

# No Phone Line System

Used in conjunction with EntraGuard Gold Telephone Entry Systems, the NPL II provides “No Phone Line” communication and door or gate control through existing building telephone lines without the need to purchase phone company switching services. The NPL II consists of a NPL II Cabinet and one or more Auxiliary Relay Cabinets which mount in out-of-the-way locations such as telephone or utility closets. Each relay within an Auxiliary Relay Cabinet is associated with one telephone in the area to be serviced. Mounting and wiring instructions for EntraGuard Gold Panels are unchanged when using the NPL II, except for the phone line, which is wired to the NPL II.

## 1.0 Installation

The NPL II Cabinet provides the link between the EntraGuard Gold Panel and the Auxiliary Relay Cabinet. The Auxiliary Relay Cabinet controls switching to the individual building phones. Up to 96 lines can be supported by each Auxiliary Relay Cabinet and up to 16 cabinets can be linked together for a total of 1,536 lines.

### 1.1 Unit Location

Ideally, both the NPL II Cabinet and all Auxiliary Relay Cabinets should be located adjacent to the phone line punch down block(s) which distributes calls to the individual building phones. If installation adjacent to the phone line punch down block(s) is not possible, contact your dealer for alternative installation procedures and applicable wire-run limitations.

### 1.2 Unit Mounting

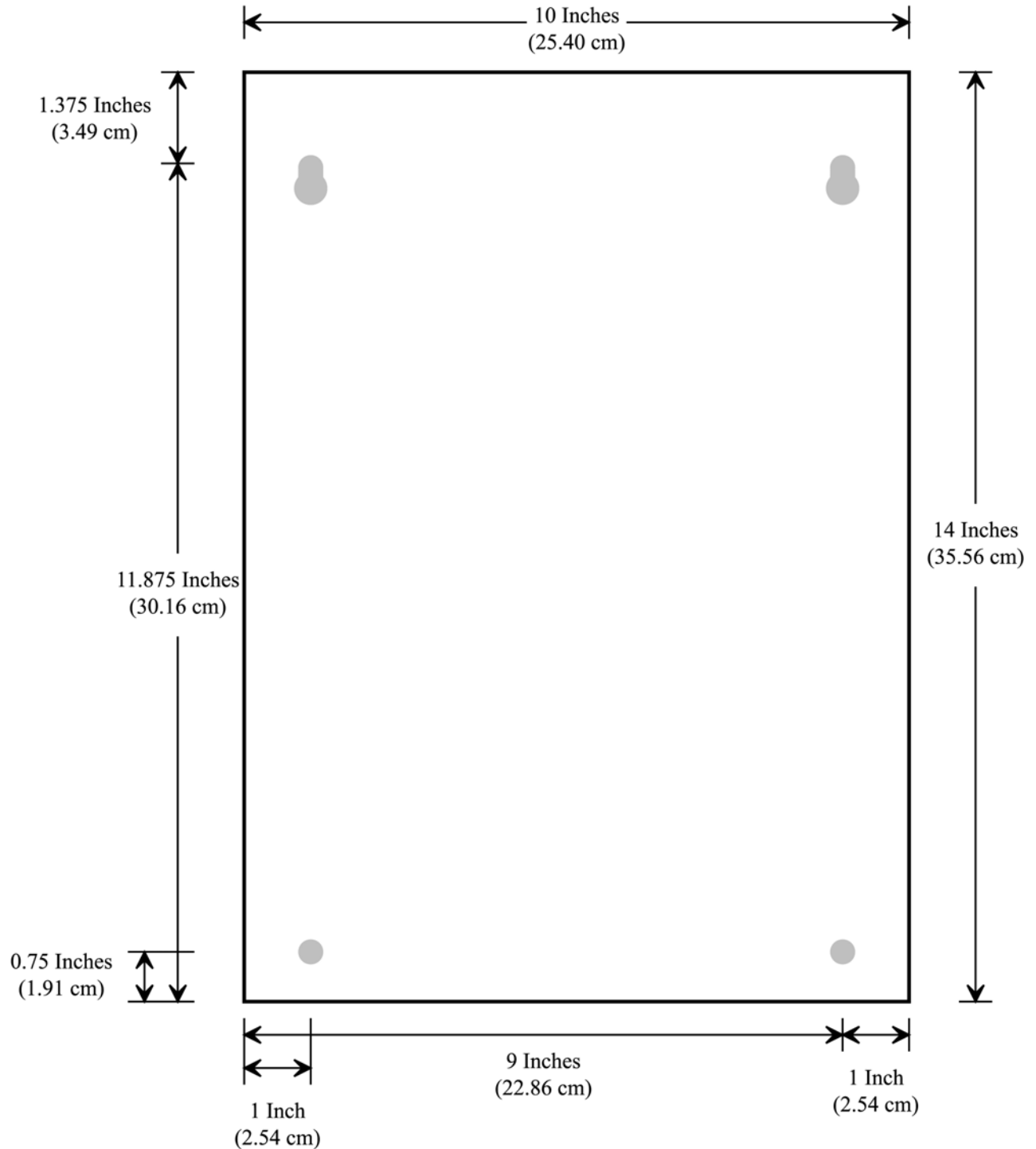
Each unit should be mounted on a solid wall. Typically, four #10 1-1/2 inch wood screws into studs or a Telco back board are used. If necessary, provide additional framing or a backing plate if the cabinets are being mounted to paneled or dry walled areas. The more securely the units are mounted, the higher the level of ongoing system integrity.

*NOTE: Before beginning unit mounting and wiring, check all applicable local, state, and federal codes to ensure that all mounting location and wiring requirements are met.*

1. For each NPL II Cabinet or Auxiliary Relay Cabinet, prepare the mounting surface to receive four #10 1-1/2 inch wood screws, or four 3/16 inch bolts or drive studs (see Figure 1 on page 2).
2. Remove the electrical knockouts from each cabinet as required.
3. Start the upper two screws (the upper mounting holes in each cabinet are slotted to allow the cabinet to be slipped over these two screws). Set the cabinet in place. Insert and tighten the lower two screws, then tighten the upper two screws.



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**Figure 1: NPL II Cabinet and Auxiliary Relay Cabinet Mounting Hole Locations**

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## 1.3 Power Requirements

The NPL II Cabinet is powered by a 16 VAC @ 40 VA Class II step down transformer which must be connected to a separate, unswitched (always ON) 120VAC circuit (typically a standard wall outlet). If possible, provide a dedicated power circuit free from any other loads to avoid any inadvertent power fluctuations to the unit, and locate the transformer as close as possible to the cabinet (see Table 1) in a place where it will not be accidentally unplugged.

**Table 1: Wire Gauge per Run Length**

Run Length in Feet	Minimum Wire Gauge
0 to 80 feet	18
31 to 300 feet	16
301 to 500 feet	14
501 to 800 feet	12

### 1.3.1 Earth Ground

Make a quality earth ground connection to the NPL II panel to ensure the best possible operating conditions for the panel (see Figure 3 on page 6). Without a quality earth ground connection, the NPL II panel may appear to operate correctly, but will be extremely susceptible to transients and electromagnetic interference on data and power lines. An earth ground brings all electrically neutral lines to the earth's surface potential (essentially to a zero potential) providing two primary benefits to the NPL II panel.

1. An earth ground protects the NPL II panel from electrical transients such as power surges and lightning strikes (also providing a degree of safety for an operator).
2. An earth ground provides a path to ground for electrical interference minimizing data and communication problems for the NPL II panel communication lines.

Here are some possible sources for an earth ground.

- copper shrouded ground rod
- cold water pipe (must be a metal pipe - not PVC)
- steel building framing member (if the building's frame is embedded in the earth)
- electrical system ground (at the breaker/fuse box)
- telephone system ground



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## 2.0 Wiring

The following components are needed to completely wire an NPL II system.

- NPL II Cabinet (P/N 07304-001)
- 16 VAC - 40 VA Transformer (P/N 50003-001)
- Auxiliary Relay Cabinet (P/N 07306-001)
- Relay Card(s) (P/N 07305-001)
- Auxiliary Relay Cable (1 per Relay Cabinet – approximately 42 inches long)
- RJ-71C Punch Down Block with Amphenol Jumper Block (P/N 54004-001)
- Amphenol RJ-71C Cable – approximately 15 feet long – (1 per Relay Card – P/N 54005-001)

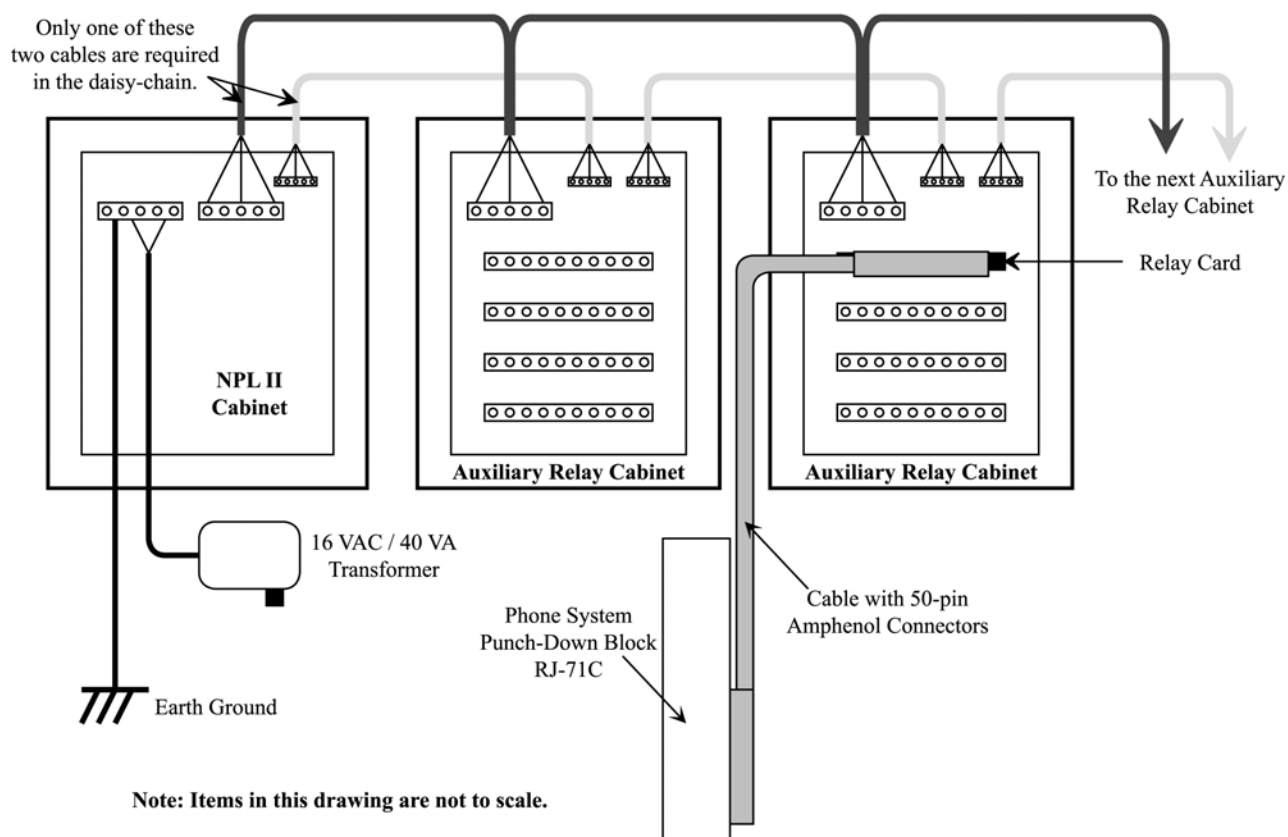


Figure 2: NPL II System Diagram

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## 2.1 Connecting the NPL II Cabinet to the Entry Panel

Using a standard, two-conductor telephone cable, connect one end of the cable to Terminals 2 and 3 on the Control Board (labeled Lobby – see Figure 3 on page 6). The opposite end of the cable should be fitted with a standard RJ-11 telephone plug and then plugged into the RJ-11 jack on the EntraGuard Gold circuit board.

## 2.2 Connecting the NPL II Cabinet to the Auxiliary Relay Cabinet

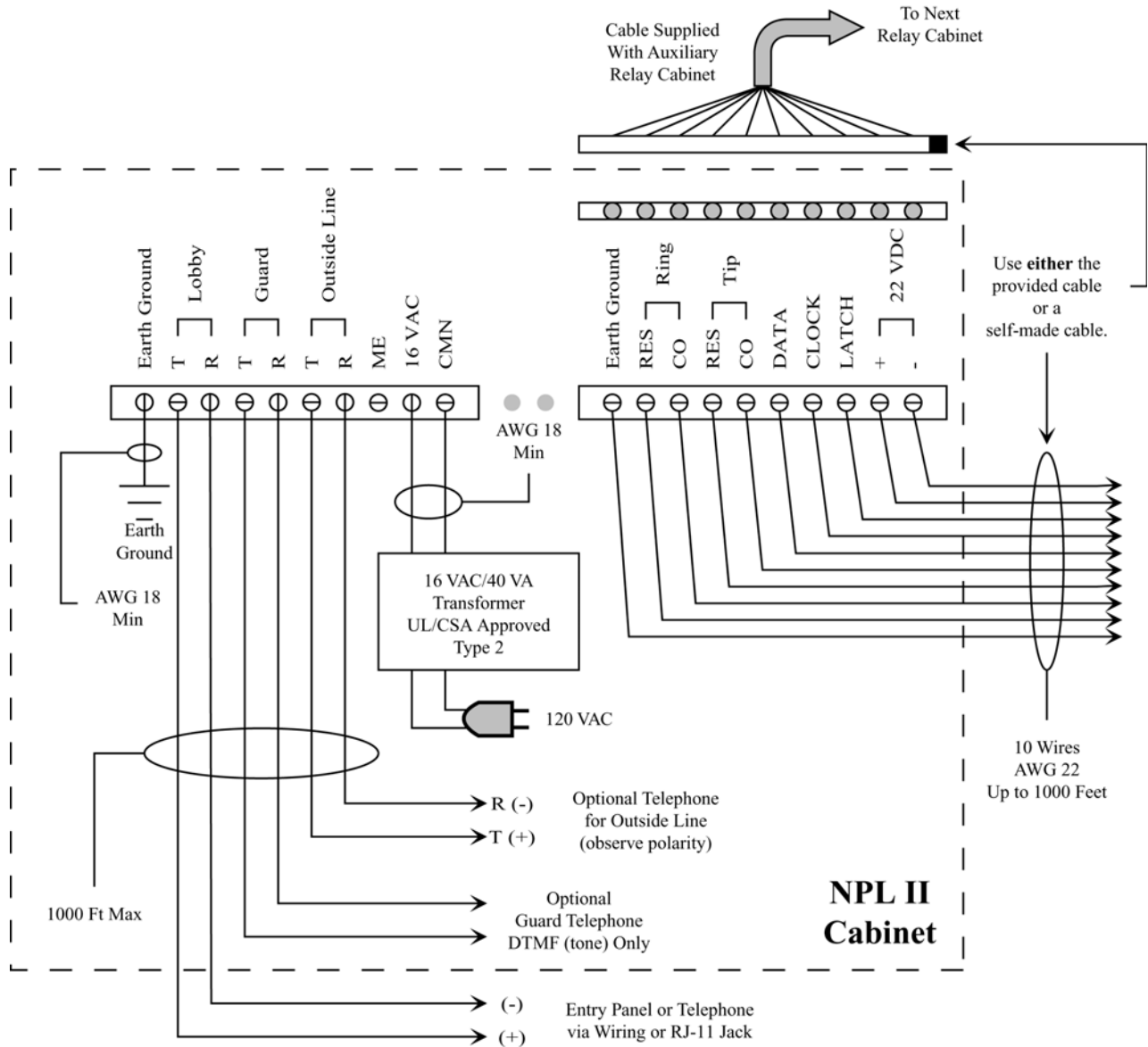
The NPL II Cabinet and the Auxiliary Relay Cabinet must be connected using ten conductor AWG 22 wire. Such connections cannot exceed 1,000 feet in length. Use the cable provided with the Auxiliary Relay Cabinet or create a cable per the information in Table 2, Figure 3 on page 6, and Figure 4 on page 7.

**Table 2: NPL II Cabinet to Auxiliary Relay Cabinet Wiring**

NPL II Cabinet	Auxiliary Relay Cabinet
Earth Ground	Earth Ground
Ring – RES	Ring – RES
Ring – CO	Ring – CO
Tip – RES	Tip – RES
Tip – CO	Tip – CO
Data	Data
Clock	Clock
Latch	Latch
+22 VDC	+22 VDC
VDC Ground	VDC Ground



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**Figure 3: NPL II Cabinet Connections**

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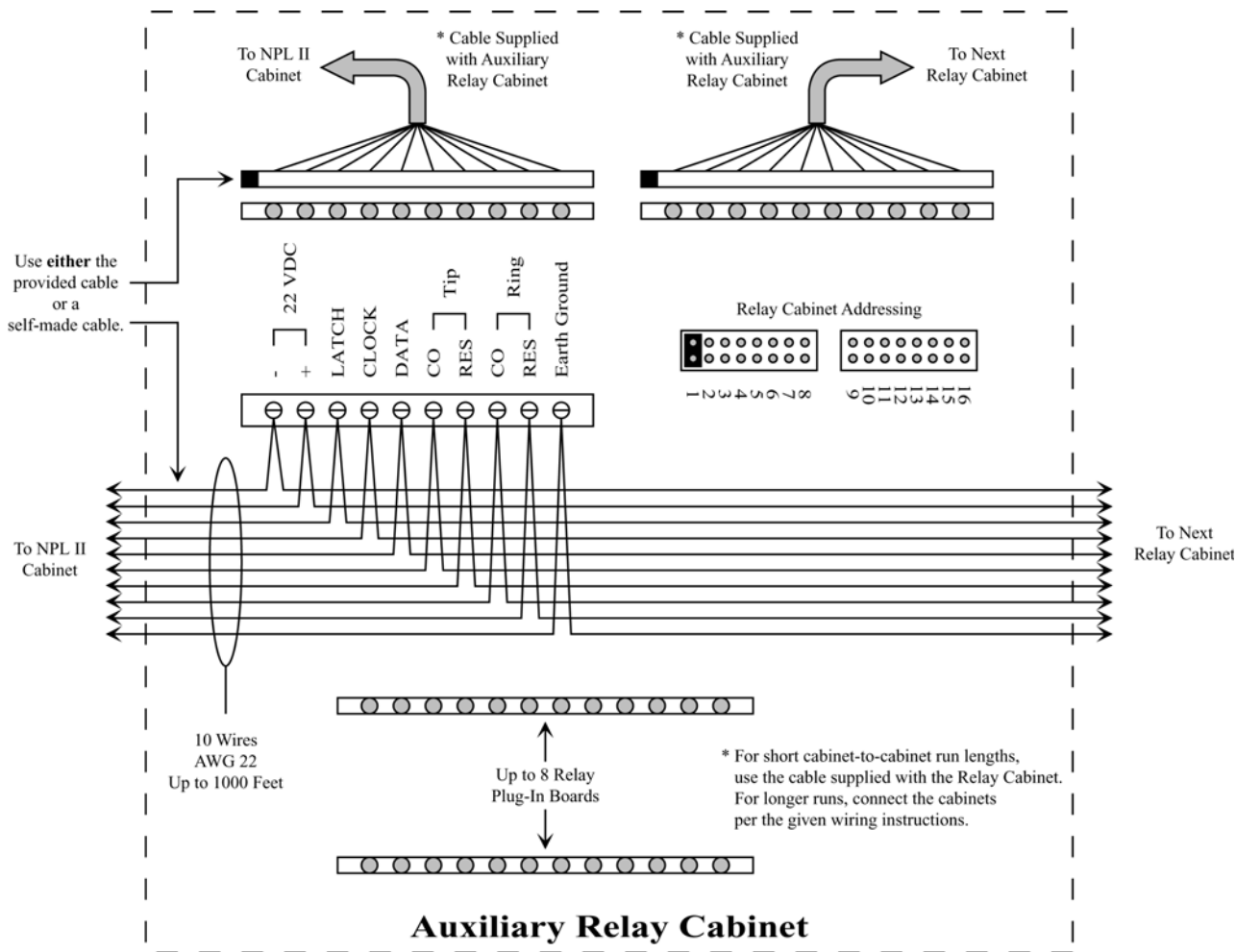
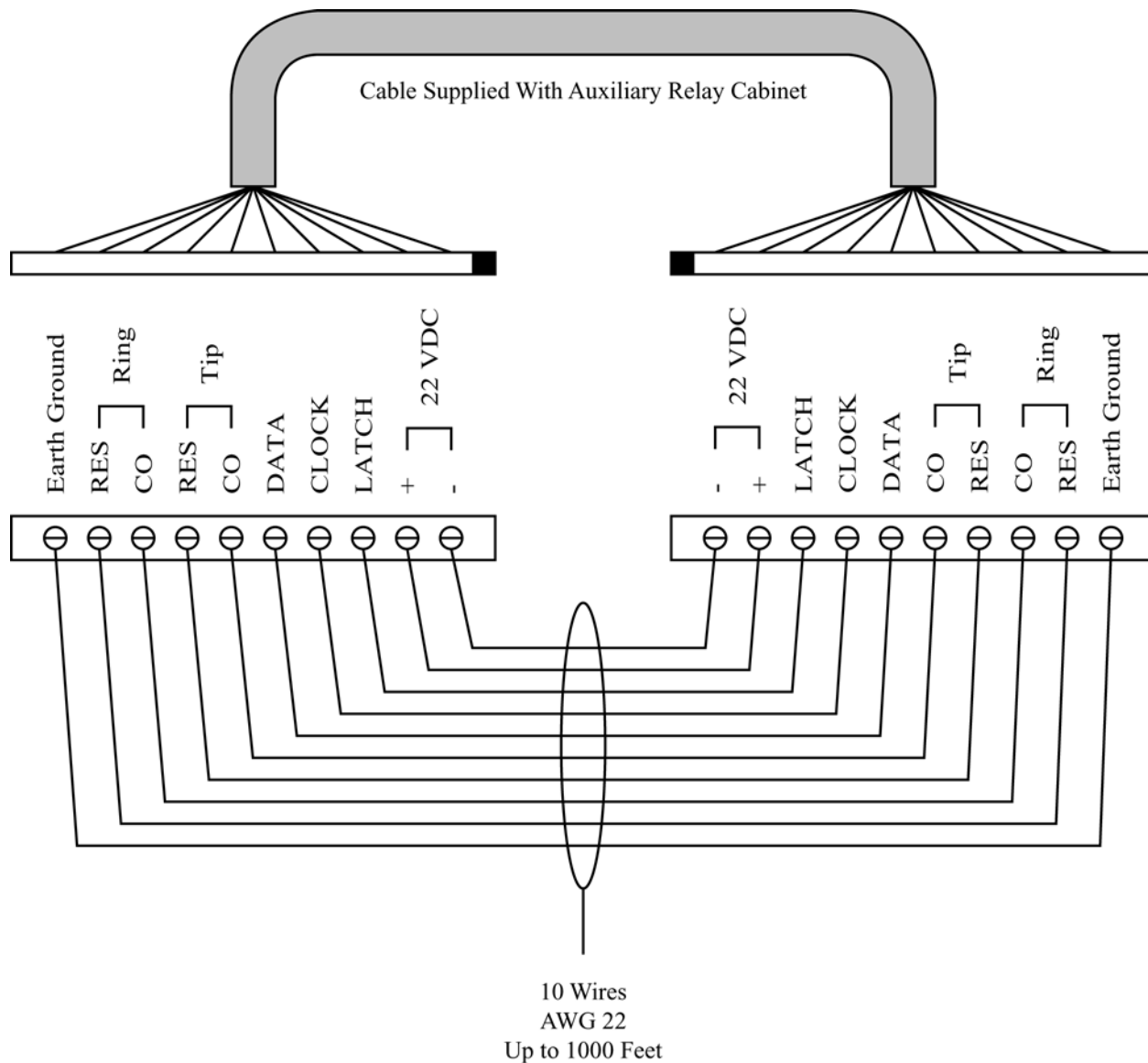


Figure 4: Auxiliary Relay Cabinet Connections

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## 2.3 Connecting Auxiliary Relay Cabinets

Auxiliary Relay Cabinets must be interconnected using ten conductor AWG 22 wire. Use either the cable provided with each Auxiliary Relay Cabinet (approximately 42 inches long) or create a cable per the information in Table 2, and Figure 5. Such connections cannot exceed 1,000 feet in length.



**Figure 5: NPL II to Auxiliary Relay Cabinet Cable Wiring**

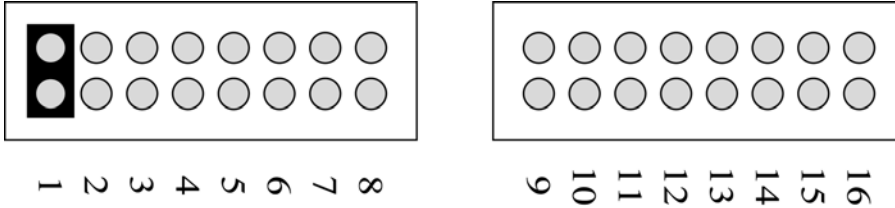


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## 2.4 Addressing Auxiliary Relay Cabinets

Each Auxiliary Relay Cabinet has a set of two jumper blocks in the upper right corner (see Figure 4 on page 7) that are used to address each cabinet. Each cabinet must have a unique address and all cabinets must be addressed sequentially.

Figure 6 shows a cabinet set to Address 1; the jumper is placed in Position 1. For all other addresses, simply move the jumper to the position corresponding to the desired address.



**Figure 6: Addressing Auxiliary Relay Cabinets**

## 2.5 Installing Relay Option Boards

Down the center of the Auxiliary Relay Cabinet board is a column made up of rows of pins (see Figure 7 on page 10). A Relay Option board can be plugged into each row of pins.

To install a Relay Option board, orient the Option board with the LED on the left side. Align the connector at the base of the board with the row of pins on the Auxiliary Relay Cabinet board and press the Relay Option board into place onto the pins. Each Relay Option board has 12 telephone switching relays allowing one Relay Option board to manage up to 12 telephones, one relay per telephone.

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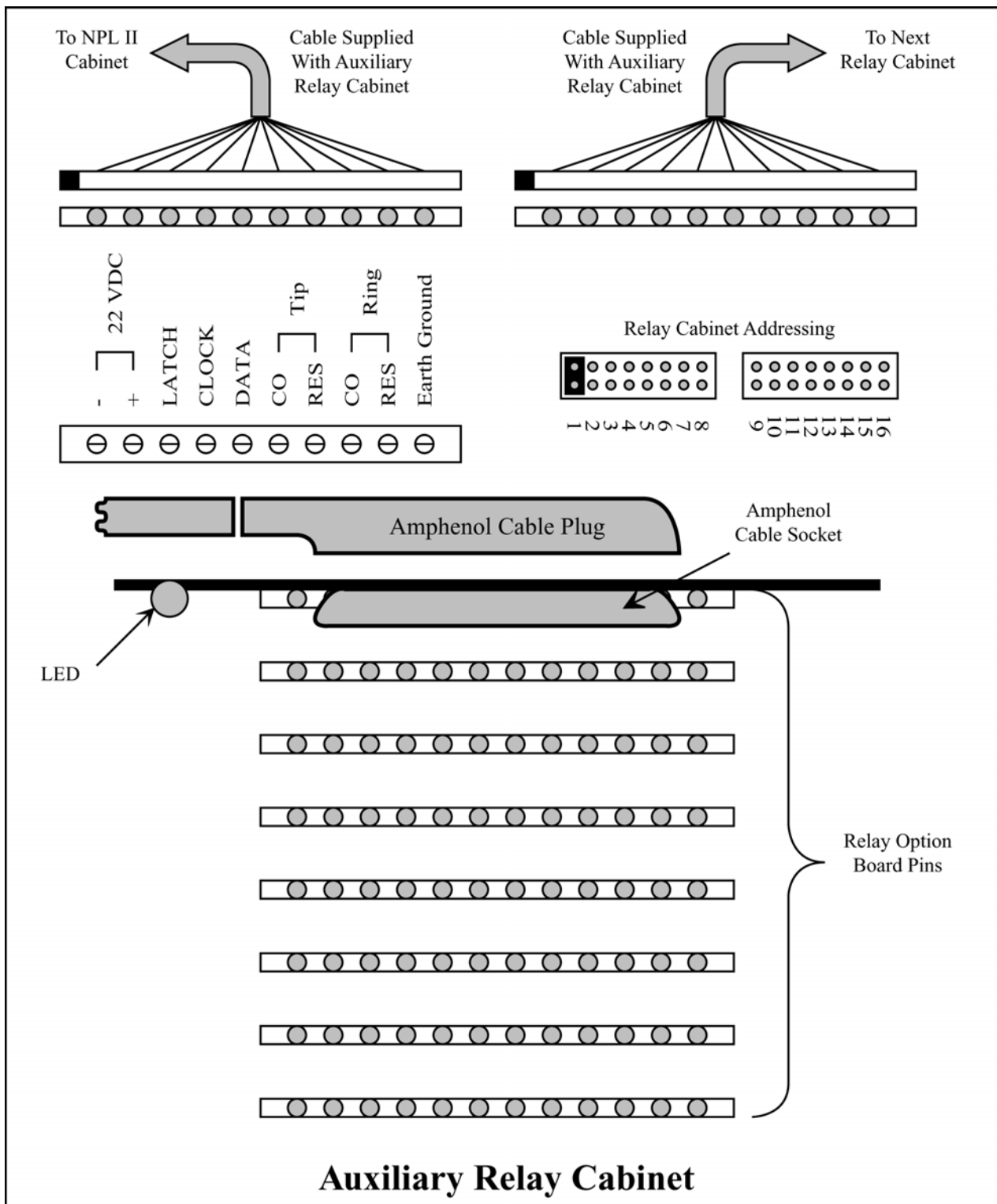


Figure 7: Installing Relay Boards

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## 2.6 Inserting an NPL II Into a Phone System

To insert an NPL II into a phone system you must insert a punch down block (RJ-71C) into the incoming house telephone lines for each house being managed by the NPL II system (see Figure 8). Once the punch down block is installed, a relay option board is connected to the punch down block, managing the switching between regular phone service and entry management.

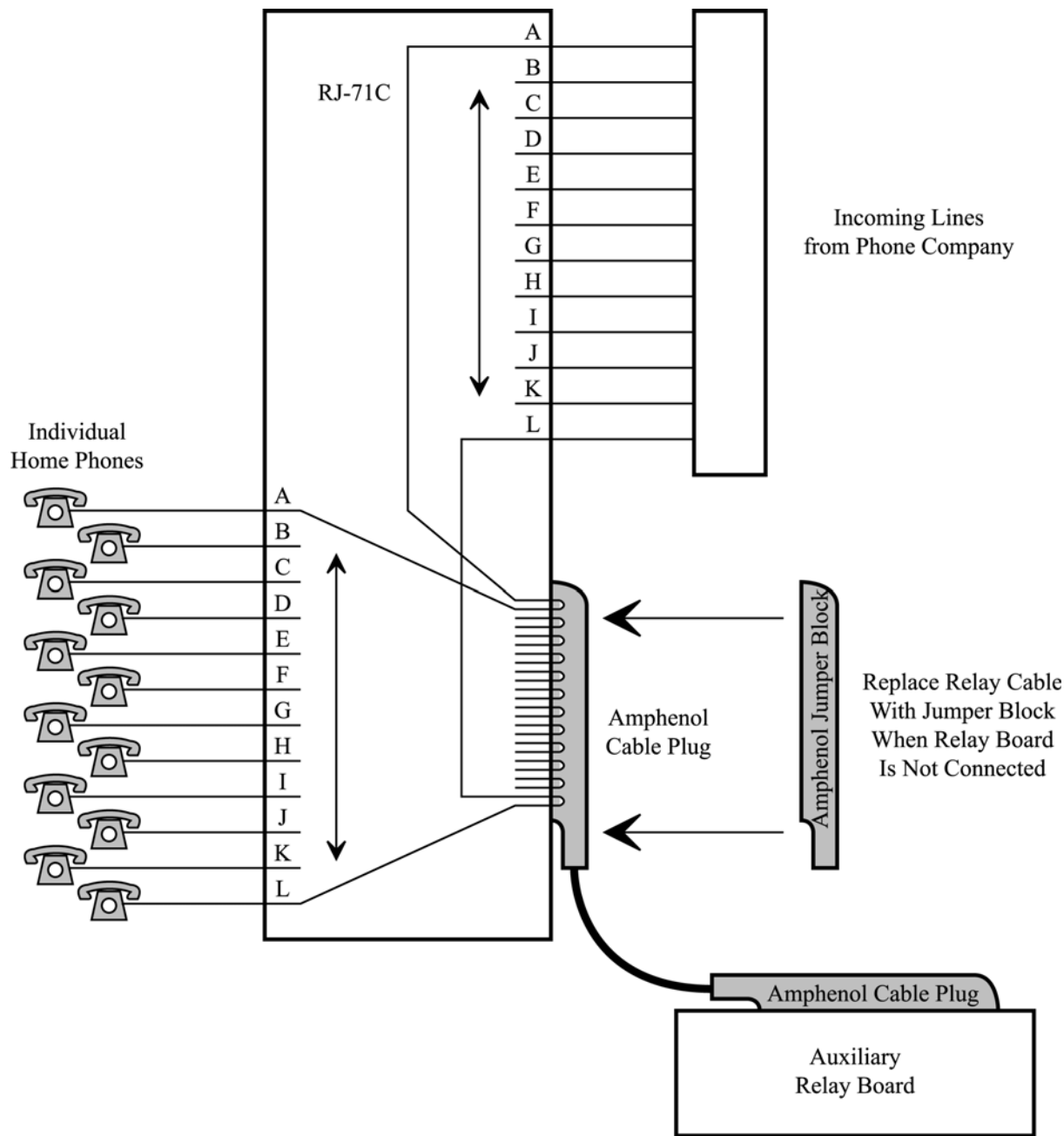


Figure 8: Inserting the NPL II Into a Phone System

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## 2.6.1 Insert a Punch Down Block Into the Phone Lines

The lines coming in from the phone company for each house telephone must be opened and connected to the RJ-71C punch down block – one punch down block for every 12 phones. It is recommended that you work with one phone line at a time to minimize telephone down time and reduce the possibility of crossing lines.

Ensure a 50-pin Amphenol jumper block (P/N) is inserted into the Amphenol connector on the body of the punch down block (see Figure 8 on page 11). This jumper block completes the telephone line circuit to allow use, and will be replaced by a cable to an Auxiliary Relay Cabinet when the NPL II system is ready to be used.

Locate the phone company D-mark punch down block and the house telephone D-mark punch down block. You must insert the RJ-71C punch down block in between the two D-mark punch down blocks.

- Connect the incoming TIP line (from the telephone company) to the appropriate split-pin connector on the RJ-71C punch down block (see Table 3 on page 13 and Figure 9 on page 15).
- Connect the incoming RNG line (from the telephone company) to the appropriate split-pin connector on the RJ-71C punch down block (paired with the incoming TIP line – see Table 3 on page 13 and Figure 9 on page 15).
- Connect the outgoing TIP line (to the house telephone) to the appropriate split-pin connector on the RJ-71C punch down block (see Table 4 on page 14 and Figure 9 on page 15).
- Connect the outgoing RNG line (to the house telephone) to the appropriate split-pin connector on the RJ-71C punch down block (paired with the outgoing TIP line – see Table 4 on page 14 and Figure 9 on page 15).

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**Table 3: Incoming Phone Line Punch Down Block Assignments**

Relay Assigned to Phone (See Figure 8 on page 11)	Phone Line	Punch Down Block Pin Number
A	TIP	Pin 1
	RING	Pin 2
B	TIP	Pin 3
	RING	Pin 4
C	TIP	Pin 5
	RING	Pin 6
D	TIP	Pin 7
	RING	Pin 8
E	TIP	Pin 9
	RING	Pin 10
F	TIP	Pin 11
	RING	Pin 12
G	TIP	Pin 13
	RING	Pin 14
H	TIP	Pin 15
	RING	Pin 16
I	TIP	Pin 17
	RING	Pin 18
J	TIP	Pin 19
	RING	Pin 20
K	TIP	Pin 21
	RING	Pin 22
L	TIP	Pin 23
	RING	Pin 24

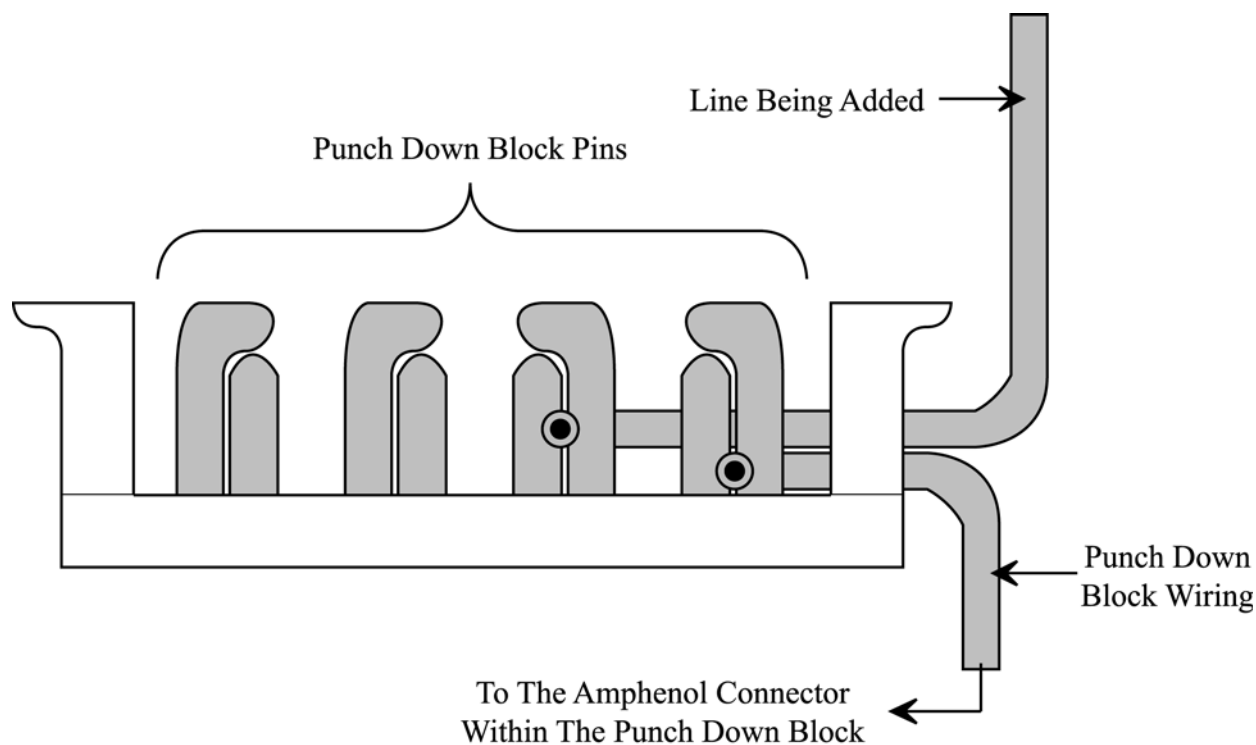


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**Table 4: Outgoing Phone Line Punch Down Block Assignments**

Relay Assigned to Phone (See Figure 8 on page 11)	Phone Line	Punch Down Block Pin Number
A	TIP	Pin 27
	RING	Pin 28
B	TIP	Pin 29
	RING	Pin 30
C	TIP	Pin 31
	RING	Pin 32
D	TIP	Pin 33
	RING	Pin 34
E	TIP	Pin 35
	RING	Pin 36
F	TIP	Pin 37
	RING	Pin 38
G	TIP	Pin 39
	RING	Pin 40
H	TIP	Pin 41
	RING	Pin 42
I	TIP	Pin 43
	RING	Pin 44
J	TIP	Pin 45
	RING	Pin 46
K	TIP	Pin 47
	RING	Pin 48
L	TIP	Pin 49
	RING	Pin 50

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**Figure 9: Inserting the Punch Down Block**

## 2.6.2 Connect a Relay Option Board to an RJ-71C Punch Down Block

A 50-pin Amphenol cable is provided with each relay option board to connect the option board to the RJ-71C punch down block (Table 5 on page 16 and Table 6 on page 17 provide information associating the phone line relay number with the relay option board in the auxiliary relay cabinet). Cable orientation does not matter – either connector end may be attached to either the option board or the punch down block. Align the cable’s Amphenol plug with the Amphenol socket on the relay option board or the punch down block and press the connector into place (see Figure 8 on page 11).

## 2.7 Connecting Optional Equipment

If desired, options such as a guard phone, an outside line telephone, or a line blocking device (line privacy circuit) should be connected after the NPL II and its Auxiliary Relay Cabinets are completely installed.

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**Table 5: Phone Line Relay Identification – Cabinets 1 through 8**

	Relay Cabinet Number							
	1	2	3	4	5	6	7	8
Option Board Position	Phone Line Relay Number							
<b>J1</b>	0000 to 0011	0096 to 0107	0192 to 0203	0288 to 0299	0384 to 0395	0480 to 0491	0576 to 0587	0672 to 0683
<b>J2</b>	0012 to 0023	0108 to 0119	0204 to 0215	0300 to 0311	0396 to 0407	0492 to 0503	0588 to 0599	0684 to 0695
<b>J3</b>	0024 to 0035	0120 to 0131	0216 to 0227	0312 to 0323	0408 to 0419	0504 to 0515	0600 to 0611	0696 to 0707
<b>J4</b>	0036 to 0047	0132 to 0143	0228 to 0239	0324 to 0335	0420 to 0431	0516 to 0527	0612 to 0623	0708 to 0719
<b>J5</b>	0048 to 0059	0144 to 0155	0240 to 0251	0336 to 0347	0432 to 0443	0528 to 0539	0624 to 0635	720 to 731
<b>J6</b>	0060 to 0071	0156 to 0167	0252 to 0263	0348 to 0359	0444 to 0455	0540 to 0551	0636 to 0647	0732 to 0743
<b>J7</b>	0072 to 0083	0168 to 0179	0264 to 0275	0360 to 0371	0456 to 0467	0552 to 0563	0648 to 0659	0744 to 0755
<b>J8</b>	0084 to 0095	0180 to 0191	0276 to 0287	0372 to 0383	0468 to 0479	0564 to 0575	0660 to 0671	0756 to 0767



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**Table 6: Phone Line Relay Identification – Cabinets 9 through 16**

	Relay Cabinet Number							
	9	10	11	12	13	14	15	16
Option Board Position	Phone Line Relay Number							
<b>J1</b>	0768 to 0779	0864 to 0875	0960 to 0971	1056 to 1067	1152 to 1163	1248 to 1259	1344 to 1355	1440 to 1451
<b>J2</b>	0780 to 0791	0876 to 0887	0972 to 0983	1068 to 1079	1164 to 1175	1260 to 1271	1356 to 1367	1452 to 1463
<b>J3</b>	0792 to 0803	0888 to 0899	0984 to 0995	1080 to 1091	1176 to 1187	1272 to 1283	1368 to 1379	1464 to 1475
<b>J4</b>	0804 to 0815	0900 to 0911	0996 to 1007	1092 to 1103	1188 to 1199	1284 to 1295	1380 to 1391	1476 to 1487
<b>J5</b>	0816 to 0827	0912 to 0923	1008 to 1019	1104 to 1115	1200 to 1211	1296 to 1307	1392 to 1403	1488 to 1499
<b>J6</b>	0828 to 0839	0924 to 0935	1020 to 1031	1116 to 1127	1212 to 1223	1308 to 1319	1404 to 1415	1500 to 1511
<b>J7</b>	0840 to 0851	0936 to 0947	1032 to 1043	1128 to 1139	1224 to 1235	1320 to 1331	1416 to 1427	1512 to 1523
<b>J8</b>	0852 to 0863	0948 to 0959	1044 to 1055	1140 to 1151	1236 to 1247	1332 to 1343	1428 to 1439	1524 to 1535



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## 3.0 Programming

In an EntraGuard active telephone line application, people are contacted by dialing that person's telephone number. An association has been made in the *Doors* program between a person and that person's telephone number.

In an NPL application, the telephone number is replaced by the assigned NPL relay number, and the association is made between a person and the NPL relay number. For each person, simply enter the corresponding NPL relay number into the Phone Number field of the user database in the *Doors* program. See Figure 10 and Figure 11 for examples.

	Last Name	On Off	Phone Number	Directory Code	Name Displayed	Dial Timezone	Local APB	Enroll Date	Enroll Time	Void Date	Void Time
1	Polk	ON	0000		ON	6am-Midnight	OFF	03/04/2002	9:45		
2	Washington	ON	0001		ON	6am-Midnight	OFF	03/04/2002	14:43		
3	Jackson	ON	0002		ON	6am-Midnight	OFF	03/02/2002	15:23		
4	Jefferson	ON	0003		ON	6am-Midnight	OFF	02/17/2002	10:58		
5	Lincoln	ON	0004		ON	6am-Midnight	OFF	04/07/2002	14:43		
6		OFF			ON		OFF				
7	Adams	OFF	555-3456	403	ON	6am-Midnight	OFF	02/09/2002	12:25		
8		OFF			ON		OFF				
9		OFF			ON		OFF				
10		OFF			ON		OFF				

Annotations in the image:  
 - "NPL Entry Relay Number" points to the "0000" value in the Phone Number field of row 1.  
 - "Standard Telephone Entry Phone Number" points to the "555-3456" value in the Phone Number field of row 7.

Figure 10: Relay Number Assignment in *Doors* User Spreadsheet

Annotations in the image:  
 - "No Directory Code" points to the empty Directory Code field.  
 - "NPL Relay Number (in place of telephone number)" points to the "0000" value in the Telephone Number field.

Figure 11: Relay Number Assignment in *Doors* User Dialog Box