Cabling Methods - Distributing Frames

Contents

1. General

1.1 Purpose

This practice provides the proper methods of:

- Cabling or wiring distributing frames in central offices (COs).
- Loose wire cabling to single-sided distributing frames using cable brackets

NOTE: Because of different situations that may be encountered, use this practice in conjunction with the engineering specifications of the particular Installation.

1.2 Filing Instructions

This practice supersedes Issue 4, October 1989 Remove Issue 4 and replace with this Issue 5 in the practices set.

1.3 Supersedures

This practice supersedes the following local practices:

- 256-050-953CA, Connectorized Terminal Blocks and Cable Assemblies.
- 256-150-961CA, Cable Methods – Central Office Distributing Frames.

1.4 Copyright and Responsibility

This practice was written by the COE Construction Department and published by the Telephone Operations Administrative Services Department. For more information about this practice contact the COE Construction Department.

1.5 Disclaimer

This practice has been prepared for GTE Telephone Operations employees, customers, and end users' employees who operate and maintain the equipment engineered and installed by GTE. The information in this practice Is subject to change and may not be suitable in all situations. GTE Telephone Operations acknowledges that a customer's special requirements or practices may take precedence over those supplied in this practice if a conflict develops during installation or ongoing operations GTE Telephone Operatlons hereby disclaims any responsibility or liability for any consequential or inconsequential damages that may result from the us8 of this practice.

2. Cabling Procedure

2.1 Introduction

Check the engineering Specifications and the cable running list before proceeding with cabling operations.

Verify nonconnectorized cable locations by buzzing (per GTE Telephone Operations Practice 256-050-209) prior to butting and stripping cables. Butt and strip cables before starting connecting operations. Before proceeding, ensure that cable tags are firmly attached to the correct cable until all operations are complete.

NOTE: Refer to GTE Telephone Operations Practice 256-050-205 for the correct method of butting, stripping and fanning cables.

The most orderly method of running cables to the distributing frame is to:

- Run cables in sequence from the distributing frame to the frame lineups and in sequence within each frame lineup. This is the best looking and most orderly method of running cables In cable racks.
- Run the cables to the frame lineup farthest from the distributing frame first to create a base of straight cables on the runway. This hides cables that feed frame lineups closer to the distributing frame.
- Run cables from the distributing frame to the next farthest frame lineup on top of the base cables, etc.

Similarly, within a lineup, run the cables from the distributing frame to the farthest frame within a lineup first. Run the cables from the distributing frame to the next farthest frame in the same lineup, etc.

Form vertical cables to the front half of the vertical side transverse arm Form horizontal cables to the back half of the arm as viewed from the vertical side of the Frame. Refer to Exhibit 2.

When using cable ties, cut the excess portion fo the cable tie (tail) flush with the eye of the cable tie. If a flush cut is not made, melt the remaining portion with a soldering iron, and turn the cable tie so the head Is to the rear of the cable.

NOTE: Refer to GTE Telephone Operations Practice 075-I 70-I 00 for the description and use of cable ties.

2.2 References

See GTE Telephone Operations Practice...	For Information on...
075-170-100	Description and use of cable ties.
244-010-202	Numbering and lettering distributing frames.
256-050-202	Cable tags, attachment to correct cable.
256-050-203	Runnhg switchboard cable.
256-050-204	Securing switchboard cable.
256-050-205	Butting, stripping, and fanning cable.
256-050-209	Buzzing cables.

3. Cable Breakoffs

3.1 Making Cable Breakoffs

Make cable breakoffs as shown in Exhibit 1. To avoid crossing formed cables, the cable breaking to the first vertical should be the first cable in the breakoff.

NOTE: See GTE Telephone Operations Practices 256-050-203 and 256-050-204 for Information on funning and securing switchboard cable and laying out cable runs.

Step	Making Cable Breakoffs
1	Elevate the cables where they leave the rack, trough, or grid. This will prevent excessive pressure from the cable's weight damaging the cable.
2	Raise the cables by placing a piece of large-diameter cable along the rack or trough.
3	Break the cables over the top.
4	When the "breakoff" is complete and the cables are secured to the transverse arm, remove the piece of cable used for bridging

4. Cabling Horizontal Side of Double-Sided Distributing Frames

4.1 Instructions

The distributing frame cables serving the horizontal blocks on the distributing frame break from the vertical side to the horizontal side just above the horizontal bracing strap, and contact the channel side of the transverse arm (see Exhibit 3). The cable follows the channel of the transverse arm to the terminal block. Fasten the cable to the channel with cable ties.

See Exhibit 3 for the desired location of the cable tie eye. For safety, position the cable tie eye in an inconspicuous or out-of-the-way location. Attach:

- Large cables as shown in Exhibit 3A.
- Small cables as shown in Exhibit 3B.

All nonconnectorized cables butt three inches from the terminal block fanning strip.

When one or more cables connect top only one horizontal terminal block, bring the cables down the upright to the right of the block facing the block. Cable:

- Older-type frames (where blocks are end-mounted) as shown in Exhibit 4A.
- Newer-type frames (where blocks are center-mounted) as shown in Exhibit 4B.

Use a cable tie:

- At the cable butt of the first fan when the cable is being fanned over several terminal blocks.

  AND

- On every succeeding fan.

Exhibit 5 shows the typical use of cable ties where more than one terminal block is served by a cable. Cable:

- End-mounted terminal blocks as shown in Exhibit 5A.
- Center-mounted terminal blocks as shown in Exhibit 5B.

Exhibit 6 shows a typical cable layout plan for the horizontal side of a distributing frame using 7 x 25 terminal blocks.

NOTE: The location of the cables may be varied when existing conditions prohibit installations as shown in Exhibit 6. Consult the engineering specifications for each installation

5. Cabling Vertical Side of Double-Sided Distributing Frames

5.1
Instructions

Cables for the vertical side of the distributing frame are laced or tie wrapped, butted, and formed as shown in Exhibits 2,7, and 8.

- To the top transverse arm, one cable under a cable tie/stitch.

  AND

- At every succeeding transverse arm, two cables under a cable tie/stitch.

Bunching of cables is permitted for securing, but no more cables than can be accommodated by one cable tie.

CAUTION: Avoid crossing cables.

Use cable ties when cables are fanned over more than one terminal block. The cable tie is located at the vertical bracing strap approximately 2-I/2 inches from the rear of the terminal block fanning strip. Exhibit 2 shows the correct method of cable tie and the cabling procedures for horizontal and vertical blocks on the vertical of an intermediate Distributing Frame (IDF).

NOTE: Exhibit 2 indicates which cables are run to the vertical IDE The trough or troughs from which the cables break are not ahuays as Indicated, but may be varied depending on the central office.

Use the following methods for cable ties for fanning cables on vertical frames:

- For cable tie arrangement and cabling on IDF verticals, see Exhibit 2.
- For cable tie arrangement and cabling of entrance cable on Main Distributing Frame (MDF) verticals, see Exhibit 7.

6. Cabling Single-Sided Distributing Frames

6.1
Instructions

Cables serving single-sided distributing frames are butted one inch below the cable bracket and fanned through individual cable ties as shown in Exhibit 8.

Contain the loose conductors in a neat form by using cable ties loosely.

NOTE: Refer to GTE Telephone Operations Practice 075-I 70-I 00 for Information on the use of cable ties.

7. Terminating Distributing Frame Cable and Wire

7.1
References

See GTE Telephone Operations Practice...	For Information on...
256-010-201	Cable methods – soldering.
256-050-208	cable methods – wrap and solder
256-050-211	**Wire-wrapped** terminating of wire-wrapped **distributing frame cables and jumpers.**
256-050-213	Disposing of spare and unused wire.
256-150-206	Distributing frame and cross connect splicing jumpering procedures.

8. Cabling Procedure for Connectorized Cable

8.1
Instructions

The cabling procedures **for connectorized cable are** similar to the nonconnectorized cabling procedure in Sections **2-6. The** differences in the procedures are covered in the following paragraphs.

The cable tie on the transverse arm closest to the connectorized block should be located six inches from the rear of the block. This allows space to maintain the minimum allowable radius of the cable bend.

Attach connectorized cables to the terminal block by using the appropriate fastening device for the connector used:

- Spring-loaded clips (see Exhibit 9).

  OR

- Cables ties and/or screws (see Exhibit 10).

Electronic installations utilize two types of plug-ended cables to connect to terminal blocks on the distributing frame One type is plug-ended on both ends; the other is plug-ended on one end only. The cables with tie double plug-end are provided in fixed lengths. This causes a natural slack length that cannot be avoided. Distribute this slack evenly in the trough so that this type of cable is snug in the vertical drop, allowing about a 3- **to** 5-inch maintenance loop at fts connector where it branches off the vertical drop from the trough.

me type **of** cable that has a plug on only one end Is to be run, starting from the plug end, allowing the 3- to 5 inch maintenance loop prior to the vertical run. Run the cable without leaving slack for the horizontal run to the appffcable vertical drop. Cable the open end of the cable using procedures described in Sections 2-6.

Except for special assemblies necessary to mate with a specific manufacturer's requirement, most connectors (both plugs [male] and sockets [female]) must be the plastic type (e.g., TRW/Cinch 224 series or Amp Champ-Lo&) with universal latches.

8.1 Instructions, continued

Connectors with universal latches have sockets equipped with spring-clips at each end to engage "Windows" in the plug. When connectors with spring-clips are provided:

- Place the female connector onto the appropriate male connector

  AND

- Apply upward force until the female connector is fully seated and the spring-clips latch

An audible "click" signifies that the connectors are fully mated and secured Give a slight tug to the connectors to ensure the locking mechanism Is In place. There is no need for additional locking hardware.

Disengage mated connectors by using a pointed object, such as a probe, ball point pen, screwdriver, or similar tool. Insert the tool into the cut out @'window" opposite the spring clip window (Exhibit 9) at either end, and depress the spring-clip lightly (so as to not damage the spring-clip). Disengage the plug and socket by using slight hand pressure.

CAUTION: Do not apply excesslve pressure to the latch spring as this will damage the latch spring.

Upon reinsertion of a cable, listen for the "click" sound and give a slight tug to ensure the locking mechanism is functioning properly. If the locking mechanism becomes damaged, attempt a slight adjustment to the latch spring. If this fails, apply a cable tie to the connector.

Connectors not using spring-clips must be secured to the block using one of two methods:

- Some models of terminal blocks (e.g., Telzon) must be secured with a locking screw (i.e., 4-40 x 1/2" or 4-40 x 3/4") at the front of the connector (Exhibit 10) and with an eyelet screw and cable tie wrap at the rear of the connector (Exhibits 11 and 12).

- Some non-locking connectors (metal to plastic or metal to metal) must be secured with locking screws provided with the metal connector. Metal to plastic mating may require one longer screw than what Is provided with the metal connector. A RHIM 4-40 x 3/4" screw available from stock Is fully threaded; however, take care when using this screw to ensure that the two mating connectors are pulled together and not pushed apart.

Regardless of which method is used to fasten the various connectors, the installer should always verify that they are securely mated and will not pull apart. Replace any defective terminal block or cable.

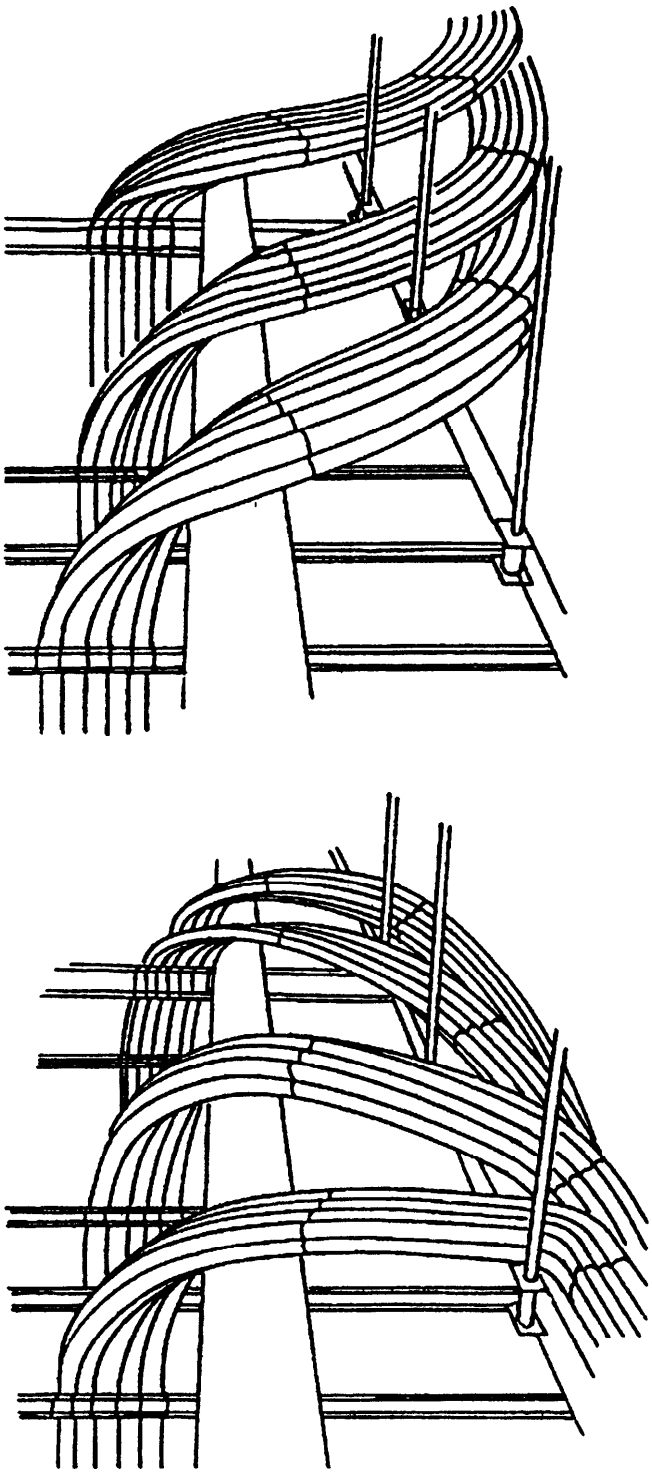


Exhibit 1 – Method of Framing Cable Break-Off

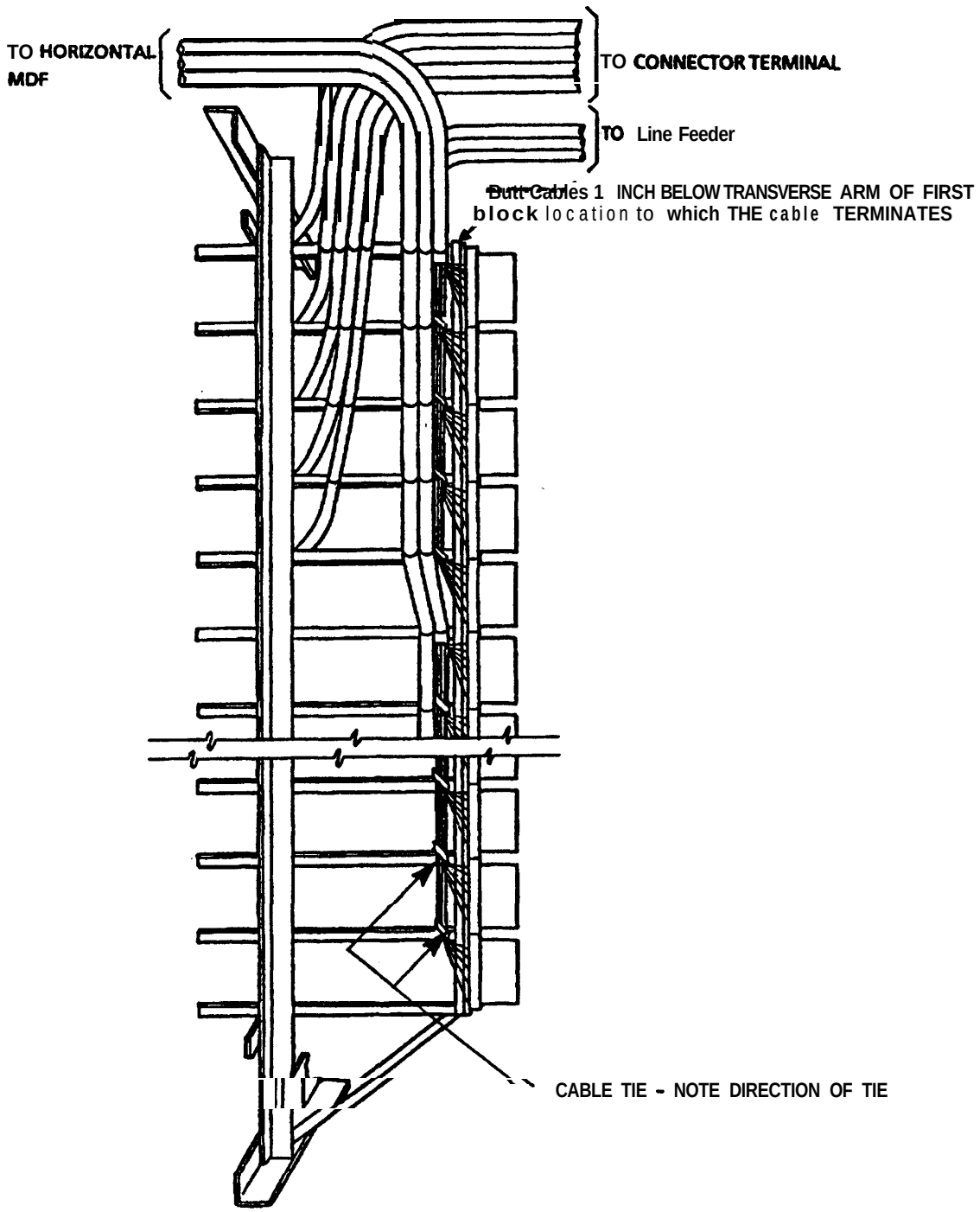
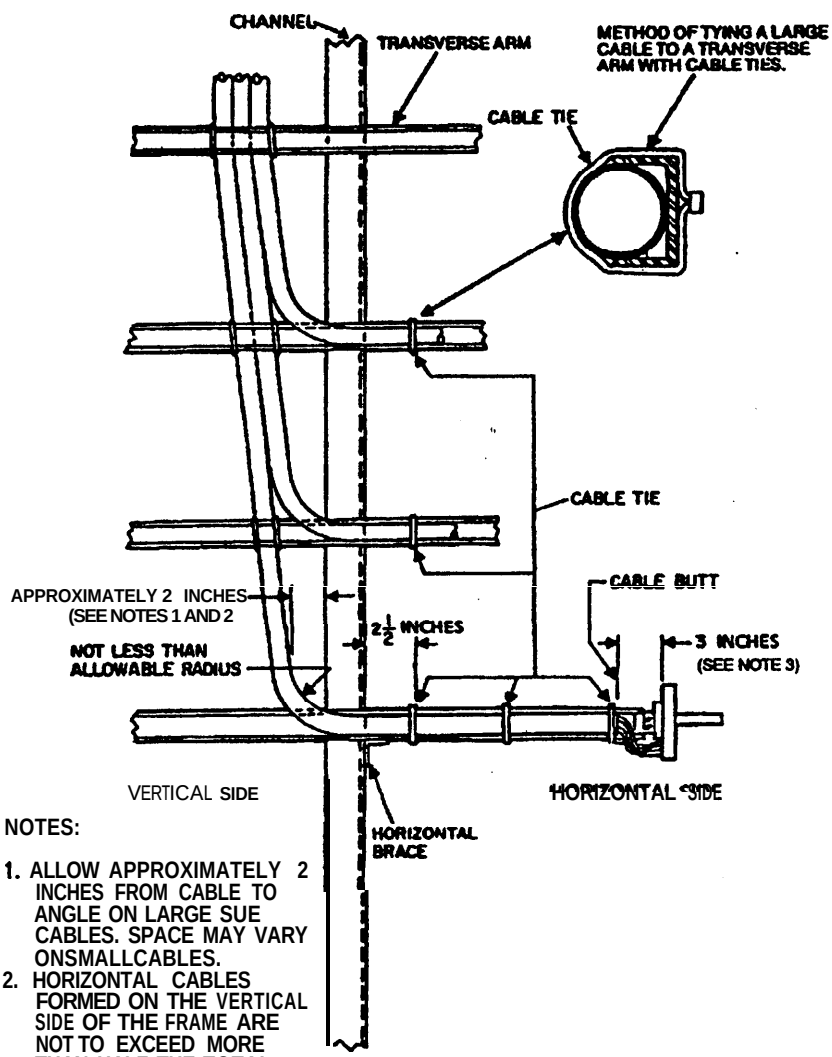


Exhibit 2 – Cable Tie Arrangement and Cabling on Vertical Line IDF



NOTES:

1. ALLOW APPROXIMATELY 2 INCHES FROM CABLE TO ANGLE ON LARGE SUE CABLES. SPACE MAY VARY ONSMALLCABLES.
2. HORIZONTAL CABLES FORMED ON THE VERTICAL SIDE OF THE FRAME ARE NOT TO EXCEED MORE THAN HALF THE TOTAL LENGTH Of THE VERTICAL ARM.
3. WHEN USING CONNECTORIZED BLOCKS, THE CABLE TIE ON THE TRANSVERSE ARM CLOSEST TO THE BLOCK SHOULD BE 6 INCHES FROM REAR OF THE BLOCK.

Exhibit 3A – Tying a Large Cable

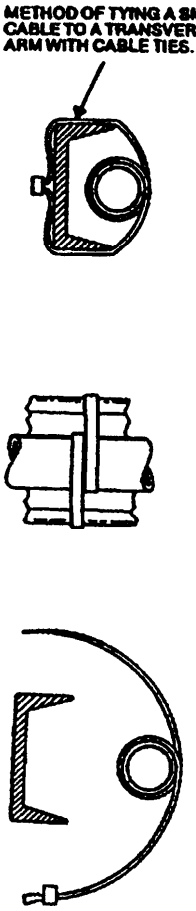
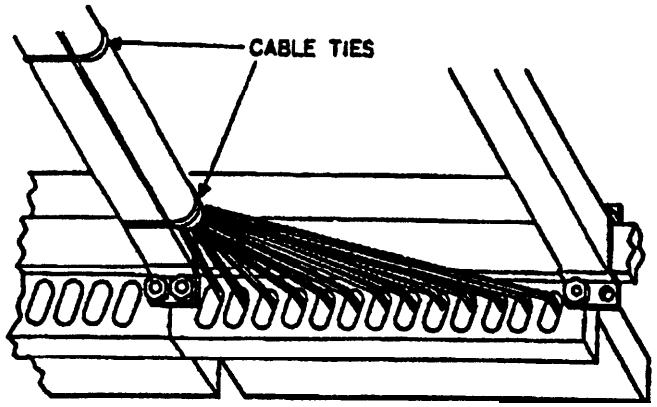


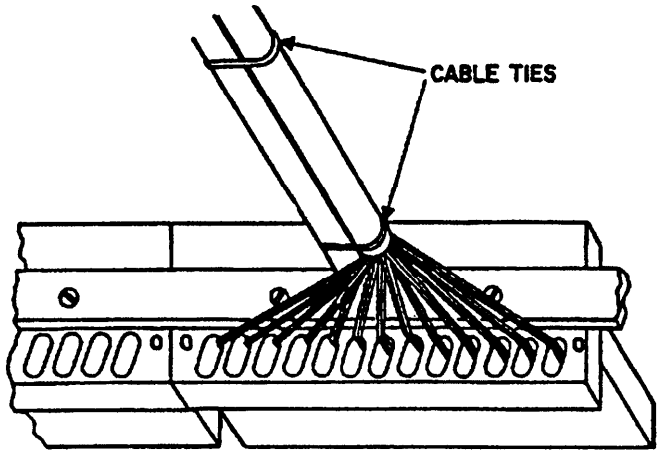
Exhibit 3B – Tying a Small Cable

Exhibit 3 – Forming Non-Plug-Ended Cables to Horizontal Blocks



NOTE: **BUTT ALL** CABLES **3 INCHES FROM FANNING** STRIP.

Exhibit 4A – **End-Mourited Blocks (Older-Type Frames)**



NOTE: **BUTT ALL** CABLES 3 INCHES FROM FANNING STRIP.

Exhibit 4B – Center-Mounted Blocks (New-Type Frames)

Exhibit 4 – Cable Serving a Single Block

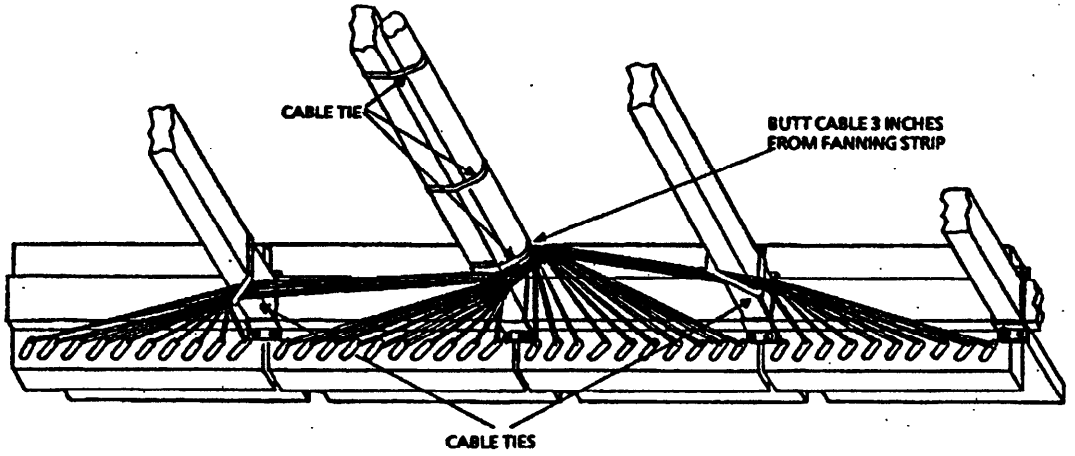


Exhibit 5A – End-Mounted Blocks

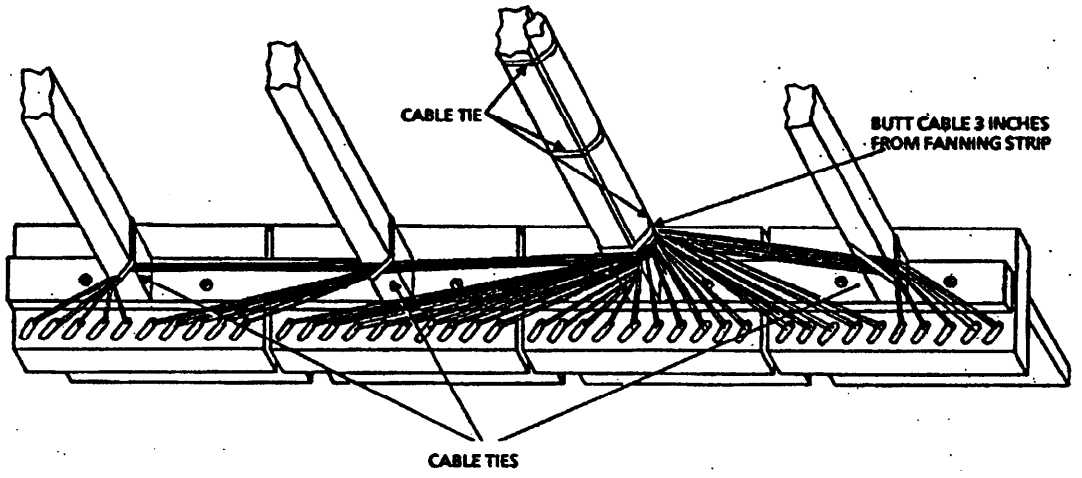
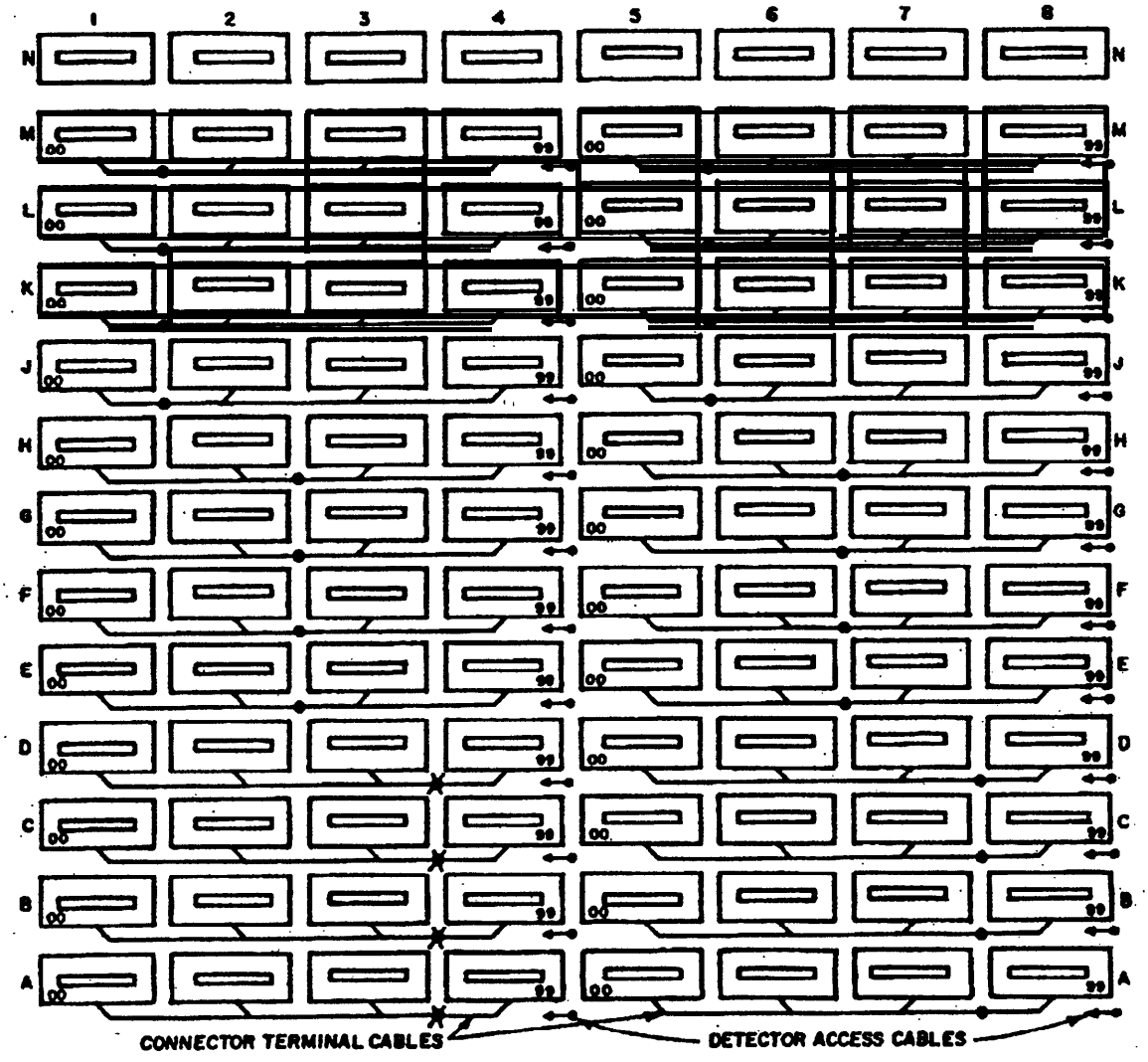


Exhibit **5B –** Center-Mounted Blocks

Exhibit 5 – Cable Serving Two or More Blocks



✗ DENOTES CABLES SEWN PER UPRIGHT

NOTE: A 13-SHELF, B-UPRIGHT FRAME IS SHOWN; HOWEVER, IF ONLY PART OF THE SHELVES IS USED, CONTINUE WITH SAME PATTERN AS ILLUSTRATED, BRINGING 4 CONNECTOR CABLES DOWN AN UPRIGHT.

Exhibit 6 – SxS Cable Layout Plan for Horizontal Side of Distributing Frame

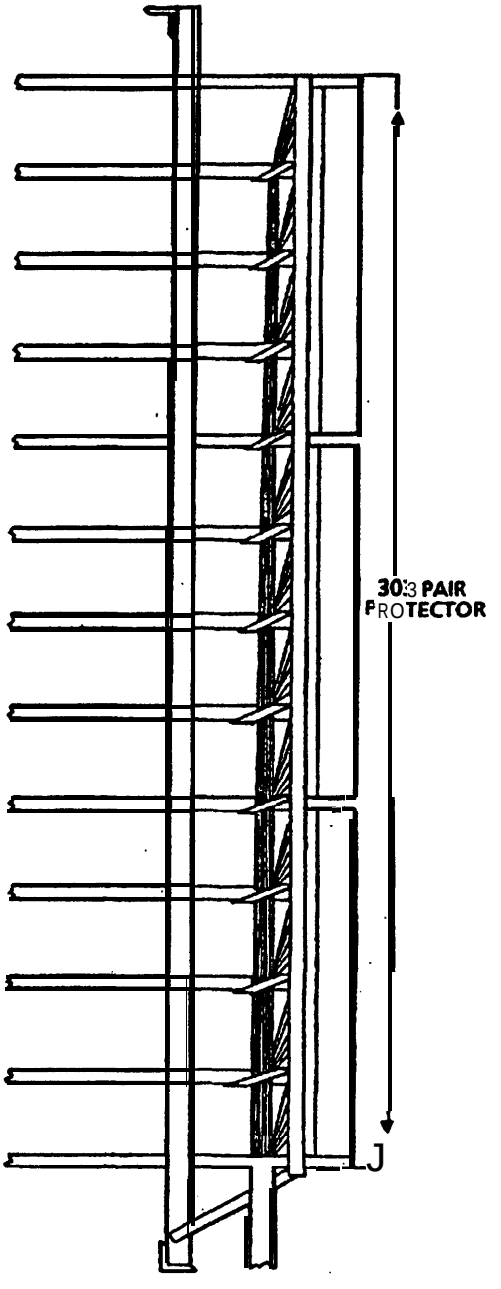


Exhibit 7 - Location of Cable Ties and Cabling for Entrance Cable on Distributing Frame

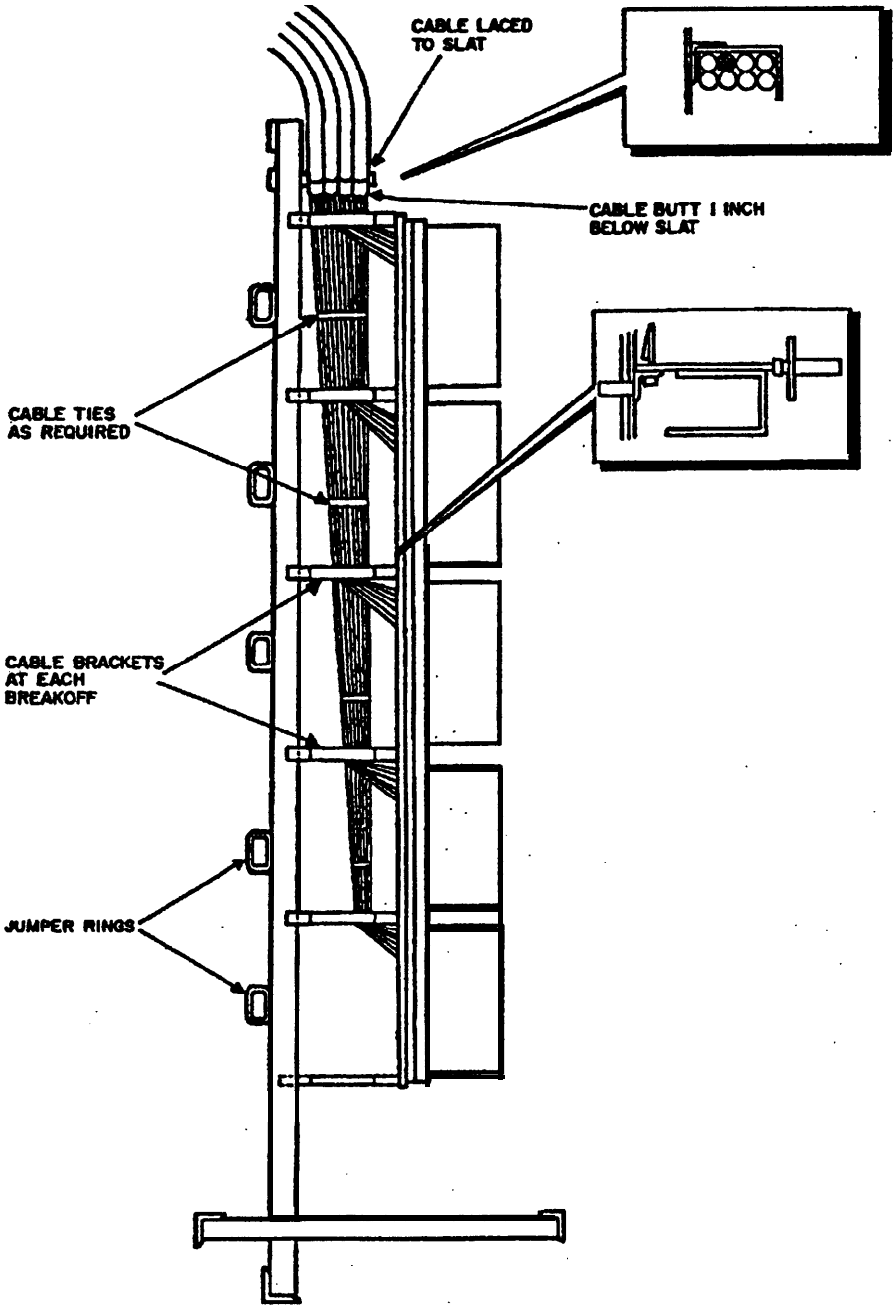


Exhibit 8 – Cabling Single-Sided Distributing Frame

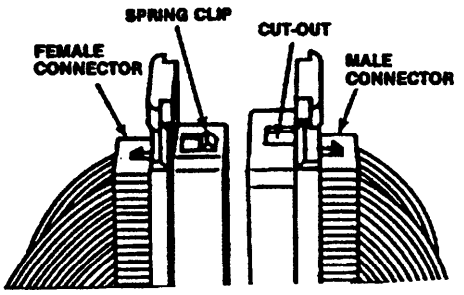


Exhibit 9 – Interlocking Connector

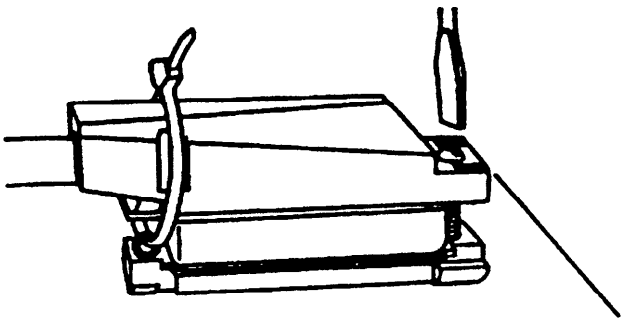


Exhibit 10 – Securing Non-Interlocking Connector to Block

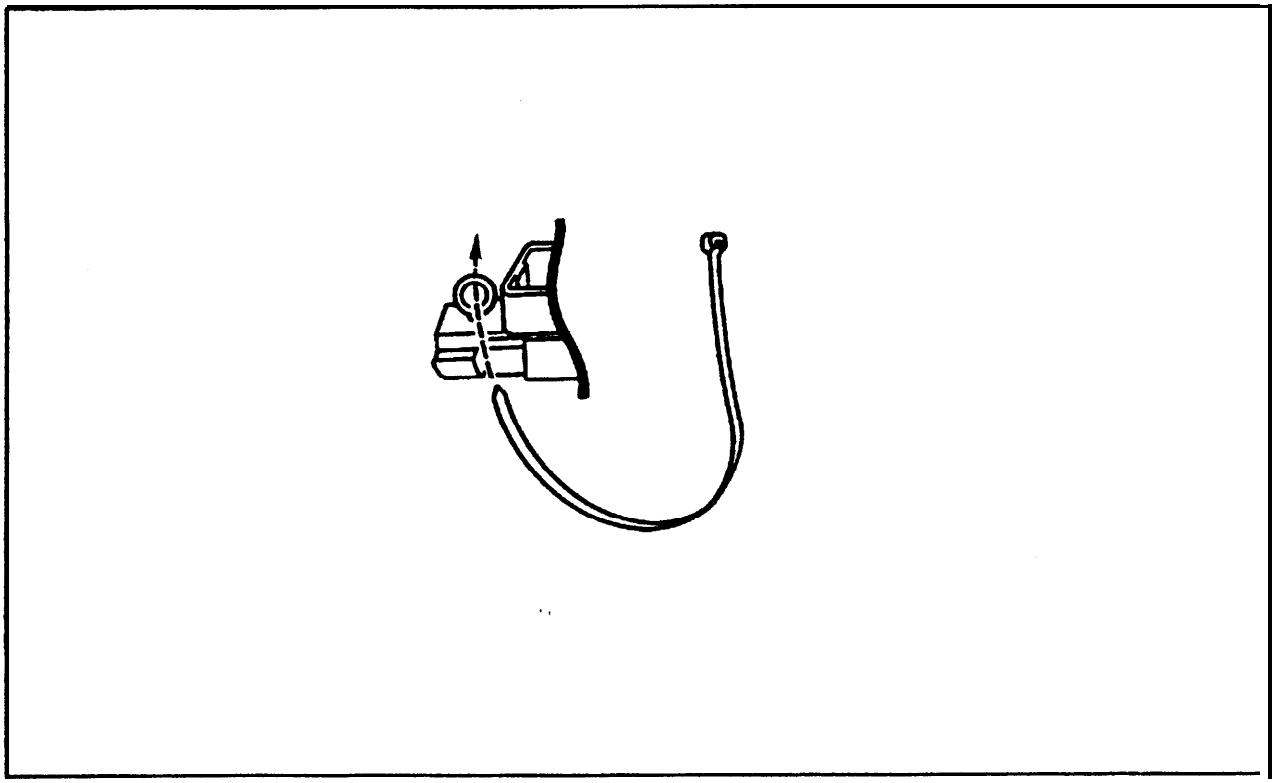


Exhibit 11 – Securing Tie Wrap to Connector

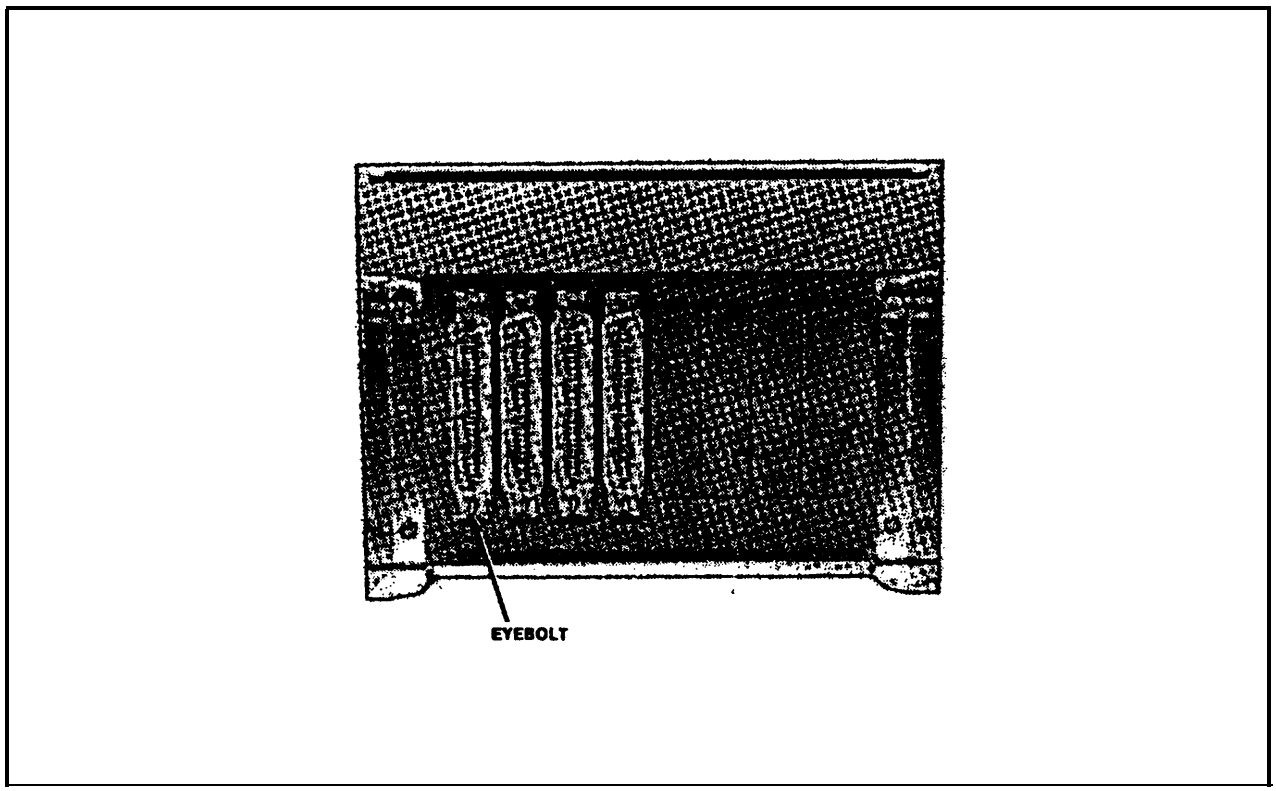


Exhibit 12 – Connector Engaged to Mounting Bracket Stops