

# **panther**<sup>G</sup> series

## Intercom System Operation Manual



**panther**<sup>G1</sup>

Base Unit Intercom

**panther**<sup>G2</sup>

Remote Unit Intercom



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## OVERVIEW

The Firecom pantherC series is a digital intercom system designed for use in rugged, physical conditions and challenging acoustic environments. The durable construction, with recessed controls, is ideal for use on fire apparatus, emergency vehicles or any other mobile command equipment. The pantherC series provides high volume, clear digital audio communication. NFPA 1500 standards require hearing protection for extreme noise environments over 98dB. Firecom headsets should be added to the intercom system for additional hearing protection.

The digital, two-wire network system is designed to provide clear communication for all personnel with minimal installation work. Multiple pantherC series units may be installed in series to service a large network of stations without audio degradation.

The remote unit, typically installed at the ladder tip, includes a live microphone to continuously transmit to base station units. Base station units include a Push-To-Talk (PTT) button to transmit to other intercom positions. All units include a headset jack. With the addition of headsets, all personnel have full two-way communication capability, radio transmit, and receive (requires the analog interface unit), as well as excellent hearing protection.

Radio transmit and receive can be added to the pantherC series with an analog interface unit. The optional interface unit provides full radio communications with either a Firecom "in-cab" intercom or with direct input from a two-way radio. The pantherC1 base stations can keep personnel fully informed by monitoring radio traffic. In addition, all positions on the pantherC series have radio transmit capability by using a Firecom series 10 headset with red PTT button.



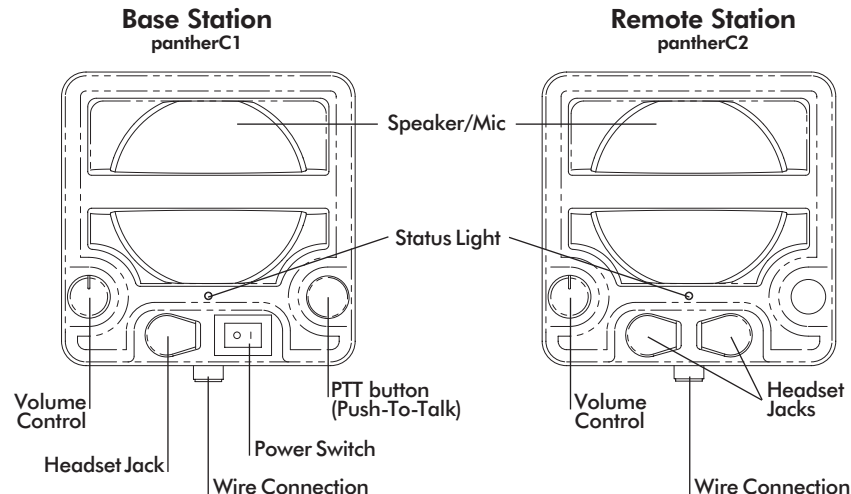
### WARNING



#### Safety Information

Firecom's pantherC series intercom speaker is loud enough to cause hearing damage. Use the volume control provided on the intercom to reduce the speaker volume to a safe level for the environment in which the intercom is being used or use Firecom headsets to reduce noise.

## FEATURES



### Speaker

The speaker broadcasts audio when headsets are not used.

### Status Light

The status light illuminates when a station is operating properly. An internal diagnostic check is performed every time a unit is turned on.

### Volume Control

The volume knob controls the audio level of the speaker. It will not turn the audio completely off.

### Microphone

The microphone receives audio. It is activated by the PTT button on base stations and "live" on remote stations. The microphone is deactivated when ever a Firecom 10 series headset with a red PTT is plugged in.

### Panel PTT Button

The PTT button activates the microphone on base stations.

### Power Switch

The power switch (only on the base units) controls station power. It will not affect other stations.

### Headset Jacks

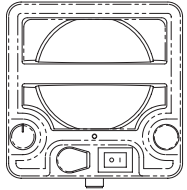
Use only Firecom 10 series headsets with red PTT buttons in the headset jacks for hands-free, full-duplex communications. Additional radio or in-cab communications are available. See "Options and Accessories" section in this manual.

### Wire Connection

See "System Wiring" section in this manual.

## INTERCOM MODELS

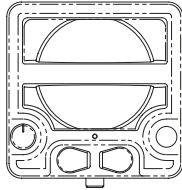
There are two pantherC series intercom models: base stations and remote stations.



### Base Station

Base stations broadcast sound via a speaker when audio is provided from another unit. Depressing the PTT button activates the

microphone and deactivates the speaker. When a headset is used, hands-free full-duplex communication is available and the speaker and microphone are disabled.



### Remote Station

Remote stations have "live" voice activated microphones that will always broadcast to other stations when sound is present.

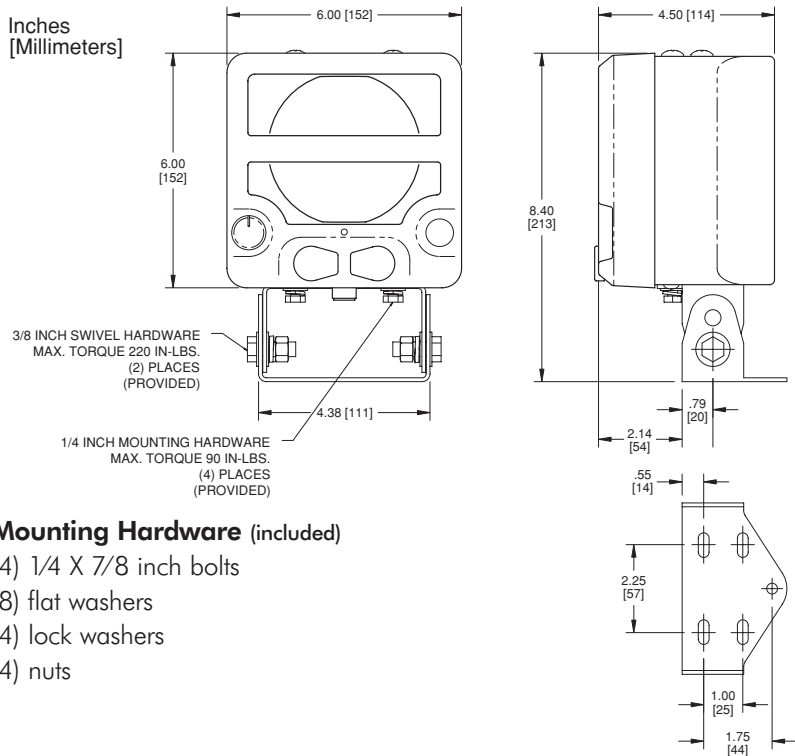
The speaker is activated and microphone deactivated, only when other units are sending. When a headset is used, hands-free full-duplex communication is available.

## INSTALLATION

Both an adjustable swivel style mounting bracket and two angle brackets are provided. A flush mount bracket is also available (see Options and Accessories).

### Mounting and Overall Dimensions (swivel mount bracket included)

Units: Inches  
[Millimeters]

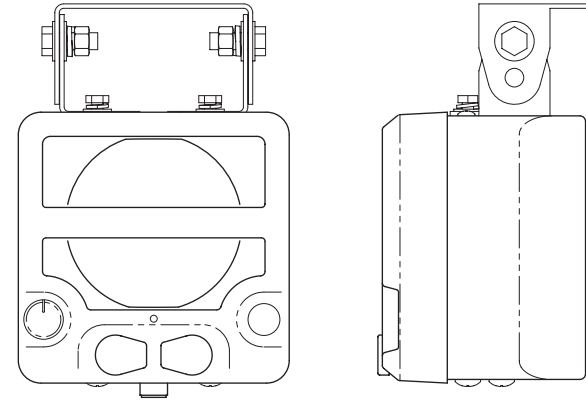


### Mounting Hardware (included)

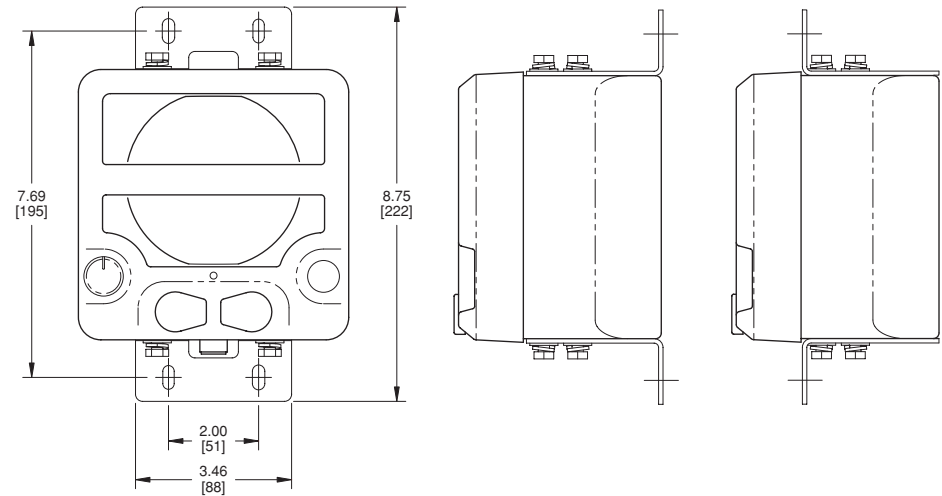
- (4) 1/4 X 7/8 inch bolts
- (8) flat washers
- (4) lock washers
- (4) nuts

## INSTALLATION

### Optional Top Mounting



### Optional Angle Bracket Mounting (included)



## WARNING



### Safety Information

Do not install unit on a flat, horizontal surface. If installed improperly, wet weather may cause water to pool in the speaker port, decreasing performance. Unit must be installed at an angle of 45 degrees or more.

## WIRE CONNECTIONS

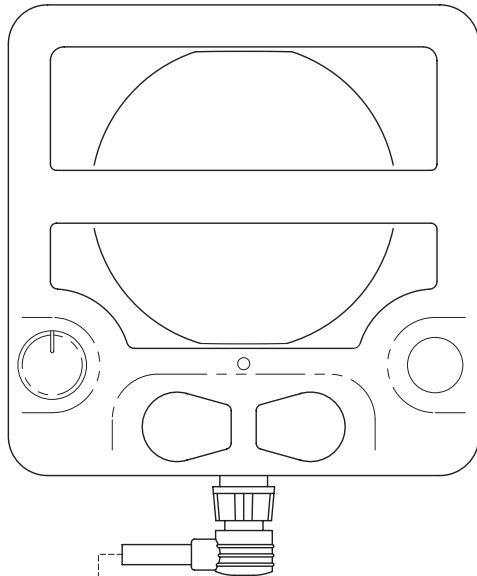
### Power

12 VDC (2.5 amps maximum)  
A 5 amp fuse is required

### Wire Size

**Power:** 18 gauge min.

**Network:** 22 gauge min.  
(Shielded twisted pair cable is recommended but may not be required for all installations.)



CABLE (PROVIDED)

Wire Color	Designation
GRY	Power (-)
YEL	Power (+)
DRAIN	Chassis Gnd
WHT	Net (-)
GRN	Net (+)
BLU	Net (-)
BRN	Net (+)

## SYSTEM WIRING

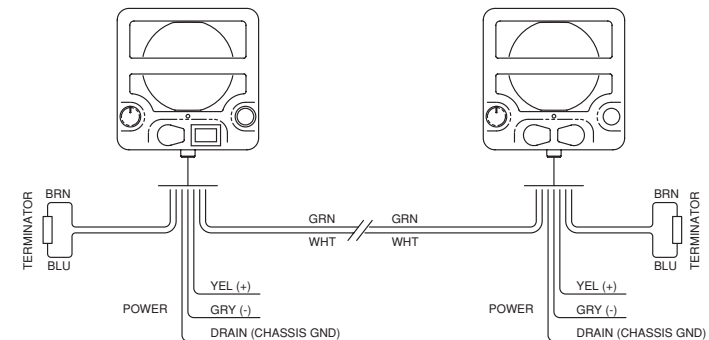
Over 100 devices can operate on one network, but only 8 full-duplex conversations can occur simultaneously.

The 2-wire network is connected by wiring intercoms in series. The positive network wire of one unit is connected to the positive network wire of the second unit. The negative network wires are connected similarly. Network wires between units must remain paired in a 2 conductor or more cable. Twisted pair wiring is preferred but not required for all installations. Both two unit wiring and multiple unit wiring are shown below. The ends of a network are always completed with a terminator.

The following are recommendations for all installations:  
(Also see Appendix A – Network Installation Tips).

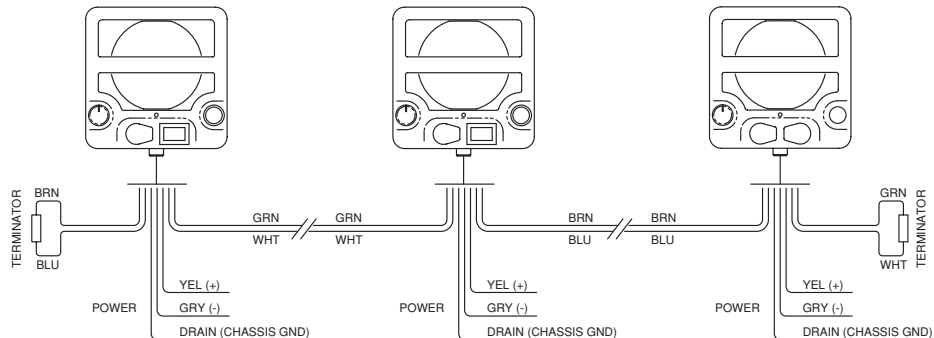
- Use Belden 9463 Twinaxial cable when possible.
- Keep network wire pairs together at all times.
- Connect network units in series.
- Do not splice additional wires into network cable runs.
- Do not bundle excess network cable.

### Two Unit Wiring



## SYSTEM WIRING

### Multiple Unit Wiring



### Terminators

Two terminators are provided to complete a network circuit. The terminators are located at both ends of a network. For optimal performance, install terminators as close to the unit as possible and no further than 6 feet in wire length away. Terminators are provided with every unit and available as an accessory (see "Options and Accessories" section).

**NOTE:** Soldering terminators is recommend over butt splicing to assure a good connection.

## OPERATION

### Without headset

Base station audio is sent over the network to other stations when the panel PTT is depressed and sound is present on the microphone. When multiple stations are on a network, a "first come, first served" principle is employed between base stations with panel PTT buttons. Depressing a panel PTT button always disengages the respective station's speaker.

Remote stations employ voice activated microphones that transmit audio over the network when sound is present at the microphone. Audio from other stations will engage the remote unit speaker and disengage the remote unit microphone when sent via a panel PTT button.

An automatic gain control is provided for every remote and base unit microphone. When extremely high noise is present the transmitted audio level from that microphone will be lowered.

### With headset

Headset usage provides hands-free full-duplex communications between stations. If two stations are using headsets, they will be able to talk and hear each other without depressing PTT buttons. Radio communication is possible with Firecom accessories (see "Options and Accessories" section in this manual). Use only Firecom 10 series headsets with red PTT buttons.

If a base station headset user is depressing the panel PTT and speaks into the headset microphone, the user's voice will transmit over remote station speakers. If a remote station is employing a headset and others are not, simply speaking into the headset microphone will allow the user to be heard over other station's speakers.

### Radio Communications

Radio broadcast and reception are available with the addition of an analog interface unit (see "Options and Accessories" section). Once an interface unit is installed on a network, radio communication is possible at every unit on the network. Incoming radio traffic will be heard on base station speakers and headsets at remote and base stations, but not heard on remote station speakers. A Firecom 10 series headset with red PTT button is required to transmit over the radio.

## TROUBLESHOOTING

When properly installed and powered, a pantherC series intercom network will perform reliably even in a harsh environment. If you believe one or more of your intercom units are malfunctioning, use the following troubleshooting information to locate the problem.

**NOTE:** This is a network communication system. Problems at one unit may affect audio quality at some or all other units. Troubleshooting should include power and network connections at all units.

If the symptoms you are experiencing are not covered in this manual, or if you are having difficulty troubleshooting your system, contact your local Firecom dealer for assistance, or see [www.firecom.com](http://www.firecom.com) for additional information.

### **Problem: One or more intercoms are not working.**

- Check that the status light is on for each intercom.

If status light is out:

Check that the power switch is on (if it has one).

Check that the station has power. (See "Installation" section.)

Check that the network wiring is connected properly, and pay special attention to correct termination. (See "Installation" and Appendix A – Network Installation Tips.)

### **Problem: Cannot hear voice traffic on the speaker of an intercom.**

- If there is a headset connected to the intercom unit, disconnect it.
- Adjust the volume control on the intercom.
- Be sure you are not pressing the PTT button while you are trying to listen.
- Check if other users can hear you talk on the intercom. If you can talk on the intercom but can not hear through the speaker, the intercom is malfunctioning and should be serviced by an intercom technician.

### **Problem: Cannot talk through the intercom microphone.**

- If there is a headset connected to the intercom unit, disconnect it.
- Be sure to press the PTT button when talking from a base unit.
- If you are trying to talk on a remote unit, be sure you are speaking loudly enough to activate the voice-activated microphone.

### **Can you hear traffic on the intercom through the speaker?**

- If you can't talk or listen on the intercom, check the connection of the network wires to your intercom unit.

## TROUBLESHOOTING

### **Problem: When listening to an intercom with a headset, the sound is distorted or intermittent.**

- Clean the headset plug and jack with contact cleaner.
- Insert and remove the headset plug into the headset jack a few times to remove oxide build up on the contacts.
- Confirm that you are using a Firecom 10 series radio transmit headset.
- Check network wiring and termination.

### **Problem: Noise or static is heard over the network.**

- Make sure the network connections are clean.
- Turn the unit off and back on after 5 seconds.
- Confirm shore power is disconnected to the vehicle on which you are installing the intercom.

### **Problem: Audio can be transmitted to, but not heard by, other units.**

- Check the terminators on the network. Make sure they are connected and have the proper resistance.
- Check network wiring. Make sure all network wires remain in pairs and there are no additional connections on any network run.
- Check for adequate power at all units.
- Check for a 5 amp fuse at all units.

### **Problem: Background noise is heard while a headset is plugged in.**

- Confirm that you are using a Firecom 10 series radio transmit headset.
- Confirm that any remote unit has a Firecom 10 series radio transmit headset plugged into it while in a high noise environment.

If a problem persists in a headset or intercom unit, contact Firecom for a Return Merchandise Authorization (RMA) number. Return the headset or intercom for replacement or repair.

**CONTACT:** Firecom 1-800-527-0555  
7340 SW Durham Road  
Portland, OR 97224  
USA

## OPTIONS AND ACCESSORIES

### UH-10

Part No. 105-0192-00

Under-helmet radio transmit headset. Adjustable volume, noise-canceling electret microphone, adjustable headstrap, flex-style boom rotates for left or right dress, comfortable liquid foam ear seals. 24dB NRR. (Red PTT located on dome.)

### UH-10S

Part No. 105-0196-00

Under-helmet headset, one slotted dome without speaker. Radio transmit capable. Noise-canceling electret microphone, flex-style boom rotates for right or left dress. (Red PTT located on dome.)

### FH-10

Part No. 105-0190-00

Over-head radio transmit headset. Adjustable volume, noise-canceling electret microphone, flex-style boom rotates for left or right dress, comfortable liquid foam ear seals. 24dB NRR. (Red PTT located on dome.)

### Terminators, Standard

Part No. 108-0051-00

Network terminators used with pantherC series 2-wire networks.  
Qty (2) per package

### Analog Interface, 30XXR Intercom and Single Radio

Part No. 108-0450-00

This unit allows the addition of a Firecom 30XXR intercom and an optional radio to the pantherC series 2-wire network. With the integration of this unit, anyone on the 2-wire network will be able to send and receive radio communications, as well as talk to anyone on a Firecom 30XXR intercom.

### HE-150

Part No. 108-0675-15

15' coiled headset extension cable for use with any single-plug headset for greater mobility at pump panel position.

### Network Cable, 2-wire

Part No. 108-0034-00 (50 feet)

Two conductor, one twisted pair network cable for panther network systems.

### C1 and C2 Flush Mount Bracket

Part No. 108-0270-00

A mounting bracket for C1 and C2 units that allows for panel in insertion with only the front bezel revealed.

## MAINTENANCE

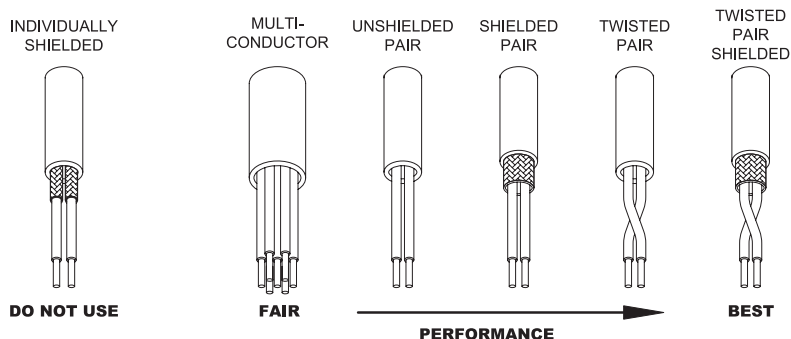
Clean headset jacks as required.

## APPENDIX A – NETWORK INSTALLATION TIPS

The following guidelines are recommended for a trouble free installation.

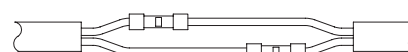
### Network Cable

A wide variety of cabling will work for network wiring including multi-conductor cabling. Do not use individually shielded conductors. When possible, we recommend Belden 9463 Twinaxial cable. If you are choosing cable from scratch, we recommend cable with a nominal impedance in the range of 70 to 95 ohms.

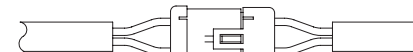


### Network Wire Connections

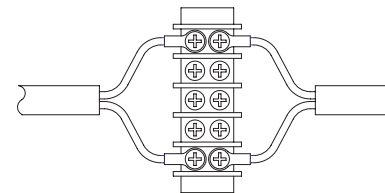
Connections on network cable should be kept in pairs. Do not route wires individually or connect independently. Always treat both wires as a pair. What happens to one wire should happen to the other wire at the same location.



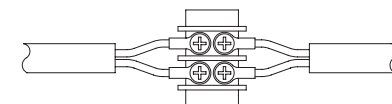
**DO NOT**  
Use non-aligned butt splices



**DO**  
Use 2-conductor automotive connections



**DO NOT**  
Use far terminal connections



**DO**  
Use near terminal connections

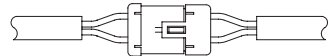
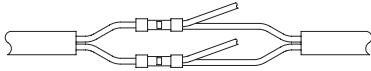
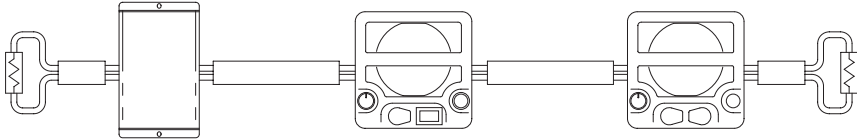


## APPENDIX A – NETWORK INSTALLATION TIPS

### Connecting Network Units

Never splice into network wires. All units come with network in and out connections. Wire all units in series with terminators at both ends.

NETWORK CONNECTIVITY



#### DO NOT

Splice additional wires into network cables

#### DO

Connect using 2-conductor connectors

### Direct Network Wiring

Do not bundle excess network wiring. Choose direct routes for network cables and remove all excess cable.



#### DO NOT

Bundle excess cable

#### DO

Cut cables to length

## APPENDIX A – NETWORK INSTALLATION TIPS

### 1. Network wires must remain in pairs.

The most important item to remember when installing a pantherC series network system is to keep the network wires as a pair; retaining a close proximity between the two conductors. A twisted pair is preferred, but not required. When using a terminal block, connect the wire pair to terminals directly next to each other. When passing through collector rings or other similar devices, use conductors that are next to each other.

### 2. Network spurs are not permitted.

A network pair from one unit to the next, or to a terminator, should contain only the two wires running directly between units with no spur routes or additional wires spliced into the run. The units in a network are connected in series. When retrofitting a pantherC series system into a previously installed wiring system, it is important to trace the wiring and confirm that no additional wires have been spliced into the intended network wires.

### 3. Identical wire treatment.

Both wires of a network pair should be treated identically. The wires should be of equal length and terminated in the same manner. If one wire is connected at a block or in-line splice, the other wire of the pair should be connected at the same point and in the same manner, keeping the wires close together. When retrofitting a system into a previously installed wiring system, it is important to trace the wiring and confirm that both conductors of the wire pair are of equal length and treated identically.

### 4. Avoid non-essential splices.

When possible, avoid splices on the network. When splices or termination is required, make sure both wires of the pair are treated identically.

### 5. Ground shields at one end only.

Cable shielding is recommended but not required. When using shielded cable, ground the shield at one end of the cable only.

### 6. Avoid bundling excess wire.

Excess network wire should be removed and not bundled. Sharp bends or kinks in network wire can be harmful. Typical minimum bend radius for network wiring is in the 2 to 3 inches range. See cable manufacturer for recommended minimum bend radius.

### 7. Avoid 3-phase power cables and fluorescent lights.

Keep all network wires 1 foot away from 3-phase power and fluorescent lights.

## APPENDIX A – NETWORK INSTALLATION TIPS

### 8. Impedance mismatches are harmful.

The pantherC series network system is designed to handle imperfections, but repeated poor network treatment can cause communication failure. Every change in impedance along the network path causes a little degradation to the network. Minor impedance changes can be managed but large jumps in impedance or repeated changes can cause the system to not work correctly.

### 9. Poor network wiring is accumulative.

The pantherC series network system is designed to handle imperfections, but repeated poor network wiring treatment can cause communication failure. A network wiring problem that does not show up on a small system may cause a failure when additional units are added and the network is expanded. Whenever a system is modified, the entire network system should be reviewed per the above rules. Network runs can be several hundred feet when handled properly.

### 10. Use Firecom 10 series headsets only.

When using headsets with the pantherC series system, use Firecom's UH-10, UH-10S, FH-10, or FH-10S headsets. Headsets are ideal for troubleshooting in a high noise environment or enclosed building that can cause feedback between units.

### 11. Continuity checks are not enough to verify network wiring.

When troubleshooting a system or retrofitting using previously installed wiring, it is important to keep in mind that a continuity check is not a conclusive test of a network wire run. Each wire must have continuity, but that is not enough. Wiring must also follow the strict pairing rule outlined above.

### 12. One network issue can affect everyone on the network.

A poor network wire or network treatment can affect all units on the network, not just the unit closest to the problem.

### 13. Bypassing a network wiring run is a quick way to isolate problems.

Bypassing a suspected section of wire with an independent external network can often provide the fastest network wire test between units. When testing, make sure the suspect wiring is completely removed from the system. If the problem goes away after you have bypassed a section of network wire, then look for a wiring problem in that section.

## WARRANTY

### Two-Year Limited Warranty to the Original Purchaser

Sonetics Corporation warrants to the original purchaser of its products, that they will be free from defects in materials and workmanship, under normal and proper use, for the period of two years from date of purchase. Sonetics Corporation will repair or replace, at its option, any parts showing factory defects during this warranty period, subject to the following provisions. This warranty applies only to a new product which has been sold through authorized channels of distribution. All work under warranty must be performed by Sonetics Corporation. All returned products must be shipped to our address, freight prepaid, accompanied by a dated proof of purchase. The purchaser voids this warranty if he, she or others attempt to repair, service or alter the product in any way. This warranty does not apply in the event of accident, abuse, improper installation, unauthorized repair, tampering, modification, fire, flood, collision, or other damage from external sources, including damage which is caused by user replaceable parts (leaking batteries, etc.). This warranty does not extend to any other equipment or apparatus to which this product may be attached or connected. The foregoing is your sole remedy for failure in service or defects. Sonetics Corporation shall not be liable under this or any implied warranty for incidental or consequential damages, nor for any installation or removal costs or other service fees. This warranty is in lieu of all other warranties, express or implied, including the warranty of merchantability or fitness of use, which are hereby excluded. To the extent that this exclusion is not legally enforceable, the duration of such implied warranties shall be limited to two years from date of purchase. No suit for breach of express or implied warranty may be brought after two years from date of purchase.



### WARNING



#### Safety Information

Firecom's pantherC series intercom speaker is loud enough to cause hearing damage. Use the volume control provided on the intercom to reduce the speaker volume to a safe level for the environment in which the intercom is being used or use Firecom headsets to reduce noise.