

Figure 1

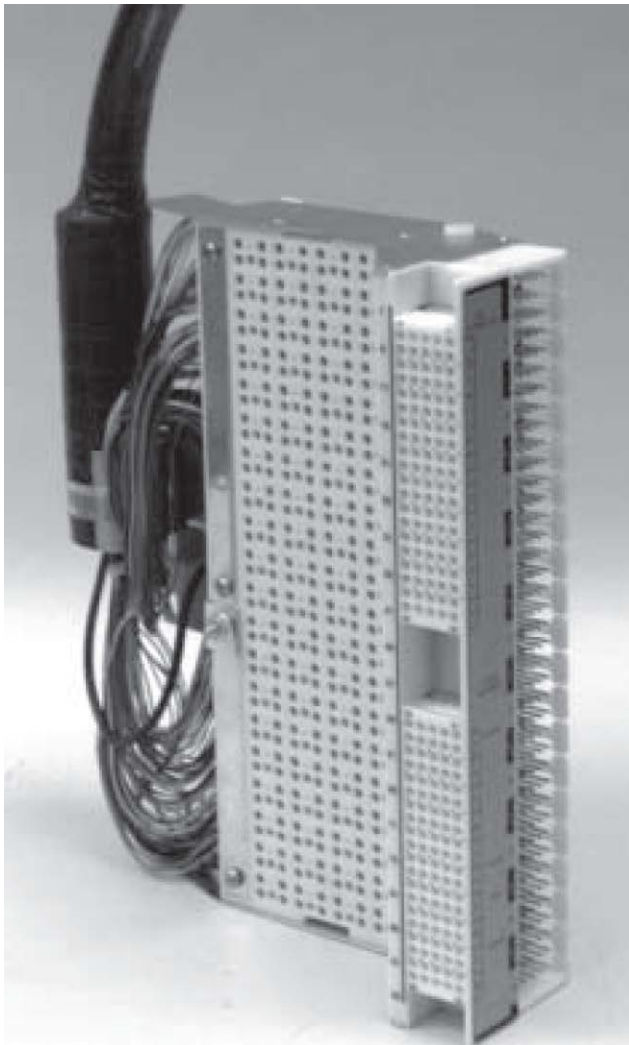


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1. General

- 1.1 This instruction provides installation information for both the C-390 (tin alloy plated contact receptacle) and the CG-390 (gold contact receptacles) Main Frame Connectors.
- 1.2 Unless otherwise noted, information in this document is valid for both types of connectors and will, therefore, be referenced as the C(G)-390 Main Frame Connector.
- 1.3 This document is being reissued to include updated corporate information.

2. Description

- 2.1 C(G)-390 Main Frame Connector (Figure 1) is a compact front angled 100-pair unit used to terminate Outside Plant (OP) cable in Central Office (CO) or customer premise locations. The C(G)-390 Main Frame Connector accommodates a variety of protector modules.
- 2.2 The C(G)-390 Main Frame Connector can be used without protection (straight-thru modules) if only the termination features are desired.
- 2.3 C(G)-390 Main Frame Connector features include facilities for:
 - Termination of OP cable pairs and CO jumpers.
 - Identification of incoming circuits.
 - Connection and disconnection of OP cable pairs from CO equipment.
 - Testing.

- 2.4 The connector mounting bar offers easy attachment to Main Distribution Frames (MDF's). The jumper terminal field is front-mounted for accessibility. The connector's design allows easy field conversion to isolated ground when required.
- 2.5 The compact size (Figure 2) of the C(G)-390 Main Frame Connector permits high pair density on the MDF. This results in a greater number of cable stubs per mounting bar. Pair density of the C(G)-390 is an important installation consideration because riser openings must be large enough to accommodate any additional cable stubs.
- 2.6 Stubbed C(G)-390 Main Frame Connectors can be ordered with either 22 or 24 AWG wire cable stubs. Cable stubs are fitted with a moisture dam plug.
- 2.7 During temperature changes, the breathing action of the cable may permit moisture to enter the cable sheath. To prevent this, a moisture dam plug is furnished with all cable stubs.



CAUTION: *These cables must not be under any pressurization.*

3. Precautions

- 3.1 **Storage.** If the C(G)-390 Main Frame Connectors are not to be installed immediately, store in a dry location. Do not leave units on loading docks or other outdoor locations.

NOTE: *Do not remove the connector, or the protector modules, from the packing carton until all preparations for installation on the MDF have been completed.*

- 3.2 **Unpacking.** To avoid damage to the connector base, protector modules or cable stub (if present), be careful when removing the C(G)-390 Main Frame Connector from the shipping carton.
- 3.3 **Handling Cable Stub (when present).** Do not bend the cable stub into a tight curve. Damage to the conductors inside the cable stub may result from undue stress. A 22-AWG 100-pair cable has an outside diameter of 1.3 inches and a minimum bending radius of 16 inches. A 24-AWG 100-pair cable has an outside diameter of 1.1 inches and a minimum bending radius of 13 inches.
- 3.4 When the C(G)-390 is mounted on the Distribution Frame, the front edge of the connector extends 7.5 inches from the mounting hole centers on the vertical mounting bar (Figure 2). The guardrail of the Frame must extend far enough into the aisle to prevent damage to the connector caused by ladders and other in-aisle equipment. The frame manufacturer should be

contacted for instructions to extend the guard rail if necessary.

- 3.5 When CO cable could possibly come in contact with power conductors of 300 volts (or more), the wires in the cable stub should be at least two gauges larger than the wires in the fusing link or entrance cable.
- 3.6 Use fuse link of least six feet (1.828 meters) or entrance cable of 24-gauge wire (or finer) with connectors stubbed with 22-gauge wire. Fuse link or entrance cable of 26-gauge wire is recommended for use with connectors stubbed with 24-gauge wire.
- 3.7 Use of fuse links insures that the cables stub does not open on severe high current power faults. In the event that a line is subjected to a sustained power fault, the current carrying capacity of the C(G)-390 Main Frame Connector is designed to exceed the current carrying capacity of 22-gauge copper wire.
- 3.8 The following precautions are included per requirement of the Underwriters Laboratories Inc.®:
 - National Electrical Code Requirements: The installation of this product, including any field installed components, shall meet all applicable federal, state, and local laws and regulations and, if unrestricted, comply with articles 800,820,830, and all other appropriate requirements of the National Electrical Code, ANSI/NFPA 70.
 - Only products marked "for indoor or outdoor use" or "for outdoor use" are suitable for outdoor use. Products without this marking are not suitable for outdoor use and are implied to be suitable for indoor use only.
 - The use of a fuse link for each and every line is recommended when connecting any equipment to the telephone circuit. For typical applications, a one-foot or longer length **fuse link** of a least two physical sizes **smaller** than the typical wire gauge in use within the circuit is recommended.
 - Should this product contain an integral fuse link, it is recommended that the **connection wire** be at least two physical sizes **larger** than the fuse link wire.
 - It is recommended that any components added to this product be both listed for the purpose and compatible.
 - Risk of electric shock-Protector is not to be used without the arrester assembly installed.

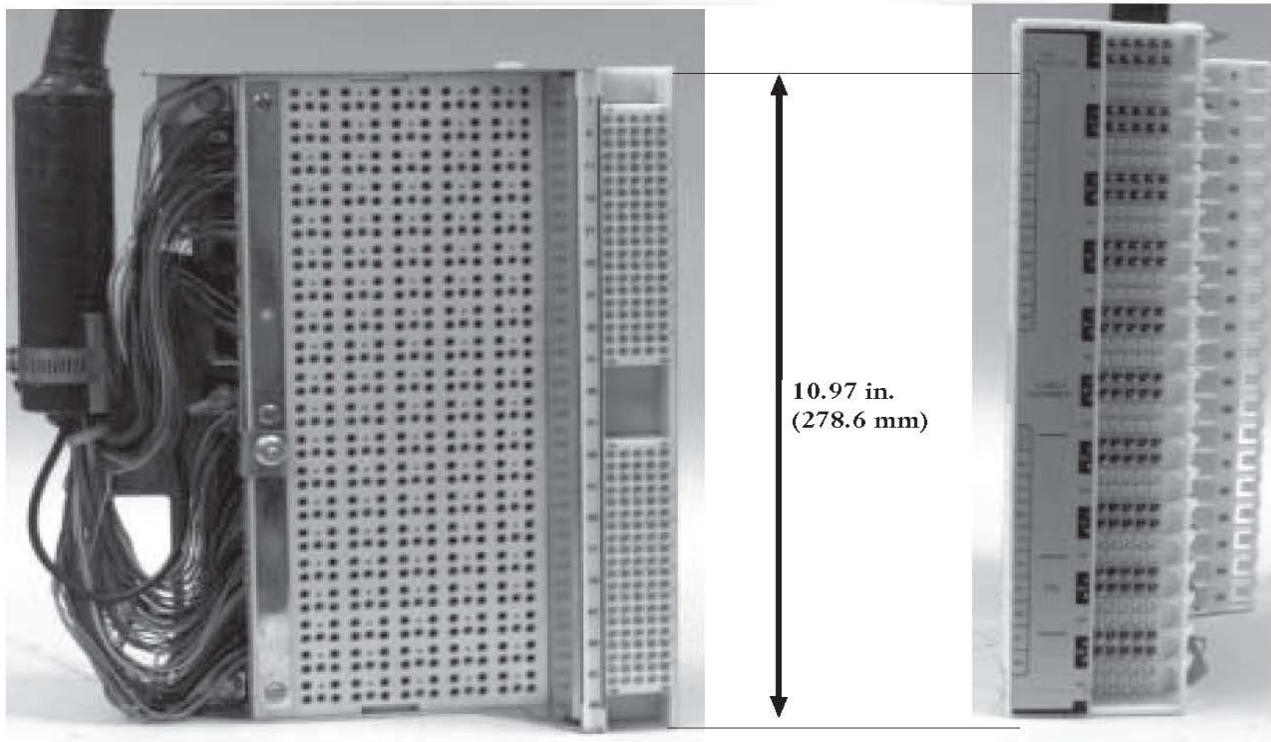
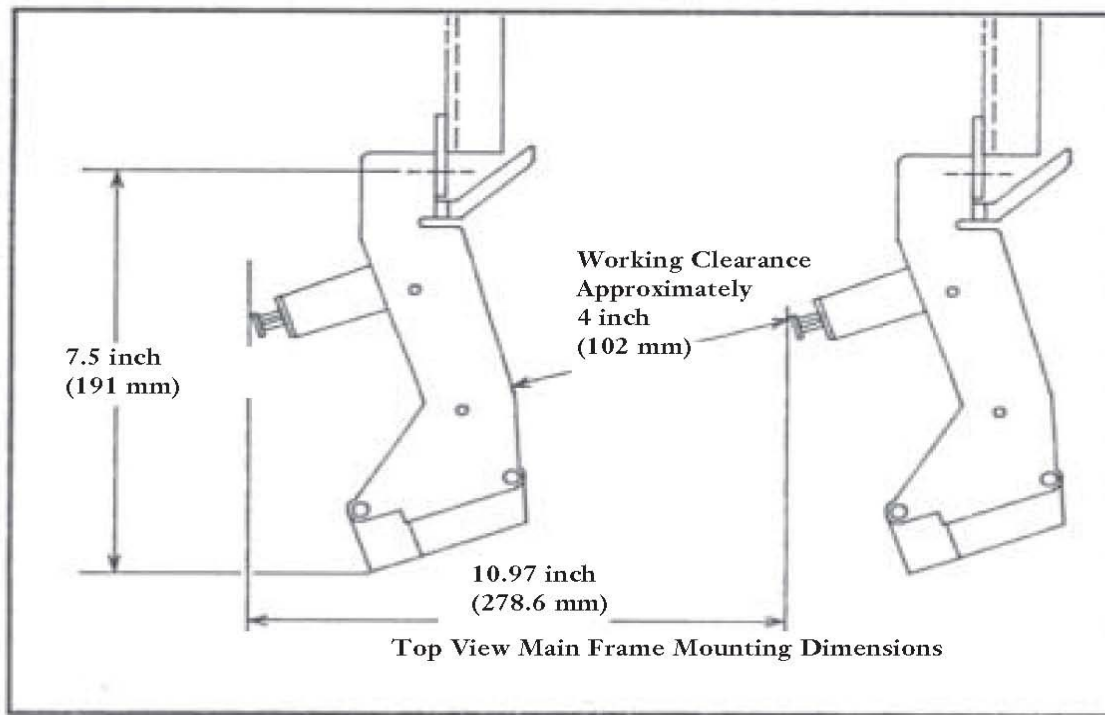


Figure 2

4. Installing Universal Mounting Bars (Standard "L" and "FW-9" Frames)

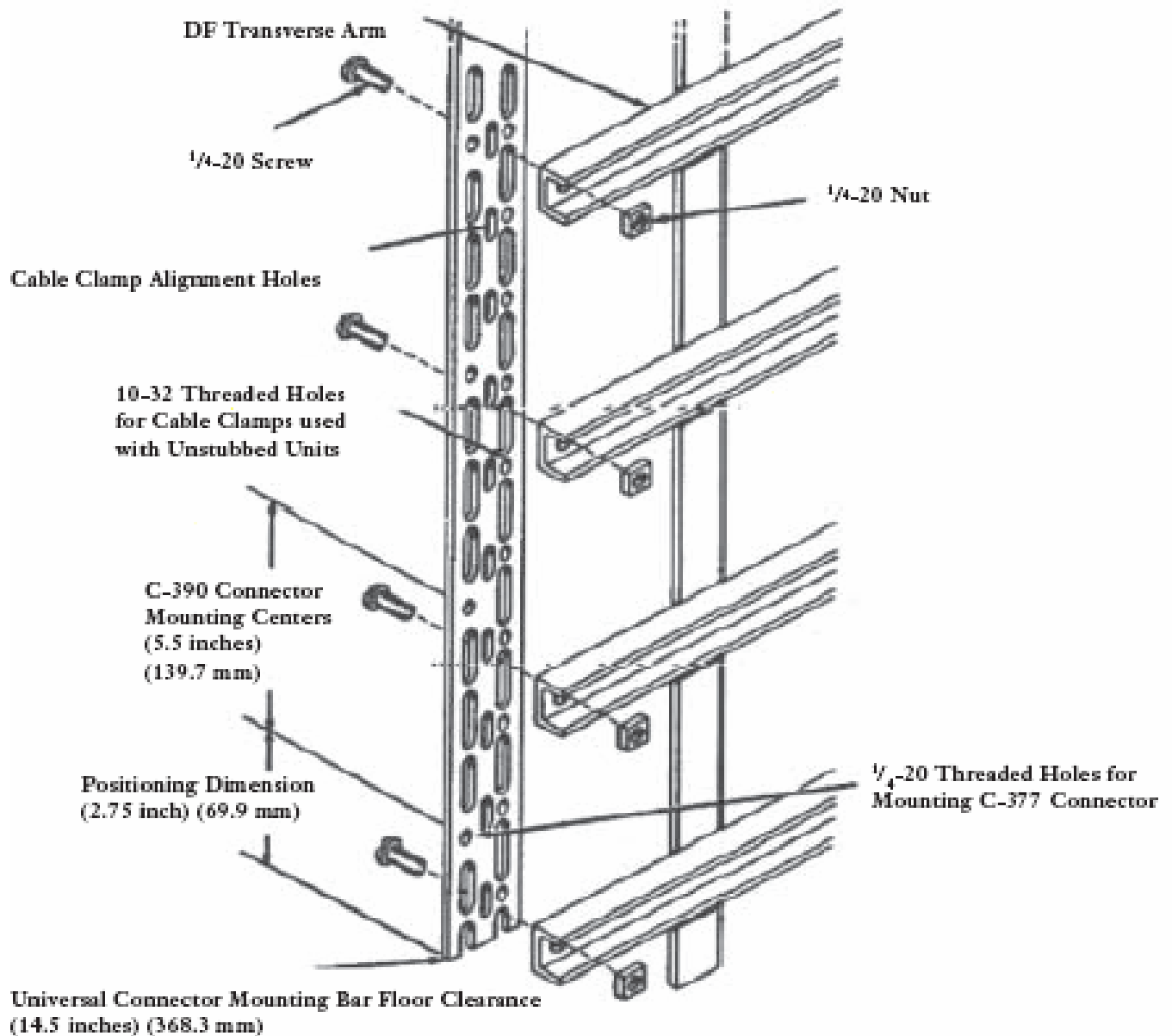


Figure 3

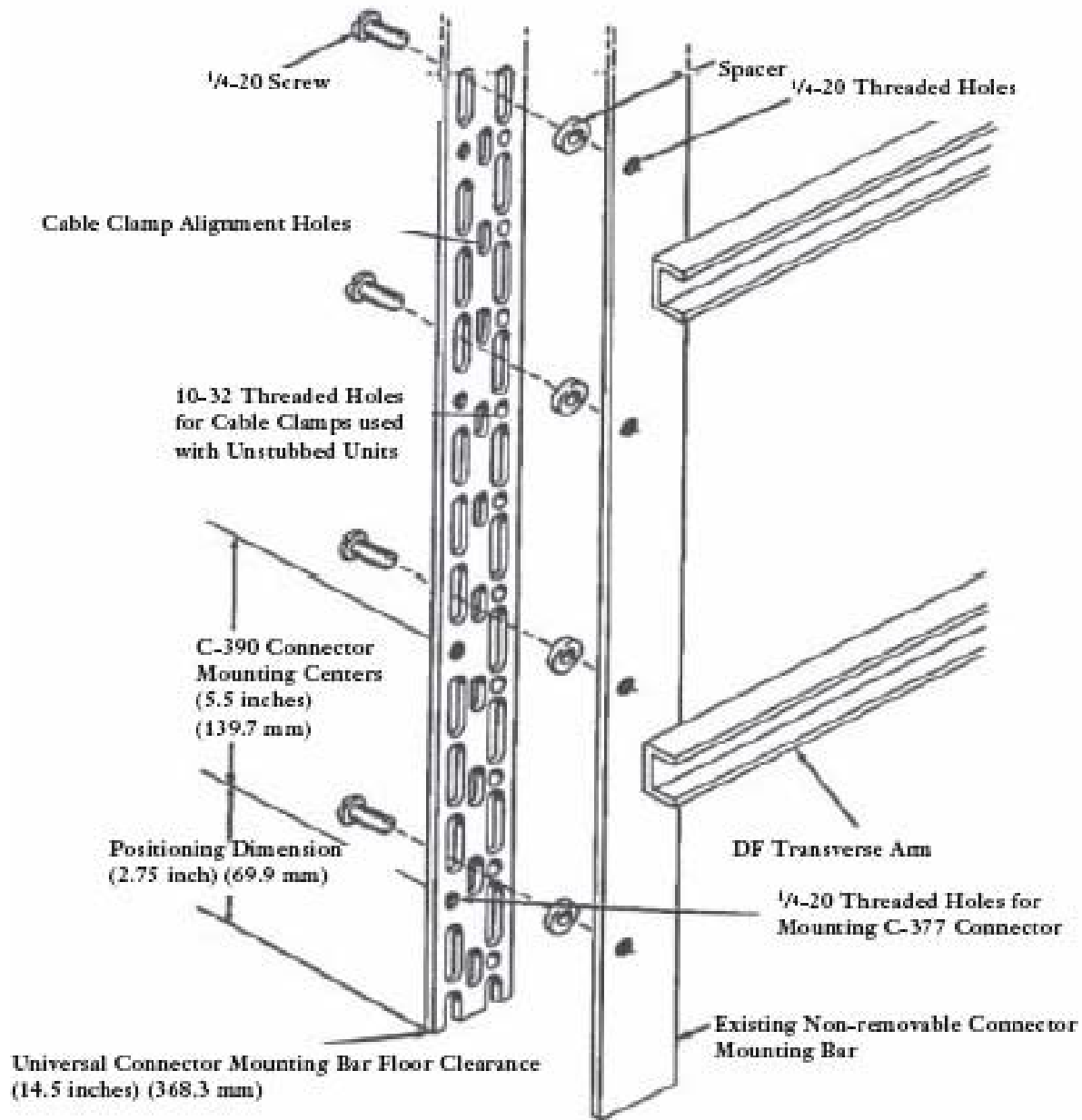


Figure 4

- 4.1 Use universal connector mounting bars when existing MDF connector mounting bars are not tapped to accommodate the C(G)-390 Main Frame Connector's compact mounting dimensions.
- 4.2 The mounting bars are slotted to permit alignment with standard "L" and "FW-9" frames. Mounting hardware required to attach the bars to the frame is supplied. Tapped holes are provided on 5 ½ inch- (139.7 mm) centers, properly spaced for C(G)-390 Main Frame Connector mounting. Provision is made for the cable stub mounting holes required for applications that call for mounting cable stubs to the frame. This is not required with the C(G)-390 connector.

NOTE: *Distribution Frames are provided with grids tapped to mount C(G)-390 Main Frame Connectors, thereby eliminating the need for connector mounting bars.*

- 4.3 The universal connector mounting bar is marked to indicate which end is to be located toward the top. Be sure that all mounting bars are installed correctly on the MDF so all connectors line up at the same height on the frame.
- 4.4 By attaching to the ends of the transverse arms, the universal connector mounting bar can be used in place of the existing bar on MDFs with removable mounting bars (Figure 3).
- 4.5 If the existing connector mounting bar cannot be removed, the universal mounting bar is bolted directly over the existing. The spacer washers (included with the mounting hardware) must be installed between the universal connector mounting bar and the non-removable bar to provide clearance for the tips of the connector mounting screws. The universal connector bar should not extend beyond the edge of the existing bar, if possible (Figure 4).

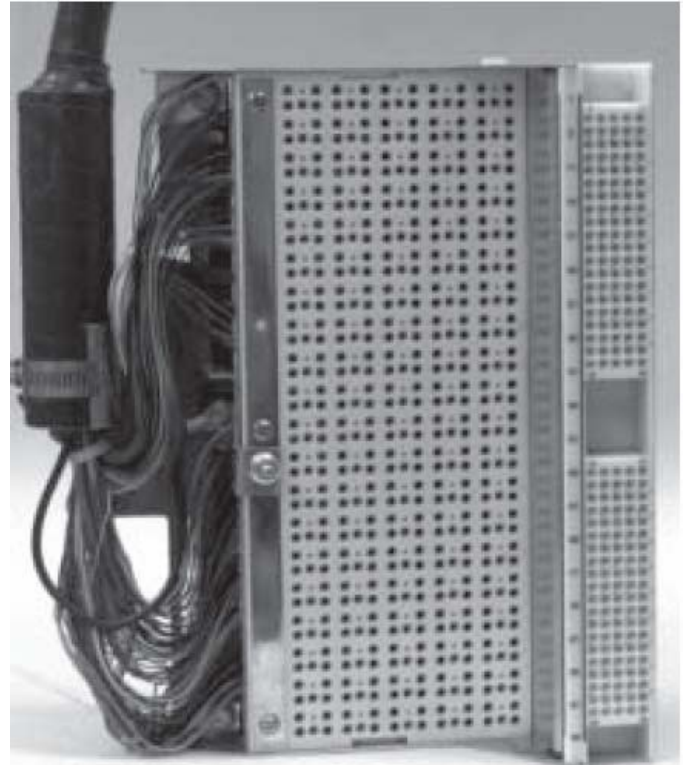


Figure 5

5. Changing Stub Position

CAUTION: *Be sure to handle the cable very carefully to avoid breaking the internal wires.*

Although the C(G)-390 Main Frame Connector may be ordered in the "stub-down" or "stub-up" position, it may be necessary to change. If this is the case, use the following procedure (Figure 5):

- Loosen the two screws attaching the cable stub bracket (the small bracket to which the moisture dam plug is attached with a hose clamp).
- Rotate the stub by lifting and turning it 180 degrees so that the outside screw slides into the slot on the opposite end of the bracket.
- Tighten the two screws.

6. Protector Modules

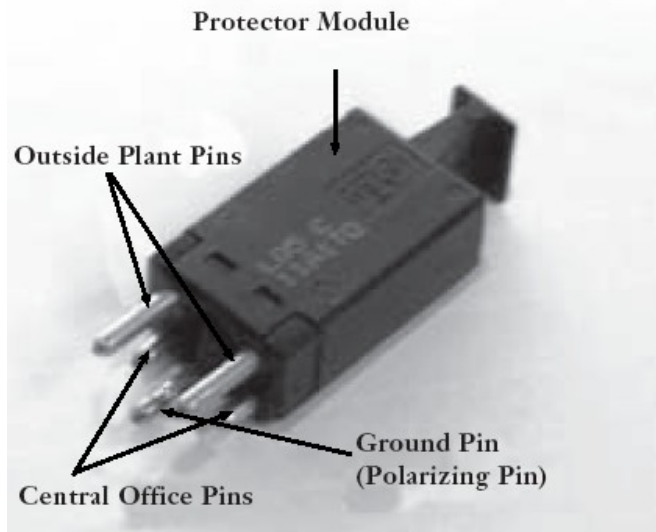


Figure 6

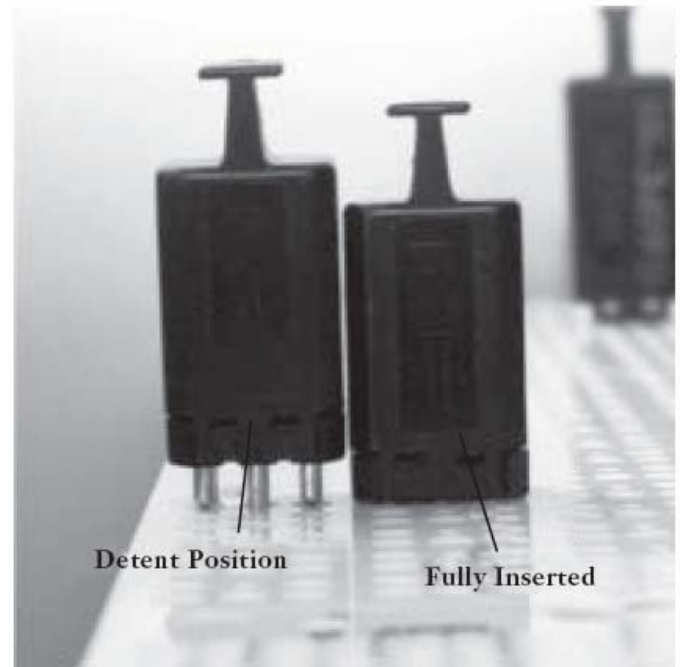


Figure 7

6.1 Several types of protector modules are available to satisfy various CO requirements for line and equipment protection. The protector modules are all equipped with five contact pins and a plastic shell (Figure 6). The plastic shell of the module is made from a self-extinguishing plastic insulating material.

6.2 When inserted into the connector base, the contact pins provide the following contacts for one cable pair:

- Tip and ring to OP (outside plant) conductors (long pins).
- Tip and ring to CO (central office) equipment (short pins).
- Ground, which also serves as a polarization pin.

6.3 When the protector modules are fully inserted (Figure 7) into the connector base, the OP equipment and the CO equipment are connected. The grounding pin is connected to provide continuity through the connector base mounting bar and interconnected ground straps to the copper ground bar at the base of the distributing frame.

6.4 During installation, the protector module, if installed, should be in the detent position (Figure 7). This keeps the CO equipment disconnected from the outside plant yet the outside plant provides protection for the OP pairs.

7. Installing C(G)-390 Connectors on the Main Distribution Frame

7.1 Stubbed and stubless connectors are installed differently.

7.1.1 A stubbed connector is attached to a mounting bar with two screws (Section 8).

7.1.2 A stubless connector is attached to temporary field stubbing brackets, which allows access to the back of the connector and stub are wired, the temporary bracket is removed.

7.2 Before you start, open the riser holes in the floor per local procedures. Remove any fanning strips from the MDF mounting bars involved in this installation. The C(G)-390 Main Frame Connector has fanning strips built into the connector base.

8. Installing of Stubbed C(G)-390 Connector

8.1 Mark the cable number and pair count on the connector cable stub. For stub-down, place the cable stub through the riser hole beneath the appropriate connector mounting bar. For stub up, place on overhead superstructure above the mounting bar.

NOTE: Typically, stub-down installation should start at the top of the frame and work downward. Stub-up should start at the bottom and work up.

8.2 Locate the two tapped holes on the left side of the mounting bar that will be used to mount the connector.

NOTE: *If access to the mounting screws is difficult, try using a short nut driver.*

8.3 Partially thread one of the two slotted hex head screws into the upper mounting hole of the MDF mounting bar. Slide the open slot in the upper portion of the connector mounting bar under the screw head. Line up the holes in the lower portion of the connector mounting bar with the MDF mounting bar; insert and thread the other slotted hex-head screw into the lower mounting hole. Tighten both screws.

8.4 Route all cable stubs against the transverse arms and other parts of the Distribution Frame to provide neat and orderly routing to the floor riser holes or

overhead superstructure. Lash cable stubs to the transverse arms, and other locations, if necessary.

8.5 For "stub-down" applications, seal the riser holes in the floor in accordance with the local practices.

8.6 Splicing Cable Stub to Entrance cable.

The cable stub is wires using standard cable wire color coding. Cable stub pairs can be matched to entrance cable pairs according to the color code information in Table 1.

8.6.1 The C(G)-390 Main Frame Connector is ready to be jumpered to the CO equipment. If protector modules are installed prior to jumpering, leave in the detent position. This will prevent line faults from appearing on the CO jumper terminals during the jumpering process.

Cable pair group	Binder color	Cable pair subgroup	Tip wire color	Ring wire color (for each tip wire color)
1 - 25	Blue	1 - 5	White	1st wire -blue
		6 - 10	Red	2nd wire-orange
		11 - 15	Black	3rd wire-green
		16 - 20	Yellow	4th wire-brown
		21 - 25	Violet	5th wire-slate
26 - 50	Orange	26 - 30	White	1st wire -blue
		31 - 35	Red	2nd wire-orange
		36 - 40	Black	3rd wire-green
		41 - 45	Yellow	4th wire-brown
		46 - 50	Violet	5th wire-slate
51 - 75	Green	51 - 55	White	1st wire -blue
		56 - 60	Red	2nd wire-orange
		61 - 65	Black	3rd wire-green
		66 - 70	Yellow	4th wire-brow
		71 - 75	Violet	5th wire-slate
76 - 100	Brown	76 - 80	White	1st wire -blue
		81 - 85	Red	2nd wire-orange
		86 - 90	Black	3rd wire-green
		91 - 95	Yellow	4th wire-brown
		96 - 100	Violet	5th wire-slate

Table 1

9. Installation of a Stubless C(G)-390 Connector

- 9.1 Remove the two hex-head screws and separate the connector mounting bracket from the connector.
- 9.2 Locate the cable stub wired with standard color-coded cable and formed with moisture dam plug and shield ground wire. Route the cable stub to the proper position on the frame. Use locally approved procedures for cable grounding and moisture sealing.

NOTE: *Cable pairs for terminal connection should be approximately 24 inches (609.6mm) long, or as long as necessary to insure pair identification.*



Figure 8

- 9.3 Attach the small cable stub bracket to the connector mounting bracket removed from the connector (Figure 8). Take care to orient the stub and bracket for stub-up or-down installation.
- 9.4 Locate the two tapped holes on the MDF connector mounting bar for mounting the C(G)-390 Main Frame Connector. From the left side of the connector mounting bar, partially thread one of the 1/4-20 or 12-24 slotted hex head screws into the upper mounting hole.

NOTE: If the MDF does not provide properly spaced mounting holes, use universal mounting bars attached to the existing frame. (If the mounting bar is not accessible, drill holes at proper spacing)

- 9.5 Position the C(G)-390 connector mounting bracket at the left side of the MDF mounting bar and slide the open upper slot the connector mounting bar under the head of the previously installed screw. Line up the lower hole at the connector mounting bar with the lower hole of the MDF mounting bar and thread the other slotted head hex screws into the lower hole. Tighten both screws.



Figure 9

- 9.6 Attach the cable stub to the small bracket with the hose clamp provided (Figure 9).
- 9.7 Separate, identify and mark the four 25-pair color binder groups of the cable stub. To allow for a dress loop, tie each binder group with a cable tie approximately 9 inches (228.6mm) from the moisture dam plug (Figure 9).
- 9.8 Separate each binder group into tracer groups following standard cable wire color coding. If desired, use fanning strip to temporarily dress each tracer group.

- 9.9 Mount the temporary mounting brackets (in mounting kit provided) to the connector mounting bar using the two 1/4-20 screws removed earlier (Figure 10 insert).
- 9.10 Mount the C(G)-390 connector temporary mounting brackets to the main distributing frame using two 1/4-20 screws at top and bottom.

NOTE: *This provides a strain relief for the wires and provides an additional length of wire if repair becomes necessary.*

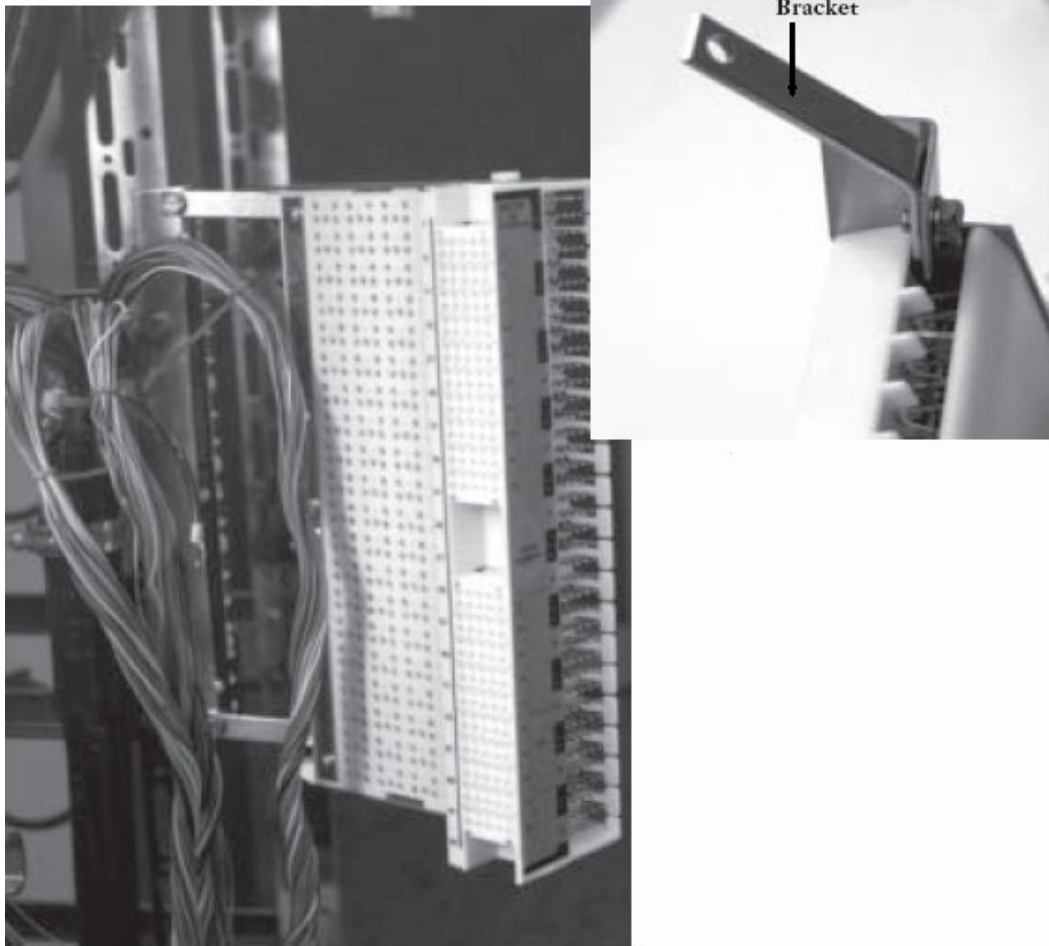
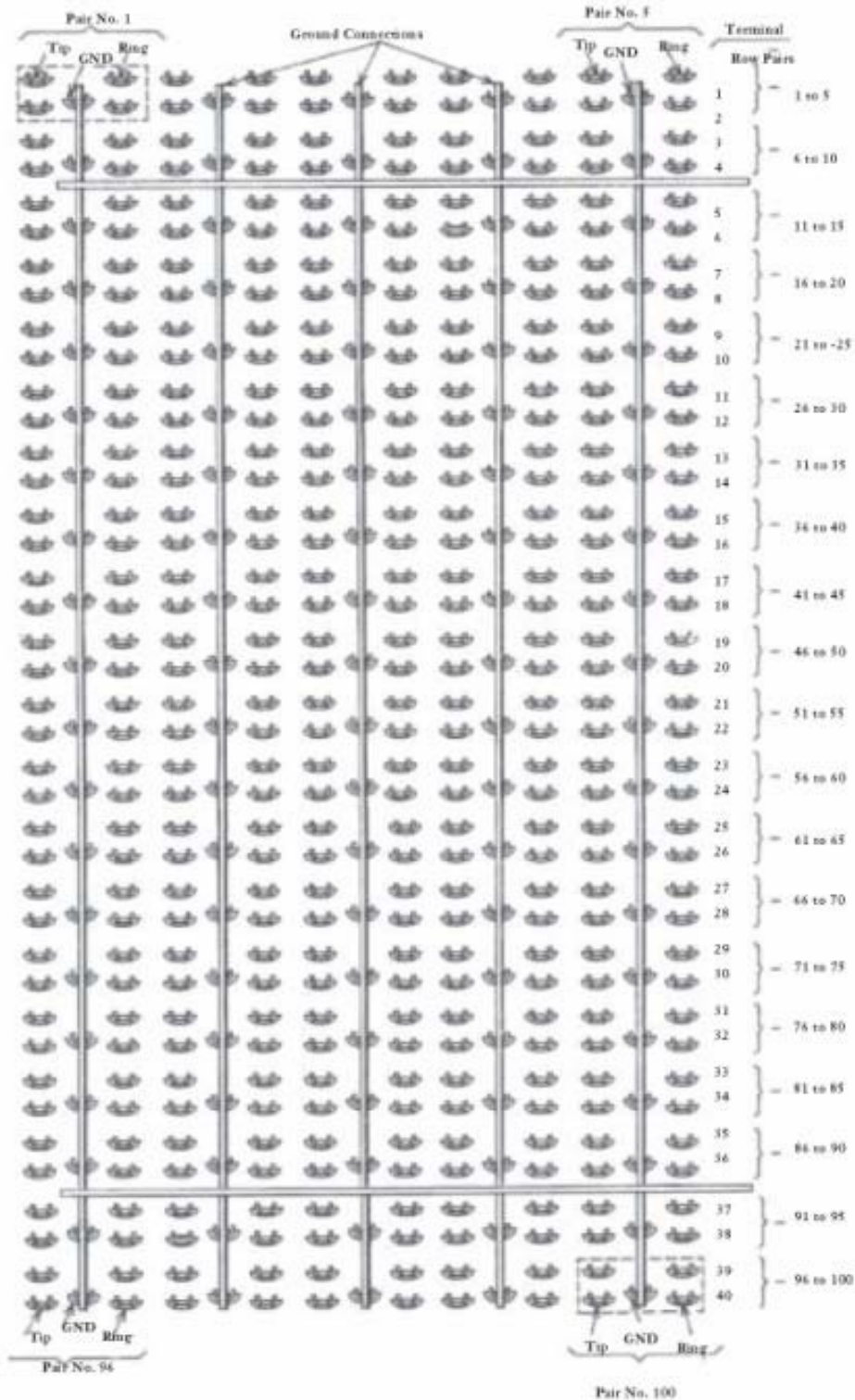


Figure 10

NOTE: *OP jumper field is to be connected at odd-numbered terminals only.
Even numbered terminal rows are factory connected to CO jumper field (no further connection required).*



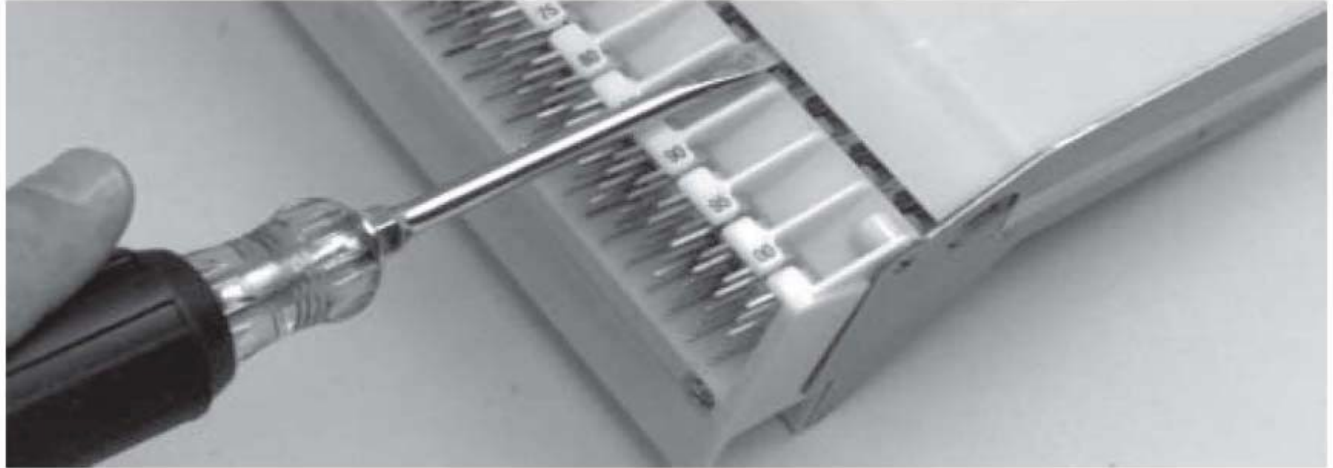


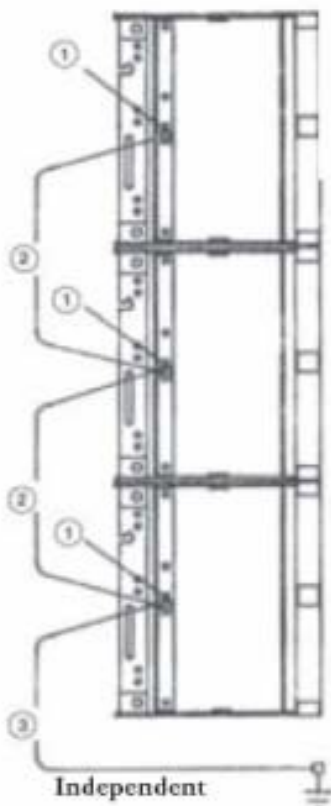
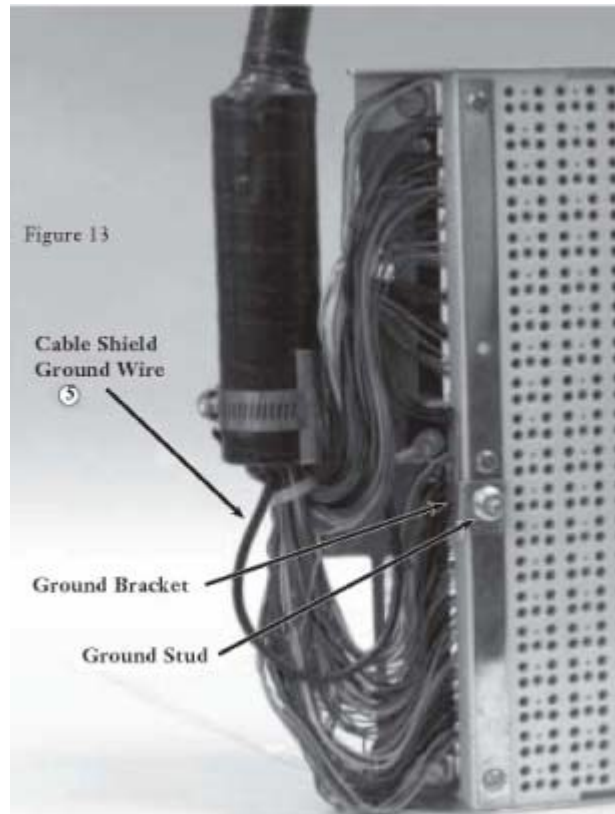
Figure 12

- 9.11 Remove the back cover from the C(G)-390 Main Frame Connector with a screwdriver (Figure 12). Using the vertical row of plastic barriers extending out along the right of the OP terminal fields as a guide, dress each 5-pair group of wires to its appropriate row of OP terminals. Wire-wrap each pair of wires to their respective OP terminal pins using Figure 11 and Table 1.

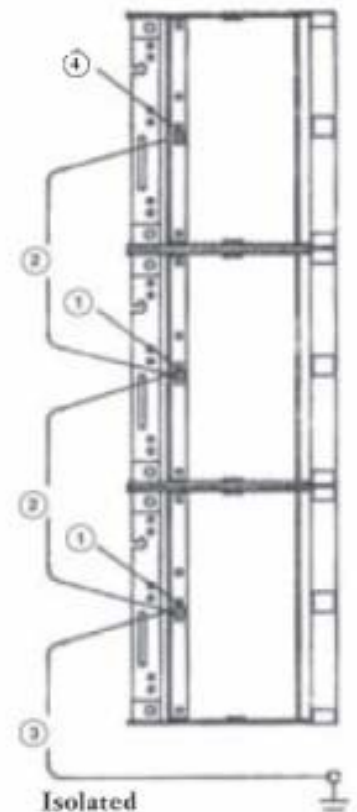
NOTE: *The OP terminal pins are located in the odd-numbered rows, 1,3,5 etc. Pairs are numbered 1-5 from left to right, five pairs per row. The pin on the left is for the tip connection; the pin on the right, the ring connection. The even connections to the CO jumper field.*

- 9.12 After all OP terminal connections are made, install the back cover on the OP terminal field. To install, position the cover vertically with the molded "hooked" edge of the cover towards the rear of the connector. Engage the hooked edge onto the tips at the rear of the two ground bars.
- 9.13 Remove the C(G)-390 connector from the temporary field stubbing brackets.
- 9.14 Remove the temporary field stubbing brackets from the C(G)-390 mounting bar.
- 9.15 Remount the C(G)-390 connector onto its mounting bar using two ¼-20 screws at top and bottom.
- 9.16 Route all cable stubs against the transverse arms and other parts of the Main Distribution Frame to provide a neat and orderly routing to the floor riser holes or overhead superstructure. Lash cable stubs to the transverse arms, and other locations, if necessary.
- 9.17 For "stub-down" applications, seal the riser holes in the floor in accordance with local practices.

10. Grounding



- ① For independent ground, do not remove ground bracket.
- ② Interconnector ground strap (023-7712, supplied) connects between ground studs of vertically adjacent connectors.
- ③ Long ground strap (689-0955, not supplied) connects between ground stud of last connector and ground bar.
- ④ For isolated ground, remove the ground bracket.
- ⑤ Cable shield ground wire may be connected as shown or to connector ground stud.



10.1 The C(G)-390 Connector can be grounded in a variety of ways. The two most recommended methods are independent and isolated (Figure 13).

10.2 Independent Grounding. C(G)-390

Connectors purchased with stubs are configured for independent grounding. A ground bracket is connected from the connector ground stud to the mounting bar. The cable ground strap is also connected to the mounting bar.

10.2.1 A ground path may also be established for vertically adjacent connectors. This is accomplished by attaching an 11-inch ground strap (supplied with C-390 Connectors) to connector ground studs of adjoining (vertical) connectors.

10.2.2 To complete the ground path on each vertical, attach a No. 689-0955 ground strap (not supplied) to the MDF ground bar (at either the top or bottom) and the ground stud of the top (or bottom connector).

10.2.3 The No. 689-0955 ground strap is a 28-inch (711.2mm) long, solid core conductor. Accessory ground straps of various lengths are available from Siecor.

10.3 Isolated Grounding Method. Isolated grounding of the C(G)-390 Connector is accomplished as follows (Figure 13):

- Remove the ground bracket connected to the connector ground stud and mounting bar.
- Establish protector ground path for vertically adjacent C(G)-390 Connectors as described in Section 10.2. Be sure to start with either the top or bottom connector of each vertical.

10.3.1 Make sure to use the supplied washers on the connector ground stud to separate the captive nut and the connector ground bus from the ground strap lugs. The locknut and washers reduce the likelihood of loose connections that might be caused by movement of the ground straps.

NOTE: *Local requirements may dictate a connection between the cable shield ground and the protector ground stud when an isolated grounding method is used. The cable shield ground may be removed from the mounting bar and attached to the connector grounding stud. Washers should be used to separate the locknut and connector ground bus from the ground strap lugs as described above.*

10.3.2 To complete the ground path on each vertical, attach a No. 689-0955 ground strap (not supplied) to the MDF ground bar and the ground stud of the nearest connector.

11. Marking & Jumping

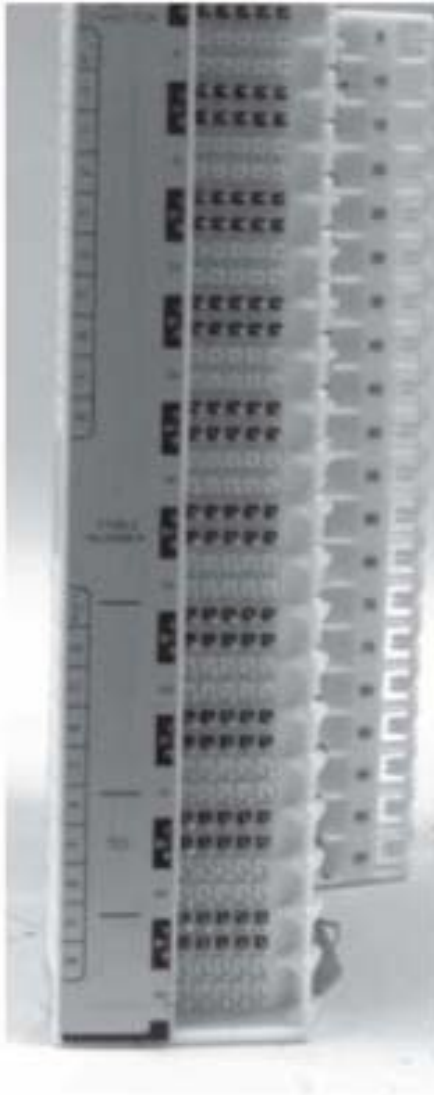


Figure 14

11.1 Space to mark the cable number and connector pair count are provided on the connector front, to the left of the CO jumper terminal field (Figure 14).

11.2 The CO jumper terminal wire-wrap field is located on the front of the connector. Terminal numbers are marked 1 and 5 at the top; 96 and 100 at the bottom. There is a number for every five terminal pairs, 5, 10, 15, etc., along the right side of the jumper field. The terminal pins provide a straightforward access for wire-wrap tools.

NOTE: The upper pin of terminal pairs is the tip connection the lower pin is the ring connection.

11.3 Two fanning strips are provided for routing of the CO jumper wires. One fanning strip is at the right front edge of the connector, to the right of the jumper terminal field. A second fanning either closed or slotted, is at the right rear of the connector base. Fanning strips facilitate jumper running by permitting jumper wires to fed through the openings.

11.4 Use both the rear and front fanning strip openings that line up with the row of jumper terminal pins at which the jumper pair terminates. This insures neat and orderly routing of jumper wires.

11.5 The recommended jumpering procedure is:



Figure 15

- Insert five pairs of jumper wires into the rear fanning strip opening. If using the slotted fanning strip, dress the wires above or below the "lock" fingers to ensure the wires do not pull back out through the slotted opening (Figure 15).
- Bring the first pair forward and dress each wire along the bottom of the appropriate row of terminals, and wire-wrap to the respective terminal pins. Repeat for each remaining jumper pair.
- Dress the slack to the rear of the connectors so that jumper pairs run neatly from the terminal field across the connector backplane.

12. Connecting Central Office and Outside Plant Pairs.

Push each protector module into the fully inserted position from the detent position. The outside plant and central office are then connected. This completes the installation procedure.

13. Testing

- 13.1 The C(G)-390 Connector has an angled test field located to the right of the protector field. This test field is divided into two fifty-pair groups of gold-plated test filed contacts, top and bottom, for access to the outside Plant pairs. The test field is designed to accommodate standard test equipment.
- 13.2 Test points are connected internally to the OP terminal fields pins, and subsequently, to the outside plant cable, with a separate connection for the tip and ring of each pair. Every five terminal pairs are marked in black, 1,6,11, etc., along the right edge of the test field. Terminal pairs are numbered from left to right (5,4,3,2,1). The upper pin of the pair is the tip connection; the lower pin is the ring connection (Figure 16).
- 13.3 Protector modules may be placed in the detent position while testing is in process. In this position, the Central Office is disconnected from the Outside Plant, but protection is still provided to the OP pairs. If testing is done from the test field location, be sure that the test voltages used do not exceed the protector module breakdown voltage.

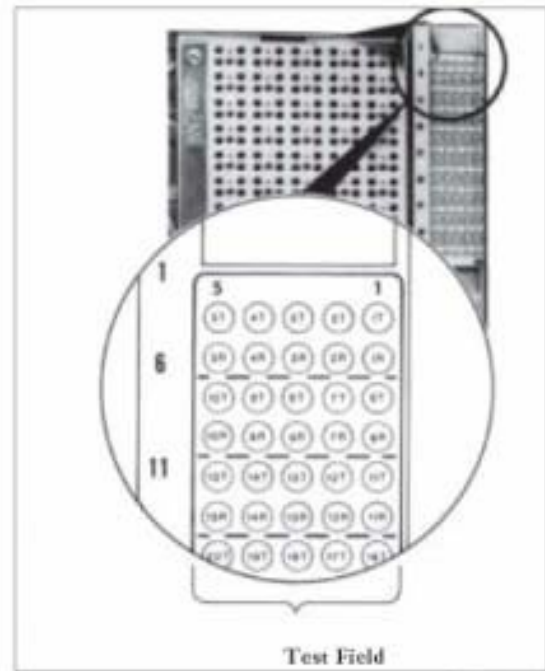


Figure 16