TUBULAR CHANNEL OR SOLID STRINGER CONSTRUCTION
CABLE RACKS-SUPPORT

BSP 800-614-157 - FIGURES 62T, 62U, 65 TO 89

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1. GENERAL

1.1 Scope

1.11 This section covers methods and requirements for the support of cable rack-BSP 800-614-157, Figures 62T, 62U, 65 to 89.

1.12 Where cable rack is supported directly by frames or where the arrangement is such that the support and fastening of frames, auxiliary framing and cable rack is an integrated assembly, reference should be made to the sections of this Handbook covering fastening of frames. BSP 800-614-157, Figures 60 through 64 inclusive fall into this category and are covered in the 20 Series of Sections, except Figures 62T and 62U.

1.13 The requirements covered in this section shall be followed except as modified by specifications and drawings furnished the job.

1.14 Refer to Section 13A, Figure 1A to identify the cable rack type. ←

1.2 Associated Information

1.21 General information pertaining to workmanship, definition of terms, general requirements for the assembly and location of equipment and other information of a general nature will be found in the "General" sections of this Handbook.

1.211 Reference should also be made to specifications and cabling, cable rack and auxiliary framing drawings furnished the job.

2. COMMON REQUIREMENTS

2.1 Cable racks should be securely supported and fastened as necessary to carry the ultimate cabling and other equipment supported by the cable racks safely.

2.2 Cable racks should be installed so that no excessive load or binding will be imposed on switchboard sections, frames, racks, or other equipment attached or adjacent to the cable racks, unless such equipment is arranged to support the cable racks. Cable racks should not be supported from the cross straps.

2.3 In cases where other cable racks, conduit runs, ladder tracks, or other equipment are hung from horizontal cable racks, the supports shall meet the requirements for all the equipment supported from the cable racks. Where ladder tracks are supported from ladder-type cable racks, 5/8"-11 hexagon nuts shall be placed above the cable rack hanger clips on the cable rack hanger rods supporting the cable rack. In no case shall cable rack stringers or cable rack hanger rods be used for support of mezzanine platforms.

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2.4 Cable racks associated with frames and racks should, in general, be supported to the top of the frame or rack uprights or top angles or to the low-type auxiliary framing over the frames and racks. See the 20 Series of Sections on fastening frames.

2.5 Cable racks do not ordinarily support frames and racks but are, in general, supported by low-type auxiliary framing, hanger rods, or other cable racks. Not more than one splice should be placed between any two adjacent points of support on horizontal runs. A splice shall not be used beyond the last point of support when the end of a rack extends beyond the last point of support in cantilever fashion.

3. SPACING OF SUPPORTS

3.1 Horizontal cable racks should be supported on approximately 5'-0" centers and in no case should the spacing between supports exceed 6'-0". A support should be provided within 3'-0" of a free end of a cable rack.

3.2 An exception to the above spacing requirement is found in step-by-step offices where 11'-6" framing is used and is rated A & M only. A cable rack support spacing of 6'-0-5/8" is allowed in these offices so that the auxiliary framing bars or channels may be placed over the uprights of the universal type frames to facilitate frame support during installation.

3.3 On additions where rearrangement of some of the existing cable rack may be necessary, the ends of the rack should be checked to see if they are marked with yellow paint. If marked with yellow paint, the cable rack was made of low tensile steel and must be supported on 5'-0" or less centers and cannot be used in any cantilever arrangements which exceed 18". This applies to all systems with the exception of step-by-step. The normal support spacing of 6'-0-5/8" maximum on step-by-step is permitted. However, cantilever arrangements exceeding 18" must not be used.

NOTE: Touch up with yellow paint the ends of any existing low tensile steel cable rack which may have been cut on the job during the rearrangement. A small can of paint may be purchased locally.

4. MAIN-AISLE LADDER-TYPE CABLE RACKS

4.1 Cabling between rows of frames was formerly carried from row to row on large cable racks in the main-aisles. This practice has been discontinued, to a large extent, in favor of cross-aisle racks spaced at frequent intervals along the lines of frames. In those cases where main-aisle racks are encountered, they should be supported by corner clamps to the cable racks over the frames or aisles, so that the bottom of the stringers of both racks are at the same level. The main-aisle rack may be continuous or it may be installed in short sections and joined to continuous cable racks over the frames or aisles in cases where it appears more practicable to extend these racks across the main aisle. Where the main racks are continuous, additional supports are used as follows:

4.2 Where the normal spacing between cable racks over the frames or aisles exceeds 6'-0" center-to-center, as in the case of toll repeater offices, with cable racks on 8'-0" centers, use additional auxiliary framing attached to the regular auxiliary framing with bolts and clips as shown in Figures 67 and 67A or 68 to support the main aisle cable racks.

4.3 Where the normal spacing of cable racks over the frames or aisles does not exceed 6'-0", additional supports for the main-aisle cable racks are required only where some of the cable racks running over the frame are omitted, as shown in Figure 69.

4.4 Where all of the cable racks over the frames on one side of a main-aisle rack are not installed initially, the main-aisle cable rack stringer on that side should be supported with hanger rods from ceiling inserts or auxiliary framing located at the ceiling.

5. END-AISLE LADDER-TYPE CABLE RACKS

5.1 End-aisle ladder-type cable racks, as in the case of main-aisle racks, are now generally not provided. In those cases where they are specified, end-aisle cable racks should be clamped to the cable racks over the frames or aisles on one side and supported by hanger rods from ceiling inserts or high-type auxiliary framing on the other side as shown in Figure 70. They should be supported so that the

bottom of the stringers of the end-aisle racks are at the same level as the bottom of the stringers of the cable rack over the frames or aisles. Where cable racks over the frames or aisles are not installed initially at end-aisles, the frame side of end-aisle cable racks should be supported with additional framing bars or channels. In offices where the end-aisles are not equipped with conduit, the cable rack may be supported directly to additional auxiliary framing at the same level as the regular framing bars or channels as also shown in Figure 70.

6. CABLE RACKS AT POWER BOARDS AND TRAFFIC REGISTER RACKS

6.1 Ladder-type cable racks supported from power boards or similar framework should be supported as shown in Figure 71.

6.2 Cable racks over traffic register racks should be fastened to the tops of traffic register racks, as shown in Figure 70A.

7. LOW TYPE AUXILIARY FRAMING SUPPORTS

7.1 Supports by means of low-type auxiliary framing should be in accordance with Figures 65, 65B, 65C, 66, and 66A.

7.2 Where cable racks are directly attached to low-type auxiliary framing per Figure 65 or 65B, both stringers should be bolted to the framing at each end of a run of cable rack. At intermediate points, only one bolt is required at each auxiliary framing intersection, the bolts being staggered so that adjacent fastenings along the rack can be made on opposite sides of the rack.

7.21 Where a bar-type over-aisle cable rack is directly attached to low-type auxiliary framing at a point where the cable rack cross strap is directly above the framing, two J-bolts should be used as shown in Figure 65C.

8. HANGER ROD SUPPORTS

8.1 Cable racks in areas not equipped with low-type auxiliary framing should generally be supported by means of threaded hanger rods to high-type auxiliary framing as shown in Figures 72, 74, 76, and 77, to other cable racks as shown in Figures 62T, 62U, 78 to 84, inclusive, or to beam clamps or ceiling inserts.

8.2 Over-aisle bar-type cable racks supported by hanger rods from ceiling or high framing require a pair of bars or channels under the racks, as shown in Figure 77B, to avoid having the rods pass through the cable run.

8.21 Alignment clips per Figure 76A will facilitate the aligning of rack when the weight of the cables, particularly on small racks, is not sufficient to hold the rack down.

8.3 In buildings of wooden construction, the cable rack hangers should be fastened at the ceiling with lag screws to wooden cleats approximately 2" thick, or to ceiling joists as shown in Figure 73. The cleats should be attached to the joists with lag screws or other equally secure devices. In buildings having plastered ceilings, where the hangers are attached directly to the joists, use 1/8" x 5" x 5" steel plates or wooden strips to distribute the pressure on the plaster. Cable rack hangers should not be fastened directly to plaster furring or hollow tile, or to metal or false ceilings.

8.4 In operating rooms and power rooms, the use of auxiliary framing for the support of cable rack should be avoided as far as possible, for appearance reasons. Where the use of auxiliary framing cannot be entirely avoided, such bars or channels as are used for the support of cable racks should be located near the ceiling. Figures 85, 86, and 87 cover the support of cable racks directly from ceiling inserts, beam clamps, or self-drilling anchor placed by the installer. The safe load, listed in Section 1A for beam clamps, ceiling inserts, self-drilling anchor, and threaded rods, should not be exceeded.

(a) The spacing of hanger rods used with expansion shields shall not exceed 5'-0".

(b) Wherever possible the rack shall be located so that the center in the case of Figures 85 and 86, or one side in the case of Figure 87, will come directly below a row of standard beam clamps or approved ceiling inserts, thus reducing the number of self-drilling anchors used.

(c) Self-drill anchors should be used for the support of cable racks and auxiliary framing only where the ceiling is of a good grade of stone concrete. They shall not be used in a ceiling of tile arch construction. If racks are to be supported from such ceilings and the use of auxiliary framing between beams is not possible, hanger bolts entirely through the ceiling arch to a metal plate on top of the arch may be used.

(d) Self-drill anchors may be used for fastening rack supports to the ceiling; particularly on PBX installations in subscribers buildings, providing their use is approved by the telephone company.

8.5 Spliced cable rack hanger rods, as shown in Figure 75, may be used where only an occasional one is required. In no case, however, shall more than one splice be made in a hanger rod.

8.6 The use of offset bent hanger rods should be avoided where possible. Where impracticable to use other devices, the offset bent rod may be used provided the bends in the rods do not exceed 20 degrees.

8.7 Where cable racks are supported from auxiliary framing, it is not necessary to cut threaded rods if the length is not more than 2" greater than that required and there is at least 2" of space between the ceiling and the auxiliary framing. The extra length can be allowed to protrude above the framing bars.

NOTE: Cutting of threaded rods after placing cable rack in position should be avoided by having them the proper length before installing.

8.8 Placing hanger clips (P-406395 and P-406396) on the rods before they are installed will facilitate the hanging of rack. The clips can be tilted to slip over stringers.

8.9 Protection: Polyvinyl Chloride tubing for the protection of cabling against abrasion should be placed on cable rack hanger rods at locations where cables turn off the side of a rack. The tubes should be long enough to protect the ultimate cabling on the rack adequately. As far as practicable, all the tubes on the same runs should be uniform in length.

9. WALL SUPPORTS

9.1 When job drawings indicate that horizontal ladder-type cable rack is to be fastened to an unfinished cinder block or concrete wall, wooden battens need not be used unless specified on the drawing. If the job drawing indicates that the cable rack is to be fastened to a wall other than those mentioned, a wooden batten should be used unless otherwise specified on the drawing.

10. SUPPORT OF VERTICAL CABLE RACKS

10.1 Support vertical cable racks in cable holes and cable slots to the sheathing angles or sheathing channels with suitable angle brackets or bars, as required.

11. TURNS, OFFSETS, INTERSECTIONS AND JUNCTIONS

11.1 At turns, offsets and intersections having the equivalent of free-ended cable racks such as those in Figures 26, 28-33, 41 and 42 supports should be provided not more than 3'-0" from the end of each rack at the turn, offset, or intersection, so that the sections of rack which are joined will be so supported that the clamps will not be depended upon to carry appreciable load.

11.2 At intersections, where a free-ended cable rack is joined to a rigidly supported cable rack by corner clamps as shown in Figures 27, 34, and 43 supports should be provided on the free-ended rack not more than 5'-0" from the intersection.

11.3 The radii required at 90° inside and outside turns in rack, except outside turns where the radius is 6" or less, are usually shown on the cable plan drawing.

12. BRACING

12.1 Cable racks should be braced where necessary to prevent sway.

12.2 Hanger rod-supported horizontal cable runs more than 2' below auxiliary framing or ceiling and over 20' long should be braced sidewise to prevent sway. Where practicable, bracing should be installed in a staggered arrangement on opposite stringers of the cable rack at approximately 20' intervals, as shown in Figures 88 and 89.

12.3 Vertical cable rack may be braced to walls or frames to prevent objectionable motion.

13. VERIFICATION ITEMS

VERIFICATION ITEMS AND BRIEF STATEMENT OF REQUIREMENT		REFERENCE	
		Par. No.	Fig. No.
13.1	Spacing of Supports		
13.11	Horizontal rack supported on approximately 5'-0" centers but not to exceed 6'-0".	3.1	
13.12	Low tensile steel cable rack supported on 5'-0" centers or less with maximum cantilever arrangement of 18" and all cut ends touched up with yellow paint.	3.2, 3.3	
13.2	Main-Aisle Ladder-Type Cable Rack		
13.21	Main-aisle cable rack supported by corner clamps and at same level as over frame and over aisle cable rack	4.1	
13.22	Main-aisle rack, where span of aisle exceeds 6', supported by auxiliary framing.	4.2	67, 67A, 68
13.23	Main-aisle racks, where all the cable rack over frames not installed, supported with hanger rods.	4.4	
13.3	End-Aisle Ladder-Type Cable Rack		
13.31	End-aisle racks properly supported by hanger rods and over frame racks	5.1	70
13.4	Cable Racks at Power Boards and Traffic Racks		
13.41	Ladder-type racks at power boards properly supported	6.1, 6.2	70A, 71
13.5	Low Type Auxiliary Framing Supports		
13.51	Properly supported by low-type auxiliary framing	7.1, 7.2, 7.21	65, 65B, 65C, 66, 66A
13.6	Hanger Rod Supports		
13.61	Support of cable racks in areas not equipped with low-type auxiliary framing	8.1, 8.2	62T, 62U, 72, 73, 74, 76, 77, 77B, 78, 79, 80, 81, 82, 83, 84
13.62	Safe load of ceiling fastenings not exceeded	8.4	85, 86, 87
13.63	Spacing of hanger rods does not exceed 5'-0"	8.40	

VERIFICATION ITEMS AND BRIEF STATEMENT OF REQUIREMENT		REFERENCE Par. No.	REFERENCE Fig. No.
13.64	Self-drilling anchors used only where ceiling is a good grade of stone or concrete	8.4C	
13.65	No more than one splice in a hanger rod	8.5	
13.66	The use of offset bend hanger rod	8.6	
13.7	Support of Vertical Cable Racks		
13.71	Vertical cable racks supported at sheathing angle or channel in cable holes and slots	10.1	
13.8	Turns, Offsets, Intersections and Junctions		
→ 13.81	Support provided within 3'-0" of free end of cable rack or equivalent	11.1	26, 28-33 41, 42
→ 13.82	Support provided within 5'-0" of free end of cable rack	11.2	27, 34, 43
13.9	Bracing		
13.91	Cable rack braced where necessary to prevent sway	12.1, 12.2	88, 89

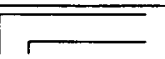
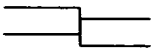
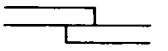
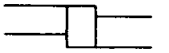
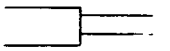
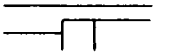
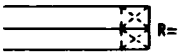
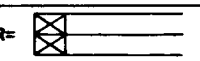
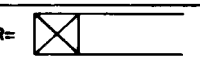
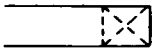
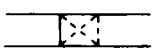
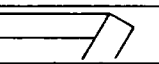
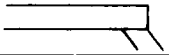
FIGURE IN 800-614-157	TITLE	DRAWING CONVENTION
26	90° TURN IN SAME PLANE	
28	SMALL OFFSET LESS THAN WIDTH OF RACK AND IN SAME PLANE	
29	OFFSET SAME AS WIDTH OF RACK AND IN SAME PLANE	
30	LARGE OFFSET LESS THAN WIDTH OF RACK AND IN SAME PLANE	
31	JOINING RACKS OF DIFFERENT WIDTHS IN SAME PLANE, SMALLER RACK APPROX. IN CENTER	
32	JOINING RACKS OF DIFFERENT WIDTHS IN SAME PLANE, SMALLER RACK AT ONE SIDE	
33	JOINING THREE RACKS OF DIFFERENT WIDTHS IN SAME PLANE	
35	90° OUTSIDE TURN FOR RADIUS MORE THAN 6"	
36	90° INSIDE TURN FOR RADIUS MORE THAN 6"	
37	90° INSIDE TURN FOR RADIUS 6" OR LESS	
38	90° OUTSIDE TURN FOR RADIUS 6" OR LESS	
38H	VERTICAL LADDER-TYPE CABLE RACK DROPPING OFF THE SIDE OF BAR-TYPE FRAME-AISLE CABLE RACK-90° OUTSIDE TURN OF 6" OR LESS	
40	OFFSET GREATER THAN 9" IN PARALLEL PLANES USING 45° EDGE CLAMPS	
40C	OFFSET GREATER THAN 9" IN PARALLEL PLANES USING 45° EDGE CLAMPS	
41	ACUTE ANGLE TURN IN SAME PLANE	
42	OBTUSE ANGLE TURN IN SAME PLANE	

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FIG. 64A TURNS, OFFSETS AND INTERSECTIONS REQUIRING SUPPORT 3'-0" FROM THE END OF EACH RACK
(PAR. 11.1)

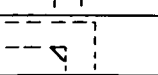
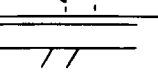
FIGURE IN 800-614-157	TITLE	DRAWING CONVENTION
27	"T" INTERSECTION	
34	CORNER BRACKET AT TURN OR INTERSECTION	
43	ACUTE OR OBTUSE ANGLE INTERSECTION	

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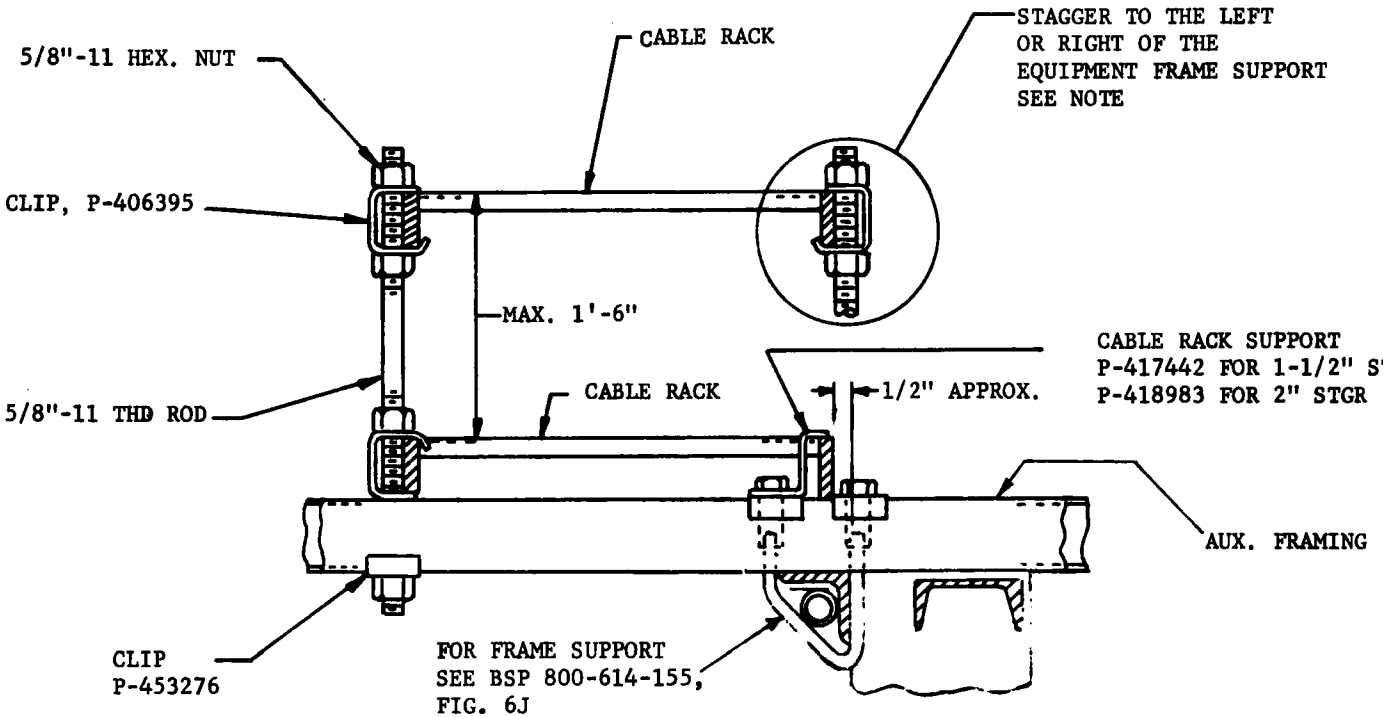
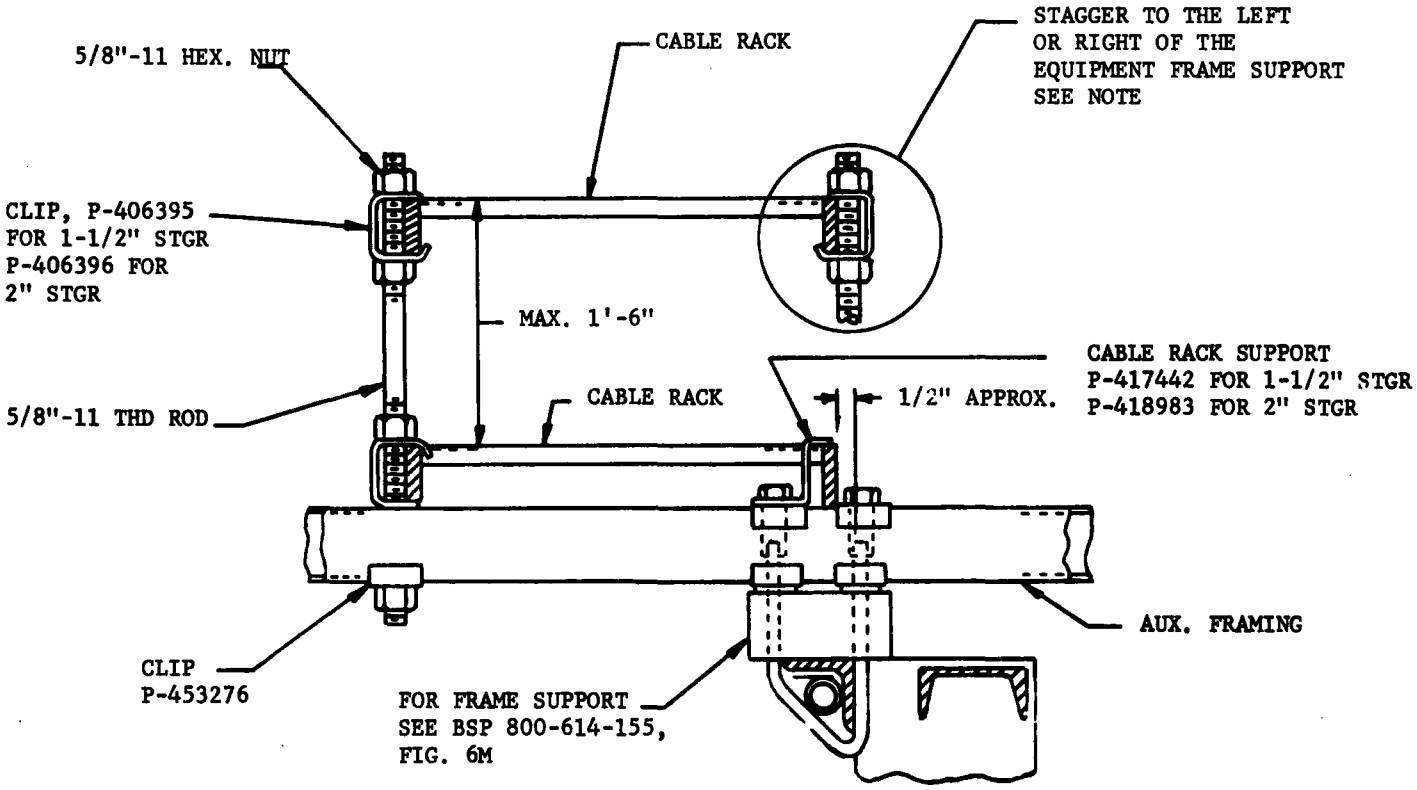
FIG. 64B TURNS AND INTERSECTIONS REQUIRING SUPPORT 5'-0" FROM THE FREE ENDED RACK
(PAR. 11.2)



NOTE: UPPER AND LOWER CABLE RACK SUPPORT MATERIAL IS THE SAME. THREADED ROD IS 2" SHORTER THAN OPPOSITE CABLE RACK STRINGER THREADED ROD.

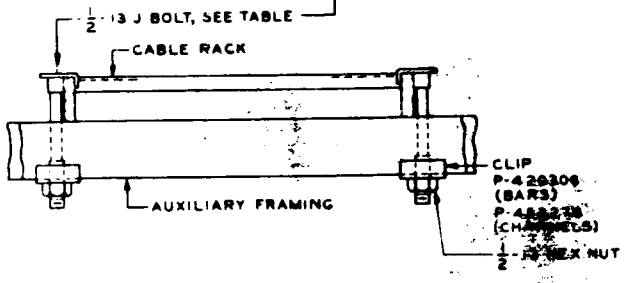
FIG. 62T MULTI-LEVEL CABLE RACK SUPPORT OVER DUCT-TYPE FRAMES
11 FT. 6 IN. FRAMING (PAR. 8.1)
(BSP 800-614-157 FIG. 62T)



NOTE: UPPER AND LOWER CABLE RACK SUPPORT MATERIAL IS THE SAME. THREADED ROD IS 2" SHORTER THAN OPPOSITE CABLE RACK STRINGER THREADED ROD.

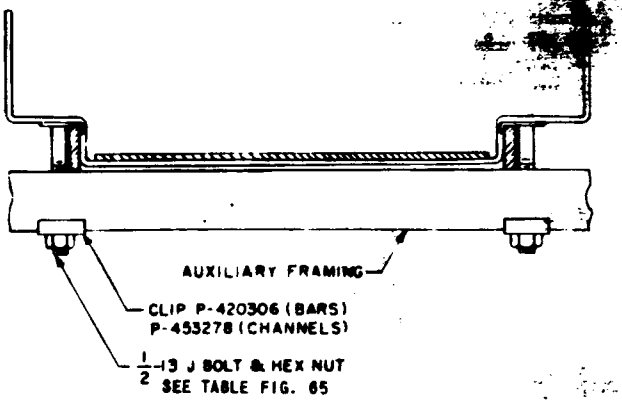
FIG. **62U** MULTI-LEVEL CABLE RACK SUPPORT OVER DUCT-TYPE FRAMES
11 FT. 8 IN. FRAMING (PAR. 8.1)
(BSP 800-614-157 FIG. 62U)

CABLE RACK STRG. SIZE	J BOLT PLAIN	J BOLT [illegible]
1 1/2	P-490706	[illegible]
2	P-490707	P-420916



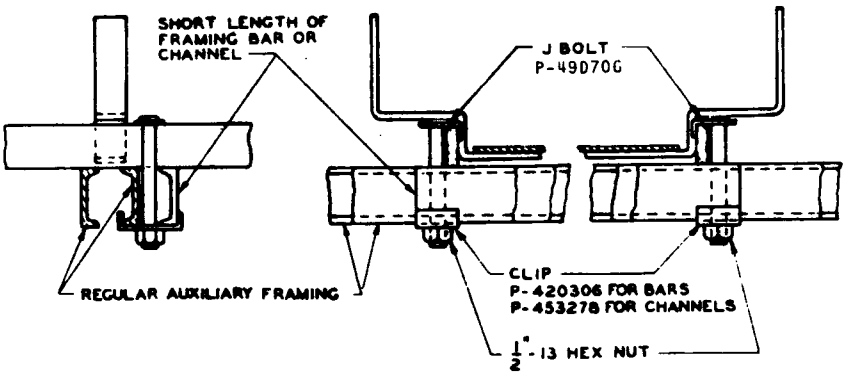
RP-0318

FIG. **65** LADDER-TYPE CABLE RACK SUPPORTED BY LOW-TYPE AUXILIARY FRAMING (PARS. 7.1, 7.2)



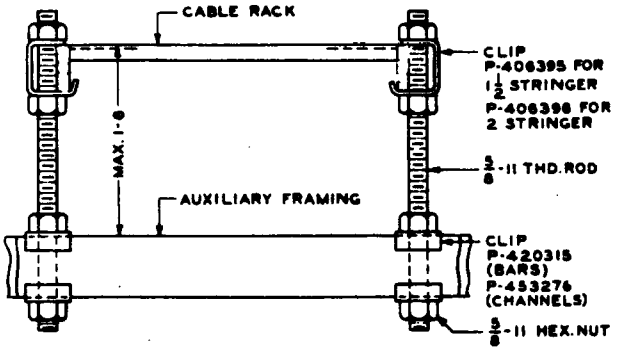
RP-0319

FIG. **65B** BAR-TYPE CABLE RACK SUPPORTED BY LOW-TYPE AUXILIARY FRAMING BAR-TYPE OVER-AISLE RACK SHOWN (PARS. 7.1, 7.2)



RP-0320

FIG. **65C** CABLE RACK SUPPORTED BY LOW-TYPE AUXILIARY FRAMING DIRECTLY BELOW A CROSS STRAP - BAR-TYPE OVER-AISLE SHOWN (PARS. 7.1, 7.21)



RP-0321

FIG. **66** CABLE RACK SUPPORTED ABOVE LOW-TYPE AUXILIARY FRAMING BY THREADED RODS (PARS. 7.1, 8.1)

CABLE RACK STRG. SIZE	"J" BOLT	SPACER
1-1/2	841563950	841563919
2	841563935	841563919
1-1/2	841563968	841563927
2	841563943	841563927

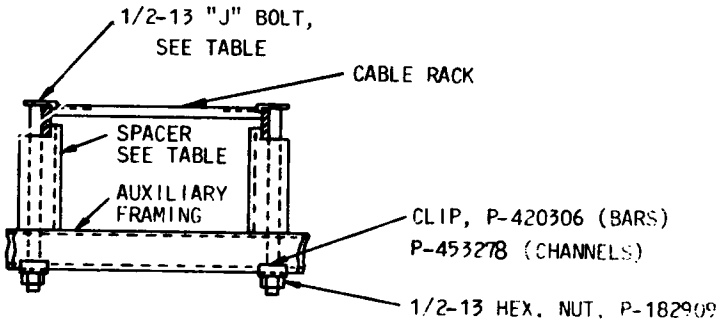


FIG. 66A CABLE RACK SUPPORTED 1 INCH OR 2 INCH ABOVE LOW-TYPE AUXILIARY FRAMING BY SPACERS AND "J" BOLTS (PAR. 7.1)

(BSP 800-614-157, FIG. 66A)

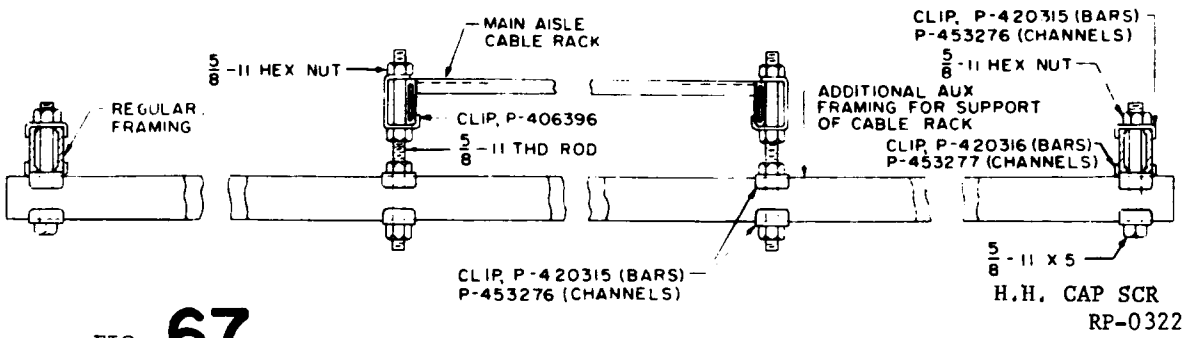
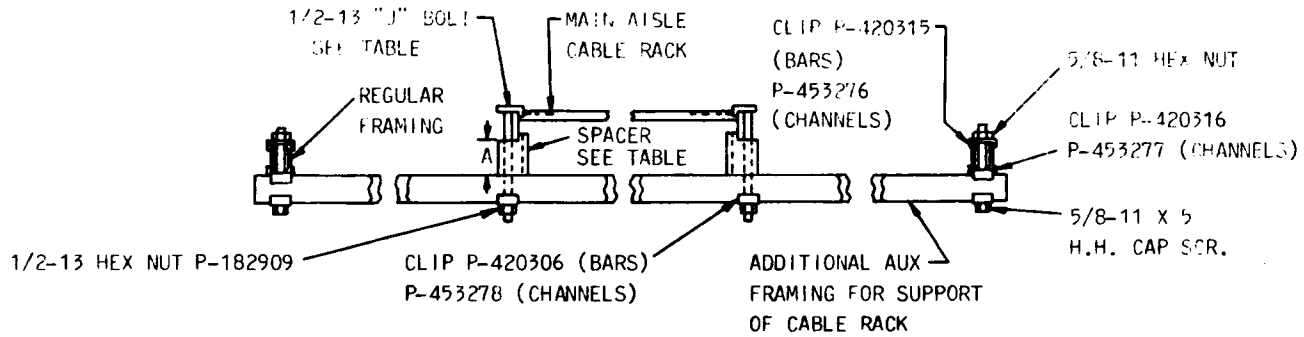


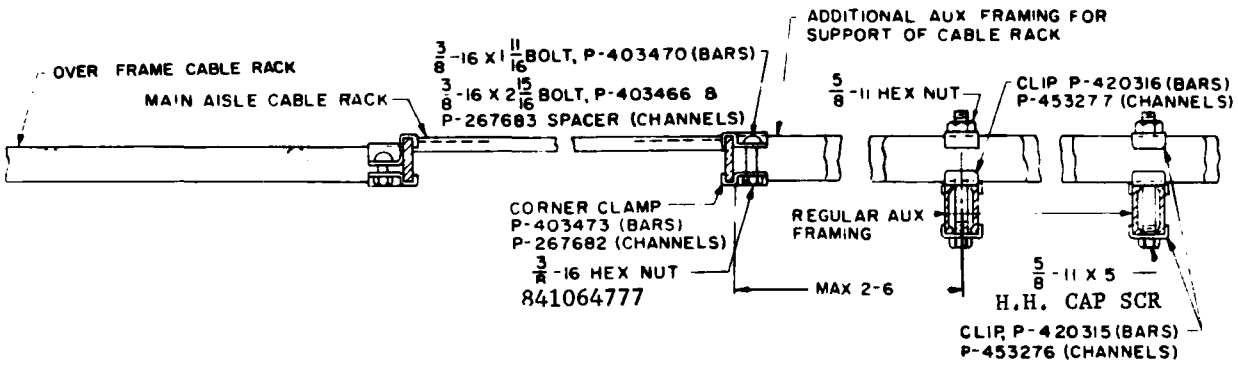
FIG. 67 MAIN-AISLE CABLE RACK SUPPORTED BY ADDITIONAL AUXILIARY FRAMING BELOW REGULAR FRAMING (PAR. 4.2)
A & M ONLY - REPLACED BY FIG. 67A



CABLE RACK STRG. SIZE	"J" BOLT		SPACER	
	LENGTH	PART NO.	DIM A	PART NO.
2	5-3/4	841563935	1	841563919
	6-3/4	841563943	2	841563927

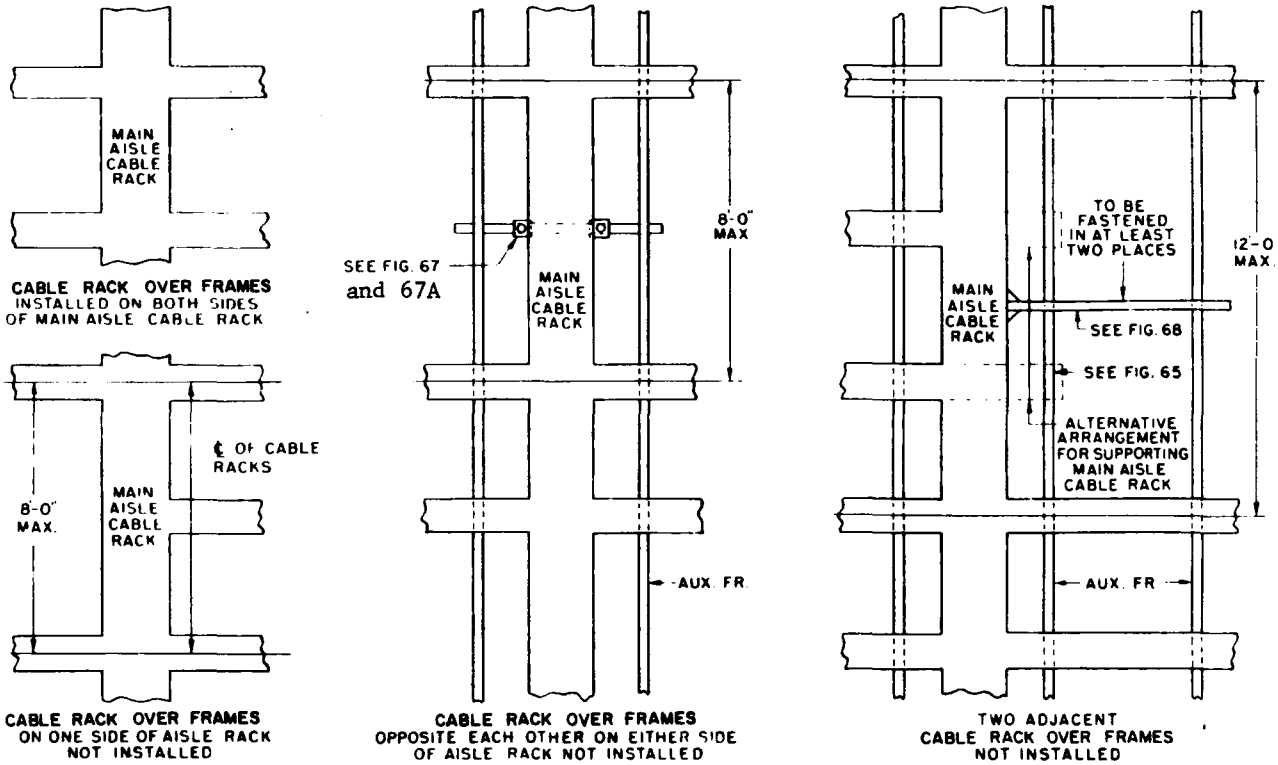
FIG. 67A MAIN-AISLE CABLE RACK 1 OR 2 INCHES FOR SUPPORT BY ADDITIONAL AUXILIARY FRAMING BELOW REGULAR FRAMING (PAR. 4.2)

(BSP 800-614-157, FIG. 67A)



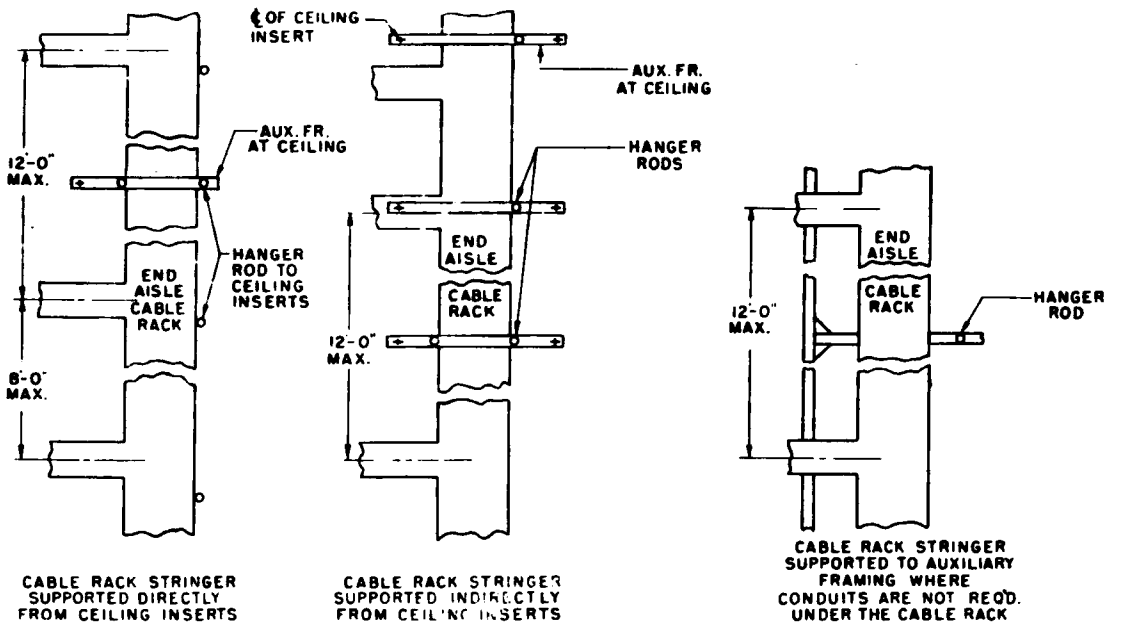
RP-0323

FIG. **68** MAIN-AISLE CABLE RACK SUPPORTED BY ADDITIONAL AUXILIARY FRAMING ABOVE REGULAR FRAMING
(PAR. 4.2)
(BSP 800-614-157, Fig. 68)



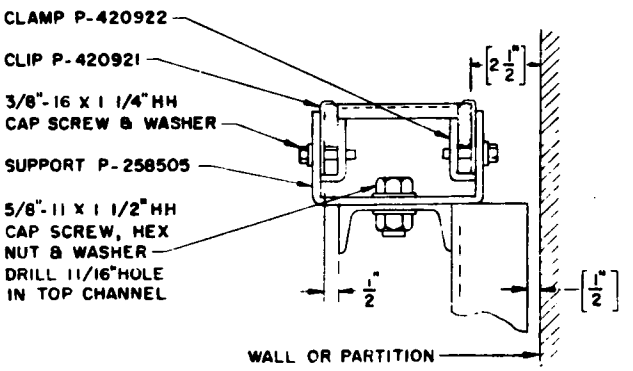
RP-0324

FIG. **69** CABLE RACKS OVER MAIN-AISLES
(PAR. 4.3)
(BSP 800-614-157, Fig. 69)



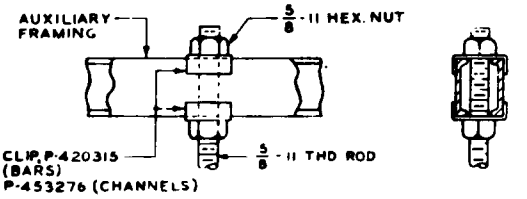
RP-0325

FIG. **70** CABLE RACKS OVER END-AISLES
(PAR. 5.1)



RP-0326

FIG. **70A** CABLE RACKS ATTACHED TO TRAFFIC REGISTER RACKS
(PAR. 6.2)



RP-0328

FIG. **72** HANGER ROD ATTACHED TO AUXILIARY FRAMING
(PAR. 8.1)

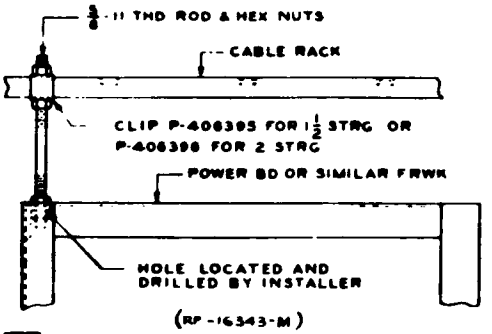
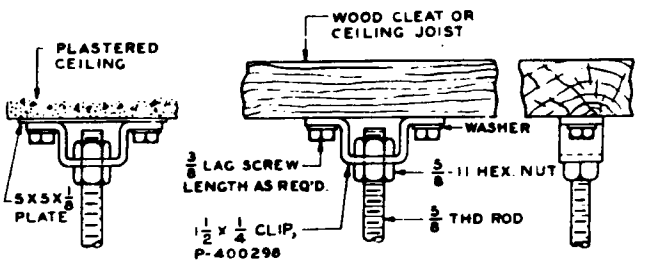


FIG. **71** CABLE RACK SUPPORTED TO POWER BOARD OR SIMILAR FRAME WORK
(PAR. 6.1)



RP-0329

FIG. **73** HANGER ROD ATTACHED DIRECT TO CEILING
(PAR. 8.3)

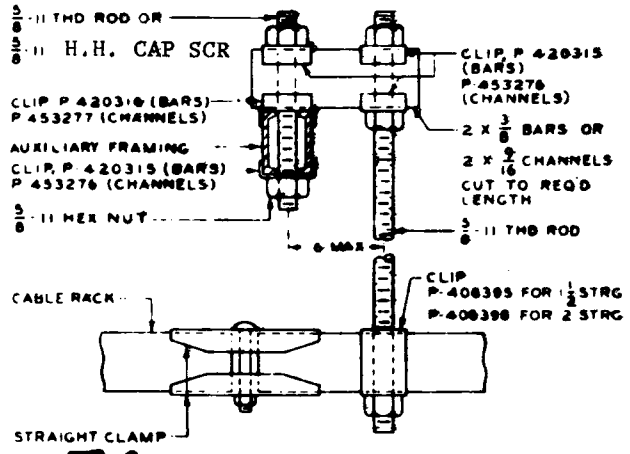


FIG. **74** RP-0330
HANGER ROD OFFSET TO CLEAR CABLE RACK CLAMP, CABLE RACK STRAP OR OTHER OBSTRUCTION
(PAR. 8.1)

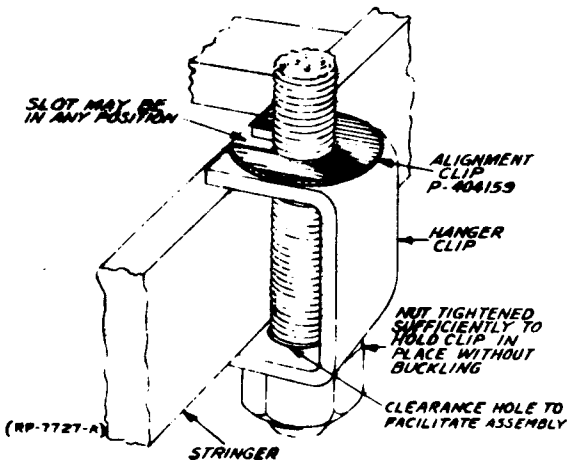


FIG. 76A USE OF ALIGNMENT CLIP
(PAR. 8.21)

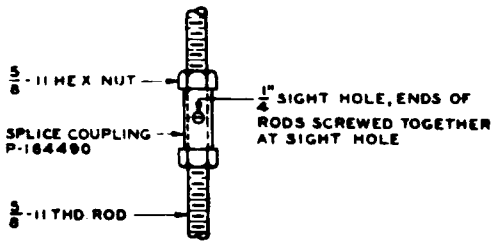


FIG. **75** RP-0331
HANGER ROD EXTENDED WITH SPLICE COUPLING
(PAR. 8.5)

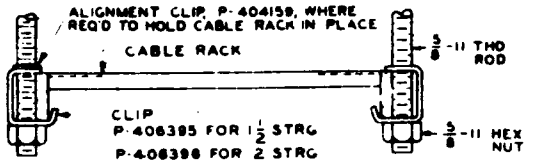


FIG. **77** RP-0334
SUPPORTING RACKS 1'-0" OR MORE WIDE
(PAR. 8.1)

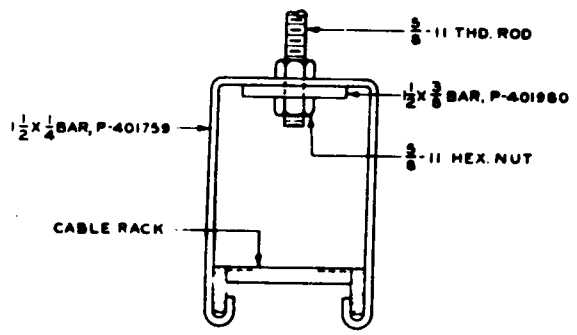


FIG. **76** RP-0332
SUPPORTING RACKS 5" WIDE
(PAR. 8.1)

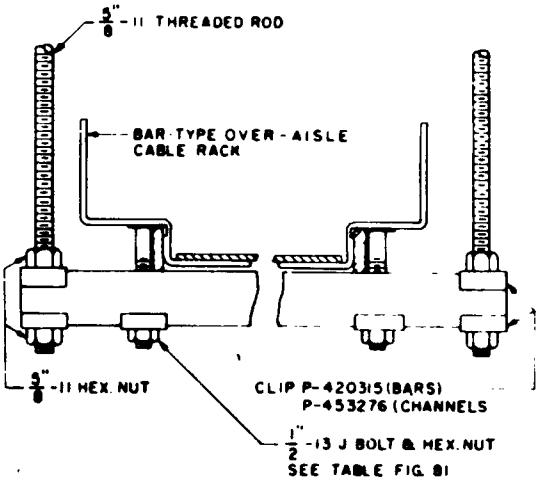
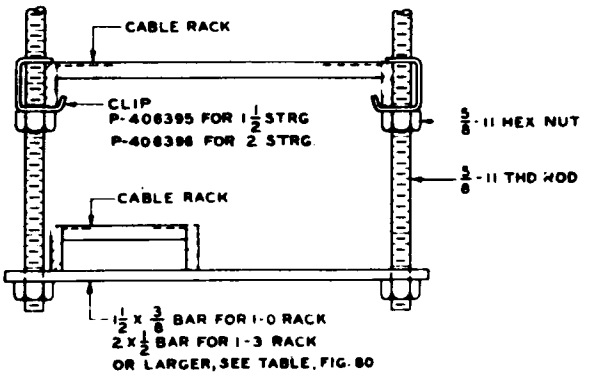


FIG. **77B** RP-0335
SUPPORTING BAR-TYPE OVER-AISLE CABLE RACK WITH HANGER RODS
(PAR. 8.2)



78 RP-0336
SUPPORTING TWO RACKS WITH SAME HANGER RODS - SMALLER RACK BELOW
(PAR. 8.1)

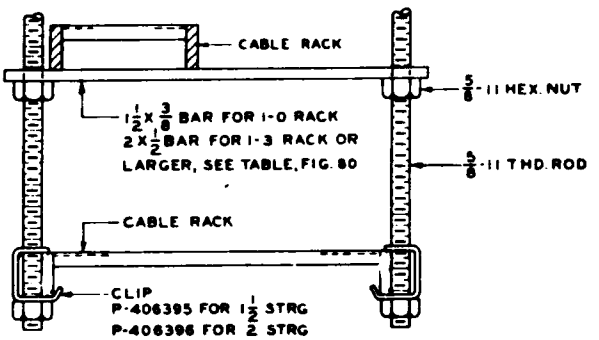
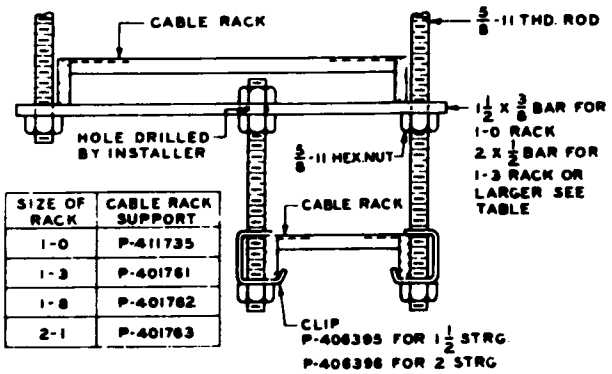
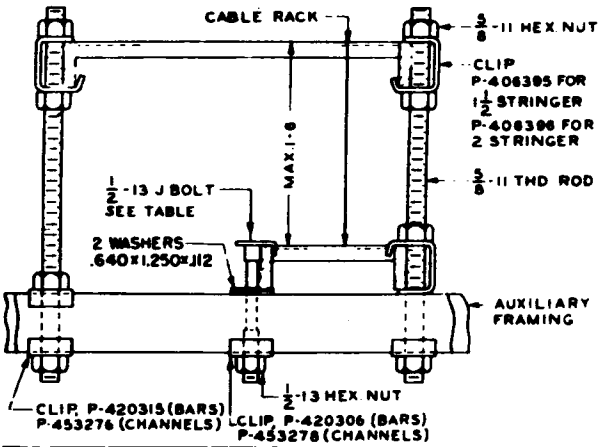


FIG. **79** RP-0337
SUPPORTING TWO RACKS WITH SAME HANGER RODS - LARGER RACK BELOW
(PAR. 8.1)



SIZE OF RACK	CABLE RACK SUPPORT
1-0	P-411735
1-3	P-401761
1-8	P-401762
2-1	P-401763

FIG. **80** RP-0338
SUPPORTING TWO RACKS WITH SAME HANGER RODS - SMALLER RACK BELOW - LIMITED SPACE BELOW
(PAR. 8.1)



CABLE RACK STRG SIZE	J BOLT	
	PLAIN	SPANNER
1½	P-490706	P-420915
2	P-490707	P-420916

FIG. **81** RP-0339
SUPPORTING A LARGE RACK ABOVE A SMALLER RACK - BOTH RACKS SUPPORTED BY AUXILIARY FRAMING
(PAR. 8.1)

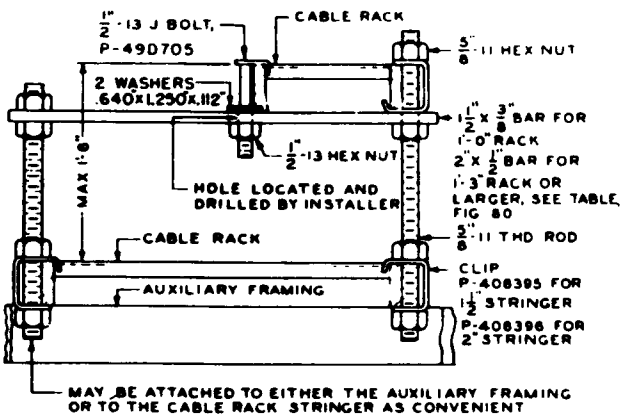


FIG. **82** RP-0340
SUPPORTING ONE RACK ABOVE AND FROM ANOTHER RACK - LARGER RACK BELOW
(PAR. 8.1)

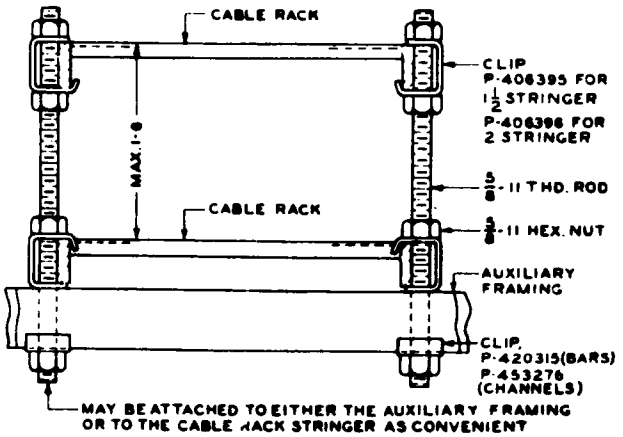


FIG. **83** RP-0341
SUPPORTING ONE RACK ABOVE AND FROM ANOTHER RACK - RACKS SAME SIZE (PAR. 8.1)

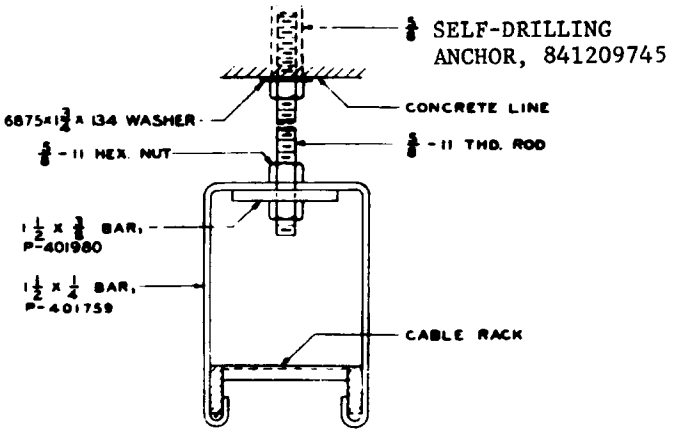


FIG. **85** RP-0343
SUPPORTING 5" CABLE RACK FROM SELF-DRILLING ANCHOR IN THE CEILING (PARS. 8.4, 8.4(b))

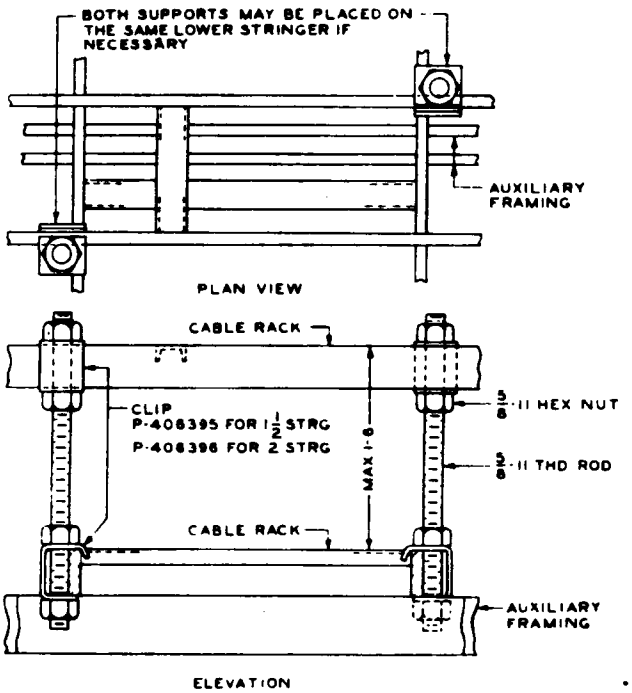
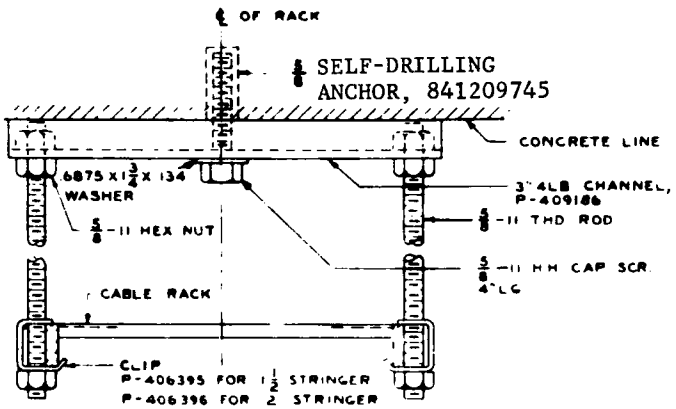
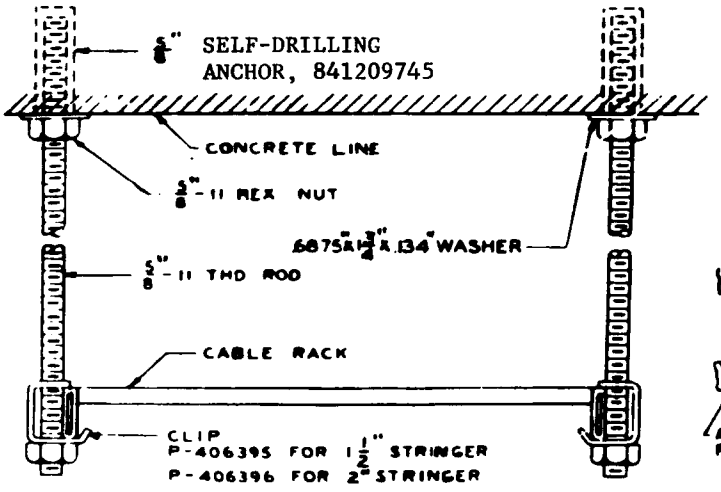


FIG. **84** RP-0342
SUPPORTING ONE RACK ABOVE AND FROM ANOTHER RACK - CABLE RACKS AT RIGHT ANGLES (PAR. 8.1)



NOTE
WHERE THE CEILING IS PLASTERED THE CHANNEL MAY BE ALLOWED TO REST ON THE PLASTER THE EXPANSION SHIELD, HOWEVER, SHALL BE EMBEDDED ITS FULL LENGTH IN SOLID CONCRETE

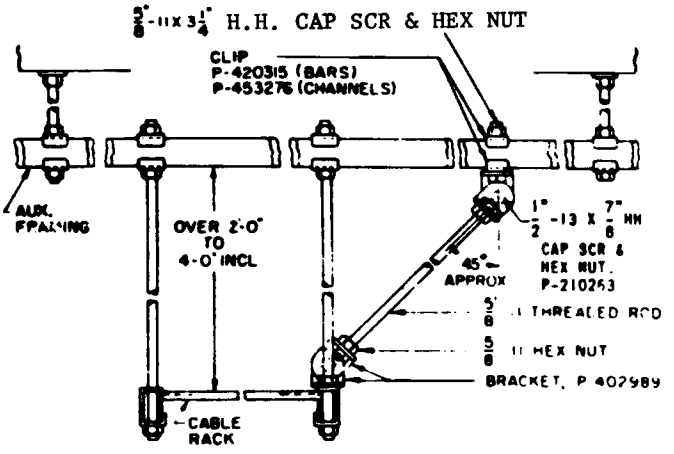
FIG. **86** RP-0344
SUPPORTING 12" AND 15" CABLE RACKS FROM SELF-DRILLING ANCHORS IN THE CEILING (PARS. 8.4, 8.4(b))



NOTE:
FIG 86 IS THE PREFERRED METHOD OF SUPPORT FOR 1 FT - 3 IN. CABLE RACKS. HOWEVER, WHERE THE RUN IS HEAVY, THE EXTRA SUPPORT PER THIS FIGURE MAY BE USED

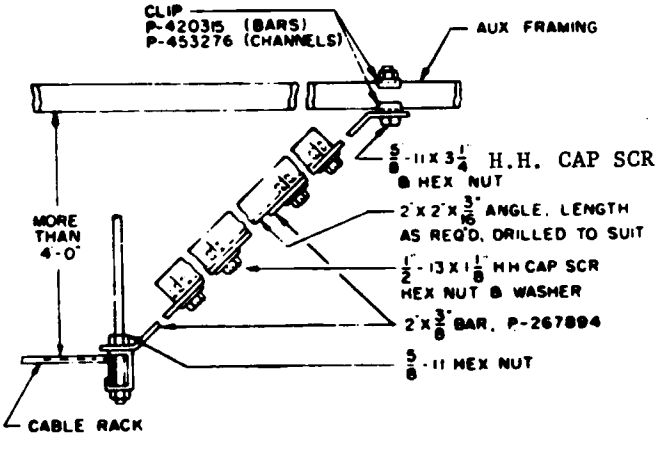
RP-0345

FIG. **87** SUPPORTING CABLE RACKS FROM SELF-DRILLING ANCHORS IN THE CEILING (PARS. 8.4, 8.4(b))
(BSP 800-614-157, Fig. 87)



RP-0346

FIG. **88** BRACING HANGER ROD-SUPPORTED CABLE RACK WITH ROD-TYPE BRACING
(PAR. 12.2)
(BSP 800-614-157, Fig. 88)



RP-0347

FIG. **89** BRACING HANGER ROD-SUPPORTED CABLE RACK WITH ANGLE-TYPE BRACING
(PAR. 12.2)
(BSP 800-614-157, Fig. 89)

→ Indicates new or changed information.

[Vertical lines at side of paragraphs
[indicate requirements.

Engineering Planning Manager
(Installation)

Reason for Reissue:
1. Add Paragraph 1.14.
2. Correct Figures referred in Paragraphs 11.1 and 11.2.