SECURING CABLE AND WIRE

FROM RACK TO BUTT LOCATION

CONTENTS

1. GENERAL

1.1 Scope of Section

1.11 This section covers the securing of cable and wire from the cable rack to the butt location, to supports at distributing frames, bays, racks, and switchboards.

1.111 The term "Frames" as used in the text of this section refers to frames other than distributing frames, When reference is made to distributing frames, they will be shown as "Distributing Frames".

1.112 Each figure in this section illustrates only conditions to which reference is made in the text of this section and is not to be considered as requirements for other conditions that may be involved or illustrated.

1.12 The arrangement of cables passing along through the various equipment is shown on the cable plan drawing covering the particular equipment.

1.2 General Information Pertaining to Arrangement of Tools, Precautions, Verification, Specification, Drawings, and Figures

1.21 Refer to Section 1 of this handbook for information pertaining to these items.

2. INSTALLING EQUIPMENT

2.1 Tools

R-4266 Tool, Fastening, Cable Tie
R-4827 Tool, Fastening, Cable Tie ←

2.2 Supplies

→ R-2916 Twine
RM-583101 Fiber Sheet, Gray, 1/64"
R-4265 Cable Tie, Nylon
List 2 for 2" Max Cables Diameter
List 3 for 3" Max Cables Diameter
List 4 for 4" Max Cables Diameter

3. SPECIFIC PRECAUTIONS

3.1 Precautions which are not specific to a particular operation but which are to be observed in connection with the various operations performed, as covered in this section, are:

3.11 Avoid using clip-on cable rack brackets installed on cable racks as a support. They may be dislodged by a pull or jerk.

3.12 Sewing twine may break if given a quick jerk or if one strand is pulled tighter than the others.

3.13 Avoid cuts and bruises by tightening stitches and knots with a steady pull of the twine.

3.14 Avoid placing tools or other objects on ladders or scaffolding where they may be accidentally pushed off or fall on those below. Keep tools in case provided for them.

3.15 Handle cable and wire carefully so the shape and condition of the cable and wire will not be altered.

3.16 Exercise the greatest care at all times in working offices to guard against fuse service hazards as blowing fuses, breaking off wires, and crossing terminals on equipment in service.

3.161 Shielded wire must be handled with extra precaution at the rear of fuse panels as the grounded shield is a potential service hazard at such points.

NOTE: Ensure that the ends of all cables and wires in the vicinity of live equipment are taped when securing from the cable rack to the butt location. See Section 200 for applying tape to the ends of the cable.

3.162 Take extra care at frames with exposed wiring and switches to prevent cables and wires from damaging the equipment or wiring.

3.2 Provide adequate protection as covered in Section 131 of this handbook, at corners, uprights, and sharp edges of ironwork so that the insulation of switchboard cables and loose wires is not damaged.

3.3 Observe the condition of the insulation of cable and wire as it is being grouped and secured and repair any damaged insulation. Refer to Section 160 of this handbook.

3.4 The practice of waxing cable forms has been discontinued by the Installation Organization. Older types of cables which have untreated textile insulated conductors (6000 Type, etc.) shall be recabled rather than rewaxed. Should it be necessary to replace existing waxed cables, the Installer shall inform the Telephone Company of this condition and request authorization for the replacement of the cables involved.

3.5 All R-4265 Cable Ties must be secured with an R-4266 or R-4827 Cable Tie Fastening Tool.

3.51 Excess "tie ends" protruding through the "tie head" of R-4265 Cable Tie shall never be cut off by any cutting instrument other than R-4266 or R-4827 Cable Tie Fastening Tool.

3.52 After cut off with the tool, the tail of the tie should, in general, be flush or slightly below the head. In no case shall the tail extend more than 1/32" beyond the head.

3.53 See Handbook 9 for proper use of R-4266 and R-4827 Tool.

4. CABLE ARRANGEMENT

4.1 Cable Arrangement from Cable Rack to Cable Butt Location

4.11 The arrangement of cables between the cable rack and cable butts shall agree with the cable plan drawings for that type of equipment.

4.111 When necessary to bend cable, refer to Section 300 of this handbook for bending radii.

4.1111 Conduit or 2" x 4" lumber with edges rounded placed at cable break-off points as a temporary support will serve as an aid in maintaining the proper radius and uniformity of the cable bends at verticals of distributing frames.

4.112 Arrange cables so as to permit the installation of the cables for the ultimate equipment.

4.12 Secure cables to new frames, bays, racks, switchboards, and verticals of distributing frames in accordance with the information shown on the equipment cabling plan drawings.

4.121 Cabling plan drawings required may not always be ordered by the Engineer on Telephone Company, or on additions to Western Electric engineered jobs. The following list of cabling plan drawings for the more commonly encountered types of equipment is provided for convenience in ordering the required drawings in these cases.

Distributing Frames

ED-26990-12	No. 5 XBAR Arrangement for Protector Mountings
ED-10233-01	Step-by-Step Wall Type MDF
ED-91236-01	Common Systems Arranged for Protector or Jack Mtgs
ED-92879-11	Common Systems-MDF
ED-10537-12	Manual Switchboard
ED-90290-10	Common Double Sided Protector Frame
ED-30731-01	Step-by-Step Single Sided Protector Frame
ED-61059-01	Toll Test Protector Frame and IDF
ED-10422-10	Manual Switchboard IDF
ED-20524-01	Panel IDF
ED-20838-01,02	Panel and Step-by-Step IDF
ED-30333-01	Step-by-Step CDF
ED-61893-10,11	Toll CDF
ED-66573-10,11	701B and 711B PBX CDF
ED-65286-10	Common PBX Distributing Frame
ED-65776-01	740E PBX Distributing Frame
ED-30140-01	Step-by-Step Double Sided TRDF
ED-31218-10	Step-by-Step Single Sided TRDF
ED-25341-10,11	No. 1 Crossbar LDF and TRDF
ED-26337-10	No. 1 Crossbar MRDF (Arranged for AMA)
ED-68654-10	Toll TRDF
ED-25256-10	No. 1 Crossbar District Junctor Grouping Frame

Fuse Boards

ED-90798-02,11	Relay Rack Mounted and Bus Arrangement I Beam and Channel Type Relay Racks
ED-91203-01	Relay Rack Mounted Bulb Angle Relay Racks
ED-26589-12,13	No. 5 Crossbar PRTD
ED-95171-01,10	Typical Fuse Board Cabling
Ed-92137-10	Duct Type Fuse Board

Relay Racks

ED-3C085-10	Duct Type, Unequal Flange
ED-92224-10,11	Bulb Angle Type-Typical Cabling
ED-26629-10	Crossbar Relay Racks
ED-90976-10,11	Channel or I Beam Type-Direct Cabling to Units or Individual Mounting Plates
ED-10537-12	Manual Systems No. 11 Switchboard, MDF to Relay Rack and Misc.

Register Racks

ED-26232-01	No. 5 Crossbar	MR Frame
ED-90587-10	Common Systems	MR Frame
ED-30113-02	Step-by-Step	TR Rack
ED-91432-01	Common Systems	TR Cabinet
ED-26498-10,11 & 12	No. 5 Crossbar	TR Frame

Step-By-Step

ED-30791-10	Step-by-Step Systems

Switchboards

ED-91118-01	Common Systems, Miscellaneous Cabling in Switchboards
ED-61651-01	Running Box and Roof Cabling in 3B and 3C Toll Switchboards

4.13 Cabling plan drawings are not ordinarily ordered by the Engineer for additions to existing frames, bays, racks, switchboards, and verticals for distributing frames. In such cases, where practicable, the present cabling arrangement should be followed as a guide for the method of cabling. However, the current requirements should be met, such as bending radii, protection of cables at points where they break sharply over the edge of the cables rack structure, method of securing, etc., irrespective of any such deviation in the existing cables. If there is any question as to the advisability of following the existing cabling arrangement, refer to the drawings. Order drawings through the regular channels.

4.14 Cable brackets furnished but not used to support cables in partially equipped bays should be left as a permanent part of the frame or rack. Brackets which are bolted on should be installed in the specified location. It is preferable to install unused clip type brackets in partially equipped bays at the top of the upright. If, however, this would result in the clips being covered with cables to such an extent as to make their removal difficult when needed, they may be installed at a point just below the cables.

4.15 Secure switchboard cables leaving cable racks and entering switchboards, frames, racks, and other equipment so that there will be no appreciabl sag in the cabling.

4.151 Cables shall not be unsupported except at distributing frames for a distance greater than 2'-0" measured along the shortest cable between the last support on the cable rack and the first support on the switchboard, frame, bay, or rack.

4.152 When cabling at duct type bays, the point where the cables enter the duct at the top of the bay is considered a point of support. The unsupported distance of cables between this point on the bay and the cable rack will not exceed 2'-0".

4.153 Where cabling to a distributing frame passes through a floor slot immediately under the frame, an unsupported length of not more than 4'-0" measured along the shortest cable is permissible. In the case of cabling entering a distributing frame from a cable rack at the top of the frame, the cables may be unsupported at the turn for a distance not exceeding 3'-0".

4.154 Secure groups of cables midway between the cable rack and the first support when the distance between these points or the fan arrangement is such that the cables tend to spread apart and result in a poor appearance, as follows.

4.1541 Where the cables are the same size and break off from a regular run, when the bundle of cables is four (4) inches in diameter or less, use an R-4265 Nylon Tie, or a band of twine; over four (4) inches in diameter, secure with Chicago stitch as shown in Figure 1 and Figure 2.

4.1542 Where the cables are of different size and break off a miscellaneous run, when the bundle of cables is (4) four inches in diameter or less, use R-4265 Nylon Tie or band of twine; over (4) four inches in diameter, secure them with a modified Chicago stitch using only one pass through the cables with twine as shown in Figure 3. Split the cables into two equal groups when coming from one direction. When cables feed from both directions, split cables in two groups according to the direction from which the cables are run.

4.16 Maintain sufficient slack where necessary to provide space for placing future cables in their proper location

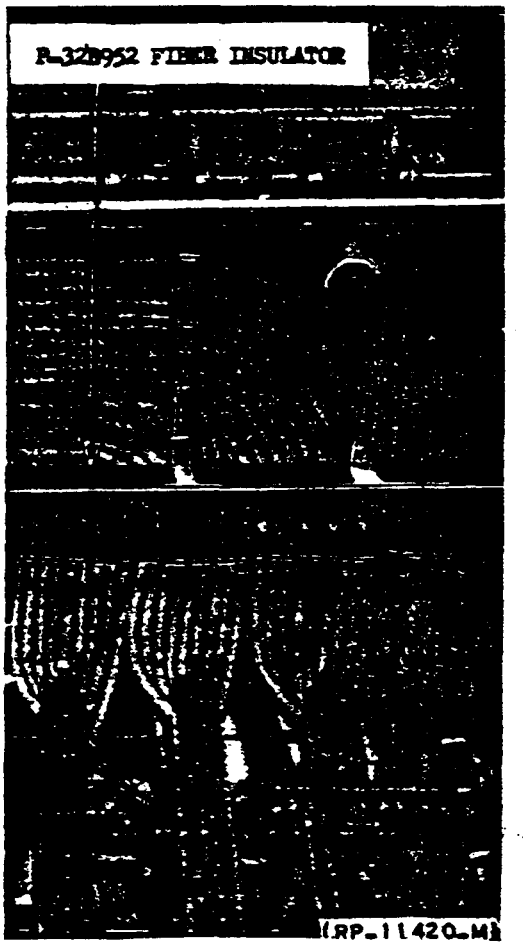

FIG. 1 CABLES FROM REGULAR RUN SECURED TOGETHER BETWEEN RACK AND FIRST SUPPORT WITH CHICAGO STITCH (PAR. 4.1541)

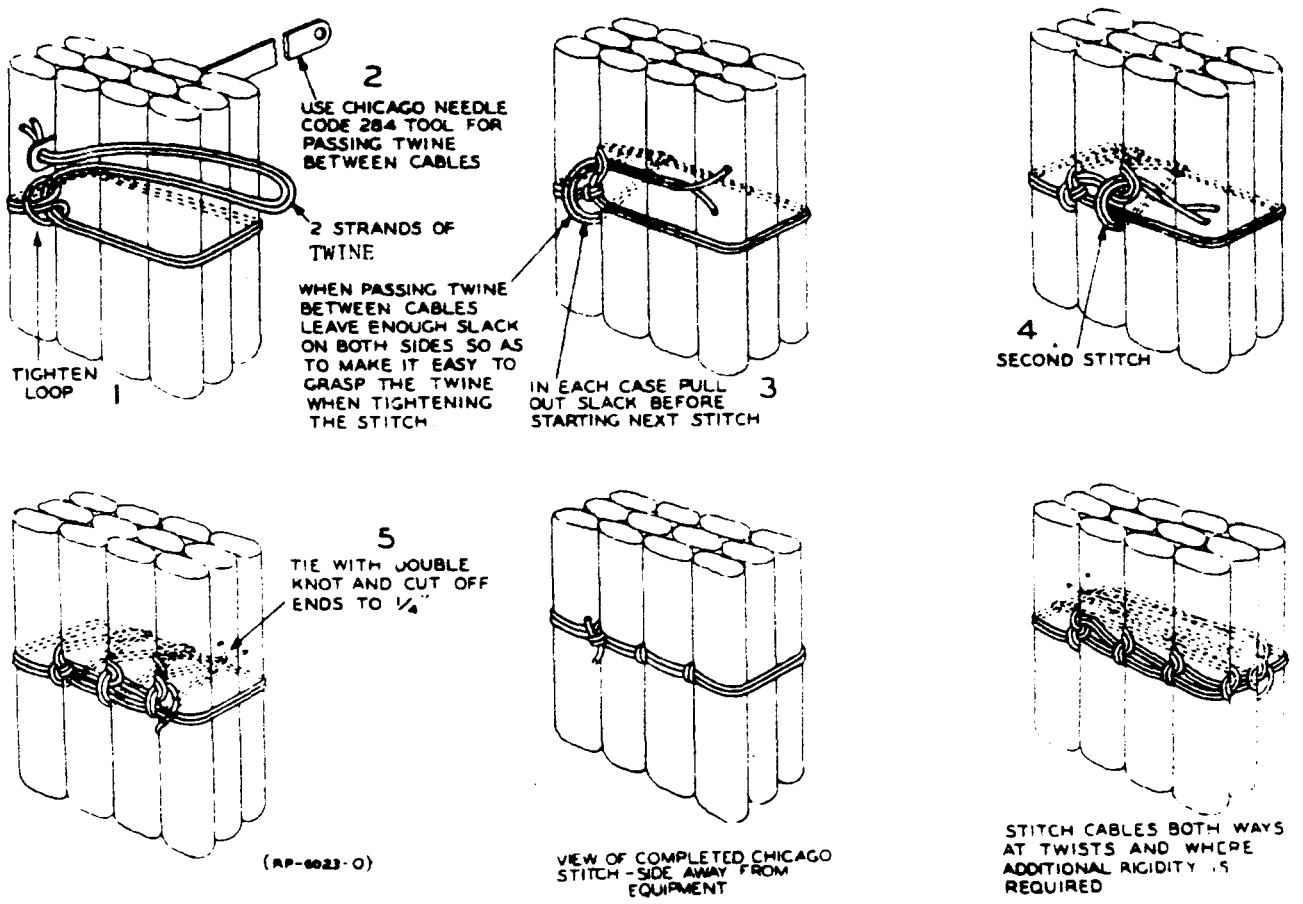

FIG. 2 CHICAGO STITCH USED TO SEW CABLES TOGETHER
(PAR. 4.1541)

5. SECURING SWITCHBOARD CABLE AND WIRE FROM THE CABLE RACK TO THE BUTT LOCATION

5.1 General

5.11 When securing cables with R-4265 Nylon Ties, the locking head of the tie shall not appear between layers of cable.

5.12 R-4265 Nylon Ties shall not be placed directly over the heads of other nylon ties.

5.13 Nylon ties shall not be used for securing coaxial cable to cable brackets, towel bars, etc., unless the coaxial cables can be completely embedded in the center of the cable form.

5.14 R-4265 Nylon Cable Ties shall not be used for securing vertically run switchboard cables totaling less than 1/2" in combined diameter to cable brackets or other wiring supports.

5.2 Securing Switchboard Cable at Frames, Bays, Racks, and in Switchboards

5.21 Secure all cables and wire to supports except short multiple in switchboards, desks, and cables passing through fanning rings. Refer to Section 221 of Handbook 9 for requirements pertaining to the protection of rubber and PE insulated wires when securing.

5.211 Secure cables to the top cable bracket of a frame with R-2916 Twine, using either the Kansas City or Chicago stitch as illustrated in Figure 6 of this section. See PAR 5.214 for exception.

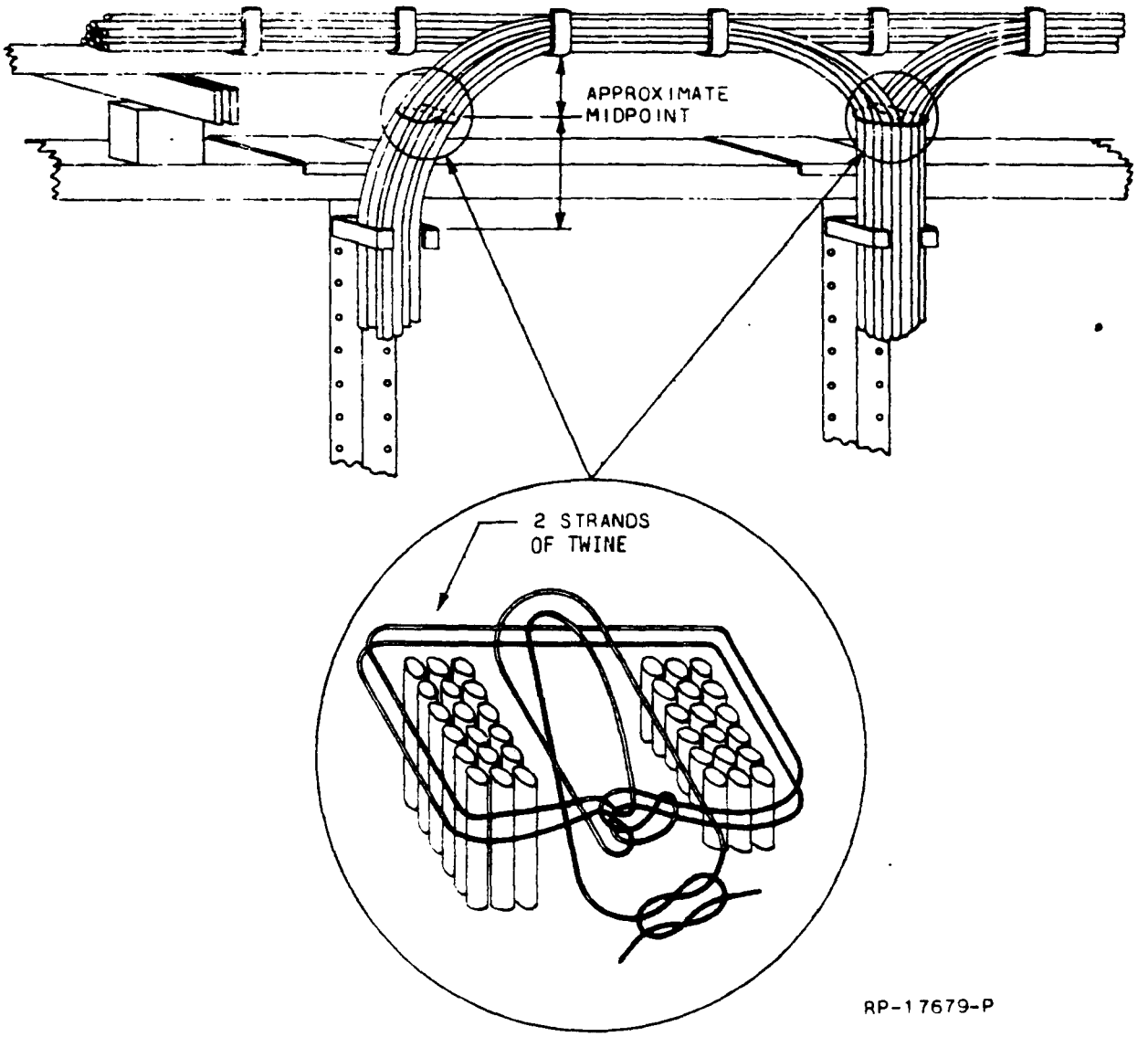

FIG. 3 CABLES FROM MISCELLANEOUS RUN SECURED TOGETHER BETWEEN RACK AND FIRST SUPPORT WITH A MODIFIED CHICAGO STITCH (PAR. 4.1542)

5.212 When securing switchboard cable butts at equipment frames, the cable butt will be secured to the cable bracket with R-2916 Twine, regardless of the location of the frame. See PAR 5.214 for exception.

5.213 Secure cables to equipment frame brackets (except cable butts and at the top bracket) using R-4265 Nylon Ties as shown in Figures 4 and 5 or R-2916 Twine as shown in Figure 6. See PAR 5.214 for exception.

5.214 When securing additional cables to a bracket that already contains secured cables, the added cables shall be anchored to the bracket if possible. Where it is not possible to anchor the added cables to the bracket due to cable build-up, they may be banded to previously secured cables. Twine shall be used for banding in the vicinity of the top bracket (first cable support) and at cable butt locations. At other cable support locations, the R-4265 Nylon Cable Ties are acceptable.

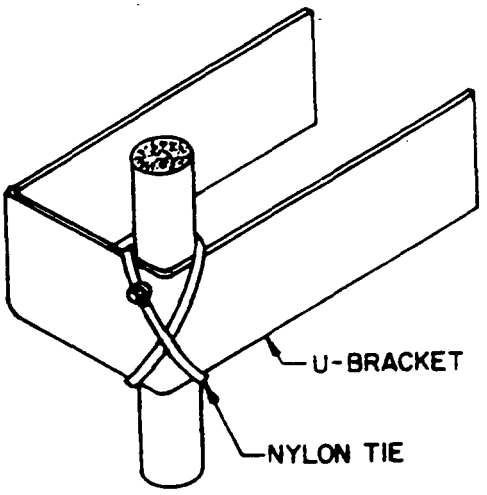

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FIG. 4 SECURING CABLE TO THE INSIDE OF U TYPE BRACKET (PAR. 5.213)

5.215 When securing at equipment frame supports, the maximum number of cables placed under an R-4265 Nylon Tie or R-2916 Twine Stitch shall be in accordance with Table "A" of this section.

5.22 When securing on a frame, the last support adjacent to the butt should be withheld until the cable has been stripped and the stripper placed in position for the fanning or forming operation.

5.23 Where the butt location of cables is between cable brackets, below the lowest bracket, or above the uppermost bracket on the frame, secure the cables to other cables passing the butting point to provide additional support.

5.231 When the butt is located in excess of 2 inches below the uppermost or an intermediate cable bracket:

(a) Secure a single cable to one or two large cables or several smaller cables with a nylon tie or band of twine placed approximately 1 inch above the butt.

(b) Secure two or more cables together with a nylon tie or band of twine placed approximately 1 inch above the butts and include one or two large cables or several smaller cables.

5.232 When the butt is located below the lowest cable bracket, it is permissible to have a length of 10 inches between the butt and the bracket.

NOTE: If the butt is located at a point in ex ess of 10" below the lowest cable bracket, the butts are considered to be inadequately supported and such cases should be referred on a Rou e "C" J.I.M. as specified in the ervice Division Instructions.

5.233 When the butt location is above the uppermost cable bracket on the frame or bay upright, the butted cable or cables should be secured to one or two large cables or several smaller cables passing the butt location. Place the nylon tie or band of twine approximately 1 inch above the butt location.

5.24 Secure cables compactly so they will not occupy a greater space than is provided for the particular runs.

NOTE: Secure cables in a compact and neat manner.

5.3 Securing Switchboard Cable and Wire at the Vertical Side of Distributing Frames

5.31 Secure cables to transverse arm with either twine or R-4265 Nylon Ties as shown in Figure 6, 7, or 8. Place the number of cables under an R-4265 Nylon Tie, or Twine Stitch, in accordance with Table "A" of this section.

5.311 On distributing frames having transverse arms on 13 inch vertical centers, secure all cables at all transverse arms.

5.312 On distributing frames having transverse arms on less than 13 inch vertical centers, secure all cables at the first (top or bottom) transverse arm where cables enter the frame and at alternate arms, counting from the first arm. At other than alternate arms, secure only those cables which butt or turn off at these arms.

5.313 When fanning rings are used on the vertical side, the ring shall be considered as a means of securement for those cables within the ring.

5.32 Arrange the cables as shown on the cable plan drawings.

5.33 Secure cables terminating on the vertical terminal strips in each vertical in the following manner.

5.331 Secure the cables to the first transverse arm after determining the arm at which each cable will break off.

5.332 Stripping and butting the cables before securing them to the other transverse arms will facilitate the stripping and butting operation.

5.3321 An exception is where cables are arranged on multilayer basis with the bottom layers serving the terminal strips furthest away (lower or upper part of vertical) from the first arm. Securing the bottom layers partially down or up the vertical before stripping and butting the cables in these layers will facilitate the securing operation.

5.333 Secure cable butts to transverse arms including cables butting at the first arm with R-4265 Tie or Twine. Arrange the butts of the cables terminating on the vertical terminal strips so that they will be in vertical alignment.

5.3331 A dimension is generally shown on cable plan drawings between the rear side of the vertical terminal strips and the side of the vertical cable run adjacent to them. This fixes the position of the cable break-offs (cable butts) on the transverse arms. Generally, this dimension is shorter for the cables butting at the first arm.

5.3332 At transverse arms where fanning rings are used, place cable butts and as many cables adjacent to the butted cables as the ring will easily accommodate within the ring. Cable plan drawings show the application of fanning rings for this purpose.

5.34 Secure cables terminating on the horizontal terminal strips in each vertical as follows.

5.341 Secure the cables to the first transverse arm after determining the arm at which each cable will turn off.

5.342 Determine the arms to which cables will be secured.

5.3421 Generally, cables turn off from the side of the cable run next to the horizontal terminal strips with the cable turn offs in a vertical line.

5.3422 Some cable plan drawings fix the vertical cable line of turn off by reference to the face of the bay vertical angle as follows:

(a) By a dimension between the line and the angle face for some verticals.

(b) By specifying the minimum bending radius for the cables involved between the line and the angle face for other verticals.

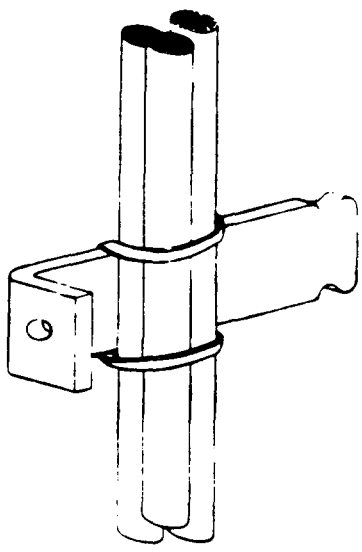
5.3423 Some cable plan drawings show cables turning off from the side of the vertical cable run away from the horizontal terminal strips but not in vertical alignment. Examples are Panel and Step-by-Step IDF's.

5.343 Pass cables through the frame and secure them to the transverse arms as in Figure 11 or 12.

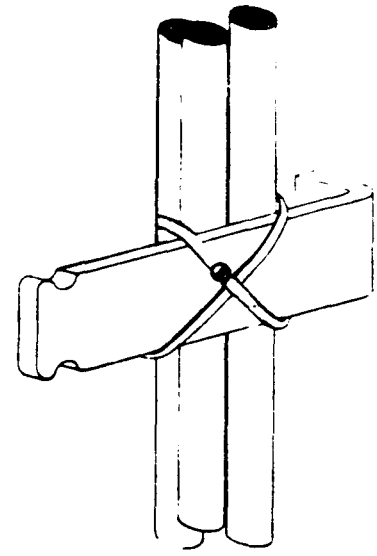
5.35 Wires run with switchboard cable at the vertical side of distributing frames shall be secured to transverse arms in the same manner as switchboard cable.

5.4 <u>Securing Switchboard Cable to Brackets at Crossbar Single Sided LDF and TRDF by Sewing</u>

5.41 At the LDF and TRDF and grouping frames on crossbar installations, it will be necessary to take special precautions to insure maintaining the radius required in the cables at each location between cable rack and top bracket. Form cables over wood strips secured to the underside of the superstructure are so located as to maintain the proper radius and uniformity of the cable bends.



FRONT VIEW



REAR VIEW RP-0033 RM-1

FIG. 5 SECURING CABLE TO "L" TYPE BRACKET
(PAR. 5.213)

5.42 Install cable brackets loosely when cables are run into the frame. Tighten after cables are sewed to the rear of the bracket. See Figure 9.

5.43 Secure cables run on the rear (outside) of cable brackets by sewing, using the Kansas City or Chicago Stitches as shown in Figure 6 of this section. Use two strands of twine and place the number of cables under a stitch in accordance with Table "A". Secure cables at every bracket.

5.431 The hole in the end of the bracket may be used to secure the sewing twine when cables are located close to the end of the bracket.

5.44 To avoid sewing cable unnecessarily at the rear of brackets, place block relay and message register cables inside of brackets which are not occupied by cables from the line link frames to the horizontal terminal strips. This practice is shown in detail on the cable plan drawing for these frames.

5.5 Securing Switchboard Cable Running Under and Perpendicular to Transverse Arms at the Horizontal Side of Distributing Frames

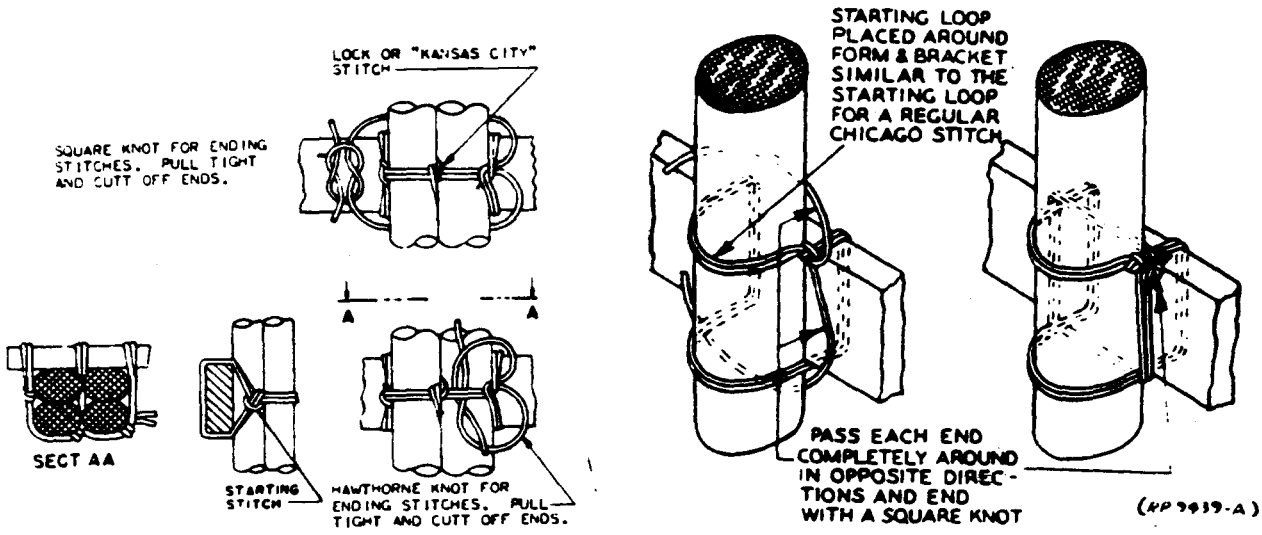
5.51 Cables running perpendicular to the horizontal transverse arms shall be secured to the underside of the transverse arm with R-4265 Nylon Ties or R-2916 Twine.

5.52 Secure all cables at each transverse arm as shown in Figure 10 or Figure 6. Refer to Table "A" for number of cable per tie or stitch.

5.6 Securing Switchboard Cable and Wire Along Transverse Arms and Similar Supports

5.61 Secure cables along transverse arms of distributing frames by using cable ties (R-4265 List 2) as shown in Figure 11 or with twine as shown in Figure 12.

5.62 Cables should be butted and stripped at the horizontal side of the distributing frame prior to applying the last R-4265 tie or twine stitch adjacent to the butt. Care should be taken to insure correct placement of cable butts and to maintain proper radius and uniformity of cable bends.



SECURING CABLE TO SUPPORT WITH KANSAS CITY STITCH

SECURING CABLE TO SUPPORT WITH CHICAGO STITCH

FIG. 6 SEWING CABLES TO CABLE BRACKETS AND DISTRIBUTING FRAME TRANSVERSE ARMS (PAR. 5.211, 5.212, 5.213, 5.31, 5.43)

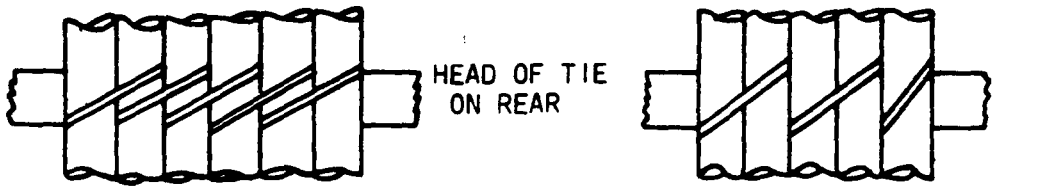
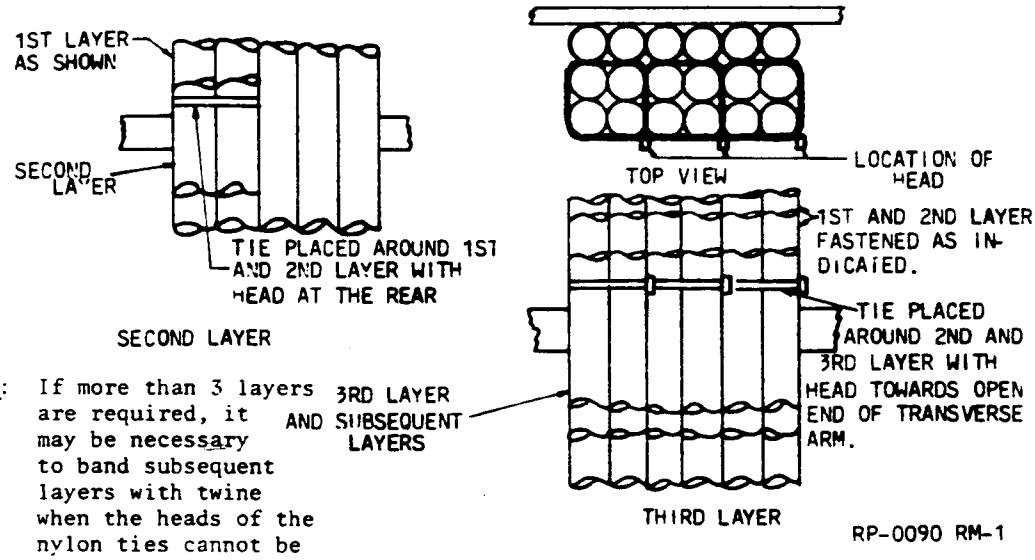


FIG. 7 SECURING FIRST LAYER OF CABLE ON VERTICAL SIDE OF DISTRIBUTING FRAME (PAR. 5.31)

CABLE SIZE (DIAMETER)	MAXIMUM CABLE BUNDLE DIAMETER (OR EQUIVALENT)
LESS THAN 1/2"	1-1/2"
1/2" to 1"	2"
LARGER THAN 1"	2-1/2"

TABLE "A"

MAXIMUM CABLES PER R-4265 TIE OR TWINE STITCH AT CABLE SUPPORTS
(PAR. 5.215, 5.31, 5.43, 5.52)



NOTE: If more than 3 layers are required, it may be necessary to band subsequent layers with twine when the heads of the nylon ties cannot be positioned so they do not appear between layers of cable.

FIG. 8 SECURING SECOND AND SUBSEQUENT LAYERS OF CABLE ON VERTICAL SIDE OF DISTRIBUTING FRAMES (PAR. 5.31)

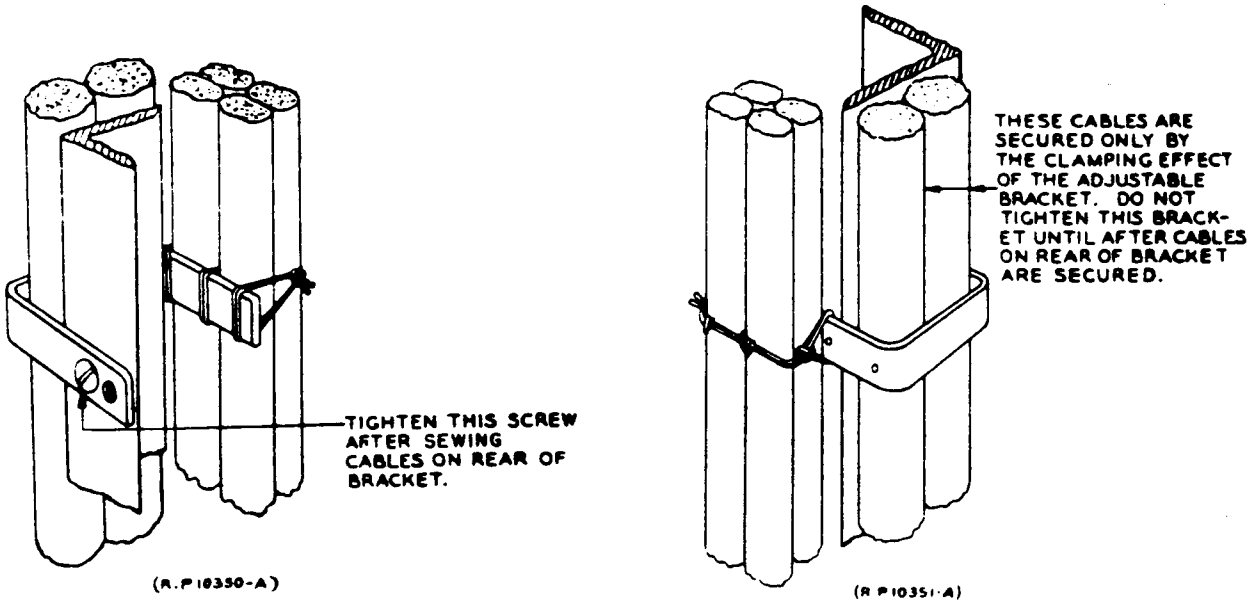


FIG. 9 SECURING CABLE TO BRACKETS AT SINGLE SIDED LDF AND TRDF BY SEWING (PAR. 5.42)

5.63 Cables which are run parallel to the transverse arms at the horizontal side of the distributing frames should be secured to the transverse arms with cable ties or twine as follows:

(a) On arms 5" or less in length, place a tie at the cable butt. (Cable Sheathing side.)

(b) On arms over 5" but less than 9" in length, place a tie midway between the butt and turn of the cable. Where fanning rings or distributing rings are not used, place additional ties at butt of cable as covered in PAR. 5.631.

(c) On arms 9" to 1'-6" in length, place a tie as near to the turn of the cable as practicable and another uniformly close to the butt. Where fanning rings or distributing rings are not used, place the second tie at the butt of the cable as covered in PAR. 5.631.

(d) On arms longer than 1'-6", place a tie as near to the turn of the cable as practicable, either on the horizontal or vertical side of the upright, a second tie midway between the butt and turn, and a third tie uniformly close to the butt. Where fanning rings or distributing rings are not used, place the third tie at the butt of the cable as covered in PAR. 5.631.

5.631 At the horizontal side of distributing frames, where cables are run parallel to the transverse arms and where fanning rings or distributing rings are not used at the cable butts, place a fiber detail, 449759 (or a piece of 1/64" fiber), between the cable butt and the transverse arm to prevent the wires at the cable butts from coming in contact with the metalwork. Secure the fiber detail in place by locating the tie (nylon or twine) at the cable butt (Cable Sheathing side) as shown in Figure 11 or 12.

5.64 Typical arrangements of nylon ties and cables secured with nylon ties are illustrated in Figure 11.

5.641 Be particularly careful not to apply ties so tight as to deform the cable covering.

5.65 Place wire run with cable between the cable and the transverse arm. Additonal protection is unnecessary.

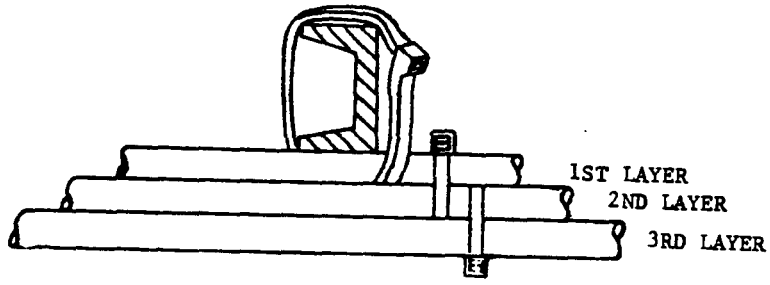


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FIG. 10 CABLES SECURED TO UNDER SIDE OF TRANSVERSE ARM WITH R-4265 NYLON TIES (PAR. 5.52)

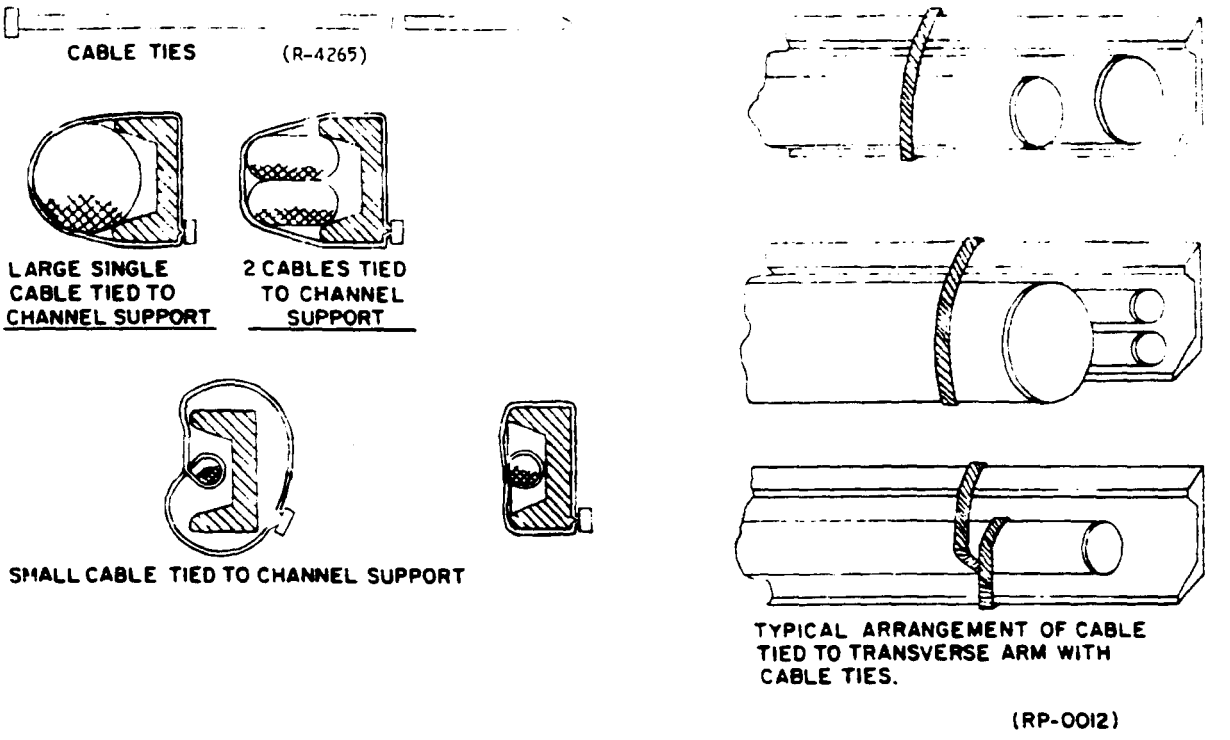

FIG. 11 CABLE SECURED ALONG TRANSVERSE ARM WITH R-4265 NYLON TIES (PARS. 5.343, 5.61, 5.631, 5.64)

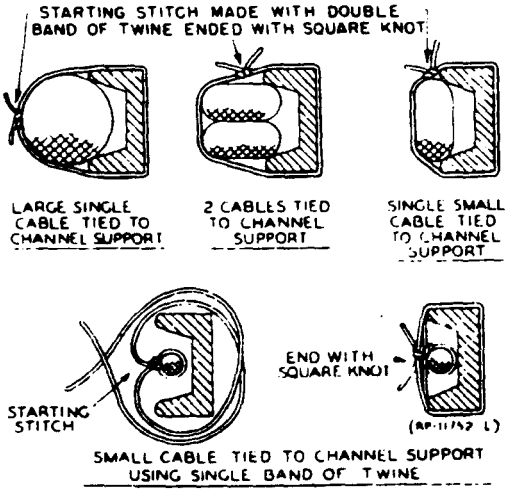

FIG. 12 TYPICAL METHOD OF SEWING CABLE AT HORIZONTAL TRANSVERSE ARM ON DISTRIBUTING FRAMES (PARS. 5.61, 5.631, 5.343)

6. VERIFICATION

	VERIFICATION ITEMS AND BRIEF STATEMENT OF REQUIREMENTS	REFERENCE	
		Paragraph Number	Figure Number
6.1	Arrangement of Cable and Wire From Cable Rack to Butt Location		
6.11	Arrangement		
6.111	Cables arranged as indicated on cable plan drawings for each type of equipment.	5.32 4.11	
6.112	Cables arranged to permit installation of ultimate equipment.	4.112	
6.2	Securing Switchboard Cable and Wire on Rack, Frames, Bays, and in Switchboards		
6.21	General		
6.2101	All cable and wire secured to supports at frames, bays, racks, and switchboards except short multiple in switchboards and desks and cables passing through fanning rings.	5.21	
6.2102	Cables secured to new frames, bays, relay racks, switchboards, and verticals of distributing frames as shown on cabling drawings.	4.12	
6.2103	Switchboard cables leaving racks and entering switchboards, frames, or other equipment secured so that there is no appreciable sag in the cable.	4.15	
6.2104	Cables between last support on cable rack and first support on frame (except distributing frames) not unsupported for a distance greater than 2'.	4.151	
6.2105	From top of duct type bays to cable rack, unsupported length of cable not more than 2'.	4.152	
6.2106	From distributing frames to cable slot in floor, unsupported length of cable not more than 4'.	4.153	
6.2107	Cable entering distributing frame from cable rack, unsupported length not to exceed 3'.	4.153	
6.2108	Cable groups secured midway between cable rack and first support where distance between these points is such that cables tend to spread apart.	4.154 4.1541	1,2
6.2109	Cables from miscellaneous runs secured together between rack and first support with nylon tie or band of twine for bundle 4" in diameter and under, over 4" in diameter with modified Chicago stitch.	4.1542	3
6.2110	Proper number of cables under stitches or nylon ties.	5.215 5.31 5.43 5.52	

	VERIFICATION ITEMS AND BRIEF STATEMENT OF REQUIREMENTS (CONTINUED)	REFERENCE	
		Paragraph Number	Figure Number
6.2111	Nylon ties shall not be placed directly over the heads of other nylon ties.	5.12	
6.2112	Locking head of nylon tie shall not appear between cable.	5.11	
6.2113	Coaxial cable not secured to cable brackets, towel bars, etc., with R-4265 Nylon Ties unless completely embedded in the form.	5.13	
6.2114	Vertically run cables totaling less than 1/2" in combined diameter not secured to cable brackets or other wiring supports with nylon ties.	5.14	
6.2115	Cables secured to equipment frame brackets with R-4265 Nylon Ties (except at cable butt and top bracket), or twine.	5.213	4,5,6
6.2116	Cables secured to top bracket of equipment frame with twine.	5.211	
6.2117	Cable butts on equipment frames secured to brackets with twine.	5.212	
6.2118	Where cable butts appear above, below, or between equipment frame brackets, the butt will be secured to other cables passing the butting point.	5.24 5.241 5.242 5.243	
6.2119	R-4265 tail flush with head. Maximum protrusion 1/32".	3.52	
6.22	Securing Cable and Wire at Vertical Side of Distributing Frames		
6.221	Cables secured to every transverse arm on distributing frames having arms on 13" vertical centers.	5.311	
6.222	Cables secured to first transverse arm, to alternate arms, and at all arms where they butt or turn off on distributing frames having arms on less than 13" vertical centers.	5.312	
6.223	Fanning rings used on the vertical side considered a means of securement for cables within the ring.	5.313	
6.224	Secure butts of cable with R-4265 Tie or Twine. Arrange butts of cable to vertical terminal strip in vertical alignment.	5.333	
6.225	Wires run with switchboard cable secured to transverse arms in the same manner as switchboard cable.	5.35	
6.23	Cables Running at Right Angles to Transverse Arms on Horizontal Side of Distributing Frames		
6.231	Cables secured to underside of transverse arms with nylon ties or twine.	5.51	
6.232	Cables secured at every transverse arm unless otherwise specified.	5.52	10

	VERIFICATION ITEMS AND BRIEF STATEMENT OF REQUIREMENTS (CONTINUED)	REFERENCE	
		Paragraph Number	Figure Number
6.24	Cable Secured Along Transverse Arms and Similar Supports		
6.241	Cables along transverse arm secured with R-4265 Cable Ties or twine.	5.61	11,12
6.242	Proper number of ties or stitches used according to length of transverse arm.	5.63	
6.243	Wires at cable butts on horizontal side of distributing frame protected with fiber detail P449759 when fanning rings or distributing rings are not used. (1/64" sheet fiber used when P449759 not available.)	5.631	
6.244	Nylon ties not applied so tight as to deform the cable covering.	5.641	
6.245	Wire run with cable placed between cable and transverse arm without additional protection.	5.65	

→ Indicates new or changed information.

[Vertical lines at side of paragraphs indicates requirements.

Engineering Planning Manager
(Installation)

Reason for Reissue:
To modify Paragraph 5.333.