons should maintain in order to avoid RF exposure higher than the allowable **MPE level set by the FCC for General Population/Uncontrolled Exposure**, as specified in 47 CFR § 1.1310.

**FAILURE TO OBSERVE THESE LIMITS MAY ALLOW THOSE WITHIN THE MPE RADIUS\* TO EXPERIENCE RF RADIATION ABSORPTION WHICH EXCEEDS THE FCC MAXIMUM PERMISSIBLE EXPOSURE (MPE) LIMIT FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE.**

The shorter MPE Radius distances listed for the Occupational/ Controlled limits, as specified in 47 CFR § 1.1310, may be used if the user meets the following conditions:

- a) the user is exposed to the RF energy as a consequence of their employment,
- b) the user is aware of their exposure to the RF energy due to their training by reading this Operator’s manual, and
- c) the user exercises control over their exposure. In this case, the user knows they are using a Push-To-Talk land mobile radio whose transmitter is rated for a 20% intermittent duty cycle.

### **Determining MPE Radius\***

In the tables following, MPE Radii are listed for ranges of power within which this radio is intended to operate (20 - 40 Watts) and for antennas having gains of 0 - 6 dBd ( $1/4 \lambda$ , quarter-wave monopole = 0 dBd).

In order to determine the MPE Radius for your specific application, choose the VHF or UHF table that meets either the FCC's **General Population/Uncontrolled Exposure limits** or the **Occupational/Controlled Exposure limits**.

Then choose the row containing the appropriate power level into the antenna and read the MPE Radius on that row under the appropriate antenna gain. For powers or gains between listed numbers, choose the next higher listed number in each case.

**If you do not know the power level at which the radio is operating (set by the personality program), assume the maximum of 40 Watts. If you do not know the gain rating of the antenna, consult the antenna provider. For antennas of higher gains than listed, consult the supplier of this radio. If you do not know whether you are qualified to use the shorter distances as defined by Occupational/Controlled Exposure limits, then you must use the longer distances specified by the General Population/Uncontrolled Exposure limits.**

*\*\*Example: 450 MHz Band, 40 Watts and 2.5 dBd gain >>> follow 40 Watt row to 3 dBd column, which yields 186 cm (73 in) as the MPE Radius.*

MPE Radii for General Population/Uncontrolled Exposure: VHF Band (136 - 174 MHz<sup>1</sup>)

Power <sup>3</sup> (Watts)	dBd Antenna Gain <sup>4</sup>													
	0		1		2		3		4		5		6	
	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in
20	115	45	128	50	144	57	161	64	181	71	203	80	228	90
30	140	55	157	62	176	69	198	78	222	87	248	98	279	110
40	162	64	181	71	203	80	228	90	256	101	287	113	322	127

MPE Radii for General Population/Uncontrolled Exposure: UHF Band (450 - 512 MHz<sup>2</sup>)

Power <sup>3</sup> (Watts)	dBd Antenna Gain <sup>4</sup>													
	0		1		2		3		4		5		6	
	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in
20	93	37	105	41	117	46	132	52	148	58	166	65	186	73
30	114	45	128	50	144	57	161	64	181	71	203	80	228	90
40	132	52	148	58	166	65	186	73	209	82	234	92	263	104

*\*\*Example: 450 MHz Band, 40 Watts and 2.5 dBd gain >>> follow 40 Watt row to 3 dBd column, which yields 83 cm (33 in) as the MPE Radius.*

MPE Radii for Occupational/Controlled Exposure: VHF Band (136 - 174 MHz<sup>1</sup>)

Power <sup>3</sup> (Watts)	dBd Antenna Gain <sup>4</sup>													
	0		1		2		3		4		5		6	
	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in
20	51	20	57	23	64	25	72	28	81	32	91	36	102	40
30	63	25	70	28	79	31	88	35	99	39	111	44	125	49
40	72	28	81	32	91	36	102	40	115	45	128	51	144	57

MPE Radii for Occupational/Controlled Exposure: UHF Band (450 - 512 MHz<sup>2</sup>)

Power <sup>3</sup> (Watts)	dBd Antenna Gain <sup>4</sup>													
	0		1		2		3		4		5		6	
	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in
20	42	16	47	18	53	21	59	23	66	26	74	29	83	33
30	51	20	57	23	64	25	72	28	81	32	91	36	102	40
40	59	23	66	26	74	29	83	33	93	37	105	41	118	46



## MPE NOTES

1. Numbers are calculated for any VHF frequency, since MPE radii is the same.
2. Numbers are calculated for 450 MHz, giving the largest (worst-case) MPE radii.
3. Power delivered to antenna: radio output less cable and mismatch losses.
4. Gains are compared to an ideal, 1/4-wave monopole (1/2-wave dipole). Add 2.15 dB for comparison with an ideal isotropic source. (0 dBd = 2.15 dBi)

## TRANSMITTER HAZARDS



The operator of any mobile radio should be aware of certain hazards common to the operation of vehicular radio transmitters. **A list of several possible hazards is given:**

1. **Explosive Atmospheres** - Just as it is dangerous to fuel a vehicle with the motor running, similar hazards exist when operating a mobile radio. Be sure to turn the radio off while fueling a vehicle. Do not carry containers of fuel in the trunk of a vehicle if the radio is mounted in the trunk.

**Areas with potentially explosive atmosphere are often, but not always, clearly marked. Turn OFF your radio when in any area with a potentially explosive atmosphere. It is rare, but not impossible that the radio or its accessories could generate sparks.**

2. **Interference to Vehicular Electronics Systems** - Electronic fuel injection systems, electronic anti-skid braking systems, electronic cruise control systems, etc., are typical electronic systems that may malfunction due to the lack of protection from radio frequency energy present when transmitting. If the vehicle contains such equipment, consult the dealer and enlist their aid in determining the expected performance of electronic circuits when the radio is transmitting.

3. **Dynamite Blasting Caps** - Dynamite blasting caps may be caused to explode by operating a radio within 500 feet of the blasting caps. Always obey the "**Turn Off Two-Way Radios**" signs posted where dynamite is being used.

When transporting blasting caps in your vehicle:

- a. Carry the blasting caps in a closed metal box with a soft lining.
  - b. Leave the radio **OFF** whenever the blasting caps are being put into or removed from the vehicle.
4. **Liquefied Petroleum (LP) Gas Powered Vehicles** - Mobile radio installations in vehicles powered by liquefied petroleum gas with the LP gas container in the trunk or other sealed-off space within the interior of the vehicle must conform to the National Fire Protection Association standard (**NFPA**) **58** requiring:
    - a. The space containing the radio equipment shall be isolated by a seal from the space containing the LP gas container and its fittings.
    - b. Outside filling connections shall be used for the LP gas container.
    - c. The LP gas container shall be vented to the outside of the vehicle.

## **SAFE DRIVING RECOMMENDATIONS**

(Recommended By AAA)

- Read the literature on the safe operation of the radio.
- Keep both hands on the steering wheel and the microphone in its hanger whenever the vehicle is in motion.
- Place calls only when vehicle is stopped.
- When talking from a moving vehicle is unavoidable, drive in the slower lane. Keep conversations brief.
- If a conversation requires taking notes or complex thought, stop the vehicle in a safe place and continue the call.
- Whenever using a mobile radio, exercise caution.

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## **OPERATING RULES AND REGULATIONS**

Two-way FM radio systems must be operated in accordance with the rules and regulations of the local, regional, or national government.

In the United States, the PANTHER 300M radio must be operated in accordance with the rules and regulations of the Federal Communications Commission (FCC). As an operator of two-way radio equipment, you must be thoroughly familiar with the rules that apply to your particular type of radio operation. Following these rules helps eliminate confusion, assures the most efficient use of the existing radio channels, and results in a smoothly functioning radio network. When using your two-way radio, remember these rules:

1. It is a violation of FCC rules to interrupt any distress or emergency message. As your radio operates in much the same way as a telephone "**party line**", always listen to make sure that the channel is clear before transmitting. Emergency calls have priority over all other messages. If someone is sending an emergency message - such as reporting a fire or asking for help in an accident - **KEEP OFF THE AIR!**
2. The use of profane or obscene language is prohibited by Federal law.
3. It is against the law to send false call letters or false distress or emergency messages. The FCC requires that you keep conversations brief and confine them to business. To save time, use coded messages whenever possible.
4. Using your radio to send personal messages (except in an emergency) is a violation of FCC rules. You may send only those messages that are essential for the operation of your business.
5. It is against Federal law to repeat or otherwise make known anything you overhear on your radio. Conversations between others sharing your channel must be regarded as confidential.
6. The FCC requires that you identify yourself at certain specific times by means of your call letters. Refer to the rules that apply to your particular type of operation for the proper procedure.
7. No changes or adjustments shall be made to the equipment except by an authorized or certified electronic technician.

**IMPORTANT**


Under U.S. law, operation of an unlicensed radio transmitter within the jurisdiction of the United States may be punishable by a fine of up to \$10,000, imprisonment for up to two years, or both.

## **OPERATING TIPS**

The following conditions tend to reduce the effective range of two-way radios and should be avoided whenever possible:

- Operating the radio in areas of low terrain, or while under power lines or bridges.
- Obstructions such as mountains and buildings.

In areas where transmission or reception is poor, some improvement may be obtained by insuring that the antenna is vertical. Moving a few yards in another direction or moving to a higher elevation may also improve communication.



## **INTRODUCTION**

This manual describes the operation for the Com-Net Ericsson Panther 300M Mobile radio. The Panther 300M radio is a high performance FM mobile radio providing reliable two-way communication in a Conventional radio system.

The Panther 300M radio can be programmed with up to 6 channels. The Panther 300M radio includes a 7-segment, two character numeric display for channel display.

The Panther 300M radio can be programmed to operate with any of the following Conventional radio system platforms:

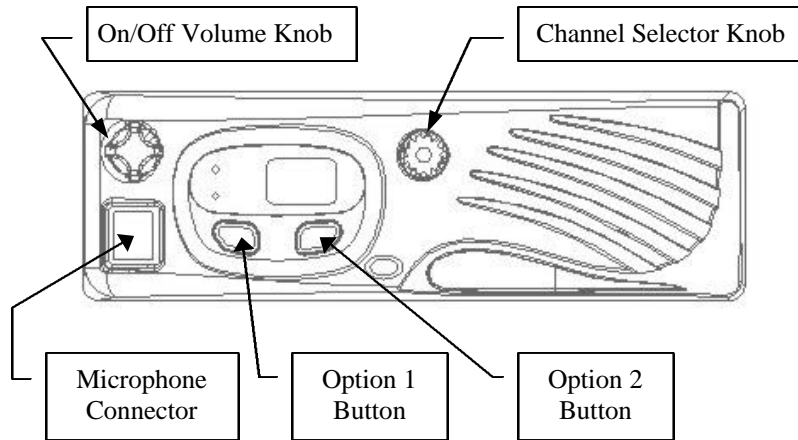
- ❑ Channel Guard (with or without STE)
- ❑ Digital Channel Guard
- ❑ Type 99

The Panther 300M is a versatile radio designed to meet most Conventional applications. The 300M radio will be available in numerous splits in the VHF and UHF bands. The 300M radio can be purchased with a maximum output power of 40 Watts with a turndown to 20 Watts. For both the 20 Watt and the 40 Watt units, the radio can be programmed for low or high power on a per channel basis. A Canadian option is available in the Maintenance software to limit the maximum power to 30 Watts. The following table provides a complete list of the 300M radios model numbers.

**Table 1 – Panther 300M Radio Model Numbers**

<b>Radio Model #</b>	<b>Description</b>
KRD 103 154/1	136-155 MHz, 20-40 Watt
KRD 103 154/2	150-174 MHz, 20-40 Watt
KRD 103 154/3	450-488 MHz, 20-40 Watt
KRD 103 154/4	470-512 MHz, 20-40 Watt

## **CONTROLS, DISPLAYS AND INDICATORS**

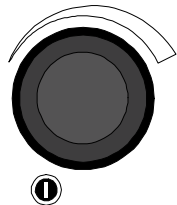


**Figure 1 – Panther 300M Radio Front View**

### **CONTROLS**

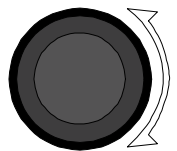
All the controls for the Panther 300M mobile radio are located on the front of the control unit and described below:

#### **ON/OFF Volume Knob**



This knob powers the radio ON/OFF and controls the volume level of the received audio at the speaker. Rotate the knob counterclockwise to turn the volume down. Rotate the knob clockwise to turn the volume up. Rotate the knob counterclockwise until it clicks and then stops, to turn the radio OFF. When the knob is in the OFF position, rotate the knob clockwise until the knob clicks to turn the radio ON.

#### **Channel Selector Knob**



This 6 position rotary knob is used to select the desired channel from a preprogrammed list of channels. Rotate the knob clockwise to increment to the next channel in the list. Rotate the knob counterclockwise to decrement to the next channel in the list.

### Option 1 Button



This button can be programmed to control one of the radio's programmable option functions. The default function is "Monitor/Clear".

### Option 2 Button



This button can be programmed to control one of the radio's option functions. The default function is "Disabled".

## OPTION BUTTON FUNCTIONS

The following functions can be assigned to one of the two option buttons. The same function can not be assigned to both option buttons.



*In order to prevent inadvertent operation, the Option Buttons must be pressed for at least one second before they execute their programmed function.*

### Disabled

No function is assigned to the option button. When pressed, the radio will give the Denied alert tone. This is the default for Option Button 2.

### Monitor/Clear

The Monitor/Clear function monitors the channel for activity. While pressed, noise squelch is disabled, Channel Guard is disabled, Type 99 is disabled, and the option button's LED is turned on.

If the channel is not busy, squelch noise will be heard. If the channel is busy, the activity on the channel will be heard.

When the option button is released, the option button's LED will turn off, Type 99 will be re-enabled, Channel Guard will be re-enabled, and noise squelch will be re-enabled.

Pressing the Monitor/Clear option button can also be used to clear the Type 99 Decoder state from Monitor Mode to Selective Signaling mode



after a successful Type 99 decode and to reset the Horn Alert function after a Type 99 Individual Call.

This is the default function for the Panther 300M's Option 1 button.

### **Local/Distant Squelch**

The Local/Distant Squelch function overrides the channel's programmed local/distant squelch setting. This is a toggle function. If the radio is currently using the tighter Local squelch, then pressing the Local/Distant Squelch button will change the squelch setting to the looser Distant setting. If the radio is currently using the Distant settings, then pressing the option Local/Distant button will change the squelch settings to the Local settings.

The option button's LED will be on when the radio is using its Local squelch settings. The option button's LED is off when the radio is using its Distant squelch settings.

There will be one keypress beep when going from Distant to Local and two keypress beeps when going from Local to Distant.

### **Type 99 On/Off**

The Type 99 On/Off function controls the state of the Type 99 Decoder. When "On", the option button's LED is on and the radio is put into Selective mode. The Type 99 function will mute receive audio until it receives a valid Type 99 call.

When "Off", the radio is always in Monitor mode. The option button's LED will be off.

The Type 99 On/Off function is a toggle function. There will be one keypress beep when the function goes from "Off" to "On" and two keypress beeps when the function goes from "On" to "Off".

The Type 99 On/Off function requires a Type 99 decode be programmed on the displayed channel. If this is not the case, the Type 99 On/Off function will just do a Denied Alert Tone.

When the channel is changed or when the radio is powered up, the Type 99 decoder will change to the programmed Selective Call or Monitor Mode default state.

## **Home Channel**

The Home Channel function will set the radio channel from the frequency switch selection to the preprogrammed Home Channel. When "On", the preprogrammed Home Channel number will be in the display and the option button's LED will be on. When the function is "Off", then the frequency switch selection channel will be in the display and the option button's LED will be off.

The Home Channel function is a toggle function. There will be one keypress beep when the function goes from "Off" to "On" and two keypress beeps when the function goes from "On" to "Off".

The radio will have all the programmed features of the home channel number when the Home Channel function is selected.

Changing the channel selection knob or turning the radio off and then back on will cancel the Home Channel Function.

## **Horn Alert On/Off**

The Horn Alert On/Off function controls operation of the Horn Alert function of the Type 99 decoder. When "On", the Horn Alert function is enabled. The option button's LED is on. Reception of a Type 99 Individual Call will activate the horn alert relay.

When "Off", the Horn Alert function is disabled. The option button's LED is off. Reception of a Type 99 Individual Call will not activate the horn alert relay.

The Horn Alert On/Off function is a toggle function. There will be one keypress beep when the function goes from "Off" to "On" and two keypress beeps when the function goes from "On" to "Off".

The Horn Alert On/Off function requires a Type 99 Individual Call be programmed on the displayed channel. If this is not the case, attempting to enable the Horn Alert On/Off function will just produce the Denied Alert tone.

If Type 99 is not enabled when the Horn Alert On/Off function is enabled, then the radio will enable the Type 99 decoder. However, disabling the Horn Alert On/Off function will not disable the Type 99 decoder function.

Changing the channel selection knob or turning the radio off and then back on will cancel the Home Channel Function.

### **Public Address On/Off**

The Public Address function controls Public Address operation. When "On", the Public Address function is active. The option button's LED is on. Pressing PTT will send microphone audio through the radio's receive amplifier to the external speaker.

When "Off", the public address function is not active. The option button's LED will be off. Pressing PTT will key the transmitter and send microphone audio through the transmitter.

The Public Address On/Off function is a toggle function. There will be one keypress beep when the function goes from "Off" to "On" and two keypress beeps when the function goes from "On" to "Off".

### **Internal/External Speaker**

The Internal/External Speaker function allows receive audio to go to an internal or external speaker. When "External Speaker" is selected, the speaker relay is activated, receive audio goes to the external speaker, and the option button's LED is on. When "Internal Speaker" is selected, the speaker relay is not activated, receive audio goes to the internal speaker, and the option button's LED is off.

When going from internal to external speaker, there will be one Keypress Alert Tone. When going from external to internal speaker, there will be two Keypress Alert Tones.

## **HOOKSWITCH FUNCTIONS**

The microphone hookswitch functions can be enabled or disabled in the radio personality. The sense of the hookswitch is also a radio personality entry.

When enabled, removing the microphone from its bracket will disable the Channel Guard and Type 99 decoders to allow monitoring of the channel. Note taking the microphone off-hook does not disable noise squelch. As a result, unlike pressing the Monitor/Clear button, the radio seems quiet when there is no activity.

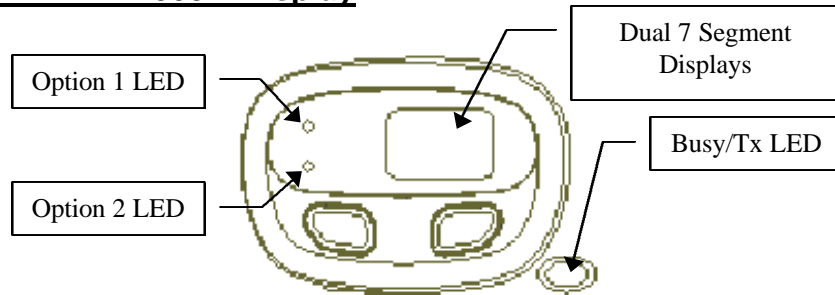
Returning the microphone to the bracket will re-enable any programmed Channel Guard or Type 99 decoder.

Returning on-hook will also reset the Type 99 decoder from Monitor Mode to Selective Call Mode after a valid Type 99 decode.

Lastly, if the Horn Alert function has been activated, returning the microphone to the hookswitch will deactivate and reset the Horn Alert function for the next in Type 99 individual call.

## DISPLAY

### PANTHER 300M Display



**Figure 2 - PANTHER 300M Display**

The PANTHER 300M includes a dual two character 7-segment display, two LEDs to indicate Option Function Status, and a tri-color LED to indicate Transmit/Receive Status. The 7 Segment Displays are also used to provide various radio status information and error status information.

**1 ... 6**

The PANTHER 300M radio normally displays the selected channel by displaying the selected channel number in the two 7 Segment Displays. The PANTHER 300M radio can not display the channel name defined in the radio personality, only the channel number.

### Display Status And Error Codes

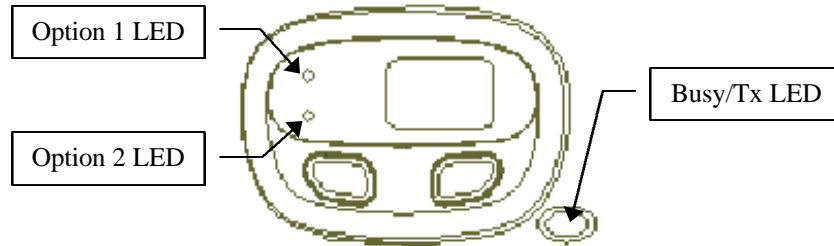
- |           |  |
|-----------|--|
| <b>C</b>  | Mobile is in CopyCat Mode number.  |
| <b>CC</b> | Carrier Control Timer Timeout. The transmitter has been disabled by the Carrier Control Timer function. "CC" will be displayed and the carrier Control Alert Tone will be sounded until PTT is released.                                       |
| <b>EC</b> | Empty Channel. The channel selector switch is either on an invalid channel position or the current channel position is not programmed. Verify the channel selector switch is in its proper detent and that the channel is properly programmed. |

<b>LC</b>	Locked Channel. The transmission is not allowed due to the channel busy lockout option and a busy channel condition..
<b>nA</b>	No Ignition A+. The transmission is not allowed due to the Ignition A+ option and the lack of DC power at the Option Connector's Ignition A+ pin.
<b>P</b>	The radio is currently in programming mode. If this inadvertently occurs during normal operation, turn the radio power off and then on.
<b>PA</b>	Public Address. The Public Address option is enabled and is currently active. Microphone Audio will be routed through the receiver audio PA to the external speaker.
<b>Pd</b>	Power Down. The transmitter is disabled due to the software thermal protection function.
<b>PE</b>	Power Error. The radio has sensed either excessive or no RF power when the radio should be transmitting. There is either an antenna failure or a radio PA failure present.
<b>UL</b>	Synthesizer Unlocked. The synthesizer is unlocked during normal operating conditions. This is an error condition where the radio is not on receive or transmit on the desired frequency. The error condition could be due to an inappropriate personality or a hardware failure in the radio's RF frequency generation circuitry. The radio should be returned for service to a qualified radio technician.

## Self Test Error Messages

- E1** Personality Checksum Error. Reprogram the radio with a valid personality. If the error persists, the radio should be returned for service to a qualified radio technician.
- E2** Tracking Data Error. The radio should be returned for service to a qualified radio technician.
- E3** Inappropriate RD Power. RF power is being sensed when the radio should not be transmitting. The radio should be returned for service to a qualified radio technician.
- E4** Synthesizer Unlocked At Power-Up. The radio could not lock upon the receive channel frequency during power-up. Reprogram the radio with a valid personality. If the error persists, the radio should be returned for service to a qualified radio technician.
- E5** CopyCat Error. The radio cloning operation failed. If the error persists, the radio should be returned for service to a qualified radio technician.
- E6** Flash Software Checksum Error. The radio's operating software has been corrupted. The radio should be returned for service to a qualified radio technician.

## RADIO INDICATORS

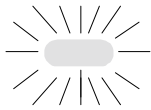


### Option Status Leds

The two Option Status LEDs to the left of the seven segment displays indicate the current state of the option that is programmed into the corresponding Option key. The upper LED indicates the state of option assigned to the Option 1 button. The lower LED indicates the state of the option assigned to the Option 2 button.

When the option is "Enabled", or "on" the LED will be on. When the option is "disabled" or "off", then the LED will be off.

### Busy / Tx Indicator



This indicator is to the right of the option buttons toward the bottom of the radio. It is a three color LED. The LED can be Red, Green, or Orange. The LED can also be on steady or flashing depending upon the radio state.

The LED is most frequently used to indicate when the radio is transmitting and when the channel is busy. When the radio is transmitting, the red LED turns on steady. When the radio channel is in use or "busy", the green LED turns on steady.

Note that the steady green LED does not necessarily indicate a received call if the channel has Channel Guard or Type 99 signaling. The steady green LED only means that the channel is in use.



A flashing green light means the radio is on a Type 99 channel that has decoded a Type 99 call. If it is flashing more off than on (950 milliseconds off, 50 milliseconds on) then there is no carrier present on the displayed channel. If the green LED is flashing more on than off (950 milliseconds on, 50 milliseconds off), then there is a carrier present on the displayed channel.

An orange LED usually indicates an error condition or radio failure.

## **ALERT TONES**

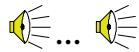
The PANTHER 300M radio generates a number of unique audible alert tones or “beeps” to indicate various operating conditions. The alert tone feature can be enabled or disabled through PC Programming. All of the PANTHER 300M alert tones are described in the following sections:

### **Power Up**



On power up, the radio performs a diagnostic test and then sounds three short tones to indicate the radio has passed the diagnostic test and is ready for operation.

### **Carrier Control Timer**

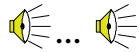


The Carrier Control Timer (CCT) is a programmable timer that limits the amount of time the radio will allow the user to continuously transmit. Once the time period has expired, the radio ends the transmission and sounds a warning tone. The warning tone will continue until the user releases the PTT button on the microphone.

### **Denied Tone**

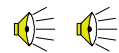
A short beep that sounds when an action produces an error or has no meaning. For example, pressing the Type 99 On/Off option button when the displayed channel does not have a Type 99 call defined.

### **Failed Tone**



The Failed tone is a continuous low frequency tone that is sounded when the radio fails its power-up self test or when another fatal error occurs. The tone will sound indefinitely until the radio is turned off.

### **Option Button Keypress That Disables**



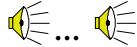
An option keypress that disables a function will sound two short beeps.

### **Option Button Keypress That Enables**



An option keypress that enables a function will sound one short beep.

### **Transmitter Disabled**



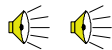
The Transmitter Disable Tone will sound when the PTT is pressed but transmit operation is locked out by the Busy Lockout Options. The warning tone will continue until the user releases the PTT button on the microphone. This tone will also sound when the PTT is pressed on a receive only channel.

### **Type 99 Individual Call**



When the radio receives an individual call, the radio will sound one (1) short beep to alert the user of an individual call.

### **Type 99 Group Call**



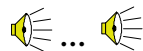
When the radio receives a group call, the radio will sound two (2) short beeps to indicate the radio has received a group call.

### **Type 99 Super Group/Quick Call**



When the radio receives a CNE super group or a Motorola Quick Call, the radio will sound three (3) short beeps to indicate the radio has received a super group or Quick Call.

### **Synthesizer Unlock**



If the synthesizer is unable to load and lock on the channel, an alert tone will sound until the synthesizer locks on the channel.

## BASIC OPERATION

### TURNING THE RADIO ON

Typically, mobile radio installations require the vehicle ignition switch to be in the Accessory or Run position before the radio will power ON. In some applications, the radio is wired directly to the battery and the radio will power ON regardless of the setting of the vehicle ignition. Verify with the installer how the radio has been connected.

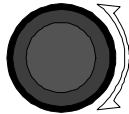


1 ... 6

From the OFF position, rotate the ON/OFF Volume knob clockwise until the knob clicks. The radio performs a diagnostic test and then sounds three short tones to indicate the radio has passed the diagnostic test and is ready for operation. The display comes ON and indicates the currently selected channel.

### SELECTING OR CHANGING CHANNELS

Rotate the Channel Selector Knob clockwise or counterclockwise until the desired channel appears in the display.



The Channel Knob is a rotary knob that is used to select the desired channel. Rotate the knob clockwise to increment to the next channel. Rotate the knob counterclockwise to decrement to the previous channel.

### TRANSMITTING A BASIC CALL



1. Make sure the radio is ON. Select the desired system and channel as described in the previous sections.
2. Observe the TX/RX indicator for any activity on the channel..
3. Press and hold the **Monitor/Clear** button for at least 1 second to monitor the channel for activity. Noise will be heard if there is no activity on the

channel. This will also help in setting the volume level to the desired level.



4. Remove the microphone from the hookswitch. Holding the microphone approximately 2 inches from your mouth, press the PTT button on the side of the microphone and speak in the microphone.



*Always speak in a normal tone of voice. Hold the microphone cupped in your hand and approximately two (2) inches from your mouth. Shouting will degrade your transmission, so do not speak any louder than normal.*

5. When you have finished speaking, release the PTT button and wait for a reply.

## **PUBLIC ADDRESS MESSAGE**

1. Verify the LED for the Public Address Option Button is on. If it is not, press the Public Address Option Button until it is.

2. Set the radio volume control to the desired public address volume level. (Usually maximum volume.)



3. Remove the microphone from the hookswitch. Holding the microphone approximately 2 inches from your mouth, press the PTT button on the side of the microphone and speak in the microphone.

4. When finished, replace the microphone on its hookswitch.

5. Reset the volume control for a comfortable level.

6. Press the Public Address Option Button until its LED turns off. The PTT and microphone audio will now be directed to the radio transmitter.

## CHANNEL GUARD

Channel Guard is a method of reducing "channel chatter" by equipping receivers with a device which only allows calls with the correct signaling to be heard by the user. Channel Guard is defined in the radio personality.

The radio will always transmit with Channel Guard unless the channel is programmed without Channel Guard.

### Channel Guard Monitor Function



- 1) Observe the TX/RX indicator for any activity on the channel.
- 2) Press the Monitor/Clear option button for at least 1 second.
- 3) If programmed, remove the microphone from its hookswitch bracket.

## SENDING DTMF WITH THE DTMF MICROPHONE

The optional DTMF microphone allows the radio to send DTMF signaling. DTMF may be used in a radio system to access a telephone line or to perform system control functions.



1. Select the desired system and channel as described in the Basic Operation section on page 26. DTMF must be enabled on the channel.
2. Observe the TX/RX indicator for any activity on the channel.
3. Press the **Monitor/Clear** button to be sure there is no activity on the channel. Typically, if there is noise, there is no channel activity.
4. Remove the microphone from the hookswitch.
5. "Dial" the required DTMF digits from the telephone keypad on the microphone. Do not hold the PTT

switch on the microphone down while dialing. The DTMF microphone will automatically key the transmitter.

## **SELECTIVE SIGNALING**

Selective signaling is a method in conventional radio systems for controlling the muting and unmuting of the receive audio. This allows the radio operator or dispatcher to selectively call an individual radio or group of radios. The PANTHER 300M radio supports selective signaling in Type 99.

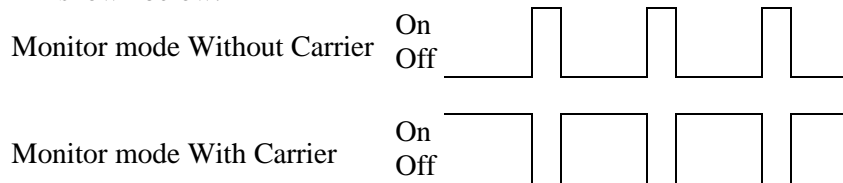
- ❑ In a selective signaling environment, the PANTHER 300M radio operates in one of two states, Monitor mode or Selective Call mode. In the monitor mode, the decoder's muting of the receive audio amp is turned OFF and the user hears all calls on the channel.

In the selective mode, the encoder and decoder is turned ON and only calls intended for the user will be heard.

- ❑ Selective signaling operates with or without Channel Guard.
- ❑ If Channel Guard is enabled, the radio can be programmed with an "And" or an "Or" option. If the "And" option is programmed, the user will only hear calls with the correct selective signaling and correct Channel Guard.

If the "Or" option is programmed, the user will hear calls with the correct selective signaling as well as calls with the correct Channel Guard. Calls with the correct Channel Guard do not have to have the correct selective signaling to be heard.

- ❑ When the radio is in the selective mode and the radio receives a selective call, the radio switches to the monitor mode and the Tx/Busy LED flashes green. The Tx/Busy LED always flashes green when the radio is in the monitor mode. The Tx/Busy LED is also used to indicate a carrier on the channel. This combination is shown below.



## TYPE 99 OPERATION

Type 99 is Com-Net Ericsson's proprietary method for in-band, two-tone sequential signaling. It is a conventional signaling protocol used to control the muting and unmuting of a radio. This signaling is commonly used for selective calling of individual units or groups of units in a conventional system. Type 99 is typically used in paging operations, where a dispatcher is able to select which radio or radios are to be selectively called.

If Type 99 has been setup, the radio can decode individual, group and supergroup paging calls. When the radio decodes an appropriate Type 99 decode sequence, an alert sounds, the Tx/Busy LED flashes green and the radio enters the monitor mode.

### Receiving An Individual, Group, or Supergroup Call



1. Select the proper system and channel as described in the Basic Operation on page 26.

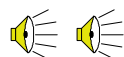
2. When the radio receives a selective call:



- The green TX/RX indicator will turn ON to indicate the radio is receiving a carrier.



- For an individual call, a single ½ second tone will sound to indicate the call is an individual call.



For a group call, two short tones will sound to indicate the call is a group call.



For a supergroup call, three short tones will sound to indicate the call is a supergroup call.



- The radio switches to the monitor mode and the Tx/Busy LED flashes green.



3. To respond to the call, remove the microphone from the hookswitch. Hold the microphone approximately 2 inches from your mouth, press the



PTT button on the side of the microphone and speak in the microphone.

### **Resetting Type 99 After A Call**

When a Type 99 call is decoded, the radio enters Monitor mode. The Type 99 decoder will now operate in the background. If the radio is called again, the Type 99 decoder will decode it and sound the call's alert tone. But the decoder will no longer mute the audio. All traffic on the channel will now be heard. (If the channel has Channel Guard, only the traffic with the radio's Channel Guard tone will be heard.)

In order for the Type 99 decoder to mute the audio, it must be "Reset". There are several methods of doing this.

1. Press the Monitor/Clear button.
2. Place the microphone on its hookswitch. (If the hookswitch function is enabled.)
3. Press the Type 99 On/Off button.
4. Allow an optional "Auto-Reset" timer to reset the Type 99 decoder. This is a programmable option. The time is also programmable between twelve seconds and three minutes.

## **PROGRAMMABLE PTT FUNCTIONS**

### **Channel Busy Lockout**

The radio may be programmed to deny the use of the transmitter when the channel is busy. This keeps another radio from interrupting a message that is in progress. This is called Channel Busy Lockout.

If the PTT switch is pressed while the Busy/Tx LED is on, the radio will display "LC" for "Locked Channel" and sound an alert tone until the PTT is released.

### **Channel Guard Channel Busy Lockout**

The radio may be programmed to deny the use of the transmitter when the channel is busy with another Channel Guard tone. The radio will transmit when the channel is busy with the radio's Channel Guard tone. This is called Channel Guard Channel Busy Lockout.

If the PTT switch is pressed while the Busy/Tx LED is on and the radio is muted because of an incorrect Channel Guard tone, the radio will display "LC" for "Locked Channel" and sound an alert tone until the PTT is released.

This option minimizes interference on repeater systems but also allows a radio to transmit during the repeater dropout timer.

### **Type 99 Disable After PTT**

The radio can be programmed to automatically disable the Type 99 decoder after a transmission. This is to allow for a reply to the transmission.

The Type 99 decoder may then be reset by pressing the Monitor/Clear button, putting the microphone back on its hookswitch, or may be programmed for an Auto-Reset time.

### **Ignition A+ Disable**

The radio can be programmed to deny the use of the transmitter if there is no voltage on the Ignition A+ line. If the PTT is pressed when there is no Ignition A+, then the radio will display "nA" for "Locked Channel" and sound an alert tone until the PTT is released.

The Ignition A+ is usually connected to the vehicle's ignition switch. The intent of the option is to allow the use of the transmitter only when the vehicle engine is running. This is meant to prevent the transmitter from draining the vehicle battery. It also has an effect of preventing unauthorized use of the transmitter.

## **PROGRAMMABLE HORN ALERT FUNCTIONS**

### **External Alarms**

The car horn alert option can be programmed to give one of three alarms. These are

1. A single 1 second alarm.
2. Three half second alarm pulses
3. Continuous alarm.

The first two are best suited for a horn function. The third option is better suited for a light.

### **Resetting the Car Horn Alert**

There are two ways of resetting the Car Horn Alert function. The default is to reset the Car Horn Alert function when the Type 99 decoder is reset. When this option is selected, a Type 99 Individual Call will activate the alarm. However, subsequent Type 99 Individual Calls while the radio is in Monitor Mode will not activate the alarm.

The second option is to automatically reset the Car Horn Alarm. When this is selected, every Type 99 Individual Call will activate the alarm. Even Type 99 Individual Calls while the radio is in Monitor Mode will activate the alarm.

### **Car Horn Alert Ignition A+ Option**

The radio can be programmed to ignore the Car Horn Alert function when Ignition A+ is present. Ignition A+ is usually connected to the vehicle's ignition switch and is used to indicate when the vehicle's engine is running.

The usual purpose of the Car Horn Alert option is to provide a notification to somebody outside the vehicle that they have an important call. When the person is inside the vehicle and able to hear the Type 99 alert tones, the horn alert feature becomes undesirable. This option provides an automatic means of disabling it while keeping it active for when the person is out of the vehicle.