

## Tek-CARE<sup>®</sup> NC150 and NC200 Intercom Nurse Call Systems

UL<sup>®</sup> 1069 Listed

### Operation and Installation Manual

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Tek-CARE<sup>®</sup> NC150 and NC200 series Intercom Nurse Call Systems are designed for nursing home or individual hospital ward use. The Tek-CARE<sup>®</sup> NC150 and NC200 systems provide selective two-way audio and visual communication from master station to staff and patient stations, as well as emergency signaling and call indication from remote locations. Emergency calls are indicated by a rapid pulsing of all audible and visual signals associated with the calling station. Emergency calls take precedence over normal calls and can only be canceled at the point of origin.

## **Tek-CARE® NC150 and NC200 Operation and Installation Manual**

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# Table of Contents

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<b>A Word about ESD (Electrostatic Discharge)</b> .....	<b>iv</b>
<b>System Operating Instructions</b> .....	<b>1</b>
NC150N, NC200N Master Stations .....	1
IR150B Staff Stations .....	5
IR151B, IR152B Patient Stations .....	5
IR155B Patient Stations .....	5
SF155B Emergency and SF156B Code Stations .....	5
LI150B Duty Stations .....	6
LI381 Corridor Lights .....	6
LI382, LI382LED Corridor Zone Lights .....	6
<b>System Installation</b> .....	<b>7</b>
Installation Procedure .....	7
Equipment Locations .....	7
Wiring Installation .....	8
Housing Installation .....	9
Wire Checkout .....	10
Wire Connections .....	11
Connections Checkout .....	11
System Test Instructions .....	11
System Checkout and Testing .....	12
<b>System Maintenance Instructions</b> .....	<b>13</b>
NC150N, NC200N Master Stations .....	13
PK151A, PK152 Power & Control Units .....	14
IR150B Staff and IR155B Patient Stations .....	14
PK800A Secondary Power Supply .....	14
FZ151 In-Line Fuse Holder .....	15
IR151B, IR152B Patient Stations .....	15
SF155B Emergency and SF156B Code Stations .....	15
LI150B Duty Stations .....	15
LI381 Corridor and LI382 Corridor Zone Lights .....	16
Replacement Parts .....	16
<b>Illustrations</b> .....	
Figure 1—NC150N and NC200N Control Locations .....	2
Figure 2—Duty, Staff, Patient, Emergency & Code Station Control Locations .....	4
Figure 3—Master Panel Housing Chart and Wall Cut-Out Details .....	8
Figure 4—Panel Removal and Replacement .....	8
Figure 5—Ring and Back Box for IR150B, IR151B, IR152B and IR155B .....	9
Figure 6—Ring and Back Box for SF155B, SF156B, LI150B, LI381, LI382 and LI382LED .....	9
Figure 7—SS106 Transformer Installation .....	10
Figure 8—NC150N, NC200N Lens, Filter and Lamp Replacement .....	14
Figure 9—NC150N, NC200N Nurse Call Systems Notes and Electrical Ratings .....	17
Figure 10—Block Wiring Diagram without Zone Lamps .....	18
Figure 11—Block Wiring Diagram with Zone Lamps .....	19
Figure 12—NC150N, NC200N Wiring Diagram .....	20
Figure 13—NC150N, NC200N, Two Stations in Parallel .....	21
Figure 14—PK153 Wiring Diagram with Smoke Detector .....	22
Figure 15—PK153 Wiring Diagram with SF156B Code Station .....	23
Figure 16—PK151A or PK152 to PK800A Interconnection .....	24
Figure 17—SK151N Switch Board PCB Assembly .....	25
Figure 18—SF337C Cross Reference Diagram .....	26
Figure 19—SF339 Cross Reference Diagram .....	27
Figure 20—NC110N Hookup to NC150N, NC200N .....	28

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# A Word about ESD (Electrostatic Discharge)

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**What Is It?** Static electricity is a result of triboelectric charging of two dissimilar nonconductive materials that are rubbed together, such as rubbing your feet on a carpet on a cold winter day or in a dry climate. The resulting charge is detected when you reach out to touch a doorknob or some other metallic object. The resulting discharge may only be startling or, in severe cases, it may even be painful. The actual electrical charge is dependant on the materials being rubbed together, humidity, the rate of separation, and other factors.

**What Can It Do?** While this effect may be disturbing to humans, the effect on electronic equipment is often more serious, ranging from operational disruption to actual component damage. These effects result from the high voltages that may be developed. The simple act of walking across a carpet may develop as much as 30,000 volts, and changing a bed sheet may create a charge of 100,000 volts or more. Such voltages readily cause arcing (the spark that can be observed when you grab a doorknob after walking across a carpet, etc.). The arcing is evidence of the discharge path. Due to the high voltage involved, the discharge current can jump to any nearby metallic or non-metallic object. If the discharge is to or through an electronic device, such as the nurse call system, the operation of the device may be affected. If the discharge current passes through internal components, these components may be damaged or their operation degraded.

**What Can We Do About It?** The manufacturer of the nurse call equipment has already taken steps to protect the equipment from electrostatic discharge (ESD) effects. However, since the cause is not in the equipment, but in the environment, further measures are required of the installer and the user to achieve complete protection.

**What The Installer Can Do:** In humid climates or in places where the relative humidity is kept at 65% or greater, there will likely be few problems with ESD. Where problems may occur the following measures can be taken.

- Ground all exposed metal surfaces. Grounding should be to a #16 gauge or larger conductor.
- Install nurse call system wiring in metal conduit. This conduit may be used to ground panels.
- Use shielded cable for nurse call system station-to-station wiring. The use of open conductors invites inductive coupling of discharge currents, which can cause the same problems as direct discharge currents.
- Ground your body before handling system components. This can be done by using a wrist strap, or simply by contacting a grounded metal surface. Use caution to avoid hazardous voltages while grounded.

**What The User Can Do:** The most common generation of ESD in hospitals is due to changing linen on hospital beds while the patient call cord or pillow speaker is still connected to the nurse call system. The following precautions will help.

Remove the call cord or pillow speaker from the bed before changing the linen. It will be necessary for the nursing staff to discharge themselves by contacting a grounded metal object before placing the call cord or pillow speaker back on the bed; otherwise a spark will jump to the nurse call equipment, causing the very damage they are trying to avoid. To avoid a shock while discharging static electricity on the body, hold a metal object, such as a key, and use that object to contact the grounded surface.

This information is provided to make you aware of ESD problems so that precautions may be taken to avoid damage and disruption of system operation.

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# System Operating Instructions

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This section provides complete operating instructions for all Tek-CARE® functions, as well as reference drawings for use in locating and describing all controls. System operators must read the following operating instructions concerning system equipment and the terms used in conjunction with the equipment.

## NC150N, NC200N Master Stations

Refer to *Figure 1* for locations, names, and functions of controls and indicators.

### ***Answer Normal Calls:***

Normal calls are indicated by simultaneous operation of the following signals:

- Steady illumination of the associated station selector lamp which is marked to indicate call origin.
- Steady illumination of call lamp.
- Slowly pulsing audible tone. The audible call signal may be canceled for normal calls by pressing the **TONE OFF** button. The button will then illuminate to indicate the tone is silenced. Pressing the **TONE OFF** button when illuminated resets the call tone.

To establish conversation with the calling station, press the associated station selector button. The remote station's **RESET** lamp will illuminate. To speak to the caller, press the **TALK** button while speaking and release to listen.

When the conversation is complete, press the associated station selector button to release the station. The remote station's **RESET** indicator will turn off. Normal calls placed from an IR155B Station must be canceled at the point of origin.

### ***Answer Normal Calls Using Optional TA150N or TA200N Handset:***

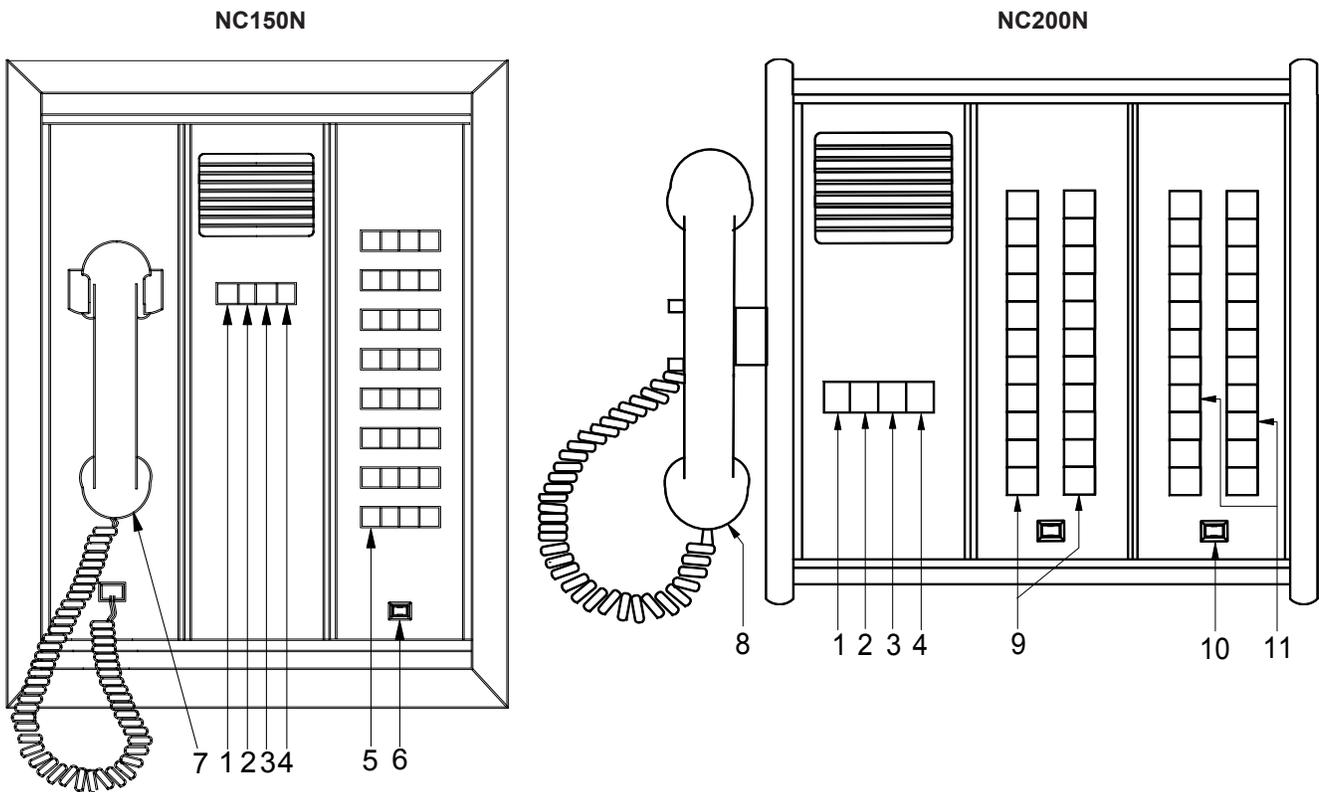
To establish conversation with the calling station, press the associated station selector button. The remote station's **RESET** lamp will illuminate. To speak to the caller, lift the handset from the cradle and begin normal two-way conversation. When the conversation is complete, press the associated station selector button to release the station. The remote station's **RESET** lamp will turn off. Replace the handset in the cradle. Normal calls placed from an IR155B Station must be canceled at the point of origin.

### ***Answer Emergency Calls:***

All emergency calls take precedence over any normal call signal. Emergency calls must be answered in person and can only be canceled from point of origin. Emergency calls are indicated by simultaneous operation of the following signals:

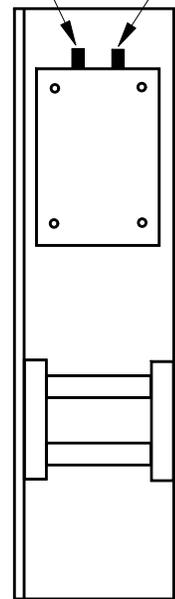
- Rapid flashing of the associated station selector lamp, which is marked to indicate call origin.
- Rapid flashing of call lamp.
- Rapidly pulsing audible tone.

**Figure 1—NC150N and NC200N Control Locations**



- 1 – **Duty Button:** Transfers call tones from master station to a selected patient station when pressed.
- 2 – **Tone Off Button:** Silences normal call tone when depressed.
  - **Tone Off Lamp:** Indicates tone silenced when illuminated.
- 3 – **Call Button:** Tone call to selected remote when pressed.
  - **Call Lamp:** Indicates incoming call when illuminated. Indicates emergency call when flashing.
- 4 – **Talk Button:** Talk when pressed. Listen when released.
- 5 – **Station Selector Buttons (PM150/4N):** Establishes conversation path with associated remote station when depressed.
  - **Station Selector Lamps:** Indicates incoming call from associated remote when illuminated. Indicates emergency call from remote when flashing.
- 6 – **Lamp Test Button (ST005D):** Illuminates all lamps on panel when pressed.
- 7 – **Telephone Handset (TA150N option):** Lift from cradle to use for two-way communication.
- 8 – **Telephone Handset (TA200N option):** Lift from cradle to use for two-way communication.
- 9 – **Group Call Button:** Places call to all remote stations represented by row of selector switches. Paging function only.
- 10 – **Lamp Test Button:** Illuminates all lamps on panel when pressed.
- 11 – **Station Selector Buttons (PM200/20N):** Establishes conversation path with associated remote station when depressed.
  - **Station Selector Lamps:** Indicates incoming call from associated remote station when illuminated. Indicates emergency call from remote when flashing.

Call Tone Volume Control    Intercom Volume Control



**NC150N, NC200N  
Rear View of  
Speaker/Control Panel**

### ***Answer Code Calls:***

All code calls take precedence over any normal or emergency call signal. Code calls must be answered in person and can only be canceled from point of origin. Code calls are indicated by simultaneous operation of the following signals:

- Very rapid flashing of the associated station selector lamp (twice the rate of emergency call), which is marked to indicate call origin.
- Very rapid flashing of call lamp (twice the rate of emergency call).
- Very rapidly pulsing audible tone (twice the rate of emergency call).

### ***Call a Remote:***

- Locate the station selector button associated with the remote station to be called. Press that selector button to establish a conversation path. The remote station's **RESET** lamp will illuminate.
- Press the **TALK** button while speaking, and release button to listen. The remote area may be monitored by selecting the remote station and releasing the **TALK** button.
- When conversation or monitoring is complete, press the station selector button to release it. The remote station's **RESET** lamp will turn off. **NOTE: Normal and emergency calls will be received even while the NC150N or NC200N Master Station is in use. The normal audible tone signal will be silenced, but the emergency tone and visual indicators will function as previously described.**

### ***Group Call Remote Stations (from NC200N only):***

- Locate the row of selector buttons for which group call is desired. Press the button labeled **GROUP CALL** for that row. The remote stations' **RESET** lamps will illuminate. Group call may be selected for only one row at a time.
- Press the **TALK** button while speaking. **NOTE: Group call serves as a paging function only. No reply will be heard.**
- When paging or announcement is completed, press the **GROUP CALL** button so it is released. The remote stations' **RESET** lamps will turn off.

### ***Activate Nurse Follower Feature:***

- Press the **DUTY** button and the associated station selector button to which calls are to be transferred. All incoming emergency and normal calls to the master station will be directed to the remote station selected.
- Calls may be answered at the master station only. When answering an emergency or normal call, depress the **DUTY** button to release it and follow procedures for answering calls as previously described. **NOTE: Origination of a call will also be indicated by associated corridor dome light, if installed.**

### ***Test Station Selector Lamp:***

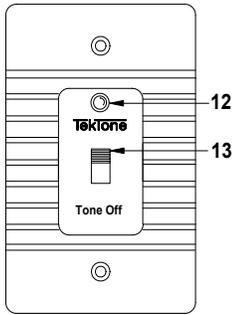
Press lamp test button (one is included for each panel of station selector button/lamps). All station selector lamps on that panel should illuminate. (See *NC150N, NC200N Master Stations* in the *System Maintenance Instructions* section for proper procedures and precautions in replacing defective lamps.)

### ***Improper Operation:***

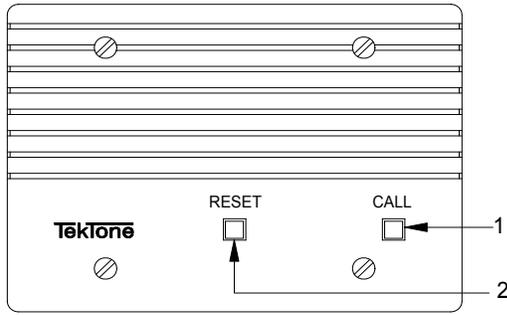
- If the NC150N or NC200N Master Station fails to operate as described, contact qualified maintenance personnel. There are no user replaceable parts on the NC150N or NC200N Master Stations other than the station selector lamps.
- If a malfunction occurs during a call and causes a lack of indication of call origin on the master station, first determine the origin of the call by observing which corridor light and corridor zone light is illuminated, then inform qualified personnel.

# Figure 2—Duty, Staff, Patient, Emergency & Code Station Control Locations

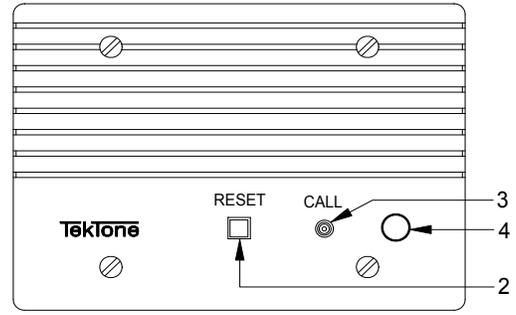
**LI150B Duty Station**



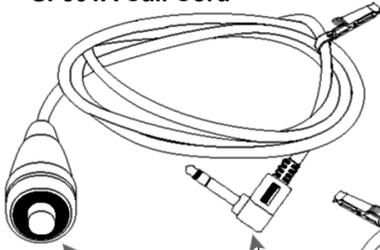
**IR150B Staff Station**



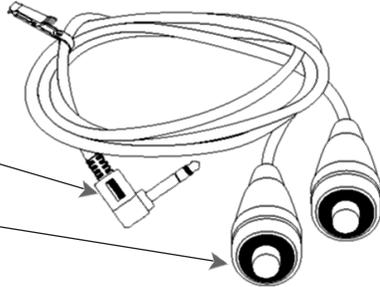
**IR151B Patient Station**



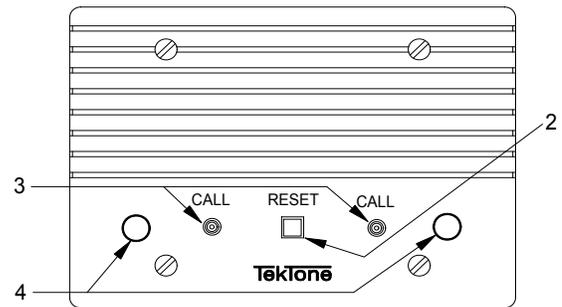
**SF301A Call Cord**



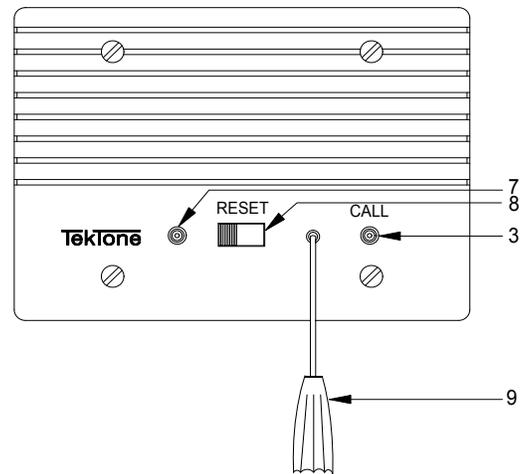
**SF302 Call Cord**



**IR152B Patient Station**

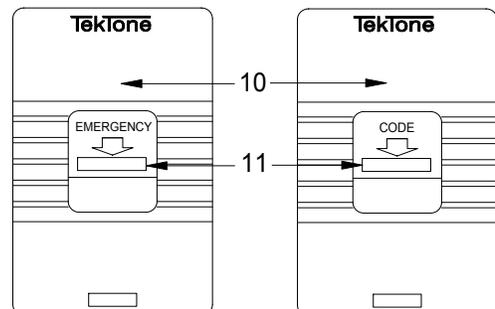


**IR155B Patient Station**



- 1 – **Call Button:** Places a call when pressed.
- **Call Placed Lamp:** Indicates a call is placed when illuminated.
- 2 – **Reset Button:** Cancels the call when pressed.
- **In Use LED:** Indicates station is in use when illuminated.
- 3 – **Call Placed Lamp:** Indicates a call is placed when illuminated.
- 4 – **Call Cord Jack:** Receptacle for SF301A or SF302 call cord.
- 5 – **Plug:** Connects call cord to patient station when plugged into call cord jack.
- 6 – **Call Button:** Places a call when pressed, if cord is connected to patient station.
- 7 – **In Use LED:** Indicates station is in use when illuminated.
- 8 – **Reset Switch:** Cancels the call when pushed to the left.
- 9 – **Call Cord:** Places a call when pulled.
- 10 – **Call Placed Lamp:** Indicates a call is placed when flashing.
- 11 – **Call/Cancel Switch:** Places a call when pulled down. Cancels the call when pushed up.
- 12 – **Call Placed Lamp:** Indicates a normal call is placed when illuminated. Indicates an emergency call when flashing.
- 13 – **Tone Off Switch:** Silences normal audible tone signal when pushed down.

**SF155B Emergency & SF156B Code Stations**



### IR150B Staff Stations

Refer to [Figure 2](#) for locations, names and functions of controls and indicators.

**Call the NC150N or NC200N Master Station:** Press the **CALL** button. The call-placed lamp will illuminate to indicate call placement. When the call is answered, the call-placed lamp will go off and the **IN USE** LED will illuminate to indicate a communication path has been established to the master station. Speak in a normal voice.

**Cancel a Call:** Press the **RESET** button. **CALL PLACED** lamp will go off.

**Improper Operation:** Contact qualified service personnel if the station does not operate as described. There are no user serviceable parts on the IR150B Staff Station.

### IR151B, IR152B Patient Stations

Refer to [Figure 2](#) for locations, names and functions of controls and indicators.

**Call a Nurse:** Press the **CALL** button located on the end of the call cord. The **CALL PLACED** lamp will illuminate to indicate call placement. When the nurse answers, the **CALL PLACED** lamp will go off and the **IN USE** LED will illuminate to indicate that a communication path has been established with master station. When the nurse speaks, reply in a normal voice. **NOTE: If the call cord is pulled from its receptacle, a call will be placed automatically and cannot be canceled until the call cord is replaced in the receptacle.**

**Cancel a Call:** Press the **RESET** button. The **CALL PLACED** lamp will go off.

**Improper Operation:** If the patient station does not operate as described, contact qualified service personnel. There are no user serviceable parts on the IR151B, IR152B Patient Stations other than call cords.

### IR155B Patient Stations

Refer to [Figure 2](#) for locations, names and functions of controls and indicators.

**Call A Nurse:** Pull the cord. The **CALL PLACED** lamp will illuminate to indicate call placement. When the nurse answers, the **CALL PLACED** lamp will go off and the **IN USE** LED will illuminate to indicate that a communication path has been established with the master station. When the nurse speaks, reply in a normal voice.

**Cancel a Call:** Call must be canceled at the point of origin. Push the **RESET** switch to the left. The **CALL PLACED** lamp will go off.

**Improper Operation:** If the station does not operate as described, contact qualified service personnel. There are no user serviceable parts on the IR155B Patient Station.

### SF155B Emergency and SF156B Code Stations

Refer to [Figure 2](#) for locations, names and functions of controls and indicators.

**Call a Nurse:** Pull the call cord, or slide the call/cancel switch down. The **CALL PLACED** lamp will flash. Wait for the nurse.

**Cancel a Call:** Push the call/cancel switch up. The **CALL PLACED** lamp will go off.

**Improper Operation:** If the call station does not operate as described, contact qualified service personnel. There are no user serviceable parts on the SF155B Emergency Call and SF156B Code Call Stations.

### LI150B Duty Stations

Refer to *Figure 2* for locations, names and functions of controls and indicators.

**Emergency Calls:** Emergency calls are indicated by a flashing **CALL PLACED** lamp and a rapidly pulsing audible tone. The audible tone signal cannot be silenced by the **TONE OFF** switch.

**Normal Calls:** Normal calls are indicated by steady illumination of the **CALL PLACED** lamp and a slowly pulsing audible tone. Push the **TONE OFF** switch down to silence the audible tone signal. Push the **TONE OFF** switch up to turn the audible tone signal on.

**Improper Operation:** If the call station does not operate as described, contact qualified service personnel. There are no user serviceable parts on the LI150B Duty Station.

### LI381 Corridor Lights

**Emergency Calls:** Emergency calls are indicated by rapid flashing of the corridor light that is associated with the calling station.

**Code Calls:** Code calls are indicated by very rapid flashing of the corridor light that is associated with the calling station.

**Normal Calls:** Normal calls are indicated by steady illumination of the corridor light that is associated with the calling station.

**Improper Operation:** If corridor light does not operate as described, contact qualified service personnel. There are no user serviceable parts on the LI381 Corridor Lights other than lamps.

### LI382. LI382LED Corridor Zone Lights

**Emergency Calls:** Emergency calls are indicated by rapid flashing of the red corridor zone light associated with the zone or area from which an emergency call has been placed.

**Code Calls:** Code calls are indicated by very rapid flashing of the designated corridor zone light associated with the zone or area from which a code call has been placed.

**Normal Calls:** Normal calls are indicated by steady illumination of the white corridor zone light associated with the zone or area from which a normal call has been placed.

**Concurrent Emergency and Normal Calls:** If an emergency and normal call are placed in the same zone at the same time, the red lamp connected to the emergency station from which a call was placed will flash rapidly, while the white lamp associated with the normal call will maintain a steady illumination.

**Improper Operation:** If corridor zone light does not operate as described, contact qualified service personnel. There are no user serviceable parts on the LI382 Corridor Zone Lights other than lamps. There are no user serviceable parts on the LI382LED Corridor Zone Lights.

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# System Installation

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## Installation Procedure

- Read the following instructions concerning system equipment and determine installation methods before proceeding.
- Determine equipment locations.
- Install wiring.
- Install housing.
- Check wires.
- Connect equipment.
- Check connections.

## Equipment Locations

**NC150N, NC200N Master Stations:** Locate NC150N or NC200N Master Station within easy reach of operating personnel. Do not exceed operating temperature of 10–30°C.

**IR150B Staff Stations:** Locate IR150B stations where convenient to operate, but not in the same room as the NC150N or NC200N Master Station. Do not exceed operating temperature range of 10–40°C.

**IR151B, IR152B, IR155B Patient Stations:** Locate patient stations where convenient for operation. Do not exceed operating temperature range of 10–40°C.

**SF155B Emergency Switch:** Locate emergency stations where convenient for operation. Avoid areas where direct contact with water may occur. The SF155B includes a 6' long pull cord permitting installation high enough to provide easy operation by the nurse and by seated or prone patients. The SF155B may be used without the cord as a pull-down actuated switch.

**SF156B Code Switch:** Locate code stations where convenient for operation. Avoid areas where direct contact with water may occur.

**LI150B Duty Stations:** Locate duty stations as needed and where convenient for operation. Location should provide for unobstructed visibility of the call indicator.

**LI381 Corridor Lights:** Locate corridor lights in the corridor above or beside the door of the associated room. Location should provide for unobstructed visibility of the corridor light in both directions.

**LI382, LI382LED Corridor Zone Lights:** Locate corridor zone lights in the corridor area nearest the nurses central monitoring station. Location should provide for unobstructed visibility of each corridor zone light from the central location.

**SF301A, SF302 Call Cords:** Insert call cord plugs into the associated station jacks as indicated on the stations. Call cords provided are 6' or 10' in length.

**PK151A, PK152 Power & Control Units:** Locate the PK151A or PK152 and IH151N Junction Box in an accessible area. Do not exceed operating temperature range of 10–30°C. Location should provide for convenient cable runs to remote and master stations. Cable run from the PK151A or PK152 to the NC150N or NC200N Master Station must not exceed 100'.

**PK800A Secondary Power Supply:** Locate the PK800A in an accessible area within 2 feet of the PK151A or PK152 that it is to be connected to. Do not exceed operating temperature range of 10–30°C. The PK800A is for use in applications that exceed the current load capacity of the PK151A or PK152 (1 amp). The PK800A allows the current load to be increased to 3 amps. The FZ151 Fuse Assembly must be located between the PK800A and the PK151A or PK152. See [Figure 16](#) for actual FZ151 connection points.

## System Installation

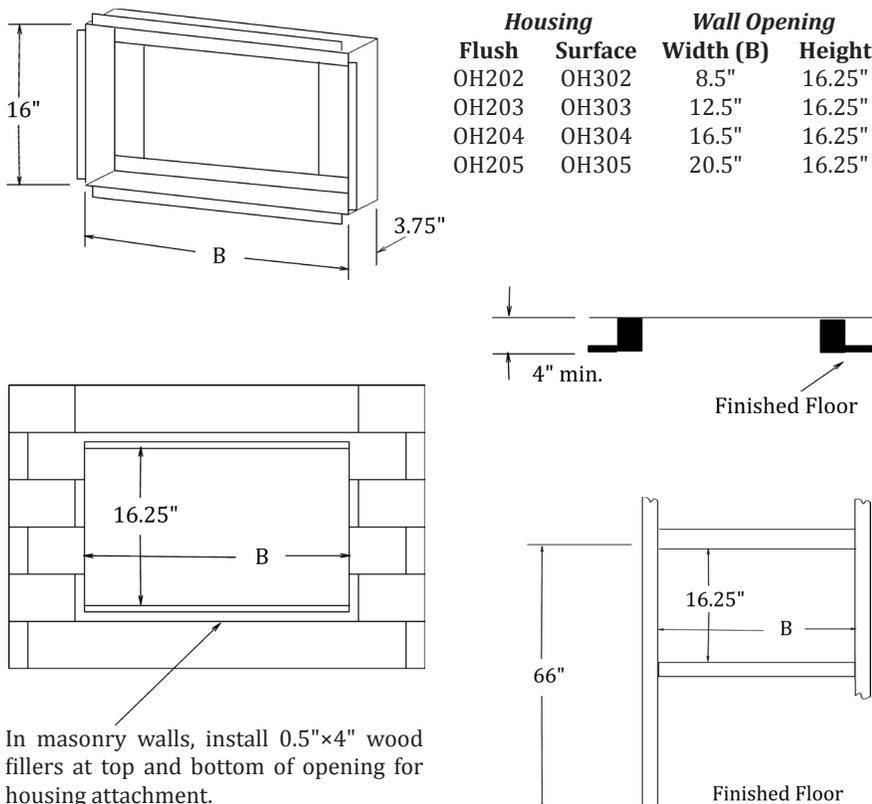
**SS100 24 VAC 100 VA Transformer:** Locate the SS100 within 3 feet of the PK800A Secondary Power Supply. Do not exceed operating temperature range of 10–30°C.

### Wiring Installation

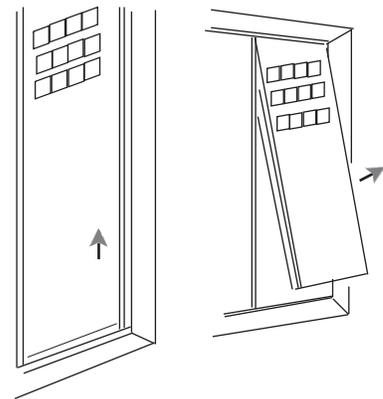
Run wiring conduit from corridor light to corridor light and terminate at the PK151A or PK152 Power & Control Unit. Limit each run to 15 corridor lights, 15 stations and 600 feet of wire. Refer to **Wiring Diagrams** section for additional connection and cabling information, starting with *Figure 9*. Select conduit size to accommodate the following cables:

- 4 cond. #18 common to all stations (except LI150B Duty Stations). Add 2 cond. #18 common if LI382 or LI382LED Corridor Zone Lights are used.
- 2 cond. #22 selective for each IR150B, IR151B, IR152B and IR155B Station in the system. Shielded cable must be used.
- 1 cond. #22 selective for each SF155B Emergency Station or SF156B Code Station not used in conjunction with a patient station.
- 4 cond. #18 to one LI150B Duty Station.

**Figure 3—Master Panel Housing Chart and Wall Cut-Out Details**



**Figure 4—Panel Removal and Replacement**



**Panel Removal:** First remove the self-tapping metal screws located in the top U-channel just above each panel. Then lift up on panel to clear bottom channel. After removal, adequate space is available to grasp and remove the remaining panels.

**Panel Replacement:** Insert top of panel into top channel, push panel in at bottom, and release. Panel should fall into place in bottom channel. Replace self-tapping metal screws.

## Housing Installation

### **NC150N Master Station:**

**Flush Wall Mounting:** Provide wall cutout as shown in [Figure 3](#). Remove panels from frame as shown in [Figure 4](#). Fit back box and frame assembly into prepared opening. Fasten assembly into place using screws provided in back box. Back box must be TekTone® OH200 Series. Replace panels using the procedure as shown in [Figure 4](#).

**Surface Mounting:** Remove panels from frame as shown in [Figure 4](#). Fasten box and frame assembly to wall through holes provided in back of box. Use suitable fasteners. Back box must be TekTone® OH300 Series. Replace panels using the procedure as shown in [Figure 4](#).

**NC200N Master Station: Desk Mounting:** Use TekTone® IH200N series Desk Cabinets.

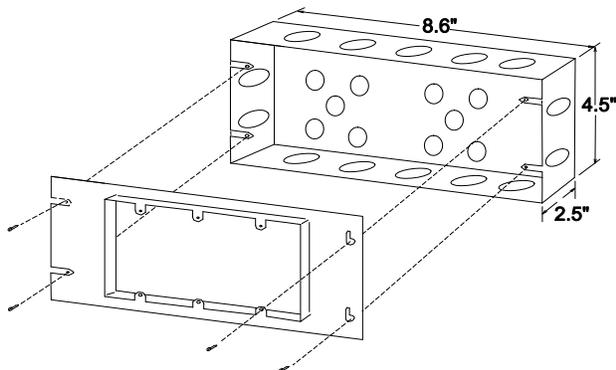
**IR150B, IR151B, IR152B, IR155B Staff and Patient Stations:** Ring and back box must be UL® approved. Install the back box (Steel City #H3BD with Steel City #3GC plaster ring or exact equivalent) as shown in [Figure 5](#) for each station in system. If a smaller back box is desired, use ARCO #2GB with ARCO #3GC ring. Minimum dimensions of the back box to be not less than 8.6"×4.5"×2.5". Minimum clearance from live parts on the station to dead metal parts to be not less than 0.5".

**SF155B Emergency and SF156B Code Stations:** Install single gang ring (or single gang ring/double gang box) as shown in [Figure 6](#) for each emergency or code station in system. Ring and back box must be UL® approved. Minimum dimensions of back box to be not less than 4"×4"×1.5". Minimum opening on ring to be not less than 1.75"×2.75". Minimum clearance from live parts on station to dead metal parts to be not less than 0.5".

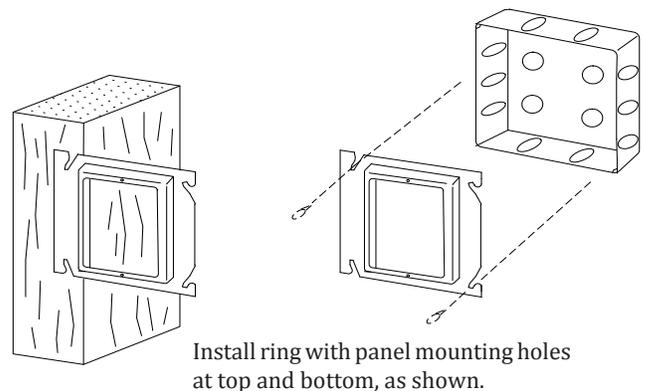
**LI150B Duty Stations:** Install single gang ring (or single gang ring/double gang box) as shown in [Figure 6](#) for each duty station. Ring and back box must be UL® approved. Minimum dimensions are the same as for the SF155B Emergency Station previously listed.

**LI381 Corridor Lights and LI382 Corridor Zone Lights:** Install double gang ring (or double gang ring and box) as shown in [Figure 6](#) for each corridor light in system. Ring and back box must be UL® approved. Minimum dimensions of back box to be not less than 4"×4"×1.5". Minimum opening on ring to be not less than 2.75"×2.75". Minimum clearance from live parts of station to dead metal parts to be not less than 0.5".

**Figure 5—Ring and Back Box for IR150B, IR151B, IR152B and IR155B**



**Figure 6—Ring and Back Box for SF155B, SF156B, LI150B, LI381, LI382 and LI382LED**



**LI382LED Corridor Zone Light:** Install standard one- or two-gang box with one- or two-gang ring as shown in [Figure 6](#) for each corridor light in system. Ring and back box must be UL® approved. Minimum clearance from live parts of station to dead metal parts to be not less than 0.5".

**PK151A or PK152 Power & Control Unit, IH151N Junction Box:** Fasten IH151N Junction Box to wall using suitable fasteners. Mount PK151A or PK152 inside junction box. Any alternate junction box must be UL® approved. Minimum dimensions of junction box must be not less than 12"×12"×4". Minimum clearance from live parts to dead metal parts on housing must be 1".

Install SS106 Transformer in junction box as shown in [Figure 7](#). Do not connect transformer primary to power source until entire installation is completed and checked for shorts and grounds.

Install transformer connection box as shown in [Figure 7](#). Transformer box must be UL® approved. Minimum dimensions must be not less than 1.75"×3.75"×1.5". The junction box, transformer and power & control unit are also available preassembled from the factory as part number IH151NK.

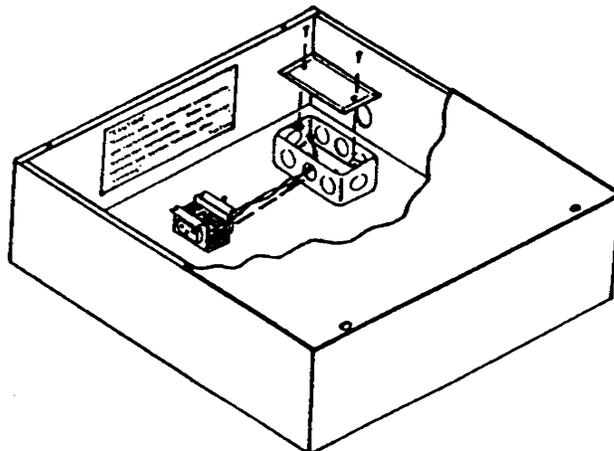
**PK800A Secondary Power Supply:** Fasten PK800A Secondary Power Supply to wall using suitable fasteners.

**SS100 24 VAC 100 VA Transformer:** Fasten SS100 24 VAC 100 VA Transformer to wall using suitable fasteners. **Do not connect transformer primary to power source until entire installation is completed and has been checked for shorts and grounds.**

### Wire Checkout

Use an ohmmeter or other continuity checking device to test wires for shorts or grounds. If shorts or grounds are encountered, find and correct the problem before continuing. Make sure minimum number of conductors needed for all of the equipment being used in the system are available.

**Figure 7—SS106 Transformer Installation**



### Wire Connections

Use crimp-style connectors for all wire connections. Do not use wire nuts.

**NC150N, NC200N Master Stations:** No internal wiring is necessary for the NC150N and NC200N Master Stations.

**IR150B, IR151B, IR152B, IR155B Staff and Patient Stations:** Connect wires as shown in [Figure 12](#).

**SF155B Emergency Stations:** Connect wires as shown in [Figure 12](#).

**SF156B Code Stations:** Connect wires as shown in [Figure 15](#).

**LI150B Duty Stations:** Connect wires as shown in [Figure 12](#).

**LI381 Corridor Lights, LI382 and LI382LED Corridor Zone Lights:** Connect wires as shown in [Figure 12](#).

**PK151A, PK152 Power & Control Unit:** Connect wires as shown in [Figure 12](#). Also connect secondary from the SS106 Transformer (24 VAC, 30 VA connections) to the PK151A or PK152 as shown in [Figure 12](#). Do not connect transformer primary to power source until entire installation is completed and has been checked for shorts and grounds.

**PK800A Secondary Power Supply:** Connect wires as shown in [Figure 16](#).

**SS100 24 VAC 100 VA Transformer:** Connect wires as shown in [Figure 16](#). Do not connect transformer primary to power source until entire installation is completed and has been checked for shorts and grounds.

### Connections Checkout

Recheck all connections to equipment. If all wires and connections are satisfactory, connect primary coil of SS106 Transformer to source of 117 VAC 60 Hz (40 watts max.) and operation of system can be checked according to **System Test Instructions** next in this section.

### System Test Instructions

Before proceeding with a system test, set all stations to normal conditions as follows:

**NC150N and NC200N Master Stations:** All push buttons should be in the **OUT** position. A depressed button may be released by pressing the button and then releasing it.

**IR150B Staff Station:** If the **CALL PLACED** lamp is illuminated, press the **RESET** button to reset it.

**IR151B, IR152B Patient Stations:** Insert a call cord in each call cord jack. If the **CALL PLACED** lamp is illuminated, press the **RESET** button to reset it.

**IR155B Patient Stations:** If the call cord has been pulled, reset the station by pushing the reset switch to the left.

**SF155B Emergency or SF156B Code Stations:** If the pull cord has been pulled, or the switch had been pulled down, reset the station by pushing the switch up.

**LI150B Duty Stations:** Push the **TONE OFF** switch up.

## System Checkout and Testing

**IR151B, IR152B, IR155B Patient Stations:** Test patient stations one at a time. Initiate a call on each patient station: Press the button on the end of the call cord for IR151B and IR152B Patient Stations (test both circuits on IR152B stations). Pull the call cord on the IR155B.

Check for operation of the following signals:

- The **CALL PLACED** lamp on the patient station should be illuminated.
- The LI381, LI382 or LI382LED Corridor Light near the room entrance should be illuminated.
- On the NC150N or NC200N Master Station, the call lamp should be illuminated and the associated station selector lamp (marked to identify the calling station) should be illuminated. A slowly repeating audible call tone should be heard. The normal call tone may be silenced by the **TONE OFF** button, which should be illuminated to indicate tone silencing.
- On all LI150B Duty Stations, the **CALL PLACED** lamp should be illuminated, and a slowly repeating audible call tone should be heard. The normal call tone may be silenced by the **TONE OFF** switch.

Reset the call at the patient station: Press the **RESET** button on IR151B and IR152B Stations. Push the **RESET** switch to the left on IR155B Stations. All signals should be canceled.

Test the intercom function:

- Initiate a call on each station as previously described.
- On the master station, select the calling station by pressing the illuminated station selector button and check for the following:
  1. The **STATION SELECTOR** lamp should be canceled.
  2. The **CALL** lamp should turn off.
  3. The audible call tone should be canceled.
  4. The remote station's **IN USE LED** should be illuminated.
- Press the **CALL** button and the **TALK** button on the master station. An electronic call tone should be heard at the master station and at the patient station.
- Press the **TALK** button and speak in a normal voice. Release the button to hear the reply.
- At the patient station, the **CALL PLACED** lamp should turn off, and the **IN USE LED** should be illuminated.
- When voice communication is heard, reply in a normal voice.
- Return all controls to the normal position.

**On each IR150B Staff Station,** test operation the same as with the IR151B Patient Station, except place a call using the **CALL** button instead of a call cord.

**On each SF155B Emergency or SF156B Code station** (one at a time), slide the call switch down, and then check the following signals:

- The **CALL PLACED** lamp should be flashing.
- The LI381, LI382 or LI382LED Corridor Light near the room entrance should be flashing.
- On the master station, the **CALL** lamp should be flashing, the associated station selector lamp (marked to identify calling station) should be flashing, and an intermittent audible call tone should be heard. The **TONE OFF** button must not cancel the emergency code call tone.

**On all LI150B Duty Stations,** check the following signals:

- The **CALL PLACED** lamp should be flashing.
- The rapidly pulsing audible call tone should be heard. The **TONE OFF** switch must not cancel the emergency call tone.

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# System Maintenance Instructions

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Most of the equipment and parts used in the NC150N and NC200N Nurse Call Systems are not user serviceable and cannot be replaced or repaired by the end user. Equipment must be repaired by qualified service personnel only. Parts which are user serviceable are listed in the following sections and their replacement explained.

## NC150N, NC200N Master Stations

There are several user serviceable parts in the NC150N and NC200N Master Stations. Only one of these parts is electrically operated. The user serviceable parts and replacement procedures are explained below.

Refer to *Figure 8* to identify replacement switch parts. A full list of replacement parts and numbers appears in the **Replacement Parts** section.

### ***Selector Lamp/Switch Lens Replacement:***

- Remove lens by squeezing top and bottom together and pulling away from panel.
- Replace with same color lens by pushing new lens towards panel. The lens should snap into place on the selector lamp/switch knob with a noticeable click.

### ***Selector Lamp/Switch Filter Identification:***

- Remove lens by squeezing top and bottom together and pulling away from panel.
- Remove white filter by lifting it out of selector lamp/switch knob.
- Identify filter by room number or other means using dry transfer lettering, labels, or other similar methods. Be sure identified filter is replaced in knob so that lettering is readable right side up.

### ***Defective Lamp Replacement:***

- Remove lens and filter by method described above.
- Using needle-nosed pliers, tweezers or similar tool, pull lamp out of socket by gripping lamp at sides and moving it from side to side as it is pulled away from the panel. **WARNING: Do not squeeze too tightly, or it will break.**
- Replace lamp by holding with tool and pushing into socket. Be sure lamp is turned so that the base is lined up with the slot in the socket. Lamp must be pushed in below the level of the filter.
- Push test button to make sure lamp has been placed in socket properly. If lamp does not light, try pressing more firmly into socket. If lamp still does not light, repeat steps above with new lamp until one works properly.
- Replace lens and filter in lamp/switch knob as previously described.

### ***Defective Handset Replacement:***

- To remove handset from panel, grip end of modular plug on the handset cord firmly and squeeze until cord is easily pulled straight away from panel.
- To replace handset, hold end of plug on the handset cord, squeeze and push straight into jack on panel. Release and plug will click into place.
- To test handset, initiate a call to a remote station. The handset should operate as described above.

### PK151A, PK152 Power & Control Units

There are no user serviceable parts in the PK151A and PK152 Power & Control Units. Notify qualified service personnel for repair or replacement.

### IR150B Staff and IR155B Patient Stations

There are no user serviceable parts on these stations. Notify qualified service personnel for repair or replacement.

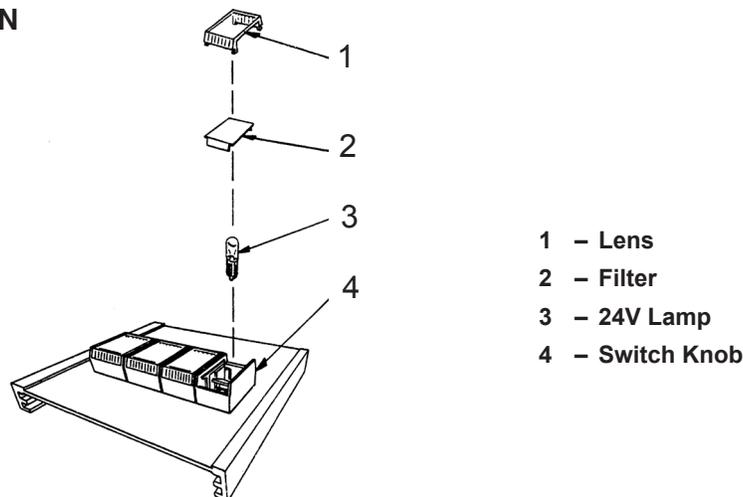
### PK800A Secondary Power Supply

The only user serviceable part is a 4A, 125 VAC fuse (1.25"×0.25").

- Disconnect power to the associated SS100 transformer. If the SS100 is hard wired, locate the associated breaker and turn it off. If a means cannot be established to remove power to the SS100, then contact qualified service personnel and do not proceed further. The SS106 powering the associated PK151A or PK152 should also be powered down in the same fashion.
- Once power has been disconnected, firmly grasp the black fuse holder knob on the side of the PK800A, push in and rotate it counterclockwise. Pull out on the knob and the fuse will be exposed.
- Remove the fuse and insert the new fuse. Reinsert fuse holder knob. Restore power to the system.

For repair or replacement of any other parts, contact qualified service personnel. A list of replacement parts and numbers appears in the [Replacement Parts](#) section.

**Figure 8—NC150N, NC200N  
Lens, Filter and Lamp  
Replacement**



### FZ151 In-Line Fuse Holder

The only user serviceable part is a 4A, 125 VAC fuse (1.25"×0.25").

- Disconnect power to the associated SS100 transformer. If the SS100 is hard wired, locate the associated breaker and turn it off. If a means cannot be established to remove power to the SS100, then contact qualified service personnel and do not proceed further. The SS106 powering the associated PK151A or PK152 should also be powered down in the same fashion.
- Once power has been removed, firmly grasp both ends of the fuse holder, push in and rotate in opposite directions. Pull out on both ends and the fuse will be exposed.
- Remove the fuse and insert the new fuse. Put fuse holder back together and verify that both pieces are interlocked. Restore power to the system.

For repair or replacement of any other parts, contact qualified service personnel. A list of replacement parts and numbers appears in the [Replacement Parts](#) section.

### IR151B, IR152B Patient Stations

The only user serviceable part on these stations is the call cord. To replace:

- To remove the call cord, grip end of plug firmly and pull straight away from patient station.
- To replace the call cord, hold by end of plug and push straight into call cord jack on patient station.
- To test, push the button at the end of the call cord. The **CALL PLACED** lamp should illuminate. Push the **RESET** button to cancel the call.

For repair or replacement of any other parts, contact qualified service personnel. A list of replacement parts and numbers appears in the [Replacement Parts](#) section.

### SF155B Emergency and SF156B Code Stations

There are no user serviceable parts on these stations. Notify qualified service personnel for repair or replacement.

### LI150B Duty Stations

There are no user serviceable parts on these stations. Notify qualified service personnel for repair or replacement.

### LI381 Corridor and LI382 Corridor Zone Lights

- To remove cover, grip firmly by sides, and pull cover away from plate.
- To remove bulb, make sure that no call is placed, then push bulb in towards plate. Turn bulb counterclockwise and pull bulb out of socket. On LI382, remove red bulb cover before removing bulb.
- To replace bulb, hold by glass part and push metal end into socket. When resistance is encountered, turn bulb clockwise until it falls into socket. (Metal part should be below the top of the socket.) Push bulb again and turn clockwise until bulb stops turning, and then release. On LI382, replace red bulb cover. Be sure to place bulb cover over the same bulb from which it was removed.
- To test light, place call at the associated station. If light still does not work, repeat steps above until corridor lamp and/or corridor zone lamps function properly.
- To replace cover, reverse instructions for removal.

### Replacement Parts

<i>Part No.</i>	<i>Description</i>	<i>Used For</i>
FZ010	4A Fuse	PK800A Secondary Power Supply and FZ151 Fuse Asst.
LI014	24V Lamp	NC150N, NC200N Control and Selector Module Lamps
LI028	28V Lamp	LI381, LI382 Corridor Lights
RP021	Blank Filter	NC150N, NC200N Selector Button Label
RP022	Orange Lens	NC150N, NC200N Call and Selector Buttons
RP024	Green Lens	NC150N, NC200N Talk Button
RP027	Clear Lens	NC150N, NC200N Duty Button
RP028	Yellow Lens	NC150N, NC200N Tone Off Button
RP037A	Red Bulb Cover	LI382 Corridor Zone Lights
SF301A	Call Cord	IR151B, IR152B
SF302	Dual Call Cord	IR151B, IR152B
TA150N	Handset	NC150N Master Station
TA200N	Handset	NC200N Master Station

## Figure 9—NC150N, NC200N Nurse Call Systems Notes and Electrical Ratings

### **Wiring Notes:**

1. Selector switch shown is representative of both NC150N and NC200N Master Stations.
2. Terminal identifications shown are not in actual order.
3. Main supply circuit: Connect to 117 VAC, 60 Hz (40 watts max). Use 18 gauge wire minimum. SS106 Transformer rating is 24 VAC, 30 VA max.
4. Use shielded cable if not in a metal conduit. If shielded cable is used, shield drain wire replaces conductor connected to Terminal C on TALK/LISTEN switch module.
5. All wiring is #18 gauge unless otherwise specified.
6. System wire description:
  - C = Audio common
  - R = Normal call
  - P = +24 VDC
  - Q = Emergency common
  - X = Audio selective
  - L = Lamp wire selective

### **Electrical Ratings (Maximum):**

NC150N/NC200N Master Station.....	24 VDC, .36 amps
PK151A Power & Control Unit.....	24 VAC, 60 Hz, 1.25 amps
PK152 Power & Control Unit.....	24 VAC, 60 Hz, 1.25 amps
IR150B Staff Station.....	24 VDC, .09 amps
IR151B Patient Station.....	24 VDC, .09 amps
IR152B Patient Station.....	24 VDC, .09 amps
IR155B Patient Station.....	24 VDC, .09 amps
SF155B Emergency Station.....	24 VDC, .03 amps
SF156B Code Station.....	24 VDC, .06 amps
LI150B Duty Station.....	24 VDC, .03 amps
LI381 Corridor Light.....	24 VDC, .06 amps
LI382 Corridor Zone Light.....	24 VDC, .068 amps
LI382LED Corridor Zone Light.....	24 VDC, .08 amps
PK800A Secondary Power Supply.....	24 VAC, 60 Hz

# Figure 10—Block Wiring Diagram without Zone Lamps

### Trunk Cable

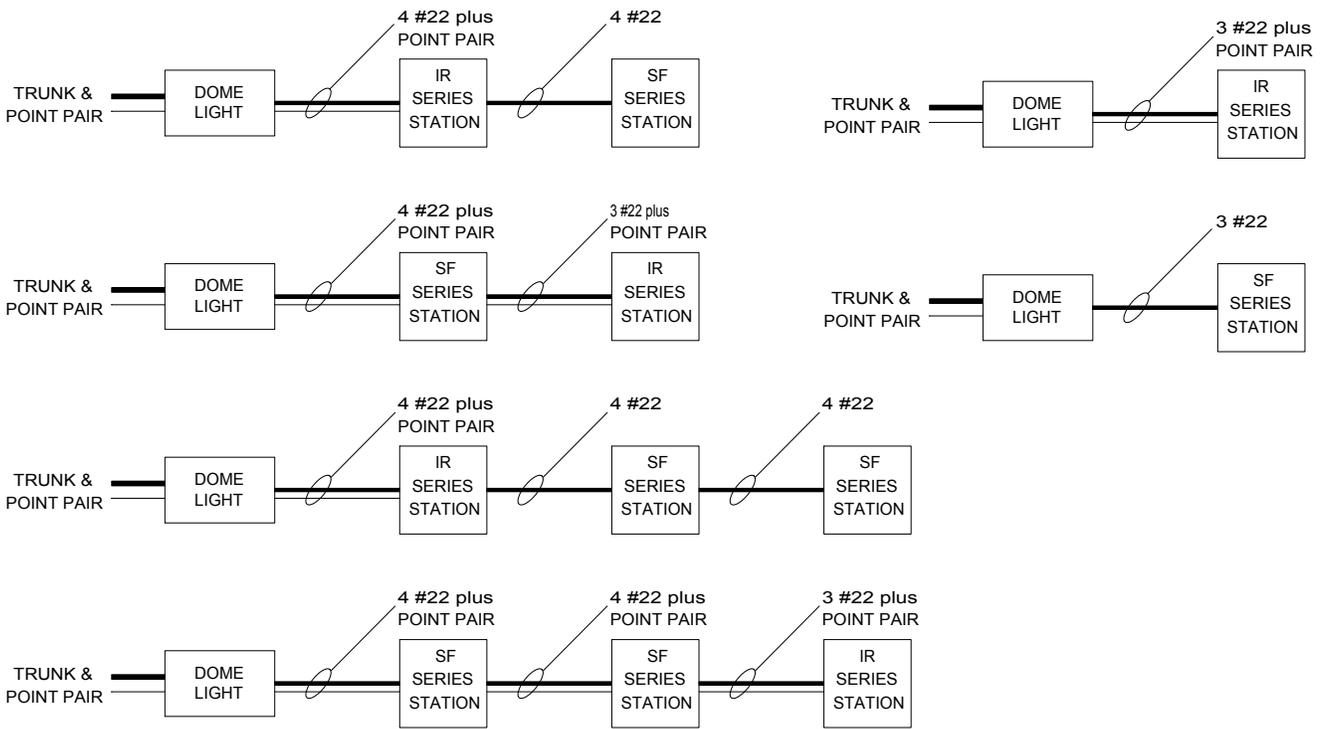
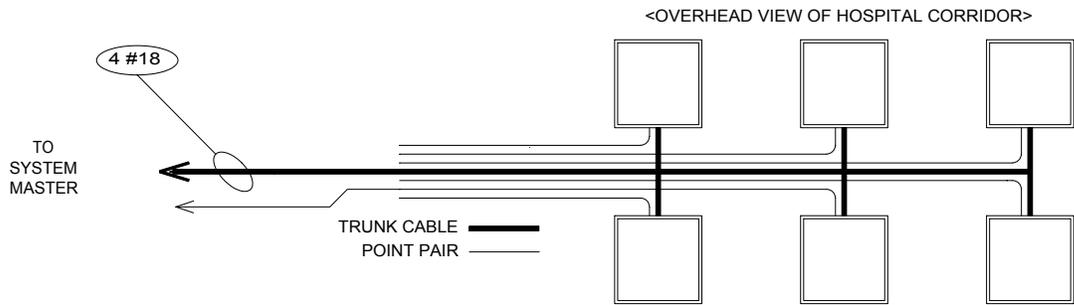
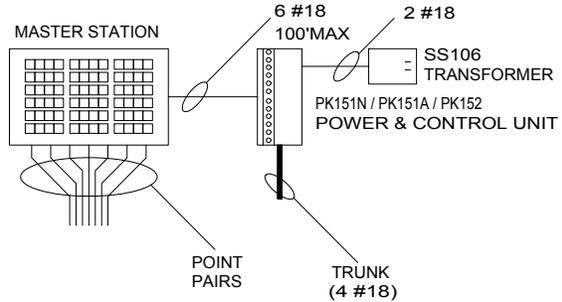
4 #18. These conductors are common to all rooms. (NOT individual home runs.) Maximum 15 corridor lights, 15 stations and 600' per run.

### Point Pair

2 #22 shielded per room, home run to the master. Shield not required if run in metal conduit. Shield must be continuous (no physical gaps) to IR station.

If shielded wire is used, the shield replaces the "C" line on each station (terminated at "C" terminal); and the shield can be ground at master end *only*.

If metal conduit is used, the conduit must be continuous (no physical gaps); it must contain only intercom wiring; and it should not be ground at multiple locations.



IL380 NC150N NC200N Block Diagram 1 Rev4 081214

# Figure 11—Block Wiring Diagram with Zone Lamps

## Trunk Cable

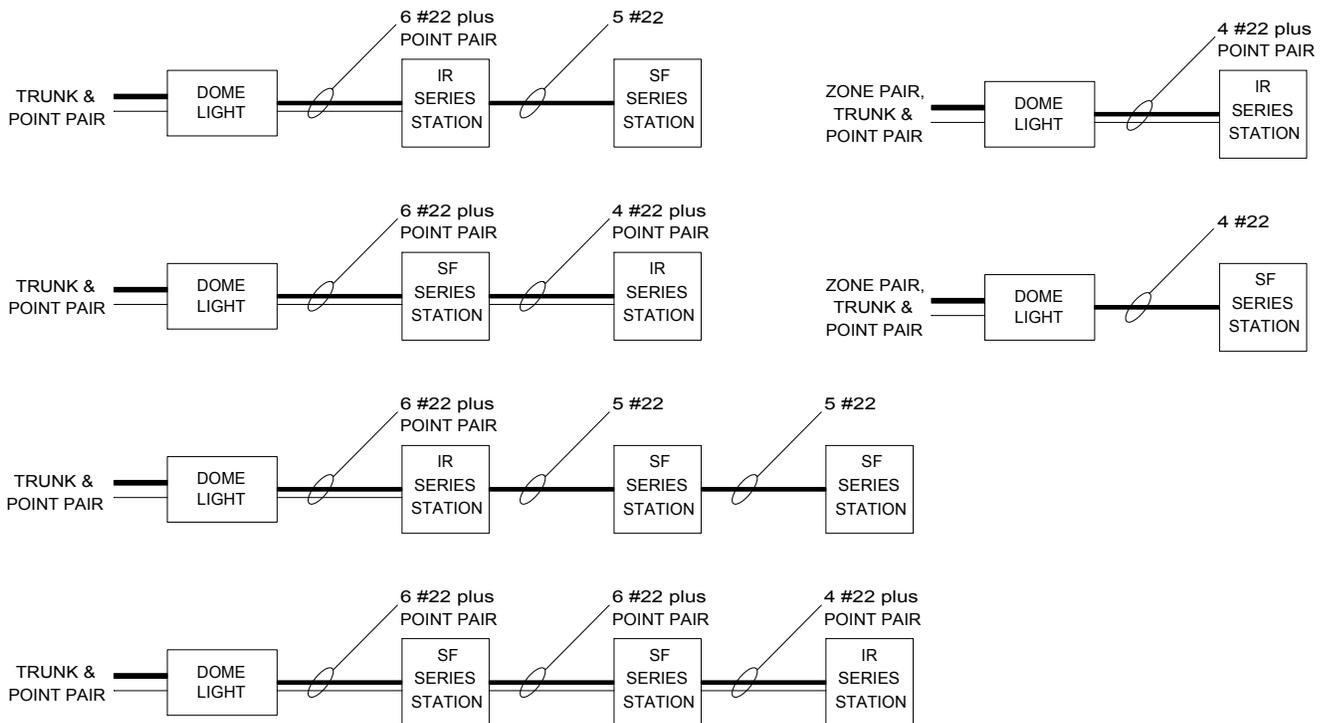
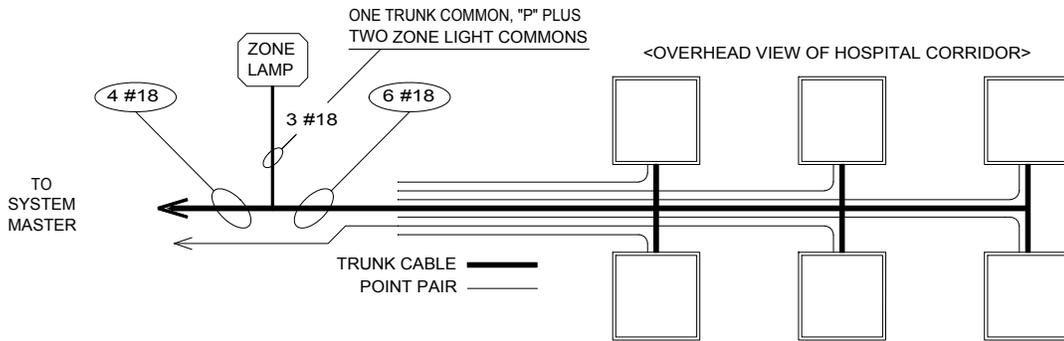
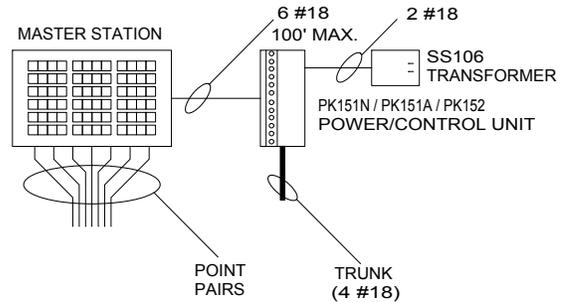
6 #18 (4 #18 + 2 #18 for zone pair). The two additional conductors extend from zone lamp through corridor. These conductors are common to all rooms. (NOT individual home runs.) Maximum 15 corridor lights, 15 stations and 600' per run.

## Point Pair

2 #22 shielded per room, home run to the master. Shield not required if run in metal conduit. Shield must be continuous (no physical gaps) to IR station.

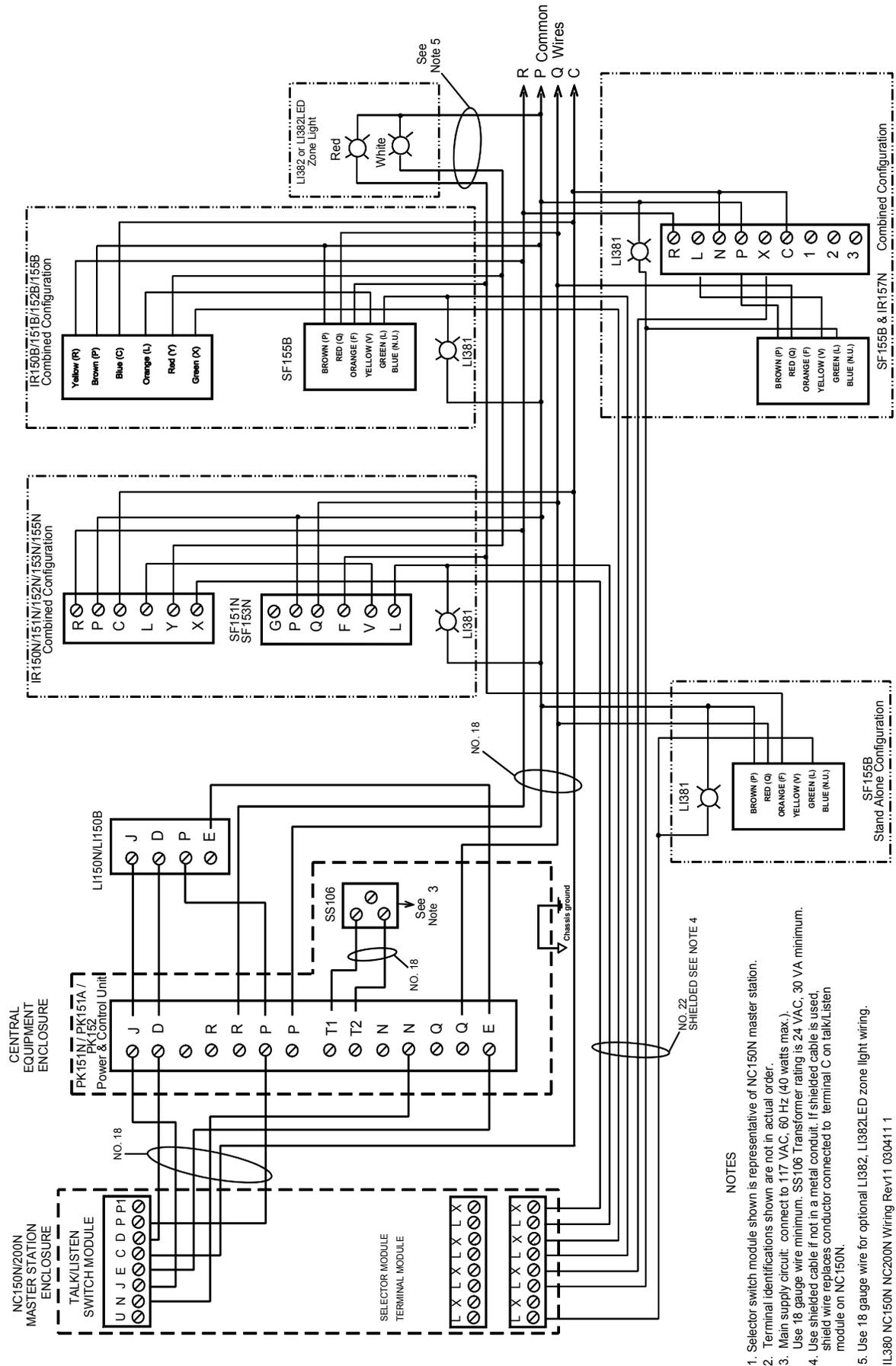
If shielded wire is used, the shield replaces the "C" line on each station (terminated at "C" terminal); and the shield can be ground at master end *only*.

If metal conduit is used, the conduit must be continuous (no physical gaps); it must contain only intercom wiring; and it should not be ground at multiple locations.



IL380 NC150N NC200N Block Diagram 2 Rev4 081214

# Figure 12—NC150N, NC200N Wiring Diagram

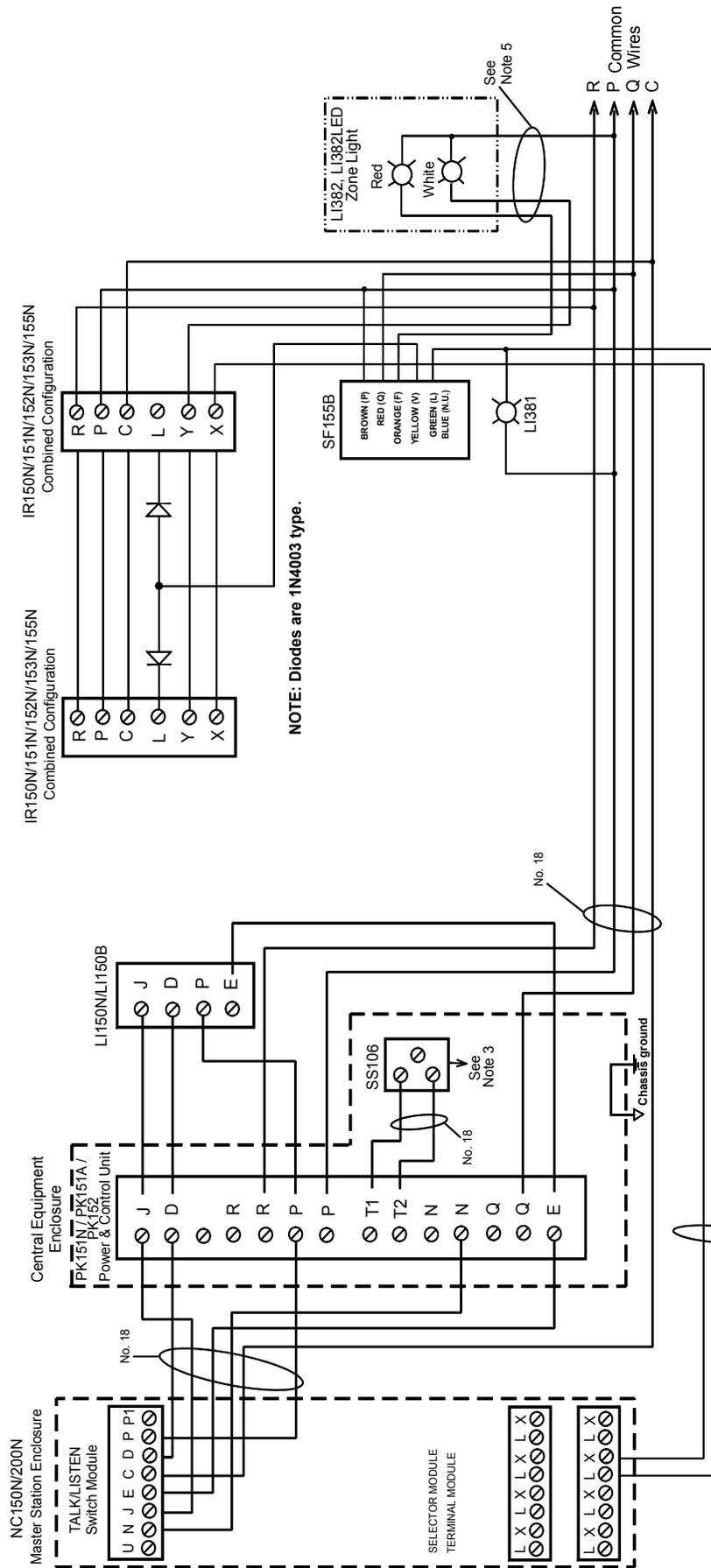


**NOTES**

1. Selector switch module shown is representative of NC150N master station.
2. Terminal identifications shown are not in actual order.
3. Main supply circuit: connect to 117 VAC, 60 Hz (40 watts max.). Use 18 gauge wire minimum. SS106 Transformer rating is 24 VAC, 30 VA minimum.
4. Use shielded cable if not in a metal conduit. If shielded cable is used, shield wire replaces conductor connected to terminal C on talk/listen module on NC150N.
5. Use 18 gauge wire for optional LI382, LI382LED zone light wiring.

IL380 NC150N NC200N Wiring Rev11 030411 1

**Figure 13—NC150N, NC200N, Two Stations in Parallel**



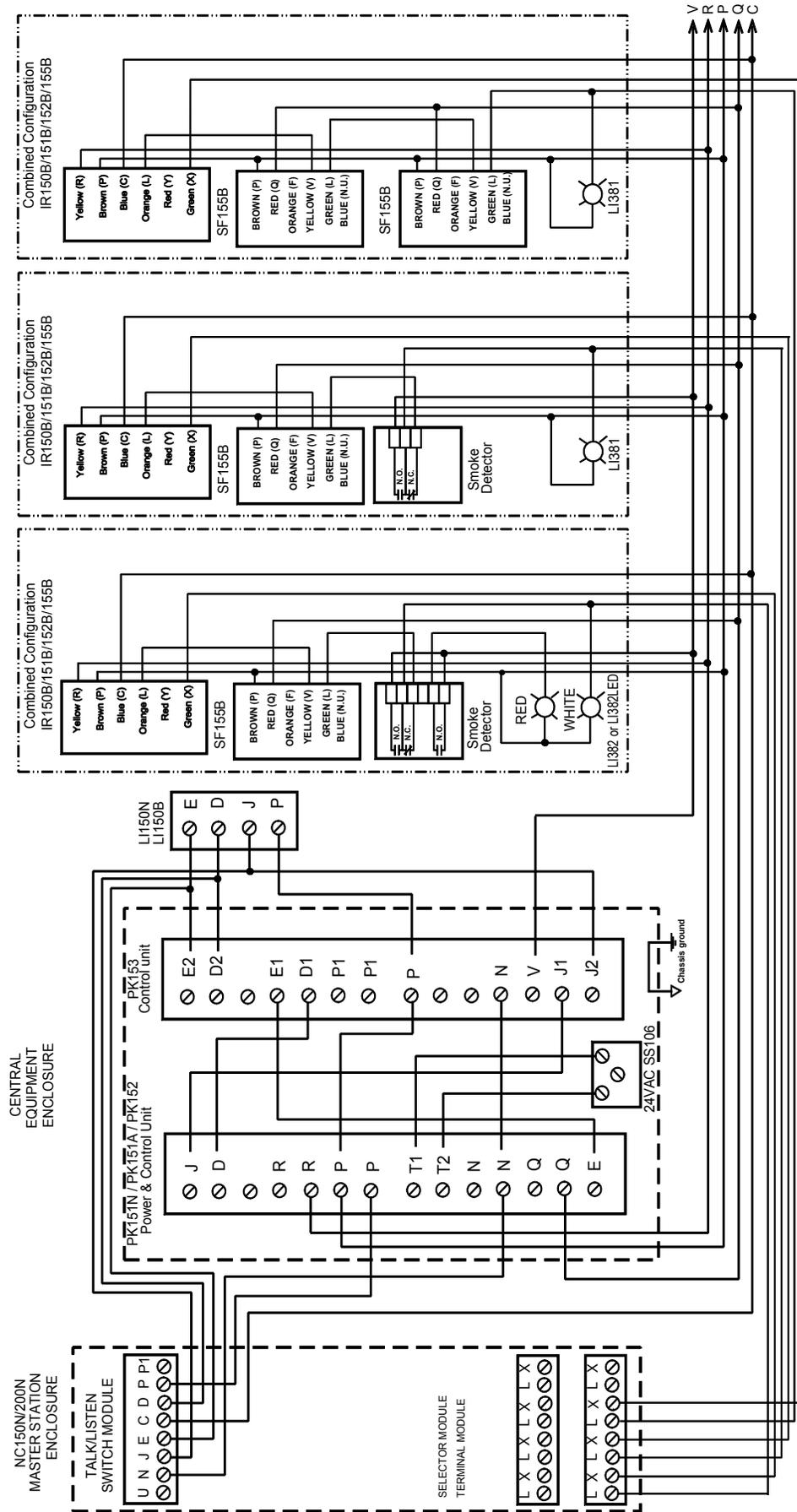
NOTE: Diodes are 1N4003 type.

**NOTES**

1. Selector switch module shown is representative of NC150N master station.
2. Terminal identifications shown are not in actual order.
3. Main supply circuit: Connect to 117 VAC, 60 Hz (40 watts max.). Use 18 gauge wire minimum. SS106 Transformer rating is 24 VAC, 30 VA minimum.
4. Use shielded cable if not in a metal conduit. If shielded cable is used, shield wire replaces conductor connected to terminal C on talk/Listen module on NC150N.
5. Use 18 gauge wire for optional L1382, L1382LED zone light wiring.

IL380 IL1381 NC150N NC200N 2 Stations Parallel Rev5 030311 1

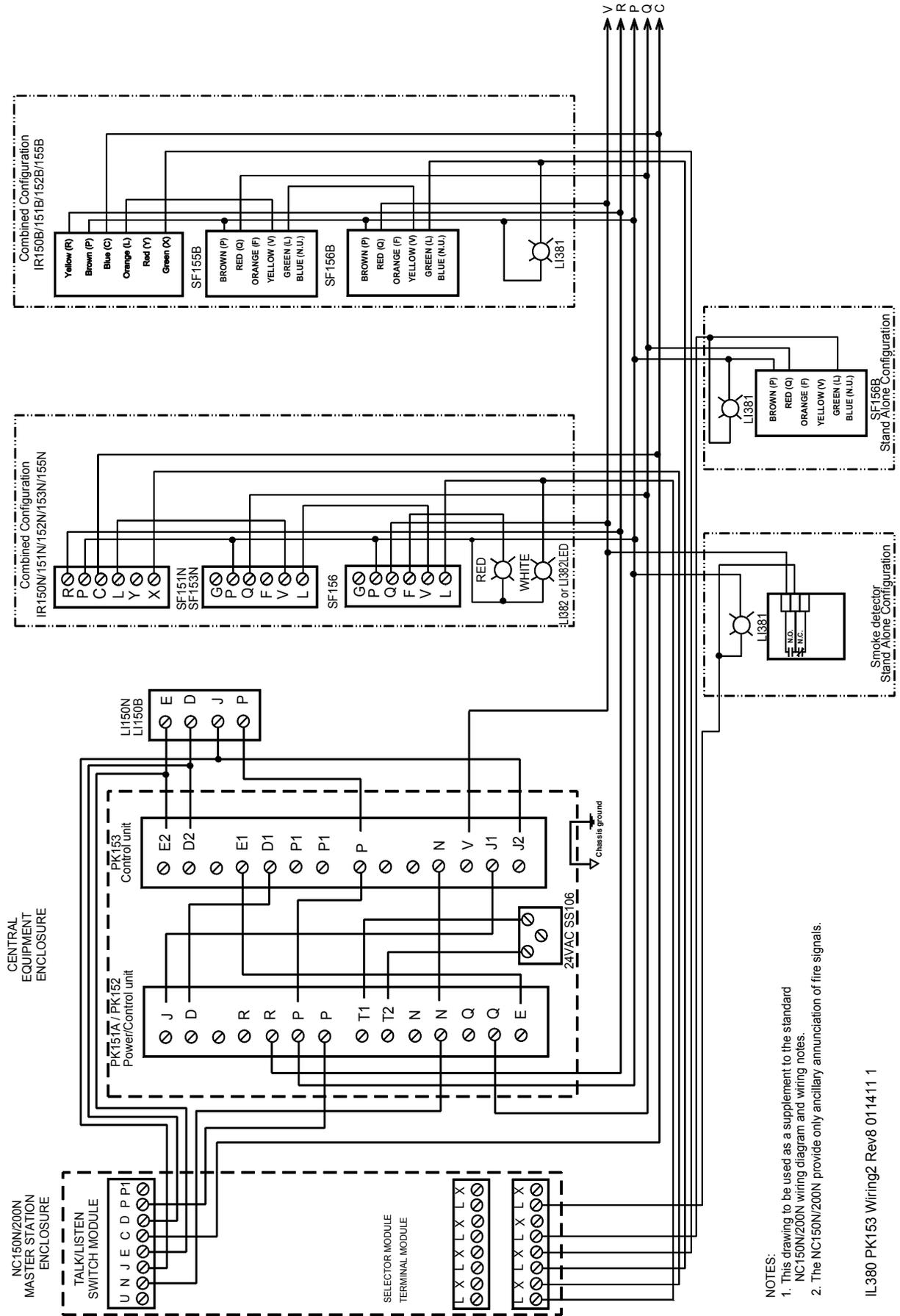
# Figure 14—PK153 Wiring Diagram with Smoke Detector



NOTES:  
 1. This drawing to be used as a supplement to the standard NC150N/200N wiring diagram and wiring notes.  
 2. The NC150N/200N provide only ancillary announcement of fire signals.

IL380 PK153 Wiring Rev10 011411 1

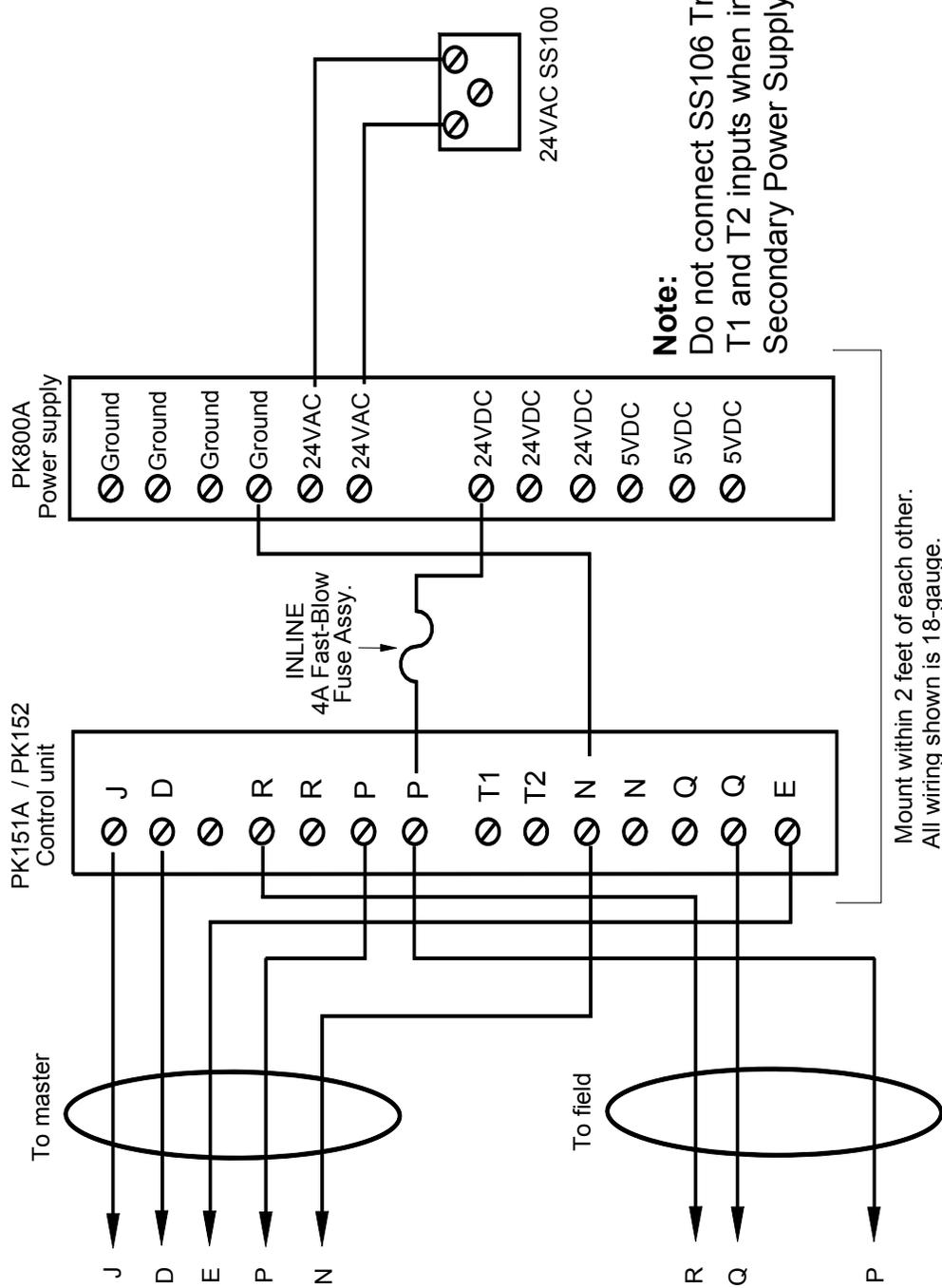
**Figure 15—PK153 Wiring Diagram with SF156B Code Station**



**NOTES:**  
 1. This drawing to be used as a supplement to the standard NC150N/200N wiring diagram and wiring notes.  
 2. The NC150N/200N provide only ancillary annunciation of fire signals.

IL 380 PK153 Wiring2 Rev8 011411 1

**Figure 16—PK151A or PK152 to PK800A Interconnection**

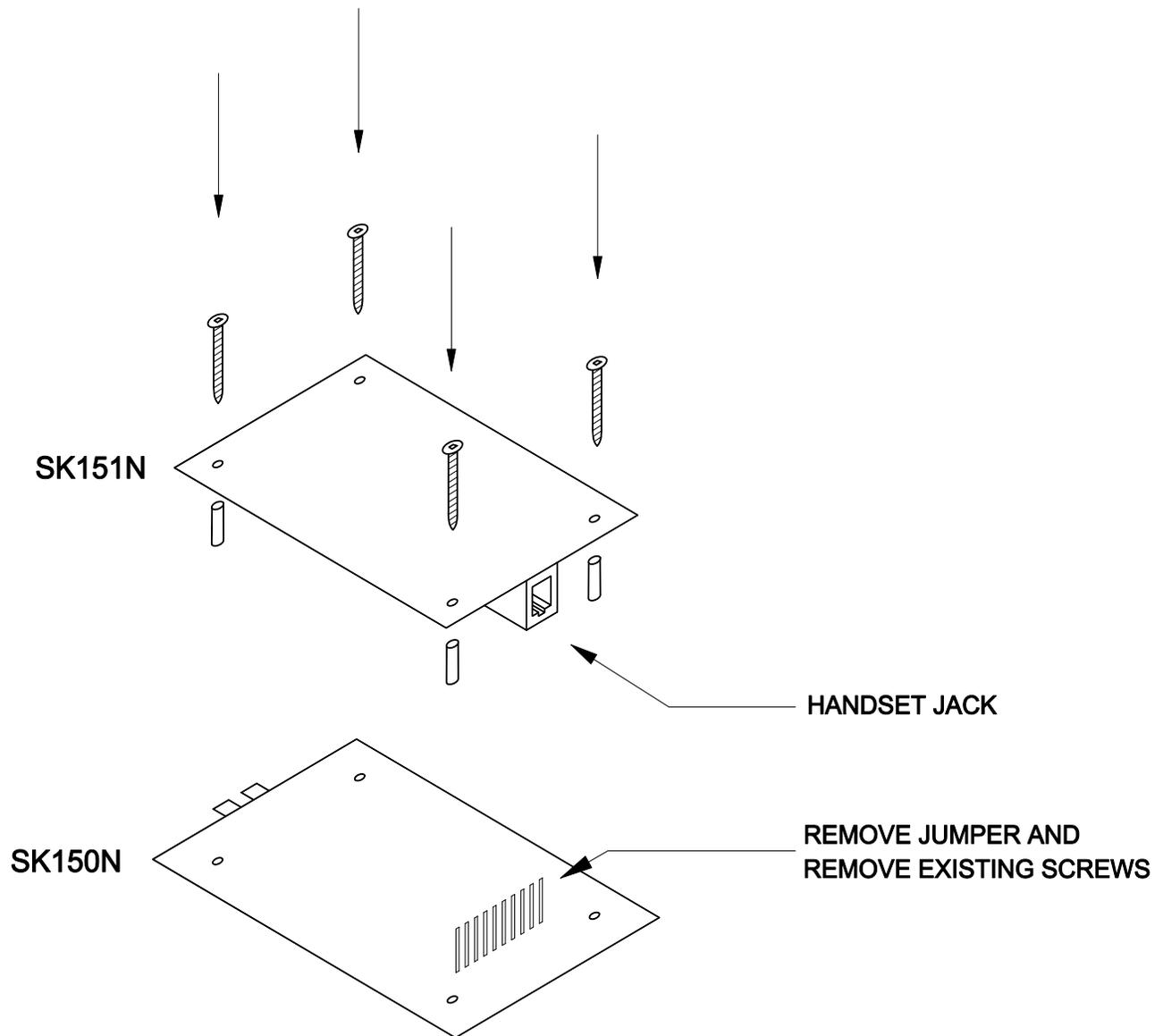


**Note:**  
Do not connect SS106 Transformer to PK151A/PK152  
T1 and T2 inputs when interconnecting PK800A  
Secondary Power Supply!

Mount within 2 feet of each other.  
All wiring shown is 18-gauge.

IL381 PK151A PK800A Interconnection Rev5 030111

**Figure 17—SK151N Switch Board PCB Assembly**



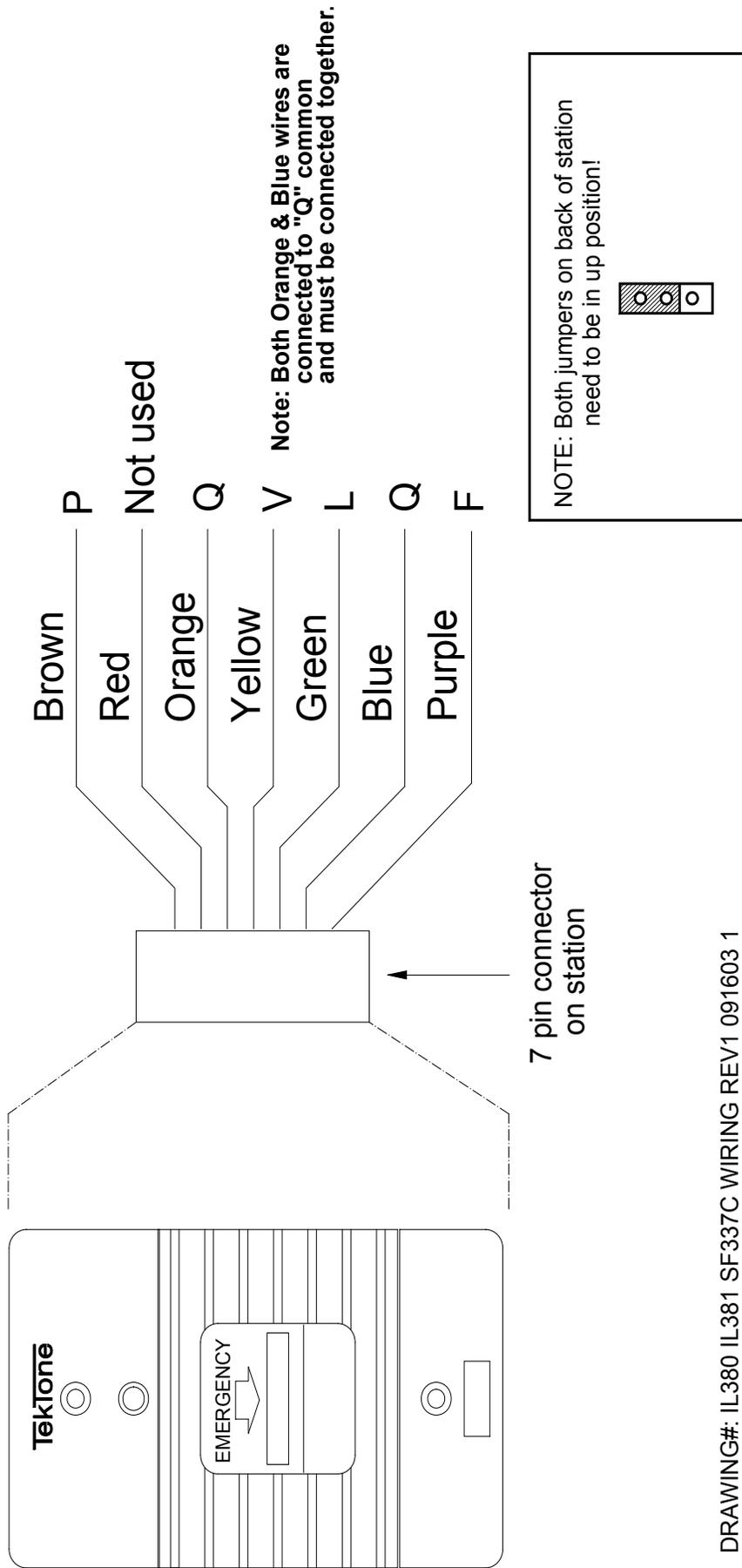
**PROCEDURE:**

1. Disconnect power from unit.
2. Remove jumper from rear of SK150N.
3. Remove screws at each corner of SK150N.
4. Attach SK151N board—inserting screws and spacers as illustrated.
5. Install handset cord & connect into jack on SK151N.
6. Apply power to unit & test handset operation.

**\* OBSERVE PIN ALIGNMENT DURING BOARD INSTALL\***

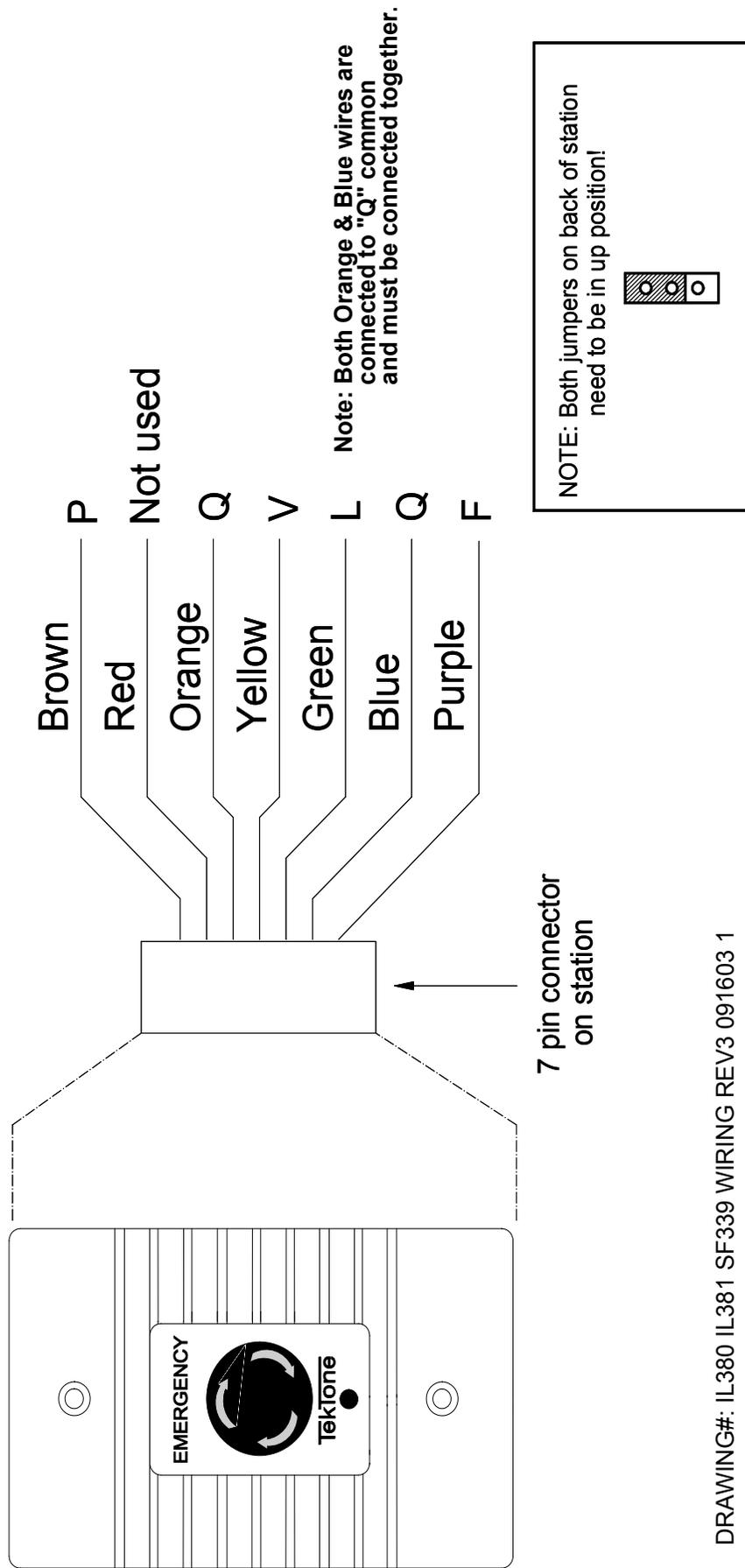
**SK151N Switch Board PCB Assembly Rev0 060501 1**

**Figure 18—SF337C Cross Reference Diagram**



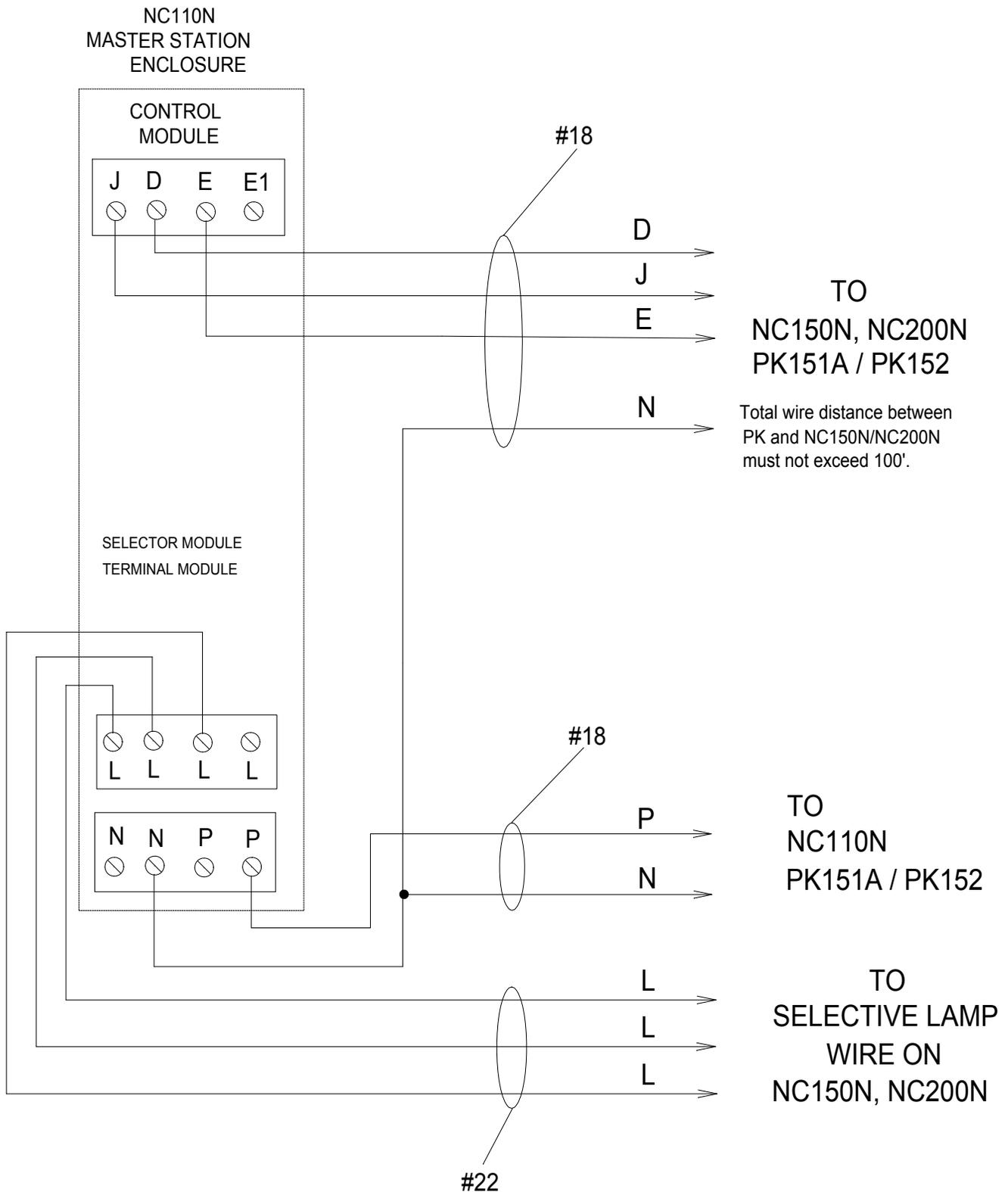
DRAWING#: IL380 IL381 SF337C WIRING REV1 091603 1

**Figure 19—SF339 Cross Reference Diagram**



DRAWING#: IL380 IL381 SF339 WIRING REV3 091603 1

**Figure 20—NC110N Hookup to NC150N, NC200N**



IL381 NC110N NC150N NC200N Hookup Rev2 100110 1