ESS-TYPE MODULAR DISTRIBUTING FRAMES

DESCRIPTION

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1. GENERAL

1.01 This section describes the types of main distributing frames, combined distributing frames, and associated protector frames commonly used with No. 1 ESS and No. 2 ESS in central office buildings.

1.02 This section is issued to include and update information previously contained in Section 201-201-101 pertaining to No.1 ESS and No. 2 ESS and associated protector frames.

1.03 The main distributing frame (MDF) in a central office building is primarily an interface between outside plant cable pairs and central office equipment. A combined distributing frame (CDF) is basically a main distributing frame which is used to interconnect trunks and miscellaneous equipment in addition to central office equipment.

1.04 The basic types of frames and terms used are:

- Main Distributing Frame (MDF)
- Combined Distributing Frame (CDF)
- Protector Frame (PF)

2. MODULAR FRAMES (ESS TYPE)

2.01 The frames originally developed for ESS central offices are the modular protector frame (Fig. 1) and the modular distributing frame (Fig. 2). When the distributing frame is used with No. 1 ESS, it is referred to as an MDF; when the distributing frame is used with No. 2 ESS, it is referred to as a CDF. These frames and the associated connectors, protectors, and connecting blocks have been developed to provide a more efficient method of connecting outside plant cable pairs to central office equipment. The frames are designed to be used with an assignment procedure, termed preferential assignment, in which attempts are made to find the shortest cross-connections which meet the subscriber need and satisfy traffic and load balancing requirements. This distributing frame should only be used where approximately 95 percent of the jumpers can be expected to be short or medium length jumpers (2.09). If this standard is met, considerably reduced operational costs can be obtained over a conventional MDF. A conventional MDF should be used if difficulty is anticipated in meeting the preferential assignment requirements.

2.02 The modular MDF is commonly used with the modular protector frame but may be used with a conventional protector frame. This description deals only with the modular combination.

2.03 Both the protector frame and the MDF modules consist of a basic framework which is 8-feet high and 6-feet, 6-inches long. Ladders or mezzanine platforms are not provided with the modular frames. Frames are single sided and are usually installed face to face on either side of a maintenance aisle (Fig. 3). In order to maintain preferential assignment and avoid costly future retermination expenses, the ultimate frame length should be installed initially and growth should be spread uniformly over the entire frame length.

PROTECTOR FRAME

2.04 The protector frame module consists of 12 verticals (Fig. 1). Each vertical accommodates five 302-type connectors, each connector having a terminating capacity of 100 cable pairs for a total of 500 pairs per vertical or 6000 pairs per module. Outside plant cable pairs and tie cable pairs from the MDF or CDF are terminated on wire-wrap terminals at the rear of the 302-type connectors. Detailed descriptions of the 302-type connectors and associated protector units are found in Sections 201-208-101 and 201-220-102.

2.05 The protector frame verticals are numbered 01 through 12 for the first module. Verticals on additional modules are numbered 13 through 24, 25 through 36, etc. Numbering may run from left to right or right to left.

DISTRIBUTING FRAME

2.06 The distributing frame when used for No. 1 ESS is referred to as an MDF; the distributing frame when used for No. 2 ESS is referred to as a CDF. The purpose of this frame in either case is similar. It provides for a flexible association of outside plant cable pairs to central office equipment. The CDF in No. 2 ESS also provides trunk and miscellaneous associations. The MDF and CDF modules are physically the same but differ in the way cable pair and equipment assignments are made.

2.07 The distributing frame module consists of 10 verticals located on 7.8-inch centers (Fig. 2). Each vertical is equipped with nineteen 66H-type (earlier design frames) or nineteen 78B1-type (later design frames) connecting blocks. Each connecting block has 64 terminal pairs for a total of 1216 terminal pairs per vertical and 12,160 terminal pairs per distributing frame module. Terminals on the connecting blocks are of the quick connect type and provide for two connections per terminal on the front of the terminal block. The rear of each terminal provides for two solderless wire-wrap connections on a single wire-wrap lug. All cross-connections are made from the front of the distributing frame. The method for making cross-connections to the quick connect terminals is covered in Sections 069-125-811 and 069-126-811. Cable pairs from central office equipment and tie cables from the protector frame are terminated on the solderless wire-wrap terminals on the rear of the connecting blocks.

2.08 Each pair of verticals is separated by a vertical jumper wire trough. A horizontal jumper wire trough is located at the bottom of the frame, and a divided horizontal jumper wire trough is located at the top of the frame (Fig. 3). Earlier design frames have an undivided trough at the top of the frame (Fig. 3). The capacity of the wiring troughs using the 22-ga W-type paired cross-connection wire is listed in Table A.

TABLE A

TYPE OF FRAME			MDF CDF
CROSS-CONNECTION PAIRS PER MODULE			6080
PAIRS PER VERTICAL			1216
SHORT JUMPER PAIRS IN A VERTICAL TROUGH			1200
LONG JUMPER PAIRS IN HORI-ZONTAL TROUGHS	TOP	UPPER SECTION	3200
		LOWER SECTION	3100
	BOTTOM		4700
	TOTAL		11,000

2.09 Cross-connect jumpers used on the modular distributing frames are identified as short, medium, and long. Short jumpers are those that are run between adjacent verticals and are placed in the vertical jumper troughs. Medium length jumpers run between terminals of nonadjacent verticals that may be separated by as many as ten verticals. Medium length jumpers are placed in the bottom horizontal jumper trough or in the lower section of the divided horizontal trough at the top of the frame. Long jumpers are placed in the upper section of the divided trough at the top of the frame. The upper section of the divided trough is accessed through ports at the top of the vertical wiring channels. A wiring needle (KS-20096) is used to draw wires from the upper section of the divided trough into the vertical wiring channels through the ports (Fig. 3). On earlier design

frames, medium and long jumpers are placed together in the undivided trough at the top of the frame.

2.10 Each vertical file is equipped with a T-shaped swinging terminal designation strip holder that extends the full length of the vertical and covers one-half of the vertical jumper trough. The holder is hinged at the top and bottom and may be swung to the left or right of the vertical to provide full access to either vertical jumper trough. The left or right position of the vertical designation strip holder is controlled by a stainless steel spring assembled to the lower hinge and prevents the designation strip from swinging free. The spring is a replaceable item and may be ordered as part number P-44G956 extension spring.

2.11 Designation cards are duplicated and placed on both sides of the designation strip holder to provide terminal identification when the holder is in either position.

2.12 Distributing frame verticals are numbered 00 through 09 for the first module (Fig. 4). Verticals on additional modules when furnished are numbered 10 through 19 and 20 through 29, etc. The numbering may be from right to left or left to right, but in any case, it should be consistent with the numbering on the protector frame verticals.

2.13 The protected cable pairs are permanently wired from the protector frame to the distributing frame via tie cables. Outside plant cables pairs are assigned to odd verticals of the MDF in No. 1 ESS offices and to even verticals of the CDF in No. 2 ESS offices.

2.14 Each cable pair is associated with a pair of connecting block terminals on the distributing frame. There are 19 connecting blocks accommodating 64 pairs per block on a vertical for a total terminating capacity of 1200 pairs per vertical. Since only the even verticals are used for cable pair terminations, the cable pair capacity per distributing frame module is 6080 pairs. The alternate verticals are used for terminating central office equipment and similarly provide for 6000 terminations. Therefore, 6080 cross-connect pairs can be accommodated on each distributing frame module.

2.15 Connecting blocks on the verticals have eight terminals in a horizontal row; hence, four tip and ring pairs can be terminated on each row. Each connecting block is administratively divided into a right half and a left half with two pair terminations in the left half and two pair terminations in the right half of each row. Cross-connections that cross the administrative boundary should be avoided because they will congest the narrow wiring channels provided between the horizontal rows of terminals in the connecting block.

2.16 The cable pairs are spread in groups of 20 over the distributing frame horizontally and not vertically as with conventional frames. The first group of 20 pairs (1 through 20) appear in the first vertical, the second group of 20 pairs (21 through 40) appear in the third vertical, etc, (Fig. 4). Each 20-pair group is further divided into 10 pairs to the left half of the vertical and 10 pairs to the right half of the vertical. Central office equipment terminating assignments are similarly divided into left-hand groupings and right-hand groupings and are also spread over the frame horizontally. This method of assignment provides the greatest amount of exposure for direct access with short jumpers between cable pairs and central office equipment. Every central office equipment termination has access by one short cross-connection jumper to a maximum of 608 pairs.

2.17 Each individual distributing frame installation differs according to the type of office served (No. 1 ESS or No. 2 ESS), the size of the office, and the growth potential of the office, etc; local records must be consulted to determine the exact assignment procedures used and cable and equipment spreads.

DESIGNATIONS

2.18 Above each protector frame vertical (both front and rear) is a designation card holder. Printed cards bearing the proper vertical number are placed in the left-hand portion of the card holder. Another card having five horizontal spaces representing the five 302-type connectors in the vertical are inserted in the right-hand portion of the holder. On this card is shown the cable number and the first pair number associated with each 302-type connector. Additional cable and pair identification also appears on each 302-type connector; this information is covered in Section 201-208-101.

2.19 Above each distributing frame vertical (both front and rear) is a designation strip holder.

Printed cards bearing the proper vertical number are inserted into the rear holder and into the left-hand portion of the front holder. Cards bearing a summary of appearances in the vertical are inserted into the right-hand portion of the front designation strip holder (for example, cable and pair number).

2.20 Each distributing frame vertical has T-shaped hinged vertical designation strips. Cards bearing identification of the terminals in the vertical are inserted into this strip. Cards are provided for each type of cable or equipment termination, and space is provided on the cards for maintenance personnel to mark designations that are different for each cable termination (for example, concentrator number).

2.21 In order to readily identify connecting blocks for cable pair terminations and connecting blocks for central office terminations, designation cards for alternate distributing frame verticals are colored differently. Designation cards also alternate in color down each vertical for identification of different hundreds groups of cable pairs and different groups of central office or miscellaneous equipment. Distributing frame verticals bearing cable pair terminations are designated by alternate blue and gray cards beginning with blue at the top of each vertical. Each card bears the cable and pair numbers appearing in the associated connecting blocks. Distributing frame verticals bearing central office or miscellaneous equipment terminations are designated by alternating yellow and gray cards beginning with yellow at the top of each vertical. In each case duplicate cards are provided for the other side of the designation strip with the designations properly reversed. Supplementary designation cards are available; these are blank cards and may be used for special designations.

2.22 The rear (wiring side) of the distributing frame verticals are provided with colored strips to identify terminals. Each even-numbered vertical bears an identification strip every 16th horizontal row of terminals beginning with the top row. Each odd-numbered vertical bears an identification strip every 25th horizontal row of terminals beginning with the top row. Every such group of terminals is designated by a stamped character on the adjacent framework. Terminal groups are designated sequentially by letters A through W (omitting I, O, Q, and V). Any terminal can be identified by the vertical number, group number, and terminal number within the group.

MAINTENANCE EQUIPMENT

2.23 Provision is made on the protector frame for mounting miscellaneous maintenance equipment. When the protector frame and the distributing frame are located across an aisle from each other, the maintenance equipment is readily accessible from either frame and is not duplicated on the distributing frame. However, where the distributing frame is remote from the protector frame, a test panel and transmitter panel can be mounted on the distributing frame.

2.24 The right-hand vertical framework of each protector frame module has provisions for mounting the following miscellaneous maintenance equipment (Fig. 1).

(a) A jack panel consisting of A and B telephone jacks together with pin jacks for −48 volts, +24 volts, ground and high resistance ground.

(b) A test panel accommodating up to 20 telephone jacks (10 pairs) per panel. These jacks are installed as required for various testing circuits (manual varley, automatic varley, test trunk in and out, etc). The jacks are multipled to each protector frame module or where a larger number of test jacks are required; 20 pairs of test jacks can be made available if the test circuits are multipled to every other module rather than every module.

(c) A KS-20100 test set for checking protector units. (Some early design frames not having provisions for mounting the KS-20100 test set on the modules are provided with a wall mounted test set which is installed at some convenient location near the frames.)

(d) An intercom system to the test desk. This consists of a transmitter, switch, and lamp mounted on the protector frame and a loudspeaker mounted on the cable rack above the frame.

2.25 When the distributing frame is remote and the maintenance facilities mounted on the protector frame are not accessible, a jack panel and a transmitter panel can be mounted on the distributing frame. The jack panel consists of A and B telephone jacks together with pin jacks for

−48 volts, +24 volts, ground, and high resistance ground. This panel is substituted for a connecting block. When the panel is used, it replaces the lowest block in a even-numbered vertical of the distributing frame and only one panel per module is used. A 677A transmitter panel, when required for central office maintenance, is installed on the distributing frame. This transmitter panel replaces the sixth connecting block from the top, one every other module (00, 02, 04, etc) in any even-numbered vertical of the frame.

2.26 The end guards of both the protector frame and the distributing frame contain a storage area and are provided with doors. On the distributing and protector frames this area is used for storing test cords.

2.27 Service observing jack panels to provide for up to 500 service observing circuits may be provided as needed. Each jack panel accommodates 50 jacks, and the panels are mounted on the rear of the distributing frame above the odd-numbered verticals.

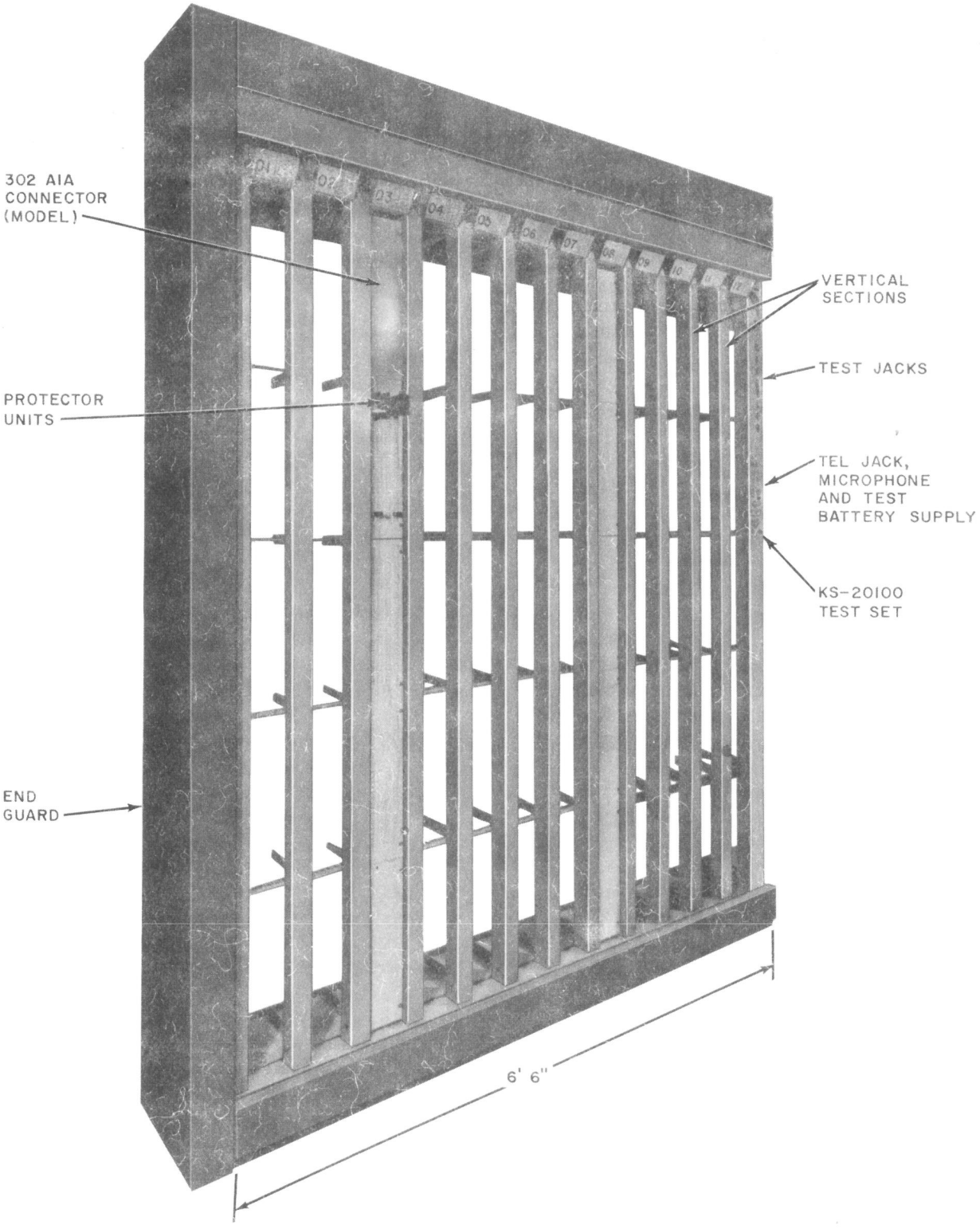


Fig. 1—Protector Frame Module—Front View

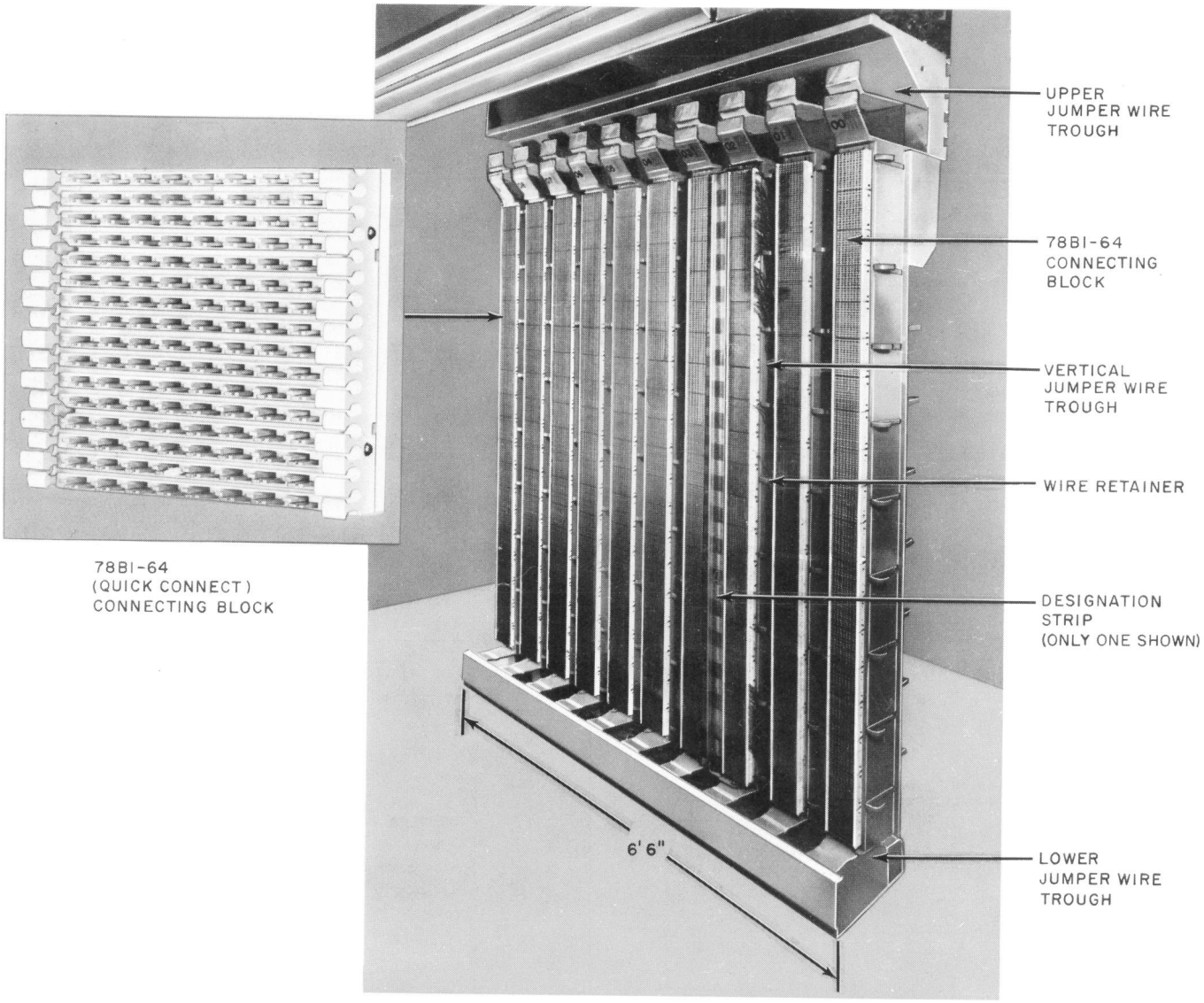


Fig. 2—Distributing Frame Module

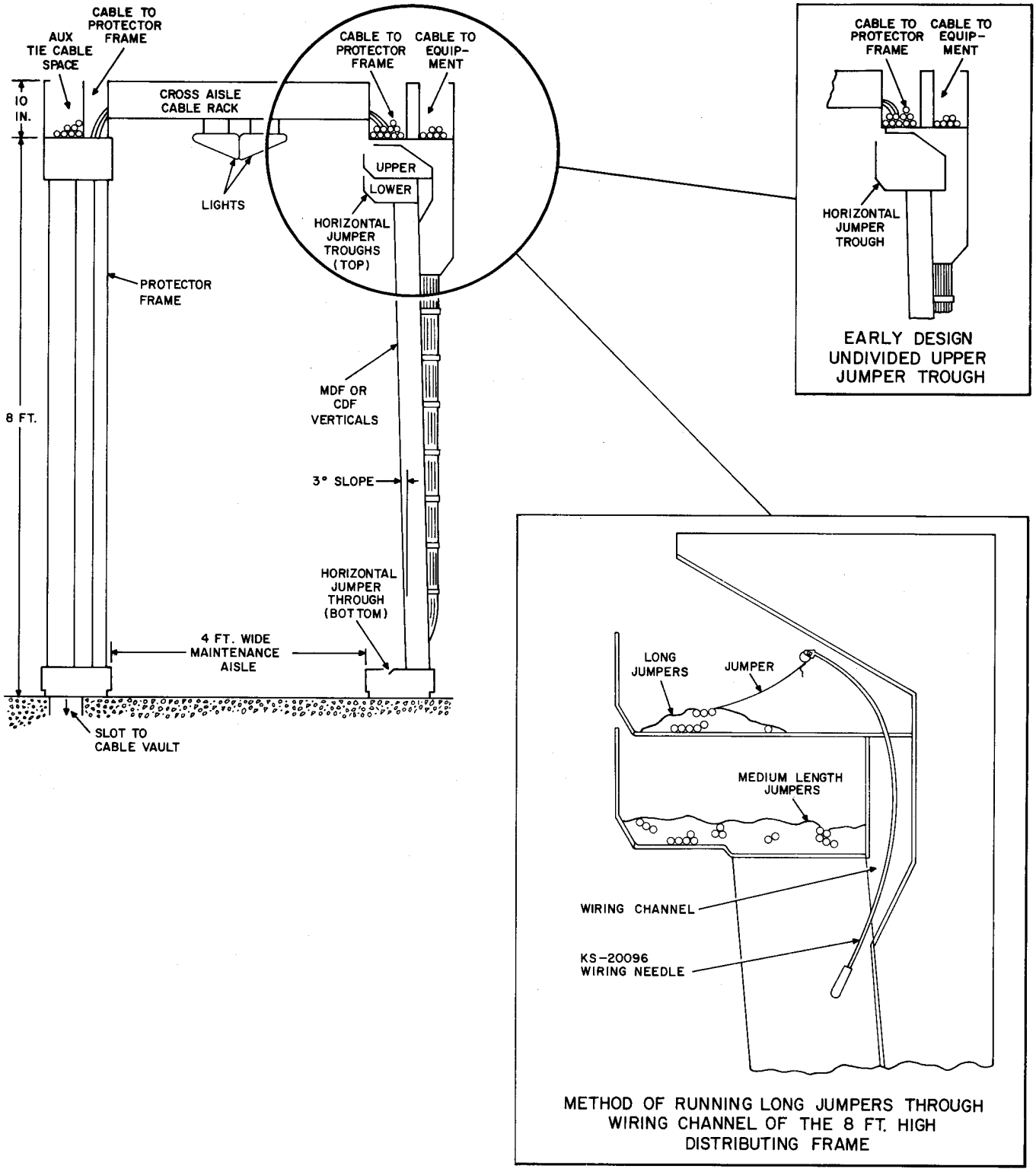
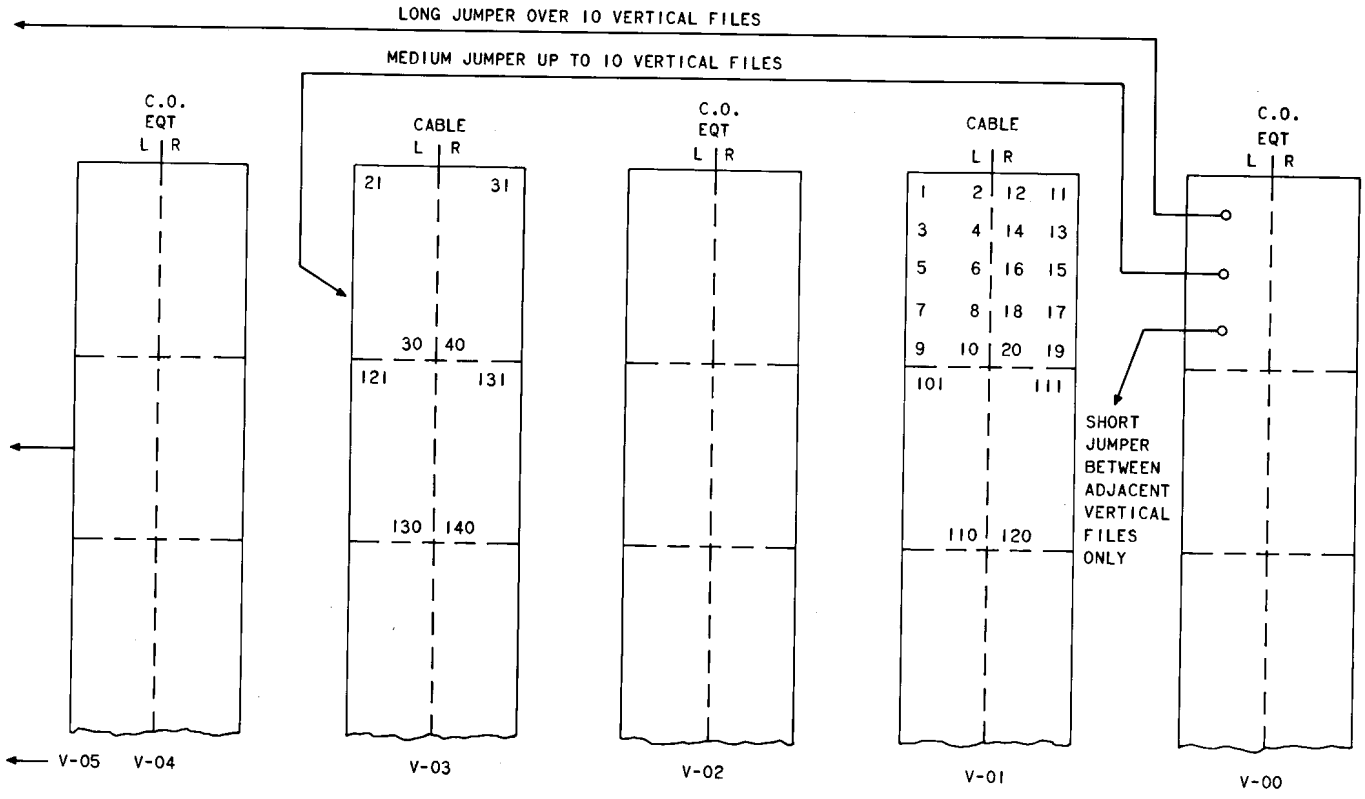


Fig. 3—Typical Protector Frame and Distributing Frame (MDF or CDF) Arrangement



NOTE:
FOR NO.2 ESS CABLE PAIRS ARE TERMINATED ON EVEN VERTICAL FILES.

Fig. 4—Typical Distributing Frame Arrangement for No. 1 ESS (Right to Left Growth)