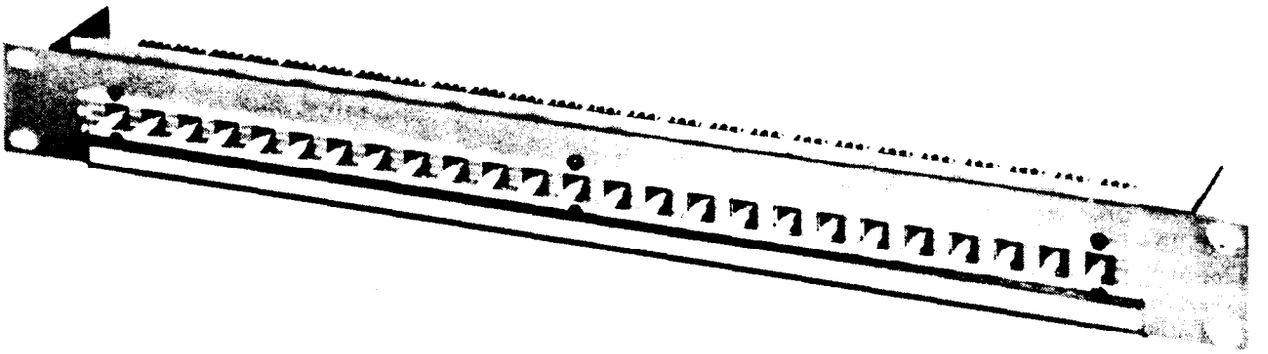
DUKANE

3-POSITION, MODULAR SPEAKER SELECTOR PANEL MODEL 9A1780



INSTALLATION AND SERVICE

403-261

DUKANE CORPORATION | COMMUNICATIONS SYSTEMS DIVISION | ST CHARLES III INOIS 60174

CONTENTS

FIGURES

SECTION 1

GENERAL INFORMATION

1.1 GENERAL DESCRIPTION

The Dukane 3-Position, Modular Speaker Selector Panel, Model 9A1780, provides for the individual selection of 25 speaker lines to one of three channels. The selector panel's modular design accommodates the addition of an optional, plug-in Modular Time and Zone Cross-Connect Kit, Model 438-485, providing for time and zone programming of the speaker lines.

1.2 OPTIONAL 438-485 MODULAR TIME & ZONE CROSS-CONNECT KIT

The 438-485 Modular Time and Zone Cross-Connect Kit provides for the individual programming of 25 speaker lines for zone paging and/or the distribution of time signals. Speaker lines are programmed through the positioning of dip switches into one or none of six zone circuits and/or six time circuits. These 12 circuits (6 time and 6 zone) may also function as 12 zone (zero time) or 12 time (zero zone) circuits.

The kit also contains 25 control circuits, one per speaker line, providing for operations such as dial intercom.

The zone, time, and dial intercom circuits operate relays in the kit that individually interrupt selector panel audio and route time, page, or dial intercom audio to each speaker line as programmed. The kit provides a common input for zone, time, and dial intercom audio.

The cross-connect kit mounts to the rear of the speaker selector panel.

2.3 INSULATION DISPLACEMENT CONNECTORS

2.3.1 Connector Identification

All wire connections to the selector panel and any of its options are made to insulation displacement connectors. These connectors are color-coded for the wire size each will accommodate:

Orange – 18 AWG, stranded or non-stranded.
Red – 22 AWG, stranded or non-stranded.

Molded in the plastic of each connector is a numbering of its terminals. This color-code and terminal numbering will be used throughout these instructions to identify the proper connector and terminal for making each connection. These connectors will be represented throughout these instructions as shown below.

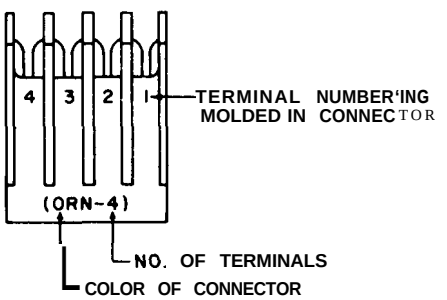


Figure 2-1. Insulation Displacement Connector.

2.3.2 Wire Insertion

To wire these connectors requires a narrow tool to insert the wires into the contacts of the connectors. A Wire Insertion Tool, Model 721-56, may be ordered from Dukane Corporation for this purpose. The use of this tool is strongly recommended for reasons of safety and efficiency in the wiring of these connectors.

To wire a connector: (Refer to fig. 2-2)

STEP 1: Position wire under plastic retainers and over metal contact of the appropriate terminal of the connector.

STEP 2: Place the connector on a flat, supportive surface and press the wire into the contact using the insertion tool. Use even, firm pressure.

SECTION 2

INSTALLATION INFORMATION

2.1 UNPACKING

Examine the speaker selector panel, any option equipment, and all shipping cartons. If there is any damage to the speaker selector panel or to any of the option equipment, bring it to the attention of the distributor from whom it was purchased. If the selector panel and option equipment was shipped to you directly from Dukane Corporation, notify the transportation company and place your claim without delay. This equipment was carefully inspected before it was packed and shipped.

Following is a listing of the parts contained within each carton of the models below. These parts are necessary for a complete installation.

9A1780 Modular Speaker Selector Panel

1 – 9A1780 Modular Speaker Selector Panel
25 – Red, 3 terminal, plastic insulation and displacement connector
1 – Orange, 2 terminal, plastic insulation displacement connector
1 – Orange, 5 terminal, plastic insulation displacement connector

438-485 Modular Time & Zone Cross-Connect Kit

1 – 1 lo-1989 Time & Zone Cross-Connect PC Board
1 – Kit chassis with pcb retaining bracket (See Note 1.)
2 – Orange, 6 terminal, plastic insulation displacement connector
1 – Orange, 5 terminal, plastic insulation displacement connector
1 – Orange, 2 terminal, plastic insulation displacement connector
6 – #6x1/4 self-tapping mounting screw

2.2 INSTALLATION PROCEDURE

The following installation procedure is provided to guide the installer through an orderly installation of the modular speaker selector panel and the optional time and zone programming kit if added.

1. See section 2.3 for information on the insulation displacement connectors used with this panel.

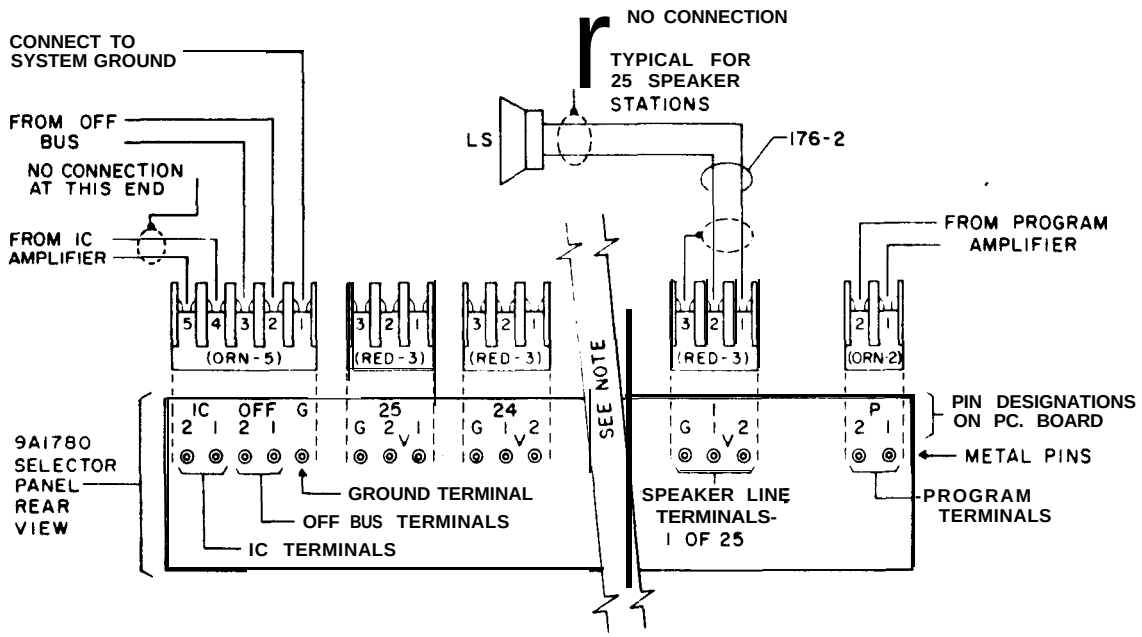
2. Install the 438485 Modular Time & Zone Cross-Connect Kit if required. See section 2.5 on page 2-5.

3. If the 438-485 Kit was installed in #2 above and is to be programmed as part of this installation, see section 2.6 and program the 1 lo-1989 Time & Zone Cross-Connect PC Board at this point in the installation. Section 2.6 begins on page 2-9.

4. Mount the 9A1780 Modular Speaker Selector Panel (with the 438-485 Kit if added in #2) to the rack or console.

5. Make program, off bus, IC, speaker line, and ground connections as described in section 2.4.

Note 1: See page 2-8 for an illustration identifying these parts.



NOTE: Terminals for speaker lines 2 through 23 are identical to 1, 24, and 25.

Figure 2-3. Connections – Rear of 9A1780 Panel.
(See section 2.4.1)

PROGRAM TERMINALS CONNECTIONS

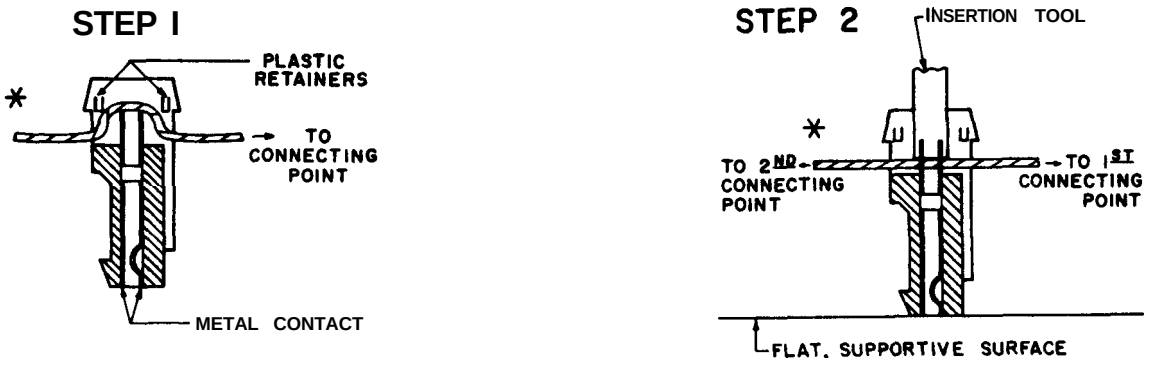
Connect the 25V output from the program amplifier.

NOTE:

For minimum cross-talk (when intercom is part of the system) the 25V line must be balanced. Balance is provided if the amplifier output transformer is center-tapped and grounded. If the output windings are floating, a pair of resistors, 2000 ohm, 1/2 watt, matched to within I%, and tied in series across the output terminals with the junction tied to COMMON will provide the necessary balance.

SPEAKER LINE TERMINALS CONNECTIONS

Connect the speaker line terminals according to the figure appropriate to your situation as described in Section 2.4.1. The recommended Dukane cable is identified on the figure.



*These are "through" connectors and may therefore be used to make a connection with one other point (as shown in STEP 1) or to two other points (as shown in STEP 2).

Figure 2-2. Wiring Connectors.

2.4 SPEAKER LINE, OFF BUS, IC, PROGRAM, AND GROUND CONNECTIONS

2.4.1 Terminal Location

The terminal locations for these connections depend on whether the 438-485 Modular Time & Zone Cross-Connect Kit has been added to the modular speaker selector panel. Therefore, two figures illustrating these connections are provided:

1. See figure 2-3 if the 9A1780 Modular Speaker Selector Panel is used alone.

2. See figure 2-4 if the 438-485 Kit has been added to the 9A1780 Modular Speaker Selector Panel.

2.4.2 Connections

Below is a brief explanation of all possible connections. Make those connections required for your application. Refer to the wiring diagram (figure 2-3 or 2-4) appropriate to your situation as described in section 2.4.1.

Wire tie holes are provided in the metalware at the rear of the speaker selector panel and the 438-485 Kit. The speaker selector panel has a wire tie bracket (identified in figure 2-7) and the optional kit has wire tie holes on the kit pc board retaining bracket which mounts at the rear of the kit.

IC TERMINALS CONNECTIONS

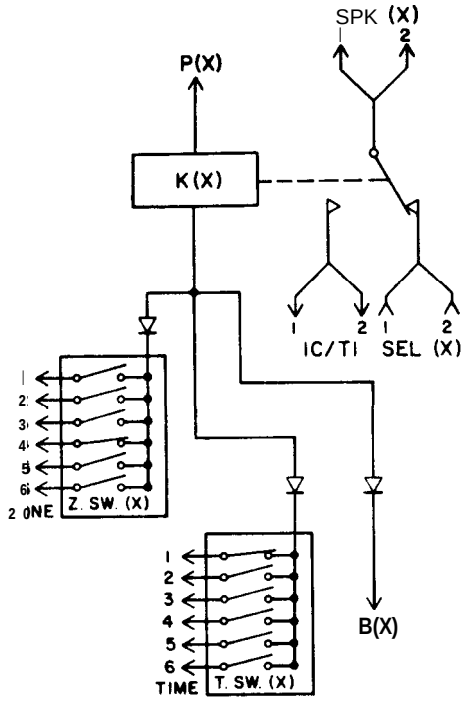
Using a twisted, shielded pair, connect the 25V output from the intercom amplifier if intercom operation is required.

OFF BUS TERMINALS CONNECTIONS

Connect to the bus that provides for gathering speakers whose switch is in the "0" (off) position for "all call" announcements.

GROUND TERMINAL CONNECTIONS

Connect to system ground.



SPK(X)	**Output terminals to speaker (1 of 25).**
P(X)	**One of five 'P' terminals. Each supplies +24VDC to 5 relays. PI-K1 to K5, P2-K6 to K10, etc.**
K(X)	**One of 25 relays, one per speaker line. 24VDC @ 23 mA nominal. Contacts rated at 2 amps.**
IC/TI	**IC/TI bus for time, zone, and dial intercom audio input.**
SEL(X)	**Audio input from speaker selector panel (1 of 25).**
B(X)	**Connects to dial intercom equipment for dial intercom control.**
Z.SW.(X)	**Zone, 6-gang dip switch - connects relay with one of six control circuits (1 of 25).**
T.SW.(X)	**Time, 6-gang dip switch - connects relay with one of six control circuits (1 of 25).**
⟵	**Male and female terminals on time and zone cross-connect pc board.**
TIME(I-6)	**Six control circuits circulating to each of 25 "T.SW."**
ZONE (I-6)	**Six control circuits circulating to each of 25 "Z.SW."**

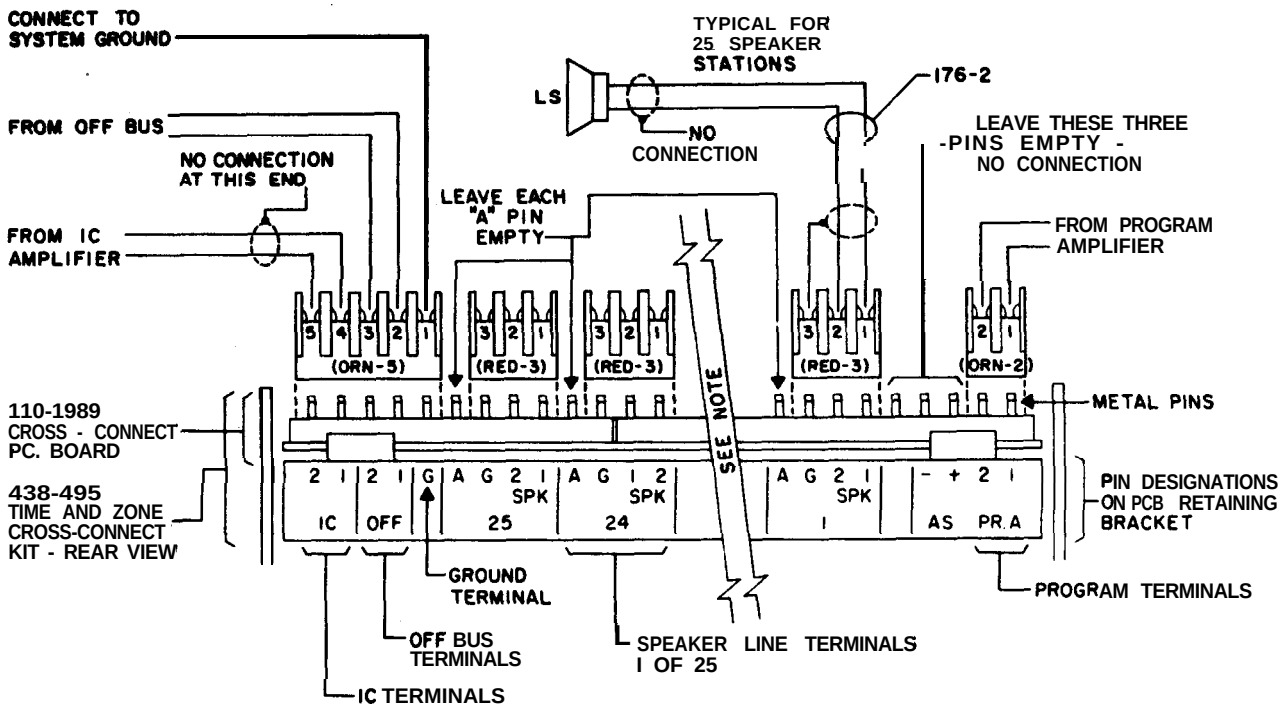
Operation

With K(X) deenergized, SEL(X) is connected to SPK(X) feeding selector panel audio to the speaker. When the control circuit selected at T.SW. or Z.SW. or the B(X) control circuit is activated, K(X) is energized connecting IC/TI to SPK(X); audio on IC/TI is fed to SPK(X).

Figure 2-5. Simplified Schematic of Cross-Connect Control Function.

1. **Using figure 2-5, Simplified Schematic of Cross-Connect Control Function, as a guide, determine which control circuits will be required for your application.**

2. **Using figure 2-6, Time, Zone, Dial Intercom Connections, as a guide, make the necessary connections by first wiring the appropriate connectors and then plugging the connectors onto the correct pins. Be certain that each connector is positioned such that the correct connector terminals and pc board pins are connected.**



NOTE: Terminals for speaker lines 2 through 23 are identical to 1,24, and 25.

Figure 24. Connections – Rear of 438485 Kit.
(See section 2.4.1.)

2.6 INSTALLING 439485 MODULAR TIME & ZONE CROSS-CONNECT KIT

1. Wire the underside of the 110-1989 Time & Zone Cross-Connect PC Board according to section 2.5.1 Time, Zone, and Dial Intercom Connections.

2. Mount the 438-485 Kit to the rear of the 9A1780 Modular Speaker Selector Panel according to section 2.5.2.

NOTE:
Connections to the underside of the 1 lo-1989 Time & Zone Cross-Connect PC Board must be made before it is mounted because there is not sufficient clearance to make these connections once the board has been mounted.

26.1 Time, Zone, and Dial Intercom Connections

Time, zone, and dial intercom connections are made by wiring the appropriate connectors and plugging them onto the PINS protruding from the UNDERSIDE of the 110-1989 Time & Zone Cross-Connect PC Board. The PINS along the EDGE of the board are for those connections described in section 2.4 and will be made at a later time in the overall installation procedure.

NOTE:
If the cross-connect pc board has been installed prior to this wiring or the wiring must be changed, follow the installation procedure in section 2.5.2 IN REVERSE to remove the board for wiring and then reinstall it.

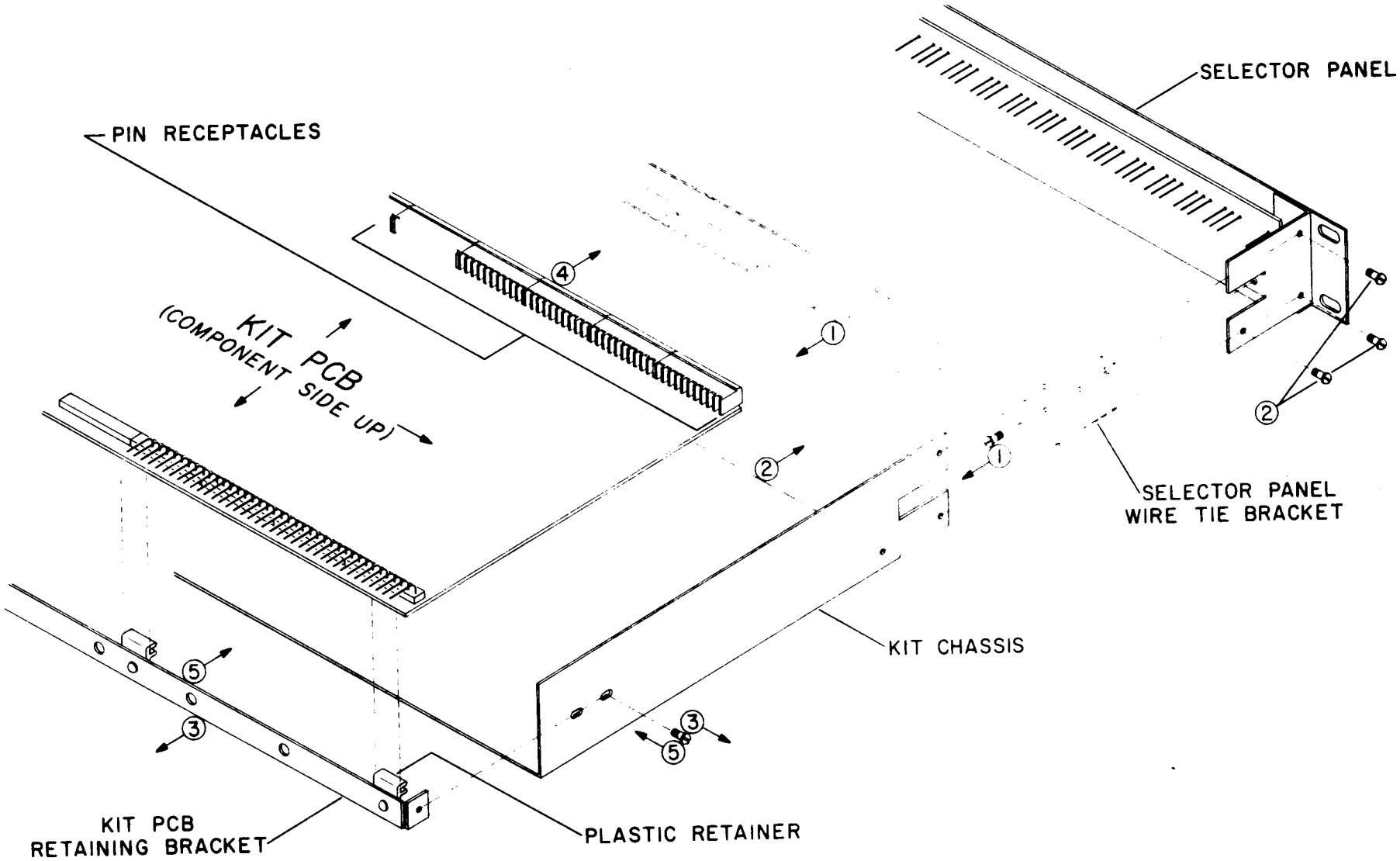
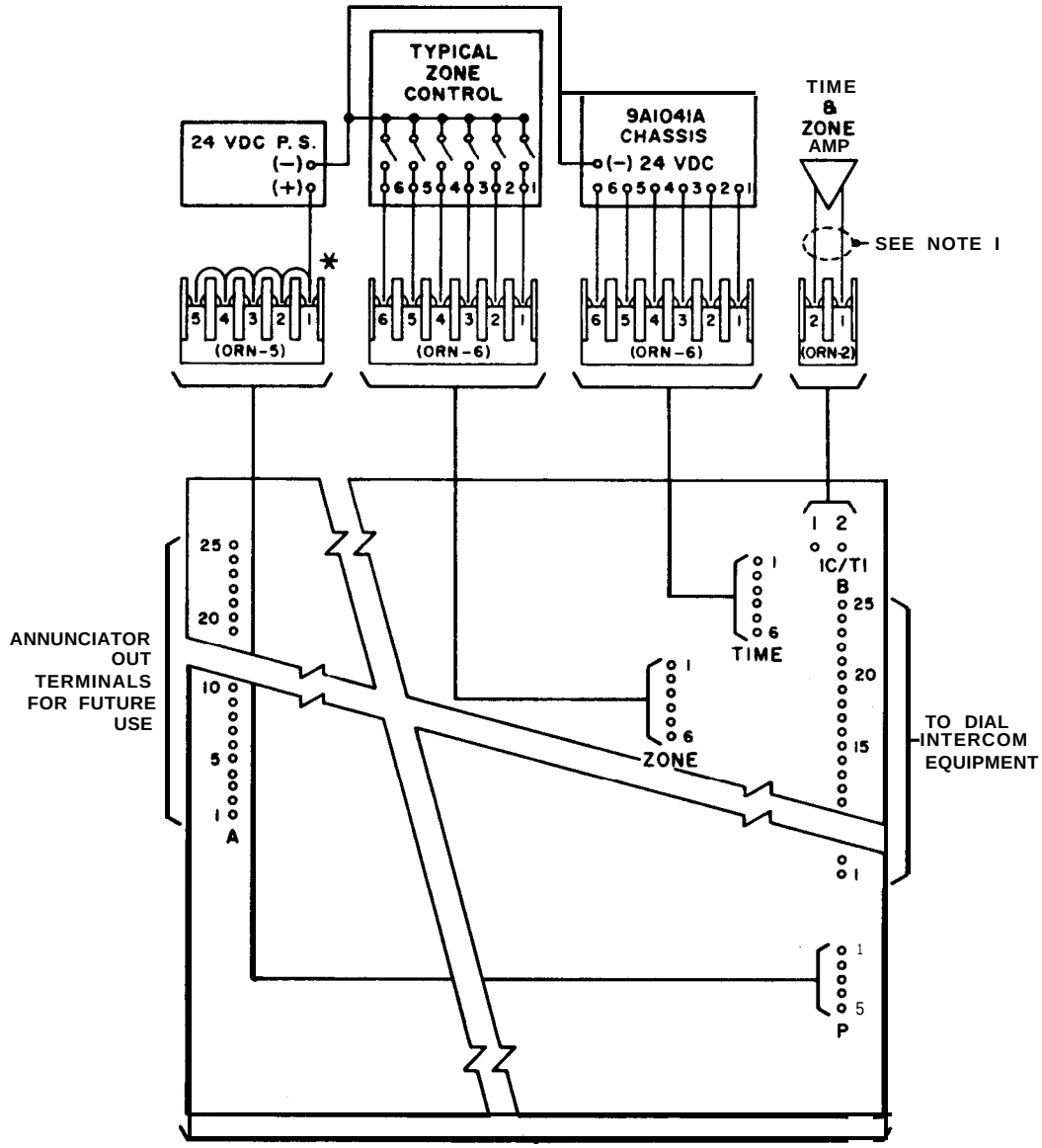


Figure 2-7. Mounting 438-485 Kit to Selector Panel.



110-1989 TIME & ZONE CROSS-CONNECT PC BOARD
UNDERSIDE VIEW

*Using "through" connection capability (page 2-3), wind wire through each terminal required.

NOTE 1: For dial intercom, this input line should be a twisted, shielded pair. The shield is not connected at this end.

Figure 26. Time, Zone, Dial Intercom Connections.

CAUTION

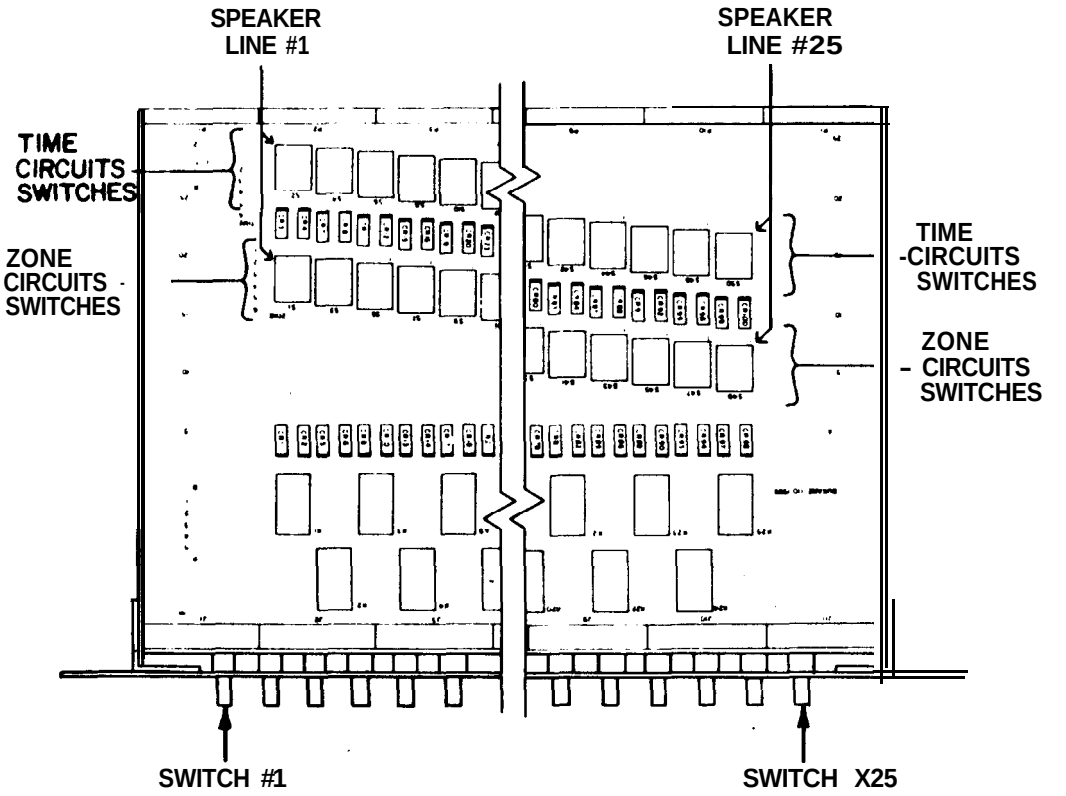
No more than one switch of each six-gang dip switch may be selected to ON. If two or more switches of a six-gang dip switch are selected to ON, a sneak circuit is created that connects the control circuits of these two or more switches. The effect is that the activation of one of these control circuits will also activate each of the other control circuits connected through the sneak circuit.

Programming Procedure:

1. **Determine the time and/or zone circuits into which each speaker line is to be programmed and record it/them on the chart on page 2-l 1**

2. **Program the speaker lines by selecting the appropriate switches to ON according to the chart from step 1.**

Mount or remount the 9A1780 Panel - 438-485 Kit Assembly to the rack or console.



9A1780 Panel - 438-485 Kit Assembly Viewed From Top Front

Figure 2-8. Programming Switch Locations.

2.5.2 Mounting 438-485 Kit to Selector Panel

Refer to figure 2-7. The figure is numbered to coincide with the following step-by-step procedure.

STEP 1: Remove selector panel wire tie bracket and discard. It is secured to the selector panel frame with two screws.

STEP 2: Mount the kit chassis to the selector panel frame using the six #6 screws provided with the kit. Each forked side of the kit chassis slides to the inner side of the selector panel frame side.

STEP 3: Remove the kit pcb retaining bracket from the kit chassis. DO NOT DISCARD.

STEP 4: Install the kit pc board:

NOTE:
Connections to the underside of the 1 lo-1989 Time & Zone Cross-Connect PC Board must be made before the board is installed. If they have not been made, see section 2.5.1 before proceeding with this step.

a. Position the kit pc board down into the kit chassis.
b. Align the metal pins on the rear of the selector panel with the pin receptacles along the edge of the kit pc board.
c. Holding the selector panel and the rear of the kit pc board near their centers, squeeze them together exerting a constant, firm pressure. Some force may be required. To minimize strain on the pins and receptacles, readjust grip as some pins begin to enter receptacles so pins enter evenly.
d. Verify that all pins are firmly seated.

STEP 5: Remount the kit pcb retaining bracket to the kit chassis. Position the plastic retainers onto the kit pc board.

2.6 TIME AND ZONE PROGRAMMING

Speaker lines are programmed on the 1 lo-1989 Time & Zone Cross-Connect PC Board which is part of the 438-485 Modular Time & Zone Cross-Connect Kit. If the 438485 Kit, mounted to the rear of the 9A1780 Modular Speaker Selector Panel (9A1780 Panel - 438485 Kit Assembly) has already been mounted in the rack or console, the cross-connect pc board can be accessed for programming by unbolting the 9A1780 Panel - 438-485 Kit Assembly from the rack/console and sliding it forward enough to expose the six-gang dip switches on the cross-connect pc board. Figure 2-8 shows the location of these switches on the 9A1780 Panel - 438-485 Kit Assembly.

Each speaker line may be programmed into ONE of six ZONE circuits AND ONE of six TIME circuits. A speaker line is programmed by selecting one of six switches on a six-gang dip switch to the ON position. Selecting a switch to ON allows the switch's corresponding circuit (into which the speaker line is to be programmed) to control a relay on the cross-connect board; the relay in turn controls audio to the speaker line. See figure 2-5 for an illustration of this function.

There are two six-gang dip switches per speaker line – one for selecting the time circuit, one for selecting: the zone circuit. Figure 2-8 identifies which switches program which speaker line and differentiates the time from the zone switches.

SECTION 3

SERVICE INFORMATION

This section contains the repair parts lists, component layout, and schematic diagrams for the Model 9A1780, 3-Position, Modular Speaker Selector Panel and the 438-485 Modular Time & Zone Cross-Connect Kit.

Repair Parts List
9A1780 Modular Speaker Selector Panel

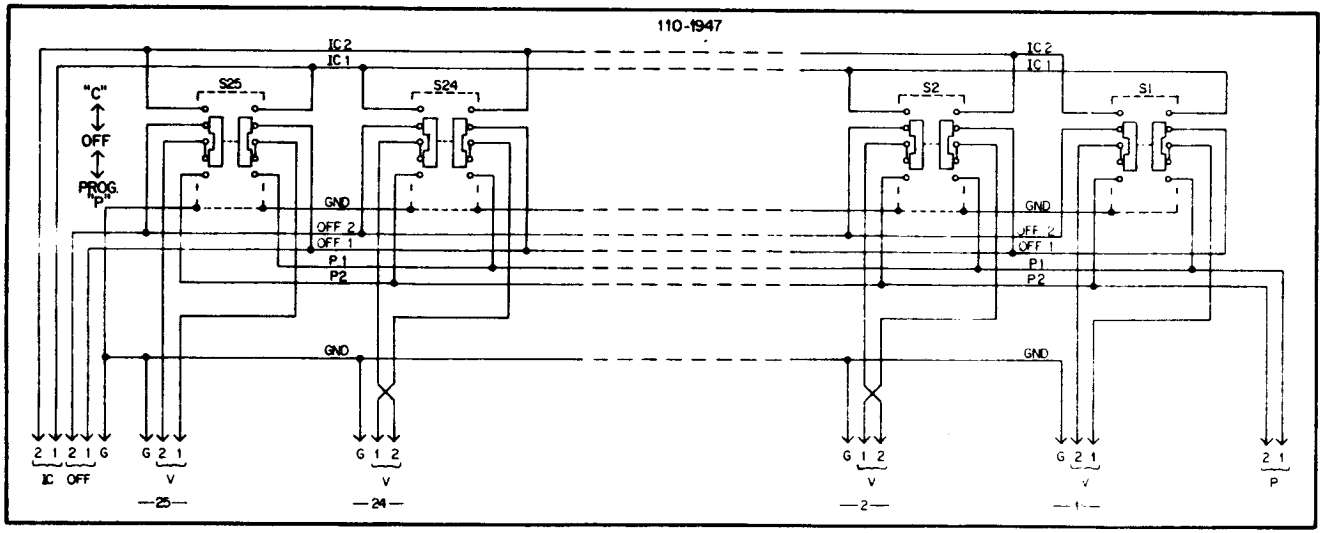
LEGEND	DESCRIPTION	DUKANE PART NO.
	On 1 lo-1947 Switch PC Board	
SI-S25	Switch, Toggle, DP3T	680-764
	Misc. Hardware	
	Designation strip, plastic holder	226-52 1
	Designation strip, clear plastic lens	226-515
	Designation strip, paper	226-517
	Insul. displace. conn., orange, 2 term.	597-321-0218
	Insul. displace. conn., red, 3 term. (25)	597-32 l-0322
	Insul. displace. conn., orange, 5 term.	597-321-0518

Repair Parts List
438-485 Modular Time & Zone Cross-Connect Kit

LEGEND	DESCRIPTION	DUKANE PART NO.
	On 1 lo-1989 Cross-Connect PC Board	
CR1-CR100	Rectifier, Silicon	595-44
K1-K25	Relay, DPDT, 24 VDC	596-242
S1-S50	Switch, six-gang dip	680-772
	Misc. Hardware	
	Insul. displace. conn., orange, 5 term.	597-321-0518
	Insul. displace. conn., orange, 6 term. (2)	597-321-0618
	Insul. displace. conn., orange, 2 term.	597-321-0218

190-2473

REVISIONS			
NO.	DESCRIPTION	APP'D	DATE



NOTES:

1 CKTS 1 & 25 TYPICAL FOR ODD CKTS 3-23, CKTS 2 & 24 TYPICAL FOR EVEN CKTS 4-22.

SYMBOLS

1 ⟵ DENOTES MALE CONNECTOR

MATERIAL _____ FINISH _____

UNLESS OTHERWISE SPECIFIED	DIMENSIONS ARE IN INCHES	FRACTIONS: ±	2 PLACE DECIMAL: ±	3 PLACE DECIMAL: ±	ANGLES: ±

REQ.	NEXT ASSY	USED ON
APPLICATION		

DUKANE
ST CHARLES ILLINOIS 60174

SCHEMATIC DIAGRAM
MINI 3 POS SW'BANK W/O LEDS
9A1780

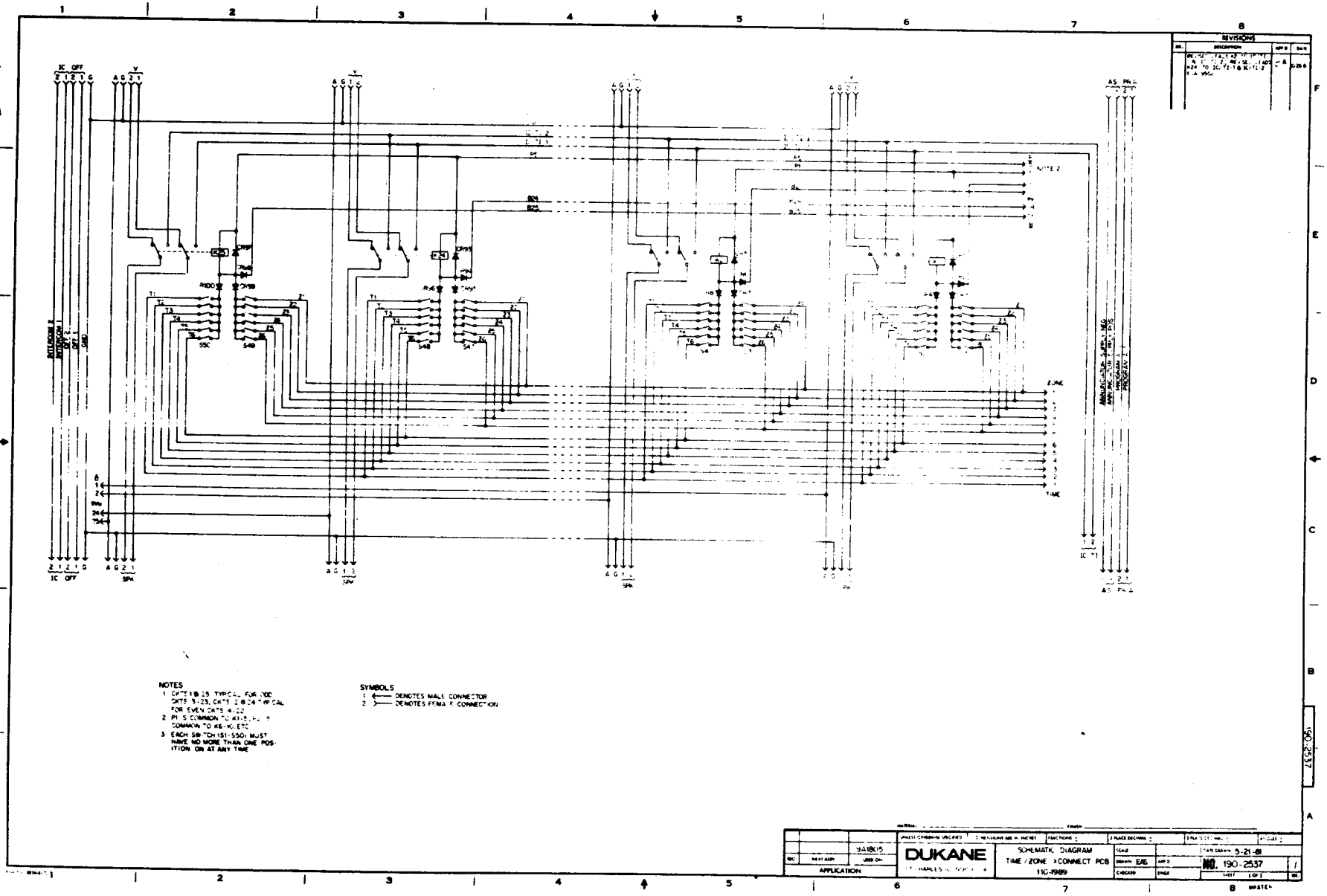
SCALE NL | DRAWN BAS | APP'D | CHECKED | ENGR. JSA

DATE DRAWN 6-17-81

NO. 190-2473

SHEET | OF | ISS.

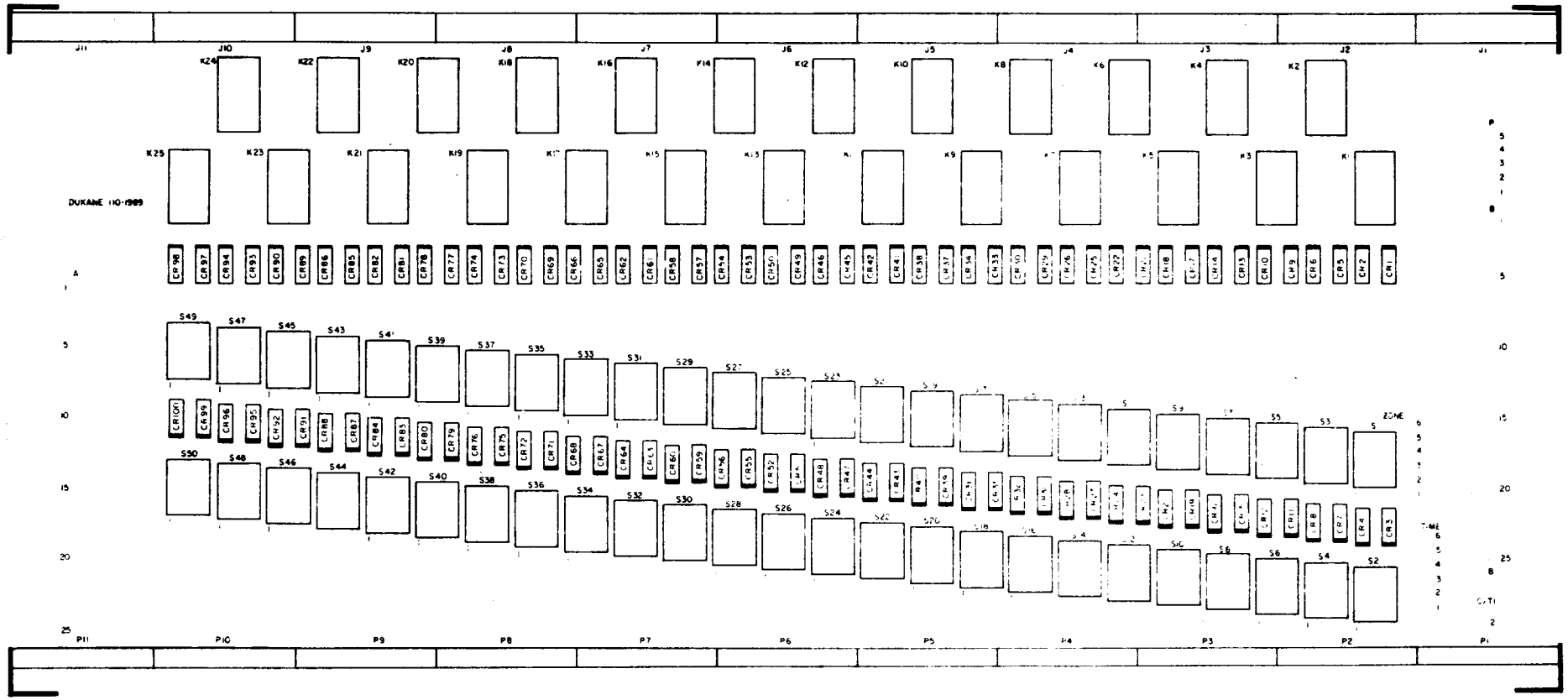
Form No. 8033-B-73



NOTES
1. DATE RELAYS, TYPICAL FOR ODD DATES 1-23, DATE 2 & 24 TYPICAL FOR EVEN DATES 4-22
2. PINS COMMON TO ALL RELAYS COMMON TO K6-K10 ETC
3. EACH SWITCH (S1-S50) MUST HAVE NO MORE THAN ONE POSITION ON AT ANY TIME

SYMBOLS
1. ⟵ DENOTES MALE CONNECTOR
2. ⟶ DENOTES FEMALE CONNECTION

DUKANE
SCHEMATIC DIAGRAM
TIME / ZONE > CONNECT PCB
110-1989
DWG NO. 190-2537



Component Layout — Time & Zone Cross-Connect PCB (110-1989)
662-4113 Issue 00