

**MAIN, INTERMEDIATE, AND TRUNK  
DISTRIBUTING FRAMES  
EQUIPMENT DESIGN REQUIREMENTS  
COMMON SYSTEMS**

**1. GENERAL**

**Scope**

**1.01** This specification, together with the supplementary information listed herein, covers the equipment requirements for the main, intermediate, and trunk distributing frames. Separate specifications for other distributing frames and protector frames are as follows:

- (a) J97031 — 801-005-152 — Main Distributing Frames, Combined Distributing Frames, Protector Frames — Common Systems
- (b) J97032 — 801-005-153 — Intermediate Distributing Frames, Trunk Distributing Frames — Common Systems
- (c) J1A050 — 820-025-150 — Protector Frame — No. 1 Electronic Switching System

**1.02** This specification is reissued to incorporate previous appendix changes.

**Description**

**1.03** There are three types of distributing frames; the main distributing frame (MDF), the trunk distributing frame (TDF), and the intermediate distributing frame (IDF).

**1.04** The MDF provides for the flexible association of outside plant with central office equipment. The design takes advantage of electronic memories and other innovations to minimize jumper changes, jumper lengths, and frame volume.

**1.05** In new buildings, the MDF will be used in conjunction with the new protector frame described in J1A050. Both the protector frame

and the MDF are single-sided frames, 8 feet high and 1 foot wide. A module of each, 6 feet 6 inches long, provides for 6000 pairs from outside plant.

**1.06** Where No. 1 ESS equipment is installed in an existing building, it may be served by either an existing MDF or a new MDF (ED-1A222-31 or equivalent); or it may have a combination of a new MDF with an existing protector frame. When an existing MDF is used, it should be cabled as shown in ED-1A236-01, Existing MDF Typical Equipment.

**1.07** The TDF provides for the cross connection of trunks to trunk link networks to simplify traffic balancing.

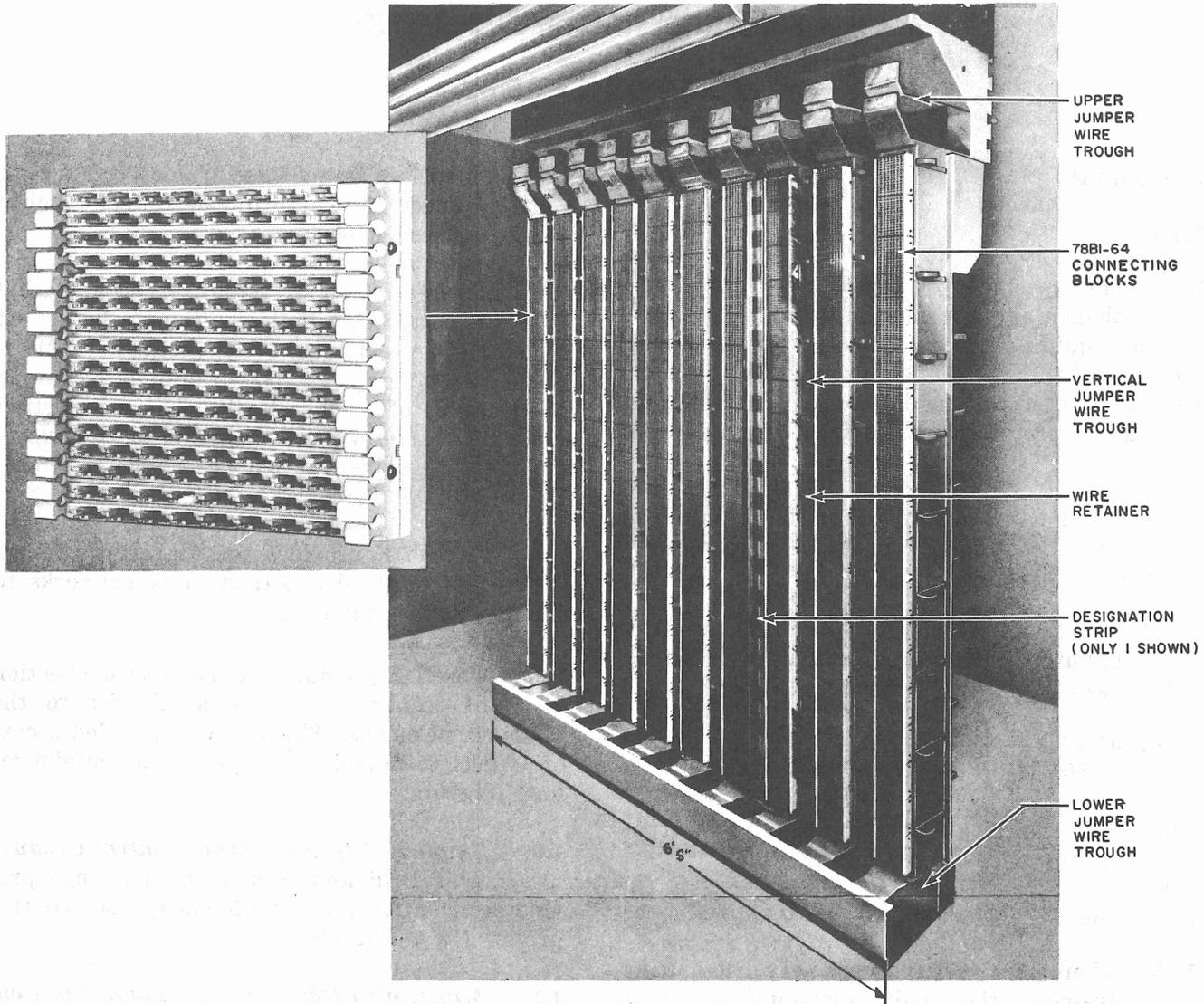
**1.08** The IDF provides for the cross-connection of trunks and trunk auxiliaries to the MDF via tie cables. This allows multiplied access of trunks to outside plant pairs and minimizes long jumpers.

**1.09 *Single Entity Office (One Control Group):*** This BSP and supporting drawings provide information for a single entity (one control group) No. 1 ESS office.

**1.10 *Multientity Offices (More Than One Control Group):*** There is at present no typical arrangement for terminating more than one control group on a single distributing frame lineup.

**1.11 *Common Systems Considerations:*** When switching systems other than No. 1 ESS are considering using this type of distributing frame the following limiting characteristics must be considered:

- (a) The use of preferential assignment procedures to obtain the maximum number



**Fig. 1 — Distributing Frame Module — 8-Foot High**

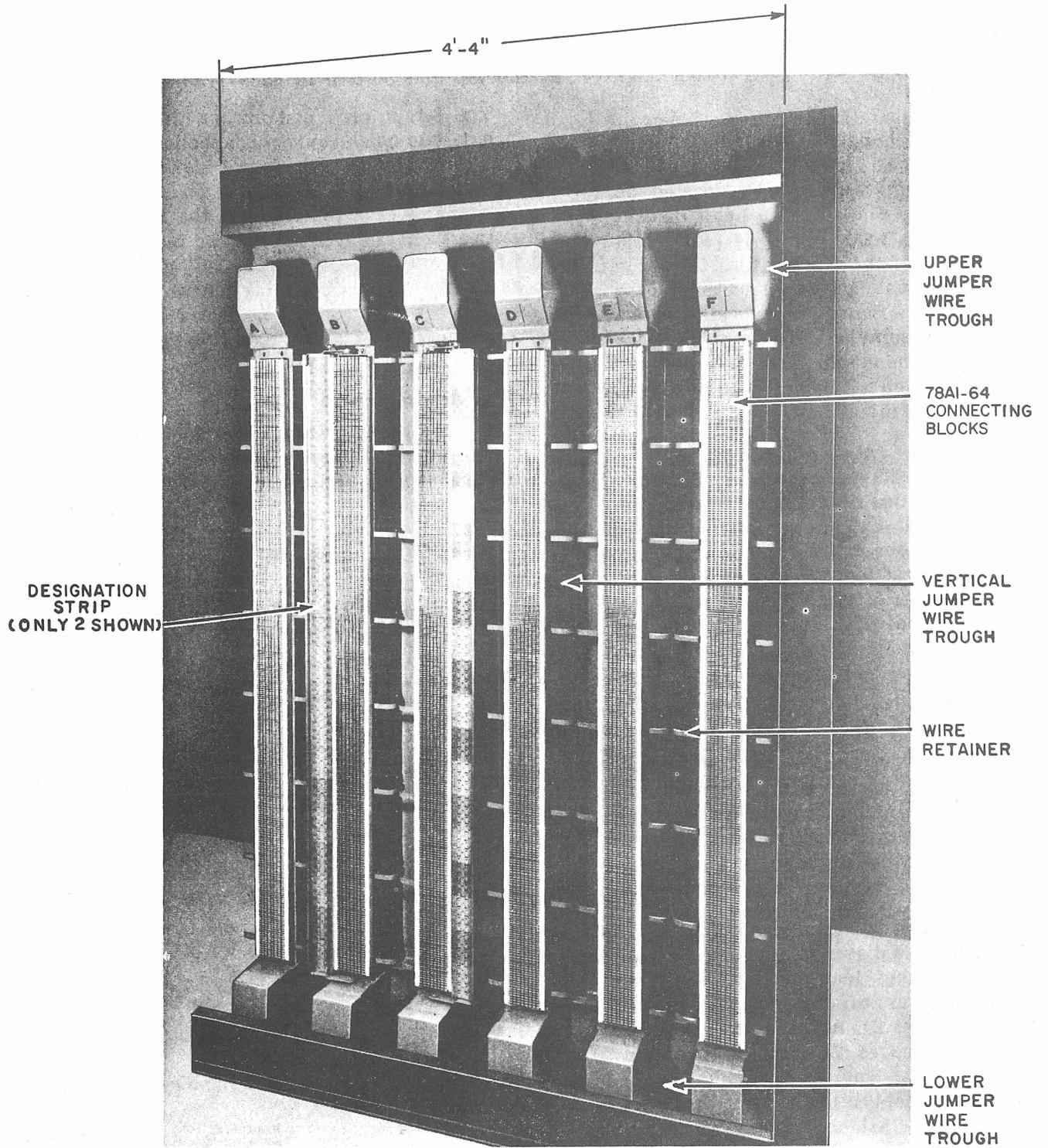


Fig. 2 — Distributing Frame Module — 7-Foot High

of short jumpers is a requirement. (See also Jumpers and Capacity.)

- (b) The rear vertical and cable brackets were designed to terminate 26-gauge cable which is common to No. 1 ESS. If other systems require 24- or 22-gauge cables, the cable pileup could limit the usable terminals on the vertical, however, a combination of different size cables might be satisfactory.
- (c) Designation cards
- (d) Method of cabling
- (e) Typical equipment arrangement and stamping.

#### The Modules

**1.12** Two basic types of framework are used for these frames, the 8-foot high distributing frame module and the 7-foot high distributing frame module. The MDF will use the 8-foot high module and the TDF will use the 7-foot high module. The IDF will normally be an 8-foot high module located at the head end of the main distributing frame. Here, the IDF will be in line with the main distributing frame, and the two frames will grow in opposite directions. Occasionally, the IDF may be located in a switching equipment line-up to provide shorter cable runs to meet transmission limits. In this case, the IDF will be a 7-foot high module.

**1.13** The 8-foot high distributing frame module (6 feet 6 inches long, 1 foot wide, and 8 feet high) has ten vertical files located on 7.8-inch centers (see Fig. 1). A full complement of connecting blocks (coded 78B1-64 [see 1.22]) is furnished on all of the vertical files. The twin quick-connect terminals on the connecting blocks face the front of the frame and provide for two connections per terminal. All cross-connections will be made from the maintenance aisle or front side of the frame and all cables will be solderless wrapped to terminals on the rear of the frame.

**1.14** A vertical T-shaped terminal designation strip is provided on every vertical file of connecting blocks. It extends the length of the vertical and covers one-half of a vertical wiring trough. It is hinged at top and bottom so it may

be rotated to the left or right of the connecting blocks on one vertical file to provide full access to either vertical trough. Designation cards are duplicated and placed on both sides of the designation strip to provide complete terminal identification in either position.

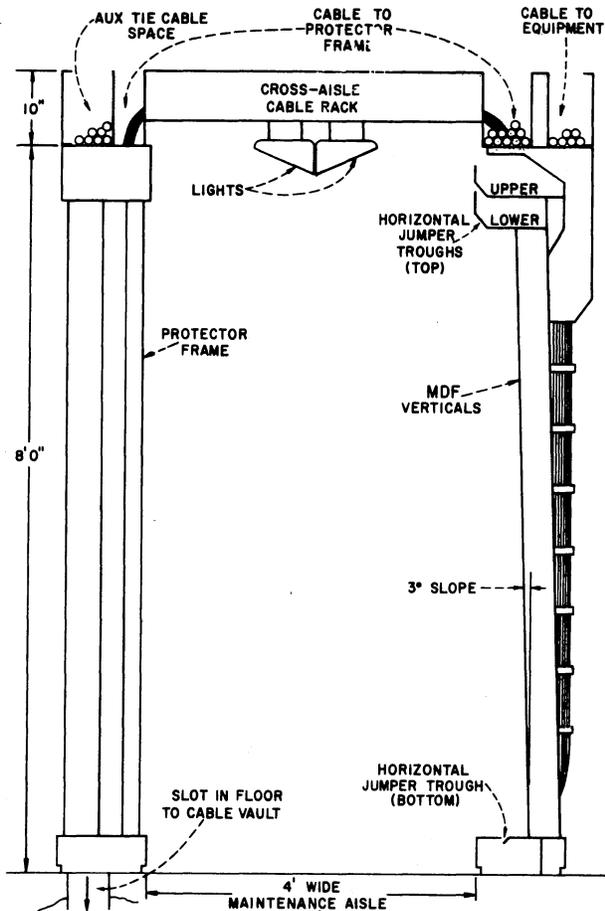
**1.15** Each pair of vertical files is separated by a vertical wiring trough. Horizontal wiring troughs for running jumpers are provided at the top and bottom of each frame. The top wiring trough is divided into lower and upper sections for running medium length and long jumpers, respectively (see 1.36).

**1.16** The 7-foot high distributing frame module (4 feet 4 inches long, 1 foot wide, and 7 feet high) has 6 vertical files located on 8.66-inch centers (see Fig. 2). A full complement of connecting blocks, coded 78A1-64 is furnished on all vertical files. The single wedge-action terminals on the connecting blocks face the front of the frame. All cross connections are made at the front of the frame; all cables are solderless wrapped to terminals on the rear of the frame. A vertical designation strip is provided on every vertical file. This strip is hinged at the top and bottom to provide full access to any vertical wire trough, and is similar to the designation strip used on the 8-foot distributing frame module. Each pair of vertical files is separated by a vertical wiring trough. Horizontal wiring troughs for running jumpers are provided at the top and bottom of each frame.

**1.17** The 8-foot high distributing frame permits two quick-connect connections on the front of each terminal; the 7-foot high distributing frame permits one quick-connect connection on the front of each terminal. In the few cases where two front connections may be required on the 7-foot frame, some of the 78A1-64 connecting blocks can be used as bunching blocks. A maximum of two wire wrapped connections may be made on the rear of all distributing frame terminals.

#### Floor Plan Arrangements

**1.18** (See Floor Plan Data.) The floor plan arrangement of the MDF-protector frame line-up is shown in Fig. 3 and Fig. 4. When an IDF is located in the MDF line-up, it should



**Fig. 3 — Floor Plan Arrangement of the MDF Protector Frame Line-Up — End View**

be located at the nongrowth end and grow in a direction opposite to the MDF. The location of the 7-foot high IDF and TDF in switching equipment line-ups should follow the recommendations of Section 12 of the floor plan data.

#### Cable Rack

**1.19** A 6 1/2 foot long line-up cable rack unit is secured to the top of each 8-foot high distributing frame module. (Total height of MDF with cable rack is approximately 8 feet 10 inches.) A cross-aisle cable rack is provided from each of these units to the protector frame line-up cable rack. Cross-aisle cable racks are also provided to the switching equipment cable racks; these are attached along the rear of the MDF line-up cable rack at positions dictated by the placement of the equipment. The MDF line-up cable rack is divided into two sections. One

section, nearest the protector frame, is reserved for 806A cables from the protector frame; the other section is reserved for cables from the switching equipment. These cables are passed down through openings in the top of an MDF to connecting block terminals on the rear of a frame.

**1.20** The line-up cable rack may extend beyond the end of an MDF line-up when desired. (See Fig. 5.) A bottom cover is provided for the cable rack in this case. A cable rack extension, one unit long, is supported at the end with an end guard; an extension length of more than one unit requires a stanchion at each joint plus an end guard at the end. When a cable rack extension is located at the growing end of an MDF line-up, additional frames may be installed as necessary by removing the stanchions and bottom cable-rack covers. Cross-aisle cable racks may be installed along an extended portion of the line-up cable rack.

**Note:** Line-up cable racks for the ED-1A222-30 frame (A&M Only) are supplied with the framework and may not be mounted independently.

**1.21** The 7-foot distributing frames use the equipment line-up cable racks ED-1A184-70, Group 1, and supplementary line-up cable racks ED-1A184-71, Group 4.

#### Connecting Blocks and Tools

**1.22** *The J78B1-64 connecting block* (used on the 8-foot high distributing frame) has 128 terminals that are located on 0.435-inch centers horizontally and 0.250-inch centers vertically (see Fig. 6a). Each terminal has two wedge-action slots to accommodate two 22-ga W-type distributing frame wires. Two solderless wrapped connections, of 24- or 26-ga wire, may be made on the rear of the terminal.

**1.23** *The 78A1-64 connecting block* (used on the 7-foot high distributing frame) has 128 terminals that are located on 0.350-inch centers horizontally, and 0.200-inch centers vertically (see Fig. 6b). Each terminal will accept one 22-ga W-type distributing frame wire in the quick-connect (wedge-action) portion of the terminal. Two solderless wrapped connections, of

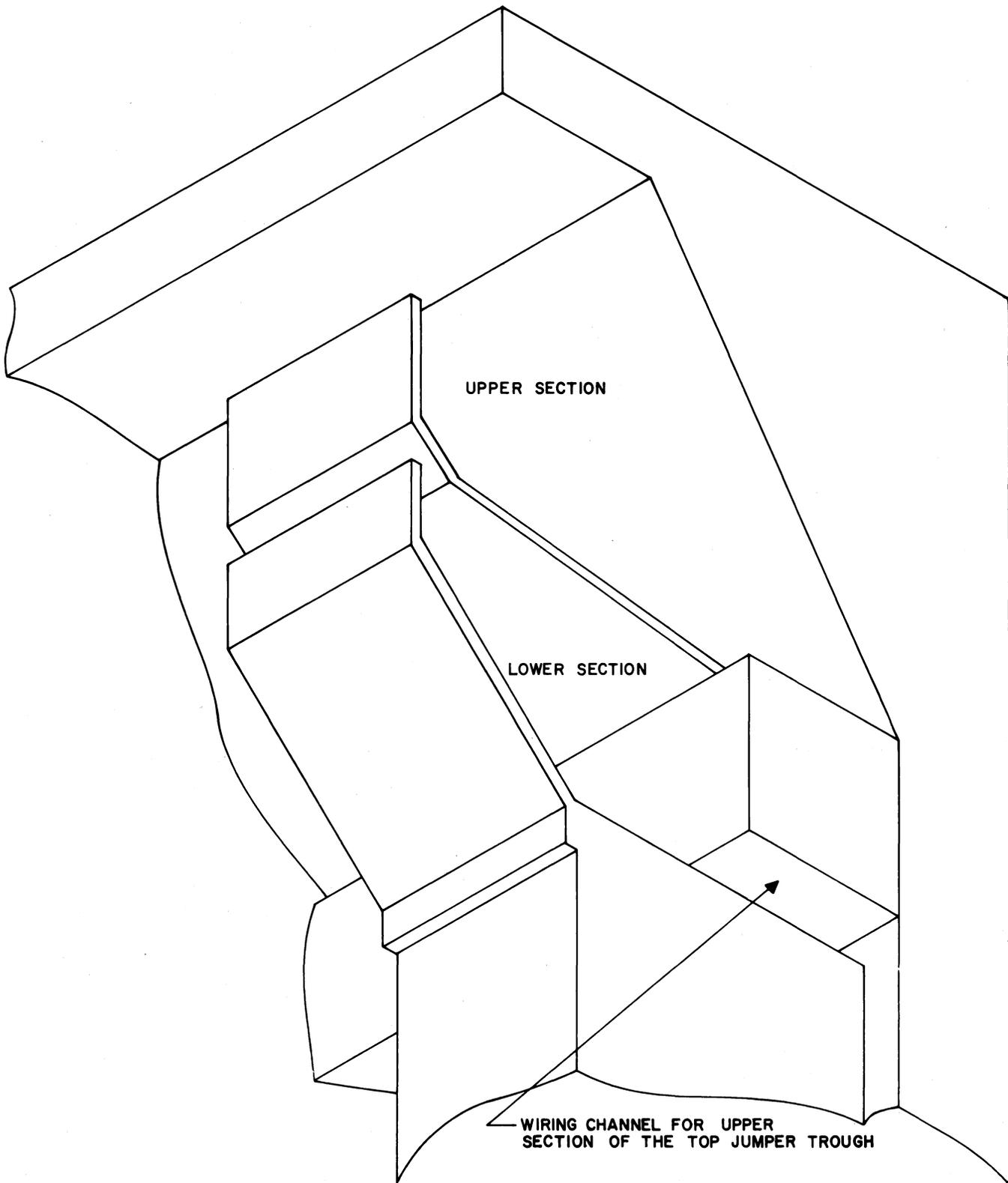
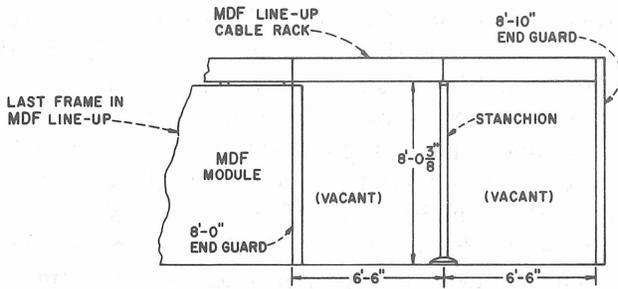


Fig. 4 — Top Jumper Wire Trough



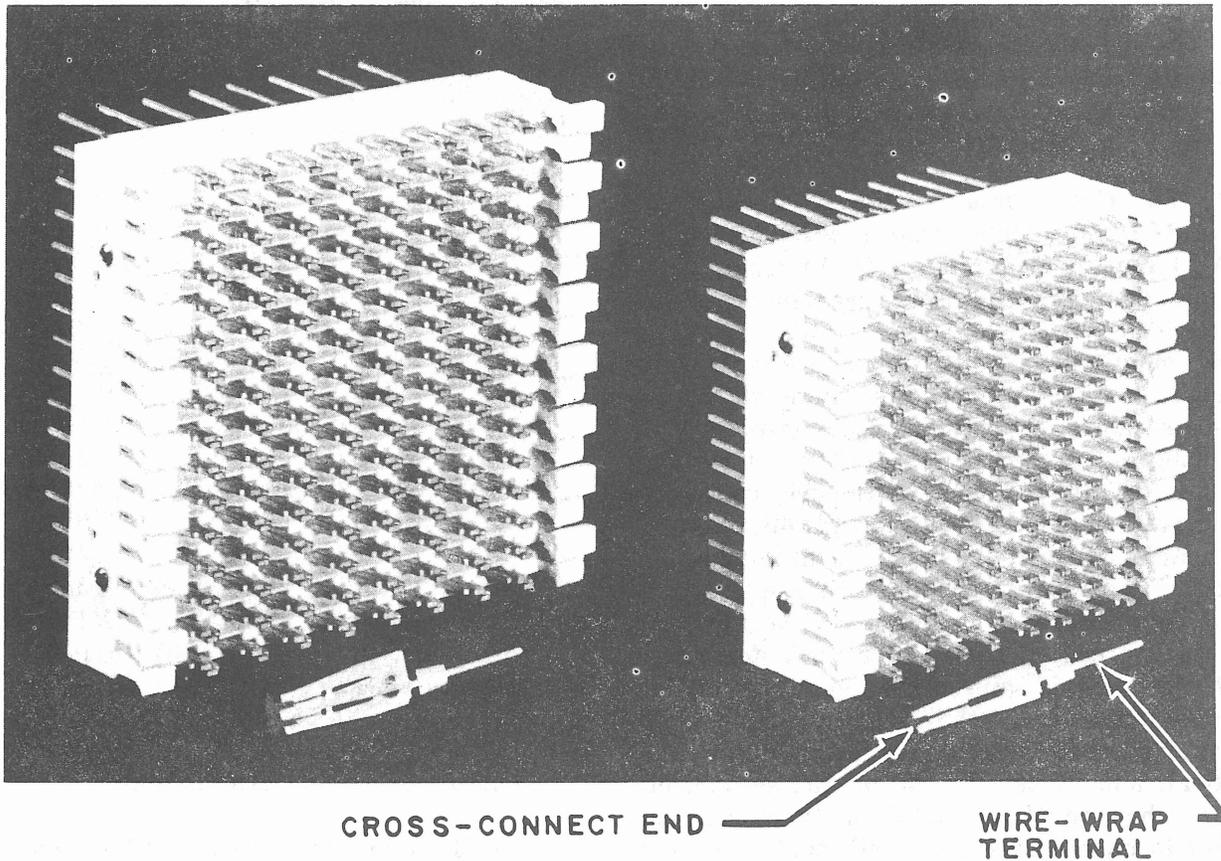
**Fig. 5 — Floor Plan Arrangement of an Extension of the MDF Line-Up Cable Rack**

24- or 26-ga wire, can be made to the rear of each terminal.

**1.24 Terminal insulators** — Terminals with special circuits will be protected with clip terminal insulators. AT-8300 C-clip terminal insulators are used on the 78A1-64 connecting block; AT-8301 D-clip terminal insulators are used on the 78B1-64 connecting block.

**1.25 Damaged terminals** on either the 78A or 78B connector blocks may be replaced. A damaged terminal may be removed by twisting the base of the wire-wrap tang until the terminal breaks in two (approximately a 90-degree turn). The portion of the terminal remaining in the connector block may be removed from the front. A new terminal should then be forced into the block from the front. If the nylon terminal-retaining spurs fail to secure the terminal firmly, a 10- to 20-degree twist should be given to the base of the wire-wrap tang.

**1.26 The 756B tool** — Reliable connections on the 78A1-64 and 78B1-64 connecting blocks can be made only with a 756B tool and 22-ga W-type distributing frame wire. A connection can be made by first putting a 90-degree bend in the unstripped wire about 3/16 inch from the end. The wire is then started by hand into the terminal slot so that approximately 1/16 inch extends beyond the terminal. The 756B



**Fig. 6a — 78A1-64 Connecting Block**

**Fig. 6b — 78B1-64 Connecting Block**

tool is now slipped onto the terminal, and pressure is applied on the tool handle with the palm of the hand. This forces the wire into the terminal. Depth of insertion is determined by an internal stop in the tool. After seating the wire, the tool should not be rocked as this may reduce the cross-section of the wire and promote wire breakage.

**Note:** The 756B cannot be used on 66H and 66G connecting blocks. These connecting blocks require the use of a 714E2 tool and 22-ga W-type distributing frame wire.

**1.27 The 724A tool**— This tool *must be used* to remove all distributing frame wires from the 78A1-64 and 78B1-64 connecting blocks. If a wire is removed from the terminal by other means, the future reliability of that terminal can be greatly reduced. Unapproved methods might also disturb adjacent connections.

#### Switchboard Cabling

**1.28** Line, network, trunk, and miscellaneous circuit cables on the MDF, IDF, and TDF will be distributed as shown on the typical drawings ED-1A223-10 and ED-1A194-10, ED-1A223-11 and ED-1A225-11, and ED-1A225-10, respectively.

#### **1.29 Tie Cable between the MDF and the J1A050 protector frame (see ED-1A194-10)**

— All 500 pairs from any protector frame vertical (two or more adjacent verticals on other protector frames) will always be run to the same MDF modules and distributed over its odd-numbered verticals as follows: there will be five 100-pair cables, the first of which will contain five subgroups of 20 pairs, numbered 1 through 20; the second will contain the five subgroups of 20 pairs, numbered 21 through 40, etc. The first cable will terminate on the first odd-numbered vertical of an MDF module, the second cable on the second odd numbered vertical, etc. Succeeding cables from other protector frame verticals (to this same MDF module) will likewise terminate only those subgroups that contain pairs 1 through 20 on the first odd numbered vertical, and 21 through 40 on the second, etc. Thus, when an MDF module is fully equipped, each odd numbered vertical will contain its particular subgroup of 20 pairs from each of 60 different protector frame connectors.

**1.30** To insure the desired exposure for direct access with short jumpers at the MDF, the tie cables from a protector frame module will be assigned over three MDF modules. The assignment pattern connects tie cables from the first protector frame module to fill 1/2 of the first MDF module, 1/3 of the second MDF module, and 1/6 of the third MDF module. This apportionment is repeated once again from the second protector frame module. Tie cables from these two protector frame modules will fill all of the first MDF module, 2/3 of the second MDF module, and 1/3 of the third MDF module. Thereafter, the apportionment of each protector frame module is 1/3 to each of three consecutive MDF modules. This gives a full, a 2/3-full, and a 1/3-full MDF module at each incremental stage (6000 outside cable pairs) of growth. In small offices, the first protector frame module may fill 2/3 of the first MDF module and 1/3 of the second MDF module.

**1.31 Equipment frame cables to the MDF (see ED-1A223-10)** — Equipment cables terminate on even-numbered MDF verticals. The top, the large midsection, and the bottom portions of each even numbered vertical are reserved respectively for: MDF to IDF tie cables, networks, and miscellaneous circuits. They should be arranged as follows:

- (a) An integral number (usually 2 or 3) of 78B connector blocks should be reserved for tie cables to the IDF to allow the ultimate number of tie cables to be uniformly distributed over the top portions of all MDF verticals. Tie cables, from each MDF vertical should, in turn, be distributed over the IDF verticals assigned to them. These cables are generally 32 pairs, each serving 1/2 of a connecting block.
- (b) Each line link network should be distributed over two or three MDF modules (as shown in ED-1A223-10) to insure short jumpers at each stage of growth. Each MDF module should be filled with approximately the same proportion of equipment terminations as protector terminations.
- (c) Miscellaneous circuits (dial long lines, bridge lifters, and other line auxiliaries) should be uniformly distributed over an in-

tegral number of 78B connector blocks across the bottom of the MDF verticals.

**1.32 *Cabling to the IDF*** (see ED-1A223-11 and ED-1A225-11) — IDF to MDF tie cable terminations should be distributed across alternate IDF verticals; B, D, F, H, etc. Ideally, every MDF vertical for equipment pairs will have a tie cable appearance on each of these alternate verticals. If this is not possible, appearances for each MDF vertical should be distributed over the IDF to approach the ideal as nearly as possible. Universal and miscellaneous trunk terminations should be distributed across the intervening IDF verticals; A, C, E, G, etc. Miscellaneous circuits and trunk auxiliaries (repeaters, carriers, etc) may be assigned to any vertical, but in such a manner that most cross-connections will be between adjacent verticals.

**1.33 *Routing of cable to IDF*** — When the IDF is located in the same line-up as the MDF, the tie cables will be run over their common line-up cable rack. When this space is exhausted, remaining cables can be routed via the protector frame line-up cable rack as shown in ED-1A194-10.

**1.34 *Cabling to the TDF*** (see ED-1A225-10) — Trunk link network terminations should be distributed across the odd numbered TDF verticals. Universal and miscellaneous trunk terminations should be distributed across even-numbered TDF verticals.

**1.35 *Switchboard cables*** from the protector frame (J1A050) to the MDF are 806A cables (100 pairs, 26-ga).

**1.36** Switchboard cables from other frames to the distributing frames will be as large as practicable for economy. The 810A cable (128 pairs, 26-ga), 809A cable (64 pairs, 26-ga), 808A cable (32 pairs, 26-ga), or 807A cable (16 pairs, 26-ga) may be used. Normally 810A cables are used for the following: (a) cables from the MDF to line switching frames and line auxiliaries; (b) cables from the TDF to trunk switching frames; (c) cables from the universal trunk frame to the IDF and TDF. Normally 808A cables are used for the cables from the MDF to the IDF.

**1.37 *All switchboard cable terminations*** on distributing frames are wire wrapped on terminals on the rear of the connecting blocks. Each cable is passed out of the line-up cable rack at the proper vertical, butted at the top, and run down the rear of the vertical in cable rings. Each wire is passed through the nearest cable ring above the desired termination, dressed through a fanning strip, and connected.

#### **Jumpers**

**1.38** Jumpers should be connected as described in 1.26, then dressed through the fanning strips of the 78-type connecting blocks, and retained in the vertical jumper troughs by flexible members. To prevent disturbing connections during subsequent activity, each jumper should be dressed down and to the rear of the vertical jumper trough with about a foot of slack.

**1.39** Jumper lengths are identified as short, medium, or long. Short jumpers are those that are run between terminals in adjacent verticals, and thus lie wholly within a vertical trough. Medium length jumpers run between terminals on nonadjacent verticals that may be separated by as many as ten verticals. A medium-length jumper is run through the horizontal trough at the bottom of the frame, or through the lower section of the trough at the top of the frame. The route depends on which trough provides the shortest path for the jumper. Long jumpers are run between terminals that are separated by ten or more verticals. Long jumpers are always run in the upper section of the trough at the top of the frames. This trough is accessible through a wiring channel at the top rear of each vertical trough. Jumpers can be passed through this channel by using a KS-20096 wiring needle. The needle is passed through the wiring channel into the upper trough where the end of the jumper is attached to the eye of the needle (see Fig. 7). By withdrawing the needle, the jumper is pulled through the wiring channel into the vertical trough. This procedure is used on both ends of the jumper wire.

**1.40** The design and operation of the distributing frame is made feasible by two features of the ESS line equipment:

- (a) Any class of service can be provided on any line equipment number (eg, terminal)

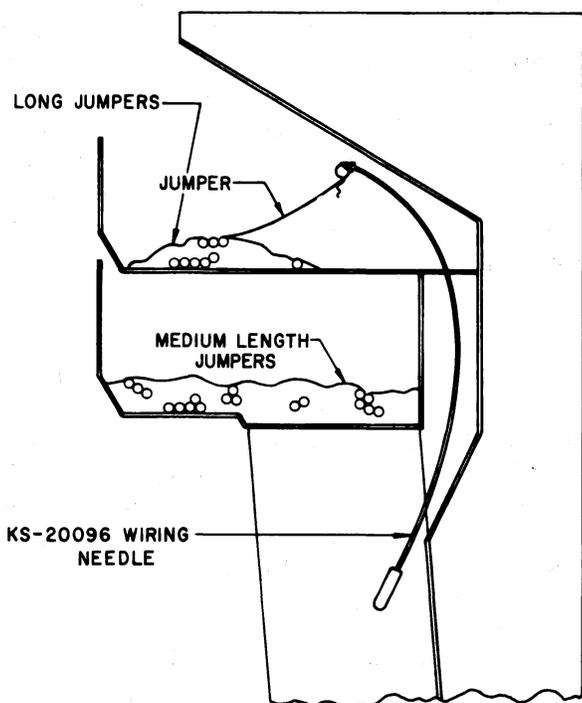


Fig. 7 — Method of Running Long Jumpers Through the Wiring Channel of the 8-Foot High Distributing Frame

subject only to the requirement of ground start. [See 1.38(b)].

(b) A specific telephone (directory) number is not dependent upon a line equipment number (terminal). Any telephone number may be assigned to any line equipment number through a program (software) change. All translations (eg, the association of telephone number to line equipment number) are made by typing the appropriate order on the ESS service order teletype.

With this arrangement there is approximately a 90-percent probability of serving a cable pair via a short jumper by using *preferential assignment procedures*.

1.41 Jumpers will usually be short for the following reasons:

(a) *Large random exposure*: Every line equipment has access, by one short jumper, to 2400 protector pair terminals. Every trunk

equipment has multiaccess to many groups of 2400 protector-pair terminals because of its secondary access at the IDF.

(b) *There are only a few restrictions in line assignments*:

(1) Class A lines must be on terminals under class A line load control; coin (and any other) lines requiring ground start must be on terminals that have their associated ferrod sensors strapped for ground start. Every vertical will have a proportionate share of class A and ground start lines.

(2) Total traffic delivered by all lines in any line concentrator must not overload its A-links. Since any protector pair will ordinarily have access to about 16 concentrators when the switching network uses line switching frames arranged for the basic 4:1 line concentration ratio (about 32 concentrators for line switching frames arranged for the basic 2:1 line concentration ratio), traffic balancing will seldom require long jumpers.

(c) *Short jumpers will remain after cable throws*: When a cable is reinforced, two line equipments in a No. 1 ESS office may be connected to the same line temporarily. The new protectors will be jumpered to new line equipments near them and the released protectors and their associated line equipments will be freed for new associations by short jumpers in their area. The initial balance between available protectors and nearby available line equipments will thus be retained.

(d) *New assignment practices will be required*: To insure a maximum of short jumpers, new line assignment procedures must be followed. These practices provide for the preferential assignment of short jumpers between adjacent verticals. When no short jumper is possible, a long jumper is assigned.

(e) New assignment practices will be described in Traffic Line Assignment and Trunk Assignment Procedures for No. 1 ESS. These practices will be issued by the AT&TCo as TEP (Traffic Engineering Practices), COM (Central Office Management), or TL (Traffic Letters).

**1.42 Relatively few jumper changes will be necessary in No. 1 ESS for the following reasons:**

(a) Electronic memories replace many cross-connection changes. No changes are needed for the following:

- (1) **Directory number translation:** Any equipment location can be given any directory number in the electronic memories.
- (2) **Disconnects or intercepts:** A protector pair can be left connected (ready for a new assignment), providing there is no immediate need for that line equipment.
- (3) **Class-of-service changes:** With few exceptions, any line can be given any class of service by a change in the memory.

(b) **Cross-connection changes will not be required for such things as:**

- (1) Customers lost or moved to another MDF
- (2) Changed telephone number
- (3) Vacation rate changes
- (4) Nonpayment (denials and restorations).

**1.43 Distributing frame wire:** The following codes of wire must be used on these distributing frames. Yellow and blue wires will be used for tip and ring, respectively.

CODE NUMBER	NUMBER OF CONDUCTORS	WIRE NO. 1	WIRE NO. 2	WIRE NO. 3	WIRE NO. 4
W22S	1	Brown			
W22P	2	Yellow	Blue		
W22T	3	Yellow	Blue	Orange	
		PAIR NO. 1		PAIR NO. 2	
W22M	4	Yellow	Blue	Orange	Brown

**Designations**

**1.44 Card Holders and Cards:** Above each distributing frame vertical, both front and rear, is a designation card holder. Printed cards

bearing the proper vertical number are inserted into the rear card holder and the left-hand portion of the front card holder. MDF and TDF verticals are numbered sequentially (00, 01, 02, etc). IDF verticals are designated alphabetically beginning with A, omitting I, O, Q, V, X, and Z. The right-hand portion of the front card holders will bear a summary card of appearances on the vertical (eg, cable and pair numbers). These cards and mounting information are shown on ED-1A195-50.

**1.45** Terminals of 78B and 78A connecting blocks are designated with printed cards inserted in the hinged vertical designation strip. A printed card is provided for each type of cable termination as shown in the typical drawings ED-1A223-10, ED-1A223-11, ED-1A225-10, and ED-1A225-11. Space is provided for installation personnel to mark (by conventional rubber stamping) designations that are different for each cable termination (eg, concentrator number).

**1.46 Designation colors:** So that the alternating verticals with protector and equipment pairs on the MDF may readily be distinguished, designation cards for their connecting blocks are colored differently. In addition, the designation cards will alternate in color down each vertical, for quick identification of the different hundreds groups for outside plant cables and the different line switch, trunk, and auxiliary groups for equipment cables. A similar color pattern is used for both the IDF and TDF.

**1.47** MDF verticals, bearing protector cable terminations, are designated by alternating blue and gray cards beginning with blue at the top of the vertical. Each card identifies the outside plant cable number and pair number. The pair is designated NXX; N is the hundreds group (designated by the installation personnel) and XX is the printed terminal number.

**1.48** MDF verticals bearing equipment cable terminations are designated by alternating yellow and gray cards, beginning with yellow at the top of the vertical. Cards are provided for both the front and rear of each vertical with tip, ring, etc, designations properly reversed on the rear. The following types of cards are used: (a) MDF to IDF tie cable cards — tie cable

pairs are numbered 00 through 31, (b) line link network cards, and (c) miscellaneous equipment cards — dial long lines, bridge lifters, and auxiliaries of all kinds.

**1.49** Alternate IDF and TDF verticals will also bear alternating blue and gray designation cards beginning with a blue card at the top. The intervening verticals will bear alternating yellow and gray designation cards, beginning with yellow at the top. Trunk link network, universal trunk, miscellaneous trunk, tie cable, and miscellaneous circuit are the type of designation cards used.

**1.50** *Supplementary front designation cards:*

When supplementary designations are required, a designation card may be placed on the third face of the T-shaped hinged designation strip. The blank cards have ruled lines and may be used for special designations (eg, SD numbers).

**1.51** *Additional rear designations:* Colored strips are provided on the wiring side of each distributing frame vertical to identify terminals. Each IDF and TDF vertical and each even-numbered MDF vertical bears an identification strip every 16th horizontal row of terminals, beginning with the top row. Each odd-numbered MDF vertical bears an identification strip every 25th horizontal row of terminals, beginning with the top row. Each such group of terminals is designated by a stamped character on the adjacent framework. MDF and TDF terminal groups are designated sequentially by letters A through W (omitting I, O, Q, and V). IDF groups are numbered 00 through 18. Therefore, any terminal can be identified by the vertical number, group number, and the terminal number within the group.

**AUXILIARY SERVICES AT THE DISTRIBUTING FRAMES**

**Service Observing**

**1.52** Access for up to 500 service observing circuits is provided for every line on the rear of the MDF. Service observing jack panels, with fifty 223C telephone jacks each, may be mounted on the rear of the MDF above the odd numbered verticals as needed. Each circuit may be multiplied to appear once every two modules (13 feet).

**1.53** Service observing circuits are numbered 000 through 499, or 000 through 399, and PBX 00 through PBX 99. The circuit number is NXX where N is stamped in a 3/8-inch character at the bottom of the block and XX is stamped adjacent to each jack. Two codes of jack mountings are provided:

- (a) 272A with provision for 50 jacks numbered 00 through 49
- (b) 272B with provision for 50 jacks numbered 50 through 99.

These mountings are ordered with a 3/8-inch stamped character (0, 1, 2, 3, and 4 or PBX). Circuits 00 through 49 from each hundreds group will be multiplied to appear on all even numbered MDF modules. Circuits 50 through 99 from each hundreds group will be multiplied to appear on all odd-numbered MDF modules.

**1.54** *W2FL, service observing cord:* A 16-foot 2-conductor cord is equipped at one end with a 347A plug while the other end is furnished with a chuck arrangement for connection to the terminals of the 78B1-64 connecting block. The chucks are identified by tip and ring designation to insure proper connection.

**Appliance Outlet**

**1.55** One 120-volt ac outlet is provided in the rear of each distributing frame module as shown on ED-1A157-70.

**Jack Panel**

**1.56** A and B telephone jacks and one spare jack, together with pin jacks for -48V, +24V, ground, and high resistance ground (12,000 ohms), can be provided on the 8-foot high distributing frame by substituting a 589A panel for a 78B1-64 connecting block. Ordinarily, these features are available on the No. 1 ESS protector frame, which is usually located across the aisle from the MDF. Thus, it is not necessary to duplicate these features on the MDF. However, when access to these circuits is not readily available, the 589A panel may be mounted on the MDF. When used, it should replace the lowest block in any even numbered vertical. No more than one panel should be used per module.

**End Guard**

1.57 An 8-foot 10-inch high end guard is required at both ends of an 8-foot high distributing frame line-up (see Fig. 4). When the line-up cable rack extends beyond the MDF line-up, an 8-foot high intermediate end guard is also required (as shown in Fig. 5). Doors on the end guards can be opened for access to service observing cord storage. The 7-foot high distributing frame will use the same end guards as other 7-foot high frames.

**Lighting**

1.58 Continuous fluorescent lighting is suspended from the bottom of the protector frame and MDF cross-aisle cable racks to illuminate the maintenance aisle.

**Grounding**

1.59 The distributing frames are connected to the system ground by a No. 6 copper wire (see ED-1A200-10). They must be electrically isolated from building ground (including the protector frame and lighting fixtures) to prevent introducing multiple grounds into the system.

**Capacity**

1.60 The capacity of the distributing frame cable troughs when using 22-ga W-type wire is approximately as follows:

CODE NUMBER		ED-1A222-31		ED-1A224-31	
TYPE OF FRAME		MDF	IDF	TDF	IDF
CROSS-CONNECTION PAIRS PER MODULE		6000	6080	3650	
PAIRS PER VERTICAL		1222		1222	
SHORT JUMPER PAIRS IN A VERTICAL TROUGH		1200		1900	
LONG JUMPER PAIRS IN HORIZONTAL TROUGHS	TOP	UPPER SECTION	3200	5500	
		LOWER SECTION	3100		
	BOTTOM		4700	5800	
	TOTAL		11,000	11,300	

**Weight**

1.61 The 8-foot high distributing frame module shipping weight is 820 pounds (fully equipped with connecting blocks). Installed it may weigh 1500 pounds with cable racks and cable loads.

1.62 The 7-foot high distributing frame module shipping weight is 540 pounds (fully equipped with connecting blocks). Installed it may weigh 900 pounds with cable racks and cable loads.

**2. SUPPLEMENTARY INFORMATION**

- 800-600-000 — List of General Equipment Requirement Sections
- 801-000-000 — Equipment Design and General Equipment Requirements and Engineering Information — Common Systems
- 820-001-170 — Central Office Engineering General No. 1 ESS
- J1A050 — 820-025-150 — Protector Frame
- J1A054 — 801-801-155 — No. 1 ESS — Cable Rack
- J1A055 — 820-001-150 — Central Office Equipment General No. 1 ESS
- J1A056 — 820-009-150 — Limiting Conductor Conditions for No. 1 ESS
- J1A057 — 820-007-150 — Index of Cross Connections for No. 1 ESS
- 069-125-811 — Quick-Connect Terminal Blocks 66G, 66H, 78A, 78B Method of Making Connections
- Floor Plan Data — Section 1.1, General Notes Section 12, Distributing Frames
- E-8056 — Questionnaire

**3. DRAWINGS**

**Keysheets**

SD-1A100-01 — No. 1 Electronic Switching System

**Framework**

ED-1A180-70 — A&M Only — No. 1 ESS — Main Distributing Frame — Framework, Assembly, and Stocklists

- ED-1A180-71 — No. 1 ESS — Main Distributing Frame — Framework, Assembly, and Stocklists
- ED-1A216-71 — No. 1 ESS — Distributing Frame — Framework, Assembly, and Stocklist

#### Equipment, Wiring, and Cabling

- ED-1A153-01 — Table of Wire Gauges and Types of Insulation
- ED-1A157-71 — No. 1 ESS — Frame Base Appliance Outlets
- ED-1A184-70 — No. 1 ESS — Line-up Cable Rack
- ED-1A184-71 — No. 1 ESS — Line-up Cable Rack Covers
- ED-1A184-72 — No. 1 ESS — Line-up Cable Rack Covers for MDF and Protector Frame
- ED-1A194-10 — No. 1 ESS — Cabling and Jumpers for the Protector Frame, and the Main, Intermediate, and Trunk Distributing Frames
- ED-1A195-50 — No. 1 ESS — Designations for Protector Frame, Main, Intermediate, and Trunk Distributing Frames
- ED-1A197-71 — No. 1 ESS — Cross-Aisle Cable Rack — Assembly and Stocklist
- ED-1A198-71 — No. 1 ESS — End Guard Assembly and Stocklist
- ED-1A200-10 — No. 1 ESS — Method of Running and Connecting +24 Volt and -48 Volt Power Feeders and Grounding Methods
- ED-1A210-() — No. 1 ESS — Method of Installing Equipment
- ED-1A223-10 — No. 1 ESS — Typical Main Distributing Frame Equipment
- ED-1A223-11 — No. 1 ESS — Typical Intermediate Distributing Frame Equipment (8 feet high, 1 foot wide, 6 feet 6 inches long)
- ED-1A225-10 — No. 1 ESS — Typical Trunk Distributing Frame Equipment
- ED-1A225-11 — No. 1 ESS — Typical Intermediate Distributing Frame Equipment (7 feet high, 1 foot wide, 4 feet 4 inches long)
- ED-1A236-01 — No. 1 ESS — Existing Main Distributing Frame Typical Equipment

- ED-1A237-30 — No. 1 ESS — Main Distributing Frame Service Observing Equipment
- ED-82079-30 — No. 1 ESS — Lighting — Frame Mounted

#### Circuits

- SD-1A129-01 — Miscellaneous Circuit
- SD-81035-01 — Frame and Aisle Lighting Circuit

#### 4. EQUIPMENT

***ED-1A222-30 — A&M Only — No. 1 ESS — Distributing Frame — Single Sided — Assembly and Equipment For One 8-Foot 0-Inch High, 1-Foot 0-Inch Wide, 6-Foot 6-Inch Long Frame***

***Group 1*** — Framework, assembly, and equipment for one main distributing frame module fully equipped with 66H2-64 connecting blocks (left to right growth). (See Notes A, B, and C.)

***Group 2*** — Framework, assembly, and equipment for one main distributing frame module fully equipped with 66H2-64 connecting blocks (right to left growth). (See Notes A, B, and C.)

***Group 3*** — Framework, assembly, and equipment for one intermediate distributing frame module fully equipped with 66H2-64 connecting blocks (growth in either direction). (See Notes A, B, and C.)

***ED-1A222-31 — AT&T Co Std — Common Systems — Distributing Frame — Single Sided — Assembly and Equipment For One 8-Foot 0-Inch High, 1-Foot 0-Inch Wide, 6-Foot 6-Inch Long Frame***

***Group 1*** — Framework, assembly, and equipment for one main distributing frame module fully equipped with 78B1-64 connecting blocks (left to right growth). (See Notes A, B, and C.)

***Group 2*** — Framework, assembly, and equipment for one main distributing frame module fully equipped with 78B1-64 connecting blocks (right to left growth). (See Notes A, B, and C.)

**Group 3** — Framework, assembly, and equipment for one intermediate distributing frame module fully equipped with 78B1-64 connecting blocks (growth in either direction). (See Notes A, B, and C.)

**ED-1A224-31 — AT&T Co Std — Common Systems — Distributing Frame — Single Sided — Assembly and Equipment For One 7-Foot 0-Inch High, 1-Foot 0-Inch Wide, 4-Foot 4-Inch Long Frame**

**Group 1** — Framework, assembly, and equipment for one distributing frame module fully equipped with 78A1-64 connecting blocks. (See Notes B and D.)

**Group 2** — A&M Only — Framework, assembly, and equipment for one distributing module fully equipped with 66G2-64 connecting blocks. (See Notes B and D.)

**Notes**

A. The ED-1A122-30 and -31 frameworks cannot be intermixed because the cable rack and connector blocks are not compatible.

B. The 66- and 78-type connecting blocks cannot be intermixed within the distributing frameworks because:

(1) The tools required for inserting cross-connections are different for the two types of blocks.

(2) The only approved distributing frame wire used with either the 66- or 78-type connecting block is the W22 type. The 78-type connecting block will, however,

permit the use of insulated polysulfone when it becomes available and is approved for this use.

C. When the MDF is remotely located from the ESS protector frame, the following may be required:

(1) No. 589A panel intended to be used as a battery test panel, and to provide a connection to enable the service employee to plug in a head telephone set. Provide one panel per module and locate in the lowest block of any even numbered vertical and instruct the installing personnel to remove 78B1-64 connecting block and replace with 589A panel.

(2) A 677A transmitter intended for central office maintenance. The 677A transmitter should replace the sixth 66- or 78-type connecting block from the top, one every other module (00, 02, 04, etc), in any even numbered vertical of the distributing frame.

D. This frame can be used as either a trunk distributing frame or an intermediate distributing frame for growth in either direction.

**List of A&M Only and Mfr Disc. Equipment**

EQUIPMENT	RATING	DETAILS	
		LAST SHOWN IN ISSUE	REPLACING EQUIPMENT
ED-1A224-30, G1 and G2	Mfr Disc.	1	ED-1A224-31, G1 and G2

The above equipment has been replaced as indicated. Where A&M Only items appear, the issue numbers shown are those of the issue in which the rating was first applied.

Bell Telephone Laboratories, Incorporated

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