LOW PROFILE COMBINED DISTRIBUTING FRAME DESCRIPTION NO. 3 ELECTRONIC SWITCHING SYSTEM

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1. GENERAL

INTRODUCTION

1.01 This section describes the low profile combined distributing frame (LPCDF) physically and functionally as it applies to the No. 3 Electronic Switching System (ESS) office.

1.02 ▶This section is being reissued to add an ED and J drawing to the list of references, to add Note 2 to Fig. 7 to include D4 channel banks, and to generate a note for Fig. 11 relative to the multifrequency transmitter unit. Revision arrows are used to show changes.◀

1.03 An LPCDF, or CDF as it will be referred to in this section, has been developed to comply with the low ceiling height and small line size of the No. 3 ESS office.

PURPOSE

1.04 The purpose of the CDF is to provide an interface between the switching and the outside plant equipment. It provides a location for terminating and cross-connecting outside plant cable pairs, central office line equipment, trunk equipment, service and miscellaneous circuits, and transmission equipment. It also provides protective apparatus designed to protect personnel and equipment from abnormal voltage surges.

EQUIPMENT CHARACTERISTICS

1.05 The equipment characteristics of the CDF are:

- Modular
- Unitizing
- 303-type connector
- 89A-type connecting block
- Wire wrap connections
- Irradiated polyvinyl chloride (IPVC) jumper wire

1.06 ***Modular:*** The CDF consists of two modules (MOD 0 and MOD 1); each is equipped with nine verticals. MOD 0, the first module, has the unitizing capability and is required. On large line sizes or where an abnormal amount of toll equipment is required, a second module (MOD 1) is required and may be shipped to the site to coincide with the installation of the transmission or toll equipment. The toll equipment is terminated on MOD 1. Upon installation of MOD 0, the toll equipment is cross-connected to the trunk equipment as required. Where applicable, small line sizes and small amounts of toll may be terminated on MOD 0, cross-connected as required, and MOD 1 installed when growth warrants it.

1.07 ***Unitizing:*** A method of fastening MOD 0 to the ends of the network frame lineups which permits wiring and testing MOD 0 with the ESS at the factory and then shipping both to the site as a unit.

1.08 ***303-type Connector:*** These connectors terminate and protect 100 pairs of the outside plant cable and are located on the vertical side of the CDF.

1.09 ***89A-type Connecting Block:*** These connecting blocks terminate the central office equipment on the horizontal side of the CDF.

1.10 ***Connections:*** The connections used on the horizontal side of the CDF are wire wrapped and the associated cable stubs employ plug-in connectors (which are also wire wrapped).

1.11 ***IPVC Jumper Wire:*** The 303-type connectors and 89A-type connecting blocks use IPVC DT-22P 22-gauge jumper wire for CDF cross-connections.

2. PHYSICAL DESCRIPTION

GENERAL

2.01 The CDF consists of two modules each 2 feet and 5/8 inches wide by 6 feet long by 9 feet high (see plan view on Fig. 1). In addition to each MOD, an end guard of approximately 2 inches bolts onto the exposed ends of the MODs. Each MOD is constructed of a welded steel assembly weighing 1100 pounds. This welding provides rigidity and resistance to racking that is required for the unitizing of the first MOD with the initial lineup(s).

> ***Note:*** When more than four MODs of main frame are required, ED-97797-70 provides optional groups that supply a 30-inch wide frame.

2.02 The first and second MODs are joined together with junctioning details and bolts.

2.03 Base covers are provided on both the horizontal and vertical sides of the CDF.

2.04 Convenience outlets (115 volts 20 amperes) are mounted on both sides of the CDF in the base covers for use of wire wrap guns or test equipment.

2.05 Two single pole switches are mounted on the right end guard (facing vertical side) of the CDF for control of the fluorescent lighting in the central office. A protector test set is provided directly below the central office light switches.

2.06 Space is provided on both the horizontal and vertical sides of the CDF for test battery (-48 volts), ground, high resistance ground, a telephone jack (TEL), and a spare jack (SP) for a central office talk circuit.

2.07 Up to four sections of 12-inch wide cable trough cross from the top of the CDF to the equipment lineups. These racks provide support for the cable running to the CDF from the ESS and toll equipment.

VERTICAL CDF (VCDF)

2.08 On the vertical side of the combined distributing frame (VCDF), each MOD has nine verticals spaced on 8-inch centers. The space to the left of each vertical is called a bay and is identified by the number of its associated vertical (Fig. 2).

2.09 Each vertical provides space to mount five 303-type connectors.

2.10 A formed aluminum designation board (1 inch deep by 5 inches wide by 6 feet long) is mounted above the verticals of each MOD and identifies by number the vertical, cable, and cable pairs that terminate on the 303-type connectors mounted on that vertical.

2.11 The 303-type connector consists of a panel, protector units, and a cable stub. The panel is a molded plastic panel 4.3 inches wide and 19.16 inches long with an integral fanning strip (for jumper access to panel). This panel is equipped with 100 groups of five pin-grip type terminals (protector terminals). Four of these terminals provide contact for tip and ring connections. The fifth terminal provides a ground connection. A sixth hole (blind) is provided for inserting circuit designation pins.

2.12 Adjacent to (on the right) and associated with each horizontal row of protector terminals is a group of five pairs of wire wrap termial lugs for connections to central office jumpers. The left tip and ring protector terminals are factory wired to a correlated wire wrap lug which terminates the stub cable.

2.13 Pair identification is provided by printed black numerals 1 through 00 (100) from top to bottom, respectively, in increments of five located between each row of pin-grip protector terminals and associated wire wrap lugs.

2.14 A 50-pair group (in groups of five) of individually recessed gold-plated test contacts is located at the top and bottom of each connector panel. Pair identification is stamped in black numerals under each double row (group of five tip and ring) of gold-plated test contacts.

2.15 The protector units associated with the 303-type connectors are a molded plastic plug-in type of apparatus equipped with five contact

pins. Two long pins make contact with tip and ring of the outside plant, two short pins make contact with tip and ring of the inside plant, and one long pin (ground) serves as a guide for proper alignment of the protector unit relative to the panel.

Note: Protector units for 303-type connectors must be ordered separately as required.

2.16 The 303-type connectors used on the VCDF must be top mounted, ie, the cable stubs enter the frame from the top. The cable stub length, wire gauge, and protector unit codes are specified by the telephone company. Table A identifies the various 303-type connectors and cable stub lengths that are available for the No. 3 ESS.

2.17 The cable stubs are formed on the transverse arms that support the vertical bars and are run to the cable entrance facilities (Fig. 3) over one of four ladder racks. Pin guides mounted in the bays on the vertical side allow forming of jumpers (running horizontal-to-horizontal) to prevent obstructing the distributing ring hole and to provide separation between cable stubs and other jumpers (those running horizontal-to-vertical).

2.18 These cable stubs may terminate on Western Electric type 710 connectors (Fig. 3). The mating portion of this connector may be installed in advance on the outside plant cable providing a means of pretesting that cable. Interconnection of the two halves of the 710 connector provides a rapid and accurate method of joining the protectors to the outside plant connections and facilitates a short installation interval. The cable entrance facilities may have a total capacity of up to 10,800 pairs; however, due to outside plant growth patterns, it is doubtful that full capacity would ever be required.

HORIZONTAL CDF (HCDF)

A. Horizontal Identification

2.19 On the horizontal combined distributing frame (HCDF), a top projection above shelf K provides a support for the cross-aisle cable troughs which contain the equipment cables connecting the HCDF with the ESS and toll lineups.

2.20 MOD 0 is equipped with ten horizontal shelves (Fig. 4) 12 inches deep, identified alphabetically A through K, bottom to top of frame, respectively. The outer end of each shelf (A through K) is equipped with a 1/4 inch thick by 2 inches wide by 6 feet long metal bar which is mounted horizontally on the transverse arms extending from verticals V01 through V09. The 8-inch lateral spaces between the transverse arms are referred to as bays. These bays identify by number with the vertical (on the vertical side) to the left of the space; ie, bay 01 identifies with vertical 01 (Fig. 4). Each shelf has eight bays identified by number 01 through 08 and may mount up to eight 89A-type connecting blocks.

2.21 Each bay has an associated distributing ring to facilitate the running of jumpers within the CDF. The space available for jumpers is approximately 4-1/2 inches wide (jumper retaining brackets are furnished with the frame); this space provides a shelf capacity of approximately 1500 jumpers.

2.22 Connecting block locations are identified by a combination of the shelf letter and bay number; ie, J-02 (Fig. 4) terminates two service circuits, regular ring (RR), and customer dial pulse receiver (CDPR).

B. Connecting Block Identification

2.23 The HCDF (Fig. 4) mounts three different 89A-type connecting blocks. These blocks are as follows: 89A11-96, 89A12-96, and 89A1-100.

2.24 These connecting blocks have the following characteristics:

- Use IPVC jumper wire
- Wire wrap terminals, bifurcated (two-pronged) on the front (jumper) side with a single prong on the rear (equipment) side capable of terminating two wraps
- A forward facing terminal field mounted vertically on the front panel which rotates 180° to provide access to the switchboard cable terminations
- A plastic sheath protects the loose and slack switchboard cable pairs within the housing of the connecting block

- A maximum density of up to 100 pairs per connecting block
- All options are provided in a standard housing in order to maintain block profile uniformity on the frame
- Horizontal mounting on 8-inch centers
- A fanning strip which provides pair identification and isolates the terminals from wire tension induced when pulling the jumper during a tracing operation
- The terminals are protected by the extended edges of the end housings, jumper wire fanning strip, and bottom identification strip
- Jumper and cable pairs enter the connecting block through slots in the back of the housing
- A hinged cover (KS-21876 L2) is provided with the 89A1-100 connecting block.

2.25 The 89A11-96 and 89A12-96 connecting blocks (8 by 24 field of wire wrap terminals) terminate a 96-pair (tip and ring) (Fig. 5). Each block is prewired with an 806A (100 pair) cable stub equipped with six 16-pair 951A connectors which plug (two 951A connectors per 296-6C switch package) into three 296-6C switch packages (Fig. 6), one mounted in each switch group 0, 1, and 2. The 89A11-96 connecting blocks terminate switches 0 through 3 and 89A12-96 connecting blocks terminate switches 4 through 7. These switches are located on the top front of each network frame. MOD 0 (Fig. 4) is capable of terminating up to ten network frames.

2.26 The cabling for connecting blocks located in bay 01 runs vertically in bay 02. They are formed under and attached to the horizontal arm of the desired shelf of a connecting block. This method of cabling continues throughout the frame; ie, cables in bay 03 serve connecting blocks in bay 02, etc.

2.27 The front panel of these connecting blocks are equipped with an 8 by 24 field of wire wrap bifurcated terminals for terminating the jumpers. The front panel is alternately shaded in blue and white in groups of eight pairs (tip and ring). The required circuit information is prestenciled in blue on the front panel, jumper fanning strip, or bottom identification strip of the connecting block.

2.28 The 89A1-100 connecting block (8 by 25 field of wire wrap terminals) is used to terminate trunks, service circuits, miscellaneous circuits, toll, and transmission equipment.

2.29 The front panel of this connecting block is equipped with an 8 by 25 field of wire wrap bifurcated terminals for terminating jumpers. This panel is white and the required circuit information is stenciled in black on any or all of the following: front panel, jumper fanning strip, bottom identification strip, or the cover.

3. FUNCTIONAL DESCRIPTION

GENERAL

3.01 The functional block diagram (Fig. 7) shows the relationship of the CDF to central office equipment and outside plant facilities.

3.02 Two functions of the CDF are flexibility and load balance. Flexibility is attained by the installation or removal of cross-connections (jumpers) to put in or take out of service specific equipment. With this flexibility, heavy usage subscribers may be conveniently intermixed with lighter usage subscribers for a better load balance of the equipment in the central office.

VERTICAL CDF (VCDF)

3.03 The VCDF provides a high density, conveniently accessible terminating point (303-type connector) for all outside plant facilities.

3.04 The 303-type connector provides a point for testing and monitoring outside and inside plant. The 303-type connector may be equipped with apparatus (protector units, Table B) that provides individual line continuity, protection, and a means of isolating outside and inside plant.

3.05 The protector unit bridges tip to tip and ring to ring at this point. The bridge protects through carbon protector blocks for voltage.

Note: Protector units without heat coils are recommended for the No. 3 ESS.

3.06 The protector unit when pulled out to the detent position acts as a switch (breaks continuity) between the central office equipment and the cable facility (protection is still provided to the cable pair). Cable pair test contacts (50 top and 50 bottom at the connector) allow testing and monitoring of the cable facility with the central office equipment isolated. The (jumper) wire wrap terminals allow testing and monitoring of the central office equipment with the cable facility isolated.

3.07 The type of circuit served by a particular cable pair is identified by the color of the protector unit (Table B) plugged into the protector location associated with that cable pair. The color of the protector unit and designation pin should be the same. Black and grey protector units do not require designation pins. Designation pins plug into the sixth hole called the blind and identify the type of circuit served by the protector unit during the time it is removed from its position.

HORIZONTAL CDF (HCDF)

3.08 The general function of the HCDF is to provide an efficient terminating point (89A-type connecting blocks) for the central office equipment. Figure 4 shows a preferential arrangement (grouping) of the central office equipment terminations to attain maximum efficiency (minimum jumper length for cross-connections).

3.09 Figure 7 provides a functional block diagram of these groupings and also references associated figures which provide detailed assignment of terminations for each group.

3.10 The central office equipment is grouped on the HCDF as follows:

- Concentrator group terminations
- Universal trunk terminations
- Miscellaneous circuits
- Service circuits
- Toll and transmission.

3.11 ***Concentrator group terminations:*** These terminations consist of tip and ring terminations (Fig. 8) for concentrator groups 1 through 15 and occupy shelves B through F for a maximum of 12 verticals (Fig. 4).

> ***Note:*** Concentrator groups 1 through 15 reside in network frames 01 through 15, respectively. Since the concentrator group number and network frame number are known to be identical, it is not necessary to show both in the office equipment number (OEN) (Fig. 9). Therefore, references to the network frame have been deleted.

3.12 The format used to specify OEN in recent change and verify messages, and in the macros that generate translation data, is shown in Fig. 9. Also shown in Fig. 9 is a hypothetical OEN (011017) with pointers A through F referring to Fig. 7 (hardware source) pointers A through F, respectively. Pointers A through F in Fig. 9 correspond to pointers A through F in Fig. 8 (tip-ring concentrator group terminations) which locate the actual tip-ring location of the OEN.

3.13 Concentrator groups provide two subscriber line options, loop and ground start. All equipment is furnished with the loop start option, with a limited number in each group that may be modified to ground start. In Fig. 8, the tip and ring terminals with the shaded areas are terminals that may be modified to ground start. The terminals illustrated in switch group 0 (SG0), switches 0 through 3, are identified by input level and switch number, ie, 7-0, 6-1, 7-1, 6-2, 7-2, and 7-3. These terminals correspond to L7-0, L6-1, L7-1, L6-2, L7-2, and L7-3 shown in Fig. 6 and are modified to ground start by the removal and installation of straps on the 296-6C switches as shown in Fig. 6. These OENs (Fig. 8) are reserved for PBX trunks and coin station lines.

3.14 ***Universal trunk terminations:*** These trunks are always mounted on each network frame and may also be mounted on miscellaneous and control frames. They are terminated on connecting blocks (Fig. 10) that occupy shelves G and H for a maximum of 12 verticals (Fig. 4). These trunks cross-connect to OENs (Fig. 8) signal and transmission facilities and applique circuit MA, MB (transmit) and EA, EB (receive) as required. A functional block diagram of the trunking path is shown in Fig. 7.

3.15 ***Miscellaneous circuits:*** These circuits are terminated on 89A1-100 connecting blocks

located on shelf A bays 01 through 12 (Fig. 4) as required. Circuits, such as bridge lifters, dial long line, and noise immunity, are located here and cross-connected as required.

3.16 ***Service circuits:*** These circuits are terminated on 89A1-100 connecting blocks located on shelf J bays 01 through 12 (Fig. 4) as required.

3.17 The HCDF (Fig. 4) dedicates space J-01 through J-05 for service circuits that are required in all No. 3 ESS offices, with any difference between offices being (in most cases) the quantity of frames and circuits.

3.18 Figures 11 through 16 provide cable terminations by terminal number, lead, and frame designations. These connecting blocks (89A1-100) are laid out row by column showing the bottom and top terminal numbers so that any lead designation may also be identified by terminal number. The top of the figure provides the name of the circuit and location.

3.19 Figures 11 and 12 provide the test and service circuits terminated on connecting blocks J-01 and J-02.

3.20 Figures 13 and 15 provide the tone or recorded announcement circuits terminated on connecting blocks J-03 and J-05.

3.21 Figure 14 (connecting block J-04) provides terminations for busy tone, call waiting, high tone, and receiver off-hook tone.

3.22 Figure 16 (connecting block J-06) provides terminations for the 7A announcement circuits.

3.23 A functional block diagram of the path for the test and service circuits is provided in Fig. 7.

3.24 ***Toll and transmissions:*** These circuits are terminated on 89A1-100 connecting blocks located in the shaded area of Fig. 4 as required. A functional block diagram of the transmission path is provided in Fig. 7.

4. MAINTENANCE

4.01 The LPCDF has been designed with maintenance features such as:

- Protector test set
- Protector test contacts
- Connecting block arrangement.

4.02 ***Protector test set:*** This unit (KS-20100 L2) is mounted in the end-guard of the frame for ready access for protector unit testing.

4.03 ***Protector test contacts:*** The gold-plated 50-pair test contacts which are located at the top and bottom of each 303-type connector panel accommodate the ***H test connector.*** For details, see Sections 636-330-100 and 106-315-121.

4.04 ***Connecting block arrangement:*** The 89-type connecting block is mounted with the front panel facing out from the frame. This position in addition to the extended edges of the jumper fanning strip, end housings, and bottom identification strip practically eliminate the possibility of any foreign objects resting on the face of the connecting block thereby causing a trouble condition.

4.05 The jumper fanning strip plus wire-wrapped connections prevent open connections induced by pulling jumpers for identification purposes.

5. REFERENCES

ED-97797-70 Low Profile Combined Distributing Frame

J-3H001C No. 3 ESS Control Frame

Section 106-315-121—D, G, H, M Test Connectors—Description and Installation

Section 233-120-100—Switching Network Description No. 3 Electronic Switching System

Section 233-121-100—Scanner Description No. 3 Electronic Switching System

Section 233-121-115—Trunk, Test, and Service Circuits Description No. 3 Electronic Switching System

Section 233-135-105—Trunk and Line Test Panel Description No. 3 Electronic Switching System

Section 233-142-100—Task Oriented Practices

Section 252-230-301—Service Observing Sets No. 7A and 7B Connections and Operation

Section 636-330-100—303-Type Connectors Description, Installation, and Marking

Section 825-215-100—Bridge Lifters (ED-3H156-30)

Section 966-210-100—General Description No. 3 Electronic Switching System.

TABLE A

303-TYPE CONNECTORS—IDENTIFICATION

CONNECTORS			
CODE	STUB CABLE SIZE	STUB CABLE DIRECTION	PROTECTOR UNIT CODE
*303A2-100	24-gauge, 100-pair	Downward	Must Be Ordered Separately (See Table B)
*303B2-100	22-gauge, 100-pair		
*303C2-100	24-gauge, 100-pair	Upward	
*303D2-100	22-gauge, 100-pair		
303E2-100	No Stub		

* These connectors are available with cable stubs of 30, 50, 80, 100, 150, or 200 feet in length.

TABLE B

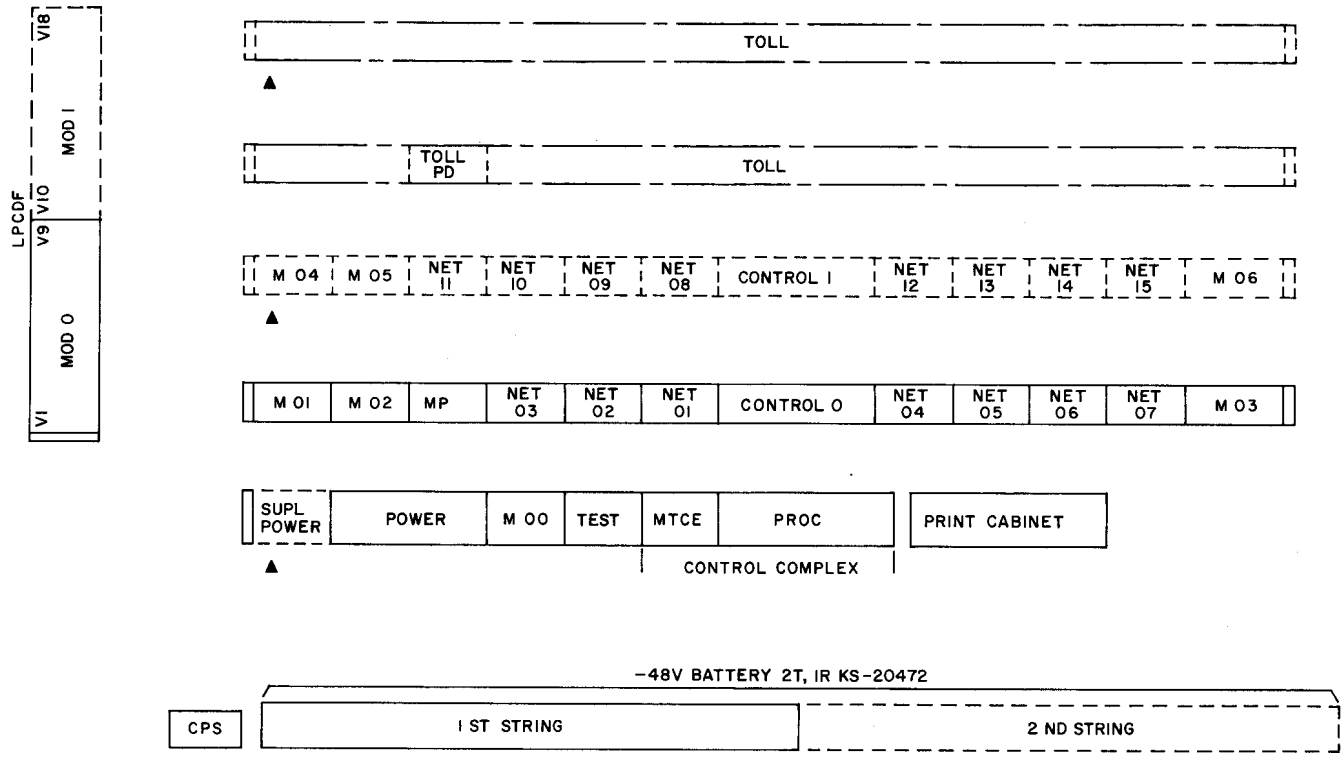
PROTECTOR UNITS – IDENTIFICATION

PROTECTOR UNITS NOTE 2			
CODE	COLOR	HEAT COILS	CIRCUIT IDENTIFICATION
3A5A	Black	None	Standard Circuit
3A6A	Green	None	Denied Circuit (Open)
3A7A	Red	None	Special Circuit
3A8A	Yellow	None	PBX Battery
4A5C	Black	80A	Standard Circuit
4A6C	Green	81A	Denied Circuit (Open)
4A7C	Red	80A	Special Circuit
4A8C	Yellow	79A	PBX Battery
5A5D	Gray	None	Standard Circuit, Unprotected
5A6D	Green	None	Denied Circuit (Open)
5A7D	Red	None	Special Circuit
5A8D	Yellow	None	PBX Battery

Note 1

Note 1: These protectors use 32B and 33B (2 each) protector blocks.

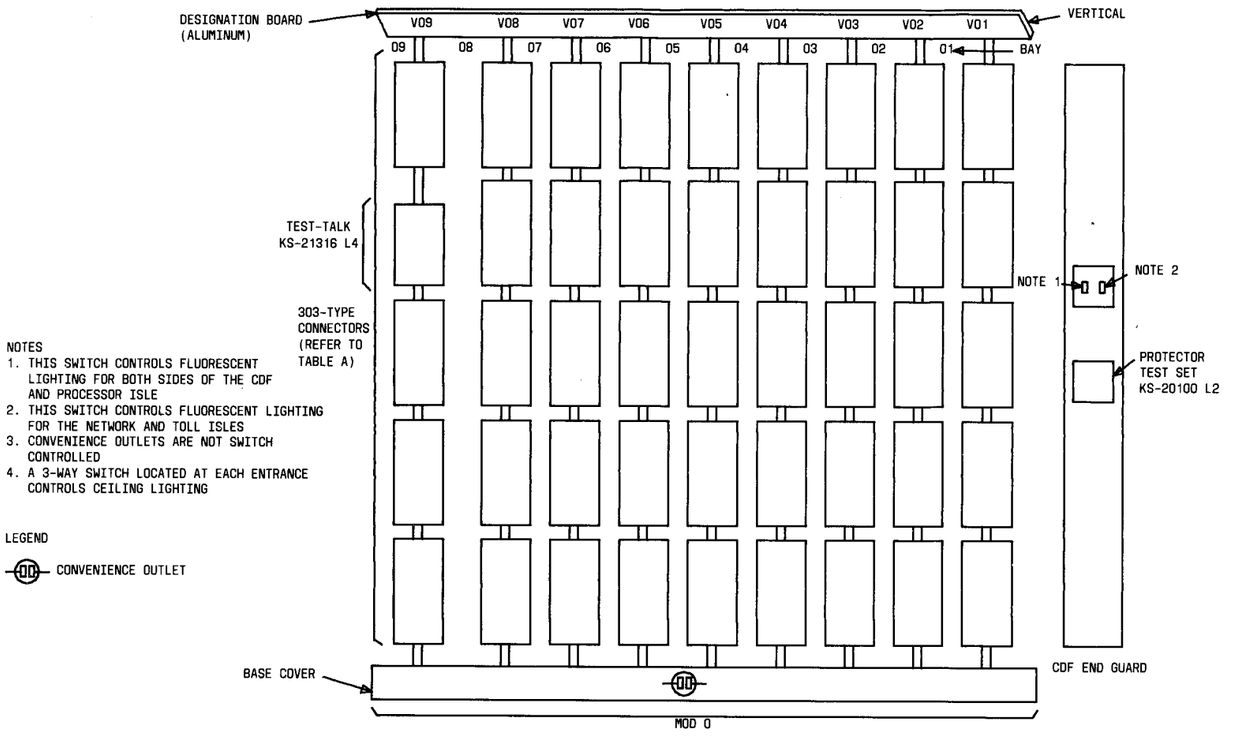
Note 2: Protector units less heat coils are recommended for the No. 3 ESS.



NOTES:
1. SOLID LINES INDICATE 2100 LINE OFFICE.
2. DASHED LINES INDICATE GROWTH TO A 4500 LINE OFFICE.
3. MINIMUM REQUIRED FLOOR SPACE IS 22 FT. X 41 FT. 8 IN.

LEGEND:
PROC - PROCESSOR FRAME
MTCE - MAINTENANCE FRAME
M 00-06 MISCELLANEOUS FRAME
MP - MISCELLANEOUS POWER FRAME
NET (01-15) NETWORK FRAMES
LPCDF - LOW PROFILE COMBINED DISTRIBUTING FRAME
PD - POWER DISTRIBUTION
MOD - MODULE
V - VERTICAL
CPS - CIRCUIT PACK STORAGE
▲ - DENOTES MAINTENANCE AISLE (FRAME EQUIPMENT FACES THIS AISLE)

Fig. 1—No. 3 Electronic Switching System Floor Plan



NOTES
1. THIS SWITCH CONTROLS FLUORESCENT LIGHTING FOR BOTH SIDES OF THE CDF AND PROCESSOR ISLE
2. THIS SWITCH CONTROLS FLUORESCENT LIGHTING FOR THE NETWORK AND TOLL ISLES
3. CONVENIENCE OUTLETS ARE NOT SWITCH CONTROLLED
4. A 3-WAY SWITCH LOCATED AT EACH ENTRANCE CONTROLS CEILING LIGHTING

LEGEND

CONVENIENCE OUTLET

Fig. 2—Vertical Side of Low Profile Combined Distributing Frame—ED-97797-70

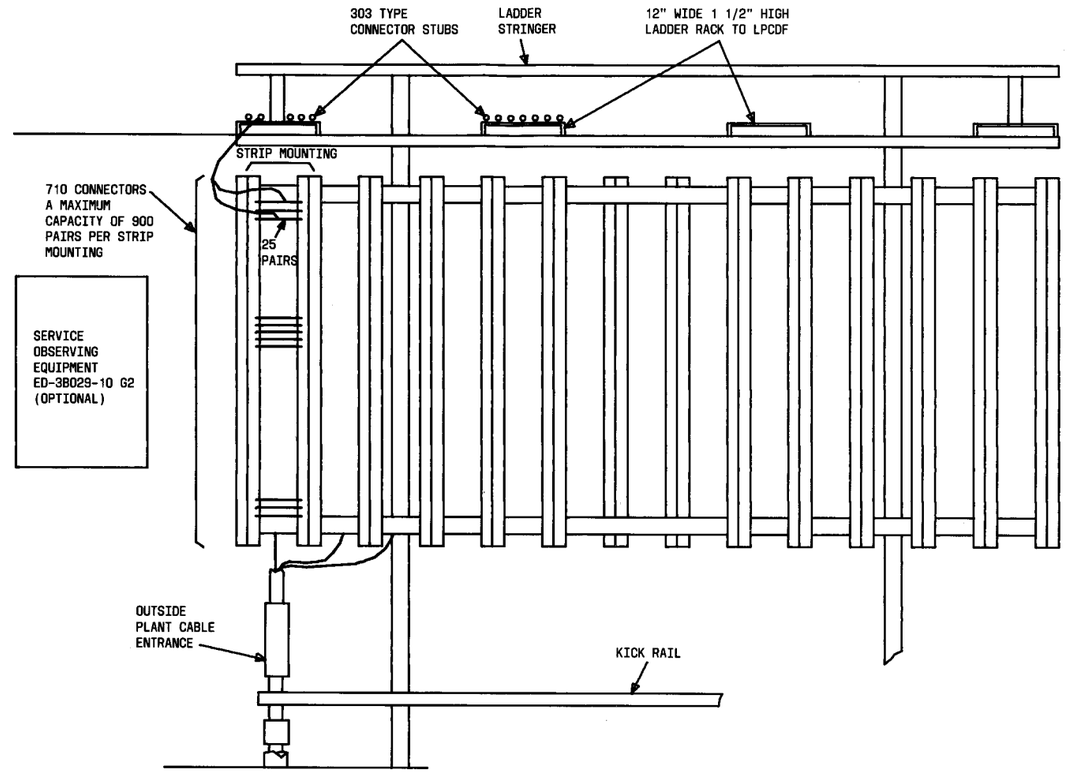
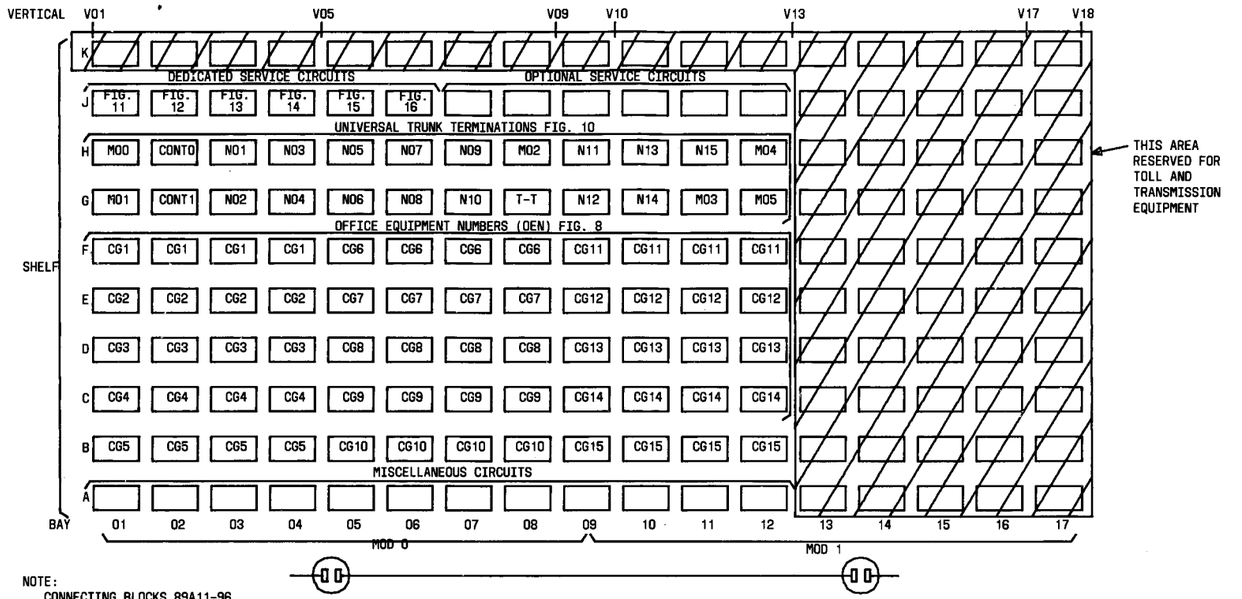


Fig. 3—Cable Entrance Facilities—Typical



NOTE:
CONNECTING BLOCKS 89A11-96 AND 89A12-96 ARE PROVIDED FOR THE OEN'S, ALL OTHER CIRCUITS USE 89A1-100 BLOCKS.

LEGEND:
CONVENIENCE OUTLETS LOCATED IN BASE COVER

ABBREVIATIONS
CG1-CG15 - CONCENTRATOR GROUPS 0/1 THROUGH 15, THESE GROUPS ARE LOCATED ON ASSOCIATED NETWORK FRAMES 01 THROUGH 15.
CONTO,CONT1 - CONTROL FRAMES 0 AND 1, UNIVERSAL TRUNKS TERMINATED ON THESE BLOCKS ARE LOCATED ON FRAMES CONTO AND CONT1.
M00-M05 - MISCELLANEOUS FRAMES 00 THROUGH 05, UNIVERSAL TRUNKS TERMINATED ON THESE BLOCKS ARE LOCATED ON FRAMES M00-M05.
N01-N15 - NETWORK FRAMES 01 THROUGH 15, UNIVERSAL TRUNKS TERMINATED ON THESE BLOCKS ARE LOCATED ON FRAMES N01-N15.
T-T - TEST-TALK KS-21316 L4

Fig. 4—Assignment of Central Office Terminations on Horizontal Side of Low Profile Combined Distributing Frame—ED-97797-70

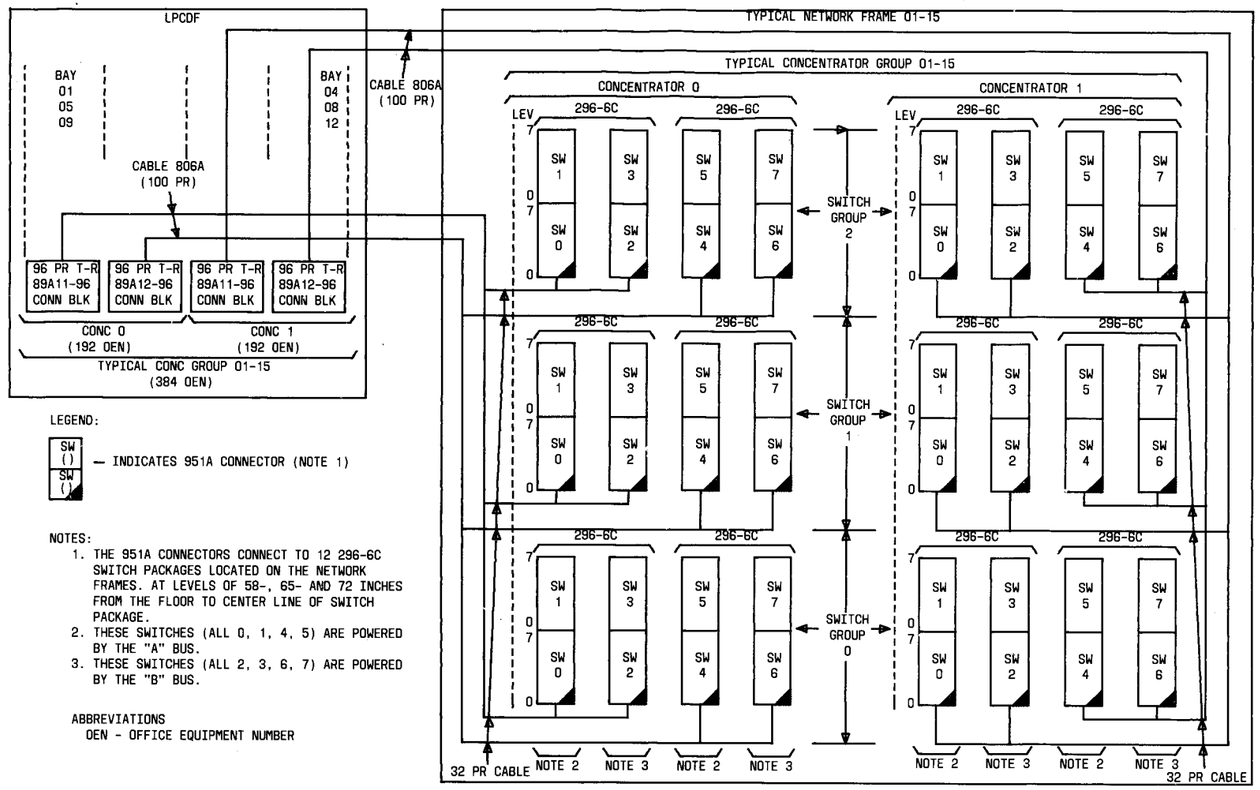
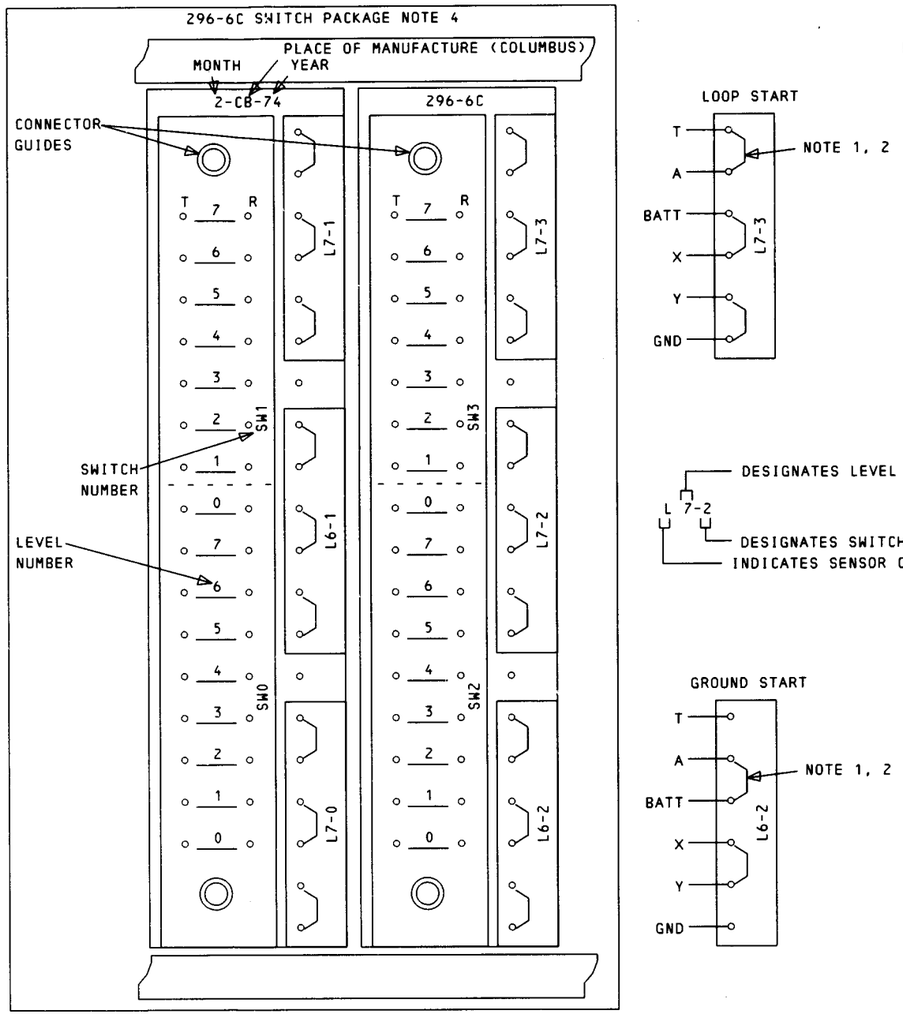


Fig. 5—Cabling of Concentrator Groups (Front View) to Low Profile Combined Distributing Frame (Horizontal Side)



NOTES:
1. THESE STRAPS ARE 30 AMERICAN WIRE GAUGE (AWG).
2. THIS STRAPPING APPLIES TO ALL OTHER SWITCH PACKAGES.
3. A COMBINATION OF SWITCH NUMBER AND LEVEL NUMBER DETERMINES THE LOCATION OF THE LINE SENSOR COIL.
4. EACH 296-6C SWITCH PACKAGE MATES WITH TWO 951A CONNECTORS THAT TERMINATE ON THE LPCDF (FIG. 8). THIS FIGURE SHOWS THE SPECIFIC TERMINALS ON THE CONNNECTING BLOCK THAT HAVE THE LOOP TO GROUND START OPTION.

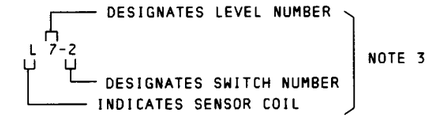


Fig. 6—Typical 296-6C Switch Package Loop To Ground Start Option—Straps

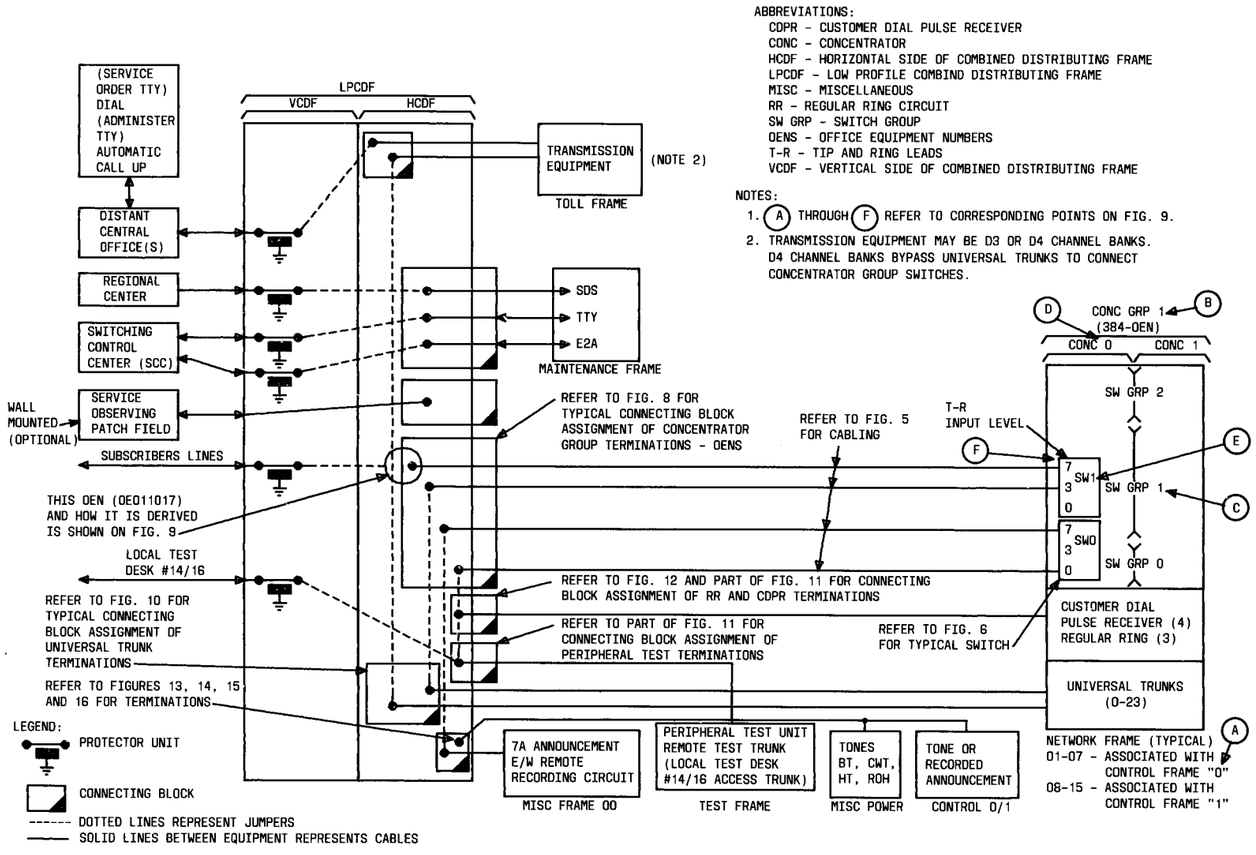
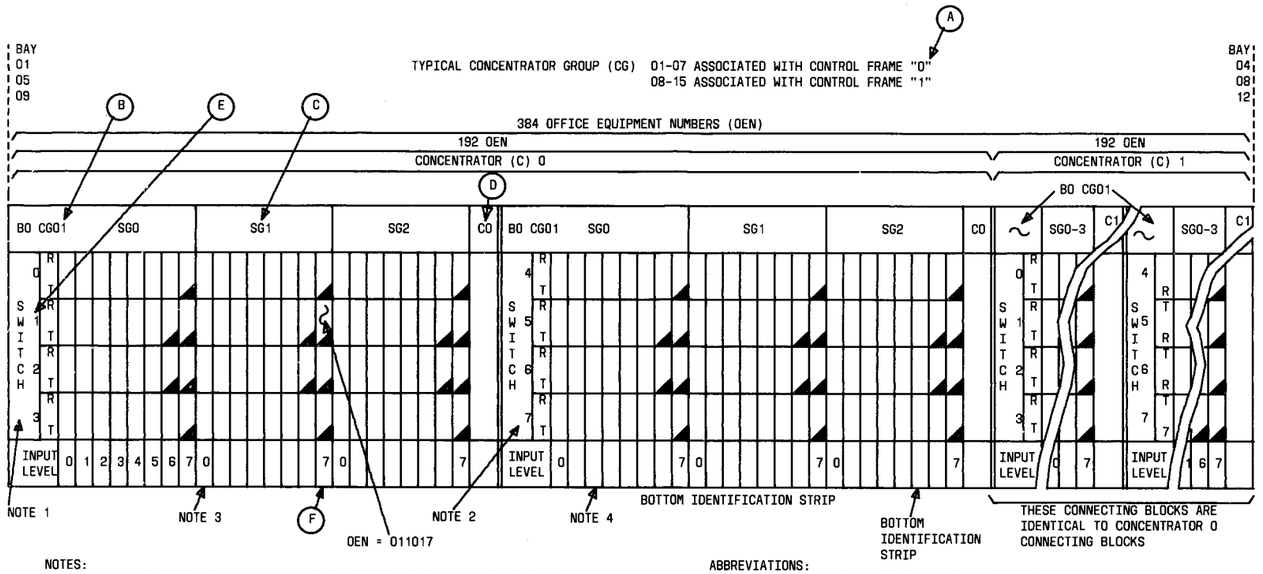


Fig. 7—Low Profile Combined Distributing Frame—Functional Block Diagram



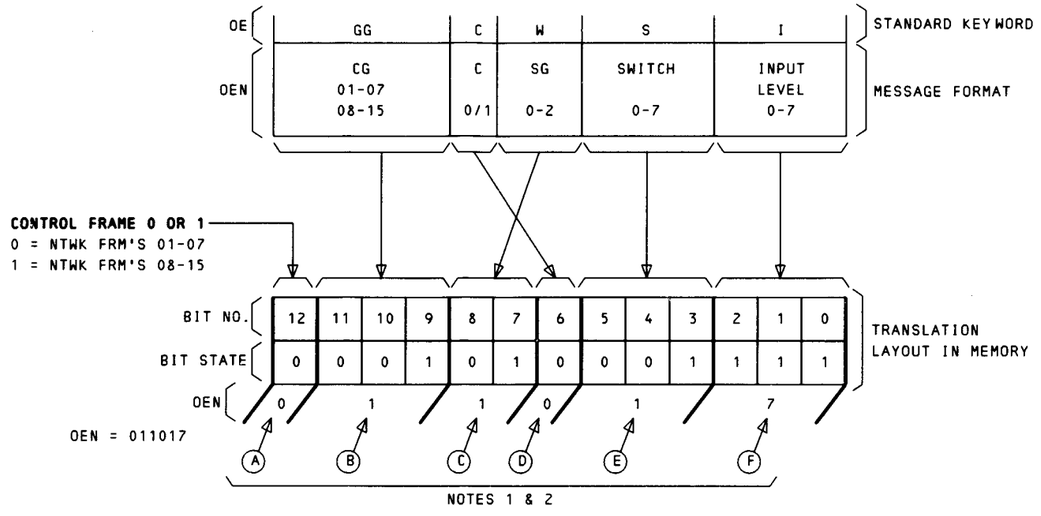
NOTES:
1. SWITCHES 0,1,4,5 (CONCENTRATORS 0 AND 1) ARE POWERED BY THE A BUS.
2. SWITCHES 2,3,6,7 (CONCENTRATORS 0 AND 1) ARE POWERED BY THE B BUS.
3. THESE CONNECTING BLOCKS ARE 96 PAIR (CODE 89A11-96) FOR SWITCHES 0-3.
4. THESE CONNECTING BLOCKS ARE 96 PAIR (CODE 89A12-96) FOR SWITCHES 4-7.
5. (A) THROUGH (F) REFER TO CORRESPONDING POINTS ON FIG. 9.

ABBREVIATIONS:
80 ← IDENTIFIES WHICH #3 ESS IF MORE THAN ONE IN A CENTRAL OFFICE
1 ← INDICATES #3 ESS
C - CONCENTRATOR (TWO, 0 OR 1)
CG - CONCENTRATOR GROUP (MAXIMUM 15, 01-15)
SG - SWITCH GROUP (THREE, 0-2)

LEGEND:

— INDICATES TIP AND RING TERMINALS FROM THOSE SWITCHES WHICH ARE MANUFACTURED WITH STRAPS TO PROVIDE "LOOP START" BUT MAY BE RE-STRAPPED TO "GROUND START". REFER TO FIG. 6 FOR STRAPPING PROCEDURE.

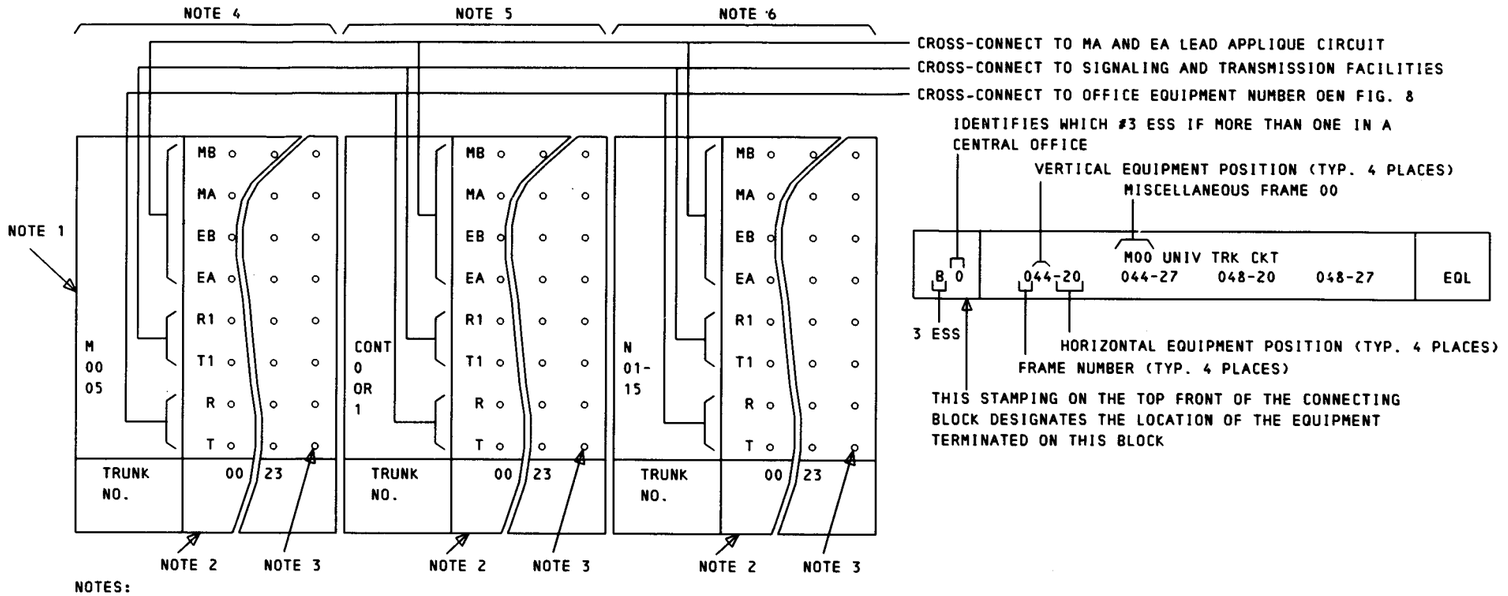
Fig. 8—Typical Connecting Block Assignment of Concentrator Group Terminations on Low Profile Combined Distributing Frame



ABBREVIATIONS:
- C - CONCENTRATOR
- CG - CONCENTRATOR GROUP
- OEN - OFFICE EQUIPMENT NUMBER
- SG - SWITCH GROUP

NOTES:
1. REFER TO POINTS (A) THROUGH (F) ON FIG. 7 FOR CORRESPONDING LOCATIONS ON NETWORK FRAME.
2. REFER TO POINTS (A) THROUGH (F) ON FIG. 8 FOR CORRESPONDING LOCATIONS ON CONNECTING BLOCK.

Fig. 9—Office Equipment Number (OEN) Format



NOTES:
1. THESE CONNECTING BLOCKS ARE 89A1-100'S.
2. THIS IS THE BOTTOM IDENTIFICATION STRIP.
3. THIS COLUMN OF TERMINALS IS UNUSED.
4. UNIVERSAL TRUNKS TERMINATED ON THESE BLOCKS ARE LOCATED ON MISCELLANEOUS FRAMES 00-05.
5. UNIVERSAL TRUNKS TERMINATED ON THESE BLOCKS ARE LOCATED ON CONTROL FRAME 0 OR 1.
6. UNIVERSAL TRUNKS TERMINATED ON THESE BLOCKS ARE LOCATED ON NETWORK FRAMES 01-15.

Fig. 10—Typical Connecting Block Assignment of Universal Trunks on Low Profile Combined Distributing Frame

89A1-100 CONNECTING BLOCK SHELF J BAY 01	CABLED FROM FRAME		TEST							CONTROL 0 BAY 1		CONTROL 0 BAY 1		CONT 1 (NOTE) BAY 1	NETWORK 01		NETWORK 02		NETWORK 03		CONTROL 0 BAY 0		CONTROL 0 BAY 1				NETWORK 04	
	CIRCUIT		PERIPHERAL TEST							TEST VERT AND PWR CONT	TEST VERT AND PWR CONT	MF TRMTR	MF TRMTR	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR
	TOP TERM. NO.		007	017	027	037	047	057	067	077	087	097	107	117	127	137	147	157	167	177	187	197	207	217	227	237	247	
	ROW	7	TDNR	CPNR	SRNR1	TENR0		ITTTR21	ITTTR31	PCR0		R3	R3		DR0-3		DR0-3		DR0-3		DR0-3		DR0-3		DR0-3		DR0-3	
		6	TDNT	CPNT	SRNT1	TENT0		ITTTT21	ITTTT31	PCT0		T3	T3		DT0-3		DT0-3		DT0-3		DT0-3		DT0-3		DT0-3		DT0-3	
		5	TPPDR	ITNR11	SRNR0	TPNR00		ITTTG11	ITTTG21	PWR1		R2	R2	R2	DR0-2	R2	DR0-2	R2	DR0-2	R2	DR0-2	R2	DR0-2	R2	DR0-2	R2	DR0-2	R2	DR0-2
		4	TPPDT	ITNT11	SRNT0	TPNT00		ITTS14	ITTTS21	PWT1		T2	T2	T2	DT0-2	T2	DT0-2	T2	DT0-2	T2	DT0-2	T2	DT0-2	T2	DT0-2	T2	DT0-2	T2	DT0-2
		3	TPNR2	ITNR10	DTNR	TPNR10	LENR	ITTTR20	ITTTR30	PWR0		R1	R1	R1	DR0-1	R1	DR0-1	R1	DR0-1	R1	DR0-1	R1	DR0-1	R1	DR0-1	R1	DR0-1	R1	DR0-1
		2	TRRNG0	ITNT10	DTNT	TPNT10	LENT	ITTTT20	ITTTT30	PWT0		T1	T1	T1	DT0-1	T1	DT0-1	T1	DT0-1	T1	DT0-1	T1	DT0-1	T1	DT0-1	T1	DT0-1	T1	DT0-1
		1	TPPDR1	LIR	TTNR	RTR	TENR1	ITTTG10	ITTTG20	SIBR		R0	R0	R0	DR0-0	R0	DR0-0	R0	DR0-0	R0	DR0-0	R0	DR0-0	R0	DR0-0	R0	DR0-0	R0	DR0-0
		0	TPPDT1	LIT	TTNT	RTT	TENT1	ITTTS10	ITTTS20	SIB		T0	T0	T0	DT0-0	T0	DT0-0	T0	DT0-0	T0	DT0-0	T0	DT0-0	T0	DT0-0	T0	DT0-0	T0	DT0-0
	BOTTOM TERM. NO.		000	010	020	030	040	050	060	070	080	090	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	
	COLUMN		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	

NOTE:
CONTROL FRAME 1 MAY BE PURCHASED WITH OR WITHOUT A MULTIFREQUENCY ASSEMBLY, BUT MAY CONTAIN ONLY ONE ASSEMBLY. WHEN ADDITIONAL MULTIFREQUENCY CIRCUITS ARE NEEDED THEY SHOULD BE INSTALLED IN CONTROL FRAME 1. IF REQUIREMENTS OF CONTROL FRAME 1 ARE EXCEEDED, INSTALL CIRCUITS IN A MISCELLANEOUS FRAME.

Fig. 11—Connecting Block J-01 Terminations of Test and Service Circuits From Test, Control, and Network Frames 01 Through 04 (Front View)

	CABLED FROM FRAME		NETWORK 05		NETWORK 06		NETWORK 07		NETWORK 08		NETWORK 09		NETWORK 10		NETWORK 11		NETWORK 12		NETWORK 13		NETWORK 14		NETWORK 15		TEST		
	CIRCUIT	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR	REG RING	CDPR	PERIPHERAL TEST		
89A1-100 CONNECTING BLOCK SHELF J BAY 02	TOP TERM NO.	007	017	027	037	047	057	067	077	087	097	107	117	127	137	147	157	167	177	187	197	207	217	227	237	247	
	ROW 7		DR0-3		DR0-3		DR0-3		DR0-3		DR0-3		DR0-3		DR0-3		DR0-3		DR0-3		DR0-3		DR0-3	TTYPLR10	TTYNR11	TTYR11	
	6		DT0-3		DT0-3		DT0-3		DT0-3		DT0-3		DT0-3		DT0-3		DT0-3		DT0-3		DT0-3		DT0-3	TTYPLT10	TTYNT11	TTYT11	
	5	R2	DR0-2	R2	DR0-2	R2	DR0-2	R2	DR0-2	R2	DR0-2	R2	DR0-2	R2	DR0-2	R2	DR0-2	R2	DR0-2	R2	DR0-2	R2	DR0-2	TTYPLR00	TTYNR01	TTYR01	
	4	T2	DT0-2	T2	DT0-2	T2	DT0-2	T2	DT0-2	T2	DT0-2	T2	DT0-2	T2	DT0-2	T2	DT0-2	T2	DT0-2	T2	DT0-2	T2	DT0-2	TTYPLT00	TTYNT01	TTYT01	
	3	R1	DR0-1	R1	DR0-1	R1	DR0-1	R1	DR0-1	R1	DR0-1	R1	DR0-1	R1	DR0-1	R1	DR0-1	R1	DR0-1	R1	DR0-1	R1	DR0-1	TTYNR10	TTYR10	TTYPLR11	
	2	T1	DT0-1	T1	DT0-1	T1	DT0-1	T1	DT0-1	T1	DT0-1	T1	DT0-1	T1	DT0-1	T1	DT0-1	T1	DT0-1	T1	DT0-1	T1	DT0-1	TTYNT10	TTYT10	TTYPLT11	
	1	R0	DR0-0	R0	DR0-0	R0	DR0-0	R0	DR0-0	R0	DR0-0	R0	DR0-0	R0	DR0-0	R0	DR0-0	R0	DR0-0	R0	DR0-0	R0	DR0-0	TTYNR00	TTYR00	TTYPLR01	
	0	T0	DT0-0	T0	DT0-0	T0	DT0-0	T0	DT0-0	T0	DT0-0	T0	DT0-0	T0	DT0-0	T0	DT0-0	T0	DT0-0	T0	DT0-0	T0	DT0-0	TTYNT00	TTYT00	TTYPLT01	
	BOTTOM TERM NO.	000	010	020	030	040	050	060	070	080	090	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	
	COLUMN	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	

Fig. 12—Connecting Block J-02 Terminations of Service Circuits (RR and CDPR) From Network Frames 05 Through 15 (Front View)

CABLED FROM FRAME: CONTROL 0 — BAY 1

CIRCUIT: TONE OR RECORDED ANNOUNCEMENT

89A1-100 CONNECTING BLOCK SHELF J BAY 03

TOP TERM NO.		007	017	027	037	047	057	067	077	087	097	107	117	127	137	147	157	167	177	187	197	207	217	227	237	247
ROW	7	R1-01	R1-03	R1-06	R1-07	R1-09	R1-11	STA-01	STA-03	STA-05	STA-07	STA-09	STA-11		RT0-03	RT0-07	RT0-11	RT1-03	RT1-07	RT1-11	RA0-03	RA0-07	RA0-11			
	6	T1-01	T1-03	T1-05	T1-07	T1-09	T1-11	ST1R-01	ST1A-03	ST1A-05	ST1A-07	ST1A-09	ST1A-11		TT0-03	TT0-07	TT0-11	TT1-03	TT1-07	TT1-11	TA0-03	TA0-07	TA0-11			
	5	R0-01	R0-03	R0-05	R0-07	R0-09	R0-11	C0-01	C0-03	C0-05	C0-07	C0-09	C0-11		RT0-02	RT0-06	RT0-10	RT1-02	RT1-06	RT1-10	RA0-02	RA0-06	RA0-10			
	4	T0-01	T0-03	T0-05	T0-07	T0-09	T0-11	BA-01	BA-03	BA-05	BA-07	BA-09	BA-11		TT0-02	TT0-06	TT0-10	TT1-02	TT1-06	TT1-10	TA0-02	TA0-06	TA0-10			
	3	R1-00	R1-02	R1-04	R1-06	R1-08	R1-10	STA-00	STA-02	STA-04	STA-06	STA-08	STA-10		RT0-01	RT0-05	RT0-09	RT1-01	RT1-05	RT1-09	RA0-01	RA0-05	RA0-09			
	2	T1-00	T1-02	T1-04	T1-06	T1-08	T1-10	ST1A-00	ST1A-02	ST1A-04	ST1A-06	ST1A-08	ST1A-10		TT0-01	TT0-05	TT0-09	TT1-01	TT1-05	TT1-09	TA0-01	TA0-05	TA0-09			
	1	R0-00	R0-02	R0-04	R0-06	R0-08	R0-10	C0-00	C0-02	C0-04	C0-06	C0-08	C0-10	DL1-11	RT0-00	RT0-04	RT0-08	RT1-00	RT1-04	RT1-08	RA0-00	RA0-04	RA0-08			
	0	T0-00	T0-02	T0-04	T0-06	T0-08	T0-10	BA-00	BA-02	BA-04	BA-06	BA-08	BA-10	DA-11	TT0-00	TT0-04	TT0-08	TT1-00	TT1-04	TT1-08	TA0-00	TA0-04	TA0-08			
BOTTOM TERM NO.		000	010	020	030	040	050	060	070	080	090	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240
COLUMN		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

Fig. 13—Connecting Block J-03 Terminations of Tone or Recorded Announcement Circuits From Control Frame 0 Bay 1 (Front View)

89A1-100 CONNECTING BLOCK SHELF J BAY 04		CABLED FROM FRAME	MISCELLANEOUS POWER																							
		CIRCUIT / BUSY TONE	CALL WAITING TONE AND HIGH TONE							RECEIVER OFF HOOK TONE			BUSY TONE													
	TOP TERM NO.		007	017	027	037	047	057	067	077	087	097	107	117	127	137	147	157	167	177	187	197	207	217	227	237	247
	ROW 7		R(BT)4	R(MTI)4	R(MTI)8	R(HT)8	R(HT)11			R(ROH)4	R(ROH)8	R(ROH)12	R(BT60)4	R(BT60)8	R(BT60)12	R(BT60)16											
	6		T(BT)4	T(MTI)4	T(MTI)8	T(HT)8	T(HT)11			T(ROH)4	T(ROH)8	T(ROH)12	T(BT60)4	T(BT60)8	T(BT60)12	T(BT60)16											
	5		R(BT)3	R(MTI)3	R(MTI)7	R(MTI)11	R(HT)10		R(HT)6	R(ROH)3	R(ROH)7	R(ROH)11	R(BT60)3	R(BT60)7	R(BT60)11	R(BT60)15											
	4		T(BT)3	T(MTI)3	T(MTI)7	T(MTI)11	T(HT)10		T(HT)6	T(ROH)3	T(ROH)7	T(ROH)11	T(BT60)3	T(BT60)7	T(BT60)11	T(BT60)15											
	3		R(BT)2	R(MTI)2	R(MTI)6	R(MTI)10	R(HT)9		R(HT)5	R(ROH)2	R(ROH)6	R(ROH)10	R(BT60)2	R(BT60)6	R(BT60)10	R(BT60)14	R(BT60)18	R(BT)6									
	2		T(BT)2	T(MTI)2	T(MTI)6	T(MTI)10	T(HT)9		T(HT)5	T(ROH)2	T(ROH)6	T(ROH)10	T(BT60)2	T(BT60)6	T(BT60)10	T(BT60)14	T(BT60)18	T(BT)6									
	1		R(BT)1	R(MTI)1	R(MTI)5	R(MTI)9	R(HT)7	R(HT)12	R(HT)4	R(ROH)1	R(ROH)5	R(ROH)9	R(BT60)1	R(BT60)5	R(BT60)9	R(BT60)13	R(BT60)17	R(BT)5									
	0		T(BT)1	T(MTI)1	T(MTI)5	T(MTI)9	T(HT)7	T(HT)12	T(HT)4	T(ROH)1	T(ROH)5	T(ROH)9	T(BT60)1	T(BT60)5	T(BT60)9	T(BT60)13	T(BT60)17	T(BT)5									
	BOTTOM TERM NO.		000	010	020	030	040	050	060	070	080	090	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240
	COLUMN		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

Fig. 14—Connecting Block J-04 Terminations of Miscellaneous Tone Circuits From Miscellaneous Power Frame (Front View)

CABLED FROM FRAME: CONTROL 1 — BAY 1

CIRCUIT: TONE OR RECORDED ANNOUNCEMENT

89A1-100 CONNECTING BLOCK SHELF J BAY 05

TOP TERM NO.		007	017	027	037	047	057	067	077	087	097	107	117	127	137	147	157	167	177	187	197	207	217	227	237	247
ROW	7	R1-01	R1-03	R1-06	R1-07	R1-09	R1-11	STA-01	STA-03	STA-05	STA-07	STA-09	STA-11		RT0-03	RT0-07	RT0-11	RT1-03	RT1-07	RT1-11	RA0-03	RA0-07	RA0-11			
	6	T1-01	T1-03	T1-05	T1-07	T1-09	T1-11	ST1A-01	ST1A-03	ST1A-05	ST1A-07	ST1A-09	ST1A-11		TT0-03	TT0-07	TT0-11	TT1-03	TT1-07	TT1-11	TA0-03	TA0-07	TA0-11			
	5	R0-01	R0-03	R0-05	R0-07	R0-09	R0-11	C0-01	C0-03	C0-05	C0-07	C0-09	C0-11		RT0-02	RT0-06	RT0-10	RT1-02	RT1-06	RT1-10	RA0-02	RA0-06	RA0-10			
	4	T0-01	T0-03	T0-05	T0-07	T0-09	T0-11	BA-01	BA-03	BA-05	BA-07	BA-09	BA-11		TT0-02	TT0-06	TT0-10	TT1-02	TT1-06	TT1-10	TA0-02	TA0-06	TA0-10			
	3	R1-00	R1-02	R1-04	R1-06	R1-08	R1-10	STA-00	STA-02	STA-04	STA-06	STA-08	STA-10		RT0-01	RT0-05	RT0-09	RT1-01	RT1-05	RT1-09	RA0-01	RA0-05	RA0-09			
	2	T1-00	T1-02	T1-04	T1-06	T1-08	T1-10	ST1A-00	ST1A-02	ST1A-04	ST1A-06	ST1A-08	ST1A-10		TT0-01	TT0-05	TT0-09	TT1-01	TT1-05	TT1-09	TA0-01	TA0-05	TA0-09			
	1	R0-00	R0-02	R0-04	R0-06	R0-08	R0-10	C0-00	C0-02	C0-04	C0-06	C0-08	C0-10	DL1-11	RT0-00	RT0-04	RT0-08	RT1-00	RT1-04	RT1-08	RA0-00	RA0-04	RA0-08			
	0	T0-00	T0-02	T0-04	T0-06	T0-08	T0-10	BA-00	BA-02	BA-04	BA-06	BA-08	BA-10	DA-11	TT0-00	TT0-04	TT0-08	TT1-00	TT1-04	TT1-08	TA0-00	TA0-04	TA0-08			
BOTTOM TERM NO.		000	010	020	030	040	050	060	070	080	090	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240
COLUMN		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

Fig. 15—Connecting Block J-05 Terminations of Tone or Recorded Announcement Circuits From Control Frame 1 Bay 1 (Front View)

CABLED FROM FRAME		MISCELLANEOUS BAY 00 7A ANNOUNCEMENT																									
CIRCUIT		FIRST		SECOND																							
89A1-100 CONNECTING BLOCK SHELF J BAY 06	TOP TERM NO.	007	017	027	037	047	057	067	077	087	097	107	117	127	137	147	157	167	177	187	197	207	217	227	237	247	
	ROW 7	CO	CO	CO	CO																						
	6	B	B	B	B																						
	5	DL	DL	DL	DL																						
	4	D	D	D	D																						
	3	ST1	ST1	ST1	ST1																						
	2	ST	ST	ST	ST																						
	1	R	R	R	R																						
	0	T	T	T	T																						
	BOTTOM TERM NO.	000	010	020	030	040	050	060	070	080	090	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	
	COLUMN	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	

Fig. 16—Connecting Block J-06 Terminations for 7A Announcement Circuits From Control Frame 0 or 1