TRIGA

Fire Fighter's Telephone
TR-FFT

Installation/Operation Manual

Fire Alarm & Emergency Communication System Limitations
While a life safety system may lower insurance rates, it is not a substitute for life and property insurance!

An automatic fire alarm system—typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control panel (FACP) with remote notification capability—can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

An emergency communication system—typically made up of an automatic fire alarm system (as described above) and a life safety communication system that may include an autonomous control unit (ACU), local operating console (LOC), voice communication, and other various interoperable communication methods—can broadcast a mass notification message. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire or life safety event.

The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premises following the recommendations of the current edition of the National Fire Protection Association Standard 72 (NFPA 72), manufacturer's recommendations, State and local codes, and the recommendations contained in the Guide for Proper Use of System Smoke Detectors, which is made available at no charge to all installing dealers. This document can be found at http://www.systemsensor.com/appguides/. A study by the Federal Emergency Management Agency (an agency of the United States government) indicated that smoke detectors may not go off in as many as 35% of all fires. While fire alarm systems are designed to provide early warning against fire, they do not guarantee warning or protection against fire. A fire alarm system may not provide timely or adequate warning, or simply may not function, for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in or behind walls, on roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second-floor detector, for example, may not sense a first-floor or basement fire.

Particles of combustion or "smoke" from a developing fire may not reach the sensing chambers of smoke detectors because:

- Barriers such as closed or partially closed doors, walls, chimneys, even wet or humid areas may inhibit particle or smoke flow.
- Smoke particles may become "cold," stratify, and not reach the ceiling or upper walls where detectors are located.
- Smoke particles may be blown away from detectors by air outlets, such as air conditioning vents.
- Smoke particles may be drawn into air returns before reaching the detector.

The amount of "smoke" present may be insufficient to alarm smoke detectors. Smoke detectors are designed to alarm at various levels of smoke density. If such density levels are not created by a developing fire at the location of detectors, the detectors will not go into alarm.

Smoke detectors, even when working properly, have sensing limitations. Detectors that have photoelectronic sensing chambers tend to detect smoldering fires better than flaming fires, which have little visible smoke. Detectors that have ionizing-type sensing chambers tend to detect fast-flaming fires better than smoldering fires. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is necessarily best and a given type of detector may not provide adequate warning of a fire.

Smoke detectors cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions (caused by escaping gas, improper storage of flammable materials, etc.).

Heat detectors do not sense particles of combustion and alarm only when heat on their sensors increases at a predetermined rate or reaches a predetermined level. Rate-of-rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist. Heat detectors are designed to protect property, not life.

IMPORTANT! Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power. If detectors are not so located, a developing fire may damage the alarm system, compromising its ability to report a fire.

Audible warning devices such as bells, horns, strobes, speakers and displays may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building. Any warning device may fail to alert people with a disability or those who have recently consumed drugs, alcohol, or medication. Please note that:

- An emergency communication system may take priority over a fire alarm system in the event of a life safety emergency.
- Voice messaging systems must be designed to meet intelligibility requirements as defined by NFPA, local codes, and Authorities Having Jurisdiction (AHJ).
- Language and instructional requirements must be clearly disseminated on any local displays.
- Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.
- Studies have shown that certain people, even when they hear a fire alarm signal, do not respond to or comprehend the meaning of the signal. Audible devices, such as horns and bells, can have different tonal patterns and frequencies. It is the property owner's responsibility to conduct fire drills and other training exercises to make people aware of fire alarm signals and instruct them on the proper reaction to alarm signals.
- In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

A life safety system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been properly maintained and replaced regularly.

Equipment used in the system may not be technically compatible with the control panel. It is essential to use only equipment listed for service with your control panel.

Alarm Signaling Communications:

- **IP connections** rely on available bandwidth, which could be limited if the network is shared by multiple users or if ISP policies impose restrictions on the amount of data transmitted. Service packages must be carefully chosen to ensure that alarm signals will always have available bandwidth. Outages by the ISP for maintenance and upgrades may also inhibit alarm signals. For added protection, a backup cellular connection is recommended.
- **Cellular connections** rely on a strong signal. Signal strength can be adversely affected by the network coverage of the cellular carrier, objects and structural barriers at the installation location. Utilize a cellular carrier that has reliable network coverage where the alarm system is installed. For added protection, utilize an external antenna to boost the signal.
- **Telephone lines** needed to transmit alarm signals from a premise to a central monitoring station may be out of service or temporarily disabled. For added protection against telephone line failure, backup alarm signaling connections are recommended.

The most common cause of life safety system malfunction is inadequate maintenance. To keep the entire life safety system in excellent working order, ongoing maintenance is required per the manufacturer's recommendations, and UL and NFPA standards. At a minimum, the requirements of NFPA 72 shall be followed. Environments with large amounts of dust, dirt, or high air velocity require more frequent maintenance. A maintenance agreement should be arranged through the local manufacturer's representative. Maintenance should be scheduled as required by National and/or local fire codes and should be performed by authorized professional life safety system installers only. Adequate written records of all inspections should be kept.

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Installation Precautions

Adherence to the following will aid in problem-free installation with long-term reliability:

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until manuals are read and understood.

CAUTION - System Re-acceptance Test after Software Changes: To ensure proper system operation, this product must be tested in accordance with NFPA 72 after any programming operation or change in site-specific software. Re-acceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for operation at 0-49º C/32-120º F and at a relative humidity 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15-27º C/60-80º F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interference, proper grounding will reduce susceptibility. Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes. Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, or printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Over-tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the unit.

Units with a touchscreen display should be cleaned with a dry, clean, lint free/microfiber cloth. If additional cleaning is required, apply a small amount of Isopropyl alcohol to the cloth and wipe clean. Do not use detergents, solvents, or water for cleaning. Do not spray liquid directly onto the display.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation.

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FCC Warning

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause interference to radio communications. It has been tested and found to comply with the limits for Class A computing devices pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when devices are operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to correct the interference at his or her own expense.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radiation noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radio-electriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

Software Downloads

In order to supply the latest features and functionality in fire alarm and life safety technology to our customers, we make frequent upgrades to the embedded software in our products. To ensure that you are installing and programming the latest features, we strongly recommend that you download the most current version of software for each product prior to commissioning any system. Contact Technical Support with any questions about software and the appropriate version for a specific application.

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Your feedback helps us keep our documentation up-to-date and accurate. If you have any comments or suggestions about our online Help or printed manuals, you can email us.

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Send email messages to:

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This symbol (shown left) on the product(s) and / or accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling, contact your local authorities or dealer and ask for the correct method of disposal.

Electrical and electronic equipment contains materials, parts and substances, which can be dangerous to the environment and harmful to human health if the waste of electrical and electronic equipment (WEEE) is not disposed of correctly.

Table of Contents

Section 1: Overview

The Triga Series TR-FFT Fire Fighter Telephone System provides supervision, annunciation, and control for the local and remote telephone handsets. The TR-FFT, with keypad, provides indications of phone activation, and corresponding trouble conditions. Additionally, up to 72 telephone circuits can be annunciated at the TR-FFT by connecting the TR-24Z-EXT zone expander.

1.1 Features

The TR-FFT features are as follows.

- One Form-C Trouble Relay, System Trouble Relay - TB6
- TR-FFT Fire Fighter Telephone module used for control and annunciation of up to 72 remote telephone jacks
- A maximum of 10 Fire Fighter Remote Handsets (TR-RHS) can be used at one time to communicate over the telephone circuit connected to the TR-FFT
- Fire Fighter Phone Jack (TR-FPJ) provides a plug-in location for the TR-RHS
- Single Telephone Station (TR-STSR/TR-STSS)
- Fire Fighter Handset Cabinet (TR-HSC) is used to store up to ten Fire Fighter Handsets (TR-RHS)
- System Status LEDs
- Supports two TR-24Z-EXT zone expanders

1.2 Optional Accessories

This Manual contains information on how to install the following compatible accessories with the TR-FFT Series equipment:

Model Number	Description
TR-24Z-EXT	24 Zone Expander
TR-FPJ	Remote Phone Jack
TR-RHS	Fire Fighter's Remote Hand Set
TR-HSC	Fire Fighter's Handset Cabinet
TR-STSR	Single Telephone Station Recessed
TR-STSS	Single Telephone Station Surface Mount
FFT-BGK	Break Glass Kit for TR-STS
TR-MINIMON	Addressable Mini-Monitor Module
TR-ISO	SLC Line Isolation Module

Table 1.1 Optional Accessories

1.3 Agency Requirements

The TR-FFT has the same requirements as the main control panel. These requirements are listed in the Triga Series Addressable FACP Installation Manuals. The FACP Installation Manuals can be found on the web site at www.trigaglobal.com.

1.4 About This Manual

This Manual is intended to be a complete reference for all installation and operation tasks for the TR-FFT. For additional information, refer to the following FACP Installation Manuals. The documents are located on the Triga website, www.triga-global.com.

Document	Document Part Number
TR-2100/ECS Manual	LS10143-003TR-E
TR-RPS1 Manual	LS10259-002TR-E
Triga ECS Manual	LS10262-002TR-E
TR-24Z-EXT Product Installation Document	LS10305-001TR-E
TR-FPJ Product Installation Document	LS10306-001TR-E
TR-HSC Product Installation Document	LS10307-001TR-E
TR-STSR/TR-STSS Product Installation Document	LS10308-001TR-E

Section 2: Prerequisites for Installation

This Section of the Manual is intended to help you plan your tasks to complete the installation. Please read this Section thoroughly, especially if you are installing a TR-FFT for the first time.

2.1 Environmental Specifications

It is important to protect the TR-FFT control panel from water. To prevent the water damage, the following conditions should be AVOIDED when you install the units:

• Do not mount the panel directly on exterior walls, especially masonry walls (condensation).
• Do not mount the panel directly on exterior walls below grade (condensation).
• Protect the panel from plumbing leaks.
• Protect the panel from splash caused by sprinkler system inspection ports.
• Do not mount the panel in areas with humidity-generating equipment (such as dryers, production machinery).

When you select a location to mount the TR-FFT, the unit must be mounted where it will NOT be exposed to temperatures outside the range of 0°C- 49°C (32°F-120°F) or humidity outside the range of 10% - 93% at 30°C (86°F) non-condensing.

2.2 Preventing Water Damage

Water damage to the Fire Fighter's Phone System can be caused by moisture entering the cabinet through the conduits. Conduits that are installed to enter the top of the cabinet are most likely to cause water problems. Installers should take reasonable precautions to prevent water from entering the cabinet. The water damage is not covered under the warranty.

2.2.1 Removing the TR-FFT Assembly from the Housing

If it is necessary to remove the control panel assembly from the cabinet for repair, remove the screws that hold the control panel in the cabinet. Do not attempt to disassemble the circuit boards.

2.3 TR-FFT Board Layout

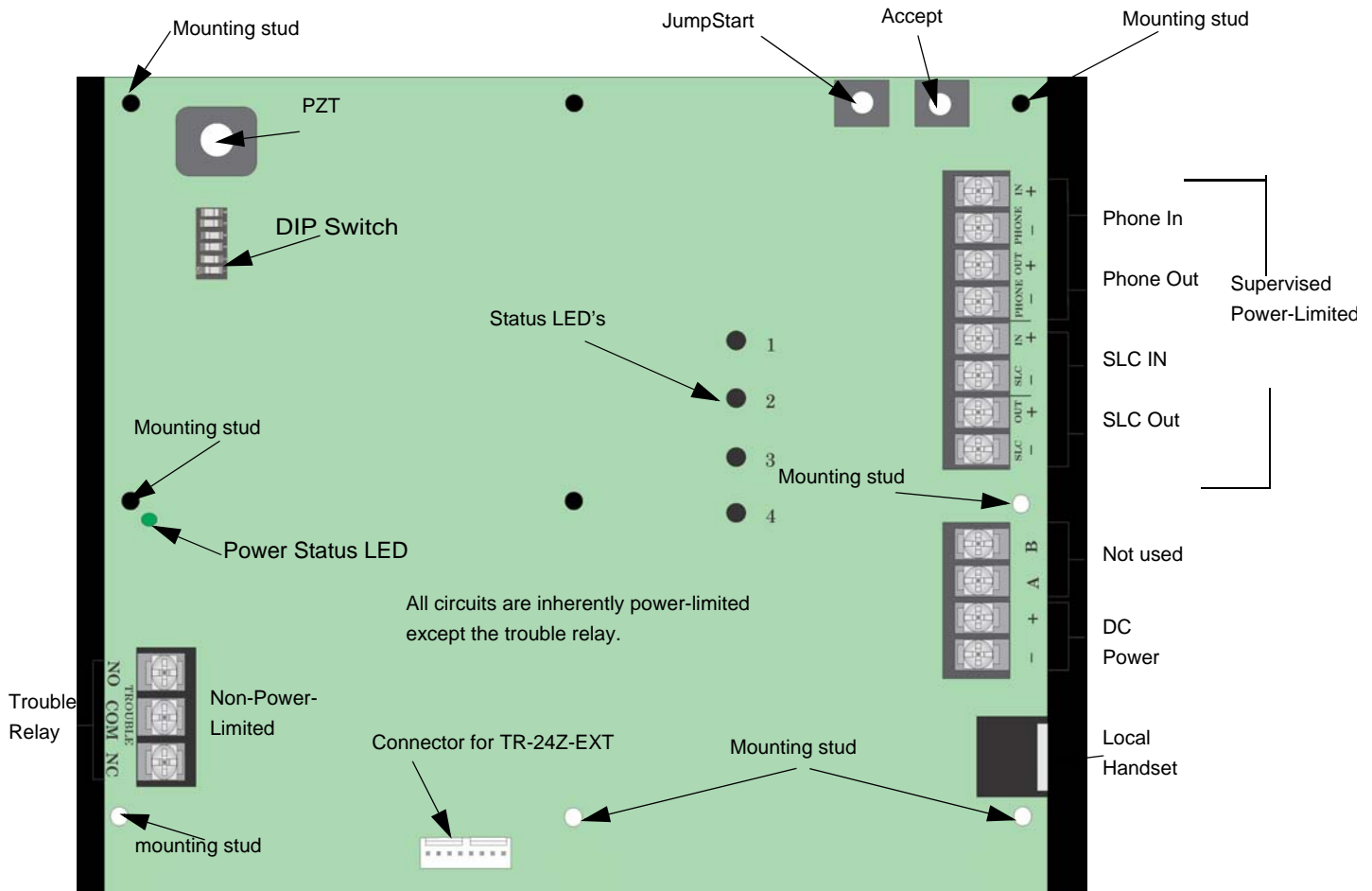Figure 2.1 illustrates the TR-FFT board layout and terminal information.

Figure 2.1   TR-FFT Back View

Figure 2.3 shows the circuit board that attaches to the cabinet. If you need to remove the board assembly for repair, remove the seven mounting nuts which hold the assembly in the cabinet. Then, lift the control board out of the cabinet.
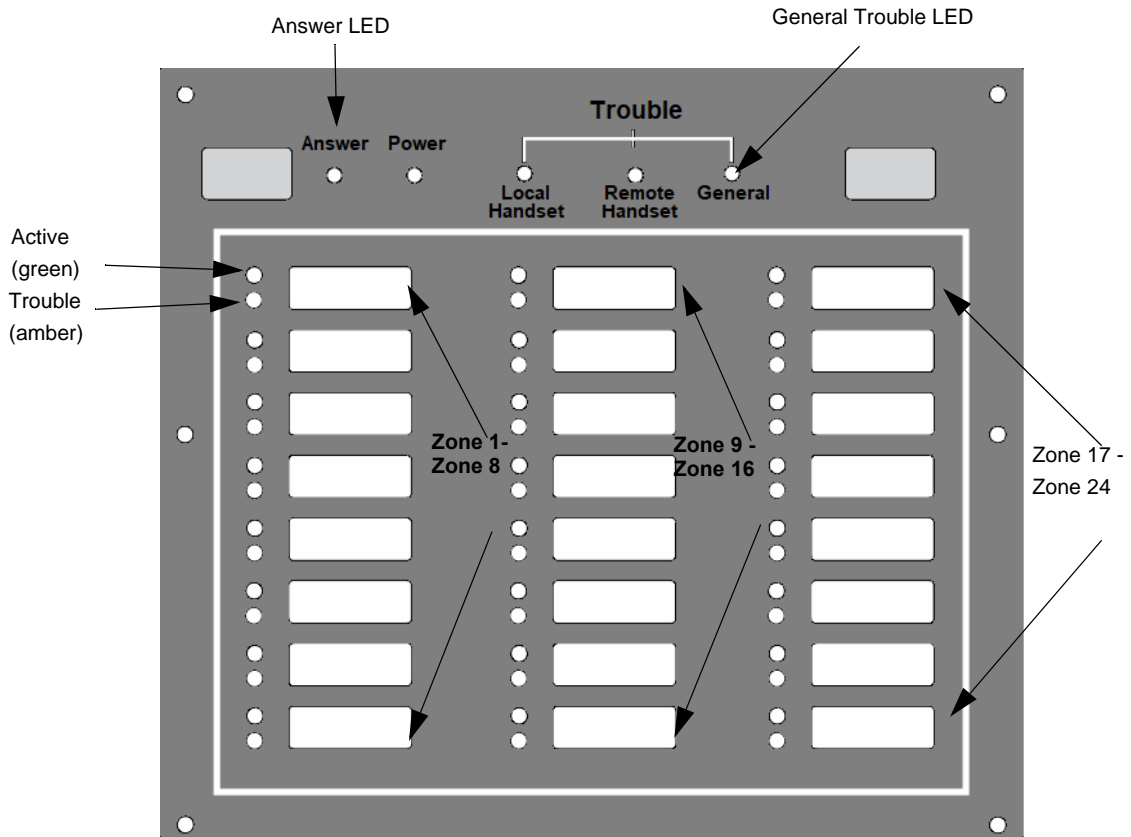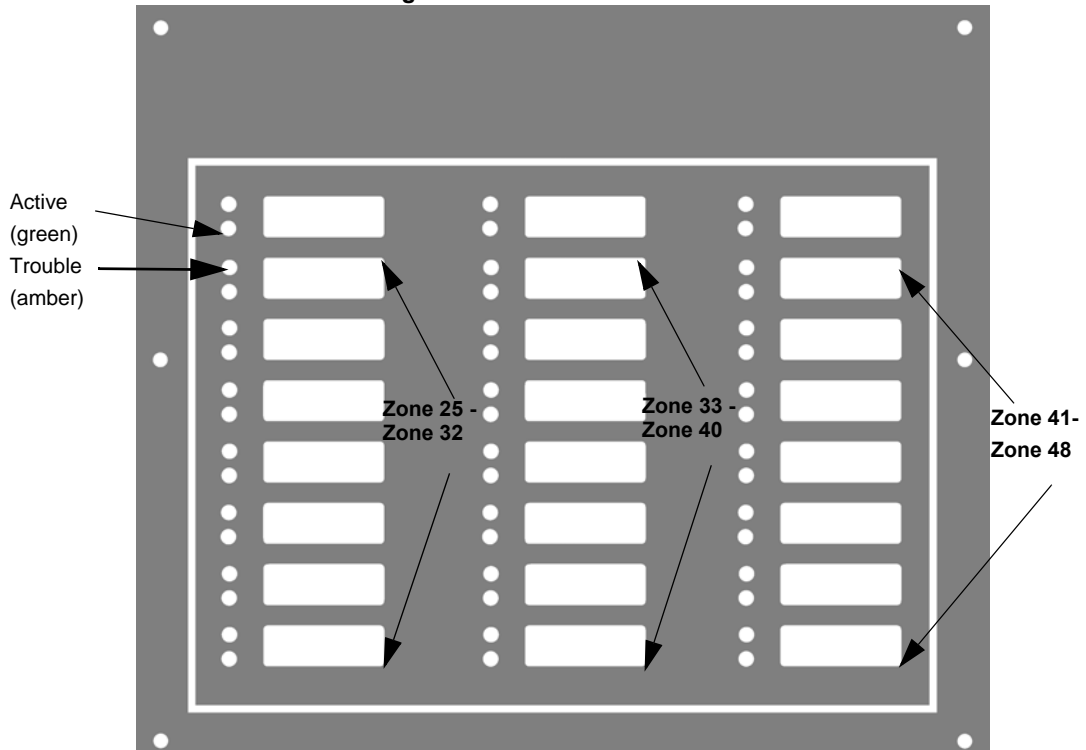

Figure 2.2 TR-FFT Front View

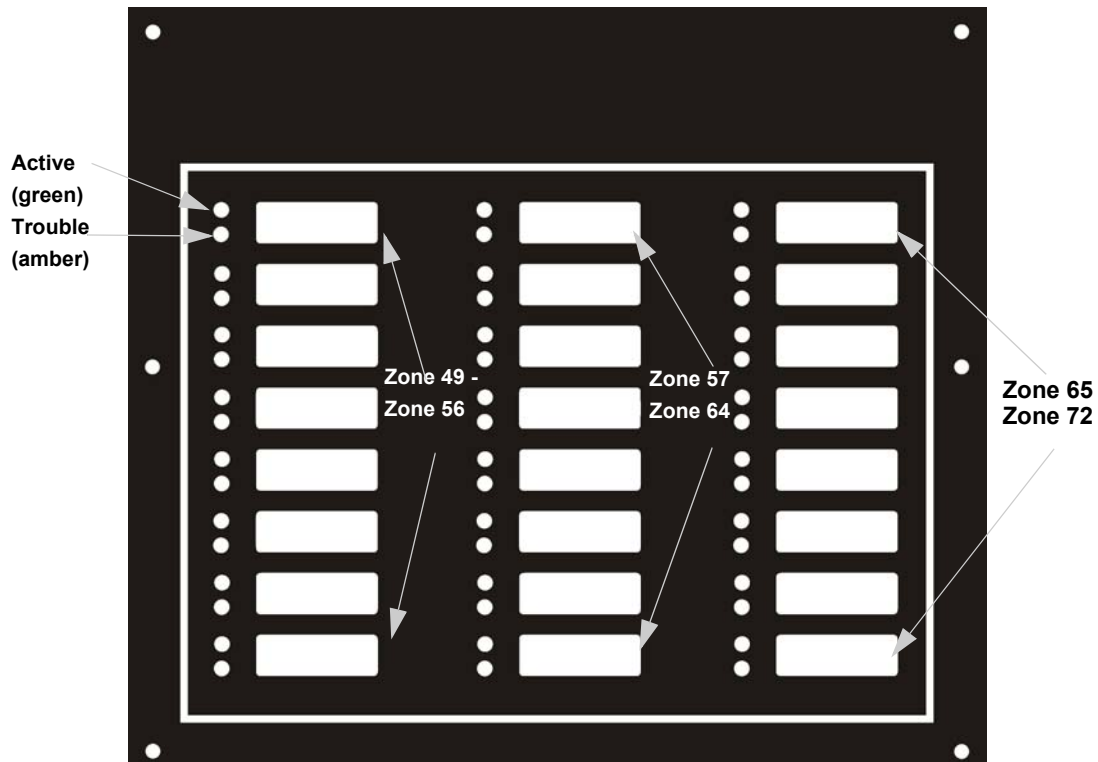**Figure 2.3 TR-24Z-EXT Expander Front View for Zone 25 - 48**

Figure 2.4 TR-24Z-EXT- Expander Front View for Zone 49 - 72

2.4 Electrical Specifications

2.4.1 Power Requirements

The voltage for the TR-FFT must be a power-limited, filtered, non-resettable nominal 24 VDC source. The voltage source must be within the range of 17-29 VDC.

Circuits	Voltage	Current
SLC Circuits	17 V	150 mA
Audio Circuits	18 V	53 mA

Table 2.1 Electrical Ratings

2.4.2 Current Ratings

The maximum current ratings required to determine the backup battery requirements for the alarm (active) and the standby conditions over the input voltage range of 17-29 VDC are shown in Table 2.2.

Model	Active	Standby
TR-FFT	230 mA	120 mA
TR-24Z-EXT	25 mA	10 mA

Table 2.2 TR-FFT Current Draw

2.5 Wiring Specifications

Induced noise (such as, the transfer of the electrical energy from one wire to another wire) can interfere with the telephone communication or cause false alarms. To avoid the induced noise, follow these guidelines:

- Isolate the input wiring from the high current output and the power wiring. Do not pull one multi-conductor cable for the entire panel. Instead, separate the wiring as follows:

SLC loops	Audio circuits
Relay circuit	

Table 2.3 Wiring Specifications

- Do not pull the wires from the different groups through the same conduit. If you must run them together, do so for as short a distance as possible or use the shielded cable. Twisted, shielded wire on the audio circuits is recommended for the maximum protection against EMI and AFI emissions and susceptibility. Connect the shield to the Earth Ground at the panel. You must route the high and the low voltages separately.
- Route the wiring around the inside perimeter of the cabinet. It should not cross the circuit board, where it could induce noise into the sensitive microelectronics or pick-up unwanted RF noise from the high speed circuits. See Figure 2.5 on page 11 for an example.
- High frequency noise, such as that produced by the inductive reactance of a speaker or bell, can also be reduced by running the wire through the ferrite shield beads or by wrapping it around a ferrite toroid.

2.6 Wire Routing

You must follow the power-limited wiring techniques, which include maintaining a one-quarter inch spacing between the power-limited and the non-power limited circuits and separating the high and the low voltage circuits.

Power-Limited

Non-Power-limited Relay Circuit

Non power-limited wiring must be run separately from power-limited wiring.
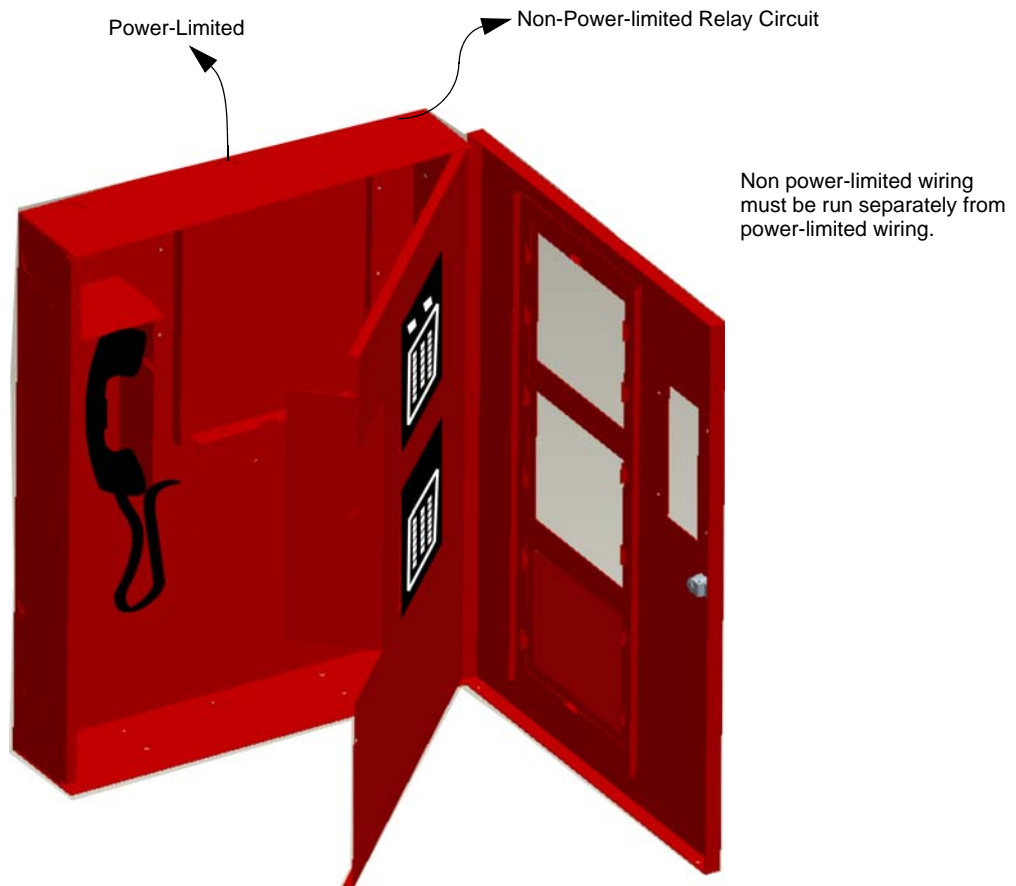
Figure 2.5 Wire Routing Example

Section 3: Installation

3.1 Mounting the Cabinet

Read the Environmental Specifications in Section 2.1 before you mount the TR-FFT cabinet. This will ensure that you select a suitable location.

The TR-FFT cabinet can be surface or flush-mounted. Do NOT flush-mount in a wall designed as a fire break.

3.1.1 Surface Mounting

The Cabinet can be mounted on the wall surface. To secure the cabinet to the wall, use the mounting holes in the back of the cabinet (see Figure 3.1 on page 12).

1. Insert two screws level with each other, spacing 14" (.36cm) apart for the top cabinet key-shaped holes. See Figure 3.1 on page 12.
2. Hang the cabinet onto the two screws. Tighten the screws.
3. Insert the two screws into the two bottom mounting holes and tighten the screws to secure them to the cabinet.
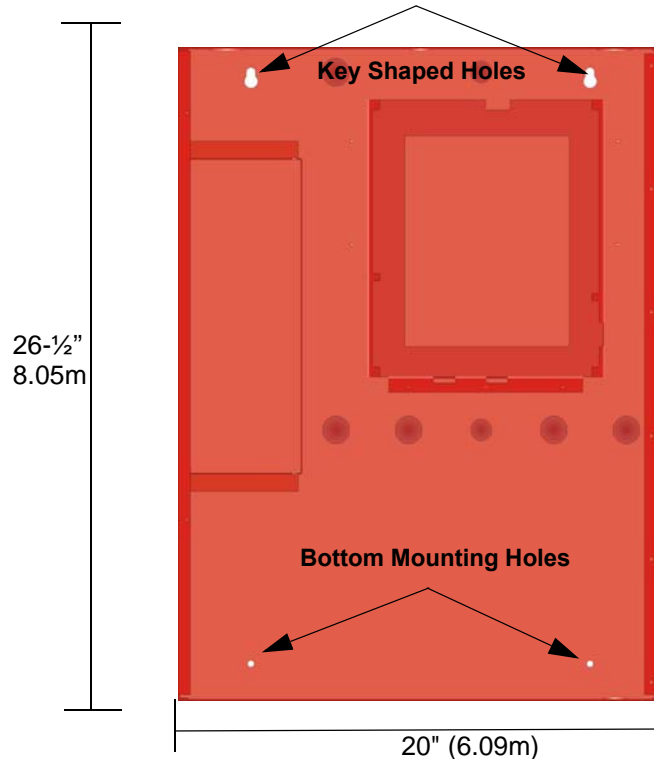

Figure 3.1 Cabinet Mounting Holes

3.1.2 Flush Mounting

This Section describes how to flush-mount the cabinet into a wall. To recess mount the cabinet, you will need to have the optional Trim Ring P/N VIP-TR (ordered separately).

To recess mount the cabinet, refer to the following these steps.

1. Remove the cabinet door and the dead front panel.
2. Cut a recess hole 20-1/4" W x 26-3/4" H (51.44 cm W x 67.95 cm H). There should be 1.5" to 1.75" (3.8cm to 4.45cm) of cabinet space extending from the wall.
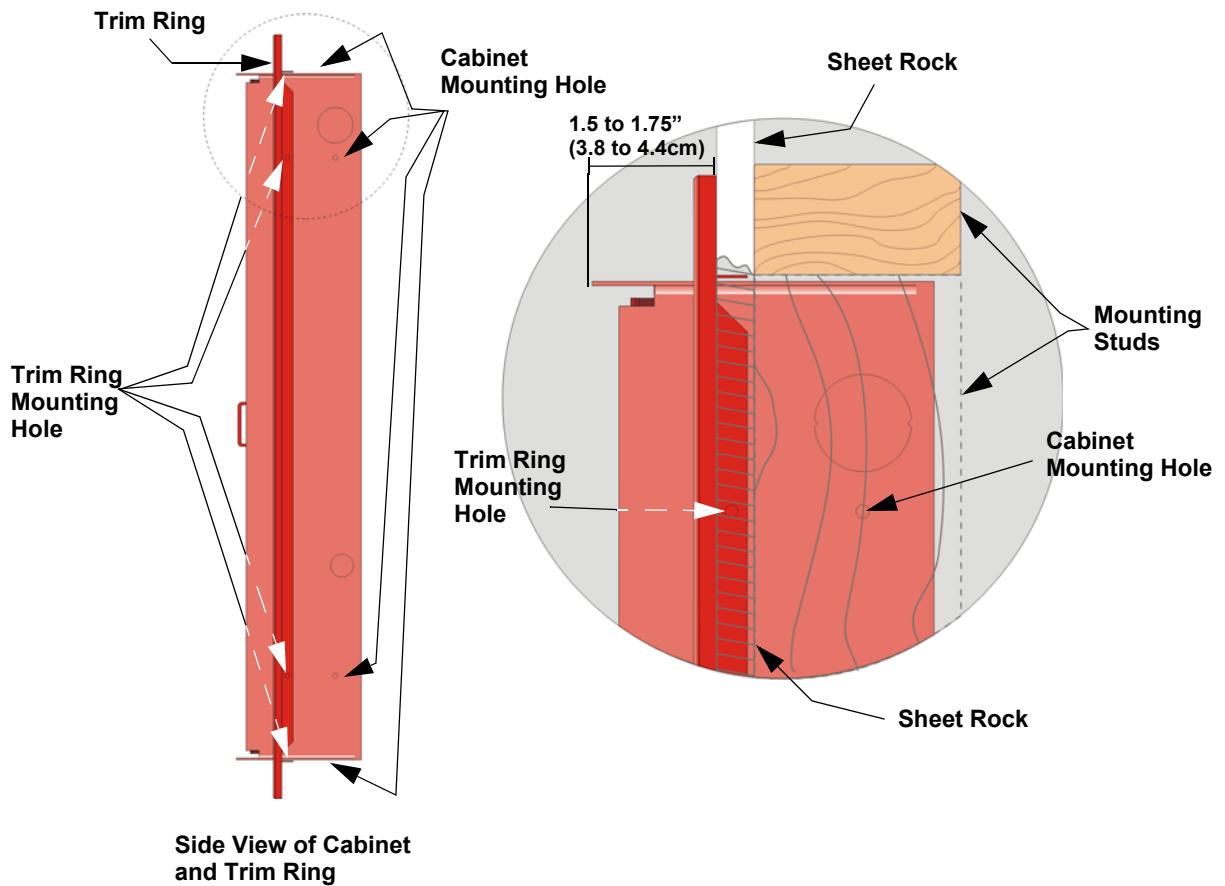
   This space should be measured from either the top edge or bottom edge to the exterior side of the sheet rock. (See Figure 3.2).

> **NOTE:**   Do not insert the cabinet deeper than recommended in Step 2. If the cabinet is mounted to deep, you will not be able to re-attach the door assembly.

3. To mount the cabinet to the wall studs, insert a screw through the cabinet's side mounting holes into the wall stud.

Figure 3.2 shows the trim ring locations and dimensions.

Trim Ring

Cabinet Mounting Hole

Sheet Rock

**1.5 to 1.75"
(3.8 to 4.4cm)**

Trim Ring Mounting Hole

Mounting Studs

Trim Ring Mounting Hole

Cabinet Mounting Hole

Sheet Rock

Side View of Cabinet and Trim Ring

Figure 3.2 Detail of Flush Mounting with Trim Ring

4.   Place the trim ring around the perimeter of the cabinet. See Figure 3.3.
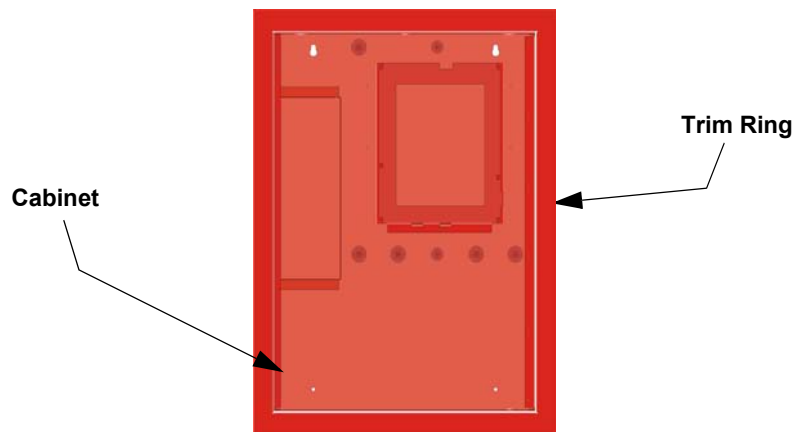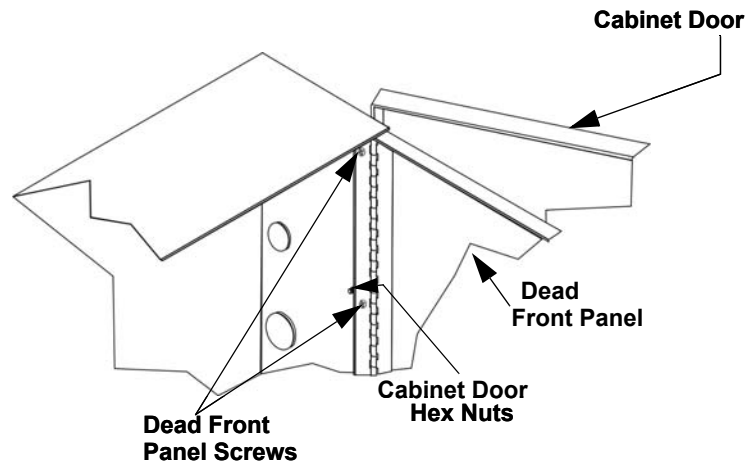
Cabinet

Trim Ring

Figure 3.3 Trim Ring Around cabinet

5.   Use the self-tapping sheet metal screws to secure the trim ring from the inside of the cabinet.
6.   Re-attach the cabinet door assembly.

Cabinet Door and Dead Front Removal

When you install the cabinet, it may be necessary to remove the cabinet door and the dead front panel. This Section provides instructions on how to remove the cabinet door and the dead front panel.

1. Using a Phillips head screwdriver, remove the six screws that hold the dead front panel in place. See Figure 3.4.

Figure 3.4 Cabinet Door and Dead Front Panel Removal

2. Using a 1/4"(.64cm) hex drive, remove the six hex nuts that hold the cabinet door in place. See Figure 3.4.

■ **Re-Attaching the Cabinet Door**

To re-attach the cabinet door, refer to the procedure in Section 3.

3.2 Fire Fighter's Handset Installation

■ **TR-FFT Local Handset installation involves the following steps:**

1. Insert the phone cord through the hole of the dead front panel. See Figure 3.5.
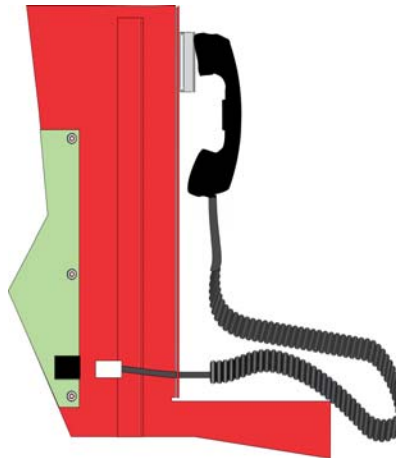
Figure 3.5 Handset Cord Inserted Through the Dead Front Panel Hole

2. Attach the strain relief clip to the phone cord. The strain relief clip should have about 2 ¾" (6.99cm) length of phone cord through it. See Figure 3.6.
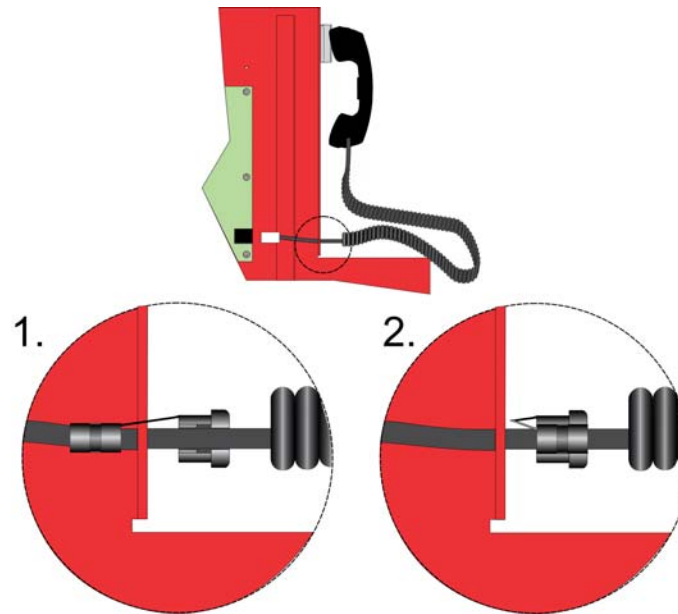3. Push the strain into the hole in the dead front panel.

Figure 3.6 Strain Relief Clip Installation

3.3 TR-24Z-EXT Installation

The TR-24Z-EXT expander board offers the option to add additional zones to the TR-FFT.

■ To install the TR-24Z-EXT, do the following steps.

1. Open the cabinet door and the dead front panel.
2. Remove the power. See Appendix A: for a list of the compatible powering devices.
3. Remove the blank plate and discard.
4. Mount the TR-24Z-EXT on the six mounting studs located on the inside of the dead front panel.
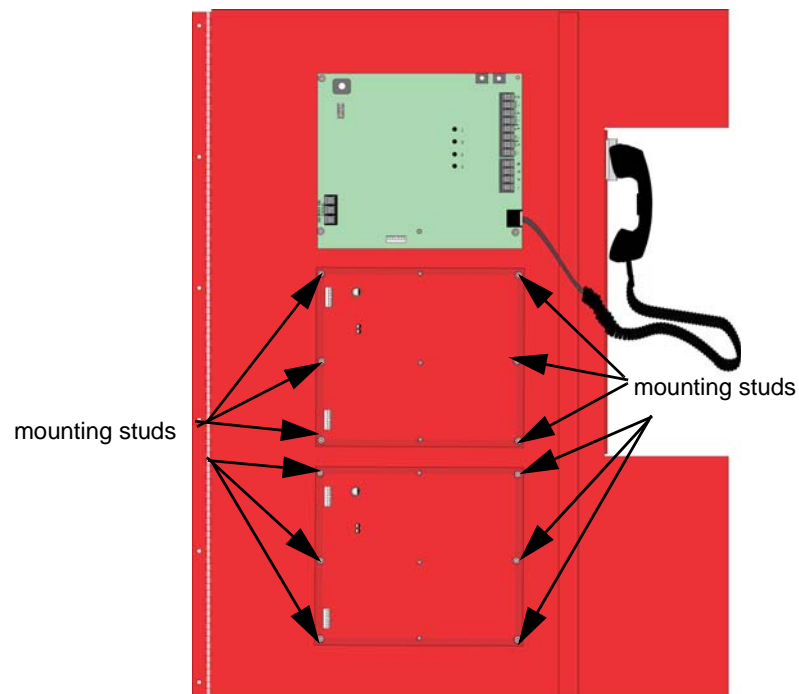5. To secure the board, use the nuts removed from the blank plate. See Figure 3.7.

Figure 3.7 Mounting Locations for the TR-24Z-EXT

6. Connect one end of the wiring harness (P/N 130398 supplied) to the TR-FFT and connect the other end of the wire harness to the TR-24Z-EXT as shown in Figure 3.8.
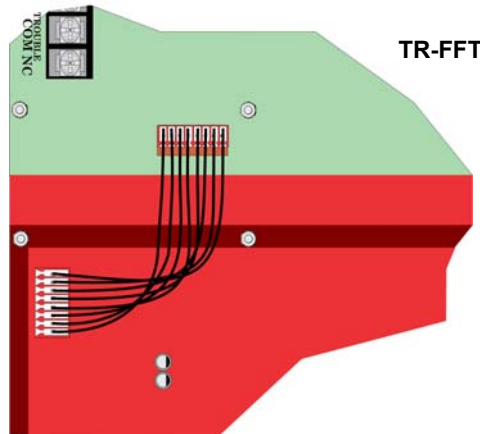
Figure 3.8 Wire Harness Connection from TR-FFT to TR-24Z-EXT Zones 25- 48

7. Restore the power. See Section 3.5.

3.4 TR-FFT Installation

The TR-FFT installation involves the following steps:

*   Connect any outputs that will power* the TR-FFT. (See Section 3.5).
*   Set the DIP switch ID for the TR-FFT (See Section 3.6.1).

*See Appendix A: for compatible powering devices. For additional information, refer to the Manuals on the website www.tri-gaglobal.com.

3.5 Power Operation

This Section provides instructions to install the appropriate DC power source.

1. Connect the TR-FFT to the appropriate DC power source. See Section 2.4.1 for power requirements. For compatible product see Appendix A.
2. Use the on-board DIP switch to assign the configuration setting to the TR-FFT. (See Section 3.6.1).

3.6 DIP Switch Settings on TR-FFT

This Section describes how to configure the DIP switch setting on the TR-FFT.

1. Refer to Section 2.3 to identify the location of the DIP switches on the TR-FFT board.
2. Configure the TR-FFT module by adding it to the System using the JumpStart feature. See Section 6.3 for information on the JumpStart Operation. Table 3.1 lists the possible DIP switch configurations.

3.6.1 DIP Switch

Figure 3.9 DIP Switch

DIP Switch	ON	OFF
1	SLC Devices Installed	SLC Devices not Installed
2	Trouble PZT Enabled	Trouble PZT Disabled
3	SLC Class A Supervision	SLC Class B Supervision
4	Phone Circuit Class A Supervision	Phone Circuit Class B Supervision
5	First TR-24Z-EXT Expander Board Installed	First TR-24Z-EXT Expander Board not Installed

Table 3.1 TR-FFT DIP Switch Configurations

3.7 TR-FFT Fire Fighter Telephone Module Connection

The TR-FFT provides the connection for a single Class B or Class A telephone audio circuit. See Section 4 and Section 5 for examples of audio zone configurations. A monitor module can be used to monitor the connection of the Fire Fighter Telephone remote handset (TR-RHS) into the TR-FPJ, which is then displayed on the TR-FFT active zone LED during the JumpStart feature.
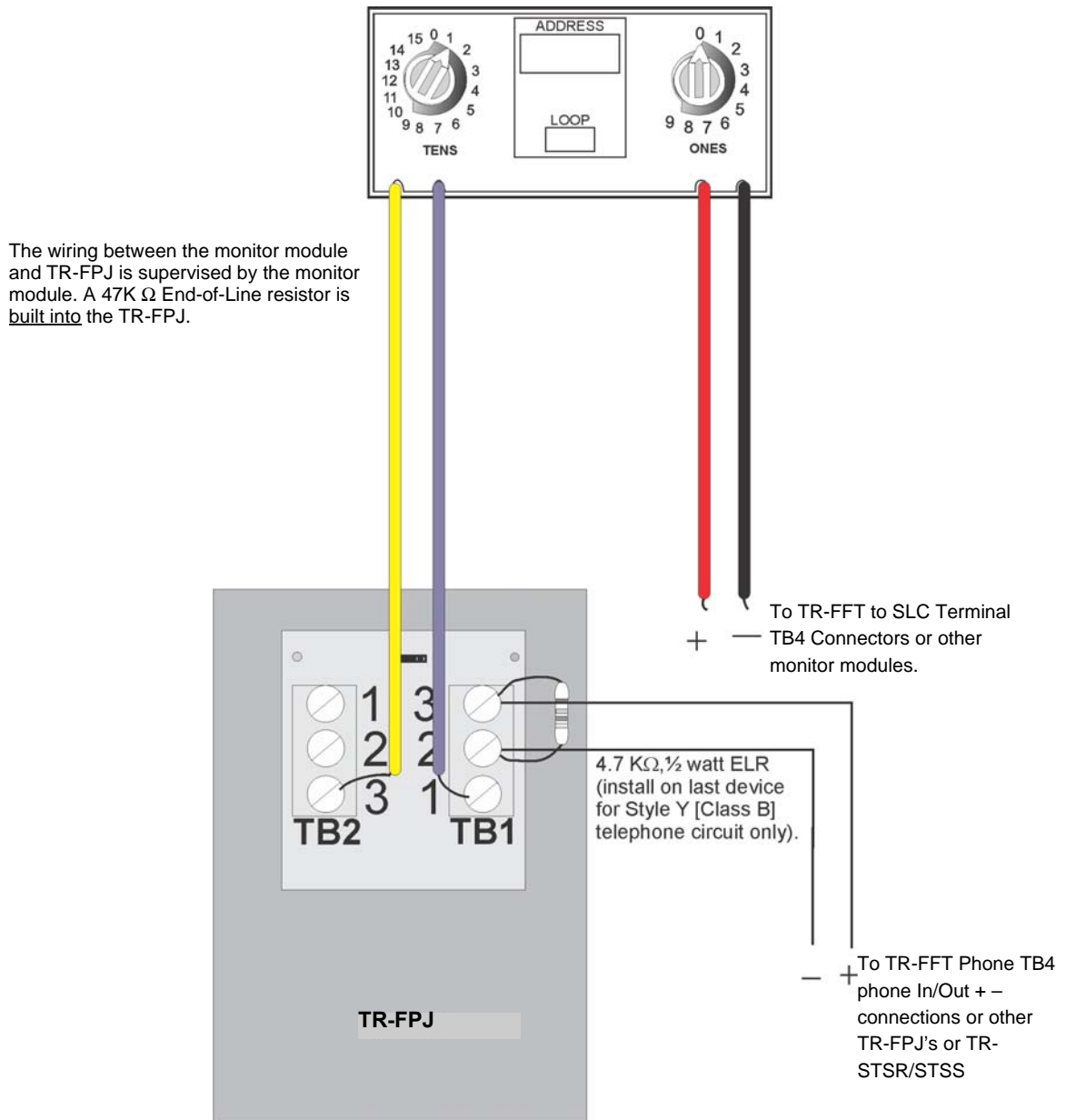

The wiring between the monitor module and TR-FPJ is supervised by the monitor module. A 47K Ω End-of-Line resistor is built into the TR-FPJ.

To TR-FFT to SLC Terminal TB4 Connectors or other monitor modules.

4.7 KΩ,½ watt ELR (install on last device for Style Y [Class B] telephone circuit only).

To TR-FFT Phone TB4 phone In/Out + − connections or other TR-FPJ's or TR-STSR/STSS

Figure 3.10 Monitor Modules to TR-FFT Connections

3.8 TR-FPJ Installation

The TR-FPJ Firefighter Phone Jack mounts to any of the following:

*   a single-gang electrical box (4" x 2-1/8" x 2-½") (10.16cm x 5.54cm x 6.35cm) or
*   when the addressable mini-monitor module is installed with it, a deep single-gang electrical box (4" x 2-1/8" x 3-¾") (10.16cm x 5.54cm x 9.53cm).

Connect the telephone audio loop between the TR-FPJ and the TR-FFT as detailed in Figure 3.12.

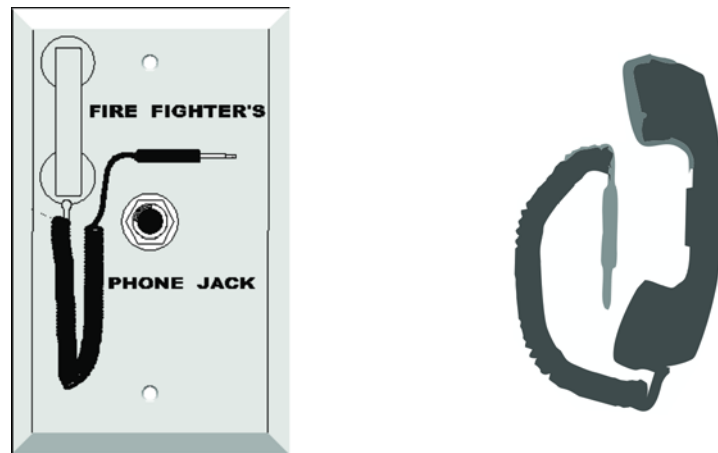All circuits are power-limited and supervised.

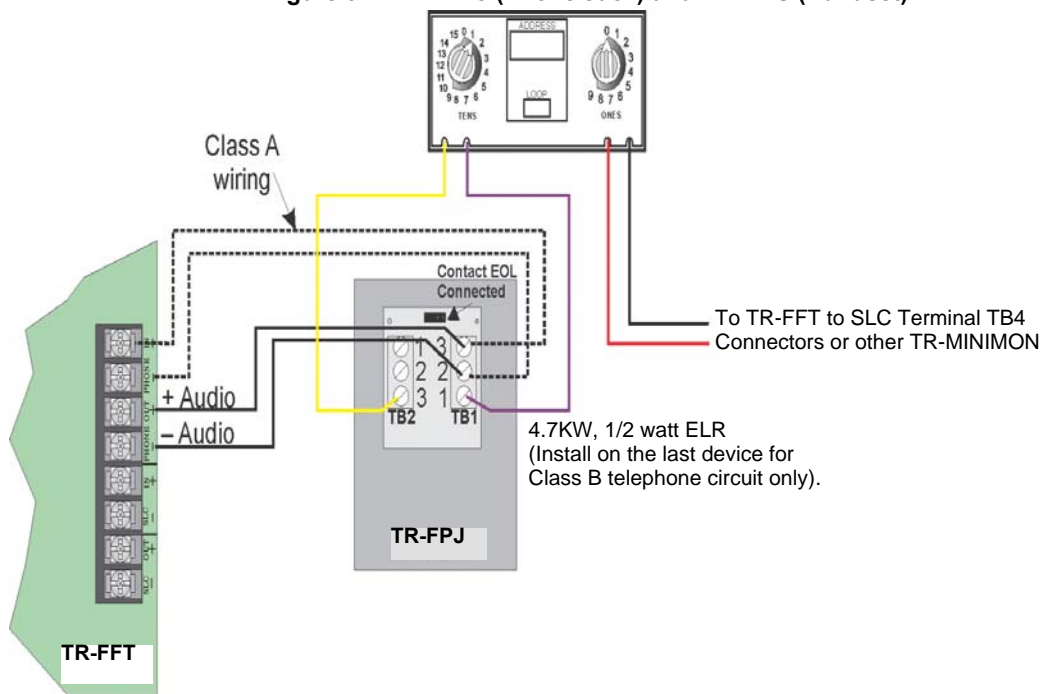**Figure 3.11 TR-FPJ (Phone Jack) and TR-RHS (Handset)**

Figure 3.12 TR-FFT-to-TR-FPJ Wiring Connection

3.9 TR-STSR/TR-STSS Installation

The Single Telephone Stations are packaged in a series of parts. The telephone chassis, backbox, break glass kit and door with key lock are all ordered separately. Up to ten remote handsets may be operated simultaneously.

3.9.1 Assembly of Units with Coiled Cord Handsets

The following assembly steps are for telephones with coiled cord handsets. These steps must be accomplished once the enclosure has been mounted and the system wiring is in place.

1. Attach the System wiring to the terminal strip on the telephone chassis assembly.
2. Insert the 6-32 nut in the backbox. Do not tighten the nuts.
3. Install the telephone chassis assembly in the backbox.
4. Install the trim ring on the backbox using the 6-32 wing nuts. Do not tighten.
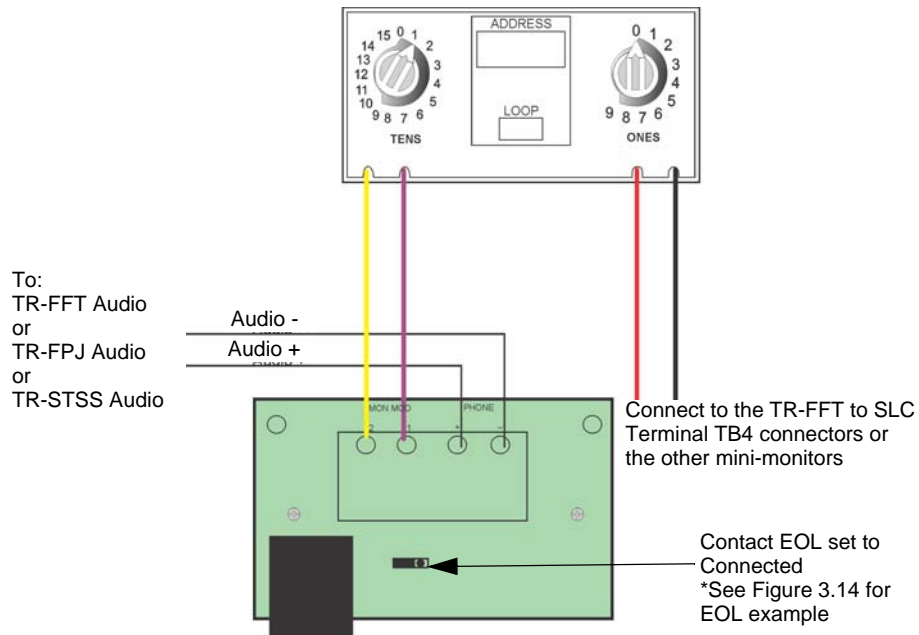5. Install the door assembly. To secure, tighten the wing nuts.

To:
TR-FFT Audio
or
TR-FPJ Audio
or
TR-STSS Audio

Audio -
Audio +

Connect to the TR-FFT to SLC
Terminal TB4 connectors or
the other mini-monitors

Contact EOL set to
Connected
*See Figure 3.14 for
EOL example

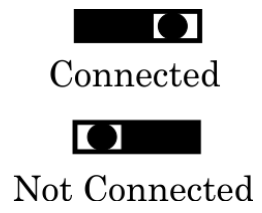**Figure 3.13 TR-STS Telephone Connection**

Connected

Not Connected

Figure 3.14 EOL Example

Section 4: SLC Device Installation

⚠️ **CAUTION: TO PREVENT THE RISK OF ELECTRICAL SHOCK AND DAMAGE TO THE UNIT, SHUT OFF THE POWER AT THE CONTROL PANEL WHEN YOU INSTALL OR SERVICE THE CONTROL PANEL.**

4.1 List of SLC Devices

The following SLC devices can be used with the Fire Fighter's Telephone. For more information, refer to the device installation instructions (packaged with the device).

Device Part Number	Model Name/Description	Install Sheet Part Number
TR-MINIMON	Mini Monitor Module	I56-6978
TR-ISO	Fault Isolator Module	I56-6977

Table 4.1 SLC Devices

4.2 Maximum Number of Devices

The TR-FFT supports up to 72 TR-MINIMON devices on one TR-FFT System.

4.3 Wiring Requirements for SLC Device

The information in Section 4.3 and Section 4.4 pertains to the TR-MINIMON - Mini Monitor Module.

4.3.1 Wiring SLC Devices in (Class B) Configuration

There is no special wire required for the addressable loops. The wire can be untwisted, unshielded, solid or stranded as long as it complies with the National Electric Code 760-51 Requirements for Power-Limited Fire Protective Signaling Cables. Wire distances are computed using copper wire.

- The maximum wiring resistance is 40 ohms to the farthest SLC device.
- The maximum loop length depends on the wire gauge. See Table 4.2.

Wire Gauge	Max. Distance
22 AWG	1200 feet
18 AWG	3100 feet
16 AWG	4900 feet
14 AWG	7900 feet
12 AWG	10,000 feet

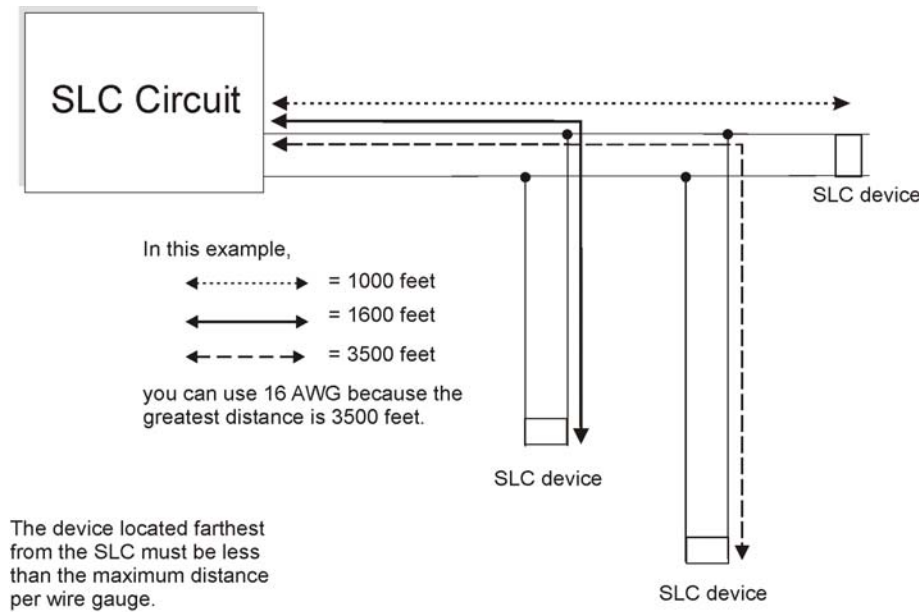**Table 4.2 Wiring Gauge and Distance Chart**

Figure 4.1 and Figure 4.2 show how the length is calculated when you use the Out and the Back Tap T-Tap style wiring.
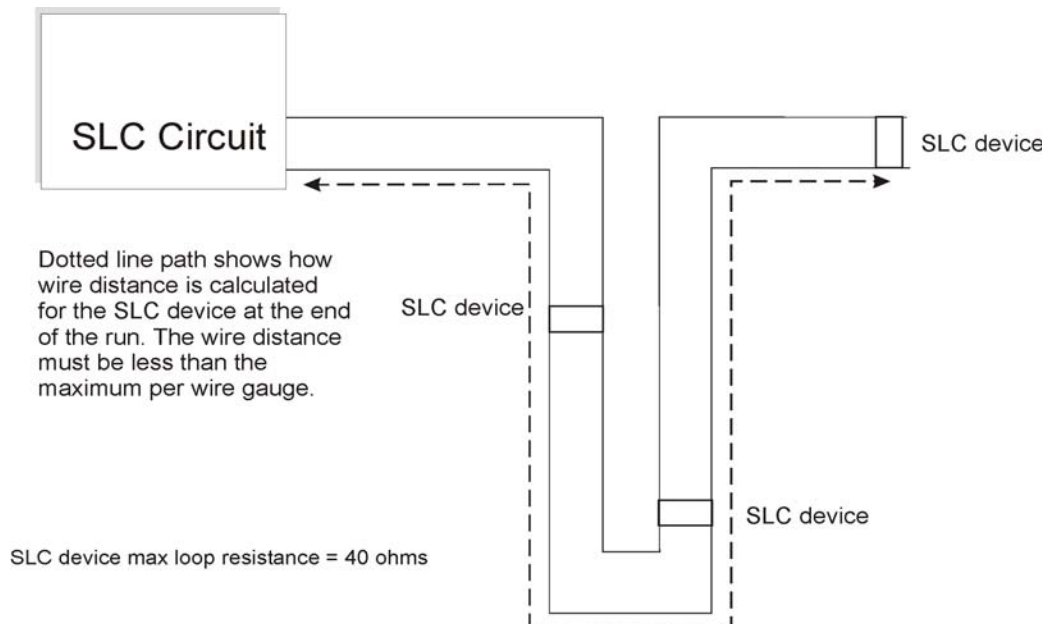
Figure 4.1 Calculating the Wire Run Length for a Simple Out and Back

When you use the T-taps, the following are required:

- The total length of all taps and the main bus must not exceed 40,000 feet.
- Use the maximum distance requirements for the various wire gauges.

Figure 4.2 Calculating the Wire Run Length for a T-tap

4.3.2 Wiring SLC Devices in (Class A) Configuration

Figure 4.3 illustrates how to wire the SLC loop for Class A installations.
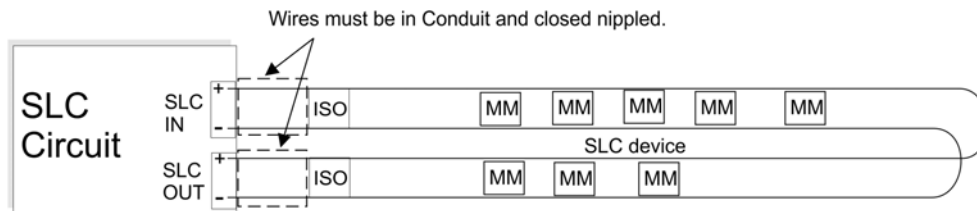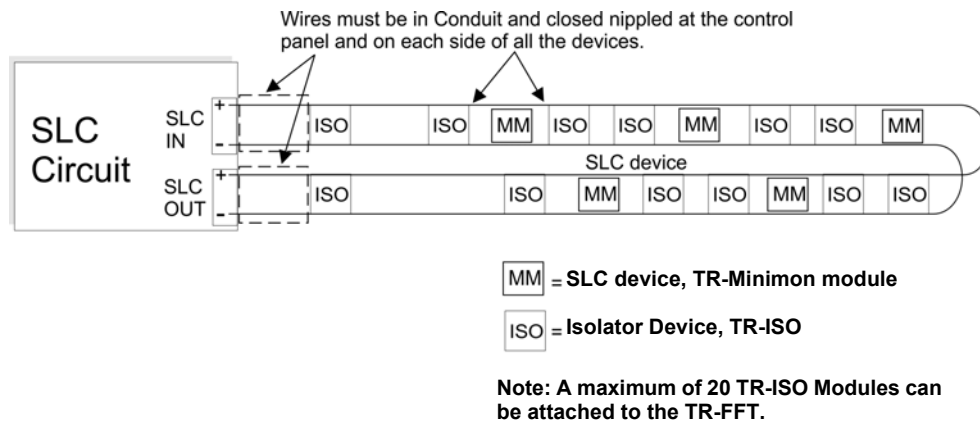

Figure 4.3 Class A SLC Configuration

NOTE: Class A does not require the use of the isolator modules.There are no T-taps allowed on the Class A SLC loops.

> ⚠️ **CAUTION: BREAK WIRE RUNS:**
> FOR PROPER SYSTEM SUPERVISION DO NOT USE LOOPED WIRE UNDER TERMINALS MARKED SLC + AND – OF THE SLC DEVICE CONNECTORS. BREAK WIRE RUNS TO PROVIDE SUPERVISION OF CONNECTIONS.
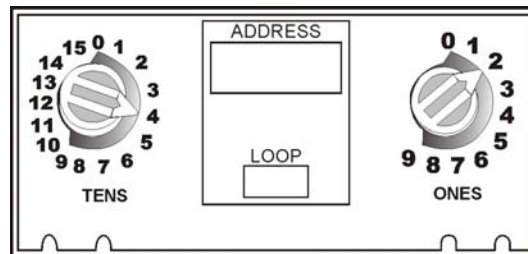
4.4 Addressing the TR-MINIMON SLC Devices

All TR-MINIMON devices are addressed using the two rotary dials that appear on the device board. Use the *ONES* rotary dial to set the Ones place in a one- or two-digit number, and use the *TENS* rotary dial to set the Tens place in a two-digit number.

TR-MINIMON modules can be assigned any unique address from 1 to 48.

- **Example 1:** To select the device address 10, turn the *ONES* rotary dial to **0** and turn the *TENS* rotary dial to **1** as shown in Figure 4.4.
- **Example 2:** To select the device address 42, turn the ONES rotary dial to **2** and turn the TENS rotary dial to **4** as show in Figure 4.4.
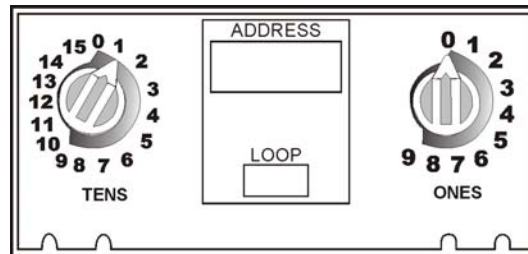
Example 1: Device set to 10

Example 2: Device Set to 42
Figure 4.4 TR-MINIMON SLC Device Addressing using the Rotary Dials

Section 5: Audio Phone Circuit Installation

5.1 List of Devices

The following device can be used with the Fire Fighter's Telephone. For more information, refer to the device installation instructions (packaged with the device).

Part Number	Description
TR-FPJ	Fire Fighter Telephone Jack

Table 5.1 Devices

5.2 Maximum Number of Devices

The TR-FFT supports up to 72 zones. Each zone consists of one addressable monitor module (TR-MINIMON) and a minimum of one Fire Fighter Telephone Jack (TR-FPJ).

5.3 Wiring Requirements for the Audio Telephone Circuit

In Section 5.3, the information pertains to the TR-FPJ Fire Fighter Phone Jack.

5.3.1 Single Phone Jack Audio Circuit in Class B Configuration

No special wire is required for the Audio Telephone Circuit. The wire can be untwisted, unshielded, twisted or shielded as long as it meets the National Electric code 760-51 requirements for Power-Limited Fire Protective Signaling Cables.

54 Ohm maximum impedance   - 12 to 18 AWG.

Twisted, shielded wire is recommended for maximum protection against EMI and AFI emissions and susceptibility.

If you use the shielded cable, attach the shield to the Grounding Stud below TB6 of the TR-FFT.

NOTE: Do not ground the shield on both ends.

Figure 5.1 illustrates the single phone jack configuration wiring for the audio circuit and the SLC for Class B configuration. Audio circuits must be connected to the TR-FFT phone out terminals for all Class B audio configurations.
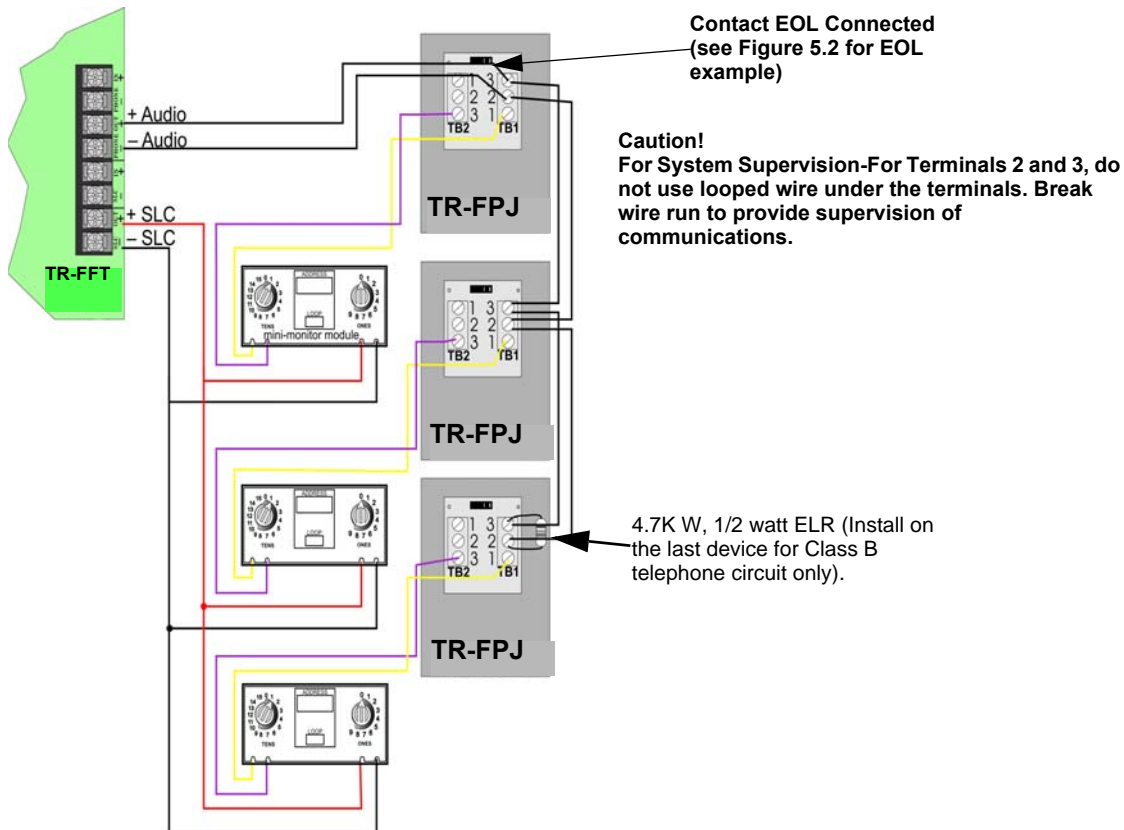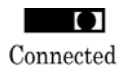

Figure 5.1 Single Phone Jack Audio Circuit Wired Class B

Figure 5.2 EOL Example

5.3.2 Single Phone Jack Audio Circuit Wired in Class A Configuration

For information on the wiring specifications, see Section 5.3.1. Figure 5.3 illustrates the Phone Jack Audio Circuit (Class A) and SLC for the (Class A) configuration.
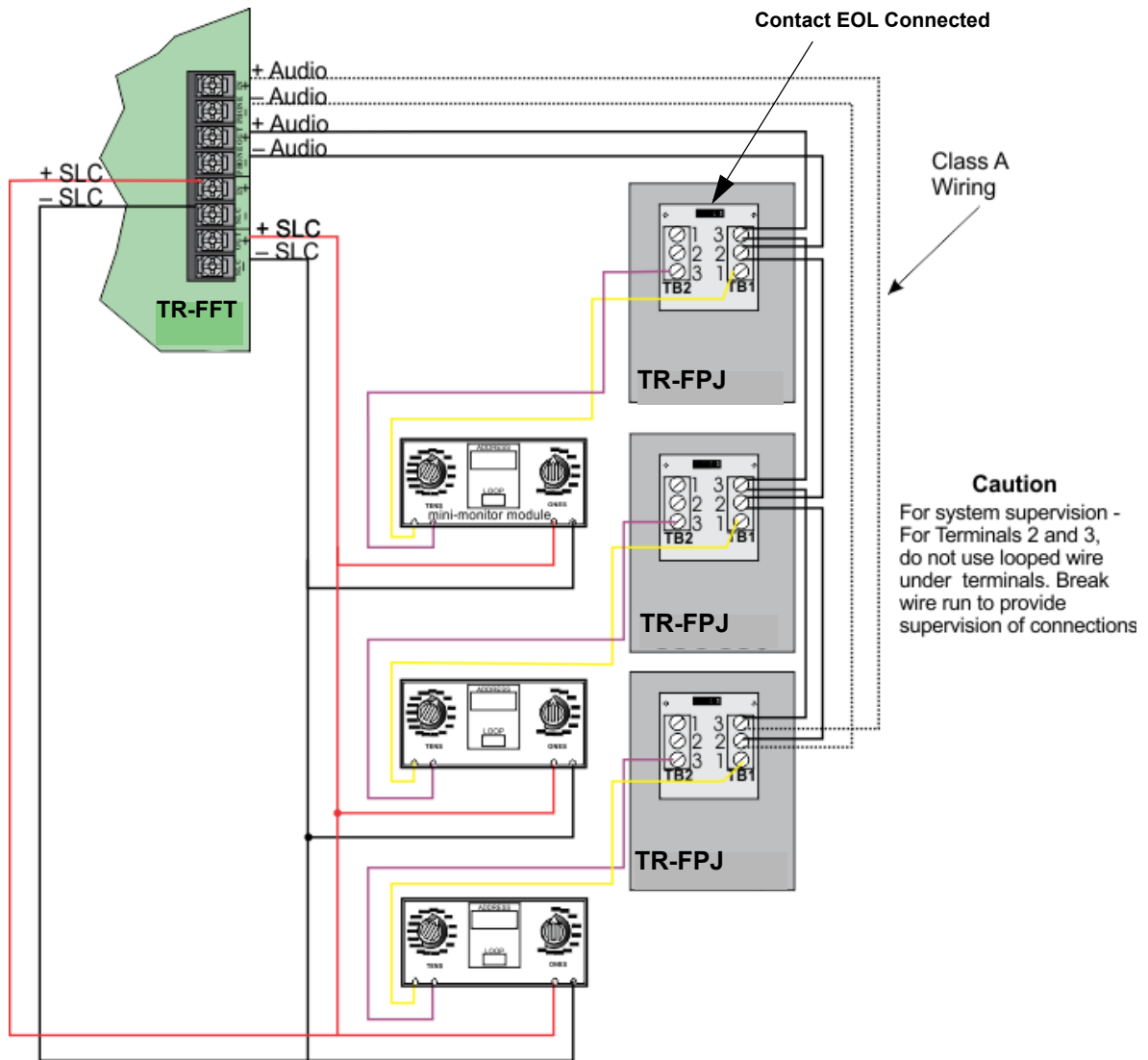

Figure 5.3 Single Phone Jack Audio Circuit in Class A

5.3.3 Multi-Phone Jack Audio Circuit Wired in Class B Configuration

For information on the wiring specifications, see Section 5.3.1. Figure 5.4 illustrates how to wire the Multi-Phone Jack Audio Circuit (Class B) and the SLC for (Class B) configuration. In the Multi-Phone Jack configuration, the maximum mini-monitor contact wiring resistance between to the first and the last TR-FPJ must be less than 100 ohms.

Figure 5.4 Multi-Phone Jack Audio Circuit Wired in Class B

5.3.4 Multi-Phone Jack Audio Circuit in Class A Configuration

For wiring specifications see Section 5.3.1. Figure 5.5 illustrates how to wire the Multi-Phone Jack audio circuit (Class A) and the SLC for (Class A) configuration. In the Multi-Phone Jack configuration, the maximum mini-monitor contact wiring resistance between the first and the last TR-FPJ must be less that 100 ohms.
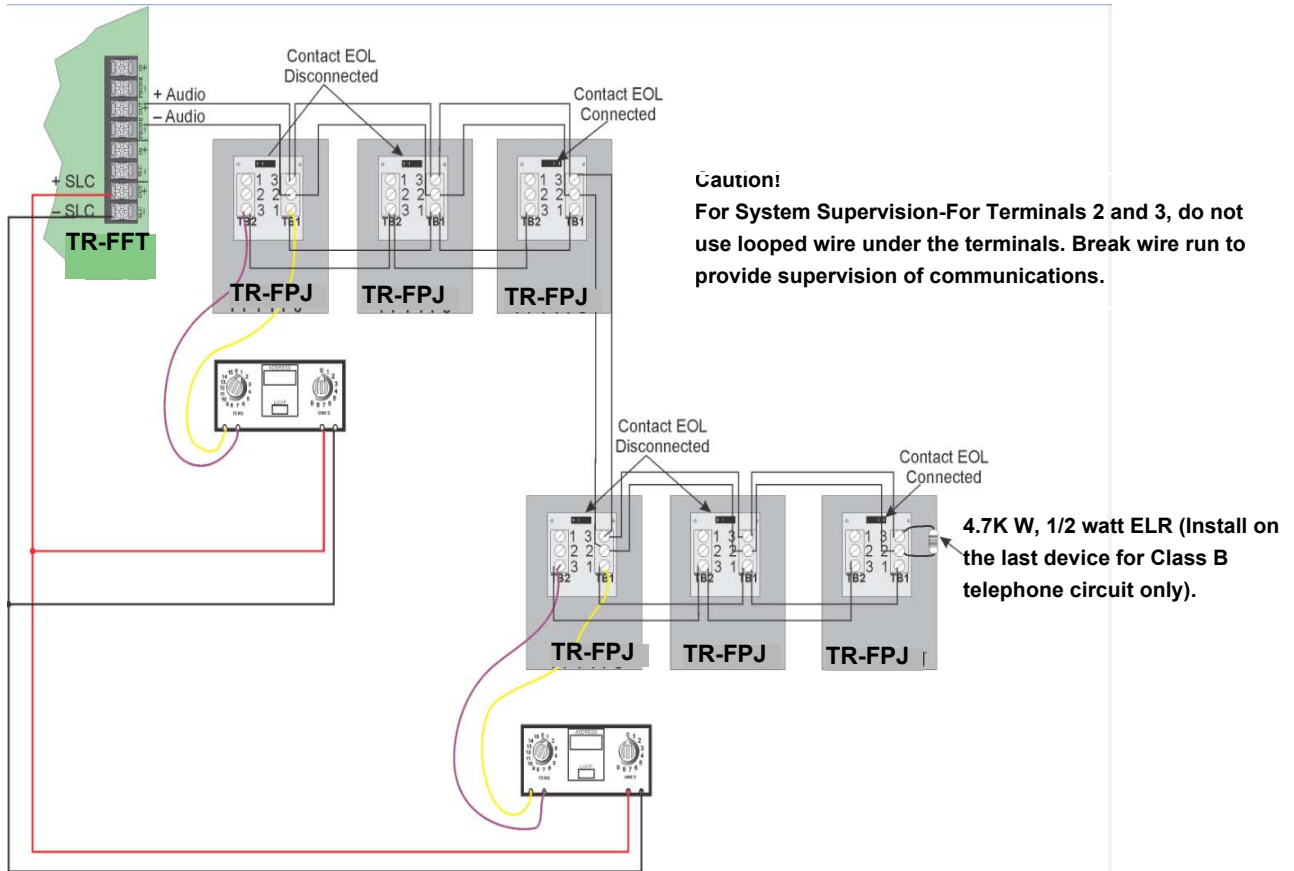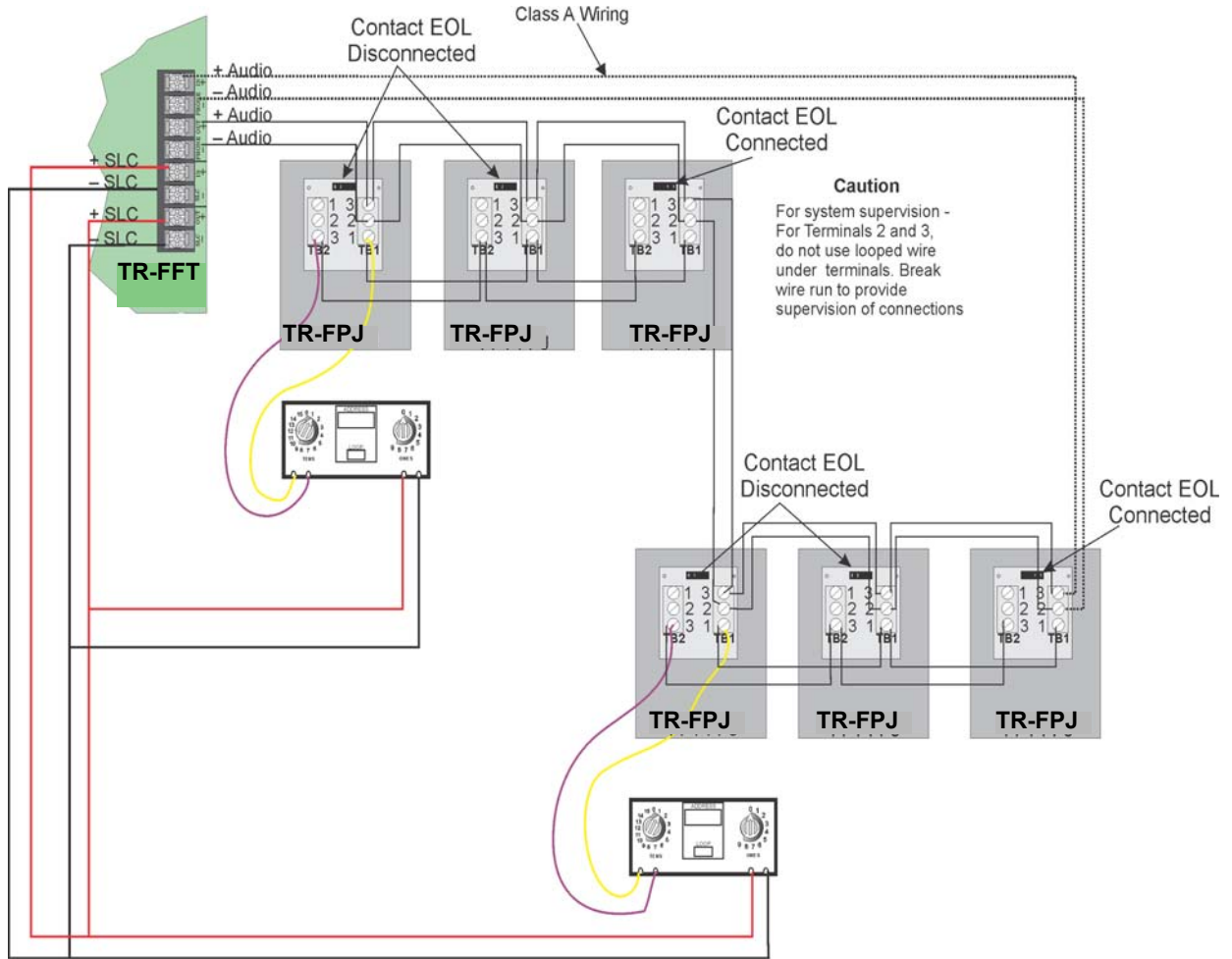

Figure 5.5 Multi-Phone jack Audio Circuit Wired in Class A

5.3.5 Telephone Jack Only Audio Circuit

The TR-FFT can be configured using only the Fire Fighter's Phone Jack (TR-FPJ). In this configuration, the TR-MINIMON module is not required for the System operation. To configure the TR-FFT for only the Telephone Jack, the DIP Switch position One must be set to OFF (SLC Devices not Installed). See Table 3.1.

See Figure 5.6 and Figure 5.7 to view the detail of the Audio wiring for this configuration.

Caution!
For System Supervision-
For Terminals 2 and 3,
do not use looped wire under the
terminals. Break wire run to provide
supervision of communications.

4.7K W, 1/2 watt ELR
(Install on the last device
for Class B telephone
circuit only).
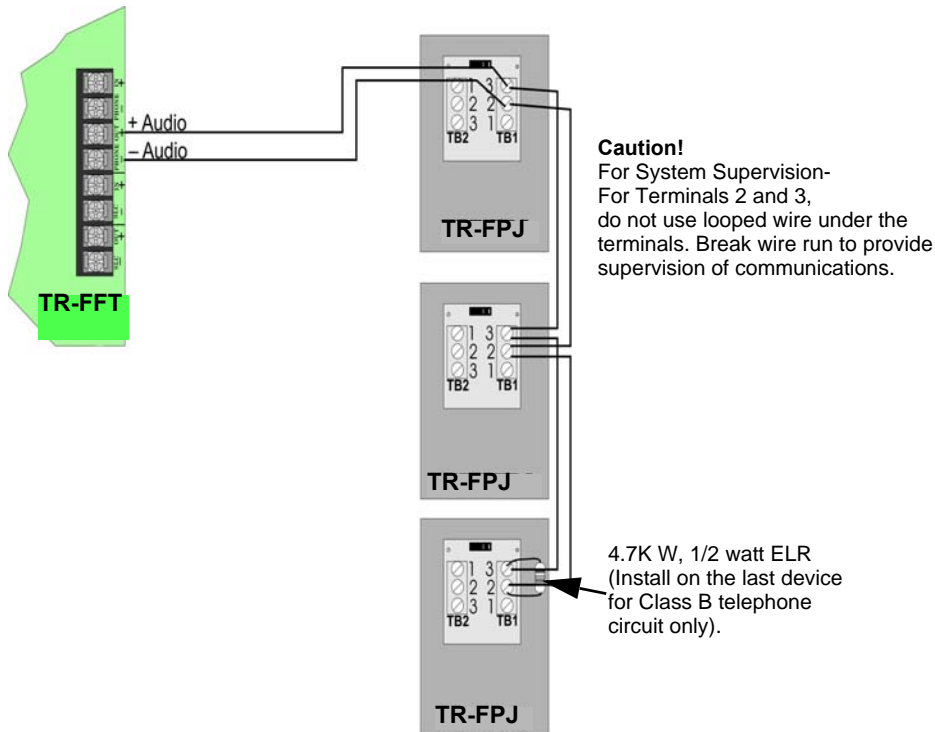
Figure 5.6 Telephone Jack Only Audio Circuit Wired in Class B

Class A
Wiring

Caution
For system supervision -
For Terminals 2 and 3,
do not use looped wire
under terminals. Break
wire run to provide
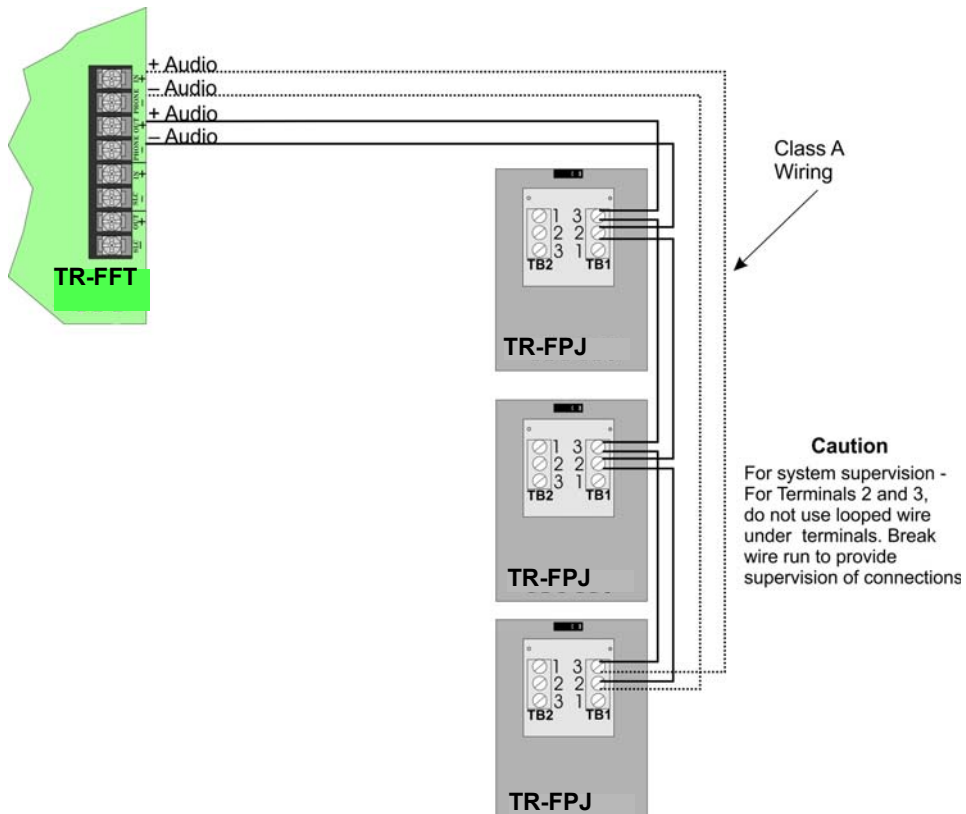supervision of connections

Figure 5.7 Telephone Jack Only Audio Circuit Wired in Class A

Section 6: System Operation

The operation of the TR-FFT Fire Fighter Telephone System allows the audio communication from 24 remote connections through the use of the remote handsets from a single local handset. Up to 10 remote handsets can be connected and communicating simultaneously at one time. The remote audio connections can be expanded to 72 with the optional TR-24Z-EXT Zone Expander.

6.1 Key Switch Operations

6.1.1 JumpStart Key Switch (on inside of TR-FFT Dead Front Panel).

The JumpStart key will cause the TR-FFT to search the SLC loop for the devices. The Active LED (green) will then blink for each zone where a device was found. Press and hold the JumpStart Key for two seconds in order to initiate the JumpStart program.

6.1.2 Accept Key Switch (on inside of TR-FFT Dead Front Panel).

The Accept key is used after JumpStart. It will save the current SLC device configuration and re-initialize the TR-FFT. If the user does not press the Accept key within one minute after the JumpStart is complete, its configuration will be discarded and the TR-FFT will be restarted.

6.1.3 Answer Switch

When a Remote Handset is connected to one of the TR-FPJ phone jacks, the Answer LED will blink and the TR-FFT's PZT will sound. If you press the Answer Switch to connect the local handset to the phone circuit, turn the answer LED on solid, and silence the PZT. The communication between the local and remote handset is now possible. Up to six remote handsets can be connected to the phone circuit simultaneously. After the initial remote handset, the connection of additional handsets does not cause the PZT to sound or the Answer LED to blink.

6.1.4 Silence Switch

The Silenced Switch is used to silence a system type trouble that has occurred in the TR-FFT System. Once pressed, the PZT will silence.

6.2 LED Operations

6.2.1 Power Status LED

The Power Status LED is located on the left side of the TR-FFT board. On Power-Up, the Power Status LED will blink at a 50% on/off rate until the TR-FFT initialization is complete (which takes approximately 20 seconds). Once initialization is complete, the Power Status LED will blink at a 10% on and 90% off rate.

No key input will be valid until the TR-FFT completes its initialization.

6.2.2 Answer

When a Remote Handset connects to the audio channel, the Answer LED will blink and the PZT will sound. The Operator at the TR-FFT then picks up the local handset and presses the Answer Switch which causes the Answer LED to remain on solid and the PZT goes silent. Communication between the local and remote handset is now established. Additional remote handsets can be attached to the audio connection without any intervention at the TR-FFT. Once the last remote handset has disconnected from the TR-FFT, the answer LED will go blank and the System will return to normal.

6.2.3 Power

The Power LED indicates that 24 VDC is connected to the TR-FFT.

6.2.4 Local Handset Trouble

The Local Handset Trouble LED will activate and blink when there is a problem with the local handset.

6.2.5 Remote Handset Trouble

The Remote Handset Trouble LED will activate and blink when there is a problem with the phone circuit.

6.2.6 General Trouble

The General Trouble LED will blink active when system troubles are detected. When the Silence Key is pressed, the General Trouble LED will become constant. Once all system troubles have been restored, the General Trouble LED will deactivate.

6.2.7 Status LEDs (on inside of TR-FFT Dead Front Panel)

- LED 1 - SLC Supervision*
- LED 2 - SLC Extra Point Detected
- LED 3 - TR-24Z-EXT Missing
- LED 4 - Audio Circuit Supervision

> **NOTE:** * Troubles that will turn LED on: SLC shorted, SLC Class A open trouble and the wrong device type.

6.2.8 Zone Active

Each Zone has an Active LED (see Figure 6.1 on page 29). The Zone's Active LED will illuminate when a remote handset is plugged into that Zone. The LED will turn off when the handset is removed from the Zone.

6.2.9 Zone Trouble

Each Zone has a Trouble LED (see Figure 6.1). The Zone's Trouble LED will blink when the specific SLC issues occur (such as, a missing device or double address). If you press the Silence Key, it will cause the Zone Trouble LED to be on solid. Once the Zone Trouble is corrected, the LED will turn off.
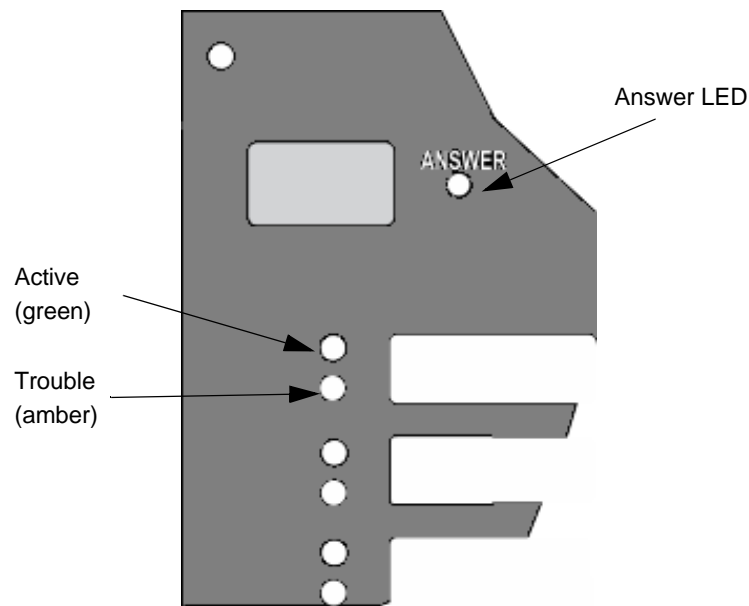

Figure 6.1 LED Operations

6.3 JumpStart Operation

The JumpStart feature will attempt to do the following:

- Locate all SLC Mini-Monitor devices installed in the System.
- Indicate all devices found on the TR-FFT and all TR-24Z-EXT Active LEDs.
- Allow the user to accept the configuration.
- Repeat the JumpStart.
- Allow the configuration to be discarded.

To perform the TR-FFT JumpStart, do the following steps.

1. Press and hold the JumpStart button for two seconds.
2. The TR-FFT will search for the installed SLC devices and activate the Active LED's of all zone/point addresses found.
3. When the JumpStart is complete, the first four status LEDs will blink.
4. The user can now press the Accept key causing the TR-FFT to save the configuration and restart.
5. The user presses the JumpStart key again to repeat the SLC search process.
6. If the user does not press the Accept key within one minute after the JumpStart is complete, its configuration will be discarded and the TR-FFT will be restarted.

Appendix A: Compatible Powering Devices

A.1 Compatible Power Devices

Table A.1 lists the available Triga Series compatible power device used with the TR-FFT.

Model	Manual PN
TR-2100/ECS Control Panel Manual	LS10143-003TR-E
TR-RPS1 Power Supply	LS10259-002TR-E

Table A.1 Compatible Powering Devices

TRÏGA

Model TR-FFT Basic Operating Instructions

These Instructions must be framed and displayed next to the TR-FFT panel in accordance with NFPA 72 fire code for Local Protected Fire Alarm Systems. Test the system in accordance to NFPA 72. Refer to Installation Manual P/N LS10309-001TR-E for more information regarding this control panel.

Operation	Task to Perform
Answer Call	When Remote handset is connected to the TR-FPJ, the Answer LED will blink and PZT will sound.
	Press Answer key and PZT will silence. Answer LED will be on solid and audio connection will be established between local and remote handset.
Silence Trouble	Press Silence key and PZT will silence. General Trouble LED will be on solid.
For Service call:	

P/NLS10329-001TR-E   ECN 151608

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