

Notifier FirstCommand  
**NFC-50/100 & NFC-50/100E**  
Instruction 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.

**Telephone lines** needed to transmit alarm signals from a premises to a central monitoring station may be out of service or temporarily disabled. For added protection against telephone line failure, backup radio transmission systems 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 0-49° C/ 32-120° F and at a relative humidity 93% ± 2% RH (noncondensing) 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 15-27° C/60-80° 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.

**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 présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

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## 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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This control panel has been designed to comply with standards set forth by the following regulatory agencies:

- Underwriters Laboratories/Underwriters Laboratories Canada
- National Fire Protection Association

**Before proceeding, the installer should be familiar with the following documents.**



**NFPA Standards**

This Fire Alarm Control Panel complies with the following NFPA Standards:

NFPA 72 National Fire Alarm Code

Note: Audible signal appliances used in public mode applications, are required to have minimum sound levels of 75 dBA at 10 feet (3 meters) and a maximum level of 120 dBA at the minimum hearing distance from the audible appliance.

To ensure that the appliance is clearly heard, the audible appliance sound level must be at least 15 dBA above the average ambient sound level or 5 dBA above the maximum sound level with a duration of at least 60 seconds, depending on which level is greater, with the sound level being measured 5 feet (1.5 meters) above the floor.



**Underwriters Laboratories Documents:**

UL 38 Manually Actuated Signaling Boxes

UL 464 Audible Signaling Appliances

UL 864 Standard for Control Units for Fire Protective Signaling Systems

UL 1480 Speakers for Fire Protective Signaling Systems

UL 1638 Visual Signaling Appliances

UL 1711 Amplifiers for Fire Protective Signaling Systems

UL 1971 Signaling Devices for Hearing Impaired

UL 2572 Communication and Control Units for Mass Notification Systems



CAN/ULC - S524-01 Standard for Installation of Fire Alarm Systems

CAN/ULC - S527-11 Standard for Control Units for Fire Alarm Systems

This Class (A) digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe (A) est conforme à la norme NMB-003 du Canada.

**Other:**

Canadian Electrical Code, Part 1

NEC Article 250 Grounding

NEC Article 300 Wiring Methods

NEC Article 760 Fire Protective Signaling Systems

Applicable Local and State Building Codes

Requirements of the Local Authority Having Jurisdiction (LAHJ)

**Notifier Documents:**

Notifier Device Compatibility Document

Document #15378

NFC Distributed Audio Manual

Document #LS10027-001NF-E

NFC-FFT Manual

Document #LS10031-001NF-E

NFC-LOC Installation Document

Document #LS10028-001NF-E

NFC-RPU Installation Document

Document #LS10030-001NF-E

NFC-RM Installation Document

Document #LS10029-001NF-E

NFC-CE6 Installation Document

Document #LS10033-001NF-E

NFC-CE4 Installation Document

Document #LS10002-001NF-E

NFC-BDA-25/70V Installation Document

Document #LS10035-001NF-E

NFC-XRM-70V Installation Document

Document #LS10032-001NF-E

NFW-100X Manual

Document #LS10131-001NF-E

NFS2-640 Listing Document

Document # 52741LD

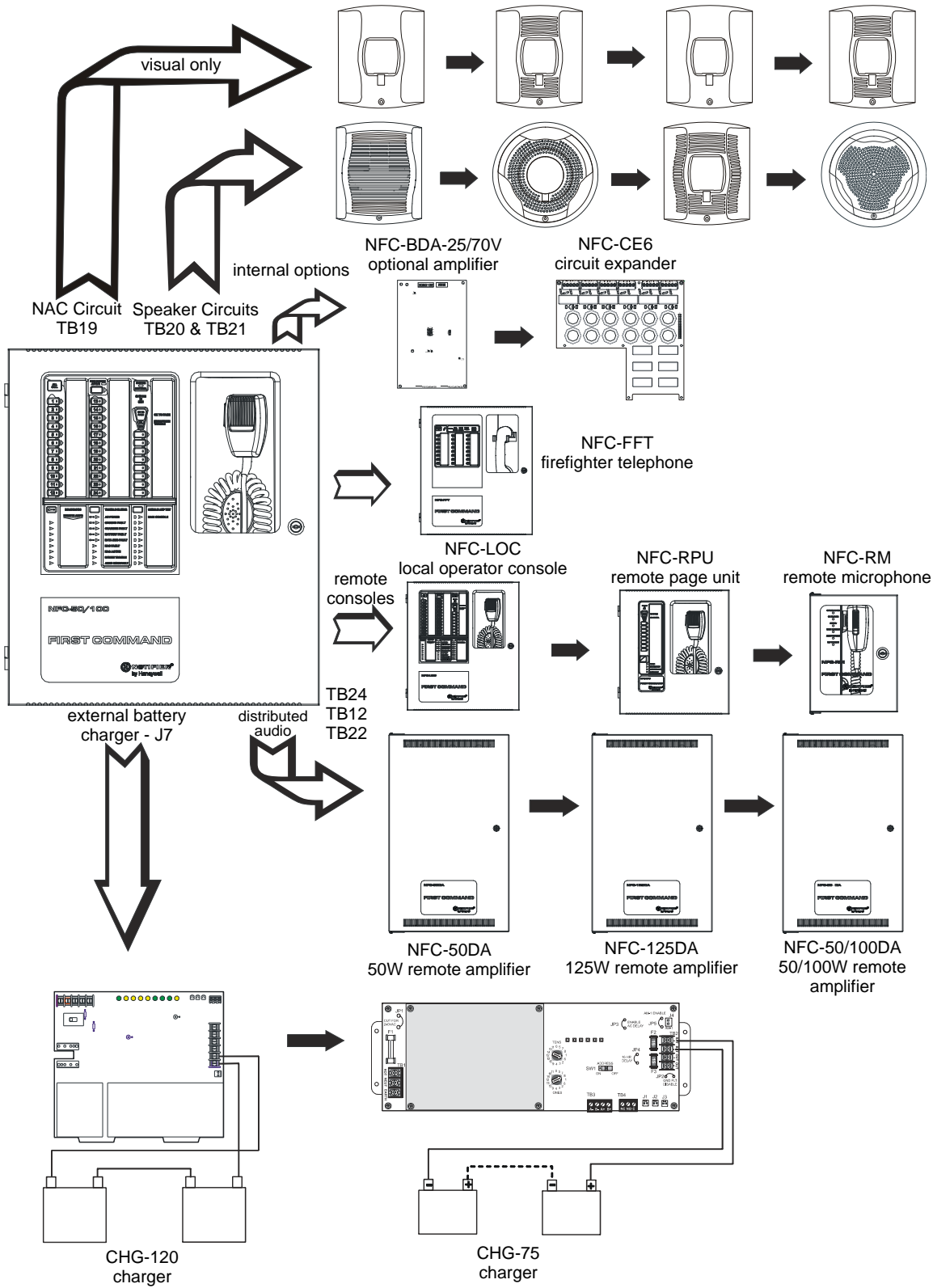
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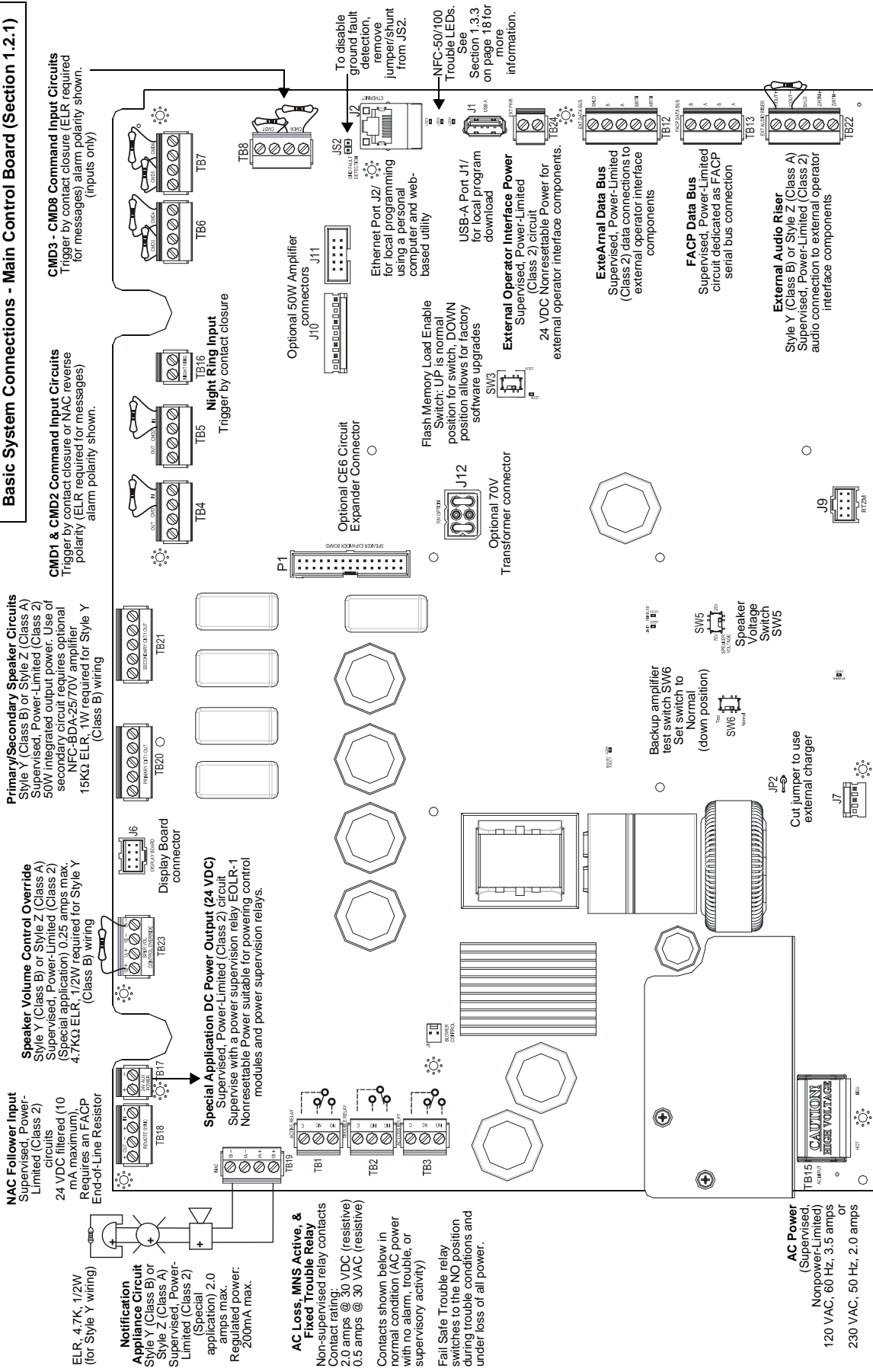
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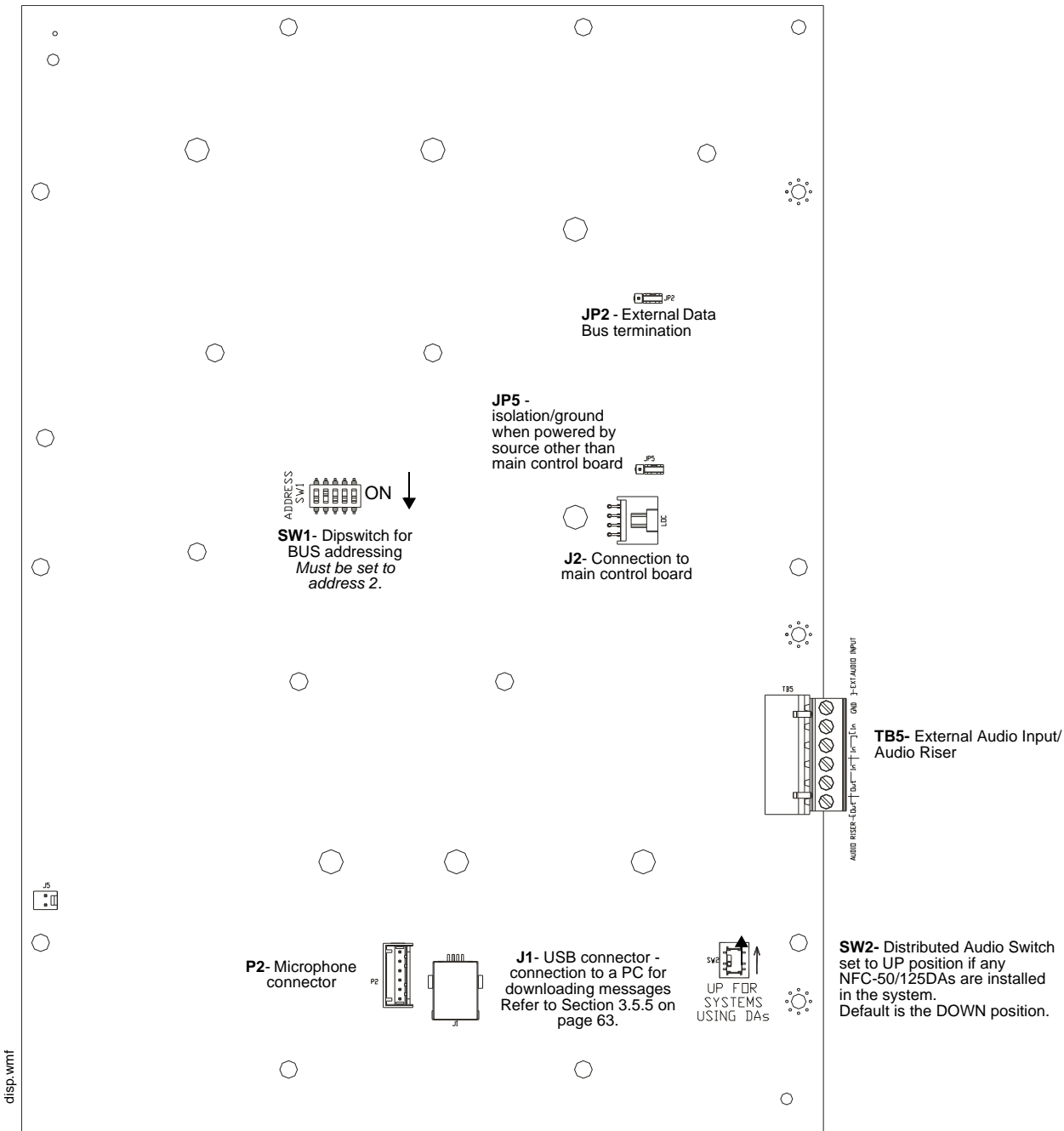
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**Basic System Connections - Main Control Board (Section 1.2.1)**



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**Basic System Connections - Display Board (Section 1.2.2)**



# Section 1: Product Description

The Notifier FirstCommand NFC-50/100 is a single channel, 50 watt, 25 V<sub>RMS</sub>, emergency voice evacuation panel that may be used for fire applications, mass notification applications, or both. The NFC-50/100 comes standard with one speaker circuit. The panel provides the ability to record fourteen field programmable messages (up to 60 seconds each) with an integral microphone or from an external audio source. An integral power supply with battery charger supplies operational power. A 50 watt audio amplifier is built into each panel. An optional second 50 watt amplifier (NFC-BDA-25/70V) is also available for backup purposes or to provide an additional 50 watts. The backup amplifier is available in either 25 volts or 70 volts depending on which application is necessary.

Automatic activation of the NFC-50/100 by an FACP is possible via eight Command Input Circuits (CMD) or via the ACS/ANN Bus serial communications link from the FireWarden-100X, FireWarden-100-2, NFS2-640, and NFS-320 FACPs.

Two Command Input Circuits can be independently field programmed for activation by an FACP Notification Appliance Circuit reverse polarity or by closure of a supervised normally open contact and six Command Input Circuits activate on contact closure. CMD 1 and CMD 2 provide terminals for NAC input and output to allow installation of the audio panel anywhere along the NAC circuit being used to activate it.

If the message generator fails, the system automatically reverts to a backup tone generator.

Power is fed independently to each amplifier so that a short circuit in one amplifier will not shut down the other. Full output power of 50 watts per amplifier is generated while in a low battery condition. Power is not diminished when the optional 70 V<sub>RMS</sub> transformer module is installed. Audio is amplified utilizing modern integrated circuits as opposed to transformer technology. This provides for very low signal distortion for crystal clear audio.

Primary applications for the audio panels include protecting structures such as military facilities, restaurants, schools, auditoriums, places of worship, buildings with occupancies over 50, etc. The NFC-50/100 is designed to interface directly to addressable or conventional (CMD inputs 1-8) fire alarm control panels or can be used with the NFC-50/125DA panel to distribute audio in systems that require more than 100 watts.

For Canadian applications, refer to Appendix C on page 83.

## 1.1 Product Features

- Modular design for maximum system flexibility and easy expansion
- Removable terminal blocks for ease of servicing and module replacement
- 50 watts of 25 V<sub>RMS</sub> audio power (expandable to 100 watts)
- 2 amp Notification Appliance Circuit (NAC) output, sync generator, or follower for protocols:
  - System Sensor
  - Wheelock
  - Gentex
- Optional 70.7 V<sub>RMS</sub> conversion transformer available for the primary amplifier (note that speaker wiring continues to be supervised in standby, alarm and when background music is playing with this optional transformer installed)
- Eight Command Input Circuits to activate messages 1 to 8:
  - CMD1 and CMD2 are field selectable to be activated from 12 or 24 VDC Notification Appliance Circuits (reverse polarity) or contact closures
  - CMD3-CMD8 are activated by contact closures
- Speaker Circuits
  - single Style Y (Class B) or Style Z (Class A) speaker circuit
  - two Style Y (Class B) or Style Z (Class A) speaker circuits (with optional NFC-BDA-25/70V Audio Amplifier installed)
  - eight Style Y (Class B) or Style Z (Class A) speaker circuits (with optional NFC-BDA-25/70V and NFC-CE6 installed)
- NFC-50/100 can be controlled by an FACP via the ANN/ACS (EIA-485) link. ACS compatible FACPs include the FireWarden-100X, FireWarden-100-2, NFS2-640, and NFS-320. ANN compatible FACPs include the FireWarden-100-2.
- Integral supervised microphone
- Microphone time-out feature which reverts back to prerecorded message if emergency page exceeds the programmed time
- Up to 14 recorded messages
- 14 prerecorded messages for fire, emergency, and weather alerts
- Field-selectable message and custom message recording capability using the local microphone, a USB port, or an external audio input
- External Audio Input can be used for background music
- Up to 60 second message duration for all messages
- Integral tone generators field selectable for multiple tone types
- Powered by integral AC power supply or batteries during AC fail
- Programmable delay of immediate, 2 hours or 6 hours reporting of AC Loss
- Piezo sounder for local trouble
- 100 event history log
- Three Form-C relays:
  - AC Power Loss Relay - TB1
  - System Trouble Relay - TB2
  - MNS Active - TB3
- 500 mA (0.5A) Special Application (auxiliary power) output for addressable modules when interfaced with compatible addressable FACPs and End-of-Line power supervision relays

- System Status LEDs (refer to “Controls and Indicators” on page 17)
- Integral Dress Panel
- Optional TR-CE-B semi-flush trim ring
- Any combination of up to eight (8) of:
  - Optional NFC-RM Remote Microphone (includes cabinet).
  - Optional NFC-RPU Remote Page Unit (includes cabinet)
  - Optional NFC-LOC (includes cabinet)
- Optional NFC-CE6 Circuit Expander
- Optional NFC-BDA-25V amplifier, 50 watts, 25 volts
- Optional NFC-BDA-70V amplifier, 50 watts, 70 volts
- Optional NFC-50DA distributed amplifier, 50 watts
- Optional NFC-125DA distributed amplifier, 125 watts
- Optional NFC-50/100DA distributed amplifier, 50/100 watts

## 1.2 Input/Output Circuit Specifications

### 1.2.1 NFC-50/100 Main Control Board

#### AC Power - TB15

NFC-50/100: 120 VAC, 60 Hz, 3.5 amps (HOT, NEU)

NFC-50/100E: 240 VAC, 50 Hz, 2.0 amps (HOT=HotLeg1, NEU=HotLeg2)

Wire size: minimum #14 AWG (2.00mm<sup>2</sup>) with 600 V insulation.

#### Battery (lead acid only) - J7

Maximum Charging Circuit: Normal Flat Charge - 27.3V @ 2.8 amps

Maximum Charger Capacity: 26 Amp Hour battery. (NFC cabinet holds max. 18 Amp Hour Battery.)

Minimum Battery Size: 12 Amp Hour

#### MNS Active Relay - TB1

Form-C relay contact rating: 2.0 amps @ 30 VDC (resistive), 0.5 amps @ 30 VAC (resistive),

#### Form-C Trouble Relay - TB2

Form-C relay contact rating: 2.0 amps @ 30 VDC (resistive), 0.5 amp @ 30 VAC (resistive).

#### AC Loss Relay - TB3

Form-C relay contact rating: 2.0 amps @ 30 VDC (resistive), 0.5 amps @ 30 VAC (resistive),

#### NAC Output - TB19, Terminals 1 (B+), 2 (A+), 3 (A-), & 4 (B-)

One (1) Style Y (Class B) or Style Z (Class A) circuit

Power-limited circuitry (Class 2), supervised

Nominal operating voltage: 24 VDC

Maximum signaling current for special application power: 2.0 amps

Maximum signaling current for regulated power: 200mA

Current limit: fuseless, electronic, power-limited

Maximum wiring impedance: 1  $\Omega$

End-Of-Line Resistor: 4.7 K $\Omega$ , ½ watt, (P/N 71252) required for Style Y (Class B) operation

Refer to the *Device Compatibility Document* for listed compatible devices.

#### NAC Follower - TB18, Terminals 3 (IN+), 4 (IN-), 1 (OUT+) & 2 (OUT-)

Connections for FACP NAC synchronization trigger signal

Output terminals: pass-through to other system components

Trigger input voltage: 9 to 32 VDC, 24 VDC rated

Input current draw in Alarm condition: 10 mA at rated voltage

#### Special Application Power (Aux. Power) - TB17 Terminals 1(+) & 2(-)

Up to 500 mA @ 24 VDC of special application power is available for powering addressable modules and associated End-of-Line power supervision relays.

Power-limited (Class 2) circuitry. Refer to the *Device Compatibility Document* for a list of compatible devices.

#### Speaker Volume Control Override - TB23, Terminals 1 (B+), 2 (A+), 3 (A-), & 4 (B-)

Style Y (Class B) or Style Z (Class A) circuit

Special Application power

Power-limited (Class 2) circuitry, supervised

Nominal operating voltage: 24 VDC

Maximum signaling current: 0.25 amps

Current limit: fuseless, electronic, power-limited

End-Of-Line Resistor: 4.7 K $\Omega$ , ½ watt, (P/N 71252) required for Style Y (Class B) operation

## Speaker Circuits

**Primary Speaker Circuit - TB20**, Terminals 1(+) & 2(-) Style Y (Class B), 4(+) & 5(-) Style Z (Class A), 3 Shield (Standby and Alarm Polarity Shown) on main control board

**Secondary Speaker Circuit (with optional amplifier only) - TB21**, Terminals 1(+) & 2(-) Style Y (Class B), 4(+) & 5(-) Style Z (Class A), 3 Shield (Standby and Alarm Polarity Shown) on main control board

Power-limited (Class 2) circuitry

Operation: Circuit can be wired Style Y (Class B) or Style Z (Class A)

Normal Operating Voltage:  $25 V_{RMS}$  @ 2 amps max. and maximum Load Impedance of  $12.5\Omega$

( $70.7 V_{RMS}$  @ 700 mA max. with maximum Load Impedance of  $100\Omega$  operation possible by plugging optional NFC-XRM-70V conversion transformer into J12 of the main control board).

Output Power: 50 watts, standard; 100 watts with optional amplifier (100 watts total, maximum, allowed in standby for background music)

Frequency Range: 800 - 2,800 Hz

Maximum total capacitance for each speaker circuit: 250  $\mu$ F.

End-of-Line Resistor required for Style Y circuit: 15 K $\Omega$ , 1 watt (P/N: ELR-15K)

## Command Input Circuits (alarm polarities shown)

- CMD1 - TB4 Terminals 3(+) & 4(-) are input terminals and Terminals 1(-) and 2(+) are output terminals which provide feed through of the NAC circuits to NAC devices downstream; provides internal trouble relay rated at 3.0 amps maximum
- CMD2 - TB5 Terminals 3(+) & 4(-) are input terminals and Terminals 1(-) and 2(+) are output terminals which provide feed through of the NAC circuits to NAC devices downstream
- CMD3 - TB6 Terminals 1(+) & 2(-) are input terminals for contact closure only
- CMD4 - TB6 Terminals 3(+) & 4(-) are input terminals for contact closure only
- CMD5 - TB7 Terminals 1(+) & 2(-) are input terminals for contact closure only
- CMD6 - TB7 Terminals 3(+) & 4(-) are input terminals for contact closure only
- CMD7 - TB8 Terminals 1(+) & 2(-) are input terminals for contact closure only
- CMD8 - TB8 Terminals 3(+) & 4(-) are input terminals for contact closure only

Power-limited (Class 2) and supervised circuitry

Normal Operating Voltage Range: 10.5 VDC - 29 VDC; Maximum Voltage: 29 VDC

NAC Reverse Polarity Current (requires End-of-Line Resistor from NAC): 1.6 mA maximum.

Contact Closure Operation Current (requires 4.7K, 1/2 watt End-of-Line Resistor P/N 27072 only when messages have been assigned to the command input): 6.6 mA maximum

Maximum Wiring Impedance CMD1 - CMD8 (Contact Closure Operation): 200 $\Omega$

Maximum Input Impedance:

- CMD1 & CMD2 (Reverse Polarity Operation): 20K $\Omega$
- CMD1 - CMD8 (Contact Closure Operation): 4.75K $\Omega$

## Night Ring Input - TB16, Terminals 1 (+) & 2 (-)

Contact closure input

Isolated, nonsupervised

Operation current: 3.8 mA, maximum

Maximum wiring impedance: 30K  $\Omega$

Minimum isolation withstand voltage: 1500  $V_{RMS}$

## External Operator Interface Power Output - TB24, Terminals 1 (PWR, +) & 2 (GND, -)

Non-resettable power for external operator interface components

Power-limited (Class 2) circuitry, Supervised

Nominal operating voltage: 24 VDC

Maximum output current: 0.80 amps

Current limit: fuseless, electronic, power-limited circuitry

## External Data Bus (EIA-485) - TB12, Terminals 2 (B), 3 (A), 4 (BRTN), 5 (ARTN), & 1 (SHLD)

Data connections for external operator interface components

Redundant transceiver circuitry for Class A operability

Power-limited (Class 2) circuitry, supervised

Maximum wiring impedance: 13.2  $\Omega$

## FACP Data Bus (EIA-485) - TB13, Terminals 1 (B IN), 2 (A IN), 3 (B OUT), & 4 (A OUT)

Dedicated connection to FACP serial bus

Output terminals: pass-through to other system components

Isolated, supervised

Minimum isolation withstand voltage: 1500  $V_{RMS}$

Maximum wiring impedance: 40  $\Omega$  (ANN-BUS)/26  $\Omega$  (ACS BUS)

### External Audio Riser TB22, Terminals 1 (OUT+), 2 (OUT-), 4 (IN+), 5 (IN-), & 3 (SHLD)

Style Y (Class B) or Style Z (Class A) audio connections to external operator interface components  
 Power-limited (Class 2) circuitry, supervised  
 Audio signal level: 3.85 V<sub>RMS</sub>, maximum  
 Frequency range: 800 - 2,800 Hz  
 Frequency range (NFC-50/125DA): 800 Hz - 2.8 KHz



**NOTE:** Zero impedance to ground will cause a ground fault.

#### ■ Current Availability

The following figures illustrate the maximum current allowed for each output circuit in the panel and the total output current available from the power supply. Refer to Section 6, "Power Supply Calculations" for additional current draw by option cards that must be considered when determining total standby and alarm currents.

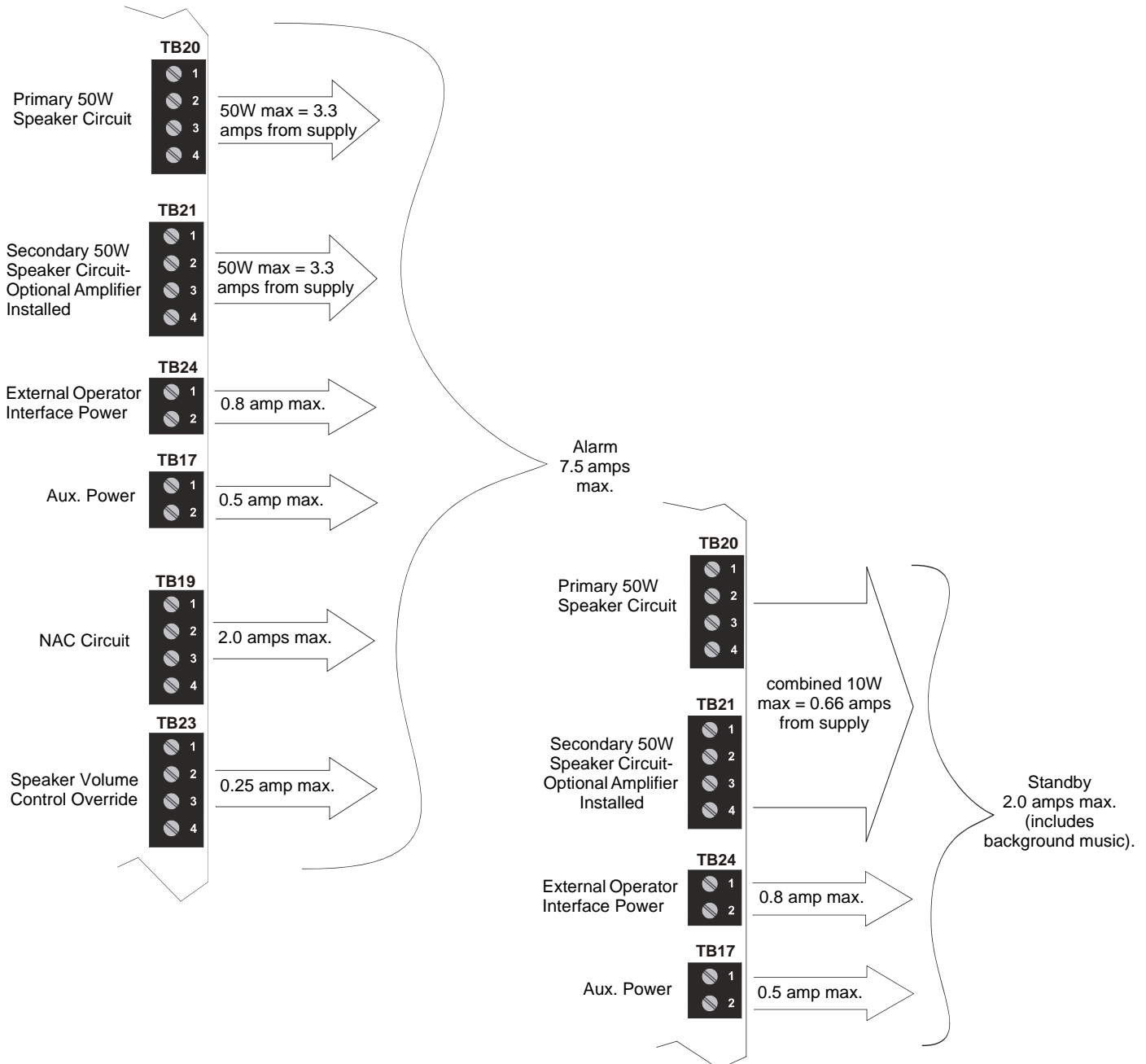


Figure 1.1 Current Availability - 100 Watt System

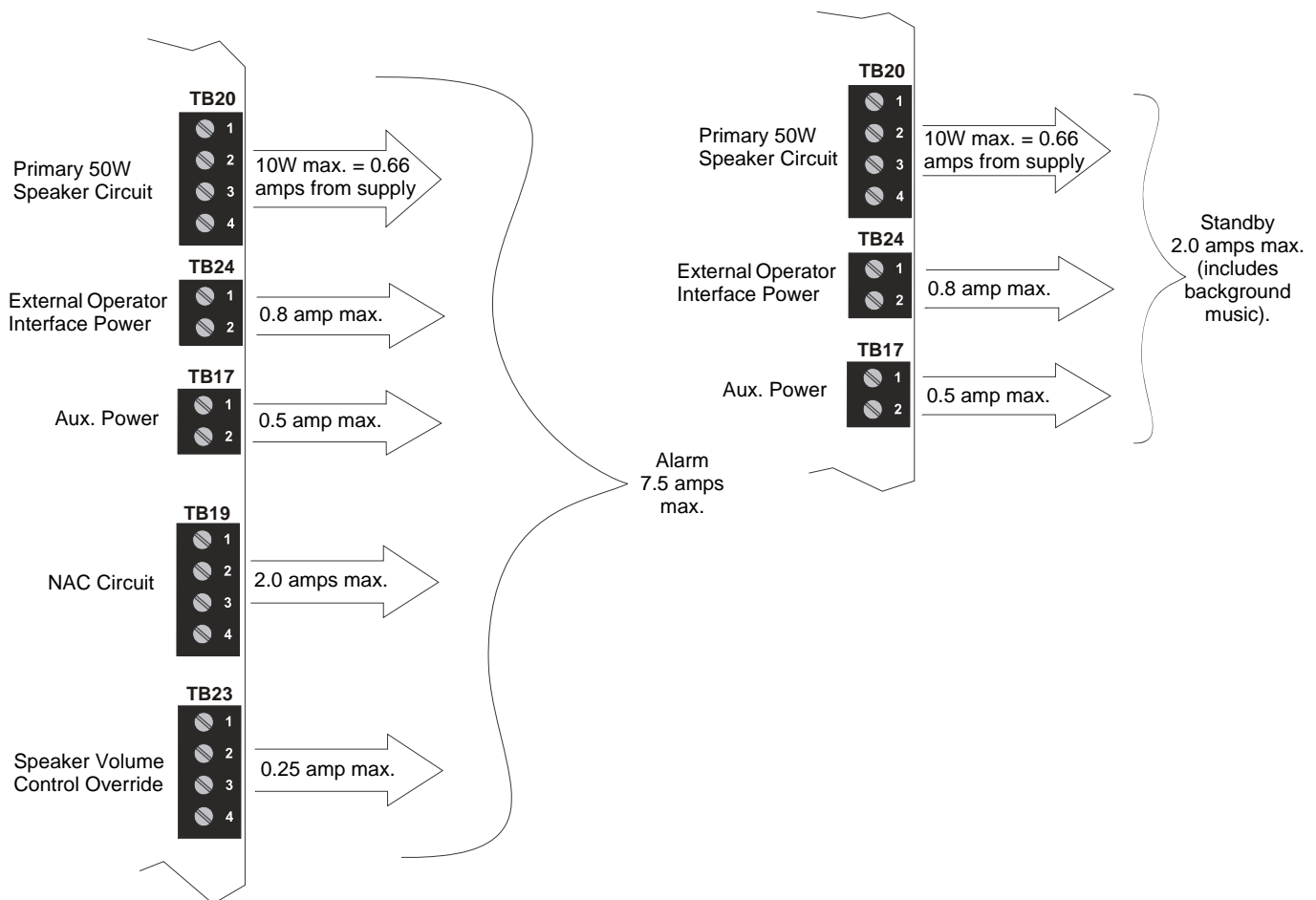


Figure 1.2 Current Availability - 50 Watt System

## 1.2.2 Display Board

### External Audio Input - TB5, Terminals 1(-), 2 (+)

Input Impedance: 8.5K $\Omega$ , nominal @ 1 KHz

Input Voltage: 700 mV<sub>RMS</sub> maximum

Input Current: 0.1 mA, maximum @ 700 mV

Background Music Input Voltage (Non-Canadian applications): 225mV<sub>RMS</sub>, maximum



**NOTE:** Some laptops/personal computers only provide an audio output for headphones. It may be necessary to adjust the headphone output level for proper recording of voice messages.

## 1.2.3 NFC-CE6 Circuit Expander Module

Power-limited (Class 2) circuitry

Up to six (6) circuits on the NFC-CE6 can be wired as Style Y (Class B) or Style Z (Class A).

Normal Operating Voltage for Speaker Circuits: 25 V<sub>RMS</sub> @ 2 amps max. and maximum Load Impedance of 12.5 $\Omega$

(70.0 V<sub>RMS</sub> @ 700 mA max. with maximum Load Impedance of 100 $\Omega$  operation possible for the primary circuit by plugging optional NFC-XRM-70V conversion transformer into J12 of the main control board. The same operation is possible for the optional 50W amplifier by selecting the NFC-BDA-70V model.)

Speaker circuit wiring is supervised during standby, background music, and alarm.

Output Power: 50 watts total; Frequency Range: 800 - 2,800 Hz

Maximum total capacitance: 250  $\mu$ F. (Note that the total capacitance for the speaker outputs must not exceed the maximum of 250  $\mu$ F).

End-of-Line Resistor required for Style Y (Class B) speaker circuit: 15 K $\Omega$ , 1 watt (P/N: ELR-15K)

TB13 on the main control board: ACS/ANN (EIA-485) electrically isolated link to FACP provides programmed speaker control



### 1.3 Controls and Indicators

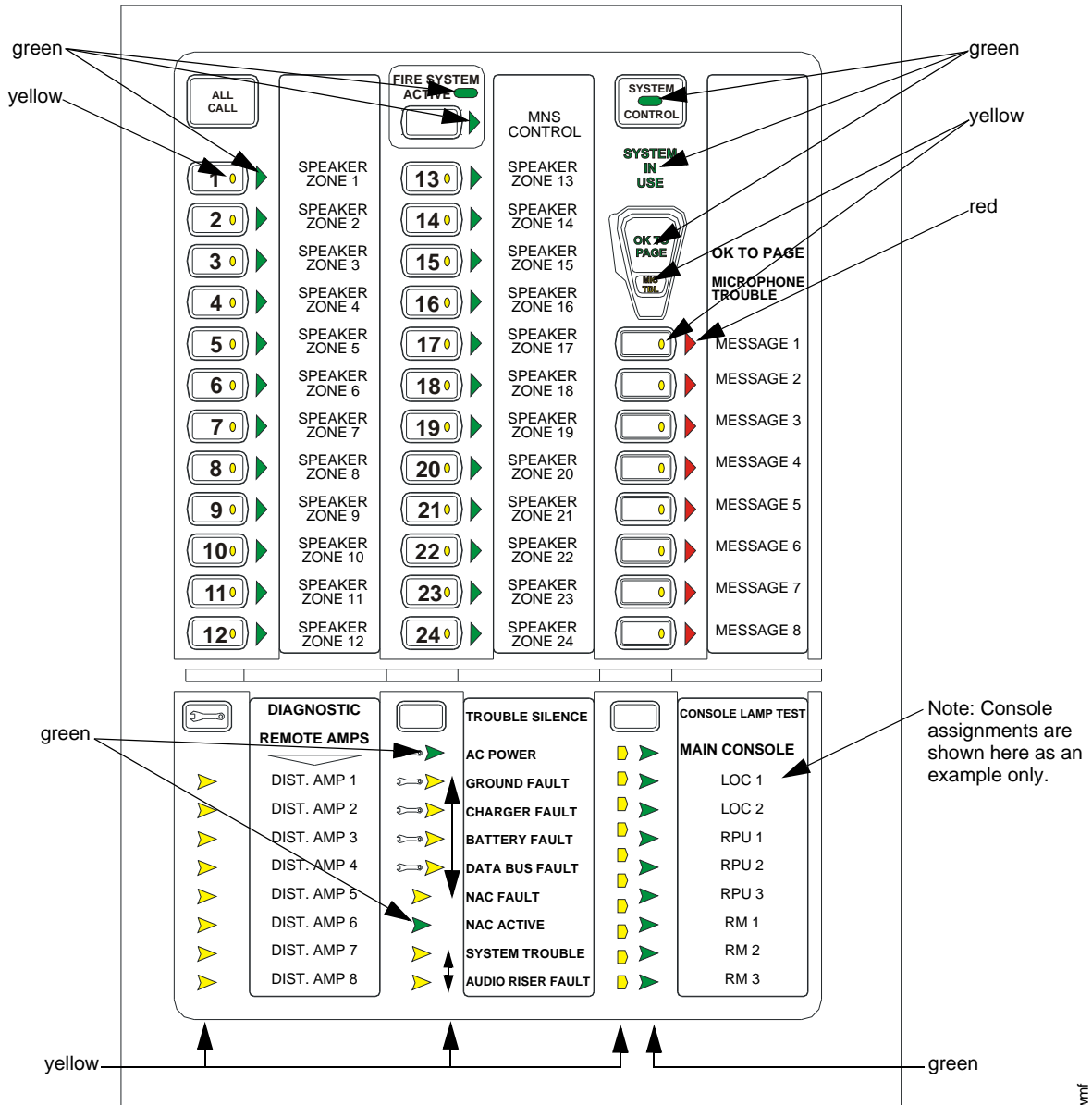


Figure 1.3 NFC-50/100 Keypad

eccdyd.wmf

#### 1.3.1 Push-Button Controls

- All Call
- MNS Control
- System Control
- Speaker Select 1-24
- Message Select 1-8
- Diagnostic Select
- Trouble Silence
- Console Lamp Test

#### 1.3.2 LED Indicators (visible with door closed)

- Fire System Active (green)
- MNS Control (green)
- System Control (green)
- System in Use (green)
- Speaker Zone 1-24 Active (green)

- Speaker Zone 1-24 Fault (yellow)
- OK to Page (green)
- Microphone Trouble (yellow)
- Message 1-8 Active (red)
- Message 1-8 Fault (yellow)
- Remote Amplifier 1-8 Fault (yellow)
- LOC/RPU/RM 1-8 Fault (yellow)
- LOC/RPU/RM 1-8 Active (green)
- Main Console Fault (yellow)
- AC Power (green)
- Ground Fault (yellow)
- Charger Fault (yellow)
- Battery Fault (yellow)
- Data Bus Fault (yellow)
- NAC Fault (yellow)
- NAC Active (green)
- System Trouble (yellow)
- Audio Riser Fault (yellow)

### 1.3.3 LED Indicators (visible with door and dress panel open)

- MCB Trouble (yellow)
  - Integral 50W amplifier electronics fault
- Option Card Trouble (yellow)
  - NFC-CE6 card missing
  - NFC-BDA-25/70V card missing
  - NFC-BDA-25/70V electronics fault
- Amplifier Over Current Fault (yellow)
  - Missing or incorrect EOL resistor
  - Short circuit on volume control module

## 1.4 Components

### Main Control Board

The NFC-50/100 main control board contains the system's CPU, power supply, battery charger, other primary components and wiring interface components. One 50W amplifier is integrated into the main control board.

### Display Board

The display board contains the user interface along with tone generators, digital message recorder/generator, integral microphone input, and preamplifier.

## Cabinet

The cabinet is black with an attractive grey front overlay. A clear window allows viewing of the display board, status LEDs and location of microphone. The backbox measures 16.65" x 19.0" x 5.2" D (42.29cm x 48.26cm x 13.23cm) and provides space for two 12AH or two 18AH batteries.

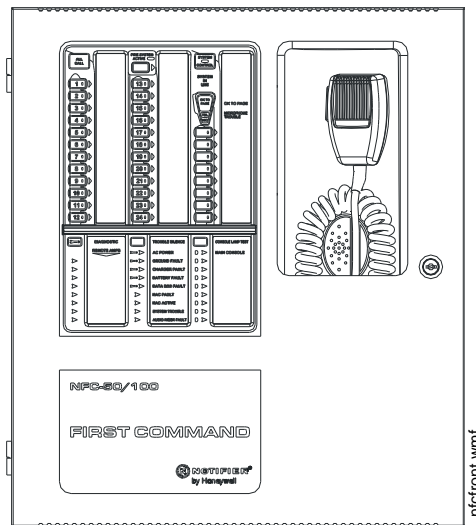


Figure 1.4 Cabinet

## Batteries

The cabinet provides space for up to 18 Amp Hour batteries (charged by integral Power Supply/Battery Charger) with all options installed.

## Dress Panel

The Dress Panel is supplied standard with the system. It mounts to the cabinet with two supplied screws. The Dress Panel protects the user from high voltages and circuit boards from accidental damage.

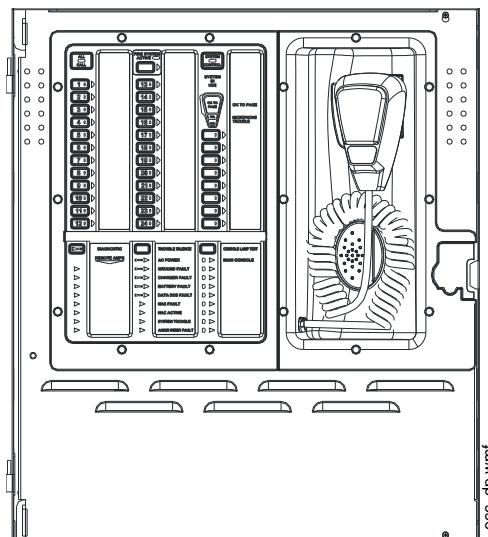


Figure 1.5 Dress Panel

## Trim Ring

An optional TR-CE-B trim ring is available for semi-flush mounting of the audio panel.

## 1.5 Optional Equipment

### NFC-BDA-25/70V Audio Amplifier Modules

An optional second audio amplifier can be plugged into connectors J10 & J11 located in the upper right of the main control board in the NFC-50/100. This amplifier also provides 50 watts of power at 25 V<sub>RMS</sub> or 70 V<sub>RMS</sub>, depending on the model, and can therefore be used to expand system power to 100 watts (providing dual 50 watt speaker circuits) or it can be used as a backup amplifier. The output is power-limited (Class 2) and speaker circuit connections to it are provided on the main control board and optional speaker circuit expander module. The circuit can be wired for Style Y (Class B) or Style Z (Class A) operation.

LEDs are provided to indicate Amplifier Supervision (green indicates amplifier is functional) and Circuit Trouble (yellow indicates field wiring fault or amplifier fault). The LEDs are only visible with the panel door open.

### NFC-CE6 Circuit Expander Module

This optional module plugs into connector P1 in the upper middle of the main control board. The NFC-CE6 adds three primary speaker circuits to the NFC-50/100. The NFC-CE6 adds three secondary circuits to the system when the NFC-BDA-25/70V Audio Amplifier Module is also installed.

### NFC-XRM-70V Transformer 70.7 V<sub>RMS</sub>

This optional module plugs into connector J12 of the main control board and provides conversion for the integral audio amplifier from 25 V<sub>RMS</sub> to 70.7 V<sub>RMS</sub> at full rated 50 watts output power.

### NFC-FFT Fire Fighter Telephone

The NFC-FFT has a telephone handset and user interface that allows an operator to communicate with remotely located telephone handsets in a building. It is housed in its own cabinet with key lock. It requires an external operator interface power connection (24 volts DC) from the NFC-50/100 main console or it may be powered from an external 24 VDC power supply such as HP300ULX. The NFC-FFT provides supervision, annunciation, and control for the local handset and for up to 24 remote telephone handsets. It provides indications of phone activation and corresponding trouble conditions. Refer to the *NFC-FFT Fire Fighter Telephone* manual. Not for use in UL2572 Mass Notification or Canadian applications.

### NFC-50DA Distributed (Remote) Audio

The NFC-50DA is a 50-watt audio amplifier (audio booster) with its own cabinet and key lock. It requires an external data bus connection and an external audio riser connection from the NFC-50/100 main console. The unit comes standard with 4 speaker circuits. An option card, NFC-CE4, provides 4 more speaker circuits for a total of 8. Speaker circuits are activated/de-activated manually or automatically by the NFC-50/100 main console. The unit is capable of either 25 V<sub>RMS</sub> or 70.7 V<sub>RMS</sub> operation. Refer to the *NFC-50/125DA Distributed Audio* manual. Not for use in Canadian applications.

#### NFC-125DA Distributed (Remote) Audio

The NFC-125DA is a 125-watt audio amplifier (audio booster) with its own cabinet and key lock. It requires an external data bus connection and an external audio riser connection from the NFC-50/100 main console. The unit comes standard with four (4) speaker circuits. An option card, NFC-CE4, provides 4 more speaker circuits for a total of eight (8). Speaker circuits are activated/de-activated manually or automatically by the NFC-50/100 main console. The unit is capable of 25 V<sub>RMS</sub> operation. Refer to the *NFC-50/125DA Distributed Audio* manual. Not for use in Canadian applications.

#### NFC-50/100DA Distributed (Remote) Audio

The NFC-50/100DA is a 50/100-watt audio amplifier (audio booster) with its own cabinet and key lock. It requires an external data bus connection and an external audio riser connection from the NFC-50/100 main console. The NFC-50/100DA is capable of producing up to 100 watts of audio power. The amplifier functions as 50 watts with 50 watts as backup, 100 watts with no backup or 100 watts with 50 watts backup using NFC-BDA-BU. The unit comes standard with 8 speaker circuits. Speaker circuits are activated/de-activated manually or automatically by the NFC-50/100 main console. The unit is capable of either 25 V<sub>RMS</sub> or 70.7 V<sub>RMS</sub> operation. Refer to the *NFC Distributed Audio* manual. Not for use in Canadian applications.



**NOTE:** Any combination of up to eight audio boosters comprised of NFC-50DA, NFC-125DA, and NFC-50/100DA can be used in the system. Their external data bus addresses must be unique and must be sequential. Addresses are set via dialswitches on each unit's PC board. Refer to Section 2.14 on page 48.

### NFC-RM Remote Microphone

The NFC-RM has a hand held microphone and is housed in its own cabinet with keyed lock. It requires an external data bus connection, an external audio riser connection, and an external operator interface power connection (24 volts DC) from the NFC-50/100 main console. ALL CALL paging can be broadcast over the speaker circuits by depressing the microphone's push-to-talk switch. Not for use in UL2572 Mass Notification or Canadian applications.

### NFC-RPU Remote Page Unit

The NFC-RPU has a hand held microphone and 8 message buttons. It is housed in its own cabinet with a keyed lock or thumb lock (requires AHJ approval). It also has a 9th button that will activate a monitor module mounted inside the cabinet. This may be used for HVAC shutdown applications when the monitor module is connected to the FACP SLC polling loop. The remote page unit requires an external data bus connection, an external audio riser connection, and an external operator interface power connection (24 volts DC) from the NFC-50/100 main console. ALL CALL paging can be broadcast over the speaker circuits by depressing the microphone's push-to-

talk switch. ALL CALL broadcast of a stored message can be done by pressing a message button. The message buttons operate in the same fashion as the message buttons on the NFC-50/100 main console. Not for use in UL2572 Mass Notification or Canadian applications.

### NFC-LOC Local Operator Console

The NFC-LOC has a complete operator interface like the NFC-50/100 main console and is housed in its own cabinet with a keyed lock or thumb lock (requires AHJ approval). The local operator console requires an external data bus connection, an external audio riser connection, and an external operator interface power connection (24 volts DC) from the NFC-50/100 main console.



**NOTE:** Any combination of up to eight remote consoles comprised of NFC-RM(s), NFC-RPU(s), and NFC-LOC(s) can be used in the system. Their external data bus addresses must be set via dip switches on each unit's PC board. Refer to Section 2.14 on page 48.

## 1.6 UL 464 Low Frequency Sounders

This product complies with the requirements for a low frequency sounder (520Hz) as specified in UL 464 when used as part of a system with the following items.

### Amplifiers:

| Amplifier/Audio Product                     | Description  |
|---|--|
| NFC-50/100                                  | Main console   |
| NFC-50/100 with NFC-BDA-25V                 | Main console with optional second 25V amplifier installed  |
| NFC-50/100 with NFC-XRM-70V                 | Main console with 70V transformer installed  |
| NFC-50/100 with NFC-XRM-70V and NFC-BDA-70V | Main console with 70V transformer and optional second 70V amplifier installed  |
| NFC-50/100 with NFC-50/100DA                | Main console with 50/100 watt remote amplifier (with or without internal options listed above), 25V or 70V                               |
| NFC-50/100 with NFC-50/100DA and NFC-BDA-BU | Main console with 50/100 watt remote amplifier and optional backup amplifier (with or without internal options listed above), 25V or 70V |

### Audio File:

The 520 Hz audio file is available for download at [esd.notifier.com](http://esd.notifier.com).

### Speakers:

For a complete list of speakers that can be used in a Notifier FirstCommand system with the above specifications, refer to the current version of the Device Compatibility document, p/n 15378.

## Section 2: Installation

### 2.1 Mounting Options

The cabinet may be semi-flush or surface mounted. The cabinet mounts using three key slots at the top of the backbox and two additional 0.250" diameter holes located at the bottom.

Carefully unpack the system and check for shipping damage. Mount the cabinet in a clean, dry, vibration-free area where extreme temperatures are not encountered. The area should be readily accessible with sufficient room to easily install and maintain the panel. Locate the top of the cabinet approximately five feet above the floor with the hinge mounting on the left. Determine the number of conductors required for the devices to be installed. Sufficient knockouts are provided for wiring convenience. Select the appropriate knockout(s) and pull the required conductors into the box. Note that knockouts are also located on the back of the cabinet. All wiring should be in accordance with the National and/or Local codes for fire alarm systems. Refer to Figure 2.4 for knockouts that cannot be used.

### 2.2 Backbox Installation

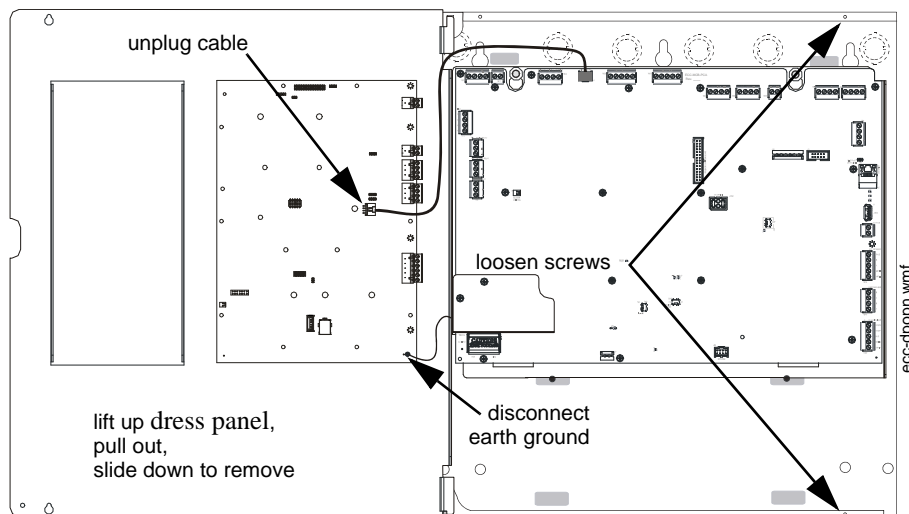


#### **CAUTION: STATIC SENSITIVE COMPONENTS**

THE CIRCUIT BOARD CONTAINS STATIC-SENSITIVE COMPONENTS. ALWAYS GROUND YOURSELF WITH A PROPER WRIST STRAP BEFORE HANDLING ANY BOARDS SO THAT STATIC CHARGES ARE REMOVED FROM THE BODY. USE STATIC SUPPRESSIVE PACKAGING TO PROTECT ELECTRONIC ASSEMBLIES.

#### **Removing the Dress Panel**

1. Open the door and lift the door off the pin hinges.
2. Loosen the two (2) screws that secure the dress panel to the backbox. Then, lift up to swing the dress panel open.
3. Disconnect the ground wire from the dress panel.
4. Unplug the cable on the display board at J2. This is the connection to the main control board on the chassis.
5. Lift the dress panel up and gently pull the lower hinge out of the backbox. Gently pull down to remove the top hinge. Store the dress panel in a safe place.



**Figure 2.1 Dress Panel Removal**

## Removing the Chassis Assembly

1. If present, remove the two (2) screws which fasten the lower chassis tabs to the backbox. These are for shipping purposes only and do not need to be reinstalled.
2. Loosen the two nuts which secure the top of the chassis with an 11/32" socket.
3. Carefully lift up and remove the chassis assembly from the backbox and store in a safe, clean place. Avoid static discharge which may damage static sensitive components on the board.

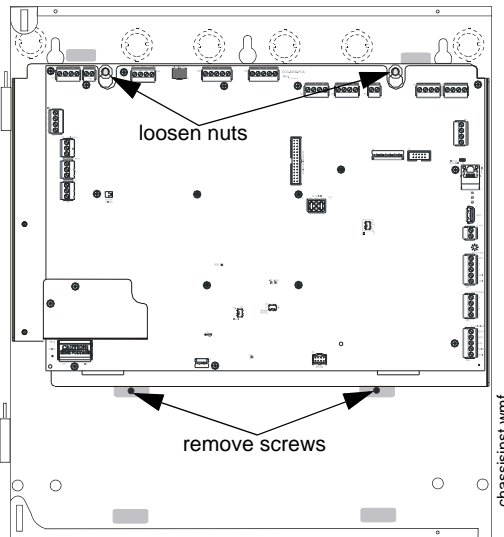


Figure 2.2 Chassis Removal

## Mounting the Backbox

1. Mark and predrill hole in the wall for the center top keyhole mounting bolt using the dimensions illustrated in Figure 2.4 on page 24.
2. Install center top fastener in the wall with the screw head protruding.
3. Place backbox over the top screw, level and secure.
4. Mark and drill the left and right upper and lower mounting holes.  
Note: Outer holes (closest to sidewall) are used for 16" O.C. stud mounting.
5. Install remaining fasteners and tighten.
6. Carefully reinstall the chassis assembly and dress panel by reversing the steps above. Use appropriate precautions to prevent damage to components due to static discharge. When reinstalling the chassis assembly, be sure that all four (4) tabs are seated properly in the slots of the backbox to avoid possible damage to the unit.



### CAUTION: POSSIBLE EQUIPMENT DAMAGE

REINSTALL THE CHASSIS ASSEMBLY CAREFULLY, MAKING SURE TO PROPERLY SEAT THE UNIT TO THE BACKBOX.

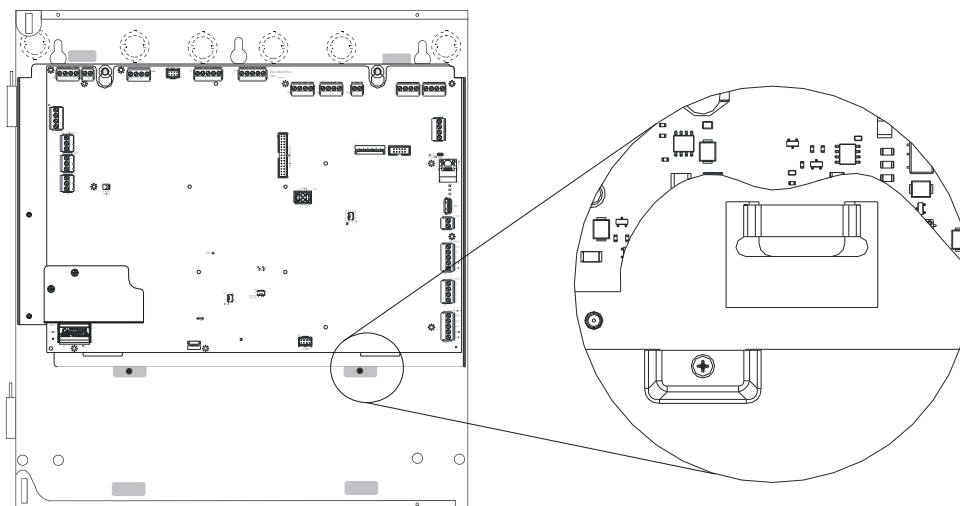


Figure 2.3 Chassis Installation

7. Draw wires through the respective knockout locations.

An optional Trim Ring (P/N TR-CE-B) is available for semi-flush mount installations.

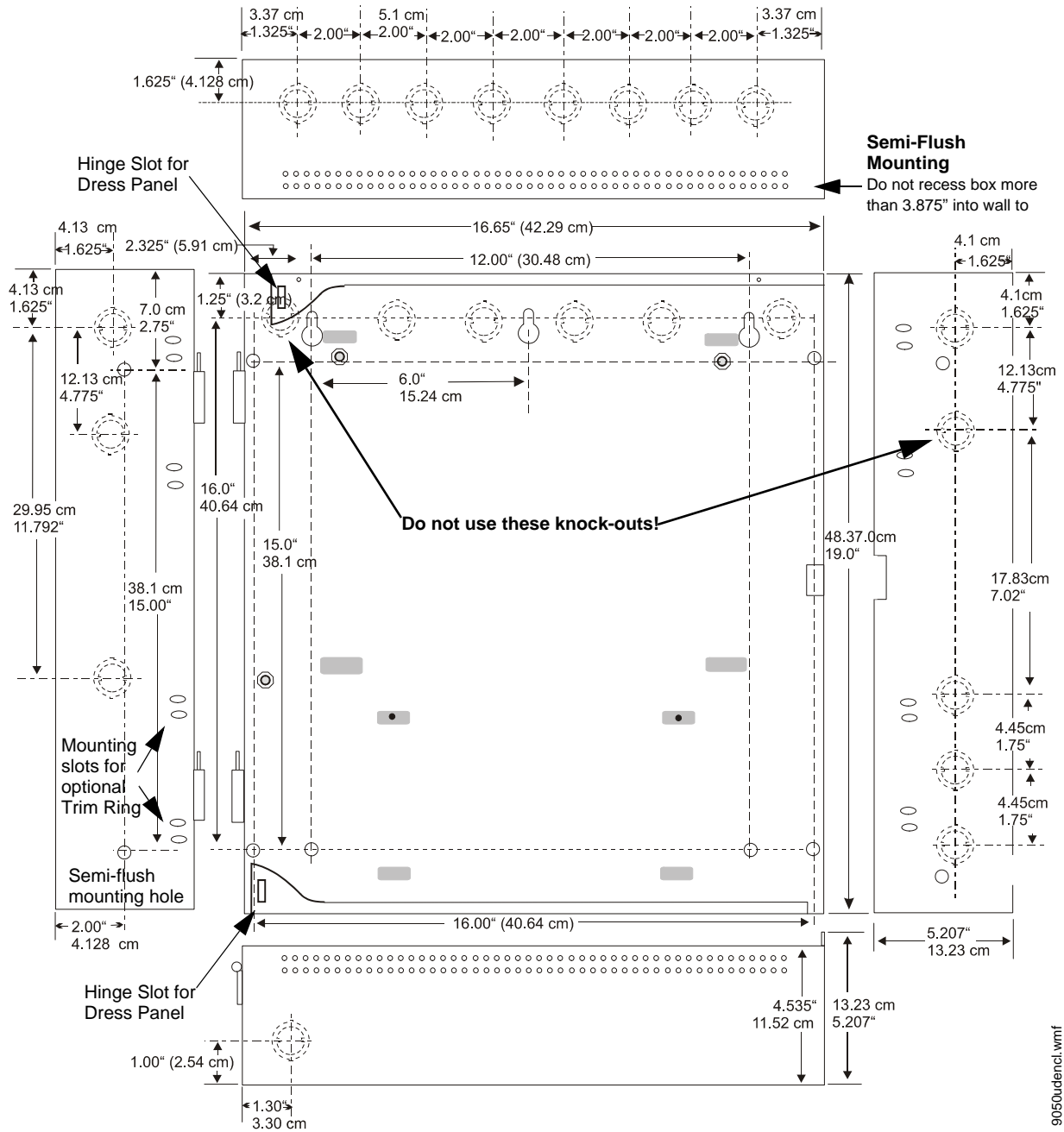


Figure 2.4 Cabinet Dimensions & Knockout Locations



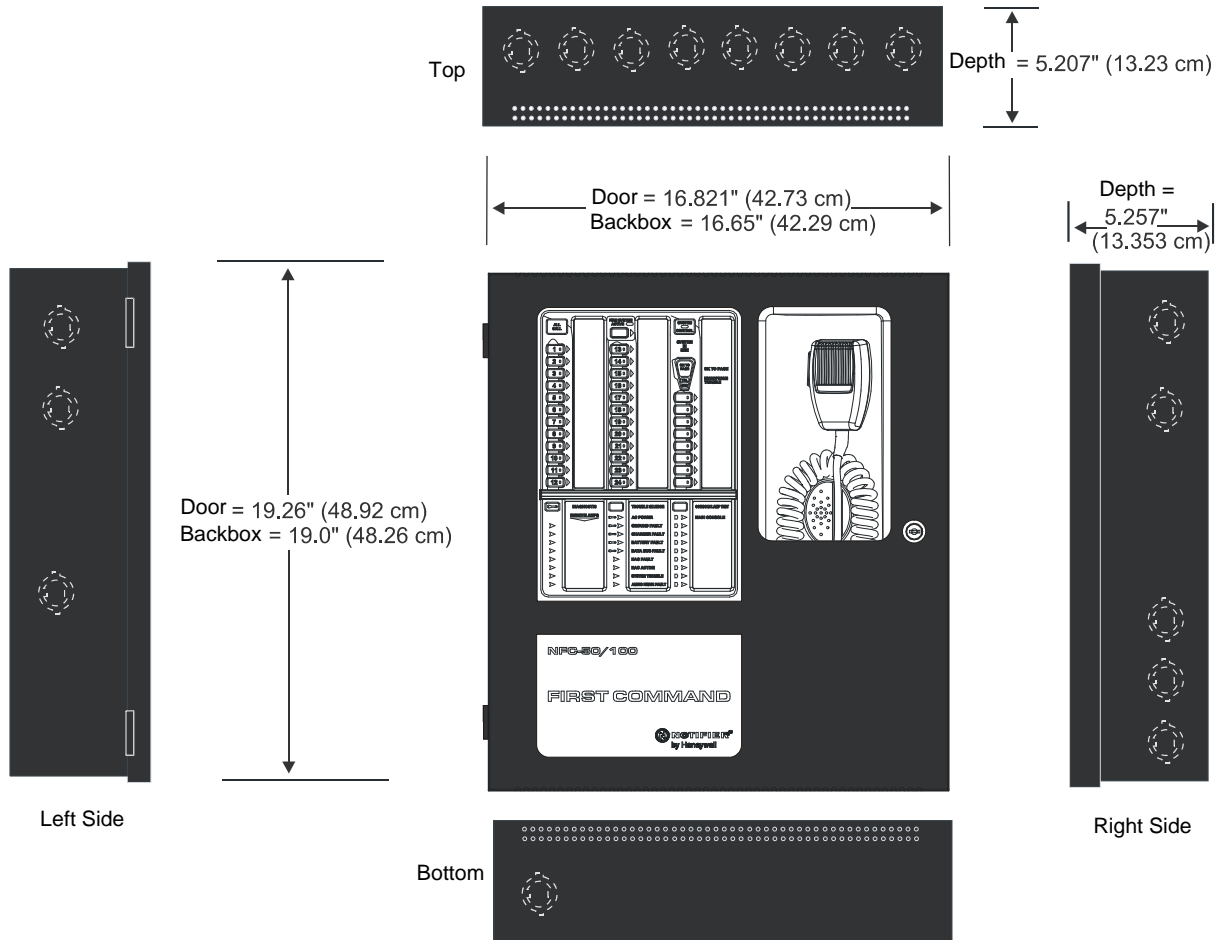


Figure 2.5 NFC-50/100 Backbox Dimensions

## 2.3 Operating Power



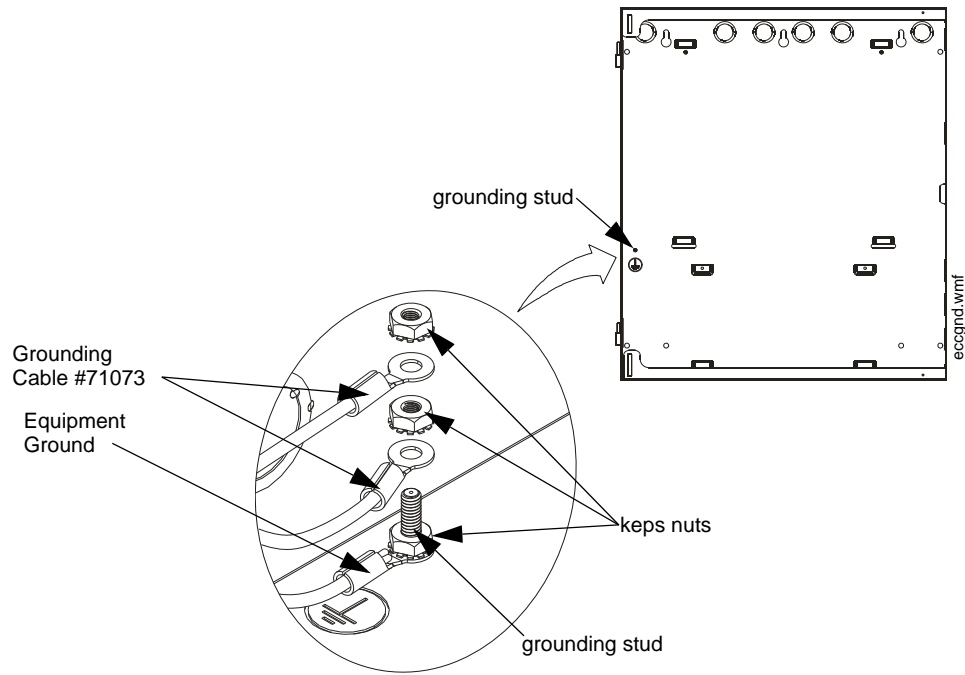
### WARNING: RISK OF EQUIPMENT DAMAGE AND PERSONAL INJURY

SEVERAL DIFFERENT SOURCES OF POWER CAN BE CONNECTED TO THIS PANEL. DISCONNECT ALL SOURCES OF POWER BEFORE SERVICING. THE PANEL AND ASSOCIATED EQUIPMENT MAY BE DAMAGED BY REMOVING AND/OR INSERTING CARDS, MODULES OR INTERCONNECTING CABLES WHILE THIS UNIT IS ENERGIZED. BE SURE TO OBSERVE PROPER GROUNDING AND HANDLING PROCEDURES.

### 2.3.1 AC Power and Earth Ground Connection

Primary power source for the NFC-50/100 is 120 VAC, 60 Hz, 3.5 amps. Primary power source for the NFC-50/100E is 240 VAC, 50 Hz, 2.0 amps. Over-current protection for this circuit must comply with Article 760 of the National Electrical Code (NEC) and/or local codes. Make certain that the AC mains circuit breaker is off before making any wiring connections between the mains and the panel. Connect AC mains wiring from the protected premises main breaker box to TB15 of the main control board. Use 14 AWG (2.0 mm<sup>2</sup>, 1.6 mm O.D.) or heavier gauge wire with 600V insulation. No other equipment may be connected to this circuit and it may not contain any power disconnect devices. A separate Earth Ground connection must be made to ensure proper panel operation and lightning and transient protection. Do not use conduit for the Earth Ground connection since this does not provide reliable protection. Remove the two keps nuts from the grounding stud in the backbox. Connect the incoming earth ground wire to supplied cable #71073 with a wire nut. Position the ring terminal end over the grounding stud. Secure with one of the keps nuts. Place the ring terminal from the other supplied

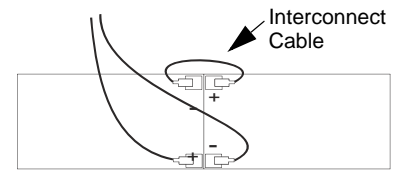
cable to TB15. Refer to Figure 2.6 for the location of the stud. Apply AC power to the panel only after the system is completely installed and visually checked. *Note that AC power must be applied to the panel before installing the battery interconnect cable (refer to the following section).*



**Figure 2.6 Earth Ground Connection**

### 2.3.2 Secondary Power Source (Batteries)

The batteries must be sealed lead acid type. Before connecting the batteries to the FACP, make certain that the interconnect cable between the batteries is *not* connected. Do not connect the interconnect cable until the system is completely installed.



**WARNING: RISK OF PERSONAL INJURY**

**BATTERY CONTAINS SULFURIC ACID WHICH CAN CAUSE SEVERE BURNS TO THE SKIN AND EYES AND CAN DESTROY FABRICS. IF CONTACT IS MADE WITH SULFURIC ACID, IMMEDIATELY FLUSH THE SKIN OR EYES WITH WATER FOR 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.**

Observe polarity when connecting the batteries. Connect the battery cable to J7 on the main control board, using the plug-in connector and cable provided. The battery charger is current-limited and capable of recharging sealed lead acid type batteries (See Figure 2.7 for battery orientation). The charger shuts off when the system is in alarm. See page 78 for calculation of the correct battery rating.

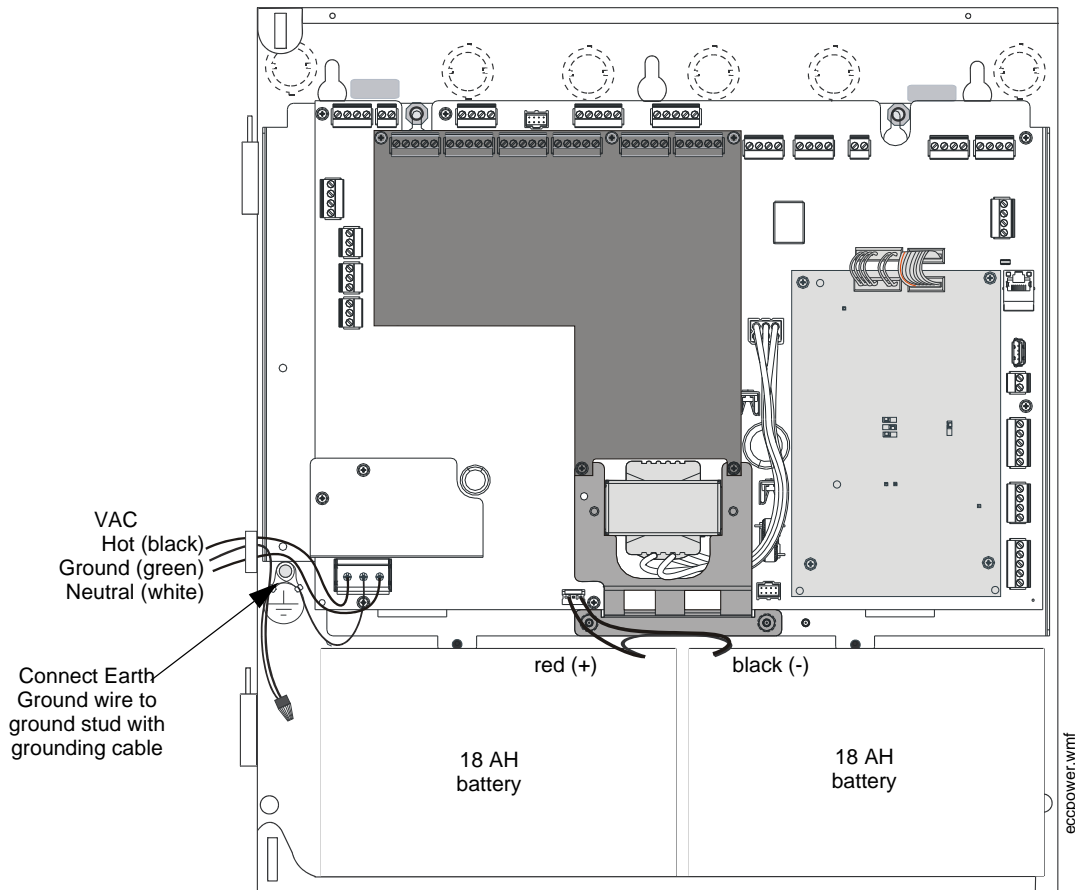


Figure 2.7 Operating Power Connections

### 2.4 Auxiliary DC Power Output Connections

The Special Application Auxiliary DC power output is power-limited (Class 2).

Special Application Power (500 mA @ 24 VDC nominal) is non-resettable power suitable for powering control modules and End-of Line Power supervision relays. See Device Compatibility Document for compatible devices.

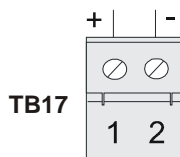


Figure 2.8 Auxiliary Power Connection

## 2.5 Input/Initiating Circuits

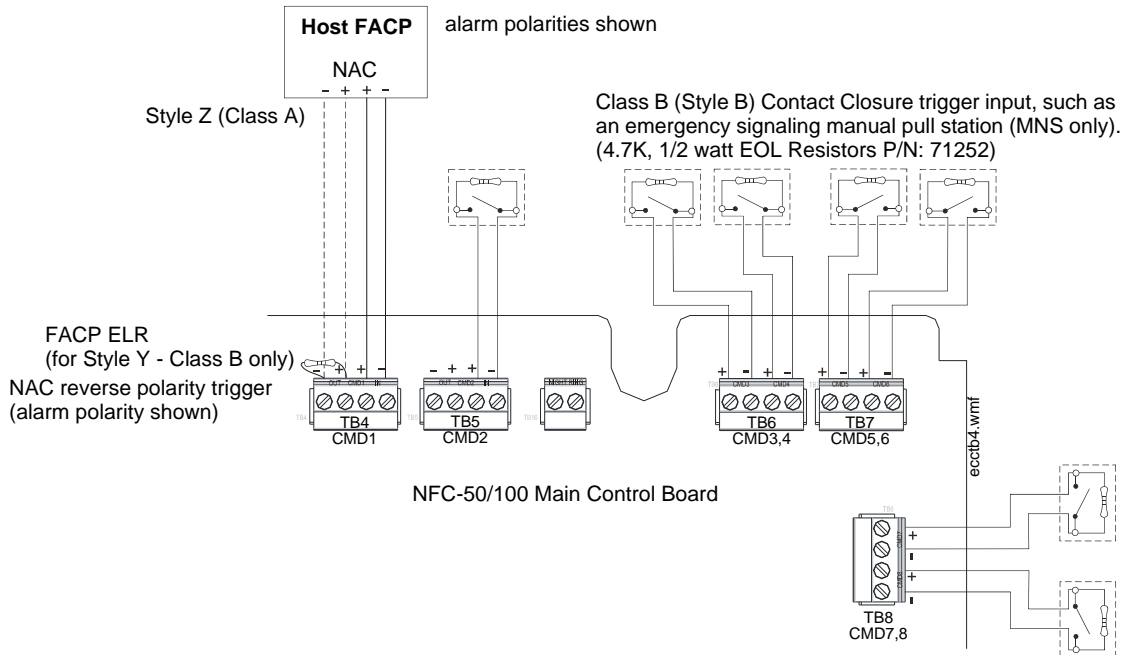
### 2.5.1 CMD Inputs

The NFC-50/100 has eight Command Input circuits, which are used to activate the panel amplifiers which, in turn, transmit an audio signal over the system speakers. All field wiring for the circuits is power-limited (Class 2) and supervised for opens and ground faults. Note that zero impedance to ground will cause a ground fault.

CMD1 and CMD2 Command Input circuits can be field programmed to be triggered by a contact closure or by the reverse polarity of a Notification Appliance Circuit. Their configurations can be independently set so that both circuits are triggered by the same type of input or by different types of inputs. See Figure 2.9 below.

**IMPORTANT! When CMD1 and CMD2 are configured for reverse polarity, the NAC cannot be Coded (including NAC Sync).**

Note that CMD1 has internal relay contacts in series with its OUT terminals which are used in the reverse polarity configuration to open the outgoing NAC circuit during an NFC-50/100 trouble condition. In standby, this generates a NAC trouble at the host FACP (feature is bypassed in alarm condition). These contacts *do not* open during AC loss at the NFC-50/100, however they are fail-safe, meaning that a complete loss of power there will open the circuit..



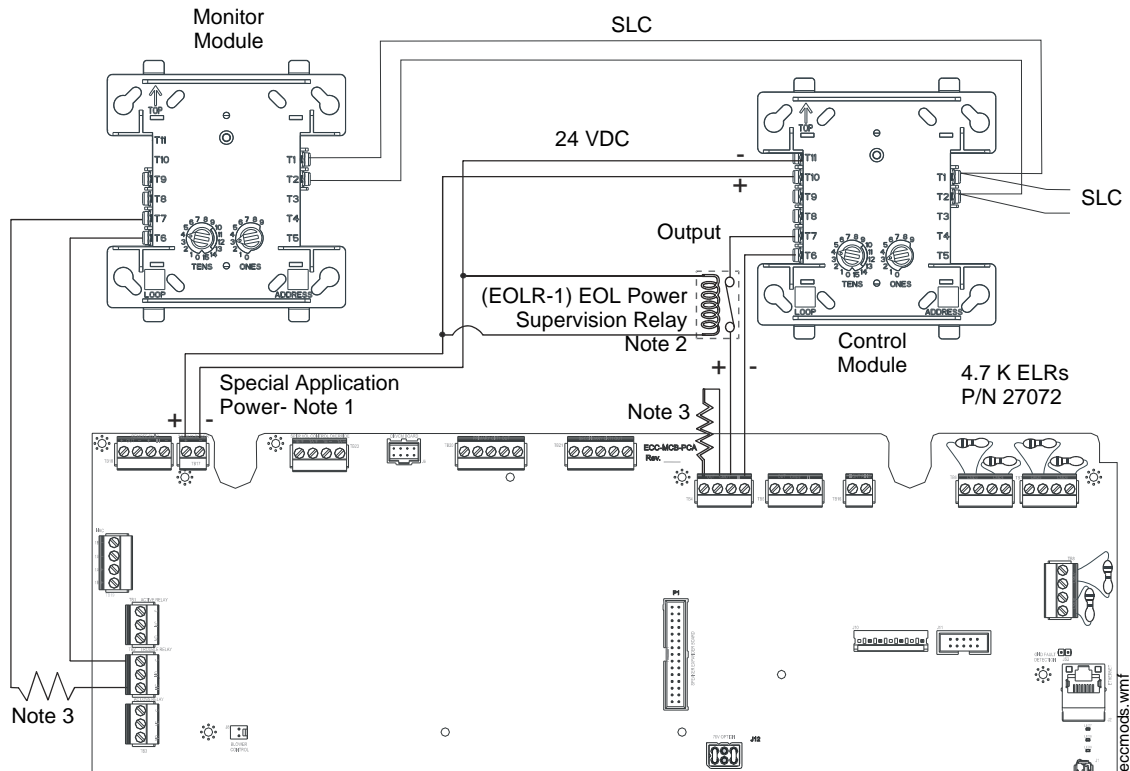
**Figure 2.9 Command Input Circuits**

CMD3, CMD4, CMD5, CMD6, CMD7, and CMD8 Command Input circuits are triggered by a contact closure only. Each Command input will activate various messages and amplifiers depending on the Message Control selection configured in user programming (refer to Section 3).



**NOTE:** CMD8 cannot be used when the system is programmed to provide more than eight (8) messages.

When configured with a compatible, addressable FACP, the NFC-50/100 may be triggered either by the FACP main NAC output or from addressable control modules. Figure 2.1 illustrates CMD1 triggered by an addressable control module. The addressable control module may trigger the NFC-50/100 via reverse polarity (shown) or relay contact. The FACP monitors the NFC-50/100 for faults while in the standby or alarm state by wiring a monitor module to the trouble contacts as shown in Figure 2.1. Activation of the addressable control module is controlled by the FACP. Refer to the appropriate FACP manual for additional information.



**Figure 2.1 Addressable Module Connections**

Notes:

1. 24 VDC Auxiliary Power terminals for special application power only. Wiring must remain in the room.
2. Supervise the wiring between the NFC-50/100 Auxiliary Power output and the control module with an EOL relay (EOLR-1).
3. End-of-Line resistor supplied with modules.

## 2.5.2 External Audio Input

The display provides connection to various ancillary sources. See Sections 2.5.4 on page 30, 3.5.2 on page 61, and 4.4.15 on page 76 for more information.

## 2.5.3 NAC Follower Input

For fire-only applications, the NAC follower input may be used to trigger the onboard NAC. Strobes driven by the onboard NAC must be visibly isolated from FACP NAC(s).

This can be accomplished by connecting the NAC Follower input at TB18 of the control board to the FACP's NAC output. The NFC-50/100 NAC output will then follow the FACP's NACs. A redundant pair of terminals is provided at TB18 for convenient connection of an EOL resistor, or for wiring to any additional equipment requiring this feature (such as an FCPS-S6/8 remote power supply).

The NAC Follower input is power-limited (Class 2) (refer to Section 2.12, “UL Power-limited Wiring Requirements”, on page 42) and supervised by the host FACP. Supervision requires that a 4.7 KΩ EOL resistor be connected to the last device in the NAC Follower chain.

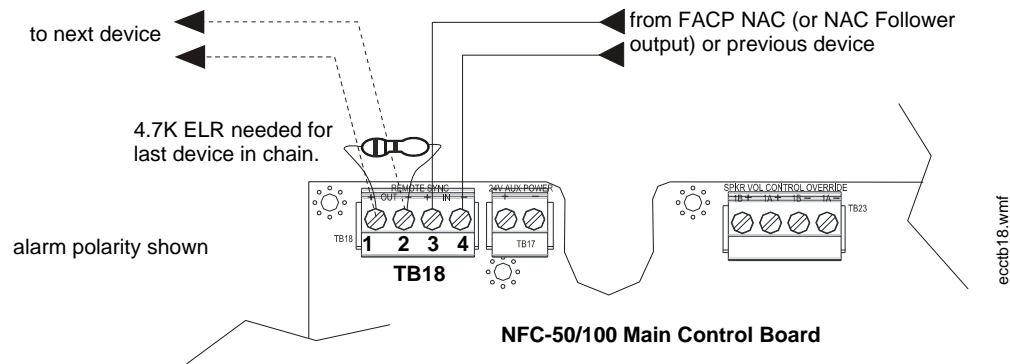


Figure 2.10 NAC Follower Wiring

### 2.5.4 Night Ring

The external audio input allows a building’s Private Branch Exchange (PBX) to activate the NFC-50/100. Connections need to be made to TB16 on the main control board and to TB5.1 and TB5.2 on the display board. Refer to Section 1.2.2 for electrical specifications to the external audio input.

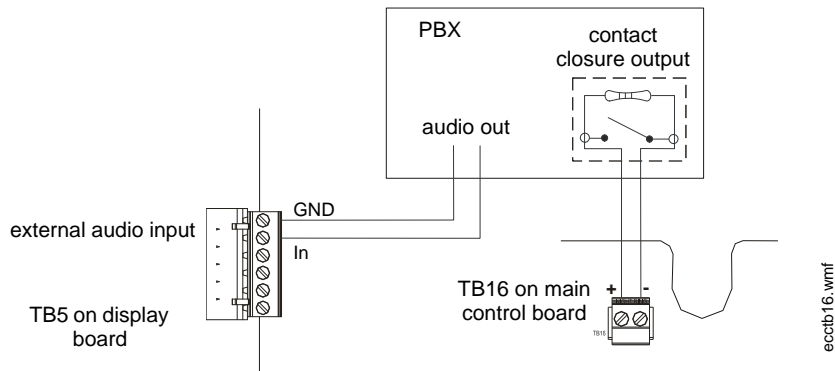


Figure 2.11 Night Ring Wiring

## 2.6 Output Circuits

### 2.6.1 Relays

#### MNS Active Relay - TB1

The main control board provides a Form-C MNS Active relay. The MNS Active Relay will transfer state when any Mass Notification (MNS) event occurs. The system must be enabled for Mass Notification in programming for use of this relay.

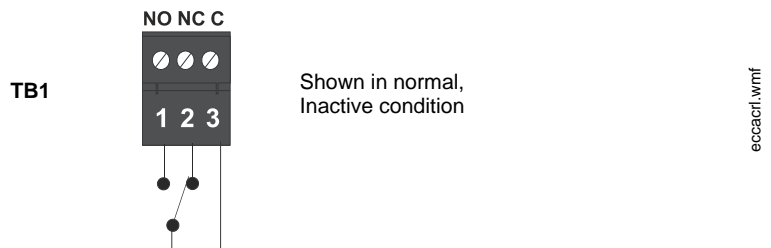
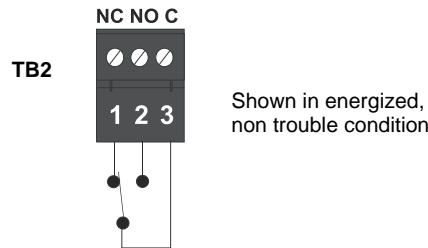


Figure 2.12 MNS Active Relay

### Trouble Relay - TB2

The main control board provides a Form-C Trouble relay for independent, general system fault monitoring. This relay is ‘fail safe’, meaning that it is normally energized. Should system power shut off, this relay will de-energize, transferring its contacts.

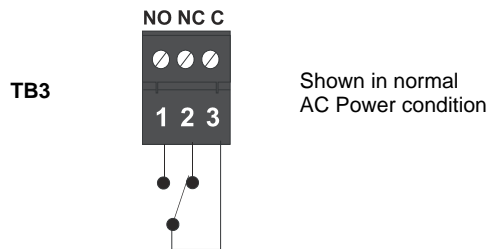


eccrbl.wmf

Figure 2.13 Trouble Relay

### AC Power Loss Relay - TB3

The main control board provides a Form-C AC Power Loss relay.



eccacrl.wmf

Figure 2.14 AC Power Loss Relay

## 2.6.2 Speaker Circuits

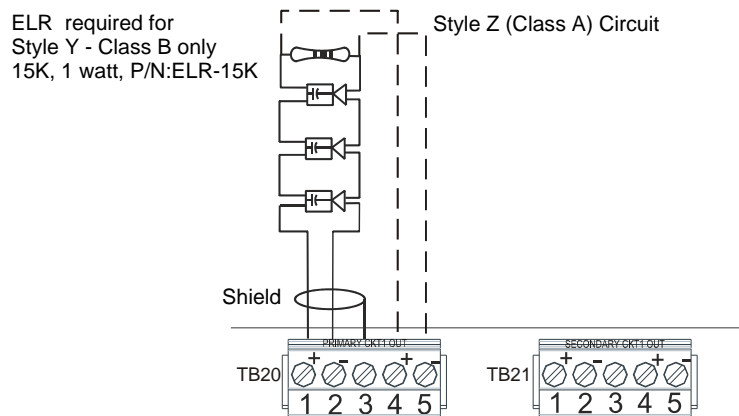
- One Speaker Circuit Style Y (Class B) or Style Z (Class A) standard
- Two Speaker Circuits Style Y (Class B) or Style Z (Class A) with NFC-BDA-25/70V
- Four Speaker Circuits Style Z (Class B) or Style Z (Class A) or Style Y with NFC-CE6
- Eight Speaker Circuits Style Z (Class B) or Style Z (Class A) or Style Y with NFC-BDA-25/70V and NFC-CE6

The integral amplifier and optional amplifier each provide audio for one Speaker Circuit. The circuit can be wired Style Y (Class B) or Style Z (Class A). Each supervised and power-limited (Class 2) circuit is capable of 50 watts of power. Refer to the Notifier Device Compatibility Document for a listing of compatible speakers.



**CAUTION: OBSERVE POLARITY**

MATCH PROPER POLARITY CONNECTIONS TO FIELD WIRING AND SPEAKERS. POLARITY SHOWN IS IN THE STANDBY AND ALARM CONDITIONS.



eccck1.wmf

Figure 2.15 Speaker Circuit Connections

Shielded cable is not required, however, shielded cable will reduce RFI/EMI emissions and susceptibility. For additional information, refer to “Wiring Requirements” on page 82.

### 2.6.3 Notification Appliance Circuit

The NFC-50/100 provides a Style Y (Class B) or Style Z (Class A) NAC (Notification Appliance Circuit). Use UL-listed 24 VDC visual notification appliances only. Circuit is supervised and power-limited (Class 2). Refer to the Notifier Device Compatibility Document for a listing of compatible notification appliances.

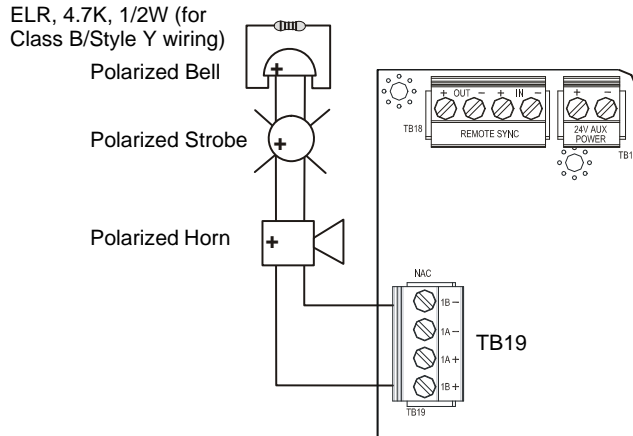


Figure 2.16 NAC Wiring - Style Y (Class B)

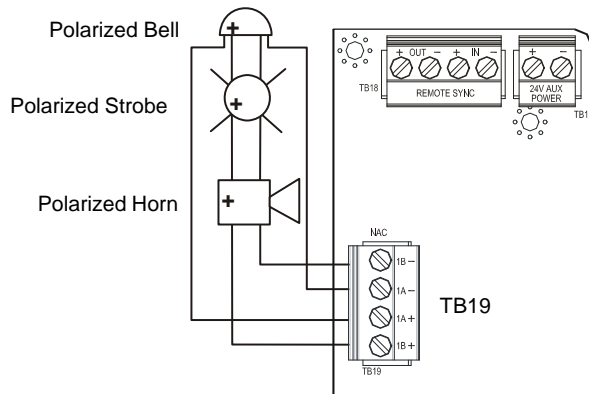


Figure 2.17 NAC Wiring - Style Z (Class A)

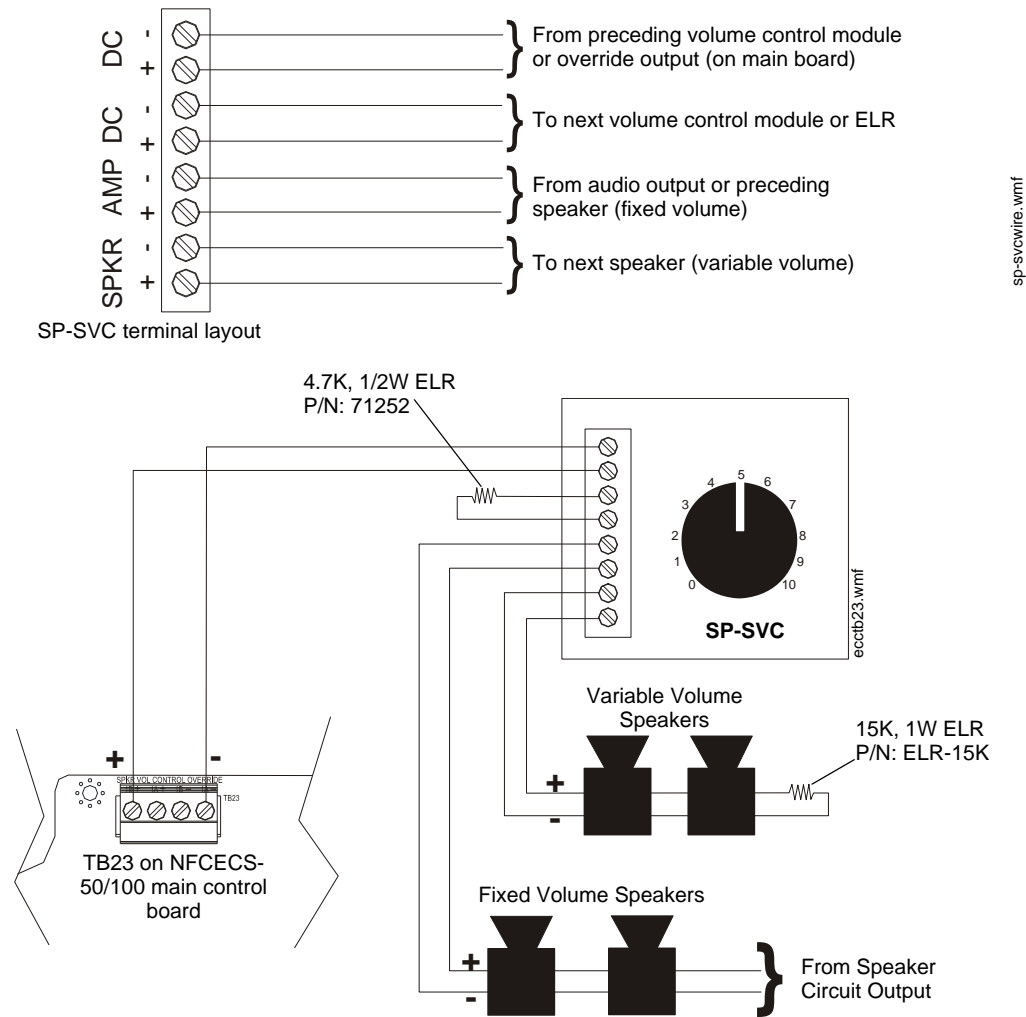
eccnac.wmf

eccnaca.wmf



## 2.6.4 Speaker Volume Control

Speaker Volume Control requires use of the Cooper Wheelock SP-SVC module. The Supervised Volume Control (SP-SVC) allows manual volume setting for telephone paging and background music for a specific speaker or speaker zone. The selected adjustment will not affect the volume setting of emergency prerecorded messages or live microphone usage. Refer to the *Cooper Wheelock Safepath SP-SVC Installation Instructions* (P/N: P84598) for more information.



**Figure 2.18 Speaker Volume Control Wiring**

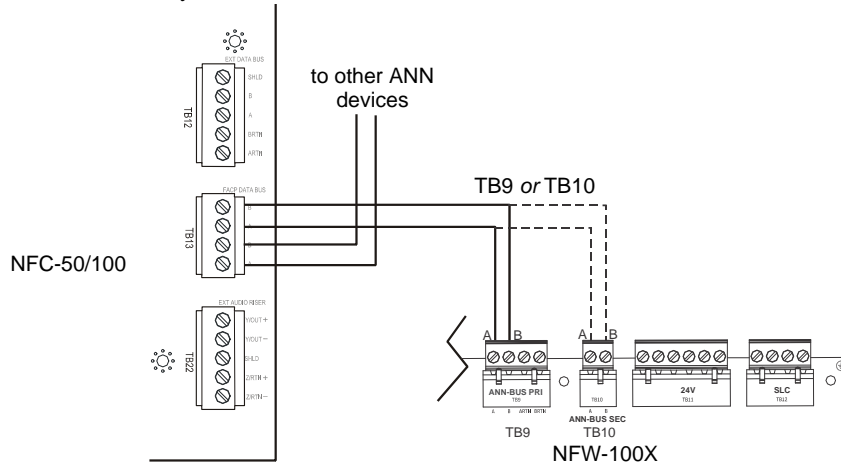
### Notes:

1. Only one (1) SP-SVC can be installed per audio zone; however, multiple speakers can be controlled by the same speaker volume control override output.
2. All fixed volume speakers must be placed before the SP-SVC in the speaker circuit. Any speakers placed after the SP-SVC module will be able to be attenuated.
3. An end-of-line resistor (ELR) must be installed on the last speaker connected to the SP-SVC.
4. Attach wires according to the label on the terminal block. The DC input/output terminals are interchangeable. If the SP-SVC is the last unit in the Speaker Volume Control Override circuit, then an ELR must be installed.
5. The maximum wire impedance between devices must not exceed 35 ohms.

## 2.6.5 FACP Data Bus

### NFW-100X

The FACP communicates with the NFC-50/100 over the ANN-BUS annunciator bus. Wiring must be connected between the primary ANN-Bus terminal TB9 or the secondary ANN-BUS terminal TB10 on the FACP and Terminal TB13 on the NFC-50/100 panel.

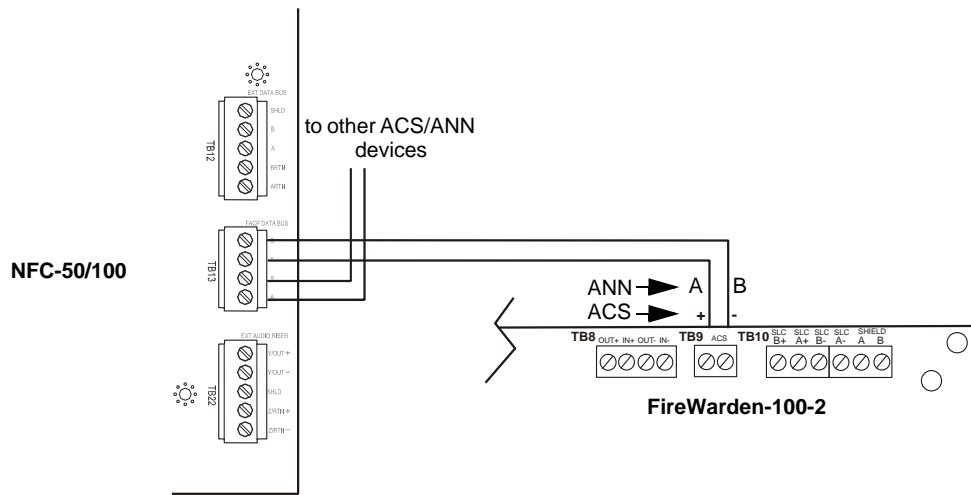


esecc.wmf

**Figure 2.19 Connection for NFW-100X to NFC-50/100**

### FireWarden-100-2

The FireWarden-100-2 FACP communicates with the NFC-50/100 over the ACS or ANN-BUS annunciator link. Wiring must be connected between Terminal TB9 on the FACP and Terminal TB13 on the NFC-50/100 panel.



9200udecc.wmf

**Figure 2.20 Connection for FireWarden-100-2 to NFC-50/100**



## 2.7 NFC-LOC Local Operator Console



### CAUTION: EXTERNAL WIRING CONNECTIONS

THE NFC-LOC IS A SEPARATE DEVICE, NOT PART OF THE NFC-50/100 ASSEMBLY!

Wiring for the Local Operator Console is accomplished between TB24, TB12, and TB22 on the NFC-50/100 main control board to TB3, TB4, and TB5 on the LOC. If the NFC-LOC is the last device on the audio and data bus chain, signal terminations are required. For the external data bus, a removable jumper must be on pins 1 and 2 of JP2 when the LOC is the last device on the chain. If the NFC-LOC is not the last device, the jumper must be on pins 2 and 3 of JP2 as shown below. For the external audio riser, when the LOC is the last device, termination ELR-15K must be connected to pins 5 and 6 on TB5. T-taps and multiple home runs to the main control board are not allowed for the external data bus or the external data riser.

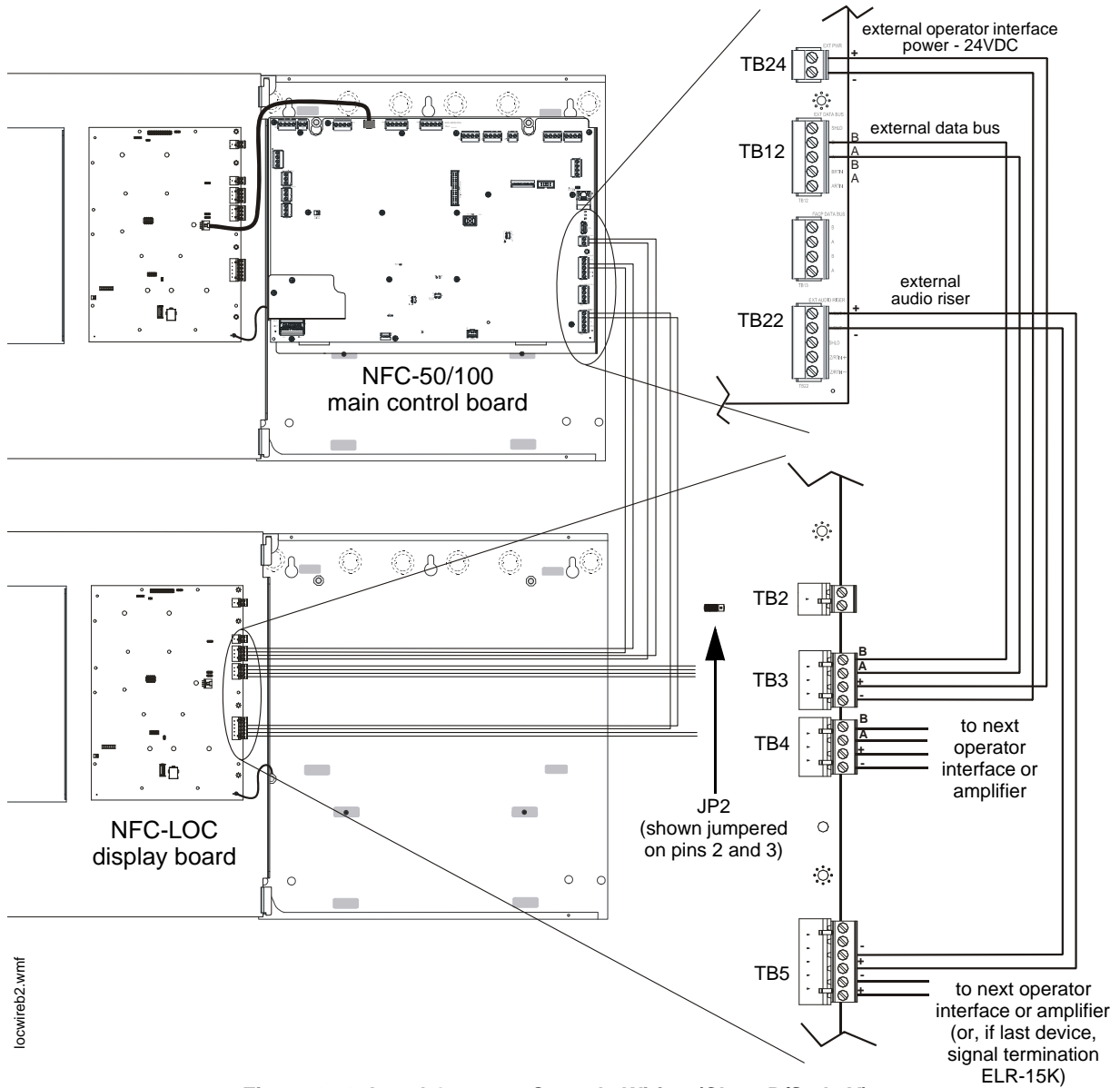
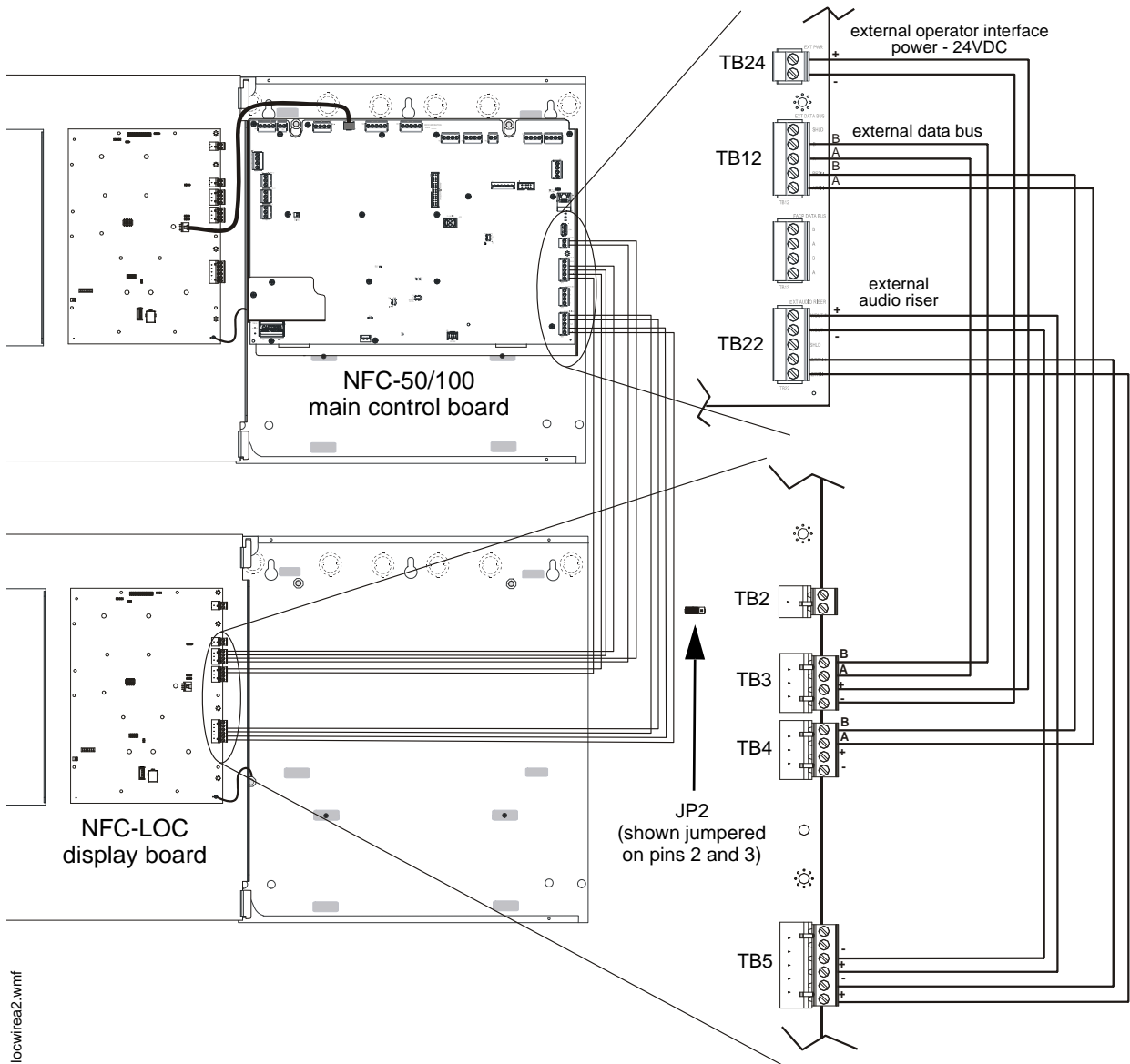


Figure 2.23 Local Operator Console Wiring (Class B/Style Y)



locwirea2.wmf

**Figure 2.24 Local Operator Console Wiring (Class A/Style Z)**

## 2.8 NFC-RPU Remote Page Unit

Connections are made from TB24, TB12, and TB22 on the NFC-50/100 main control board to TB1, TB3, and TB2 on the RPU. If the NFC-RPU is the last device on the audio and data bus chain, signal terminations are required. For the external data bus, a removable jumper must be on pins 1 and 2 of JS4. If the NFC-RPU is not the last device, the jumper must be on pins 2 and 3 of JS4 as shown below. For the external audio riser, when the NFC-RPU is the last device, termination ELR-15K must be connected to pins 4 and 5 on TB2. T-taps and multiple home runs to the main control board are not allowed for the external data bus or the external data riser.

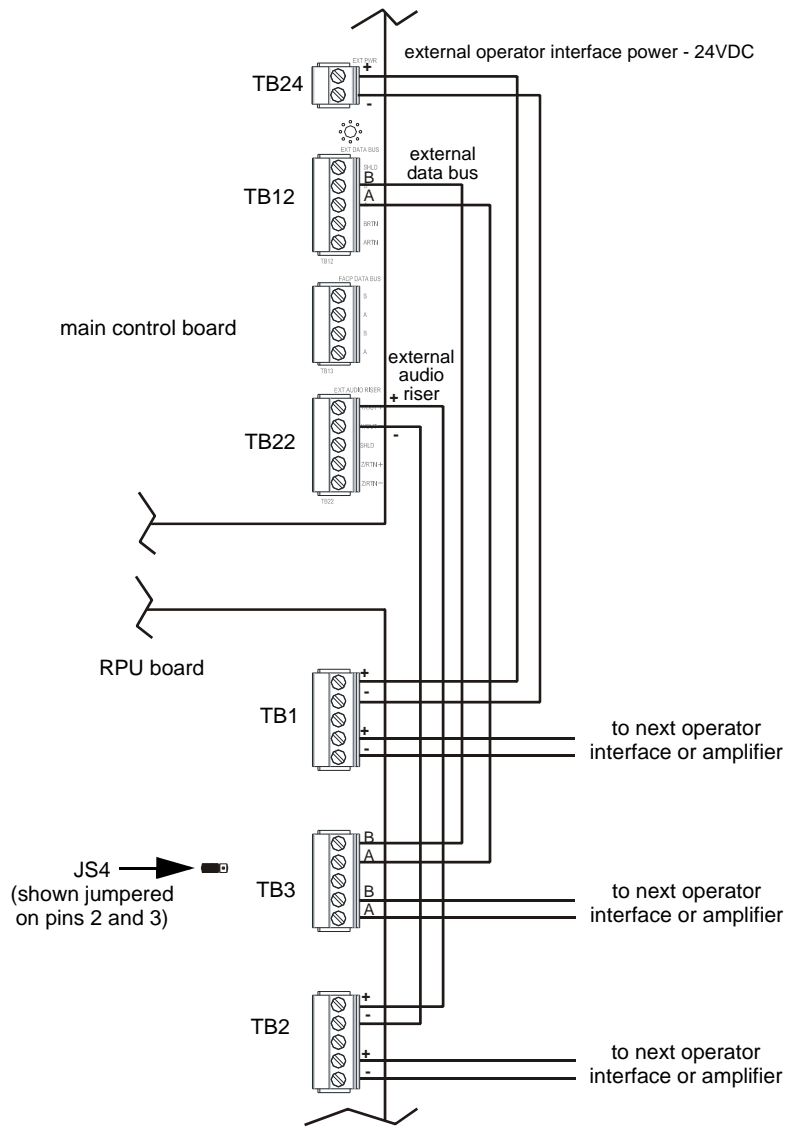


Figure 2.25 Remote Page Unit Wiring (Class B/Style Y)

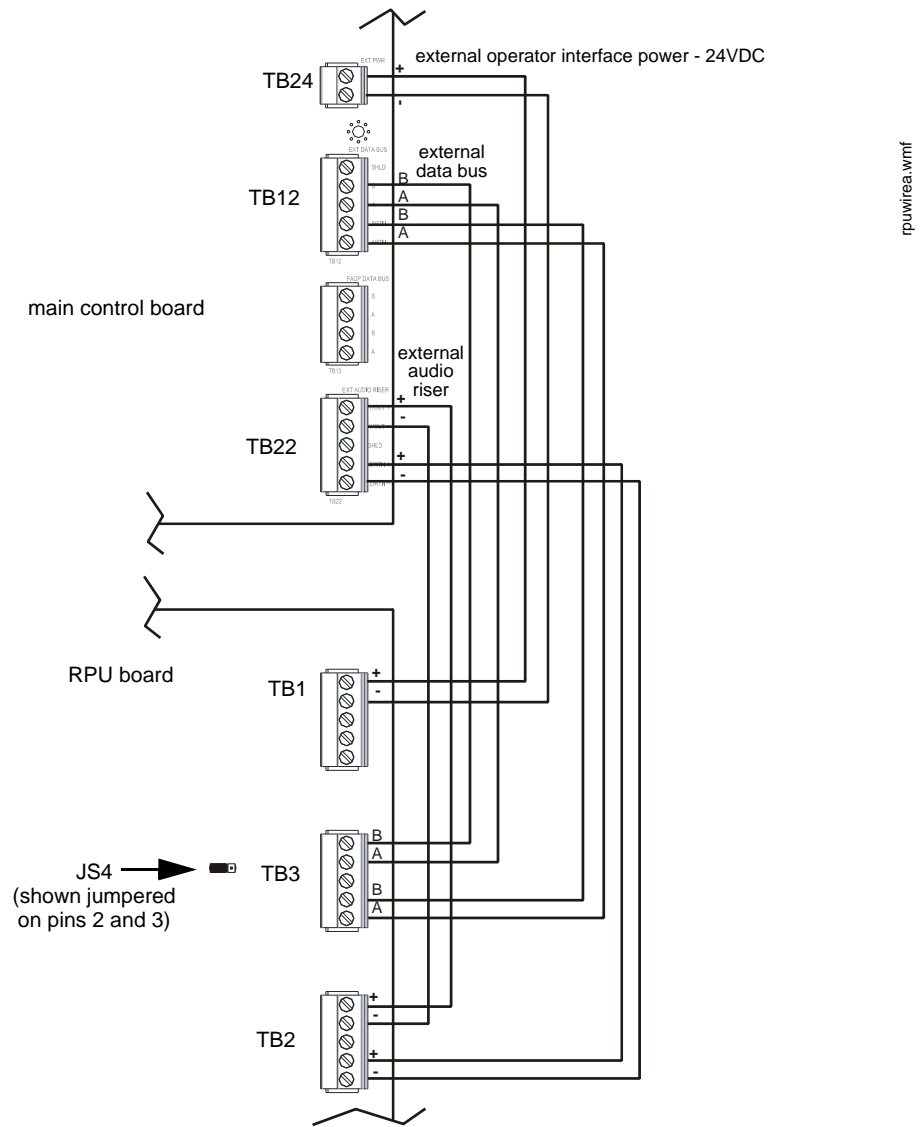


Figure 2.26 Remote Page Unit Wiring (Class A/Style Z)

## 2.9 NFC-RM Remote Microphone

Connections are made from TB24, TB12, and TB22 on the NFC-50/100 main control board to TB3, TB2, and TB1 on the RM. If the NFC-RM is the last device on the audio and data bus chain, signal terminations are required. For the external data bus, a removable jumper must be on pins 1 and 2 of JS4. If the NFC-RM is not the last device, the jumper must be on pins 2 and 3 of JS4. For the external audio riser, when the NFC-RM is the last device, termination ELR-15K must be on pins 4 and 5 on TB2. T-taps and multiple home runs to the main control board are not allowed for the external data bus or the external data riser.

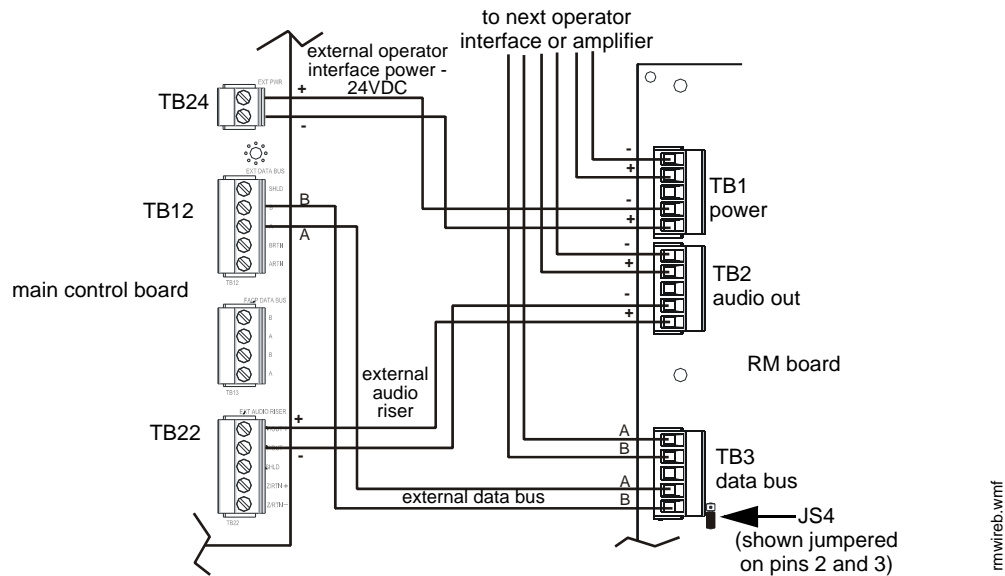


Figure 2.27 Remote Microphone Wiring (Class B/Style Y)

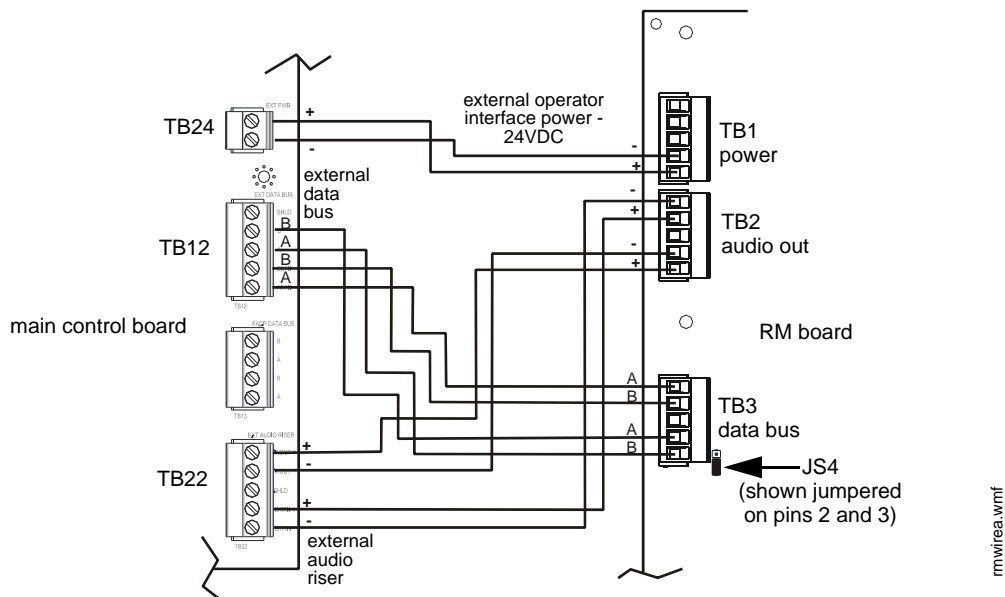


Figure 2.28 Remote Microphone Wiring (Class A/Style Z)

## 2.10 NFC-50DA, NFC-125DA, NFC-50/100DA Distributed Audio Amplifiers

SW2 on the NFC-50/100's display board must be set to the UP position if *any* remote audio boosters are installed on the system. Refer to the *NFC Distributed Audio Amplifier Manual*, LS10027-001NF-E, for installation instructions.



## 2.11 Shielding for External Device Wiring

The external data bus and external audio riser circuits must be wired using twisted pair cable. Shielded cable is optional but is recommended for sites with electric machinery, electric motors, etc. to minimize the effects of electrical interference. Do not run either cable adjacent to or in the same conduit as 120 VAC service, noisy electrical circuits that are powering mechanical bells or horns, speaker circuits, motor control circuits or SCR power circuits. External operator interface power (24VDC) may be run adjacent to or in the same conduit as the external data bus and external audio riser circuits.

At the NFC-50/100 unit, the cable shields must be connected to the same connectors where the signals originate. If only one external device (i.e. an NFC-RM) is used in the system, the shield in the external device must be left floating. It must not touch anything. If multiple external devices are used in the system then the shields must “pass through” (connect to the outgoing shield using wire nuts without touching anything else). For Class A (Style Z) installations, the shield from the last external operator interface must be connected to the same NFC-50/100 terminal that the shield originated from.



**NOTE:** Never use a cable shield as an enclosure’s earth ground. The EIA-485 shield is for radiated noise emission protection (RFI, EMI). Refer to the following illustrations for details on shield termination.

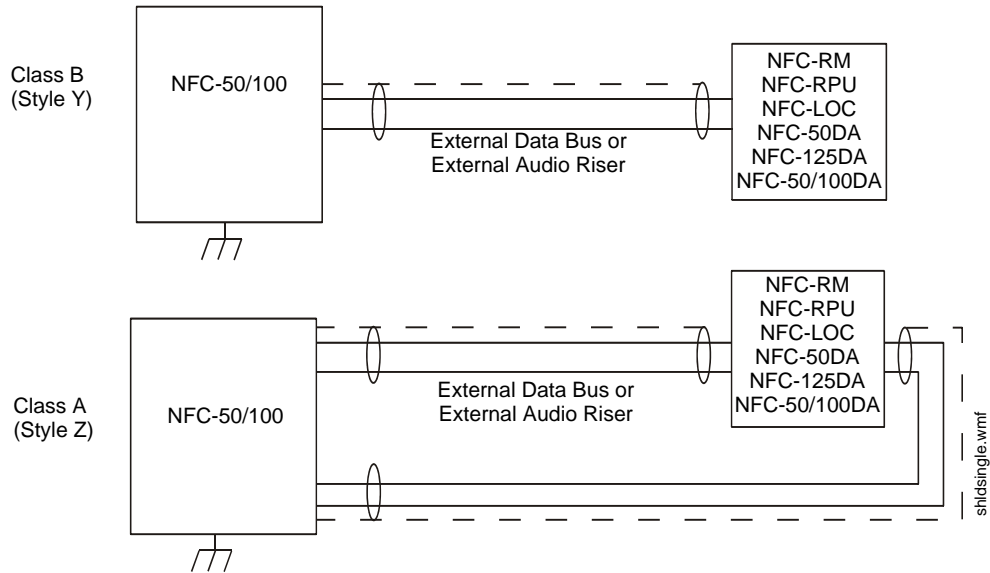


Figure 2.29 Shielding for One External Device

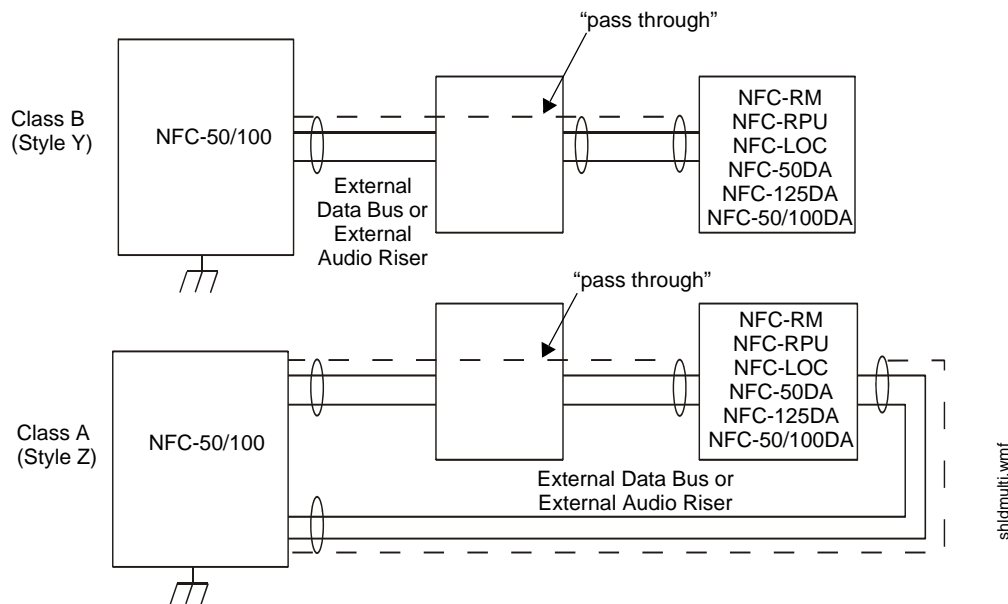


Figure 2.30 Shielding for Multiple External Devices

## 2.12 UL Power-limited Wiring Requirements

Power-limited and nonpower-limited circuit wiring must remain separated in the cabinet. All power-limited circuit wiring must remain at least 0.25" away from any nonpower-limited circuit wiring. Furthermore, all power-limited and nonpower-limited circuit wiring must enter and exit the cabinet through different knockouts and/or conduits. A typical wiring diagram for the NFC-50/100 with two speaker circuits is shown below.

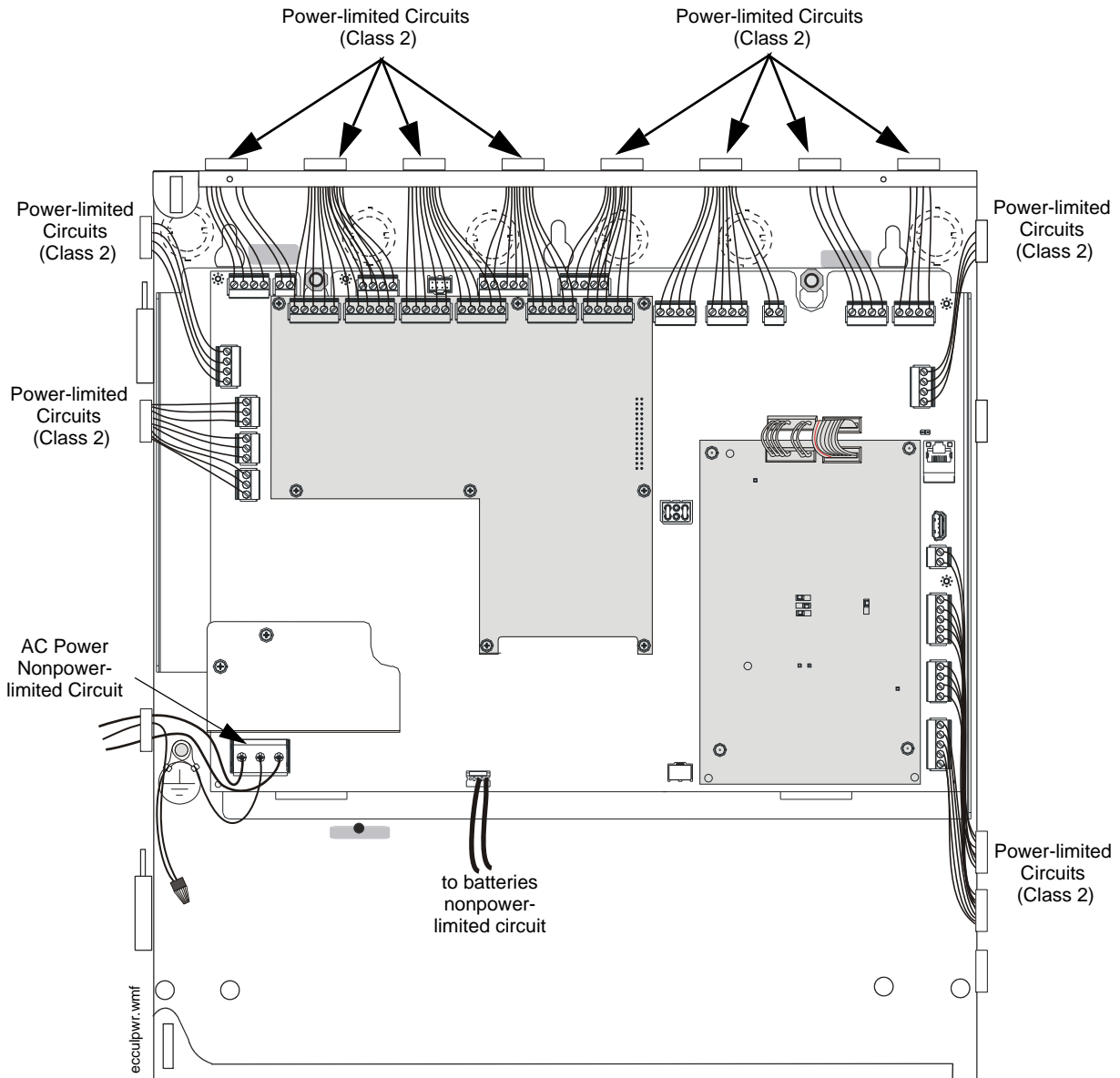


Figure 2.31 Typical Wiring Diagram for UL Power-limited Requirements



**NOTE:** Use of the 70V transformer makes all power-limited circuits Class 3.

## 2.13 Installation of Option Modules



### CAUTION: DISCONNECT POWER

BEFORE INSTALLING ANY MODULES OR CABLES, MAKE CERTAIN ALL POWER (AC AND DC) HAS BEEN REMOVED AND BE SURE TO OBSERVE PROPER GROUNDING AND HANDLING PROCEDURES.

### 2.13.1 NFC-CE6 Circuit Expander Module

The NFC-CE6 Circuit Expander Module provides connections for up to six Style Z (Class A) or Style Y (Class B) speaker circuits. Circuits are configured through the web-based programming utility. Refer to Section 3.2.2 on page 53.

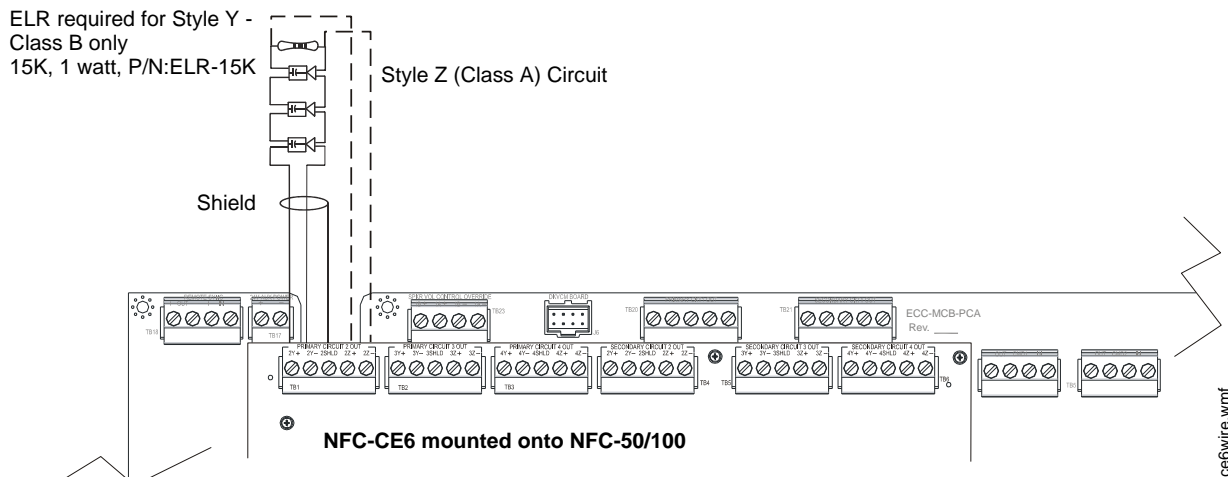


Figure 2.32 Circuit Expander Module Wiring

### 2.13.2 Audio Amplifier Module (NFC-BDA-25/70V)

#### Installation

The optional audio amplifier module can be used to provide a second 50 watt speaker circuit, increasing the total NFC-50/100 power to 100 watts, or it can be used as a backup amplifier. Refer to Section 3.2.2 on page 53 for programming the amplifier's operation. Connectors J1 & J2 of the audio amplifier module plug into connectors J10 & J11, respectively, located at the upper right of the main control board.

Figure 2.34 shows the installation of a NFC-BDA-25/70V onto an NFC-50/100 panel. The optional amplifier may be programmed and wired for backup or for providing a second audio channel.



**NOTE:** Both the primary and secondary amplifiers must be same voltage output (25V or 70V).

1. Remove mounting screws shown, from the main control board, and save (refer to Figure 2.34).
2. Install four supplied metal standoffs in locations from which mounting screws were removed in Step 1.
3. Secure the Audio Amplifier Module with the screws removed in Step 1. It is important to secure the module with the metal screws in order to help protect against electrical transients.
4. Plug the supplied power cable into J10 on the main control board, then into J1 on the audio amplifier. Plug the supplied control cable into J11 on the main control board, then into J2 on the audio amplifier.
5. Configure the slide switches, SW6 and SW7, per Figure 2.36. Do *not* use any other setting.
6. Configure the slide switch, SW5, on the main control board for 25V or 70V operation. (70V operation requires Amplifier model NFC-BDA-70V and the NFC-XRM-70V transformer.)
7. Connect field wiring to TB21 on the main control board (if not using the amplifier as backup). Refer to Figure 2.15 on page 31 for illustration of speaker connections if the amplifier is being used to expand system power to 100 watts (providing dual 50 watt speaker circuits).
8. Configure the Audio Amplifier for primary or backup amplifier operation through the web-based programming utility.

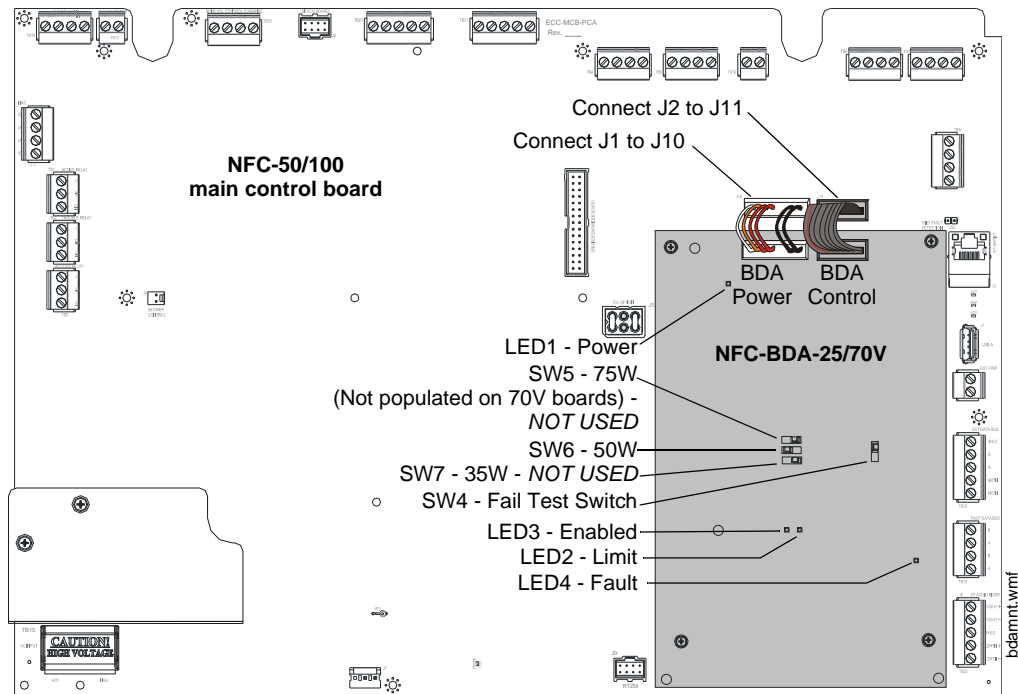


Figure 2.33 Installation of the Optional Audio Amplifier

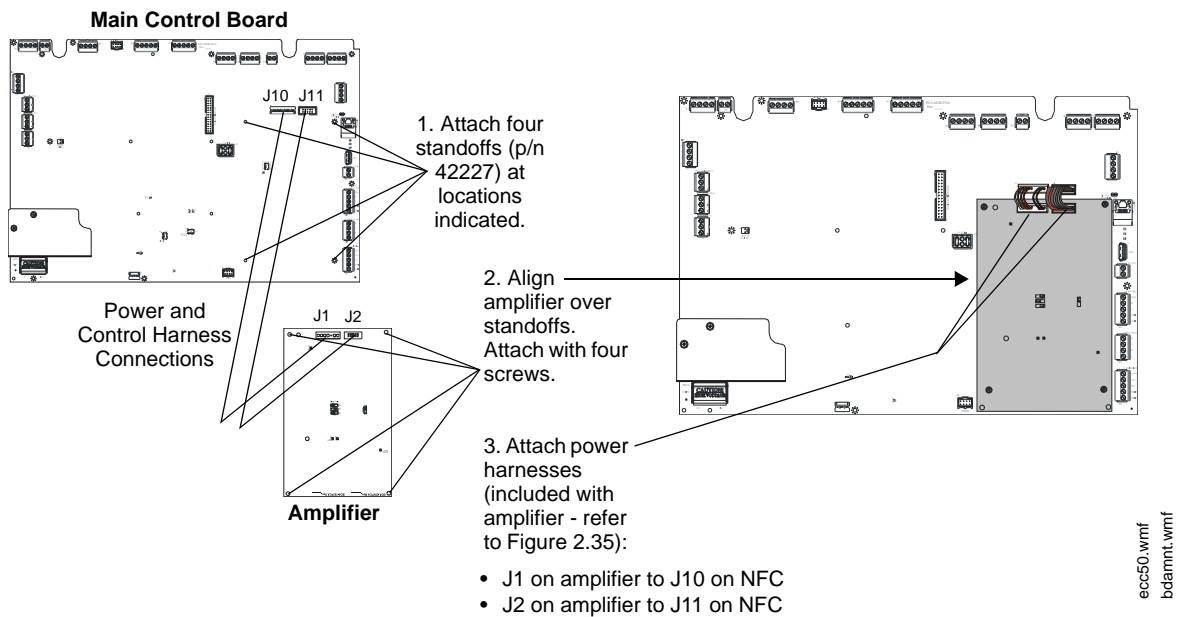


Figure 2.34 NFC-BDA-25/70V Installation

### Power and Control Cables

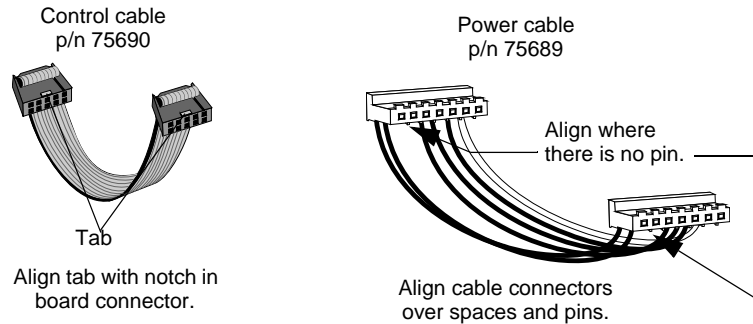


Figure 2.35 Control and Power Cables

### Configuration

#### Enable Switches, SW6 & SW7

SW6 must be enabled. Do not enable SW7. Do not confuse this switch from SW6 on the main circuit board!

Switches come from the factory disabled.

Note that the board is installed upside-down. Pay close attention when setting switches. Figure 2.36 shows the amplifier in its installed position, not the actual silk-screening on the board.

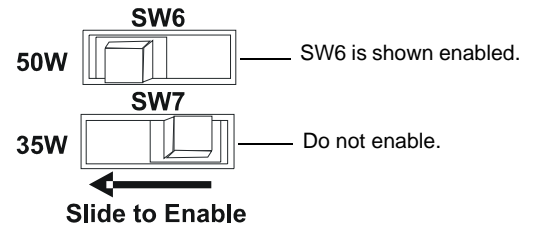


Figure 2.36 Enable Switches

#### FAIL TEST Switch, SW4

This switch is not used. It should always be set to “Normal”.

#### NFC-50/100 Configurations with NFC-BDA-25/70V

Following are descriptions of audio speaker circuit configurations with optional amplifier and optional NFC-CE6 circuit expander.

#### ■ Applications Without Backup

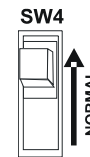


Figure 2.37 FAIL TEST Switch

#### Primary

- 50W
- One Class B or Class A Output
- No Backup

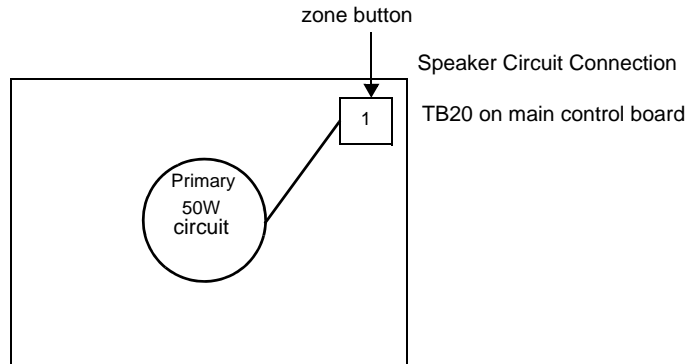


Figure 2.38 Basic (No Optional Amplifier)

#### Primary/Secondary

- Two amps at 50W each
- Two Class B or Class A Outputs
- Optional amplifier is the secondary
- No Backup

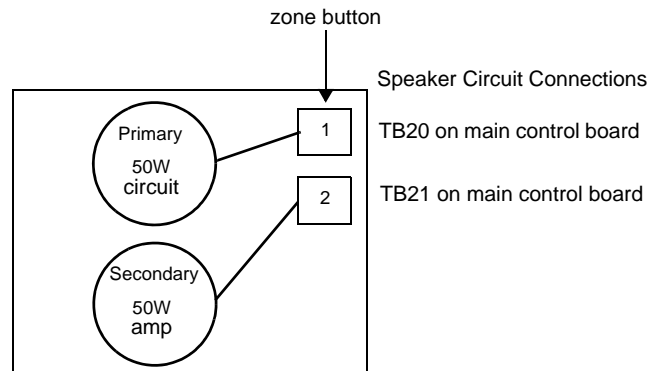
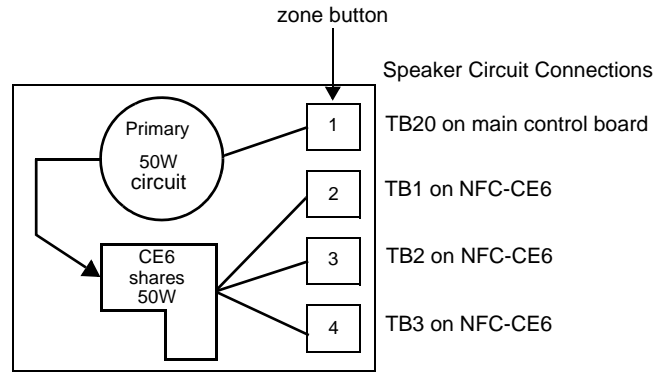


Figure 2.39 Primary/Secondary

Primary with Circuit Expander

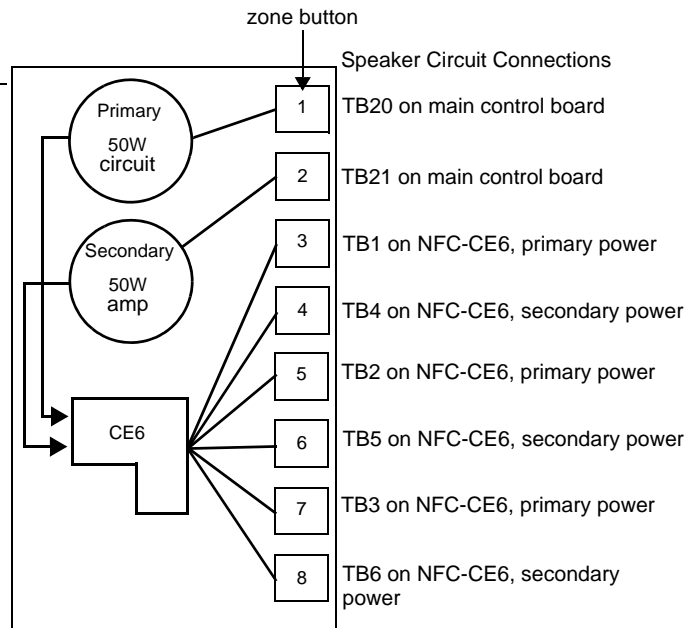
- 50W
- Four Class B or Class A Outputs
- NFC-CE6 adds 3 speaker circuits
- No backup



**Figure 2.40 Primary with Expander**

Primary/Secondary with Expander and Optional Amplifier

- 50W for primary, 50W for secondary
- Eight Class B or Class A Outputs
- Optional amplifier supplies all secondary circuits
- NFC-CE6 adds 3 primary and 3 secondary circuits
- No backup

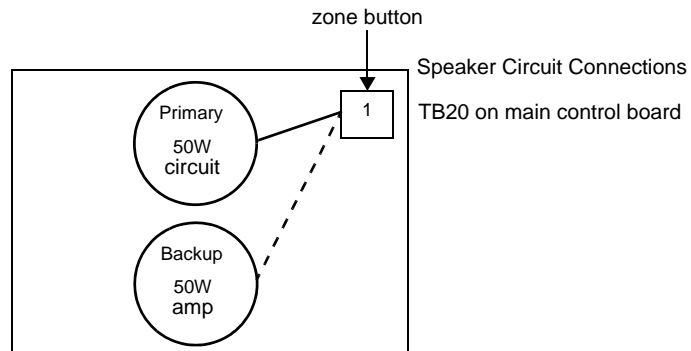


**Figure 2.41 Primary/Secondary with Expander and Optional Amplifier**

■ Applications With Backup

Primary with Backup

- One amp at 50W
- One Class B or Class A Output
- Optional amplifier is the backup



**Figure 2.42 Primary with Optional Amplifier Backup**

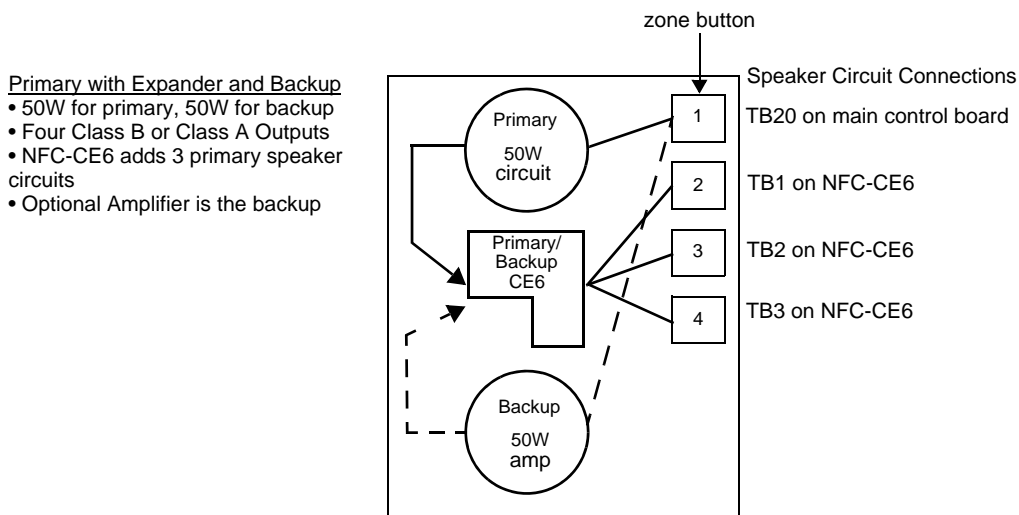


Figure 2.43 Primary with Expander and Optional Amplifier Backup

### 2.13.3 70.7 V<sub>RMS</sub> Transformer (NFC-XRM-70V)

The 70.7 V<sub>RMS</sub> Transformer can be used to convert the integral 25 V<sub>RMS</sub> amplifier for installations where 70.7 V<sub>RMS</sub> speakers already exist or are to be installed. Speaker wiring continues to be supervised during standby, alarm and while background music is playing when transformer is installed. The transformer comes pre-installed onto a bracket for mounting to the chassis. Installation onto the chassis depends on what other option modules are installed. See the *NFC-XRM-70V Installation Document*. Refer to the drawing below.

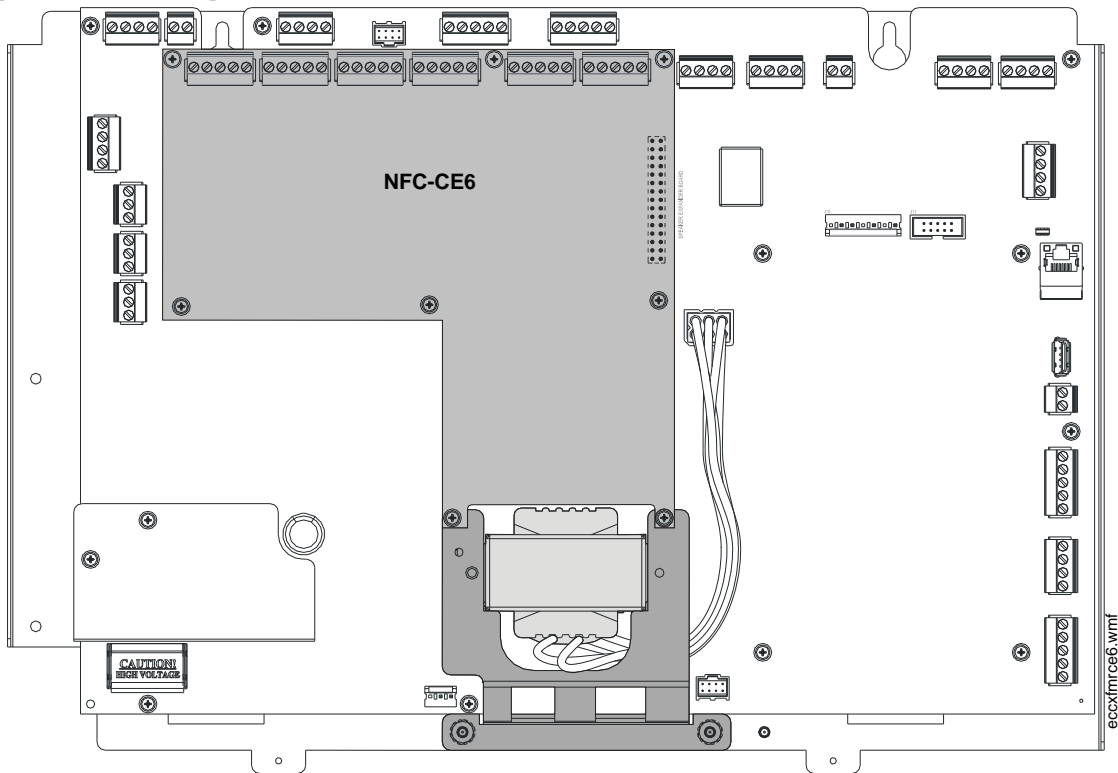


Figure 2.44 70.7 V<sub>RMS</sub> Transformer Installation



**NOTE:** For 70.7V<sub>RMS</sub> operation with the optional amplifier, use model NFC-BDA-70V.



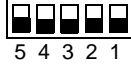


























**CAUTION: DISCONNECT POWER**  
BEFORE INSTALLING ANY MODULES, MAKE CERTAIN ALL POWER (AC AND DC) HAS BEEN REMOVED.

When installing the NFC-XRM-70V, be sure to:

- ✓ carefully remove the factory-installed jumper plug from connector J12 on the main control board.
- ✓ set SW5 on the NFC-50/100 main control board to 70V operation.

## 2.14 Addressing External Data Bus Devices

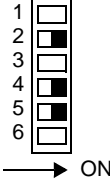
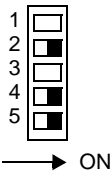
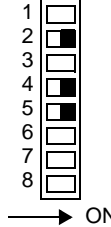
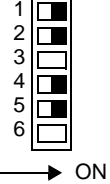
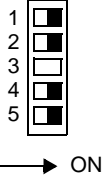
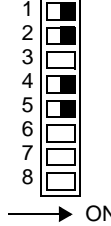
The table below defines an address map for the external data bus devices which include the NFC-LOC, NFC-RPU, NFC-RM, NFC-50DA, and NFC-125DA. Dipswitches are used on each of these devices to set the bus address in order to properly communicate with the NFC-50/100 panel. Any combination of up to eight (8) remote consoles (NFC-LOC, NFC-RPU, and NFC-RM) can be used in the system. Their external data bus addresses must be unique. Note that these four (4) consoles occupy two (2) data bus addresses each. The second address is already “reserved” in the system for each console. Up to eight (8) distributed amplifiers (NFC-50DA and NFC-125DA) can be used in the system. Their external data bus addresses must also be unique and sequential. All addressing must also be set in user programming. Refer to Section 3.2.3 on page 55.

| Bus Address | Device              | Dipswitch Setting on LOC (SW1)   | Dipswitch Setting on RPU (S11)  | Dipswitch Setting on RM (S1)   |
|-------------|---------------------|--|---|--|
|             |                     | ON ↓  | ON ↓  | ON ↑  |
| 0           | reserved            | n/a  | n/a   | n/a  |
| 1           | reserved            | n/a  | n/a   | n/a  |
| 2           | reserved for POC    | n/a  | n/a   | n/a  |
| 3           | reserved            | n/a  | n/a   | n/a  |
| 4           | LOC or RPU or RM #1 |       |       |       |
| 5           | reserved            | n/a  | n/a   | n/a  |
| 6           | LOC or RPU or RM #2 |       |       |       |
| 7           | reserved            | n/a  | n/a   | n/a  |
| 8           | LOC or RPU or RM #3 |     |     |     |
| 9           | reserved            | n/a  | n/a   | n/a  |
| 10          | LOC or RPU or RM #4 |     |     |     |
| 11          | reserved            | n/a  | n/a   | n/a  |
| 12          | LOC or RPU or RM #5 |     |     |     |
| 13          | reserved            | n/a  | n/a   | n/a  |
| 14          | LOC or RPU or RM #6 |     |     |     |
| 15          | reserved            | n/a  | n/a   | n/a  |
| 16          | LOC or RPU or RM #7 |     |     |     |
| 17          | reserved            | n/a  | n/a   | n/a  |
| 18          | LOC or RPU or RM #8 |     |     |     |
| 19          | reserved            | n/a  | n/a   | n/a  |



The table below shows the dipswitch settings for all possible addresses. Note that some devices have a 5-position dipswitch while others have a 6-position dipswitch. The sixth switch on these dipswitches are not used. Dipswitches are shown as they are oriented in the cabinet. Pay close attention when setting addresses.

| Bus Address | Device          | Dipswitch Setting on NFC-50DA(SW1) | Dipswitch Setting on NFC-125DA (SW1) | Dipswitch Setting on NFC-50/100DA (SW3) |
|-------------|-----------------|------------------------------------|--------------------------------------|---|
| 20          | External Amp #1 |                                    |                                      |   |
| 21          | External Amp #2 |                                    |                                      |   |
| 22          | External Amp #3 |                                    |                                      |   |
| 23          | External Amp #4 |                                    |                                      |   |
| 24          | External Amp #5 |                                    |                                      |   |
| 25          | External Amp #6 |                                    |                                      |   |

| Bus Address | Device          | Dipswitch Setting on NFC-50DA(SW1)  | Dipswitch Setting on NFC-125DA (SW1)   | Dipswitch Setting on NFC-50/100DA (SW3)   |
|-------------|-----------------|---|--|---|
| 26          | External Amp #7 |  <p>1 <input type="checkbox"/></p> <p>2 <input checked="" type="checkbox"/></p> <p>3 <input type="checkbox"/></p> <p>4 <input checked="" type="checkbox"/></p> <p>5 <input checked="" type="checkbox"/></p> <p>6 <input type="checkbox"/></p> <p>→ ON</p>            |  <p>1 <input type="checkbox"/></p> <p>2 <input checked="" type="checkbox"/></p> <p>3 <input type="checkbox"/></p> <p>4 <input checked="" type="checkbox"/></p> <p>5 <input checked="" type="checkbox"/></p> <p>→ ON</p>            |  <p>1 <input type="checkbox"/></p> <p>2 <input checked="" type="checkbox"/></p> <p>3 <input type="checkbox"/></p> <p>4 <input checked="" type="checkbox"/></p> <p>5 <input checked="" type="checkbox"/></p> <p>6 <input type="checkbox"/></p> <p>7 <input type="checkbox"/></p> <p>8 <input type="checkbox"/></p> <p>→ ON</p>            |
| 27          | External Amp #8 |  <p>1 <input checked="" type="checkbox"/></p> <p>2 <input checked="" type="checkbox"/></p> <p>3 <input type="checkbox"/></p> <p>4 <input checked="" type="checkbox"/></p> <p>5 <input checked="" type="checkbox"/></p> <p>6 <input type="checkbox"/></p> <p>→ ON</p> |  <p>1 <input checked="" type="checkbox"/></p> <p>2 <input checked="" type="checkbox"/></p> <p>3 <input type="checkbox"/></p> <p>4 <input checked="" type="checkbox"/></p> <p>5 <input checked="" type="checkbox"/></p> <p>→ ON</p> |  <p>1 <input checked="" type="checkbox"/></p> <p>2 <input checked="" type="checkbox"/></p> <p>3 <input type="checkbox"/></p> <p>4 <input checked="" type="checkbox"/></p> <p>5 <input checked="" type="checkbox"/></p> <p>6 <input type="checkbox"/></p> <p>7 <input type="checkbox"/></p> <p>8 <input type="checkbox"/></p> <p>→ ON</p> |

## Section 3: Programming

### NOTICE TO USERS, INSTALLERS, AUTHORITIES HAVING JURISDICTION AND OTHER INVOLVED PARTIES

This product incorporates field-programmable software. In order for the product to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, and in the standard for Communication and Control Units for Mass Notification Systems, UL 2572, certain programming features or options must be limited to specific values or not used at all as indicated below:

| Program feature or option | Permitted in UL 864/UL 2572? (Y/N) | Possible settings  | Settings permitted in UL 864/UL 2572 |
|---------------------------|------------------------------------|--|--------------------------------------|
| AC Loss Delay             | Y                                  | AC Loss Delay = 0, 2 (factory default), 6, 12, or 23 hours<br>Refer to "AC Loss Delay" on page 53. | AC Loss Delay = 2 hours              |
| 24 Hour Resound           | Y                                  | 24 Hour Resound = Enabled<br>24 Hour Resound = Disabled<br>Refer to "24 Hour Resound" on page 53   | 24 Hour Resound Enabled              |
| Active With Page          | N                                  | Enable/Disable   | Disabled                             |
| Page Timeout              | N                                  | 0-60 in 15 second increments   | 0 seconds                            |

All NFC programming is done using the built-in web-based programming utility. It is recommended that tone selection, message repeat cycles and background music options be reviewed and approved by the local AHJ.

To start programming, use a standard CAT5e Ethernet (patch) cable to connect a personal computer's IP port (Ethernet) to the IP port (Ethernet) J2 on the main control board (right side of the board). Set the computer's local area network connection address as follows:

IP address: 169.254.3.5  
Subnet mask: 255.255.0.0



**NOTE:** Be sure to record the computer's original addresses so they can be restored when NFC programming is complete.

Activate the PC's web browser (Google Chrome or Mozilla Firefox). Enter the following in the browser's navigation bar:  
<http://169.254.3.3>

The main menu will display and allow further menu navigation.



**NOTE:** All screen shots reflect default programming.

Security and Data Protection:

**NO ENCRYPTION EMPLOYED**

- Communication Security:
  - a. Level 1
- Stored Data Security:
  - a. Level 0
- Access Control Security:
  - a. Level 1
- Physical Security:
  - a. Level 1

Audit Control: not provided

### 3.1 NFC-50/100 Panel Installation/Maintenance Security Checklist

**System Description:** \_\_\_\_\_

**System Location:** \_\_\_\_\_

**Installer:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Complete the following security tasks for each NFC-50/100 installation.**

- Install the NFC-50/100 panel in a secure location considering both software and hardware vulnerabilities.
- Change the default password to a unique password.
- Securely configure networks and firewalls.
- Assess security risks.
- Develop a Disaster and Recovery Plan.
- Develop a Backup and Recovery Strategy.
- Install, configure, and maintain anti-virus software on all computers which access the panel.
- Keep the operating system updated and maintain version compatibility with the panel.
- Deliver all required system information upon delivery to the system owner.
- Train end-users on security maintenance tasks upon system delivery.
- For decommissioning, dispose of data securely.
- Ensure the Ethernet cable is removed from the NFC-50/100 when not being utilized for configuration.

### 3.2 Main Menu - User Programming

This screen shows the main menu for the NFC user programming options. Changes to programming require a valid password for system login. Note that a password is NOT required to change the date/time, view the informational screens, or view the panel history.

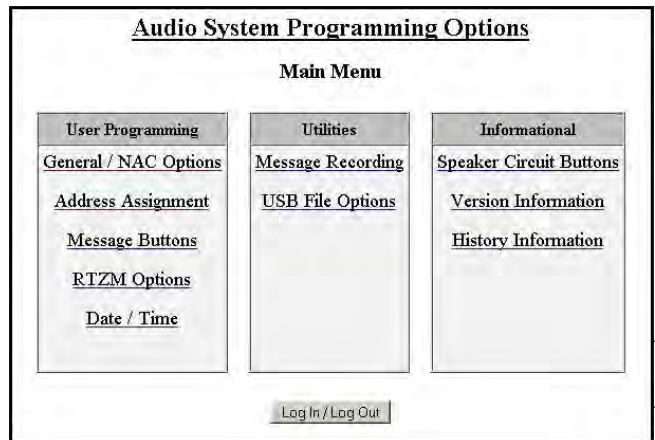


Figure 3.1 Main Menu

#### 3.2.1 Password Options

Changes to NFC programming require a valid password login. Programming changes *cannot* be made when there is an active event in the system.

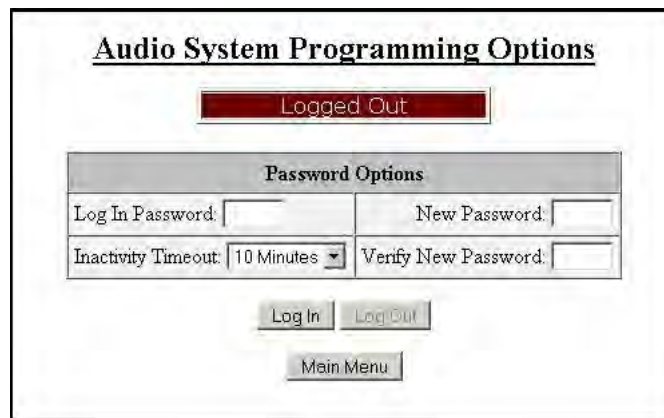


Figure 3.2 Password Options

**Log In Password** The default password for the NFC-50/100 is 0000.

**New Password** It is recommended that the password be changed to increase system security. Valid passwords contain four digits from 0000-9999.

**Verify New Password** Re-enter the new password for confirmation.

**Inactivity Timeout** Select the amount of time, 5 minutes, 10 minutes, 20 minutes, 30 minutes, or 60 minutes, the system is allowed to remain idle before automatic user log out. The timeout feature helps the system protect against unauthorized programming changes.

**Log Out** When all programming has been successfully completed, the user must *fully* log out, with a green indicator at the login screen, to allow the system to reboot and apply the programming changes.

## 3.2.2 General/NAC Options

### General Options

| General Options                   |                                     |
|-----------------------------------|-------------------------------------|
| Unit Operation: Mass Notification | Event Priority: Mass Notification   |
| FACP Data Bus Control: None       | FACP Data Bus Address (0-32): 0     |
| 24 Hour Resound: Enabled          | Canadian Configuration: Disabled    |
| Class A / Style Z: Disabled       | Canadian Isolator Modules: Disabled |
| AC Loss Delay: 2                  | Secondary Amplifier: None           |
| Primary Amp 25/70 VAC: 25 VDC     | Secondary Amp 25/70 VAC: Disabled   |
| External Audio Input: None        | IP Address: 0 0 0 0                 |
| Identification:                   |                                     |

Figure 3.3 General Options

**Unit Operation** Select whether the NFC will function for *Fire Evacuation*, *Mass Notification*, or a *Combination* of both.

**Event Priority** When *Combo* or *Mass Notification* is selected for Unit Operation, select whether *Mass Notification* events or *Fire Evacuation* events will take priority in the system. If *Mass Notification* is selected as the Unit Operation with the Event Priority set to *Fire Evacuation*, the NFC will be a mass notification only system but will allow the FACP to override it if a fire alarm sounds. If *Mass Notification* is selected as the Unit Operation with the Event Priority also set to *Mass Notification*, the NFC will not have any fire evacuation capabilities and will report mass notification events to the FACP. In this configuration, FACP outputs can be turned off for mass notification events if desired.

**FACP Data Bus Control** If an FACP will directly communicate with the NFC, select which communication protocol will be used, *ACS-Bus* or *ANN-Bus*.

**FACP Data Bus Address** *This field has no effect on programming and is used for informational purposes only.* When using the FACP ACS-bus protocol, address *01* must be enabled in the FACP programming. When using the ANN-Bus protocol, the FACP will automatically detect the audio system connection during annunciator auto-configuration. No ANN-Bus address selection is necessary at the FACP. Enter the NFC's address (1-8) here. If FACP control of the NFC is not selected, enter *0*.

**24 Hour Resound** As *enabled* (default), the 24 Hour Resound feature causes the piezo on the NFC to sound a reminder 'beep' for alarms and troubles after the panel has been silenced.

**Canadian Configuration** Selecting *enable* will configure the panel to comply with Canadian requirements. See Appendix C for more information.

**Class A / Style Z** Select *enable* if all circuits on the NFC will operate in Class A (Style Z) or *disabled* if all circuits will operate in Class B (Style Y).

**Canadian Isolator Modules** If audio isolator modules are required in the system, select *enabled*. Refer to "Audio Room Isolator Modules" on page 83 for more information.

**AC Loss Delay** The reporting of a loss of AC power using the AC Loss relay output can be delayed by programming the length of the desired delay. The factory default setting is 2 hours. Options are *0*, *2*, *6*, *12*, or *23* hours.

**Secondary Amplifier** if an NFC-BDA-25/70V is installed, select whether it will be used as a *backup* amplifier or for *secondary* speaker circuits. If an NFC-BDA-25/70V is not installed, select *none*.

**Primary Amp 70 VAC** *This field has no effect on programming and is used for informational purposes only.* The system can be converted from 25V to 70V by installing the NFC-XRM-70V. If this transformer has been installed, be sure that SW5 on the main control board has been set to "70V" operation. Use this field to record the amplifier's settings.

**Secondary Amp 70 VAC** *This field has no effect on programming and is used for informational purposes only.* When the NFC-XRM-70V has been installed and a secondary amplifier is required, model number NFC-BDA-70V must be used. Use this field to record which model has been installed in the system.

**External Audio Input** If there is a permanent connection to TB5 on the display board, select whether the external audio input will function as *Background Music* or *External Paging - Night Ring*. See Section 4.4.15 for more information.

**IP Address** The default IP address of 169.254.3.3 can be changed to another address with numbers from 0-255. Changing the IP address is suggested for a higher level of security on the system's programming. This number should be written down and stored in a safe location.

**Identification** Enter a label for this NFC system. Up to 80 character may be entered.

## NAC Options

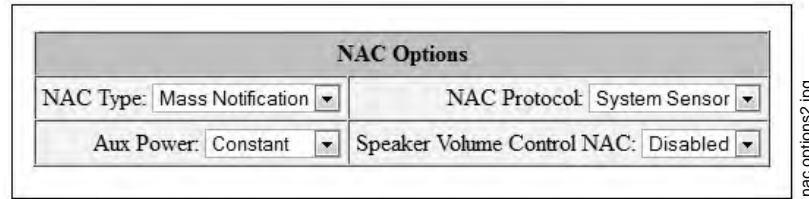


Figure 3.4 NAC Options

**NAC Type** The NAC circuit can be programmed to activate for specific applications. Select *Mass Notification* to turn on the NAC circuit only for a mass notification event, *Fire Evacuation* to turn on the NAC circuit only for a fire evacuation event, *Both* to turn on the NAC circuit for both mass notification and fire evacuation events, or *Follow Input* to have the NAC follow the input from an external source (connections to TB18). To use *Both*, the Unit Operation must be set to Combination. Refer to “Unit Operation” on page 53.

**NAC Protocol** The programmer can select the notification appliance coding or strobe synchronization by selecting the corresponding drop-down box. Select *System Sensor* for System Sensor synchronization, *Wheelock*, for Wheelock synchronization, *Gentex* for Gentex synchronization, or *Steady*, for a continuous output with no coding.

To ensure proper strobe and circuit operation, there is also a limit to the number of strobes that can be attached to each circuit. Following is a list of the strobes that have been tested with the NFC and the maximum number that can be connected to each NAC. Make sure that the NAC maximum current is not exceeded.

| Strobe Manufacturer | Maximum Number of Strobes |
|---------------------|---------------------------|
| System Sensor       | 31                        |
| Wheelock            | 34                        |
| Gentex              | 26                        |

Table 3.1 Maximum Number of Strobes by Manufacturer

**Aux Power** Selects whether this power is *Constant* or *Resettable* use from TB17.

**Speaker Volume Control NAC** If the Cooper Wheelock SP-SVC module is installed on TB23 of the main control board, allowing manual volume setting for telephone paging and background music for a specific speaker or speaker zone, select *Enabled*.

## Console Control

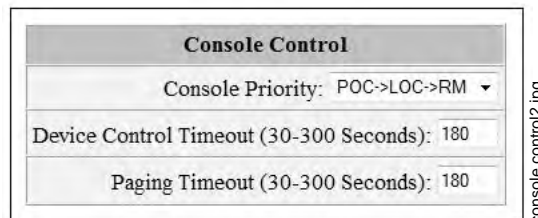


Figure 3.5 Console Control

**Console Priority** Priority can be assigned to the operator consoles so that the primary operator interface can always override the functions at the local operator consoles or remote microphones. Select *POC->LOC->RM* for console priority. Selecting *Equal* for priority allows users with access to the system on a “first come, first served” basis.

**Device Control Timeout** Enter the maximum amount of time (30-300 seconds) that one of the devices (Primary Operator Console, Local Operator Console, Remote Page Unit, or Remote Microphone) can remain in manual control of the NFC system.

**Paging Timeout** Enter the maximum amount of time (30-300 seconds) that the microphone’s PTT switch can be held.

### 3.2.3 Address Assignment

#### Remote Microphone / Operator Console Address Assignments

**Audio System Programming Options**

| Operator Console Address Assignments |             |                   |             |
|--------------------------------------|-------------|-------------------|-------------|
| 2: Primary Operator Console          |             |                   | Mic Gain: 3 |
| 4: Not Installed                     | Mic Gain: 1 | 6: Not Installed  | Mic Gain: 1 |
| 8: Not Installed                     | Mic Gain: 1 | 10: Not Installed | Mic Gain: 1 |
| 12: Not Installed                    | Mic Gain: 1 | 14: Not Installed | Mic Gain: 1 |
| 16: Not Installed                    | Mic Gain: 1 | 18: Not Installed | Mic Gain: 1 |

console address.jpg

**Figure 3.6 RM/Console Address Assignments**

Any combination of up to eight (8) remote consoles (NFC-LOC, NFC-RPU, and NFC-RM) can be used in the system. Odd numbered addresses are not selectable. Addresses must be sequential, even numbers. Identify which consoles are installed at addresses 4, 6, 8, 10, 12, 14, 16, and 18 as either *Local Operator Console* or *Remote Microphone*. Note that the NFC-RPU and NFC-RM are both considered remote microphones. Refer to Section 2.14, “Addressing External Data Bus Devices” for information on dipswitch settings. Note that Address 2 is reserved for the POC.

Mic Gain is the microphone's transmitting “volume control”. The gain number is automatically entered when a remote console is programmed.

#### Speaker Circuit Address Assignment

**Audio System Programming Options**

| Amplifier Address Assignments | Circuit Expander Option | Speaker Circuit Assignments | 70 VAC Option |
|-------------------------------|-------------------------|-----------------------------|---------------|
| Primary Operator              | CE6 - Not Installed     | 1                           | Not Installed |
| 20: Not Installed             | CE4 - Not Installed     | 0                           | Not Installed |
| 21: Not Installed             | CE4 - Not Installed     | 0                           | Not Installed |
| 22: Not Installed             | CE4 - Not Installed     | 0                           | Not Installed |
| 23: Not Installed             | CE4 - Not Installed     | 0                           | Not Installed |
| 24: Not Installed             | CE4 - Not Installed     | 0                           | Not Installed |
| 25: Not Installed             | CE4 - Not Installed     | 0                           | Not Installed |
| 26: Not Installed             | CE4 - Not Installed     | 0                           | Not Installed |
| 27: Not Installed             | CE4 - Not Installed     | 0                           | Not Installed |

address assign.jpg

**Figure 3.7 Remote Amplifier Address Assignments**

**Primary Operator Console - Circuit Expander** If the NFC-CE6 has been installed on P1 of the main circuit board, select *CE6 - Installed* from the drop down box. The NFC-50/100 comes with one (1) integrated speaker circuit. Adding the CE6 gives the system three (3) more speaker circuits for a total option of four (4) from the drop-down box. If the optional amplifier (NFC-BDA-25/70V) has been installed and programmed as a *secondary* speaker circuit on the General / NAC Options page, then the total available speaker circuits allowed for the POC will be eight (8). Refer to application examples on pages 45–46.

**Remote Amplifiers** Identify which, if any, remote amplifiers are *Installed* on the system in addresses 20-27. The remote amplifiers must be installed sequentially. If, for example, remote amplifiers are installed on addresses 20 and 21, address 22 must be *Disabled* if address 23 is to be used. If no remote amplifiers are installed at a given address, select *Not Installed*.

**Circuit Expander Option** For any installed remote amplifier, select whether any circuit expanders (NFC-CE4) have been *Installed*.

**Speaker Circuit Assignments** Select how many speaker circuits will be used for each amplifier. Each amplifier offers four (4) speaker circuits standard. If the CE4 has been installed, eight (8) speaker circuits will be available. Note the the NFC allows a maximum of 24 speaker circuits in the system.

**70VAC Option** For every programmed 50W remote amplifier, select whether a 70V transformer has been *Installed* or *Not Installed*. 70V operation is not available on the 125W model.

### 3.2.4 Message Buttons

#### Message Buttons

| Message Buttons |            |      |                       |                             |              |
|-----------------|------------|------|-----------------------|-----------------------------|--------------|
| Message Button  | Assignment | Tone | Leading Tone Duration | Inter-Message Tone Duration | Repeat Cycle |
| 1               | Not Used   | ANSI | Seconds 0             | Seconds 4                   | 0            |
| 2               | Not Used   | ANSI | Seconds 0             | Seconds 4                   | 0            |
| 3               | Not Used   | ANSI | Seconds 0             | Seconds 4                   | 0            |
| 12              | Not Used   | ANSI | Seconds 0             | Seconds 4                   | 0            |
| 13              | Not Used   | ANSI | Seconds 0             | Seconds 4                   | 0            |
| 14              | Not Used   | ANSI | Seconds 0             | Seconds 4                   | 0            |

Figure 3.8 Message Buttons

**Assignment** Message buttons 1-14 can be used to broadcast prerecorded messages over the system. They must be designated as *Fire Evacuation* or *Mass Notification* in the Assignment field.

For combination fire and MNS applications, messages must be organized per the system priority setting. For example, if MNS has priority over fire, all MNS messages must be assigned/recorded to higher priority message buttons than the fire messages. If fire has priority, then all fire messages must be assigned/recorded to higher priority message buttons than the MNS messages. Message button 1 has highest priority.

**Tone** Prior to transmitting a message, the NFC can be programmed to produce a pre-announce and post-announce tone. In the Tone field, select the desired tone pattern: *ANSI*, *March Code*, *California*, *Steady*, *Alert Tone*, *Hi-Lo*, *ANSI Whoop*, *Continuous Whoop*, or *No Tone*.

**Leading Tone Duration** If a pre-announce tone is desired, select the length of time it will play before a message is broadcast. Select 4, 8, 12, 16, 20, 24, or 28 seconds. In a pre-announce tone is not desired, select 0 seconds.

**Inter-Message Tone Duration** Select the length of time for the tone in between message broadcast. Select 4, 8, 12, 16, 20, 24, 28, or 32 seconds from the drop-down menu.

**Repeat Cycle** Select the number of times the message will be repeated during an alarm. A message can be repeated 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or an *Infinite* amount of times.



## CMD Input Style

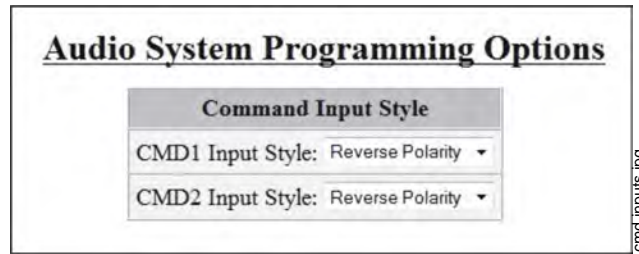


Figure 3.9 Tone Duration / CMD Input Types

**CMD Input Style** CMD1 and CMD2 Command Input circuits can be independently programmed to be triggered by a *Contact Closure* or by the *Reverse Polarity* of a Notification Appliance Circuit. When the system is programmed for Mass Notification, CMD1 and CMD2 will be programmed for Reverse Polarity only. See Section 2.5.1 for more information.

## 3.2.5 Date / Time



Set the local time and date for the panel using the drop-down boxes. Pressing the *Refresh* button automatically fills these fields with current information.

## 3.2.6 Send to Panel



After completing the desired programming on each page, click the *Send to Panel* button to save changes to the panel. Selecting the *Load Defaults* button will apply default programming to the given page. To then save the applied default settings to the panel, press the *Send to Panel* button. The *Main Menu* button will disregard any programming selections and jump back to the main menu screen. Changes made to panel programming will not be applied until *complete* log out of user programming, with a green indicator at the login screen. After a successful log out from the programming utility, the panel will reboot and the changes will become effective.

## 3.3 Main Menu - Utilities

Services for recording messages and software file transfers via USB are located in the Utilities menu. These program utilities require a valid password for system login. Refer to Section 3.2.1.

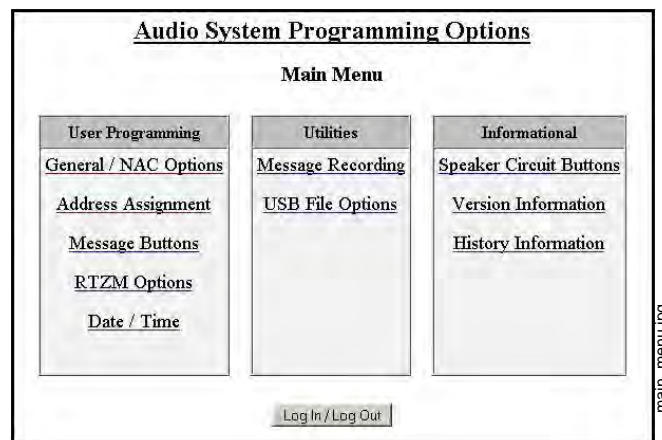


Figure 3.10 Main Menu

### 3.3.1 Message Recording



The NFC allows up to 14 recorded messages. These custom messages can be recorded using the local microphone, external audio input, or via USB port using a third party audio editing program. Clicking the *Enable Recording* will put the system in message record mode. Refer to Section 3.5. When the button has been clicked, the background screen will turn dark red, giving a visual cue that the system is ready to record. After all messages have been successfully recorded, message recording must then be disabled. Simply click the *Disable Recording* button.



### 3.3.2 USB File Options



The NFC system allows software files to be saved, shared, and transferred via the computer’s USB port. The program file must be named CONFIG.TXT. **When saving the program file to USB, it is vital that no other files with the same name exist on the drive. The existing file will be completely overwritten.** Only files named CONFIG.TXT can be recalled from a USB drive. The NFC system will verify that the file is compatible.

After a *Save* or *Recall* has been performed, the screen will show “Processing USB Request”. Once this is complete, the screen will show either a success message in green or a failure message in red. If a failure message appears, correct the issue and try again.

### 3.4 Main Menu - Informational

From the main screen, programmed information for the 24 possible speaker circuits can be viewed without accidentally making changes. Viewing this information does *not* require login to the system.

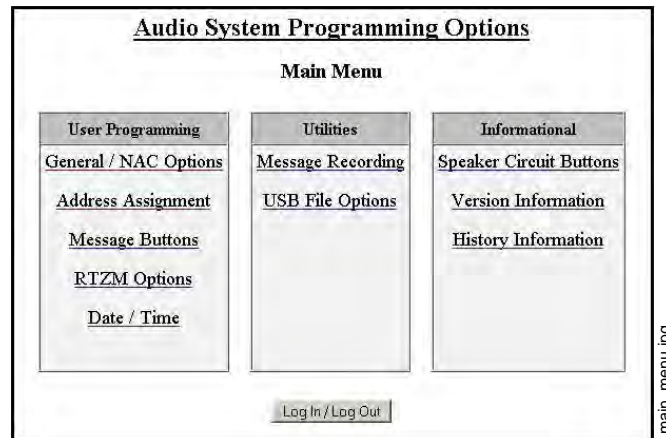


Figure 3.11 Main Menu

#### 3.4.1 Informational

##### Speaker Circuit Buttons

**Audio System Programming Options**

**Speaker Circuit Button Assignments**

|   |                         |
|---|-------------------------|
| Button 1 : Primary Operator Console - Circuit 1 | Button 13: Not Assigned |
| Button 2 : Primary Operator Console - Circuit 2 | Button 14: Not Assigned |
| Button 3 : Primary Operator Console - Circuit 3 | Button 15: Not Assigned |
| Button 4 : Primary Operator Console - Circuit 4 | Button 16: Not Assigned |
| Button 5 : Remote Amplifier 1 - Circuit 1       | Button 17: Not Assigned |
| Button 6 : Remote Amplifier 1 - Circuit 2       | Button 18: Not Assigned |
| Button 7 : Remote Amplifier 2 - Circuit 1       | Button 19: Not Assigned |
| Button 8 : Remote Amplifier 2 - Circuit 2       | Button 20: Not Assigned |
| Button 9 : Remote Amplifier 2 - Circuit 3       | Button 21: Not Assigned |
| Button 10: Not Assigned                         | Button 22: Not Assigned |
| Button 11: Not Assigned                         | Button 23: Not Assigned |
| Button 12: Not Assigned                         | Button 24: Not Assigned |

buttonassign.jpg

Figure 3.12 Speaker Circuit Button Assignments

The *Speaker Circuit Button Assignment* page reflects what has been programmed into the *Address Assignment* page. (Refer to “Speaker Circuit Address Assignment” on page 55.) Based on the example above, the NFC system’s primary operator console has four (4) programmed speaker circuits, a remote amplifier at address 20 has two (2) speaker circuits, and a second remote amplifier at address 21 has three (3) speaker circuits. There is a maximum of 24 speaker circuits allowed in the system.

### Version Information

| Address | Board Type                   | Software Part # | Software Revision | Hardware Part # | PCB Revision | Hardware Revision |
|---------|------------------------------|-----------------|-------------------|-----------------|--------------|-------------------|
| 1       | Main Control Board           | 000000          | 00                | 000000          |              | 00                |
| 2       | Primary Operator Console DK  | 010203          | 04                | 050607          | A            | 08                |
| 3       | Primary Operator Console VCM | 974112          | 10                | 208207          | A            | 01                |
| 4       | Local Operator Console DK    | 010203          | 04                | 050607          | A            | 08                |
| 5       | Local Operator Console VCM   | 974112          | 10                | 208207          | A            | 01                |
| 6       | Remote Microphone / RPU      | 010203          | 04                | 050607          | A            | 08                |
| 7       | Not Installed                | 000000          | 00                | 000000          |              | 00                |
| 8       | Remote Microphone / RPU      | 010203          | 04                | 050607          | A            | 08                |
| 9       | Not Installed                | 000000          | 00                | 000000          |              | 00                |
| 10      | Not Installed                | 000000          | 00                | 000000          |              | 00                |

Figure 3.13 Version Information

The *Version Information* screen lists the devices programmed to the NFC system by address. All software and hardware revision information can be viewed here. This screen is updated every time a device is added or changed.

### History Information

| Date     | Time     | Address | Board Type | Message             |
|----------|----------|---------|------------|---------------------|
| 01/01/12 | 01:29:49 | 02      | POC        | Trouble Silence     |
| 01/01/12 | 01:00:40 | 04      | LOC        | System Control      |
| 01/01/12 | 01:00:37 | 04      | LOC        | All Call Activation |
| 01/01/12 | 01:00:32 | 06      | RM-RPU     | All Call Activation |
| 01/01/12 | 01:00:26 | 08      | RM-RPU     | All Call Activation |

Figure 3.14 History Information

The History Information screen shows the system’s event history. A maximum of 100 events can be viewed, starting with the most recent. This information can be erased by clicking the *Clear History* button. Clicking the *Print* button will activate the print dialog box. Print options are selected in this box. Note that the Date and Time in the heading of the print screen correspond to those of the panel and not the computer. The Unit ID reflects the name of the panel assigned in the General Options page. Refer to “General Options” on page 53.

### 3.5 Recording Custom Messages

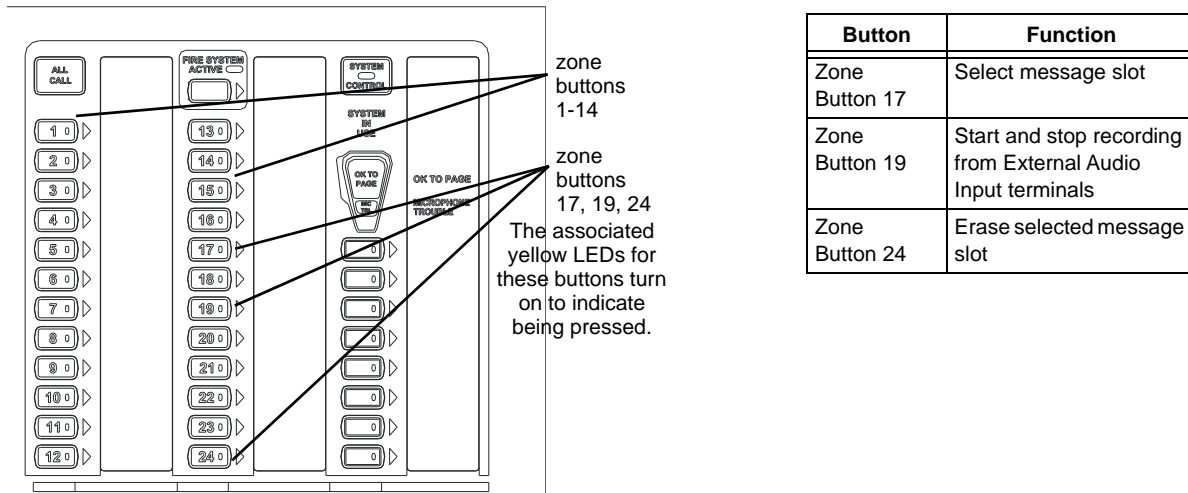
The system has 14 recordable message slots. Messages can be recorded from the microphone, external audio input, or uploaded via USB using the Voice Loader (VL) software. Each message can be up to one minute in duration.

#### 3.5.1 Message Record Mode

Enable *Recording Mode* in the system’s message recording programming section. Refer to Section 3.3.1 on page 58.

While in Local Record mode, zone buttons 1-14 are used to reference message slots 1-14. The associated green zone LED will indicate whether a message is currently programmed in the corresponding slot. The associated yellow zone LED will indicate a recording in progress. The zone buttons 1-14 will be used to play back a recorded message or to reference a message slot that needs to be recorded or erased.

Zone buttons 17, 19, and 24 are used to control the recording/erasing process.



When in Local Record mode, the display board’s LEDs will function as follows:

| LED                         | Active LED Status | Meaning  |
|-----------------------------|-------------------|--|
| Zone Button 1-14 Green LED  | On                | Message is currently programmed in this slot.                              |
| Zone Button 1-14 Yellow LED | On                | LED will turn on until recording is complete or the 1 minute slot is full. |
| Zone Button 1-14 Green LEDs | Off               | Slot is available to record.   |

#### 3.5.2 External Audio Input

The external audio input allows customized, pre-recorded messages to be loaded into a message slot.

1. Wire a speaker cable with 1/8” mini plug (Radio Shack p/n 42-2454) to EXT Audio GND and IN terminals on the display board.
2. Plug the mini plug into the Line Out/Headphone Jack on a PC or laptop. See Figure 3.15.

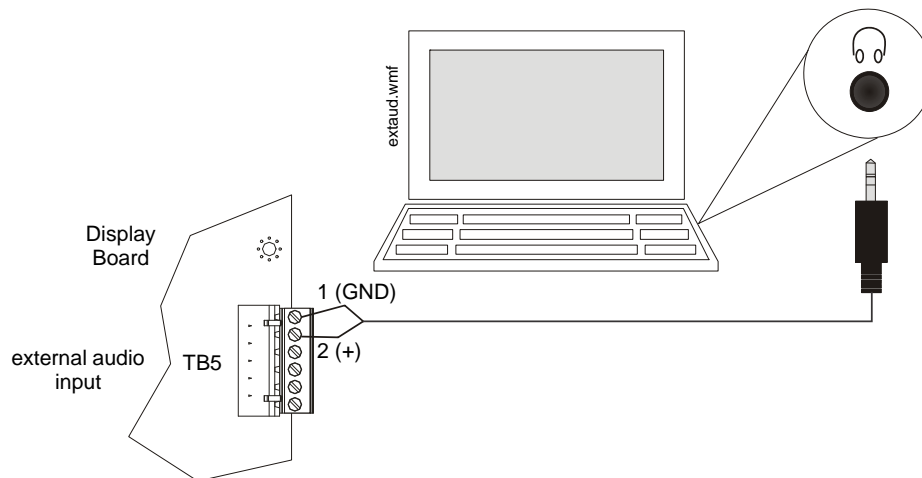


Figure 3.15 External Audio Connection for Recording

3. Enter programming mode at the main control board.
4. Enable *Recording Mode* in the system's message recording programming section. Refer to Section 3.5.1 on page 61.



**NOTE:** The display board will light green LEDs for message slots that are occupied. If a message is already stored in that message slot, it must first be erased prior to recording a new message. See Section 3.5.4.

5. Press zone button 17 to record. Then press zone button 1-14 that will be the designated message slot. The yellow zone LED will blink.
6. Simultaneously, press zone button 19 and start the external audio channel. The yellow zone LED will be on steady.
7. When the audio file from the PC is finished playing, press zone button 19 again. The green zone LED will light and the yellow zone LED will turn off.
8. Press the zone button that was previously selected in step 5 to play back your recorded message.
9. Enter programming mode again and deselect *Message Record Mode*.

### Recording with External Audio - Example

To record into message slot 2 via the external audio input:

Enter the Local Recording mode via the the online programming utility. Select the *Message Record Mode* option. The display board will light green zone 1-14 LEDs for all message slots that are occupied.

If a message already exists in message slot 2, it must first be erased. Press zone button 24, then zone button 2. (See Section 3.5.4.) When the message has been erased, the green zone LED will turn off.

To record the message, press zone button 17, then zone button 2. The yellow zone LED will blink.

Press zone button 19 and PLAY on the PC simultaneously to start recording. When the PC message is done, press zone button 19 again to stop recording. The yellow zone LED 2 will stay lit until completed. The green LED for zone button 2 will light after the recording is complete.

Enter programming mode again and deselect *Message Record Mode*.

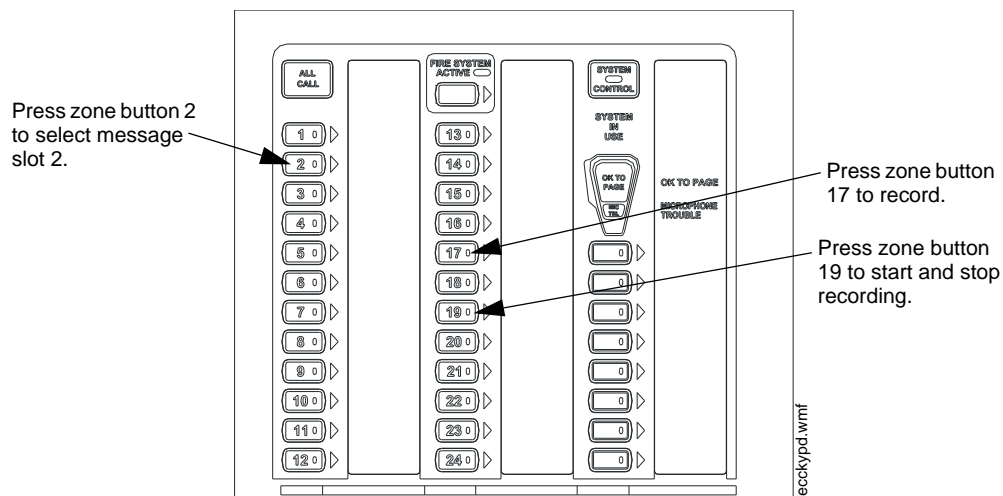


Figure 3.1 External Audio Example

### 3.5.3 Microphone

Messages can be recorded into the system using the onboard microphone.

1. Enter programming mode at the main control board.
2. Enable *Recording Mode* in the system's message recording programming section. Refer to Section 3.5.1 on page 61.



**NOTE:** The display board will light green zone LEDs for message slots that are occupied. If a message is already stored in that message slot, it must first be erased. See Section 3.5.4.

3. Press zone button 17 to record. Then press zone button 1-14 that will be the designated message slot. The yellow zone LED will light.
4. Press the push-to-talk (PTT) button on the microphone and speak the message.
5. Release the PTT button on the microphone to save the message. The green LED for this message slot will light.
6. Press the zone button selected in step 3 to play back the recorded message.
7. If the recorded message is not satisfactory, it can be erased (see Section 3.5.4) and re-recorded by following these steps.
8. Enter programming mode again and deselect *Message Record Mode*.

## Recording with Microphone - Example

To record into message slot 5 via the microphone:

Enter the Local Recording mode via the online programming utility. Select the *Message Record Mode* option. The display board will light green zone 1-14 LEDs for all message slots that are occupied.

If a message already exists in message slot 5, it must first be erased. Press zone button 24, then zone button 5. (See Section 3.5.4) When the message has been erased, the green zone LED will turn off.

To record the message, press zone button 17, then zone button 5. The yellow zone LED will blink.

Press the PTT button on the microphone and speak the message. Release the PTT button to save the message. The yellow zone 5 LED will stay lit while recording. The green LED for zone button 5 will light after the recording is complete.

Enter programming mode again and deselect *Message Record Mode*.

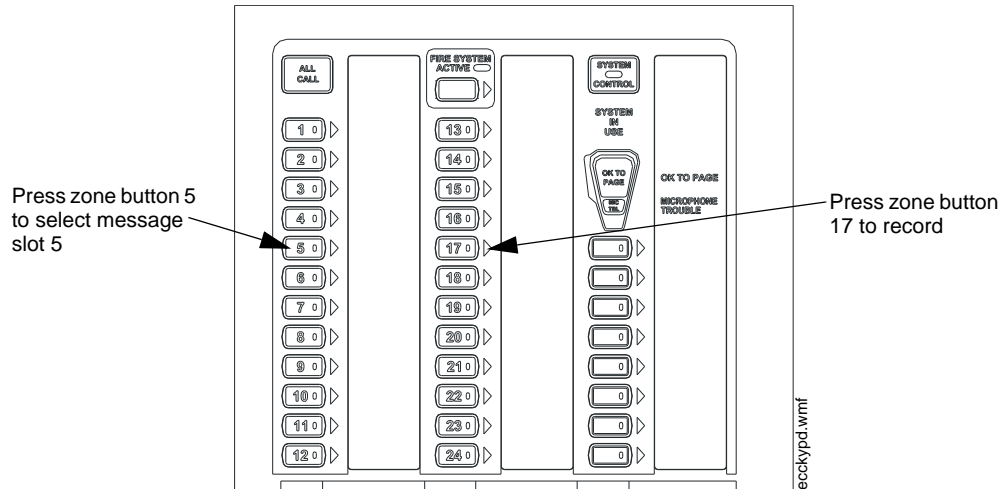


Figure 3.1 Microphone Recording Example

### 3.5.4 Erasing a User Message

Messages stored in message slots 1-14 can be erased.

1. Enter programming mode at the main control board.
2. Enable *Recording Mode* in the system's message recording programming section. Refer to Section 3.5.1 on page 61. The display board will then light the green zone 1-14 LEDs for all message slots that contain messages.
3. Press zone button 24 on the display board, then zone button 1-14 for the slot to be erased. The associated green zone LED will stay lit until complete.
4. Enter programming mode and deselect *Message Record Mode*.

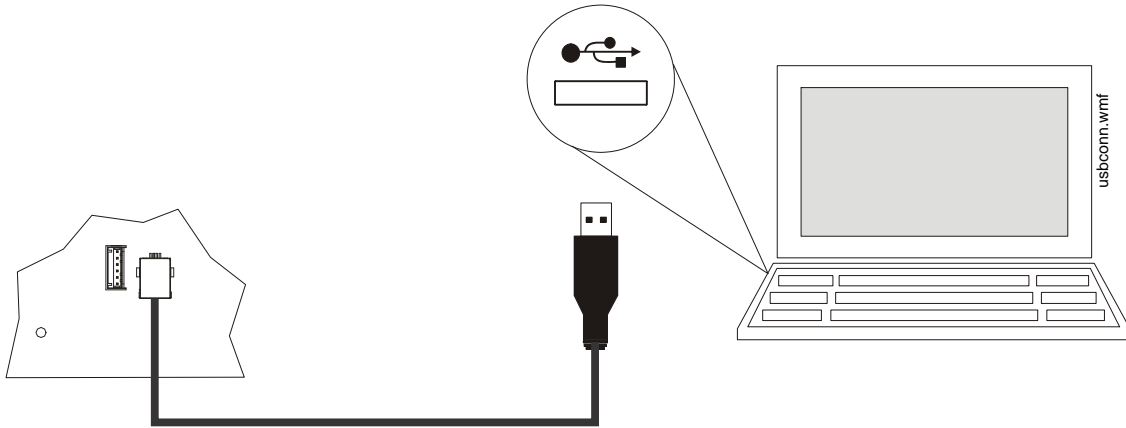
### 3.5.5 Voice Loader Software

The Voice Loader (VL) software is used to download recorded messages (in .ske format stored on a computer's hard drive) to the various message slots of the NFC-50/100. Messages can be uploaded, stored, and used again in similar installations.

Make sure the system is in Normal Standby mode.

To write a message to the panel follow steps 1 through 5. To read a message from the panel follow steps 1 through 4. To move a message from one message slot location to another, follow the combination of steps.

1. Connect the PC to the panel using a standard Male A to Male B USB cable.



2. Run the VL software.
3. Assure that the USB icon in the VL application window is *green*. If the icon is *black* then the VL software has not established communication with the panel. Recheck the USB cable connection. If the USB icon turns *red* while using the VL, then the VL has determined that the USB connection has become "disconnected".

### Writing a Message to the Panel

1. From the "Source/Destination Message" drop-down box select any one of the message slot locations "Message 01" through "Message 14".
2. From the "File Select" browse button search for and select the desired message (in .ske format) stored on the PC to be written to the panel.
3. Select "Write File To Panel" in the application window.
4. Answer "Yes" in the "Confirm Write" box that appears.
5. Repeat steps 1 through 4 for any addition messages to be written, or close VL software if finished.

### Reading a Message from the Panel

1. From the "Source/Destination Message" drop-down box select any one of the message slot locations "Message 01" through "Message 14".
2. In the "File Select" box specify the directory and filename (type in or use browse button) in which to store the desired message from the panel to the PC. Filenames should have a .ske extension. Provide a unique filename as needed to avoid overwriting existing message files.
3. Select "Read File From Panel" in the application window. *The VL will alert the user if there is no message stored (blank) in the selected message slot location.*
4. Repeat steps 1 through 3 for any addition messages to be read, or close VL software if finished.

### Moving a Message to a Different Slot

To move a message from one message slot location to another - first read the desired message from its current message location into the PC, and then write this message file from the PC to the new message slot location. Follow steps 1 through 3 in , "Reading a Message from the Panel" above to read the message and steps 1 through 4 in , "Writing a Message to the Panel" to write the message.

## 3.6 Programmed Activation by FACP

The table below defines the capabilities for the Notifier FACP's that can automatically trigger the audio system using the audio system's "FACP Data Bus". The FACP annunciator bus serves as "FACP Data Bus" to the audio system. Note that automatic triggering capability is dependent upon the FACP model, FACP version, and which annunciator bus protocol is used.

When using the FACP ACS-bus protocol, address 01 must be enabled in the FACP programming. (Refer to the FACP user manual.)

When using the ANN-Bus protocol, the FACP will automatically detect the audio system connection during annunciator auto-configuration. No ANN-Bus address selection is necessary at the FACP.

Once the FACP can communicate with the audio system, FACP zones Z33 through Z56 become dedicated as output zones for speaker circuits 1 through 24 respectively. FACP zone Z32 is dedicated to turn on all speaker circuits. FACP programming allows association between any addressable SLC input device (module, detectors) with any of the speaker circuits. In addition, 1 of 14 messages can be generated over the selected speaker circuit.



Any fault in the audio system is sent to the FACP via the FACP Data Bus and is indicated as an annunciator fault on the FACP display.

| FACP  | Individual Audio Zone Control via FACP Data Bus |     | Individual Control of All Messages |     |     | Simultaneous Activation of All Audio Zones |
|---|---|-----|------------------------------------|-----|-----|--|
|   | ACS   | ANN | ACS                                | ANN | CMD |  |
| FireWarden-100X   | N/A   | Yes | N/A                                | Yes | Yes | Yes  |
| FireWarden-100-2 software version 6 or higher (hardware revision 3) | Yes   | Yes | Yes                                | Yes | Yes | Yes  |
| FireWarden-100-2 software version 4 (hardware revision 2)           | Yes   | No  | Yes (Limited) <sup>1</sup>         | No  | Yes | Yes  |
| FireWarden-100-2 software version 2 or 3 (hardware revision 1)      | Yes   | No  | Yes (Limited) <sup>1</sup>         | No  | Yes | Yes  |
| NFS-320 or NFS2-640 version 2 or higher                             | Yes   | N/A | Yes                                | N/A | Yes | Yes  |

**Table 3.2 FACP Message/Zone Control Capability**

<sup>1</sup> Limited to five (5) messages- fire only.

Column Descriptions for Table 3.2:

- *FACP* - the Fire Alarm Control Panel being used
- *Individual Audio Zone Control via FACP Data Bus* - ACS or ANN-BUS compatible FACP's can control each audio zone on the NFC-50/100 (refer to Section 3.6.1 and Section 3.6.2.)
- *Individual Control of All Messages* - control of all voice messages in the NFC-50/100 can be accomplished through the FACP Data Bus or by triggering the CMD inputs (refer to Section 3.6.1 and Section 3.6.2.)
- *Simultaneous Activation of All Audio Zones* - this is a single trip mechanism via a zone on the FACP Data Bus or CMD input trigger that activates all the audio zones at the same time (refer to Section 3.6.1 and Section 3.6.2.)

### 3.6.1 FireWarden-100X and FireWarden-100-2

**Important Notes:**

1. For proper operation, a message must be assigned to each FACP zone that is programmed to activate an audio speaker circuit.
2. The message repeat setting on the NFC-50/100 should be set to infinite. This will ensure that lower priority activated zones will continue to broadcast the voice message.
3. CMD inputs are not used for activation when the FACP Data Bus is being used, however, 4.7KΩ ELRs must still be connected across CMD3 - CMD8.
4. When using the ACS communication protocol, a monitor module must be wired to TB1 of the NFC-50/100. Type Code, "MNS EVENT" must be assigned to the monitor module for mass notification event monitoring. See Figure 2.22 for wiring information.

### FACP Programming

The FireWarden-100X and FireWarden-100-2 FACP's must be programmed to operate with the NFC-50/100. The following table summarizes the steps involved in programming the FACP's.

|  |  |
|--|--|
| 1. Enable the ACS or ANN-BUS annunciator at FACP                     | refer to FACP manual Option Module Programming   |
| 2. Assign zone(s) to each SLC input device at FACP                   | refer to FACP manual Point Programming           |
| 3. Program message to be generated over each speaker circuit at FACP | refer to Message Assignment in following section |
| 4. Activate individual SLC devices to ensure proper programming      | compare to desired programming                   |

**Table 3.3 FACP Programming Steps**

**Note 1:** Zone 32 is assigned to all speaker circuits. If an addressable device programmed to Zone 32 is activated, the message programmed to Zone 32 will be generated to **all** speaker circuits. The exception is when one or more devices programmed to Zones 33 through 40 is also activated. If the newly activated zone is programmed to a message with a higher priority than Zone 32, the higher priority message will be generated to all circuits.

**Note 2:** Messages have a priority scheme with Message 1 having the highest priority and Message 14 having the lowest priority. For example, If an addressable device activates a speaker circuit programmed to generate Message 14, that message will be generated over the selected speaker zone. If later, another device activates a speaker circuit programmed to generate Message 3, Message 3 has a higher priority than Message 5 and will therefore be generated over both activated speaker zones. The highest priority message will always be generated over all activated speaker circuits.

**Note 3:** It is important to note that Message 1 is assigned to Zone 00 (General Alarm) as a default. A message, however, will not be generated over the speaker circuits unless one of the following programming steps is completed:

- For General Alarm applications, all input points must have an audio zone assigned to it:
  - ✓ Z32 to activate all audio zones

**OR**

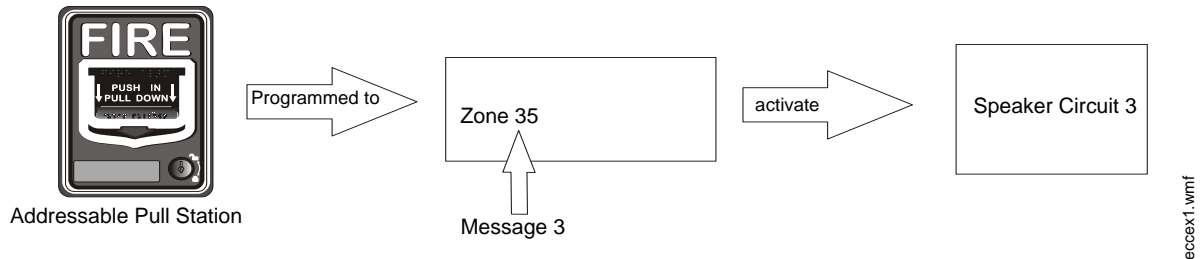
  - ✓ Z33 to Z56 for specific audio zone control

- For non-General Alarm applications where input devices and/or messages are mapped to specific zones, Message 1 must be removed from Zone 00 programming.

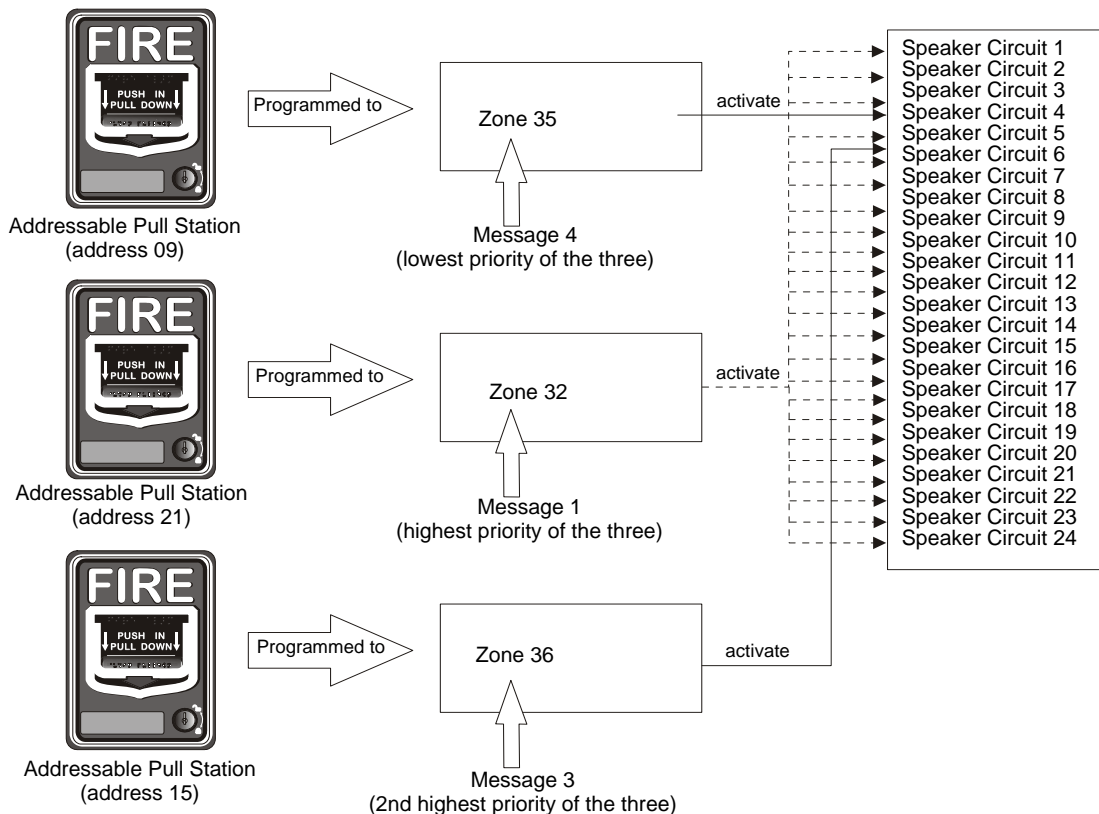
### FACP Message Assignment - Speaker Specific

The NFC-50/100 has the capability of generating up to fourteen different messages. Any one of the fourteen messages can be programmed to each of the speaker circuit zones Z32 through Z56.

**Example 1:** If an addressable device programmed to Zone 35 is activated and no other devices are active, the message programmed for Zone 35 will be generated over speaker circuit 3.



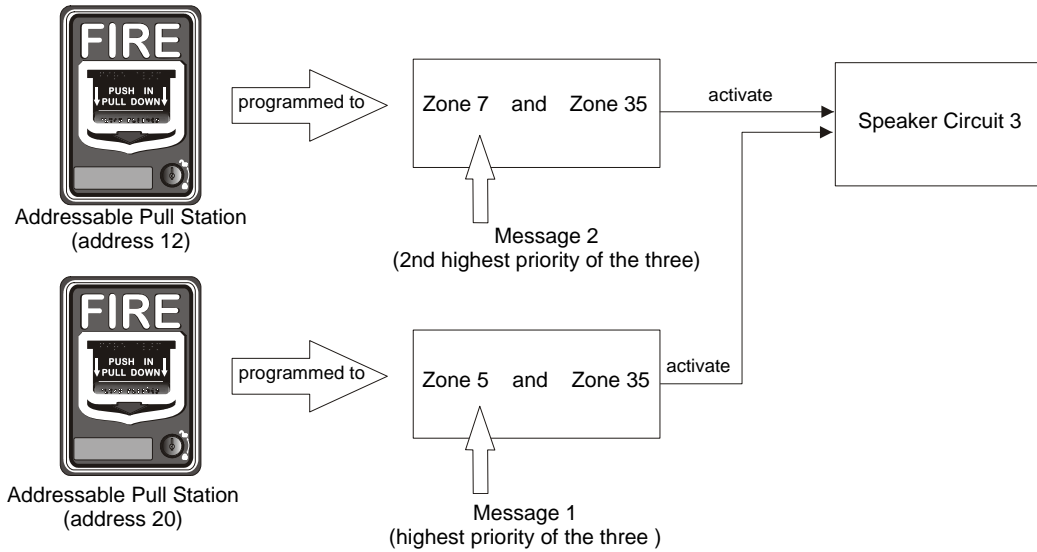
**Example 2:** If an addressable device (address 09 in example below) programmed to Zone 35 is activated and a second addressable device (address 15 in example below) programmed to Zone 36 is activated, the highest priority message programmed to either Zone 35 or Zone 36 (Message 3 in example below) will be generated over speaker circuits 3 and 4. If an addressable device (address 21 in example below) programmed to Zone 32 is then activated, the highest priority message programmed to Zone 32, 35, or 36 (Message 1 in example below) will be generated over all speaker circuits.



### FACP Message Assignment - Zone Specific

The FACP can be programmed to allow a specific addressable input device to generate one of fourteen messages over any speaker circuit. Any one of the fourteen messages can be programmed to each of the available zones (Zone 1 through Zone 99). In the following example, assume that Zone 5 is programmed to Message 1, Zone 7 is programmed to Message 2, and Zone 35 is not programmed to a message.

**Example 3:** If two devices are being programmed and the *first* addressable input device is programmed to Zone 7 and Zone 35, and a *second* addressable input device is programmed to Zone 5 and Zone 35, activation of the first addressable input device (address 12 in the example below) will cause Message 2 to be generated over speaker circuit 3. If the second addressable device (address 20 in the example below) is also activated, Message 1 will now be transmitted over speaker circuit 3 since Message 1 has a higher priority than Message 2.



eccex3.wmf

### FACP Programming Menus

To Program one of fourteen messages to a speaker zone, press the *ENTER* key at the FACP. The following screen will be displayed:



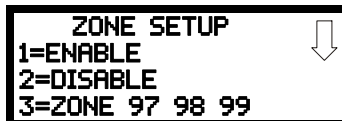
Access Programming Mode by pressing the 2 key. The following screen will be displayed:



Entering the Master level password (default 00000) will cause the following screen to appear:



Select the *Zone Setup* option by pressing 3. The following screens will be displayed.



Zone Setup Screen #1



Zone Setup Screen #2



Zone Setup Screen #3

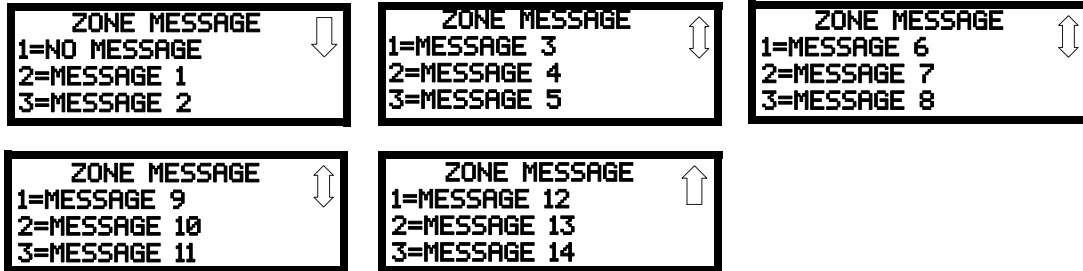
Pressing 3 while viewing Zone Setup Screen #3 will cause the following screen to be displayed:



Press the down arrow key until the following screen is displayed.



The default setting is *No Message* for each speaker circuit. As shown in the screen above, Z32 is the zone dedicated for all speaker circuits (all call). To change from No Message, press 3 to display the following screens:



Select the message (Message 1 through Message 14) by pressing the number corresponding to the desired message. After the selection is made, the display will return to the screen displaying Z32 which will have changed from No Message to the selected message.

Repeat the procedure outlined above for each speaker zone (Z32 through Z56) and then exit Programming by pressing the Escape (ESC) key to save the programming changes. Test the system to ensure proper operation.

### 3.6.2 NFS2-640 and NFS-320

**Important Notes:**

1. For proper operation, a message must be assigned to each FACP zone that is programmed to activate an audio speaker circuit.
2. The message repeat setting on the NFC-50/100 should be set to infinite. This will ensure that lower priority activated zones will continue to broadcast the voice message.
3. The NFS2-640 or NFS-320 communicates with the NFC-50/100 over the ACS annunciator terminals. Annunciator Group M must be selected for annunciator address number 1 in FACP programming using VeriFire® Tools.

### FACP Programming

The NFS2-640 or NFS-320 must be programmed to operate with the NFC-50/100. The following table summarizes the steps involved in programming the FACP.

|   |   |
|---|---|
| 1. Enable the ACS annunciator at FACP or in VeriFire® Tools | refer to FACP Programming Manual, Annunciator Options section |
| 2. Assign ACS points using VeriFire® Tools                  | refer to FACP Programming Manual, Annunciator Options section |
| 3. Activate individual devices to ensure proper programming | compare to desired programming                                |

**Table 3.4 FACP Programming Steps**

**ACS Annunciator**

The NFC-50/100 communicates with the FACP via the ACS link. Enable the ACS Annunciator as described in the NFS2-640 or NFS-320 manual. The ACS programming options can be accessed by entering Programming Mode and selecting option 7=*SYS* from the list of programming options. This can also be accomplished using VeriFire Tools.

A monitor module must be wired to TB1 of the NFC-50/100 for ACS protocol. Type Code, “ECS/MN SUPT” must be assigned to the monitor module for mass notification event monitoring. See Figure 2.22 for wiring information.

**VeriFire Tools Programming**

Map ACS Address 1 to M. Assign desired panel points (SLC devices, zones, logic zone, releasing zones, etc) to ACS Points in User Map 1.

| FireVoice Speaker<br>Circuit/Message Assignment | Panel ACS Point          |
|---|--------------------------|
|   | 1 - 9 (Do Not Use)       |
| NFC Message 0                                   | No Message (Message Off) |
| NFC Message 1                                   | 11                       |
| NFC Message 2                                   | 12                       |
| NFC Message 3                                   | 13                       |
| NFC Message 4                                   | 14                       |
| NFC Message 5                                   | 15                       |
| NFC Message 6                                   | 16                       |
| NFC Message 7                                   | 17                       |
| NFC Message 8                                   | 18                       |
| NFC Message 9                                   | 19                       |
| NFC Message 10                                  | 20                       |
| NFC Message 11                                  | 21                       |
| NFC Message 12                                  | 22                       |
| NFC Message 13                                  | 23                       |
| NFC Message 14                                  | 24                       |
|   | 25 - 39 (Do Not Use)     |
| All Speaker Circuits - All-Call (1-24)          | 40                       |
| Speaker Circuit 1<br>(on NFC)                   | 41                       |
| •<br>•<br>•                                     | •<br>•<br>•              |
| Speaker Circuit 24<br>(on NFC)                  | 64                       |

**Table 3.5 Speaker Circuit and Message Assignments**

ACS Point 40 is assigned to all speaker circuits. If an addressable device programmed to ACS Point 40 is activated, the message will be generated to **all** speaker circuits. If the newly activated point is programmed to activate a message with a higher priority, the higher priority message will be generated to all circuits.

**Panel Programming**

If VeriFire Tools is not used and Group M is programmed at the panel, Zone 00 (general alarm) will be mapped to A1p11 and A1p40. A general alarm will play message 1 and activate an all-call on the FirstCommand. VeriFire Tools must be used for speaker and circuit and message control.

**IMPORTANT!** Messages have a priority scheme with Message 1 having the highest priority and Message 14 having the lowest priority. The highest priority message will always be generated over all activated speaker circuits.

## Section 4: Operating Instructions

### 4.1 Main Control Panel Keypad Labels

The NFC-50/100 is shipped with slide-in labels installed in the keypad as illustrated in the following figure. Blank labels are provided to allow the user to customize the zone and message description. Remove the center piece to access the label slots. Using a small, flat screwdriver, press and release the small plastic latch located on the left side of the center piece. The top row of labels can be easily removed by sliding them down through the slots in the middle of the keypad and installed by sliding them up. The bottom row of labels can be removed by sliding them up through the slots in the middle of they keypad and installed by sliding them down into position.

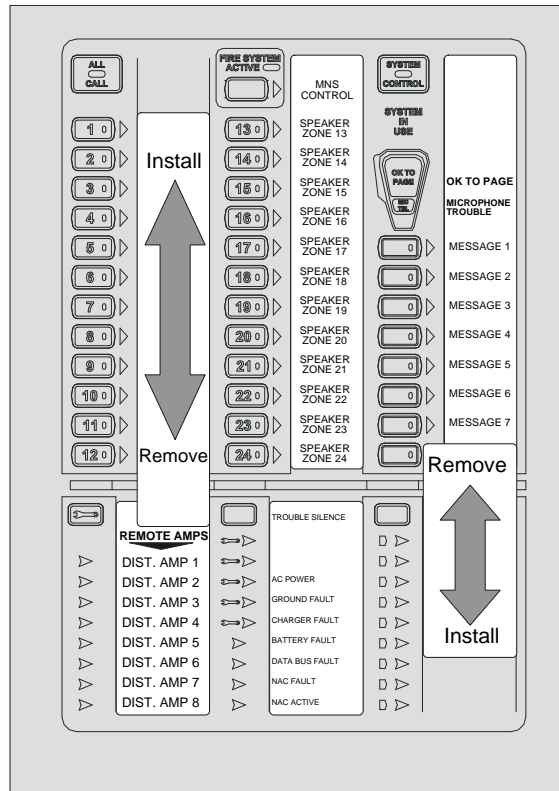


Figure 4.1 Keypad Labels

### 4.2 NFC-50/100 Switch Functions

The NFC-50/100 display consists of 38 tactile push-button keys. Pressing one or more of the keys while the panel is not in alarm will select the corresponding circuit for paging or to generate a manually activated evacuation or drill signal. If the panel is in alarm, pressing a key corresponding to an activated speaker circuit will turn off the circuit and turn on the Trouble LED.

#### All Call

Pressing this button activates all speaker circuits (that were not manually deactivated) for broadcast. ALL CALL paging from the main console's microphone will override paging/manual activation operations initiated from the other consoles (NFC-LOC, NFC-RPU, NFC-RM) or from a FACP (if programmed for priority to do so). If all consoles in the system are programmed for equal priority then the ALL CALL will only occur when the system is not already in use ("System in Use" LED is not on, remote console active LED is not on). Refer to the SYSTEM CONTROL button description. When the operator completes the page, any previously interrupted emergency broadcast will resume. Previously initiated emergency broadcast will also resume after the push-to-talk (PTT) switch is held for more than 3 minutes (timer is programmable).

#### MNS Control

This button is only used when the system is configured for combination fire/mass notification operation or mass notification only operation.

For mass notification only operation, pressing this button will activate the "MNS active" relay and the onboard NAC. A second press will de-activate the "MNS active" relay, turn main control board NAC off, and cancel all broadcasting.

For combination systems (fire and mass notification) where mass notification has a higher priority through user programming, pressing this button will result in the shutdown of audible FACP NACs and audio system speakers if they were active for fire. Pressing the button again causes the FACP to re-activate audible FACP NACs and audio system speakers if they were previously active for fire.

### System Control

This button is used to manually gain control of the audio system in preparation for an ALL CALL, message activation, or general page. The main console will have system priority based upon user programming. If the main console has higher priority than other system consoles (NFC-LOC, NFC-RPU, NFC-RM) then the green LED will turn on steady to confirm control. If no other console is in control then pressing this button is not necessary to gain system control. A second press is required after paging to relinquish control of the system.

### Speaker Select 1-24

These buttons are used to manually activate or deactivate speaker zones (circuits).

### Message Select 1-14

These buttons are used to manually activate or deactivate stored messages. If the system has been programmed for greater than 8 messages then button 8 (the bottom button) becomes a “shift” button. To activate messages 8 through 14, the user must press the “shift” button followed by a message button physically above it. Messages are in priority order where message 1 (the top button) has highest priority. Pressing a higher priority message button after pressing a lower priority message button will result in a message override.

For combination fire and MNS applications, messages must be organized per the system priority setting. For example, if MNS has priority over fire, all MNS messages must be assigned/recorded to higher priority message buttons than the fire messages. If fire has priority, then all fire messages must be assigned/recorded to higher priority message buttons than the MNS messages.

### Diagnostic Select

This button is used to examine specific trouble conditions for the remote amplifiers (distributed audio amplifiers). The button is used to select or “scroll” to a specific remote amplifier. The fault LEDs in the lower center of the display with “wrench” graphics will represent the amplifier selected. When no amplifier is selected, those fault LEDs represent the main console status.

### Trouble Silence

This button is used to manually silence the local trouble sounder.

### Console Lamp Test

This button is used to test the console LEDs and local sounder. When pressed, all LEDs temporarily light and the local sounder is turned on temporarily.

## 4.3 LED Indicators

Refer to Figure 1.3, “NFC-50/100 Keypad” on page 17.

### Fire System Active

A green LED that turns on steady when the FACP is in alarm. This LED is used when the FACP to NFC data bus has signaled a fire alarm or when any of the command inputs (CMD1-CMD8) has activated for a fire alarm.

### MNS Control

A green LED that turns on steady when an operator has initiated a mass notification event by pressing the MNS Control button or by pressing an MNS message button

### System Control

A green LED that turns on steady when the main console has control of the audio system

### System in Use

Green LED text that turns on steady when the main console, an LOC, an RPU, or an RM has control of the audio system

### Speaker Zones 1-24

A green LED per speaker circuit button that turns on steady when a speaker circuit has been selected and is active

A yellow LED per speaker circuit button that turns on steady when a speaker circuit fault exists or when the speaker circuit has been turned off after having been automatically turned on by the FACP

### OK to Page

Green LED text that turns on steady to instruct the operator that he/she may start paging

### Microphone Trouble

A yellow LED that turns on steady to indicate a microphone wiring fault

### Messages

A red LED per message button that turns on steady when the message has been selected and blinks when the message has been overridden

A yellow LED per message button that turns on steady when no message has been recorded or there is an associated command input fault. All eight (8) message button LEDs will turn on steady to indicate a message generator fault.

When more than eight (8) messages are enabled, the 8th message button becomes a “shift” key. The red LED turns on when viewing messages 8-14 and off when viewing 1-7. The yellow LED will turn on indicating an overridden message or message trouble in the group of messages *not* currently being viewed.

**Remote Amplifiers 1-8 Fault**

A yellow LED per remote amplifier (distributed audio) that turns on steady when an amplifier has a fault. Specific, additional fault indication is annunciated via the fault LEDs with the “wrench” graphic next to them on the keypad.

**LOC/RPU/RM 1-8 Fault**

A yellow LED per remote console that turns on steady when a remote console has a fault. Specific, additional fault indication is annunciated by LEDs at the remote consoles.

A green LED per remote console that turns on steady when a remote console is active

**Main Console Fault**

A yellow LED that turns on steady when the main (or primary operator) console has a fault

**AC Power**

A green LED that turns on steady when AC power is present

**Ground Fault**

A yellow LED that turns on steady when a ground fault exists in the system

**Charger Fault**

A yellow LED turns on steady when the battery charger voltage is too high or low

**Battery Fault**

A yellow LED that turns on steady when battery voltage is too low

**Data Bus Fault**

A yellow LED turns on steady when the main and remote console(s) cannot communicate

**NAC Fault**

A yellow LED that turns on steady when the onboard NAC wiring is open or short-circuited.

**NAC Active**

A green LED that turns on steady when the NAC output is on

**System Trouble**

A yellow LED that turns on steady when any fault exists in the system

**Audio Riser Fault**

A yellow LED that turns on steady when the audio riser wiring is open or short-circuited

## 4.4 Operation

The NFC-50/100 continuously monitors system status. When no system alarm or local trouble conditions exist, all LEDs are off except the AC Power On LED located on the front panel keypad. The Notification Appliance Circuits are off and all relays are in their normal state.

### 4.4.1 Paging from the Microphone

1. The NFC-50/100 main console must be in control of the system to perform a page. If the green System in Use LED is lit, press the SYSTEM CONTROL button. The NFC-50/100 is ready to page once the System in Use LED turns off and the System Control LED lights steady. If the System Control LED is already lit, this action is not required.
2. Activate desired paging areas. Press either the ALL CALL button, to page to *all* speaker zones, or individual speaker zone buttons (1-24). This will override the evacuation tone/message if the panel is in alarm and activate desired speaker circuits.
3. Key the microphone by pressing the push-to-talk switch on side of microphone. Speak clearly into the microphone.
4. When finished speaking, release the push-to-talk switch.
5. Press the ALL CALL button (or individual speaker zone buttons pressed in step 2) to end the broadcast and continue the evacuation tone/message.
6. Press the SYSTEM CONTROL button to relinquish control of the audio system.

### 4.4.2 Manual Message Control

1. The NFC-50/100 main console must be in control of the system to perform a page. If the green System in Use LED is lit, press the SYSTEM CONTROL button. The NFC-50/100 is ready to page once the System in Use LED turns off and the System Control LED lights steady. If the System Control LED is already lit, this action is not required.
2. Activate desired message areas. Press either the ALL CALL button, to broadcast to *all* speaker zones, or individual speaker zone buttons. This will override the evacuation tone/message if the panel is in alarm and activate desired speaker circuits.
3. Press the desired message button.
4. When the message has finished playing, press the ALL CALL button (or individual speaker zone buttons pressed in step 2) to deactivate the message areas and continue the evacuation tone/message.
5. Press the SYSTEM CONTROL button to relinquish control of the audio system.



### 4.4.3 Fire Alarm Response, System Configured for Fire Only

Upon detection of an alarm condition (any of CMD1 to CMD8 inputs active or automatic activation from the FACP Data Bus) the system will:

- Turn the appropriate speaker zone LED(s) on steady
- Turn the appropriate speaker circuits on
- Turn the appropriate audio amplifier(s) on
- Turn the 24 VDC aux. power output on (if programmed)
- Turn the speaker volume control override on
- Turn the “System in Use” LED on steady
- Turn the “Fire System Active” LED on steady
- Play a leading tone (if programmed)
- Play and repeat the appropriate audio message (if programmed to repeat)
- Play an inter-message tone (if programmed)
- Play a primary evacuation tone only (if programmed)
- Store the event in the history log

### 4.4.4 Fire Alarm Restoral, System Configured for Fire Only

Upon restoral the system will:

- Turn the speaker zone LED(s) off
- Turn the speaker circuits off
- Turn the audio amplifier(s) off
- Turn the 24 VDC aux. power output off (if programmed)
- Turn the speaker volume control override off
- Turn the “System in Use” LED off
- Turn the “Fire System Active” LED off

### 4.4.5 Manual Activation

Upon pressing speaker zone button(s) followed by pressing a message button the system will:

- Turn the appropriate speaker zone LED(s) on steady
- Turn the appropriate speaker circuit(s) on
- Turn the appropriate message LED on steady
- Turn the appropriate audio amplifier(s) on
- Turn the 24 VDC aux. power output on (if programmed)
- Turn the speaker volume control override on
- Turn the “System in Use” LED on steady
- Activate the “MNS active” relay (if the system is programmed for mass notification)
- Activate the NAC output (if programmed to do so for mass notification)
- Play a leading tone (if programmed)
- Play and repeat the appropriate audio message (if programmed to repeat)
- Play an inter-message tone (if programmed)
- Play a primary evacuation tone only (if programmed)
- Store the event in the history log

### 4.4.6 Manual Activation Restoral

Upon restoral the system will:

- Turn the speaker zone LED(s) off
- Turn the speaker circuit(s) off
- Turn the audio amplifier(s) off
- Turn the 24 VDC aux. power output off (if programmed)
- Turn the speaker volume control override off
- De-activate the “MNS active” output relay
- De-activate the NAC output (if programmed to do so for mass notification)
- Turn the “System in Use” LED off

### 4.4.7 Alarm/Alert Response, System Configured for Mass Notification Only

Upon detection of an alarm/alert condition (any of CMD1 to CMD8 inputs active) the system will:

- Turn all speaker zone LEDs on steady
- Turn all speaker circuits on
- Turn the appropriate audio amplifier(s) on
- Turn the 24 VDC aux. power output on (if programmed)
- Turn the speaker volume control override on

- Turn the “System in Use” LED on steady
- Activate the “MNS active” relay (if the system is programmed for mass notification)
- Activate the NAC output (if programmed to do so for mass notification)
- Play and repeat a leading tone (if programmed)
- Play and repeat the appropriate audio message (if programmed to repeat)
- Play an inter-message tone (if programmed)
- Play a primary alert tone only (if programmed)
- Store the event in the history log

#### 4.4.8 Alarm/Alert Restoral, System Configured for Mass Notification Only

Upon restoral the system will:

- Turn the speaker zone LEDs off
- Turn the speaker circuits off
- Turn the audio amplifier(s) off
- Turn the 24 VDC aux. power output off (if programmed)
- Turn the speaker volume control override off
- De-activate the “MNS active” output relay
- De-activate the NAC output (if programmed to do so for mass notification)
- Turn the “System in Use” LED off

#### 4.4.9 Alarm/Alert Response, System Configured for Combo Fire/Mass Notification with Fire Priority

If a fire alarm **only** occurs under this configuration, then the system will respond as in Section 4.4.3 above.

If a mass notification alarm/alert **only** occurs under this configuration, then the system will respond as in Section 4.4.7 above and additionally will:

- Signal the FACP of the alarm/alert using the FACP Data Bus such that the FACP can annunciate the alarm/alert and notify a central station (if programmed to do so).

If a fire alarm is active in the system and a subsequent mass notification alarm/alert occurs, then the system will not respond until the fire alarm has been restored.

#### 4.4.10 Alarm/Alert Restoral, System Configured for Combo Fire/Mass Notification with Fire Priority

If the restoral is for a fire alarm **only** under this configuration then the system will respond as in Section 4.4.4 above.

If the restoral is for a mass notification alarm/alert **only** under this configuration then the system will respond as in Section 4.4.8 above and additionally will:

- Signal the FACP of the restoral using the FACP Data Bus such that the FACP can stop annunciation of the alarm/alert and notify a central station (if programmed).

If the restoral is for a fire alarm that overrode an earlier active mass notification alarm/event then the system will:

- Stop playing the fire alarm message
- Turn the “Fire System Active” LED off
- Return the system to the active state of the earlier mass notification alarm/event

#### 4.4.11 Alarm/Alert Response, System Configured for Combo Fire/Mass Notification with Mass Notification Priority

If a fire alarm **only** occurs under this configuration then the system will respond as in Section 4.4.3 above.

If a mass notification alarm/alert **only** occurs under this configuration then the system will respond as in Section 4.4.7 above. and additionally will:

- Signal the FACP of the alarm/alert using the FACP Data Bus such that the FACP can annunciate the alarm/alert and notify a central station (if programmed to do so).

If a fire alarm is active in the system and a subsequent mass notification alarm/alert occurs, then the system will:

- Stop playing the current fire message
- Signal the FACP of the alarm/alert using the FACP Data Bus such that the FACP can annunciate the alarm/alert, notify a central station (if programmed), and turn off audible NACs (if programmed).
- Respond as in Section 4.4.7 above

If a mass notification alarm/alert is active in the system and a subsequent fire alarm occurs, then the system will not respond until the mass notification alarm/alert is restored.

#### 4.4.12 Alarm/Alert Restoral, System Configured for Combo Fire/Mass Notification with Mass Notification Priority

If the restoral is for a fire alarm **only** under this configuration then the system will respond as in Section 4.4.4 above.

If the restoral is for a mass notification alarm/alert **only** under this configuration then the system will respond as in Section 4.4.8 above.

If the restoral is for a fire alarm that was over ridden by a currently active mass notification alarm/event then the system will:

- Continue playing the current mass notification message
- Turn the “Fire System Active” LED off

#### 4.4.13 Trouble Condition Response

Upon detection of any trouble condition the system will:

- Activate (de-energize) the trouble relay
- Turn the local sounder on
- Turn the system trouble LED on
- Open command input 1 (CMD1) only if command input 1 is not in the alarm state
- Store the event in the history log

The following will occur on the display for more specific indication.

- For speaker circuit faults, the appropriate speaker zone fault LED(s) turns on steady
- For message faults, the appropriate message fault LED(s) turns on steady
- For a microphone fault, the microphone fault LED turns on steady
- For AC loss the AC power LED turns off, the AC loss and system trouble relays activate (de-energize) (after a programmable time out).
- For a earth ground fault, the ground fault LED turns on steady
- For a battery charger fault, the battery charger fault LED turns on steady
- For a battery voltage fault, the battery fault LED turns on steady
- For a fault on the data bus to peripheral consoles, the data bus fault LED turns on steady
- For an onboard NAC fault, the NAC fault LED turns on steady
- For an audio riser fault, the audio riser fault LED turns on steady
- For a peripheral console fault, the associated peripheral console fault LED turns on steady
- For a distributed amplifier fault, the associated distributed fault LED turns on steady

For distributed amplifier faults, the following will occur on the display when the operator uses the DIAGNOSTIC button to select a distributed amplifier for more specific indication.

- For a power fault, the AC power LED turns off
- For a ground fault, the ground fault LED turns on steady
- For a battery charger fault, the battery charger fault LED turns on steady
- For a battery voltage fault, the battery fault LED turns on steady
- For a fault on the data bus to peripheral consoles, the data bus fault LED turns on steady

The following will occur on the main control board for more specific indication.

- For speaker volume control fault, the speaker volume control fault LED(s) turns on steady
- For an amplifier over current fault, the amplifier over current fault LED turns on steady and all associated speaker circuit fault LEDs turn on steady
- For an option card missing (NFC-XRM-70V, NFC-BDA-25/70V, NFC-CE6), the option card LED turns on steady

The following actions will occur on the NFC-BDA-25/70V optional amplifier for more specific indication.

- For an over current condition, the over current LED turns on steady

#### 4.4.14 Trouble Condition Restoral

Upon complete restoral the system will:

- De-Activate (energize) the trouble relay
- Turn the local sounder off
- Turn the system trouble LED off
- Close command input 1 (CMD1) only if command input 1 is not in the alarm state
- Store the event in the history log

The following will occur on the display for more specific indication when the specific fault restores.

- For speaker circuits, the appropriate speaker zone fault LED(s) turns off
- For messages, the appropriate message fault LED(s) turns off
- For the microphone, the microphone fault LED turns off
- For AC power, the AC power LED turns on, the AC loss and system trouble relays de-activate (energize)
- For earth ground, the ground fault LED turns off
- For the battery, the battery charger fault LED turns off
- For battery voltage, the battery fault LED turns off

- For the data bus to peripheral consoles, the data bus fault LED turns off
- For the onboard NAC, the NAC fault LED turns off
- For the audio riser, the audio riser fault LED turns off
- For a peripheral console, the associated peripheral console fault LED turns off
- For a distributed amplifier, the associated distributed fault LED turns off

For distributed amplifier restorals, the following will occur on the display when the operator uses the DIAGNOSTIC button to select a distributed amplifier for more specific indication.

- For power present, the AC power LED turns on
- For earth ground, the ground fault LED turns off
- For the battery charger, the battery charger fault LED turns off
- For battery voltage, the battery fault LED turns off
- For the data bus to peripheral consoles, the data bus fault LED turns off

The following will occur on the main control board for more specific indication when the specific fault restores.

- For the speaker volume control, the speaker volume control fault LED(s) turns off
- For the amplifier over current, the amplifier over current fault LED turns off and all associated speaker circuit fault LEDs turn off
- For the option cards (NFC-XRM-70V, NFC-BDA-25/70V, NFC-CE6) the option card missing LED turns off

The following actions will occur on the NFC-BDA-25/70V optional amplifier for more specific indication when the condition restores.

- For over current, the over current LED turns off

#### 4.4.15 External Audio Input Operation

The external audio input (aux. audio) located on the display board terminal TB5 can serve as any one of the following:

- A background music input
- A message recording input from an audio source
- A general paging input from a paging microphone or telephone system
- A night ring input from a telephone system

The function of the external audio input must be selected in programming. Refer to “External Audio Input” on page 61. For external audio input electrical requirements, “Input/Output Circuit Specifications” on page 13.

When programmed, background music will play on all NFC-50/100 speaker circuits only when the audio system is in a normal, standby condition. During alarm or alert operation of the audio system, background music is suspended. Background music is also suspended during an AC power loss condition to preserve the batteries. Speaker circuits on the main NFC-50/100 panel are fully supervised while background music is playing. Speaker circuits on the NFC-50DA or NFC-125DA distributed amplifiers are not supervised while playing background music.

For programming messages using the external audio input, refer to “Recording Custom Messages” on page 61.

When programmed, the external audio input may be used for general paging or night ring operation. The building's “Private Branch Exchange (PBX)” telephone system or a third party microphone system must provide the audio signal along with a contact closure to trigger the paging or night ring. Paging or night ring will occur only when the audio system is in a normal, standby condition. During alarm or alert operation of the audio system, paging or night ring is suspended. All speaker circuits are fully supervised during paging or night ring operation. Refer to “Input/Output Circuit Specifications” on page 13 for night ring electrical requirements. Refer to “Night Ring” on page 30 for wiring requirements.

## Section 5: Getting Started

This section describes the basic guidelines for setting up the various NFC-50/100 systems, assuming that the speaker and FACP cabling has been installed.

### 5.1 System Requiring up to 50 Watts of Audio Power

1. Install backbox and chassis assembly as described in Section 2, "Installation", on page 22.
2. Connect laptop or PC to Ethernet port (J2) and launch the web-based programming utility.
3. Configure the NFC-50/100 for Single Zone operation, if individual speaker circuit control is not required. The factory default setting is Single Zone output control. Refer to Section 3, "Programming", on page 51.
4. Record any new voice messages as described in Section 4, "Operating Instructions", on page 70.

### 5.2 System Requiring Up to 100 Watts of Audio Power

1. Install backbox, chassis assembly, and NFC-BDA-25/70V and circuit boards as described in Section 2, "Installation", on page 22.
2. Connect laptop or PC to Ethernet port (J2) and launch the web-based programming utility.
3. Configure the NFC-50/100 for Single Zone operation. Refer to Section 3, "Programming", on page 51.
4. Record any new voice messages as described in Section 4, "Operating Instructions", on page 70.

### 5.3 System Requiring Greater Than 100 Watts of Audio Power

1. Install backbox and chassis assembly as described in Section 2, "Installation", on page 22.
2. Connect the external Audio Riser and external Data Bus (for All-Call) cabling between the NFC-50/100 and NFC-125DA and/or NFC-50DA panels.
3. Connect laptop or PC to Ethernet port (J2) and launch the web-based programming utility.
4. Configure the NFC-50/100 for Single Zone operation. Refer to Section 3, "Programming", on page 51.
5. Record any new voice messages as described in Section 4, "Operating Instructions" on page 70.
6. Program the FACP to operate with the NFC-50/100 per the FACP manual.
  - Enable the ACS-BUS serial link or ANN-BUS serial link.
  - Assign audio zones where applicable (see Section 3.6, "Programmed Activation by FACP", on page 64).
  - Assign message numbers (1 - 5) where applicable (refer to Section 3.6, "Programmed Activation by FACP", on page 64).
7. Connect the external Audio Riser and NFC external Data Bus cabling between the NFC-50/100 and the NFC-125DA and/or NFC-50DA.

## Section 6: Power Supply Calculations

### 6.1 Overview

This section contains instructions and tables for calculating power supply currents in alarm and standby conditions. This is a four-step process, consisting of the following:

1. Calculating the total amount of AC branch circuit current required to operate the system
2. Calculating the power supply load current for non-fire and fire alarm conditions and calculating the secondary (battery) load
3. Calculating the size of batteries required to support the system if an AC power loss occurs
4. Selecting the proper batteries for your system

### 6.2 Calculating the AC Branch Circuit

The audio distribution panel requires connection to a separate, dedicated AC branch circuit, which must be labeled **FIRE ALARM**. This branch circuit must connect to the line side of the main power feed of the protected premises. No other non-fire alarm equipment may be powered from the fire alarm branch circuit. The branch circuit wire must run continuously, without any disconnect devices, from the power source to the transponder. Over-current protection for this circuit must comply with Article 760 of the National Electrical Codes as well as local codes. Use 14 AWG (2.00 mm<sup>2</sup>) wire with 600 volt insulation for this branch circuit.

The NFC-50/100 requires 3.5 amps from the AC branch circuit. The NFC-50/100E requires 2.0 amps from the AC branch circuit.

### 6.3 Calculating the System Current Draw

#### 6.3.1 Overview

The secondary power source (batteries) must be able to power the system during a primary power loss. To calculate the non-fire alarm load on the secondary power source, use Calculation Column 1 in Table 6.3. The NFC-50/100 must support a larger load current during a fire alarm condition and primary power loss. To calculate the fire alarm load on the secondary power source, use Calculation Column 2 in Table 6.3.

When calculating current draw and the battery size, note the following:

- ‘Primary’ indicates that the audio panel is being powered by AC
- ‘Secondary’ indicates that the audio panel is being powered by battery backup during AC failure
- All currents are given in amperes (A) and refer to the DC current being supplied by the panel. Table 6.1 shows how to convert milliamperes and microamperes to full amperes

| To convert....                   | Multiply      | Example                      |
|----------------------------------|---------------|------------------------------|
| Milliamperes (mA) to amperes (A) | mA x 0.001    | 3 mA x 0.001 = 0.003 A       |
| Microamperes (µA) to amperes (A) | µA x 0.000001 | 300 µA x 0.000001 = 0.0003 A |

Table 6.1 Converting to Full Amperes

#### 6.3.2 How to use Table 6.2 to calculate system current draws

1. Enter the quantity of devices in both columns.
2. Enter the DC current draw where required. Refer to the *Notifier Device Compatibility Document* for compatible devices and their current draw.
3. Calculate the current draws for each in both columns.
4. Sum the total current for each column.
5. Copy the totals from Column 1 and Column 2 to Table 6.3 on page 80.

Following are the types of current that can be entered into Table 6.2:

- ✓ **Calculation Column 1** - The standby current load that the audio panel must support (from the batteries) during a non-fire alarm condition and a loss of AC power.
- ✓ **Calculation Column 2** - The alarm current draw that the audio panel must support (from the batteries) during a fire alarm condition and a loss of AC power

Table 6.2 contains two columns for calculating current draws. For each column, calculate the current and enter the total (in amps) in the bottom row. When finished, copy the totals from Calculation Column 1 and Calculation Column 2 to Table 6.3 on page 80.

| Device Type  | Calculation Column 1<br>Secondary (Battery) Power Source<br>Standby Current (amps) |                           |       | Calculation Column 2<br>Secondary (Battery) Power Source<br>Alarm Current (amps) |                         |       |
|--|--|---------------------------|-------|--|-------------------------|-------|
|  | Qty  | X [current draw] =        | total | Qty  | X [current draw] =      | total |
| NFC-50/100 Primary Console<br>(Not including speaker load)   | 1  | X [0.272]=                | 0.272 | 1  | X [0.446]=              | 0.446 |
| NFC-BDA-25/70V<br>Optional Audio Amplifier Module <sup>1</sup>                                       | [ ]<br>(1 max.)  | X [0.100]=                | [ ]   | [ ]<br>(1 max.)  | X [0.235]=              | [ ]   |
| NFC-CE6 Speaker Circuit Expander   | [ ]<br>(1 max.)  | X [0.020]=                | [ ]   | [ ]<br>(1 max.)  | X [0.189]=              | [ ]   |
| NFC-LOC Local Operator Console <sup>2</sup>  | [ ]  | X [0.085]=                | [ ]   | [ ]  | X [0.100]=              | [ ]   |
| NFC-RM Remote Microphone <sup>2</sup>  | [ ]  | X [0.050]=                | [ ]   | [ ]  | X [0.064]=              | [ ]   |
| NFC-RPU Remote Page Unit <sup>2</sup>  | [ ]  | X [0.050]=                | [ ]   | [ ]  | X [0.068]=              | [ ]   |
| NFC-50DA, NFC-125DA, NFC-50/100DA<br>Remote Amplifiers <sup>3</sup>                                  | [ ]  | X [0.012]=                | [ ]   | [ ]  | X [0.012]=              | [ ]   |
| NFC-FFT Firefighter Telephone  | [ ]  | X[0.120]=                 | [ ]   | [ ]  | X[0.230]=               | [ ]   |
| Speakers (50 watts maximum/amplifier)  |  |                           |       |  |                         |       |
| 1/4 Watt   |  |                           |       | [ ]  | X[0.017]=               | [ ]   |
| 1/2 Watt   |  |                           |       | [ ]  | X[0.033]=               | [ ]   |
| 3/4 Watt   |  |                           |       | [ ]  | X[0.050]=               | [ ]   |
| 1 Watt   |  |                           |       | [ ]  | X[0.068]=               | [ ]   |
| 2 Watts  |  |                           |       | [ ]  | X[0.132]=               | [ ]   |
| Additional Current Draw from TB17 Special<br>Application Auxiliary Power Output<br>(0.5 amp maximum) | [ ]  | X [ ] =                   | [ ]   | [ ]  | X [ ] =                 | [ ]   |
| NAC Circuit Output (2.0 amps maximum)  |  |                           |       | [ ]  | X [ ] =                 | [ ]   |
| Power Supervision Relays <sup>4</sup>  | [ ]  | X [0.025]=                | [ ]   | [ ]  | X [0.025]=              | [ ]   |
| AIM-1A, RSM-1A Isolators   | [ ]  | X [0.0145]=               | [ ]   | [ ]  | X [0.0145]=             | [ ]   |
| SP-SVC Volume Control  | [ ]  | X[0.010]=                 | [ ]   | [ ]  | X[0.010]=               | [ ]   |
| <b>Sum each column for totals</b>  |  | <b>Secondary Standby:</b> |       |  | <b>Secondary Alarm:</b> |       |

**Table 6.2 System Current Draw Calculations**

1 In backup configurations, the optional amplifier draws no additional current in alarm.

2 Maximum combined total of eight (8) operator interface devices.

3 Maximum combined total of eight (8) remote amplifiers.

4 Must use a compatible, UL-listed Power Supervision Relay

## 6.4 Calculating the Battery Size

Use Table 6.3 to calculate the total Standby and Alarm load in ampere hours (AH). This total load determines the battery size (in AH), required to support the NFC-50/100 under the loss of AC power. Complete Table 6.3 as follows:

1. Enter the totals from Table 6.2 on page 79 Calculation Columns 1 and 2 where shown.
2. Enter the NFPA Standby and Alarm times (refer to Section 6.4.1, “NFPA Battery Requirements”).
3. Calculate the ampere hours for Standby and Alarm, then sum the Standby and Alarm ampere hours.
4. Multiply the sum by the derating factor of 1.2 to get the proper battery size (in AH).
5. Write the ampere hour requirements on the Protected Premises label located inside the cabinet door

|   |  |   |       |
|---|--|---|-------|
| Secondary Standby Load<br>(total from Table 6.2 Calculation Column 1)<br>[            ] | Required Standby Time<br>(24 or 60 hours)<br>[            ]  | = | AH    |
| Secondary Alarm Load<br>(total from Table 6.2 Calculation Column 2)<br>[            ]   | Required Alarm Time<br>(for 5 min., enter 0.084,<br>for 10 min., enter 0.168,<br>for 15 min., enter 0.250)<br>for 30 min., enter 0.50)<br>[            ] | = | AH    |
| Sum of Standby and Alarm Ampere Hours   |  | = | AH    |
| Multiply by the Derating Factor   |  |   | X 1.2 |
| Battery Size, Total Ampere Hours Required   |  | = | AH    |

**Table 6.3 Total Secondary Power Requirements at 24 VDC**

### 6.4.1 NFPA Battery Requirements

NFPA requires 24 hours of standby plus 15 minutes activation for audio systems. The total ampere hours required cannot exceed 26 AH with an internal charger. An external charger can be used to increase the total ampere hours (internal charger must be disabled).

### 6.4.2 Selecting and Locating Batteries

Select batteries that meet or exceed the total ampere hours calculated in Table 6.3. The audio panel can charge batteries in the 12 AH to 26 AH range. The NFC-50/100 can house up to 18 AH batteries.



## Appendix A: Digital Voice Messages

The FirstCommand digital message generator provides up to 14 messages each with up to 60 seconds of record time. The NFC-50/100 is provided with factory recorded messages which can be changed in the field. The prerecorded messages (female voice) are:

### Fire Evacuation Messages:

- “May I have your attention, please? May I have your attention, please? A fire has been reported in the building. A fire has been reported in the building. Please proceed to the stairways and exit the building. Do not use the elevators.”
- Su atención por favor. Su atención por favor. Un incendio se ha reportado en el edificio. Un incendio se ha reportado en el edificio. Por favor, proceder a las escaleras y salir del edificio. No use los ascensores.
- “May I have your attention, please? May I have your attention, please? There has been a fire reported in the building. Please proceed to the nearest exit and leave the building.”
- Su atención por favor. Su atención por favor. Un incendio se ha reportado en el edificio. Un incendio se ha reportado en el edificio. Por favor, proceder a la salida más cercana y salir del edificio.
- “May I have your attention, please? May I have your attention, please? An alarm has been activated in the building. Please proceed to the stairways and exit the building. Do not use the elevators.”
- “May I have your attention, please? May I have your attention, please? There has been a fire reported on your floor. There has been a fire reported on your floor. Please proceed to the stairways and exit the building. Do not use the elevators.”
- “May I have your attention, please? May I have your attention, please? A fire has been reported in the building. A fire has been reported in the building. Please proceed to the nearest exit and leave the building. Do not use the elevator, but proceed to the nearest exit and leave the building.”

### Fire Alert Message:

- “May I have your attention please? An alarm has been activated. We are investigating the cause. Please remain calm and stand by near the speakers for further instructions.”

### Emergency Evacuation Messages:

- “May I have your attention, please? May I have your attention, please? There has been an emergency reported in this area. Please proceed to the closest exit or stairwell and leave the building. Do not use the elevators.”
- Su atención por favor. Su atención por favor. Una emergencia se ha reportado en este área. Por favor, proceder a la salida más cercana o escaleras y salir del edificio. No use los ascensores.

### Emergency Alert Message:

- “Attention, please. This signal tone you have just heard indicates a report of an emergency in this building. If your floor evacuation signal sounds after this message, walk to nearest stairway and leave the floor. While the report is being verified, occupants on other floors should await further instructions.”

### All Clear Emergency Messages:

- “Attention. Your attention, please. The building emergency condition has been cleared. You may return to your normal activities. The building emergency has been cleared. You may return to your normal activities.”
- Atención. Su atención por favor. La condición de emergencia del edificio se ha resuelto. Regrese a sus actividades normales. La emergencia del edificio se ha resuelto. Regresa a su actividades normales.

### Severe Weather Message:

- “Your attention please. A severe weather warning has been received. Please walk to the nearest safe area and wait for further instructions. Elevator lobbies, stairwells, bathrooms and auditoriums are designated safe areas in the event of severe weather. Stay away from windows and glass. Do not use the elevators”

New messages can be recorded in the field. Be certain to get the approval of the local Authority Having Jurisdiction prior to recording new messages.

## Appendix B: Wiring Requirements

Connecting external system accessories to the NFC-50/100 main circuits must be carefully considered to ensure proper operation. It is important to use the correct type of wire, wire gauge and wire run length per each circuit. Refer to the following table to specify wire requirements and limitations.



**NOTE:** If an SLC loop is to be run in conduit with NFC-50/100 Notification Appliance Circuits, the risk of encountering problems can be greatly reduced by using twisted, shielded cable on the SLC and NACs.

| Circuit Type   | Wire Type & Limitations  | Maximum Distance (feet)                                     | Wire Gauge<br>(terminals support) |
|--|--|---|-----------------------------------|
| CMD1-CMD2<br>TB4, TB5: polarity reversal                     | untwisted/unshielded,<br>twisted/shielded, see note <sup>1</sup> | depends on trigger circuit,<br>9-32 VDC, 1.6 mA             | 12-18 AWG                         |
| CMD1-CMD2<br>TB4, TB5: contact closure                       | untwisted/unshielded,<br>twisted/shielded, see note <sup>1</sup> | max loop impedance 200 ohms                                 | 12-18 AWG                         |
| CMD3-CMD8<br>TB6-TB8: contact closure                        | untwisted/unshielded,<br>twisted/shielded, see note <sup>1</sup> | max loop impedance 200 ohms                                 | 12-18 AWG                         |
| speaker circuits<br>TB20, TB21                               | untwisted/unshielded,<br>twisted/shielded, see note <sup>2</sup> | determine using Lite-Calcs utility<br>see note <sup>3</sup> | 12-18 AWG                         |
| ECC-CE6 speaker circuits<br>TB1 - TB6                        | untwisted/unshielded,<br>twisted/shielded, see note <sup>2</sup> | determine using Lite-Calcs utility<br>see note <sup>3</sup> | 12-18 AWG                         |
| external data bus: TB12                                      | twisted/shielded   | max loop impedance 13.2 ohms                                | 12-18 AWG                         |
| external audio riser: TB22                                   | twisted/shielded   | max loop impedance 13.2 ohms                                | 12-18 AWG                         |
| external operator interface power:<br>TB24                   | untwisted/unshielded,<br>twisted/unshielded                      | max loop impedance 13.2 ohms                                | 12-18 AWG                         |
| NAC output: TB19   | untwisted/unshielded,<br>twisted/unshielded                      | refer to Section 2.6.3 , max loop<br>impedance 120 ohms     | 12-18 AWG                         |
| speaker volume control override:<br>TB23                     | untwisted/unshielded,<br>twisted/unshielded                      | max loop impedance 120 ohms                                 | 12-18 AWG                         |
| night ring input: TB16                                       | untwisted/unshielded,<br>twisted/unshielded                      | max impedance 30 K ohms                                     | 12-18 AWG                         |
| external audio input<br>TB5 (on display board)               | twisted/shielded   | max loop impedance 100 ohms                                 | 12-18 AWG                         |
| MNS active, AC loss, and trouble<br>output relays: TB1 - TB3 | untwisted/unshielded,<br>twisted/shielded, see note <sup>1</sup> | depends on the panel monitoring<br>these outputs            | 12-18 AWG                         |
| auxiliary power: TB17  | untwisted/unshielded, see note <sup>1</sup>                      | distance set by 4 VDC max line<br>drop                      | 12-18 AWG                         |

**Table B.1 Wiring Requirements**

1 Refer to NEC Standards.

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

3 Must also meet NFPA 72 Standards for minimum and maximum sound levels.



**NOTE:** Wire to wire short circuit trouble = zero ohms.  
Open circuit trouble = infinite ohms.  
Ground fault trouble = zero ohms to ground.

# Appendix C: Canadian Applications

When using the NFC in Canadian Applications, note the following:

- The NFC-50/100 is for fire evacuation use only.
- The NFC-50DA, NFC-125DA, and NFC-50/100DA amplifiers are not permitted for use in Canada.
- The NFC-RPU and NFC-RM are not permitted for use in Canada.
- The NFC-50/100 must be mounted next to the FACP.

## C.1 Audio Room Isolator Modules

### C.1.1 Description

The audio isolator modules described below may be used to isolate short circuits during alarm signaling.

**AIM-1A** This module provides isolation to a separate circuit on an audio riser. A short circuit on an AIM-1A speaker circuit will not disable other speaker circuits on the riser.

**RSM-1A** This module works the same as the AIM-1A, with the exception that there is a silence button for in-suite operation. The silence button will silence the audible signal to the module's circuit for ten minutes during alarm. Resounding will occur automatically after ten minutes or upon activation of a new audio alert.

### C.1.2 Panel Programming

“Canadian Configuration” and “Canadian Isolator Modules” must be enabled in ECCNFC programming. Refer to “General/NAC Options” on page 53. In addition, “NAC Type” must be set for steady operation. See “NAC Options” on page 54.

### C.1.3 Applications

The following figures illustrate typical applications for audio isolator modules. Jumper settings are specified below to configure operation with speaker circuits. Jumpers are located on the back side of each module.

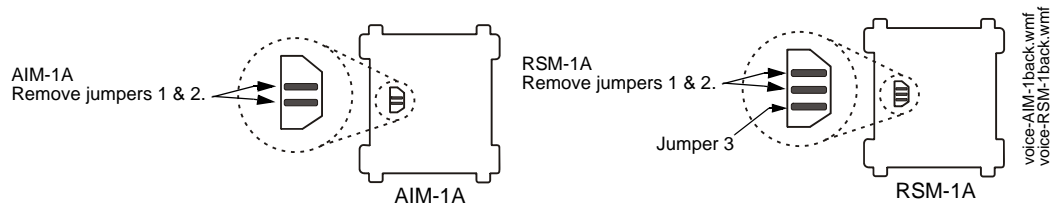


Figure C.1 Jumper Settings

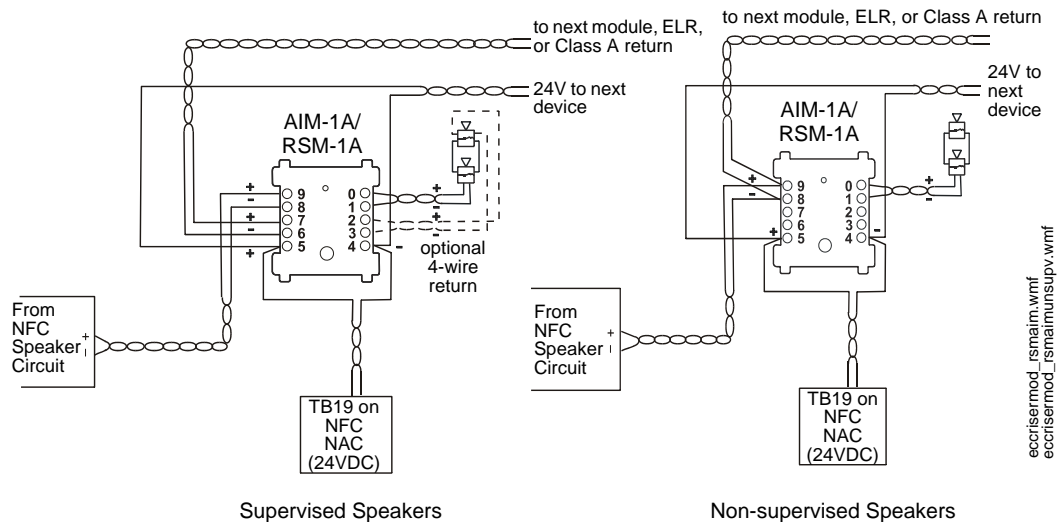
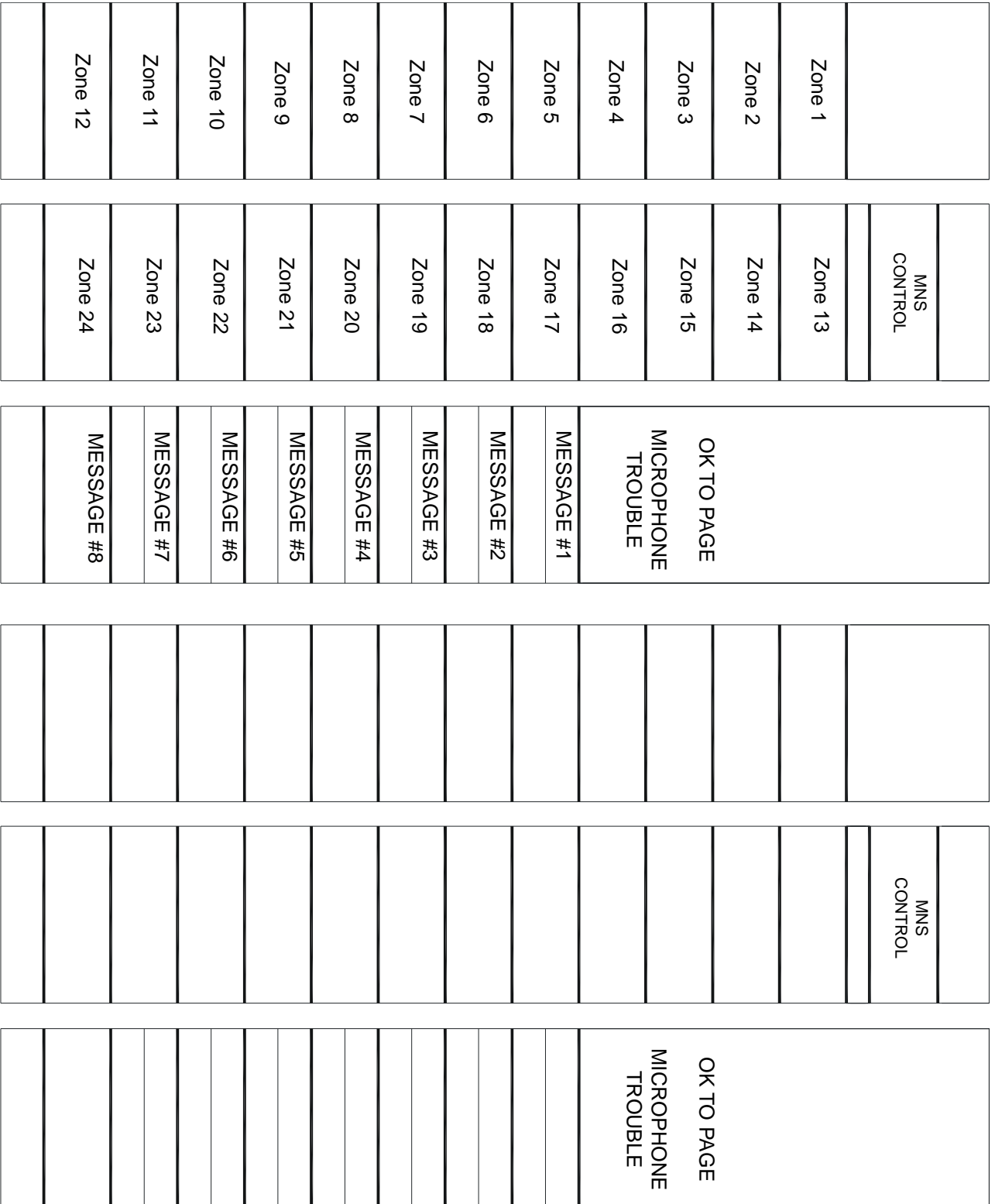


Figure C.2 RSM-1A/AIM-1A Module Wiring

## Notes

# Slide-in Labels - Upper Portion

Carefully cut along the outside of each label. Identify keypad buttons as desired and slide the labels in. Refer to Section 4.1 on page 70 for installation instructions.



Cut along dotted line.

Figure 1.1 Slide-in Labels - Top Row of Keypad

Cut along dotted line.

# Slide-in Labels - Lower Section

|             |
|-------------|
| DIAGNOSTIC  |
| REMOTE AMPS |
|             |
|             |
|             |
|             |
|             |
|             |
|             |
|             |

|                   |
|-------------------|
| TROUBLE SILENCE   |
| AC POWER          |
| GROUND FAULT      |
| CHARGER FAULT     |
| BATTERY FAULT     |
| DATA BUS FAULT    |
| NAC FAULT         |
| NAC ACTIVE        |
| SYSTEM TROUBLE    |
| AUDIO RISER FAULT |

|                   |
|-------------------|
| CONSOLE LAMP TEST |
| MAIN CONSOLE      |
|                   |
|                   |
|                   |
|                   |
|                   |
|                   |
|                   |
|                   |

Cut along dotted line.

Figure 1.2 Slide-in Labels - Bottom Row of Keypad

Cut along dotted line.



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## Notes

# NFC-50/100 and NFC-LOC OPERATING INSTRUCTIONS

## Section 1 Operating Information

### NORMAL STANDBY OPERATION.

1. Green AC POWER indicator lit steadily.
2. Yellow TROUBLE indicators off.
3. Green speaker zone indicators off.

### ALARM CONDITION.

1. Green speaker zone indicator(s) lit steadily.
2. Green SYSTEM IN USE indicator lit steadily.
3. Audio message plays.
4. Green FIRE SYSTEM ACTIVE indicator lit steadily (when FACP is in alarm).
5. Green MNS CONTROL indicator lit steadily and relay activated (for mass notification events).

**ALARM RESET.** After locating and correcting a fire alarm condition at the FACP, the system will return to Normal Standby Operation. After correcting a mass notification event, press the MNS CONTROL button to clear the system and return to Normal Standby Operation.

**TROUBLE CONDITION.** Activation of trouble signal under normal operation indicates a condition that requires **immediate** attention. Contact your local service representative. Silence the audible signal by pressing the TROUBLE SILENCE switch. The trouble indicator will remain illuminated.

## Section 2 Paging and Manual Message Control

1. Press the SYSTEM CONTROL button if the green LED is not lit.
2. Press either the ALL CALL button or individual speaker zone buttons. This will override the evacuation tone/message if panel is in alarm and activate desired speaker circuits.
3. Once the OK TO PAGE lights green, broadcast:
  - By paging: Key the microphone by pressing the push-to-talk switch on side of microphone and speak clearly into the microphone.
  - By prerecorded message: Press the desired message button.
4. Press the ALL CALL switch (or individual speaker zone buttons) to end broadcast and continue evacuation tone/message.
5. Press the SYSTEM CONTROL button to relinquish control of the audio system.

## Section 3 Switch Functions

**ALL CALL.** Activates all speaker circuits for broadcast.

**MNS CONTROL** (for systems configured for mass notification operation which has higher priority). Activates the MNS Active Relay and the onboard NAC. A second press turns these back off. For a combination fire and mass notification system, pressing MNS CONTROL will result in the shutdown of audible FACP NACs and audio system speakers, allowing the system to override the system. Pressing MNS CONTROL again causes the FACP to re-activate audible FACP NACs and audio system speakers.

**SYSTEM CONTROL.** Manually gains control of the audio system in preparation for an ALL CALL, message activation, or general page. The green LED will turn on steadily to confirm control. A second press is required after paging to relinquish control of the system. The main console will have system priority based upon user programming. In order for the LOC to gain control, the ECC must first relinquish control of the system.

**SPEAKER SELECT 1-24.** Manually activates or deactivates speaker zones (circuits).

**MESSAGE SELECT 1-8.** Manually activates or deactivates stored messages. 8th button becomes a "shift" for messages 9-14.

**DIAGNOSTIC SELECT.** selects a specific remote amplifier to examine specific trouble conditions for the remote amplifiers. The fault LEDs with wrench graphics represent the amplifier selected.

**TROUBLE SILENCE.** Manually silences the local trouble sounder.

**CONSOLE LAMP TEST.** Tests the local LEDs and sounder.

## Section 4 LED Indicators

**FIRE SYSTEM ACTIVE.** Green LED that turns on steady when the FACP is in alarm.

**MNS CONTROL.** Green LED that turns on steady when an operator has initiated a mass notification event by pressing the MNS Control button or by pressing an MNS message button.

**SYSTEM CONTROL.** Green LED that turns on steady when the main console has control of the audio system.

**SYSTEM IN USE.** Green LED text that turns on steady when the main console, an LOC, an RPU, or an RM has control of the audio system.

**SPEAKER ZONES 1-24.** Green LED per speaker circuit button that turns on steady when a speaker circuit has been selected and is active. Yellow LED per speaker circuit button that turns on steady when a speaker circuit fault exists or when the speaker circuit has been turned off after having been automatically turned on by the FACP.

**OK TO PAGE.** Green LED text that turns on steady when the system is ready for paging.

**MICROPHONE TROUBLE.** Yellow LED text that turns on steady to indicate a microphone wiring fault.

**MESSAGES 1-8.** Red LED per message button that turns on steady when the message has been selected and blinks when the message has been overridden. Yellow LED per message button that turns on steady when no message has been recorded or there is an associated command input fault. All eight message button LEDs will turn on steady to indicate a message generator fault. 8th button "shift" key red off when viewing messages 1-7 and on steady when viewing messages 8-14. Yellow LED will turn on indicating a message trouble in the group of messages not currently being viewed.

**REMOTE AMPLIFIERS 1-8 FAULT.** Yellow LED per remote amplifier that turns on steady when an amplifier has a fault.

**LOC/RPU/RM 1-8 FAULT.** Yellow LED per remote console that turns on steady when a remote console has a fault. Green LED per remote console that turns on steady when a remote console is active.

**MAIN CONSOLE FAULT.** Yellow LED that turns on steady when the main (or primary operator) console has a fault.

**AC POWER.** Green LED that turns on steady when AC power is present.

**GROUND FAULT.** Yellow LED that turns on steady when a ground fault exists in the system.

**CHARGER FAULT.** Yellow LED turns on steady when the battery charger voltage is too high or low.

**BATTERY FAULT.** Yellow LED turns on steady when battery voltage is too low.

**DATA BUS FAULT.** Yellow LED that turns on steady when the main and remote console(s) cannot communicate.

**NAC FAULT.** Yellow LED that turns on steady when the onboard NAC wiring is open or short-circuited.

**NAC ACTIVE.** Green LED that turns on steady when the NAC output is on.

**SYSTEM TROUBLE.** Yellow LED that turns on steady when any fault exists in the system.

**AUDIO RISER FAULT.** Yellow LED that turns on steady when the audio riser wiring is open or short-circuited.

## Section 5 Periodic Testing and Maintenance

To ensure proper and reliable operation, system inspection and testing should be scheduled monthly, or as required by NFPA 72 or local fire codes. A qualified Service Representative should perform testing.

**BEFORE TESTING:** Notify fire department and/or central alarm receiving station if alarm condition is transmitted. Notify facility personnel of the test so alarm sounding devices are ignored during the test period.

**AFTER TESTING:** Notify all fire, central station, and/or building personnel when testing is complete.



In the event of trouble, contact the local  
Notifier Service Representative.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Cut along dotted line.

## Manufacturer Warranties and Limitation of Liability

**Manufacturer Warranties.** Subject to the limitations set forth herein, Manufacturer warrants that the Products manufactured by it in its Northford, Connecticut facility and sold by it to its authorized Distributors shall be free, under normal use and service, from defects in material and workmanship for a period of thirty six months (36) months from the date of manufacture (effective Jan. 1, 2009). The Products manufactured and sold by Manufacturer are date stamped at the time of production. Manufacturer does not warrant Products that are not manufactured by it in its Northford, Connecticut facility but assigns to its Distributor, to the extent possible, any warranty offered by the manufacturer of such product. This warranty shall be void if a Product is altered, serviced or repaired by anyone other than Manufacturer or its authorized Distributors. This warranty shall also be void if there is a failure to maintain the Products and the systems in which they operate in proper working conditions.

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