PLACING, FASTENING, AND ALIGNING SWITCHBOARD SECTIONS, DESKS AND ASSOCIATED PARTS NOS. 3CL, 5, 607A AND 607B SWITCHBOARDS

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2. GENERAL

2.1 Scope

2.11 This section covers the specific requirements and installation procedure for placing, fastening and aligning 3CL switchboards and other switchboards having similar universal type frameworks.

2.2 Associated Information

2.21 Floor plan and switchboard assembly drawings furnished the job.

2.22 Drawing H-299-201 showing location of floor bolt holes for switchboards and desks.

2.23 Refer to the Associated Handbook Information Chart for the location of information to which reference may be necessary when performing operations covered by this section.

2.24 General information pertaining to workmanship, definition of terms, general requirements for the assembly and location of equipment, precautions and other information of a general nature pertaining to the installation of equipment will be found in the "General" section of this handbook.

3. INSTALLING EQUIPMENT

3.1 Tools and material required for the operations in this section, except as listed below, are generally available on all jobs.

3.2 Tools

R-3051	Set, Level and Straightedge
Obtain Locally	Twist Drill No. 50 (.070") (See Par. 14.101)
	Twist Drill 5/64" (.078") (See Par. 14.102)
	Twist Drill No. 24 (.152") (See Par. 11.291)

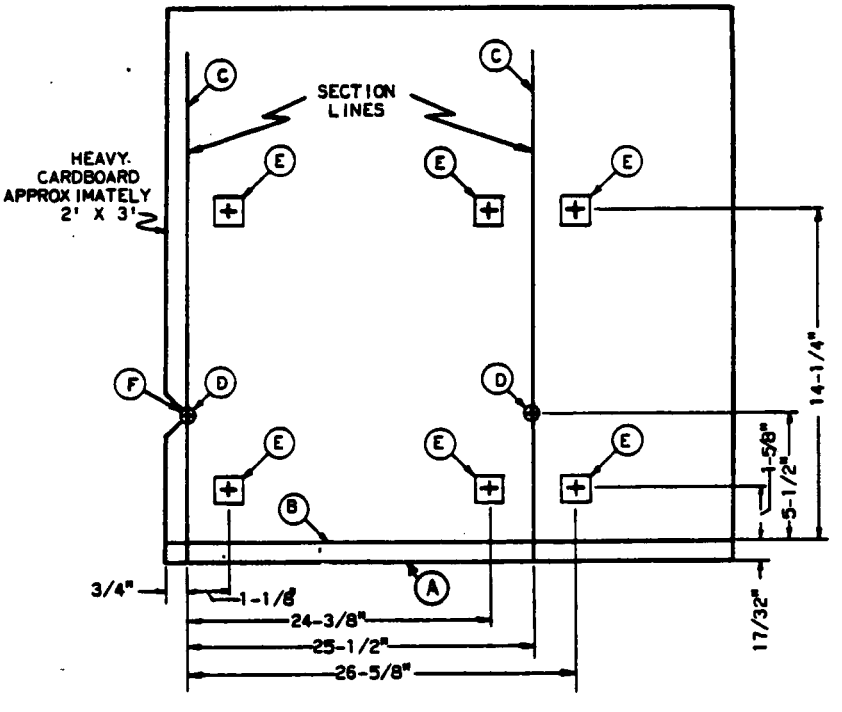
3.3 Material

Obtain Locally	Fibre, Sheet, Black, 1/64" (See Par. 8.2702)
RM-591862	Fibre, Sheet, Gray, 1/64" (See Par. 13.2)
Obtain Locally	Shims, Floor, Wood (See Par. 14.04)

4. LAYING OUT FLOORS

4.1 Lay out floors in accordance with job drawings and instructions contained in Sections 6A and 6E.

4.2 Mark locations of expansion shield holes and leveling plates using a template similar to that shown in Figure 1.



NOTES:

1.- (A) INDICATES LONG EDGE OF TEMPLATE.

2.- (B) INDICATES THE FACE OF JACK LINE. IT IS TO BE DRAWN ABOUT 1" IN FROM AND PARALLEL TO EDGE OF TEMPLATE (A)

3.- (C) INDICATES THE SECTION LINES. THE TWO SECTION LINES ARE DRAWN PERPENDICULAR TO THE FACE OF JACK LINE (B) PER DIMENSIONS SHOWN ON SKETCH.

4.- (D) INDICATES LOCATION OF TWO HOLES FOR THE EXPANSION SHIELDS.

5.- (E) INDICATES THE CENTER OF LOCATION FOR THE LEVELING SCREW STEEL PLATES.

6.- DRILL 1/8" HOLES THROUGH CARDBOARD AT LOCATIONS MARKED (D) AND (E).

7.- NOTCH OUT CARDBOARD AT (F) TO THE 1/8" HOLE DRILLED AT (D).

8.- REFERENCES H-299-201 AND ED-92059-70.

FIG. 1 TEMPLATE FOR MARKING LOCATIONS OF EXPANSION SHIELD HOLES AND LEVELING PLATES - 3CL SWITCHBOARDS (Pars 4.2, 4.21)

4.21 Make a template from a piece of heavy cardboard (side of a shipping case) about 2' x 3' in size as shown in Figure 1. The template dimensions shown in Fig. 1 are for 3CL switchboards.

4.22 The location of the expansion shield holes for the floor fastening of lower units at the CTS and at the end of a line-up does not fall on the section lines as in the intermediate sections. Modify location of the end expansion shield holes to agree with fastening arrangement shown in Figure 4A.

4.23 Location of all expansion shield holes for floor fastenings of all lower units within angle sections fall on the section lines.

5. HIGH AND LOW SPOTS IN FLOOR

5.1 Determine the high and low spots in the floor for the ultimate line-up of the switchboards along the Face of Jack Line using the method outlined in Section 4. This is done before placing the sections in position to insure that the level and horizontal alignment requirements in the ultimate switchboard line-up can be met, particularly when starting a new line-up.

5.2 If necessary, due to excessive variations in floor levels, the high points in the floor shall be channeled out to insure that the space under sections at low points will not exceed 3/4". Where excessive channeling would be required to maintain a level, the line-up, as a whole, shall be set with the minimum slope practicable.

6. DRILLING HOLES IN FLOOR AND INSTALLING EXPANSION SHIELDS

6.1 Drill the holes for the P-428519 expansion shields and install the shields as outlined in Section 9, for the first 5 lower units.

NOTE: The lower units should be positioned and leveled in groups of about 5 at a time starting at the cable tuning section end. This is done so that minor adjustments in placing the lower units can be made in order to compensate for cumulative discrepencies that may occur thus eliminating adjustments that may have to be made later to the entire line-up.

7. PLACING LEVELING PLATES

7.1 Where either linoleum or asphalt tile has been previously laid, cut out the floor covering at the spots marked for the leveling plates for the first five lower units. Use the steel plate P-379375 as a template, centered over the mark, and scribe the linoleum for the cutout. Use a cold chisel R-1452 to cut out the floor covering.

7.2 Insert the steel plates P-379375 into the cutouts so that plate rests firmly on the concrete or wood floor surface.

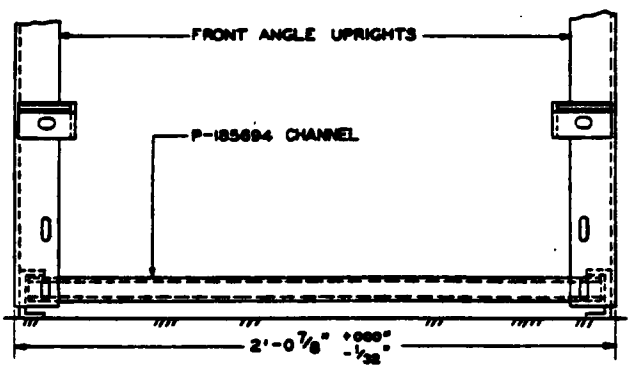


FIG. 2 SPACING BETWEEN FRONT UPRIGHTS OF LOWER UNITS OF NOS. 3CL, 5, 607A AND 607B PBX SECTIONS. (Par. 8.12)

8. PLACING, ALIGNING AND FASTENING LOWER UNITS

8.1 Move first lower unit into place and perform operations outlined in Paragraphs 8.11 to 8.16.

8.11 Insert first and second studs P-407718 into expansion sheilds in floor along left and right side of first lower unit.

8.12 Check the distance between the outer surfaces of the front angle uprights. Force the uprights together or apart as necessary to meet the required dimension shown on Figure 2. If the dimension is not as shown, trouble will be encountered in assembling the kick panel assembly.

8.13 Align lower unit so that lower front surface of the front angle uprights are 1/4" back of "face-of-jack" line and that the side surfaces of the front angle uprights are 5/16" in from the section line.

8.14 Refer to Table in Figure 5 of Section 30A determine distance that the first unit is to be raised off the floor. Temporarily shim the lower unit to required distance off the floor.

8.15 Install the four leveling screws P-423046 into channel base members and advance these screws sufficiently to take effect and then remove temporary shims. Adjust leveling screws so that unit is level from front to rear and from side to side. Use 24" level R-8370 or equivalent. Recheck that the lower unit is at the required distance off the floor as determined per Paragraph 8.13. Also recheck alignment per dimensions specified in Paragraph 8.12. Make corrections as necessary and when corrections are made make an additional check on alignment and level of the lower unit.

8.16 On side adjacent to CTS fasten the lower unit to the floor in accordance with details shown in Figure 4A.

8.2 Move each lower unit into place and as each unit is moved into position perform the operations outlined in Paragraphs 8.201 through 8.210.

8.201 Insert stud P-407718 into expansion sheild in floor along the side of the lower unit.

8.202 Check the distance between the outer surfaces of the front angle uprights. Force the uprights together or apart as necessary to meet the required dimension shown on Figure 2. If the dimension is not as shown, trouble will be encountered in assembling the kick panel assembly.

8.203 Align lower unit so that lower front surface of the front angle uprights are 1/4" back of "face-of-jack" line and that the side surfaces of the front angle uprights are 5/16" in from the section line.

8.204 Using temporary shims, raise the lower unit so that the top surface of unit being installed is on a level with that of the previously placed unit.

8.205 Install the four leveling screws P-42B046 into channel base members and advance these screws sufficiently to take effect and then remove temporary shims. Adjust leveling screws so that unit is level from front to rear and from side to side. Use 24" level R-8370 or equivalent.

8.206 Where required, place, but do not fasten, calculagraph shelves into position between the two lower units. This is done to check that sufficient space is available for the calculagraph shelf and still have the lower unit positioned 5/16" within section lines marked on the floor. Make adjustments, when necessary, keeping lower unit positioned within section lines.

8.207 After making necessary adjustments in the positioning of the lower unit being placed, recheck alignment and level of the lower unit. The alignment of the top surfaces of the adjacent keyshelves and plugshelves should not vary more than one-half the distance that the spacer projects above the surface of the keyshelf and plugshelf to which it is attached. The front contiguous surfaces may be out of alignment not to exceed 1/16", provided neither of the surfaces projects beyond the outermost surface of the spacer.

8.2071 A small up and down adjustment of the lockrail may be required at times. Loosen the six 1/4" - 20 hex head cap screws that are located in the keyshelf pan (See Figure 3) to make necessary adjustment and then tighten the screws.

8.2072 Excessive space between keyshelves can be corrected by placing black fibre between keyshelves and rubber separation strips.

8.2073 Any bind between keyshelves can generally be eliminated by repositioning the keyshelf and plugshelf. See Figure 5. This can be done by loosening the two screws directly behind the plugshelf that secure the plugshelf supports to the lower unit. Reposition the keyshelf and plugshelf. If further adjustment is necessary remove rubber separation strip on the key-shelf or calculagraph shelf and plane off the edge as required and then replace separation strip.

8.208 Assemble and tighten floor fastening as shown in Figure 4 between the previously placed unit and the unit being placed.

8.209 Mount kick panel assembly on previously placed unit. The bottom edge should rest on the floor and the sides should be within the section lines marked on the floor.

8.210 Bolt unit being placed to previously placed unit using four screws P-210234 and four hex nuts P-94442. It is not necessary to use spacers between the ironwork of adjacent lower units. Tighten the bolts sufficiently to keep the units from being moved out of position. Holes for screws are located as follows: two in keyshelf support, one in the front angle upright about 8" up from the floor and one in the rear angle upright about 6" from the floor. See END VIEW on ED-92059-70.

8.3 Continue placing units in groups of five following instructions outlined in Paragraphs 6, 7 and 8.2. As each unit is placed verify that the sides of the front angle uprights are within 5/16" of the section lines as marked on the floor.

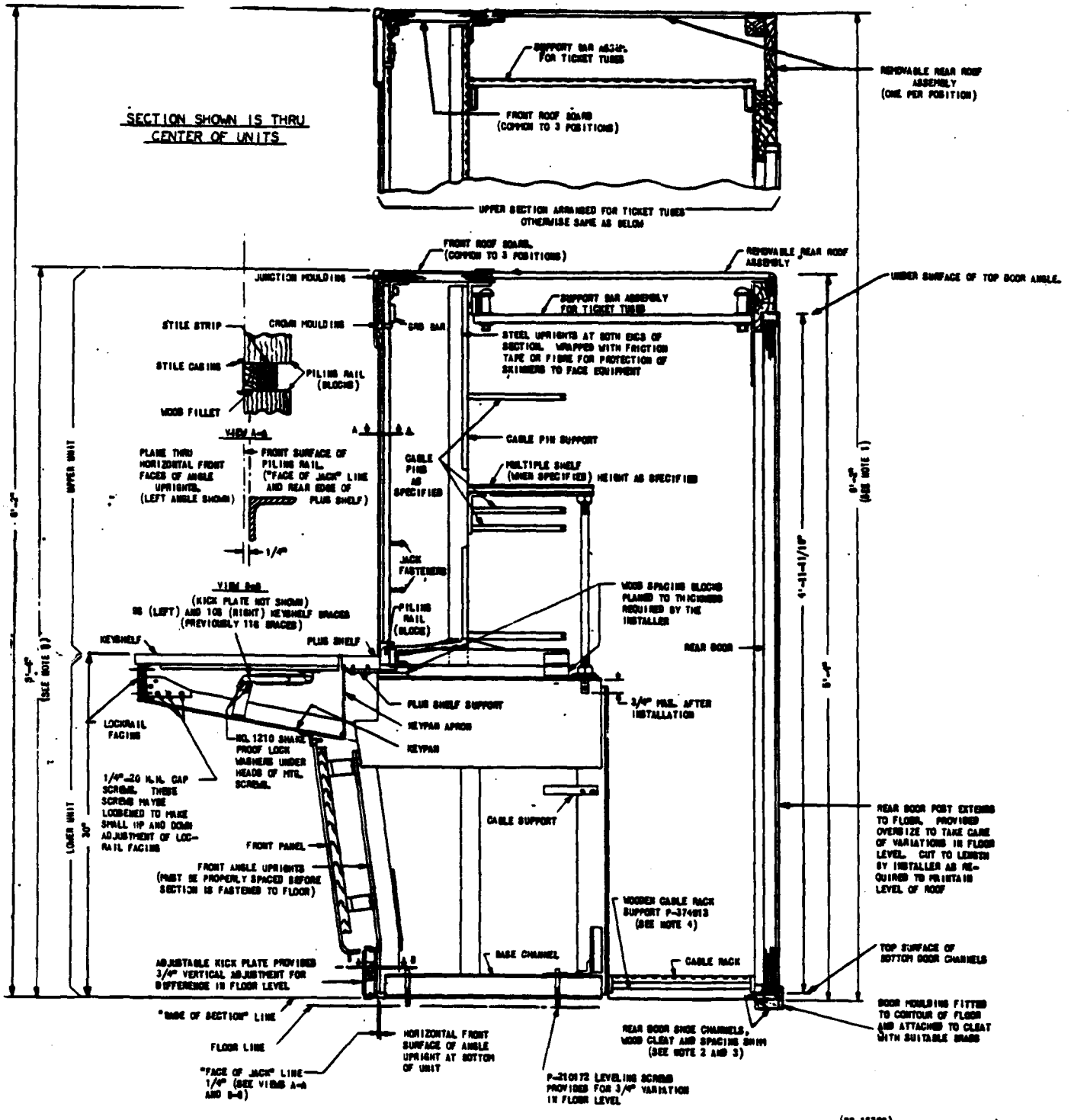
8.4 Fasten the last channel base member to the floor in accordance with details shown in Figure 4A.

8.5 Mount kick panel assembly on last unit in line-up.

8.6 Verify that entire line-up of lower units are in line. Make adjustments where necessary by loosening clamp plates P-449287, over the channel base members and then move the unit into line. Retighten clamp plates.

8.7 Place and align lower units within angle turns, when provided, in accordance with procedure outlined in Paragraphs 8.81 to 8.836.

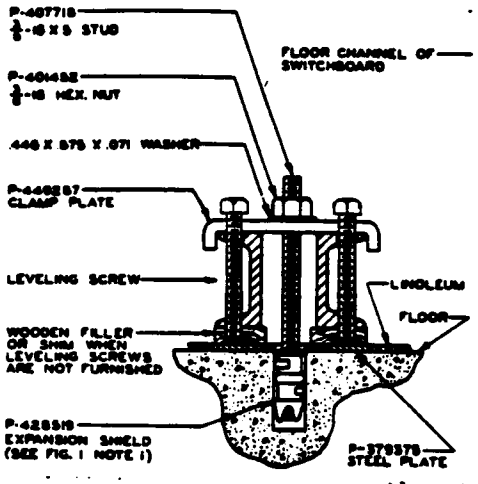
8.71 Set expansion shields P-428519 into floor and the leveling screw steel plates P-379375 into floor covering cutouts for the lower units within the angle turns and for the first unit in the line-up after the angle turn.



NOTES:

1. DIMENSIONS SHOWN MUST BE MAINTAINED BETWEEN POINTS INDICATED AT BOTH FRONT AND REAR OF SECTION.
2. REAR DOOR SHOE CHANNELS ARE ATTACHED TO BOTTOMS OF DOOR POSTS THROUGH HOLES DRILLED BY SHOP FOR THAT PURPOSE. SPACE BETWEEN WOOD CLEAT AND FLOOR SHOULD BE SHIPPED, EITHER USING SUITABLE WASHERS AT EACH FLOOR FASTENING OR BY WOOD SHIMS. THE WOOD SHIMS MAY BE FULL WIDTH OF SECTION FITTED TO CONTOUR OF FLOOR OR SHORT SECTIONS SPACED AT FLOOR FASTENING INTERVALS. ARRANGEMENTS ARE BEING MADE TO HAVE WOOD SPACING SHIMS FURNISHED WITH SECTIONS.
3. DO NOT FORCE THE DOOR CLEATS IN POSITION BETWEEN DOOR POSTS AS THIS WILL THROW THE DOOR POSTS OUT OF PLUMB. IF NECESSARY, CUT OFF THE EXCESS LENGTH OF THE CLEAT.
4. THE NUMBER AND SPACING OF THE WOOD SUPPORTS UNDER CABLE RACKS AT REAR OF SECTION IS SHOWN ON DRAWINGS E8-62001-70 OR E8-62003-70. IT IS NOT NECESSARY TO FASTEN THE WOOD BLOCKS TO THE FLOOR. THIS ALSO APPLIES TO THE CABLE TURNING AND ANGLE SECTIONS. CABLE RACK JUNCTION CLAMPS ARE NOT REQUIRED. CLAMPING OR SEWING OF CABLES TO THE RACKS WILL PROVIDE SUFFICIENT RIGIDITY OF THE PARTS.

FIG. 3 TYPICAL NOS. 3CL, 5, 607A AND 607B UNIVERSAL SWITCHBOARD SECTION (Par. 8.2071)



NOTE 1. WHEN THE EQUIPMENT IS TO BE FASTENED TO WOODEN FLOORS, SUBSTITUTE APPROPRIATE WOOD OR LAG SCREWS FOR THE SCREW AND EXPANSION SHIELD.

FIG. 4 FASTENING SWITCHBOARDS WITH REMOVABLE LOWER UNITS HAVING CHANNEL BASE CONSTRUCTION TO FLOORS (Pars. 8.208, 8.834)
(Modified Figure 4 of BSP AA614.004)

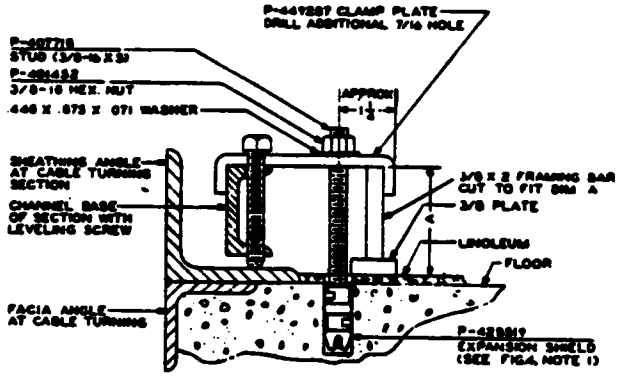


FIG. 4A FASTENING SWITCHBOARDS WITH REMOVABLE LOWER UNITS AT CTS AND AT END SECTIONS TO FLOORS (Pars. 4.22, 8.16, 8.4)
(Modified Figure 4A of BSP AA614.004)

8.72 Move and align a lower unit into the first position after the angle section. Insert the four leveling screws and bring this unit to an approximate level setting in reference to the last unit of the installed lineup. Check that this unit is positioned properly, that is, the lower front surfaces of the front angle uprights are 1/4" to the rear of the "face-of-jack" line and the side surfaces of the front angle uprights are 5/16" to the inside of the section lines as marked on the floor.

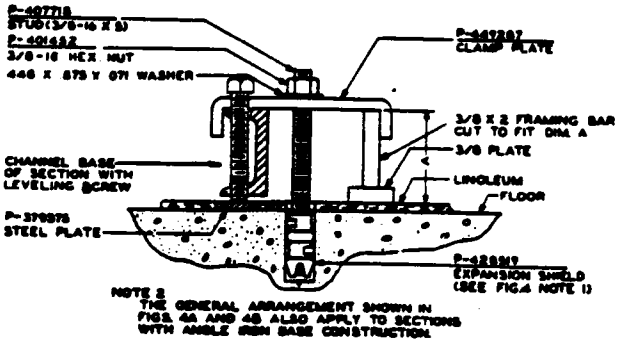


FIG. 4B FASTENING SWITCHBOARDS WITH REMOVABLE LOWER UNITS AT ANGLE SECTION TO FLOORS (Par. 8.834)
(Modified Figure 4B of BSP AA614.004)

8.73 Move the lower units for the positions within the angle section of the line-up into place. It will be necessary to raise and lock in the open position, the keyshelves on the first lower unit in the angle section in order to properly position these units.

8.731 Align the lower units within the angle section to verify that the lower units can be properly placed within the angle section. On lower units adjacent to the angle turns check that the ends of the lockrail facings coincide.

8.732 Starting at the end of the original line-up, level each lower unit within the angle section, in turn, using the previously installed unit as a reference.

8.733 Check the following items and make adjustments where necessary on each unit within the angle section.

(a) Lower front surface of each front angle upright is 1/4" to the rear of the "face-of-jack" line.

(b) Side surface of the of each front angle upright is 5/16" in from the section lines.

(c) On units adjacent to the angle turns, the ends of the lockrail facings coincide.

8.734 Fasten the lower units within the angle section to the floor in accordance with Figure 4. The end floor fastenings in the angle section should be assembled in accordance with Figure 4B.

8.735 The front left corners of keyshelves on first lower unit in the angle section and in the subsequent straight line-up should be cut to fit so that the keyshelves can be opened or closed without the edges binding.

8.736 Install the angle section piece parts listed below as required per figures on ED-92071-71 showing the placement of these parts.

Part Numbers	Group No.	Description	Figures on ED-92071-71
P-188980	G1	Kick Plate Bracket	Sect. D-D
P-126322	G1	R.H.M. Scr. .190"-32 x 1/2"	
P-188981	G1	Kick Plate Assembly	
P-121961	G1	R.H.W. Scr. 8 x 3/4"	
P-188989	G1	Front Panel Bracket	Sect. C-C
P-210239	G1	R.H.M. Scr. 1/4"-20 x 1"	
P-94442	G1	Hex. Nut 1/4"-20	
P-188974	G1	Shelf Support Assembly	End View
P-160798	G1	R.H.W. Scr. 14 x 1 1/4"	
P-188994	G7	Support Block Assembly	Sect. J-J
P-149672	G7	R.H.W. Scr. 8 x 1"	
P-188976	G1	Front Panel Assembly	End View & Sect. C-C
P-121961	G1	R.H.W. Scr. 8 x 3/4"	
P-206393	G1	F.H.W. Scr. 8 x 5/8"	

8.8 Complete the placing aligning and fastening lower units in the line-up after the angle section following instructions outlined in Paragraphs 8.2 through 8.7.

9. ASSEMBLING PARTS IN KEYSHELF PAN

9.1 Install piece parts listed below as required per figures on ED drawings showing the placement of these parts.

Part Numbers	Description	Figures on ED-92058-70
P-188630	Key apron Junction Cover	View B-B, Sect. K-K and View C-C Sect. L-L
P-385653	B.H.M Scr. .112" - 40 x 5/16"	
P-210828	Hex. Nut. .112" - 40	
P-386864	Washer .150" x 3/4" x .032"	
P-430268	Spacer	Sect. G-G Sect. H-H and Note 6
P-188631	Spacer	

Part Numbers	Description	Figures on ED-92077-70
P-374984	Bracket	View C-C
P-374985	Bracket	
P-217497	R.H.M. Scr. 164" - 32 x 7/16"	
P-249622	Lock Washer	
P-374983	Tube Support Bar	
P-168625	R.H.M. Scr. .190" - 32 x 3/8"	
P-284154	Washer .222" x .547" x .056"	
P-249681	Lock Washer	

10. CALCULAGRAPH SHELVES

10.1 Fasten calculagraph shelves to lower units in accordance with information on ED-92077-70 after ticket tubing has been placed (Handbook 32). The following parts are to be used as required.

Part Numbers	Description	Figures on ED-92077-70
As Required	Calculagraph Shelf	As Required
P-400577	H.H. Cap Scr. 1/4" - 20 x 1/2"	
P-374981 or P-374982	Cleat	
P-260664	O.H.W. Scr. 8 x 1-1/2"	
P-145296	R.H.M. Scr. .138" - 32 x 11/16"	
P-356522	Lock Washer	
27A	Valve	See G7 on H-292-205
Det. 60	Bar (Steel)	
P-138380	R.H.M. Scr. .138" -32 x 7/8"	

10.2 Defer mounting calculagraphs, clocks and other apparatus subject to injury or breakage as long as possible.

11. MOUNTING AND ALIGNING UPPER UNITS - 5' - 4" AND 6' - 2" HEIGHTS - 3 AND 9 PANEL UNITS

11.1 Mount upper units on lower units starting at the C.T.S. end of the line-up.

NOTE: When angle turns are included in a line-up, mount equivalent angle section parts as work progresses.

11.11 Dismount the cord shelf assembly on all lower units and set it down into the lower unit so that it is out of the way. This is done to prevent damage to the cord shelf assembly while mounting upper units and to provide working space to secure upper units to back of plugshelves.

11.12 Mount junction plates P-374908 at top rear of lower units. Use four of each of the parts listed below to secure the plates and two of each of the parts in rear slots of the plates at junction of lower units where the upper units will be fastened.

Part Number	Description
P-172485	H.H. Cap Scr. 1/4" - 20 x 5/8"
P-94442	Hex. Nut 1/4" - 20
P-284160	Washer .320" x .625" x .063"

11.13 Nail junction moulding P-374933 to the left end of the crown moulding on each upper unit with three 16 x 1" steel wire brads.

11.14 Place upper units into position. As each upper unit is placed, insert wooden spacers P-449280, P-449097 and P-449096 as required and then bolt the upper unit to the lower unit in a few places so that upper unit cannot be tipped over or displaced.

11.2 Align upper units so that the following conditions can be met after the upper units are fastened in place.

(a) Upright parts should be approximately vertical.

(b) Horizontal parts should be approximately level.

(c) No pronounced irreguiarity should exist throughout a line-up.

(d) The top surfaces of the piling rails in any two adjacent panels should be as nearly in alignment as practicable and in no case should the variation in level between them exceed 1/32".

(e) The crown moulding should be in apparent alignment and the space at the joints should be as small as practicable.

(f) The space between the bottom of the stile casing and the top of the plugshelf shall not exceed 1/32".

(g) The front surface of each piling rail assembly is to have a snug fit against the back top edge of the plugshelf.

11.21 Align and bolt to lower units, the two end upper sections of a line-up to meet the conditions stated in (a), (b), (d), (f) and (g) of Paragraph 11.2 following applicable instructions outlined in Paragraphs 11.231 and 11.232.

11.22 To facilitate checking front to rear and vertical alignment stretch a tight line between the end sections at a point corresponding to the top surface of the piling rails and another line at a point just below the crown moulding.

11.23 Align the intermediate upper units so as to bring the top surface of piling rails in the end panels of each section in line with the top surface of the piling rails in adjacent sections.

11.231 Plane off wooden spacers or add suitable shims between upper and lower units as required to bring the top surfaces of piling rails in adjacent sections in line and to plumb the stile strips. Install and tighten screws and nuts as required from list of parts shown below to fasten the upper units to the lower units.

Part Number	Description
P-442793	H.H. Cap Scr. 1/4" - 20 x 1-1/4"
P-160125	H.H. Cap Scr. 1/4" - 20 x 1-1/2"
P-94442	Hex. Nut 1/4" - 20

11.232 As each upper unit is being aligned check that the front surface of each piling rail assembly has a snug fit against the back edge of the plugshelf and that top surfaces are level and in line, within 1/32", with adjacent piling rail assemblies.

11.2321 Misalignment of the piling rail assemblies may be due to irregularities in the ironwork surface on which the assemblies are mounted. Remove affected assemblies, plane or chisel out the back surface of the piling rail assemblies as required or add suitable shims where required between the surfaces of the ironwork and the assemblies and remount. In some cases it may be necessary to plug the old screwholes in the piling rail before remounting.

11.2322 In some cases a plugshelf may require a slight readjustment so that the front surface of the piling rail will have a snug fit against the back edge of the plugshelf. Loosen the screws under the two plug shelf supports, shift the plugshelf forward or backward as required and retighten screws. If further adjustment is necessary remove the two piling rail assemblies to the rear of the right and left side of the plugshelf to be adjusted. Loosen the screws over the two plug shelf supports, shift the plugshelf as required and then retighten screws and remount the two piling rail assemblies. See Figure 3.

11.24 Bolt each upper unit to the adjacent upper unit after they are aligned using parts listed below. Use washers, as required, to fill space between uprights.

Part Number	Description
P-210241	R.H.M. Scr. 1/4" - 20 x 1-1/2"
P-94442	Hex. Nut 1/4" - 20
P-284160	Washer .320" x .625" x .063"

11.25 Fasten each stile strip support P-405230 to gusset plate P-449245 on adjacent upper units using P-205653, R.H.M. Scr., .164" - 32 x 1/2" and P-284148, washer, .170" x .433" x .040".

11.26 Fasten each junction plate P-405442 to roof angle (front) P-188533 on adjacent upper units using P-210237, R.H.M. Scr., 1/4" - 20 x 5/8".

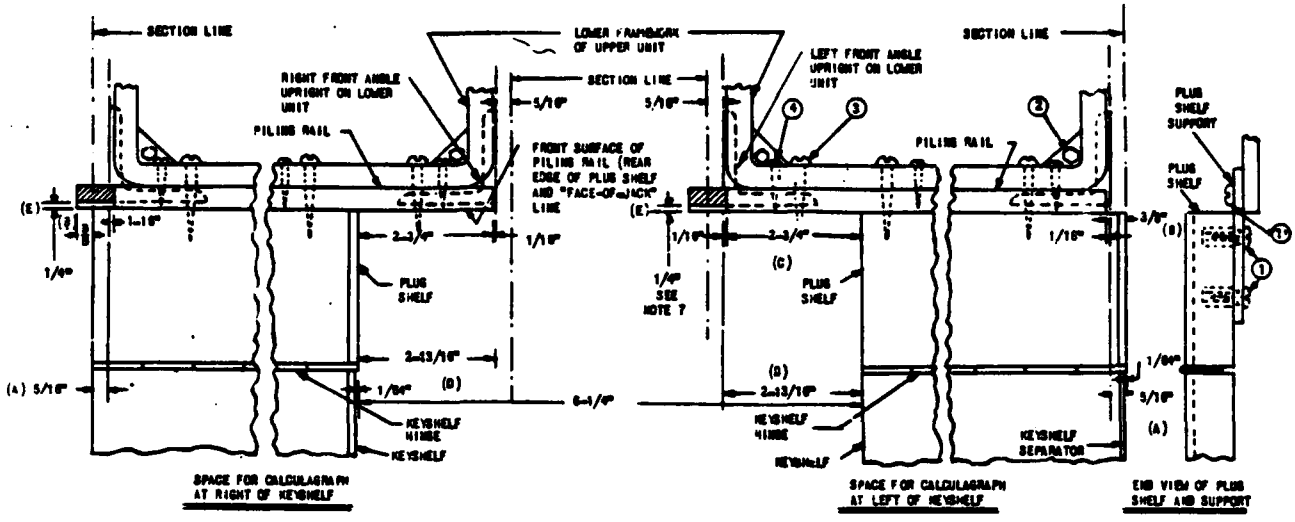
11.27 Fasten each moulding support P-374926 to crown moulding, P-188704 on adjacent upper units using P-160906, R.H.W. Scr., 10 x 5/8".

11.271 The crown mouldings should be in apparent alignment and the space at the joints should be as small as practicable.

11.2711 Where crown mouldings are out of apparent alignment at junctions between sections the condition can frequently be corrected by interchanging the crown moulding with one from another section without affecting the other section.

11.2712 Junction mouldings are furnished within ± 1/64" of their nominal thickness and may require dressing by the installer.

11.272 The partial roof fronts should be in apparent alignment.



DIMENSION TO BE MET	SCREWS TO BE LOOSENED OR REMOVED	PARTS TO BE SHIFTED
(A)-5/16"	LOOSEN TWO SCREWS (1) UNDERNEATH EACH PLUG SHELF SUPPORT AND IF THE UPPER UNITS ARE NOT MOUNTED ALSO LOOSEN THE SCREWS (1) SECURING THE SUPPORTS TO THE LOWER UNITS. REMOVE WOOD SCREWS (3) THROUGH PILING RAIL INTO PLUG SHELF IN EACH PANEL. SEE NOTE 6.	KEYSHELF. - SHIFT TO RIGHT OR LEFT AS REQUIRED. UPPER UNIT STILL SECURED TO LOWER UNIT.
(B)-3/8"	LOOSEN FOUR CAP SCREWS (2) SECURING UPPER UNIT TO LOWER UNIT. REMOVE WOOD SCREWS (3) THROUGH EACH PILING RAIL INTO PLUG SHELF. SEE NOTE 6.	UPPER UNIT ONLY. - KEYSHELF SHOULD BE SECURELY FASTENED TO LOWER UNIT.
(C)-2-3/4"	SAME AS FOR (B).	SAME AS FOR (B).
(D)-2-13/16"	SAME AS FOR (A).	SAME AS FOR (A).
(E)-SEE NOTE 7	LOOSEN TWO SCREWS (1) UNDER EACH PLUG SHELF SUPPORT. REMOVE FOUR CAP SCREWS (2) SECURING UPPER UNIT TO LOWER UNIT.	KEYSHELF AND COMPLETE UPPER UNIT. - SHIFT FORWARD OR BACKWARD AS REQUIRED.

NOTES:

(1) DIMENSIONS SHOWN IN BRACKETS ABOVE SHOULD BE CHECKED FIRST ON ONE SIDE AND THEN ON THE OTHER SIDE OF THE KEYSHELF.

(2) TO AVOID ACCUMULATION OF PERMISSIBLE MANUFACTURING VARIATIONS IN WIDTHS OF KEYSHELVES OCCURRING AT JUNCTIONS OF SECTIONS, ALWAYS LOCATE THE PARTS (LEFT TO RIGHT) WITH RESPECT TO DIMENSIONS AT LEFT-HAND SIDE OF SECTIONS. THE (E) DIMENSIONS SHOULD BE MET AT BOTH SIDES.

(3) ANY VARIATION IN EXCESS OF 1/32" AT THE RIGHT-HAND SIDE AFTER POSITIONING THE PARTS TO MEET THE DIMENSIONS AT THE LEFT-HAND SIDE MAY REQUIRE SHIMMING OR PLANNING TO OBTAIN SATISFACTORY MUTUAL ALIGNMENT BETWEEN ADJACENT SECTIONS.

(4) THE SHORTER WOOD SCREWS (4) SHOWN ARE USED FOR SECURING THE PILING RAIL TO THE UPPER UNIT FRAMEWORK DURING SHIPMENT. THE INSTALLER WILL NOT ORDINARILY HAVE ANY REASON TO LOOSEN OR REMOVE THESE SCREWS.

(5) EITHER 1, 2 OR 3 POSITION UPPER UNITS MAY BE FURNISHED. THE 1 POSITION UPPER UNIT IS ILLUSTRATED IN THIS FIGURE AND THE QUANTITIES OF CAP SCREWS (2) TO BE LOOSENED APPLY ONLY TO THE 1 POSITION UPPER UNITS.

(6) TWO WOOD SCREWS (3) ARE USED THROUGH THE PILING RAIL IN EACH PANEL. THE SHOP WILL INSTALL ONLY ONE OF THE TWO SCREWS. AFTER DETERMINING THAT THE KEYSHELF IS CORRECTLY LOCATED, THE INSTALLER SHOULD FIRST INSTALL THE SCREW IN THE HOLE NOT USED BY THE SHOP AND THEN REPLACE THE OTHER SCREW, PLUGGING THE OLD SCREWHOLE IN THE PLUG RAIL TO PREVENT KEYSHELF BEING PULLED BACK INTO ITS OLD POSITION.

(7) THE (E) DIMENSION IS 1/4" (MEASURED FROM FRONT VERTICAL FACE OF FRONT ANGLES AT BOTTOM OF SECTION) FOR NO. 5.3CL.607A AND 607B SECTIONS.

FIG. 5 LOCATING DIMENSIONS AND INSTRUCTIONS FOR RELOCATING PARTS WHICH CAN BE SHIFTED BY INSTALLER TO OBTAIN PROPER RELATION BETWEEN UPPER AND LOWER UNITS AND KEYSHELVES (Par. 11.2322)

11.2721 Where partial roof fronts are out of apparent alignment at junctions between sections the condition can be corrected by either shimming or trimming the partial roof fronts.

11.28 Mount gusset plate P-255163 at bottom of each vertical upright. Use parts, as required, from list shown below.

Part Number	Description
P-210306	R.H.M. Scr. 1/4" - 20 x 2"
P-218566	Lockwasher
P-109897	Hex. Nut 1/4" - 20
P-210231	R.H.M. Scr. 1/4" - 20 x 3/4"

11.29 Fasten upper units to plug-shelves.

11.291 Drill holes .152" x 5/8" deep in back edge of plug-shelves using holes through lower stile support P-449211 as a guide. (No. 24 (.152") drill obtained locally) Use two P-160945 R.H.W. Screws, 10 x 2", at each panel to secure the upper units to the back edge of the plugshelves.

11.292 Remount cord shelves that were removed per Paragraph 11.11.

12. BUS BARS AND TERMINAL LUGS

12.1 Install the ground bar per ED-91366-70. Requirements and method information applying to the assembly and to the treatment of the contact surfaces of current carrying connections and protective grounds are covered in Section 1B.

CAUTION: Exercise care when tightening cap screws securing connections and junction plates to ground bars to prevent stripping of threads.

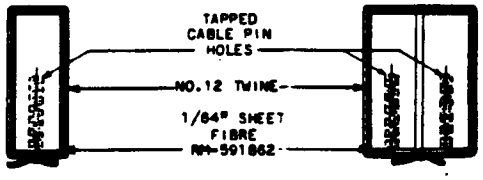
12.2 Tie insulators P-430513 and P-450640 in place over fuse panel cable connectors using two strands of No.6 Twine through the holes provided.

13. ASSEMBLING MISCELLANEOUS PARTS INSIDE OF UPPER UNITS

13.1 Assembly cable pin support details or the multiple shelf details as specified for the switchboard installation. Assembling information and stocklist of parts are shown on the Upper Unit Iron Framework drawings. Stocklist column G-2 lists parts for the multiple shelf and column G-3 lists the parts for the cable pin support assembly.

13.11 Table A and Figure A on Upper Unit Section Assembly drawings show the adjustment dimensions for multiple shelf assembly.

13.12 Temporarily omitting the multiple shelf (where possible) until the O.G.T. multiple and other multiple below the shelf are run in, may facilitate the cabling.



NOTE: FIBRE SHOULD EXTEND THE FULL LENGTH OF THE UPRIGHT AND BE FITTED AROUND BACK AND SIDES OF UPRIGHTS AS SHOWN. SECURE FIBRE TO UPRIGHTS WITH DOUBLE NO. 12 TWINE MADE AS A STARTING STITCH AND ENDED WITH A SQUARE KNOT. SPACE BANDS 6" (APPROX.) APART.

FIG. 6 USE OF SHEET FIBRE FOR COVERING END UPRIGHTS IN SWITCHBOARD SECTIONS (Par. 13.21)

13.13 When multiple shelves are not provided, install cable pins to suit job cabling conditions. Cable pins at the junction of adjacent upper sections are required only in one of the two cable pin supports at the junction.

13.2 Wrap the steel uprights (vertical supports at ends of lineups, at junctions between sections and the cable pin supports) with gray sheet fibre, RM-591862 or gray friction tape RM-591127 as outlined in Paragraphs 13.21, 13.22 and 13.23. The protection should extend the entire length of the uprights, that is, between points corresponding to the height of the piling rail and the height of the crown moulding, so as to provide protection for the ultimate as well as the initial cabling installed. This is done to protect the skinners to jacks lamps, keys and similar face equipment from the steel framework members in the switchboard. Apply this protection before the multiple cables are run in.

1313.21 Cut 1/64" gray sheet fibre, RM-591862, to the length required and a width that will fit around the front, both sides and approximately an 1/8" turn over the back surface of uprights, pair of uprights at junctions or the cable pin supports, leaving uncovered the sides having the cable pin holes. See Figure 6.

13.22 Tie the fibre strips in place with double bands of No. 12 twine. Space the bands of twine approximately 6" apart using a starting stitch ended with a square knot.

13.23 Where fibre is not available, gray friction tape, RM-591127 may be substituted. Wrap tape with a half lap and apply a coat of orange shellac varnish, RM-646726. The orange shellac varnish is to be thinned as required with shellac solvent, RM-646793. Puncture the tape with a sharp pointed tool or a screwdriver to privide access for the cable pins.

13.3 Mount floor cable rack assemblies, P-449290 and/or P-374913, on cable rack supports, P-374913. The cable rack supports are placed on the floor behind lower units, one at each cable rack assembly junction and one at each end of the run. The cable rack assembly is not fastened to floor or any part of the switchboard. See Figure 1 on ED drawing for Upper Unit Iron Framework.

14. ASSEMBLING WOODWORK

14.01 Omitting rear woodwork until cabling is completed will facilitate the cabling operations.

14.02 Mount support bar assemblies P-33A943 or P-255041, where required along the front tube support bar. The back end of each support bar assembly will be secured to the rear tube support bar when the rear woodwork is placed. See ED drawing for Upper Unit Section Assembly for details.

14.03 Starting at the Cable Turning Section, assemble in place rear door posts, support assemblies, support bars, spacers, tube support bars (rear), roof junctions for the entire lineup.

14.031 The rear door posts are furnished longer than required to provide for variations in floor level. As each door post is placed, cut bottom of door post off so that when roof assemblies are in place they are level in both front-to-rear and lateral directions. Use an R-3053, 42" Wood Level in determining the front-to-rear level. Check the level in the lateral direction with an R-3052, 6' - 5-3/4" Wood Straightedge.

14.032 As each door post is placed, check that the center of the door post coincides with the section line. Make corrections on each section as the rear woodwork is placed, either increasing or decreasing the spacing between the two rear door posts at the top as required, so that errors will not accumulate. The connection should be made so that half the spacing error compensated for is taken at each end of the support bar assembly being placed.

14.033 Align rear door posts so that they are plumb in both the front-to-rear and left-to-right alignment using a 42" level.

NOTE: Stretching a tight line, about 6"off the floor, between the door posts at ends of a lineup, which are properly aligned, will facilitate front-to-rear aligning of the intermediate rear door posts and also aid in maintaining this alignment when door shoe assemblies are fastened to the floor.

14.04 Fasten door shoe assemblies to bottoms of door posts through holes drilled by shop for that purpose. The space between door shoe assemblies and floor should be shimmed, either using suitable washers at each floor fastening or wood shims. Wood shims should be full width of door shoe assembly fitted to contour of floor or short sections spaced at floor fastening intervals.

14.041 Make up door shoe assemblies by fastening metal channels on to cleats (right and left as required) with P-160625, F.H.W. Screws, 8.1/2".

14.042 Fit the door shoe assemblies between door posts. Do not force the door shoe assemblies into position between door posts as this will throw the door posts out of plumb. If necessary, cut off the excess length of the door shoe assembly.

14.043 Mark locations of floor fastenings for door shoe assemblies. Drill holes in concrete floor and set in the P-407254 expansion shields per instructions outlined in Section 9.

14.044 Fasten cleat and channel assemblies to door posts. Slide spacing shims (See Paragraph 14.04) into place and then fasten cleats to floor with P-210257, F.H.M. Screws, 1/4" - 20 x 2-1/4".

NOTE: On wooden floors use flat head wood screws No. 14 x 2-1/2" in place of the expansion shields and flat head machine screws.

14.05 Install partial roof assemblies (rear) and fasten them in place to the support assembly. Roof boards are cut in the shop to allow a space of approximately 1/8" between the boards of adjacent sections.

14.06 Install end panel. See ED drawings showing End Panel Assembly and End of Lineup Details for detailed information.

14.07 Assemble Cable Tuning Section woodwork. See ED drawings showing Cable Tuning Section and End Panel Assembly for detailed information.

14.071 The posts on the front panel assembly and the rear door post are to be cut off at the bottom and fit to the floor so that C.T.S. roof, when in place, will be level and in line with adjacent switchboard roof.

14.072 Assemble and align in place the front panel assembly, the end panel rear door post, rear roof support, support for leveling end panel, C.T.S. roof assembly, and the door shoe assembly.

14.073 Fit shims into space between door shoe assembly and floor.

14.074 Fit front panel floor cleat into place between front panel posts.

14.075 Mark locations of floor fastenings for the front panel floor cleat and the rear door shoe assembly. Drill holes in concrete floor and set in the P-407254 expansion shields per instructions outlined in Section 9.

14.076 Fasten door shoe to the bottom of the two door posts. Slide spacing shims into space between door shoe and floor and then fasten door shoe to floor.

14.077 Fasten front panel floor cleat to floor.

14.078 Front and end panel kick plates are to be cut off at the bottom and fitted to floor as required and then fastened in place.

14.079 Complete assembly of cable turning section and associated End Panel woodwork.

14.08 Install Rear Door Assemblies and Mount Front Panel Assemblies.

14.081 Doors and removable panels, should have sufficient clearance between the fitted surfaces to make them readily removable.

14.09 Cut floor moulding P-188528 to fit contour of floor along back of switchboard and cable turning section. Fasten moulding to door shoe with suitable brads.

14.10 Fasten roof dust shields in place with flat head wood screws. Touch up screw heads to match finish of dust shield.

14.101 Dust shields, P-188549 and P-188642 are fastened to the roof with P-259202, 3 x 3/8" F.H.W. Screws. Drill screw holding holes in woodwork .070" x 1/4" deep in woodwork (.070" (#50) drill). Note that the P-188549 Dust Shields are fastened along the right surface of each partial roof only.

14.102 Dust Shields P-188640 and P-188641 are fastened to the partial roof front with P-259203, 4 x 5/8" F.H.W. Screws. Drill screw holding holes .078 x 3/8" deep in woodwork. (.078" (5/64") drill). Note that the dust shields P-188640 or P-18864 are fastened along the rear surface of the partial roof front.

14.103 Dust Shield P-188942 is fastened both to C.T.S. roof and to end panel moulding with P-384266, 3 x 5/8" F.H.W. Screws. Drill screw holding holes .070" x 3/8" deep in woodwork.

15. NUMBER PLATES AND SPACERS

15.1 Insert the 142 and 143 type number plates as required into the stile casings. Section 30H outlines a procedure that may be followed.

[Vertical lines at side of Paragraphs indicate requirement.

→ Arrowed lines indicate new or changed information.

Manager, Product Engineering

Reason for Reissue:
(1) To change Figure 2 eliminating the need to remove P-185694 channel.
(2) To change Paragraphs 8.209 and 8.5 eliminating the need to remove P-185694 channel.