BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G61.126
Issue 2, November, 1940
AT&T Co Standard

TERMINALS

INSTALLATION OF INSIDE CROSS-CONNECTING TERMINALS

Contents **Page**

1. GENERAL

1.01 This section covers locating, mounting and equipping the standard types of unprotected cross-connecting terminals which are available for use within buildings. Information is also included with regard to equipping built-in terminal cabinets which may be provided by building owners to house the cross-connecting terminal equipment. The wiring of building cable terminals is covered in the Station Installation and Maintenance Practices.

1.02 Issue 2 of this section has been prepared to bring the information into agreement with the design changes and additions that have been made to improve the inside cross-connecting terminals. The revised section also includes the changes that have been found desirable in the methods of installing and equipping these terminals.

2. LOCATING TERMINALS

2.01 Locate terminals in accordance with the detail plans complying with the following points in so far as practicable. If the specified terminal location does not seem feasible from an installation standpoint or is considered as offering potential maintenance difficulties, notify your supervisor in order that a more satisfactory location may be selected. Locate terminals:

(a) Where they will be least conspicuous and will not unnecessarily expose the associated cable and wires to view.

(b) Where they will not project in such a manner as to be hazardous.

(c) Where good lighting conditions exist.

(d) Where they will be accessible without the use of a ladder.

(e) Where the door can swing through more than 90 degrees and where it will be possible to work in the terminal without blocking a passageway.

(f) Where they will not be subjected to severe moisture under normal conditions or submersion in the event of a flood.

(g) Where they will not be subjected to high temperatures such as occur near radiators, uncovered steam pipes, etc.

(h) So as to avoid electric light and power circuits and electrical equipment.

(i) Where they will not be damaged by moving machinery, hoists, doors and shutters or by materials handled on loading platforms, etc.

(j) On a firm mounting surface.

(k) Associated with P.B.X.'s, as near as practicable to the rear of the cabinet.

3. MOUNTING WALL TYPE TERMINALS

GC Type Cable Terminal Box

3.01 The GC Type Cable Terminal Box is so designed that it can be attached to the mounting surface before the binding post chambers or the connecting blocks are installed.

3.02 To mount the GC box, proceed as follows:

(1) Locate the box in the desired position and spot the centers of the proper mounting holes. Refer to Paragraph 3.03 for the required anchoring devices and also for the method of mounting the box on rough masonry.

(2) Remove the box and drill the holes for the anchoring devices.

(3) Attach the box, making any necessary adjustment in its position before tightening the anchoring devices.

3.03 The anchoring devices required for attaching the GC Type Cable Terminal Box to the mounting surfaces most commonly encountered are listed in the following table. Refer to Section G10.375 for information with regard to the installation of anchoring devices in masonry, hollow tile and similar surfaces.

Surfaces	Anchoring Devices	Mounting Holes in Box
Smooth Masonry.	2-1/4 in. x 1 in. Hammer Drive Anchors with double-headed nails.	Elliptical
	or	
	2-1 in. No. 10 R. H. Blued Wood Screws in 10-14 x 1 in. Wood Screw Anchors.	Round
Hollow Tile, Plaster on Metal Lath and Similar Surfaces.	2-3/16 in. x 3 in. Toggle Bolts. (If a longer bolt is required, use a 3/16 in. x 4 in. Toggle Bolt.)	Round
Plaster on Masonry.	2-1/4 in. x 1-1/2 in. Hammer Drive Anchors with double-headed nails.	Elliptical
	or	
	*2—1-1/2 in. No. 10 R. H. Brass Wood Screws in 10-14 x 1-1/2 in. Wood Screw Anchors.	Round

*Use blued or galvanized wood screws if available.

Surfaces	Anchoring Devices	Mounting Holes in Box
Plaster on Wood and Similar Backing.	2—1-1/2 in. No. 14 R. H. Galv. Wood Screws.	Elliptical
	or	
	*2—1-1/2 in. No. 10 R. H. Brass Wood Screws. (If the mounting hole is located between wooden laths, use a 3/16 in. x 3 in. Toggle Bolt.)	Round
Finished Woodwork, Such as Furniture.	2-3/4 in. No. 8 R. H. Blued Wood Screws.	Round
Other Woodwork.	2-1 in. No. 14 R. H. Galv. Wood Screws.	Elliptical
	or	
	2-1 in. No. 10 R. H. Blued Wood Screws.	Round
Rough Masonry.	Attach a 1 in. wooden backboard, corresponding in size to the overall dimensions of the terminal box, to the mounting surface by means of 2-5/16 in. x 2-1/4 in. Hammer Drive Anchors with single-headed nails or 2-2 in. No. 14 R.H. Galv. Wood Screws in 10-14 x 1 in. Wood Screw Anchors. Locate the anchors for the backboard in diagonally opposite corners. Drill 3/8 in. clearance holes in the backboard for the hammer drive anchors and 5/16 in. holes for the wood screws. Attach the terminal to the backboard as specified for other woodwork.	

*Use blued or galvanized wood screws if available.

3.04 Where an additional binding post chamber or connecting block is to be installed at a distribution terminal to form a cross-connecting terminal, the existing chamber can be temporarily detached and the box replaced with a GC box of the size which will accommodate both the terminating units and the cross-connecting wires.

H Type Cable Terminal Section

3.05 The H Type Cable Terminal Section is so designed that it can be attached to the mounting surface before the binding post chambers or backboards are installed.

3.06 To mount the H102, H202 and H303 sections, proceed as follows:

(1) Locate the section in the desired position, with the door stops at the bottom, and spot the center of one of the two upper mounting holes. Refer to Paragraph 3.07 for the required anchoring devices and also for the method of mounting the section on rough masonry.

(2) Remove the section and drill this hole. When the section is to be attached by means of toggle bolts or wood screw anchors, it is necessary to locate and drill all of the mounting holes before fastening the section to the mounting surface.

(3) Place the section in position and insert the first anchoring device part way.

(4) Straighten the section and drill the diagonally opposite mounting hole.

(5) Insert and secure the second anchor and then secure the first anchor.

(6) Drill the remaining two mounting holes, insert the anchors and complete the attachment.

(7) When more than one H section is to be installed, join the adjacent sections by means of the machine screws and nuts provided for this purpose.

3.07 The anchoring devices required for attaching the H Type Cable Terminal Section to the mounting surfaces most commonly encountered are listed in the following table. Refer to Section G10.375 for information with regard to the installation of anchoring devices in masonry, hollow tile and similar surfaces.

Surfaces	Anchoring Devices
Smooth Masonry.	4-1/4 in. x 1-1/4 in. Hammer Drive Anchors with double-headed nails. or 4—1-1/2 in. No. 14 R.H. Galv. Wood Screws in 10-14 x 1-1/2 in. Wood Screw Anchors.
Hollow Tile, Plaster on Metal Lath and Similar Surfaces.	4-1/4 in. x 3 in. Toggle Bolts. (If a longer bolt is required, use a 1/4 in. x 4 in. Toggle Bolt.)
Plaster on Masonry.	4-1/4 in. x 1-1/2 in. Hammer Drive Anchors with double-headed nails. or 4—1-1/2 in. No. 14 R.H. Galv. Wood Screws in 10-14 x 1-1/2 in. Wood Screw Anchors.
Plaster on Wood and Similar Backing.	4—1-1/2 in. No. 14 R.H. Galv. Wood Screws. (If the attachment is made between wooden laths, use a 1/4 in. x 3 in. Toggle Bolt.)
Woodwork.	4-1 in. No. 14 R.H. Galv. Wood Screws.
Rough Masonry.	Attach two 1 in. x 3 in. wooden mounting cleats to the wall by means of 5/16 in. x 2-1/4 in. Hammer Drive Anchors with single-headed nails or 2 in. No. 14 R.H. Galv. Wood Screws in 10-14 x 1 in. Wood Screw Anchors. Use two anchors per cleat for one to four sections and place anchors in rear of alternate sections for larger installations. If practicable, locate the anchors for the mounting cleats opposite the large openings in the back of the sections. Drill 3/8 in. clearance holes in the cleats for the hammer drive anchors and 5/16 in. holes for the wood screws. Attach each H section to the cleats by means of 4-1 in. No. 14 R.H. Galv. Wood Screws.

J Type Cable Terminal Section

3.08 Attach a J102, J202 or J303 Cable Terminal Section at each end of one or a group of H Type Cable Terminal Sections of corresponding size by means of the

machine screws and nuts provided for this purpose. The J section is hinged and must be fully opened when making the attachment. When closing the J section, make sure that the pins enter the holes in the web of the H section before the clips are turned to lock the J section in position. If necessary, loosen the screws in the top and bottom parts of the H section in order to align the sections and then retighten the screws.

4. MOUNTING FRAME TYPE TERMINAL

K606 Cable Terminal Section

4.01 Unless otherwise specified, the K606 Cable Terminal Section should be attached directly to floors which have not been waterproofed. On waterproofed floors, omit the anchoring devices and fill in the space between the footings of the section with concrete to form a base approximately 3 inches high. Do not score the floor.

4.02 To attach the K606 section directly to the floor, proceed as follows:

(1) Establish the line along which the sections are to be erected.

(2) Set up the lower part of the first section with the proper base adjacent to the established line and spot the center of its mounting hole.

(3) Remove the section and drill this hole.

(4) Place the section in position over the drilled hole and install a 1/2 in. x 2-1/4 in. Hammer Drive Anchor with a single-headed nail.

(5) Drill the hole for and install an anchor in the other base of the section.

(6) Place the second section in position and secure it to the one already in place by means of the machine bolts and nuts supplied for this purpose. In making this attachment, care should be taken to see that the proper base of the second section is adjacent to the established line.

(7) Drill the holes for and install two anchors in the second section.

(8) Place additional sections in the same manner.

(9) Fasten the upper part of the section to the lower part by means of the machine bolts and nuts supplied for this purpose.

(10) Secure the top of each section by embedding the angles in or attaching them to the ceiling. Where this is not feasible, support the top of the frame by means of steel angles embedded in or fastened to the walls. The structural members which are required in addition to those furnished with each section should be obtained locally.

(11) Join the longitudinal wiring rods by driving the steel sleeves over the junction points.

5. EQUIPPING WALL TYPE TERMINALS

GC Type Cable Terminal Box

5.01 The GC Type Cable Terminal Box can be equipped with either two G Type Binding Post Chambers or two connecting blocks (30 or 31 type) mounted on 102 Type Adapters or one chamber and one connecting block of the sizes listed in the following table. Equipped, this box provides a cross-connecting terminal in sizes ranging from 22 to 102 pairs. Knockouts are provided in the side of the GC type box opposite the hinges to permit two of these boxes to be mounted side by side to form a cross-connecting terminal of twice the capacity mentioned above.

		Connecting Blocks		
Boxes	**Binding Post Chambers**	**30 Type Blocks**	**31 Type Blocks**	**Adapters**
GC32	G11 or G16	30B or 30C	31B or 31C	102B or 102C
*GC52	G16 or G26	30C or 30D	31C or 31D	102C or 102D
*GC102	G26 or G51	30D	31D	102D

*When a smaller chamber or adapter is to be installed, drill the additional mounting holes that are required and make the attachment at these points by means of self-tapping screws as specified in Paragraph 7.01.

5.02 To equip the GC box with a binding post chamber, proceed as follows:

(1) Remove the proper U-shaped knockout for the stub cable.

(2) Insert the two lower mounting screws for the chamber. These screws are furnished with the box. When the G51 chamber is equipped with a pulp insulated stub cable, it should be mounted in the box with the nipple extending through the U-shaped opening. If, however, this chamber is equipped with a textile insulated

stub cable, it is necessary to use the set of mounting holes which will place the larger diameter nipple entirely within the box. In the latter case, and also for chambers smaller than the maximum size, protect the stub cable where it will pass through the U-shaped opening with wrappings of 3/4 in. Black Friction Tape or by means of lead sleeving.

(3) Rest the lower mounting slots of the chamber on these screws, with the fanning strip toward the wiring space of the box, and adjust the chamber to its final position.

(4) Insert and tighten the two upper mounting screws.

(5) Tighten the two lower mounting screws.

(6) Place any unused binding post chamber mounting screws in unoccupied holes of the terminal box.

(7) Support the stub cable temporarily until the splicing has been completed.

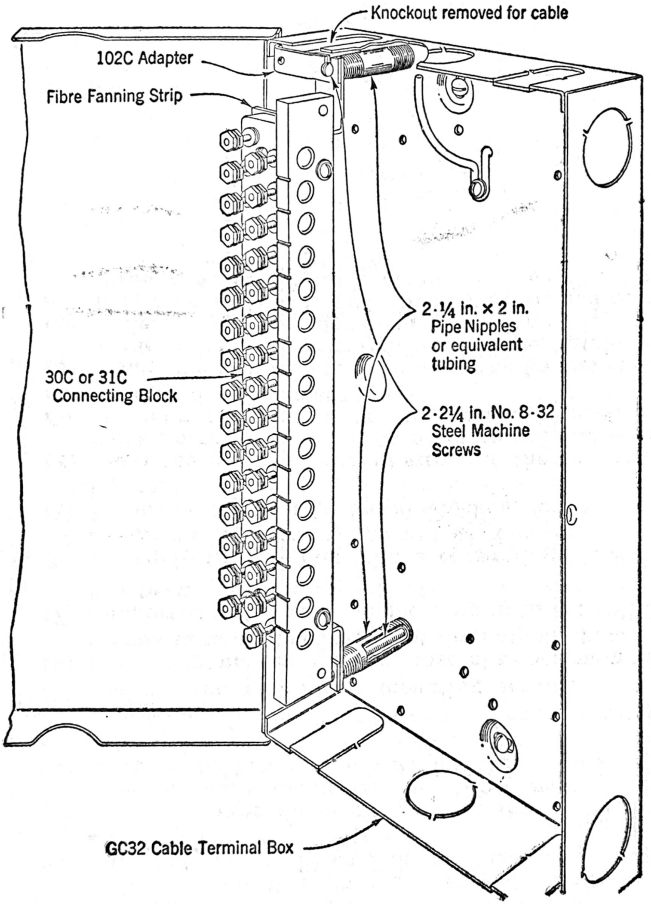
5.03 To equip the GC box with a connecting block and its associated adapter, proceed as follows:

(1) Remove the proper U-shaped knockout for the entering cable.

(2) Assemble the fibre fanning strip and the connecting block on the adapter in the order named and secure the assembly by means of the two machine screws and nuts furnished with the adapter.

(3) Mount the adapter temporarily in the box as shown in the following illustration to facilitate terminating the cable. When the maximum size adapter is to be installed, mount it in the position nearest the end of the box through which the cable enters.

GC32 CABLE TERMINAL BOX
(Connecting block in position for terminating cable)



(4) Remove the lead or braid covering from the textile insulated cable for the length necessary to terminate the conductors and fasten the cable at the end of the adapter, using the size of clamp indicated in the following table and the machine screw furnished for this purpose.

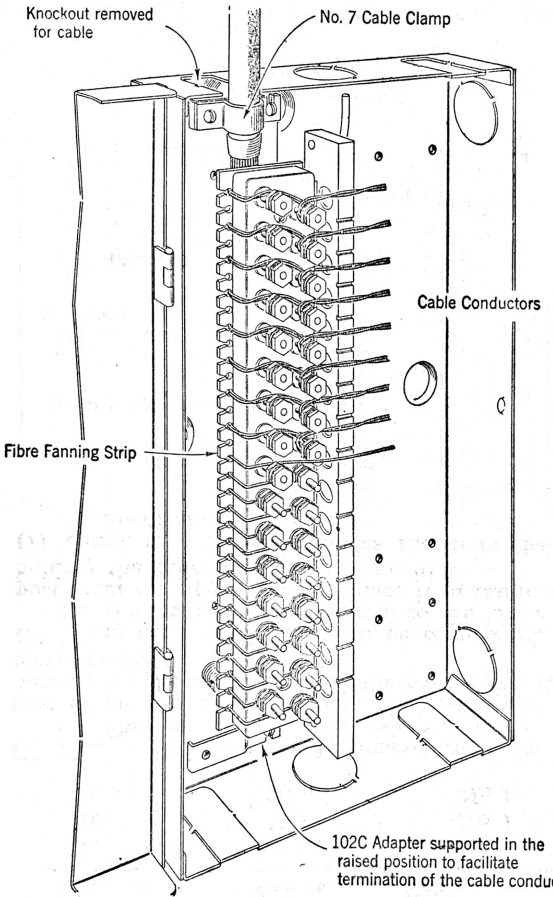
Adapters	Cables	Cable Clamps
102B	11 pr.	No. 6
102C	16 pr.	No. 7
102D	26 pr.	No. 8

(5) Place each pair of cable conductors in the slot of the fibre fanning strip opposite the upper binding post of the proper pair of posts and dispose of it temporarily as shown in the next illustration for the eight upper pairs.

(6) When each cable pair is to be terminated, remove the conductor to be connected to the lower binding post from the upper slot and place it in the lower slot, holding the other conductor in position.

(7) Terminate the conductors as shown in the following illustration.

GC32 CABLE TERMINAL BOX
(Method of terminating cable on connecting block)



(8) Detach the adapter from the box and remove the materials used to block out the adapter.

(9) Insert the lower permanent mounting screw for the adapter. The screws for mounting the adapter are furnished with the box.

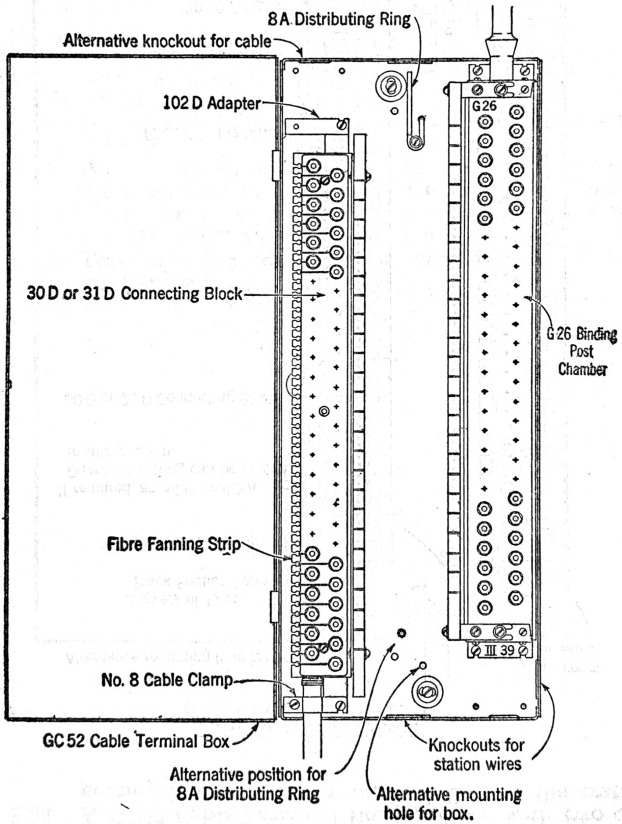
(10) Rest the lower U-shaped slot of the adapter on this screw and adjust the adapter to its final position.

(11) Insert and tighten the upper mounting screw.

(12) Tighten the lower mounting screw.

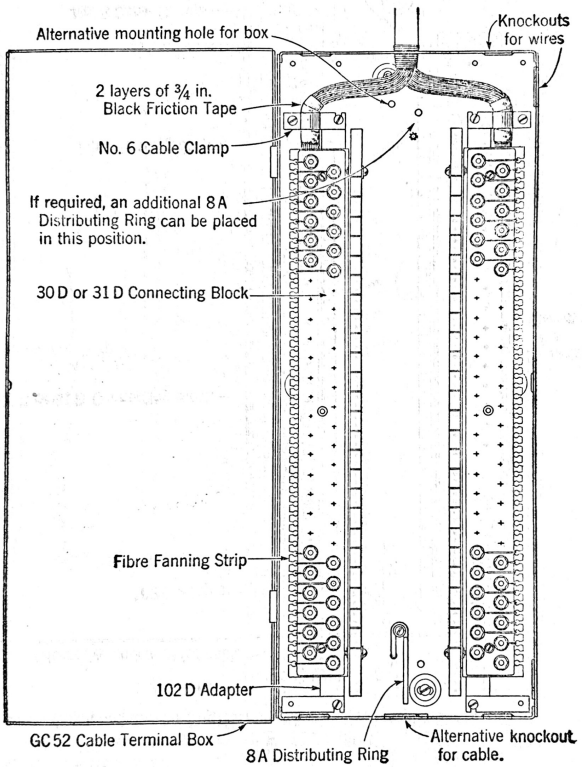
5.04 A GC52 Cable Terminal Box equipped with a binding post chamber and a connecting block is shown in the following illustration.

GC52 CABLE TERMINAL
(Equipped with binding post chamber and connecting block)



5.05 A GC52 Cable Terminal Box equipped with two connecting blocks is shown in the following illustration.

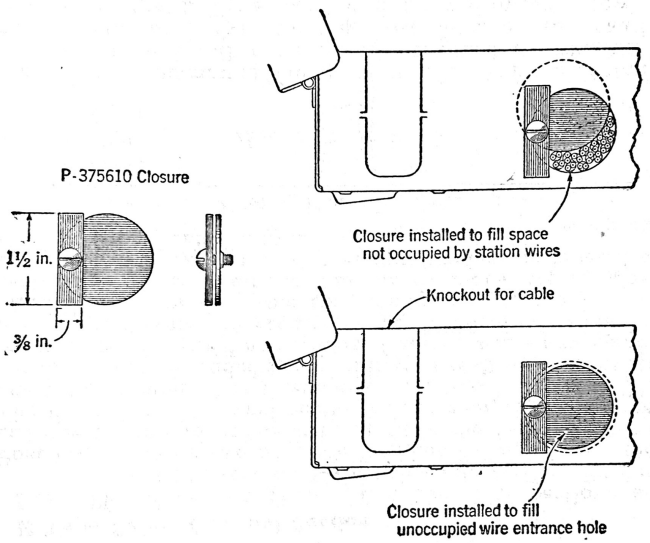
GC 51 CABLE TERMINAL
(Equipped with connecting blocks)



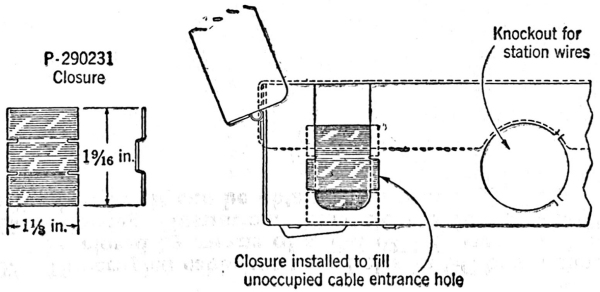
Closures for Cable and Wire Entrance Holes

5.06 The P-375610 Closure, one of which is furnished as a separate part with each GC box, should be installed as shown in the following illustration when a knockout removed for the station wires. In addition to being used as

an aid in keeping the terminal box clean by filling the space not occupied by the station wires, this closure may also be used to completely close the opening if the wires are removed from the box. The P-375610 Closure is also suitable for use in the wire entrance holes of the H Type Cable Terminal Section.



5.07 Unoccupied cable entrance holes in GC boxes should be closed by means of a P-290231 Closure as shown in the following illustration. This closure is not supplied with the box but it can be obtained on order.



H Type Cable Terminal Section

5.08 The H102 and H202 Cable Terminal Sections are designed to accommodate either two H Type Binding Post Chambers or two 82 Type Backboards or one chamber and one backboard of the sizes listed in the following table. The H303 Cable Terminal Section can be equipped with either one H303 Binding Post Chamber or one 82B Backboard. The backboards are intended for mounting 30 or 31 Type Connecting Blocks, G Type Binding Post Chambers and any special equipment that may be required at the terminal. Any number of H sections of the same size, together with two J (end) sections of corresponding size can be assembled and equipped to form a wall type cross-connecting terminal designated as the HJ Type Cable Terminal.

Sections	Binding Post Chambers	Backboards
H102	H51	82D
H202	H51, H76 or H101	82A
H303	H303	82B

5.09 The maximum number of 102 Type Adapters, equipped with connecting blocks, and also the maximum number of G Type Binding Post Chambers that can be mounted on the 82 Type Backboard is given in the following table. A typical installation of connecting blocks in the H section is illustrated in Paragraph 5.12. When the maximum number of G chambers is installed on a backboard, the two upper chambers should be mounted with the stub cables at the top and the two lower chambers with the stub cables at the bottom. The adjacent sides and ends of the chambers should abut each other with the fanning strips assembled on the outer sides of the chambers.

Backboards	Adapters	Connecting Blocks	Binding Post Chambers
82A	4-102D	4-30D	2-G26 or 1-G51 and 2-G16
82B	4-102D and 2-102C	4-30D or 4-31D and 2-30C or 2-31C	4-G26 or 4-G51
82D	2-102D	2-30D or 2-31D	2-G26 or 1-G51

5.10 To equip the H section with an H chamber, proceed as follows:

(1) Remove the top or bottom part of the section, depending upon whether the chamber is to be installed with the stub cable at the top or at the bottom. Where it is practicable, the stub of the chamber may be passed through the U-shaped opening in the top or bottom of the section without detaching this part.

(2) Remove the proper U-shaped knockout for the stub cable.

(3) Insert the two lower mounting screws for the chamber. These screws are furnished with the section. In the H202 section, the H51 and H76 chambers should be mounted in the position which will place the stub cable nipple nearest the U-shaped opening. Protect the stub cable at the point where it will pass through the U-shaped opening with wrappings of 3/4 in. Black Friction Tape or by means of lead sleeving.

(4) Rest the lower mounting slots of the chamber on these screws and adjust the chamber to its final position.

(5) Insert and tighten the two upper mounting screws.

(6) Tighten the two lower mounting screws.

(7) Support the stub cable temporarily until the splicing has been completed.

(8) Place any unused binding post chamber mounting screws in the unoccupied holes of the terminal section.

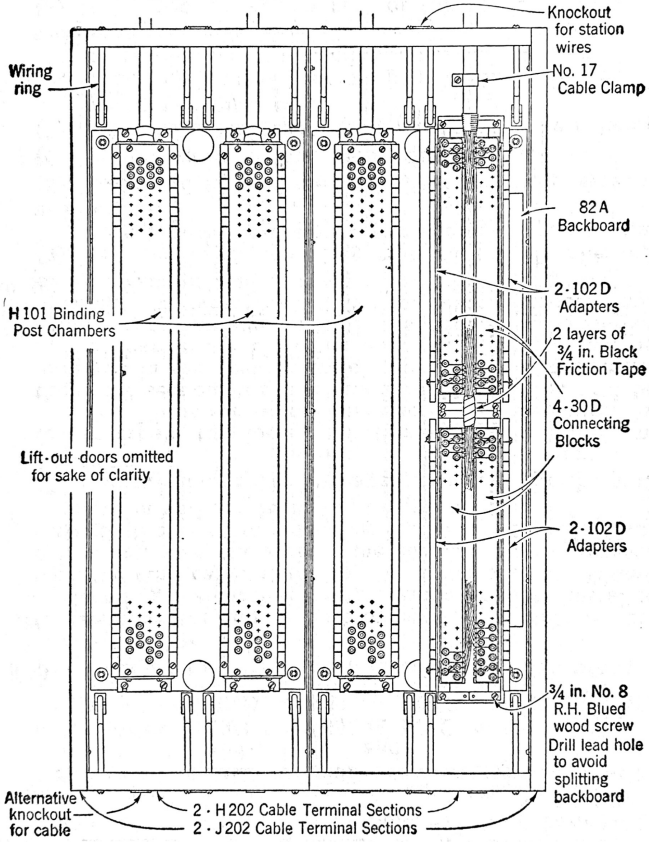
(9) If the top or bottom part of the section has been removed, replace this part and tighten the screws.

(10) Install the lift-out door.

5.11 Where an 82 Type Backboard is to be installed in the H section, attach it by means of the machine screws and washers supplied with the backboard, placing a washer under the head of each screw.

5.12 An HJ Type Cable Terminal equipped with binding post chambers, backboard, adapters and connecting blocks is shown in the following illustration.

HJ407 CABLE TERMINAL
(Equipped with binding post chambers and connecting blocks)



6. EQUIPPING FRAME TYPE TERMINAL

K606 Cable Terminal Section

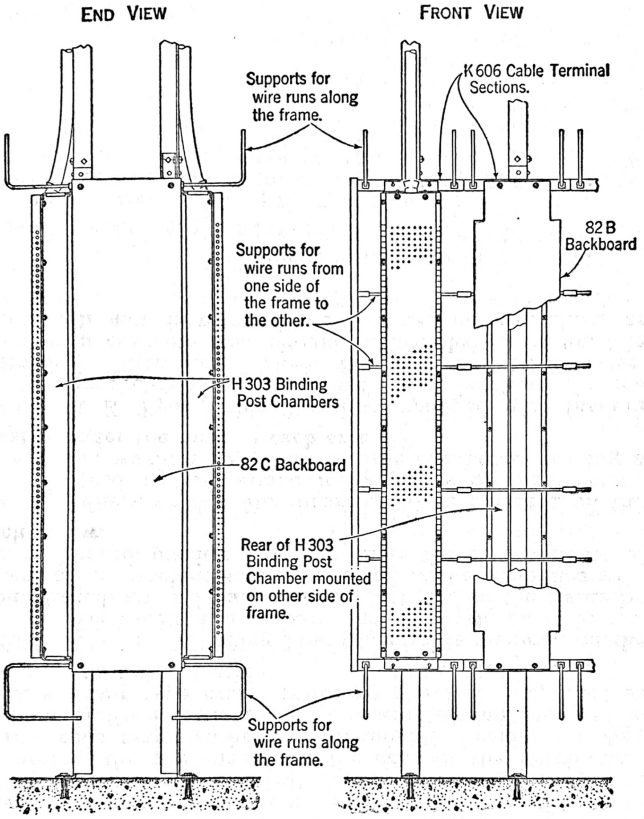
6.01 The K606 Cable Terminal Section is designed to accommodate either two H303 Binding Post Chambers or two 82B Backboards or one chamber and one backboard mounted back to back. The 82B Backboard is intended for mounting the equipment listed in Paragraph 5.09 or any special equipment that may be required at the terminal. The 82C Backboard, which is installed at each end of the frame to protect the workmen from the ends of the longitudinal wiring rods, may also be used for mounting equipment. Any number of K606 sections can be assembled and equipped to form a frame type cross-connecting terminal designated as the K Type Cable Terminal.

6.02 The H303 Binding Post Chamber is mounted on the K606 section in the same manner as in the H303 section. Attach an 82C Backboard at each end of the frame by means of the machine screws, nuts and washers supplied with the backboard, placing a washer under the head and nut of each screw.

6.03 Where an 82B Backboard is to be mounted on the K606 section, attach it by means of the machine screws and washers supplied with the backboard, placing a washer under the head of each screw.

6.04 A K Type Cable Terminal equipped with binding post chambers and a backboard is shown in the following illustration. Where the floor has been waterproofed, a concrete base should be installed as outlined in Paragraph 4.01 instead of the hammer drive anchors as shown.

K TYPE CABLE TERMINAL
(Equipped with binding post chambers and backboards)



7. EQUIPPING BUILT-IN TERMINAL CABINETS

7.01 Built-in terminal cabinets may be provided by building owners to house the cross-connecting terminal equipment. The anchoring devices required for attaching the terminal equipment to a wooden backboard, if this is pro-

vided, and to the metal backing of the cabinet are given in the following table. Where connecting blocks are to be installed in built-in cabinets, it is preferable to mount them on 102 Type Adapters. This arrangement requires fewer anchoring devices, avoids the need for sewing textile cable forms and requires somewhat less space than would be necessary if the blocks were mounted directly on a backboard or on the metal backing of the cabinet.

Equipment	Wooden Backboard (Wood Screws)	Metal Backing (*Self Tapping Screws)
G11, G16 and G26 Binding Post Chambers	4-3/4 in. No. 8 R.H. Blued	2-3/8 in. No. 8 R.H
G51 Binding Post Chamber	4-3/4 in. No. 8 R.H. Blued	4-3/8 in. No. 8 R.H.
H Type Binding Post Chamber	4-1 in. No. 10 R.H. Blued	4-3/8 in. No. 10 R.H
102 Type Adapter	2-3/4 in. No. 8 R.H. Blued	2-3/8 in. No. 8 R.H.
8A Distributing Ring	1-3/4 in. No. 8 R.H. Blued (Washer supplied with ring)	1-3/8 in. No. 8 R.H. (Washer supplied with ring)
4A, 4B and 4C Distributing Rings	2-3/4 in. No. 8 R.H. Blued	2-3/8 in No. 8 R.H.
Cable Clamps (Nos. 6, 7, 8 and 10)	1-3/4 in. No. 8 R.H. Blued	1-3/8 in No. 8 R.H.
Cable Clamps (Nos. 9, 11 and larger)	1-1 in. No. 10 R.H. Blued	1-3/8 in. No. 10 R.H.
Cable Clasp (No. 7)	1-3/4 in. No. 6 R.H. Blued	1-3/8 in. No. 6 R.H.
Cable Clasps (Nos. 9 and 14)	1-3/4 in. No. 8 R.H. Blued	1-3/8 in. No. 8 R.H.

*Parker-Kalon Type Z Self-Tapping Screws with plain steel finish or approved equivalent.

Drill hole for No. 6 Self-Tapping Screw with No. 31 or 1/8 in. Twist Drill.

Drill hole for No. 8 Self-Tapping Screw with No. 28 or 9/64 in. Twist Drill.

Drill hole for No. 10 Self-Tapping Screw with No. 22 or 5/32 in. Twist Drill.

Drill hole for unthreaded end of 8A Distributing Ring with No. 12 or 3/16 in. Twist Drill.

Where it is difficult to turn the self-tapping screw, use a larger drill.

7.02 The sizes of cable clamps and cable clasps required for the various sizes of cables are given in the following table:

Cables (Pairs)	Cable Clamps		Cable Clasps
	Chambers (Pulp Insulated Cables)	Chambers and Connecting Blocks (Textile Insulated and Inside Wiring Cables)	Connecting Blocks (Inside Wiring Cables)
11	No. 6	No. 6	*No. 7
16	No. 6	No. 7	*No. 9
26	No. 7	No. 8	*No. 9
51	No. 8	No. 13	No. 14
76	No. 10	No. 13	No. 14
101	No. 13	No. 17	—
152	—	No. 17	—
202	—	No. 21	—
303	No. 17	—	—

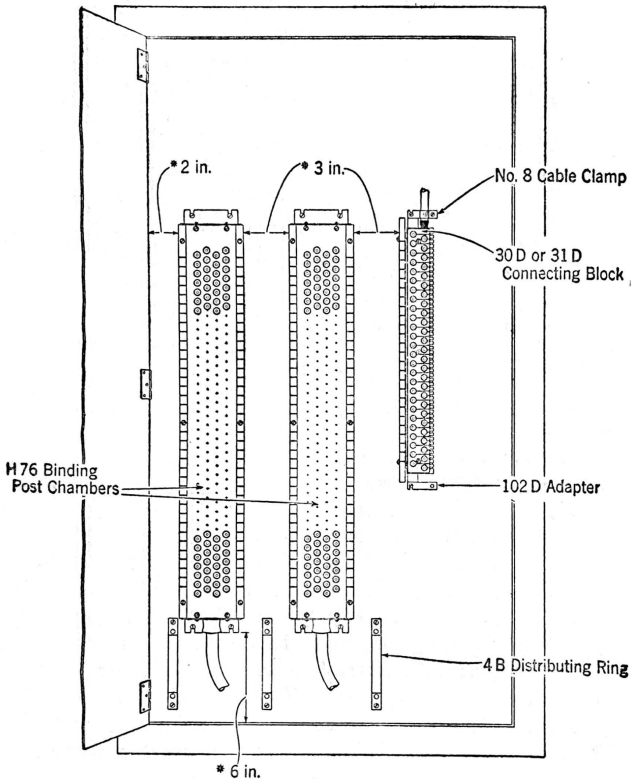
*Use a clamp for fastening cable to 102 Type Adapter.

7.03 The types of distributing rings required for the various sizes of terminals are given in the following table:

*Terminals	Distributing Rings
51-pair and smaller	8A
76-pair to 101-pair	4A
152-pair to 253-pair	4B
303-pair and larger	4C

*For intermediate sizes select next smaller size ring.

7.04 A typical installation of binding post chambers and a connecting block in a built-in terminal cabinet is shown in the following illustration.



* Minimum Dimensions