

112A KEY EQUIPMENT

SAGE-INSTALLATION

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1.00 INTRODUCTION

1.01 This section covers the installation of the station equipment of the 112A key equipment. It includes information about equipment directly associated with customer-owned operating consoles, maintenance consoles, command-post consoles, and apparatus cases. Information is provided about designation strips and miniature connectors that are used with this equipment.

1.02 This practice has been reissued to include detailed cabling information on a number of customer-owned consoles that were not included in issue 1.

1.03 Due to extensive changes marginal arrows have been omitted.

2.00 GENERAL

2.01 The connecting information for installing station equipment in consoles or apparatus cases is shown on the station systems circuit drawings.

2.02 Information is not included in this section on the following equipment which may be associated with the 112A key equipment:

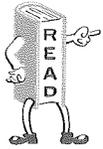
- Regular telephone sets, loudspeakers, amplifiers, power supplies, lamps, keys, and similar equipment primarily designed for general telephone use.
- Relay equipment.
- Equipment such as the radio patch and test, radio supervisory, radio monitor, and tactical channel assignment panels.

2.03 When installing cables and equipment in customer-owned consoles:

- The customer should remove or supervise the removal of panels or covers, as required.

THINK → *Extreme care should be taken to avoid contact with hazardous voltages when working in customer-owned consoles and cabinets.*

Note: The front and rear panels of operating consoles are equipped with interlock switches which operate when a panel is removed. The switch operation automatically cuts off the high voltage within the console. Side panels cannot be dismantled until either the front or rear panel has been removed.



Commercial power to convenience outlets and trouble lamps remains on within the console. A **cheater** switch has been provided in the interlock circuit. Accidental operation of this switch must be avoided.

- Cables and equipment should be placed in the locations specified for them in order to

furnish the required clearance from customer-owned equipment.

- Only specified attachments should be used. Console assembly of equipment groups including cable, screws, and clamps are provided by the Western Electric Company. Brackets and cases are furnished as part of the console.

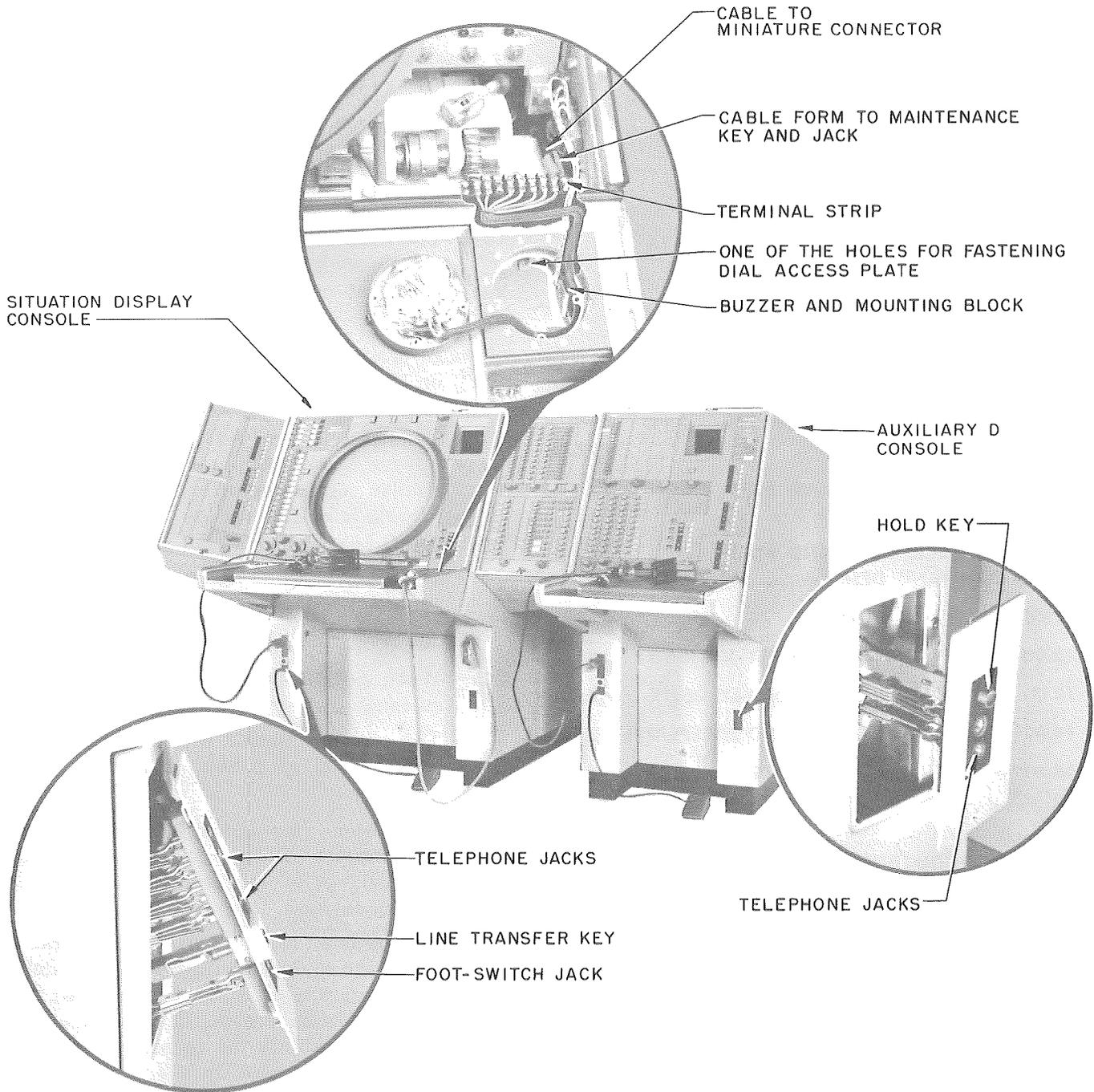


Fig. 1 – Situation Display and Auxiliary D Consoles

- Procedures similar to those outlined here should be followed for all customer-owned consoles not covered in this section.

WARNING: High voltage may be present in consoles.

3.00 CONSOLE, SITUATION DISPLAY

- 3.01 Telephone equipment installed in situation display consoles must be located as shown

in Fig. 1 through 8.

- 3.02 Faceplates snap on the key units. If faceplates do not fit into the space provided or are not easily removed, the customer should adjust the filler plate or molding strip to provide the proper space.

- 3.03 The buzzer is fastened to the mounting with two 6-32 by 3/8 RHMS, and the mounting is fastened to the console with two 6-32 by 9/16 RHMS.

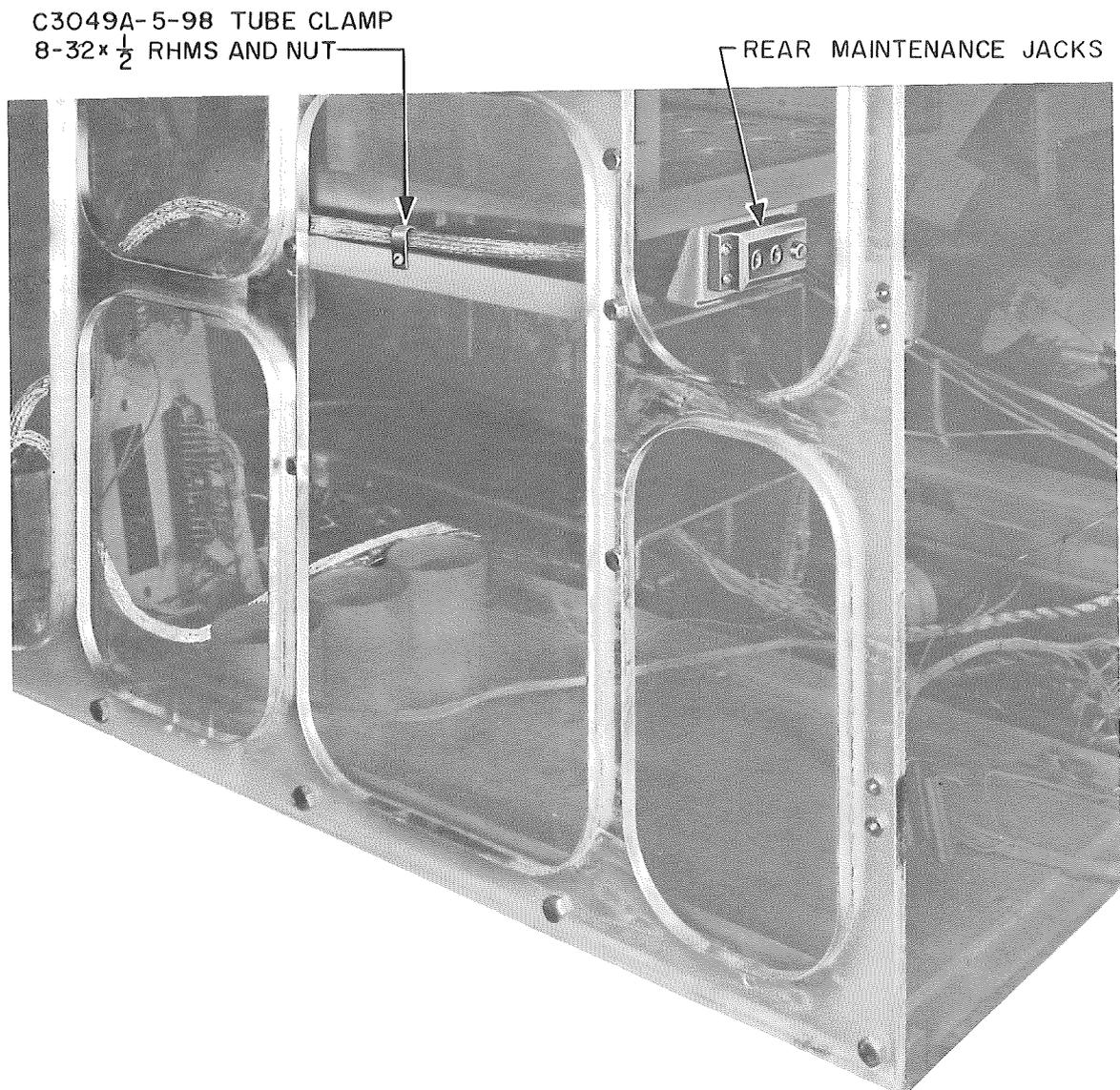


Fig. 2 — Mounting Arrangement of Maintenance Line Equipment in Rear of Situation Display Console

SECTION 480-510-200

3.04 To remove dial (Fig. 1) :

- Remove bottom access plate (two screws).
- Remove the three dial mounting screws which are accessible from below.
- Lift out dial.

3.05 Jacks and jack mountings are placed as shown in Fig. 1. The jacks in the front legs

of the consoles are mounted on a coverplate which may be removed from the front. This provides access to the jacks without having to remove the side panel of the console.

3.06 Cables must be placed in situation display consoles as shown in Fig. 2 through 8.

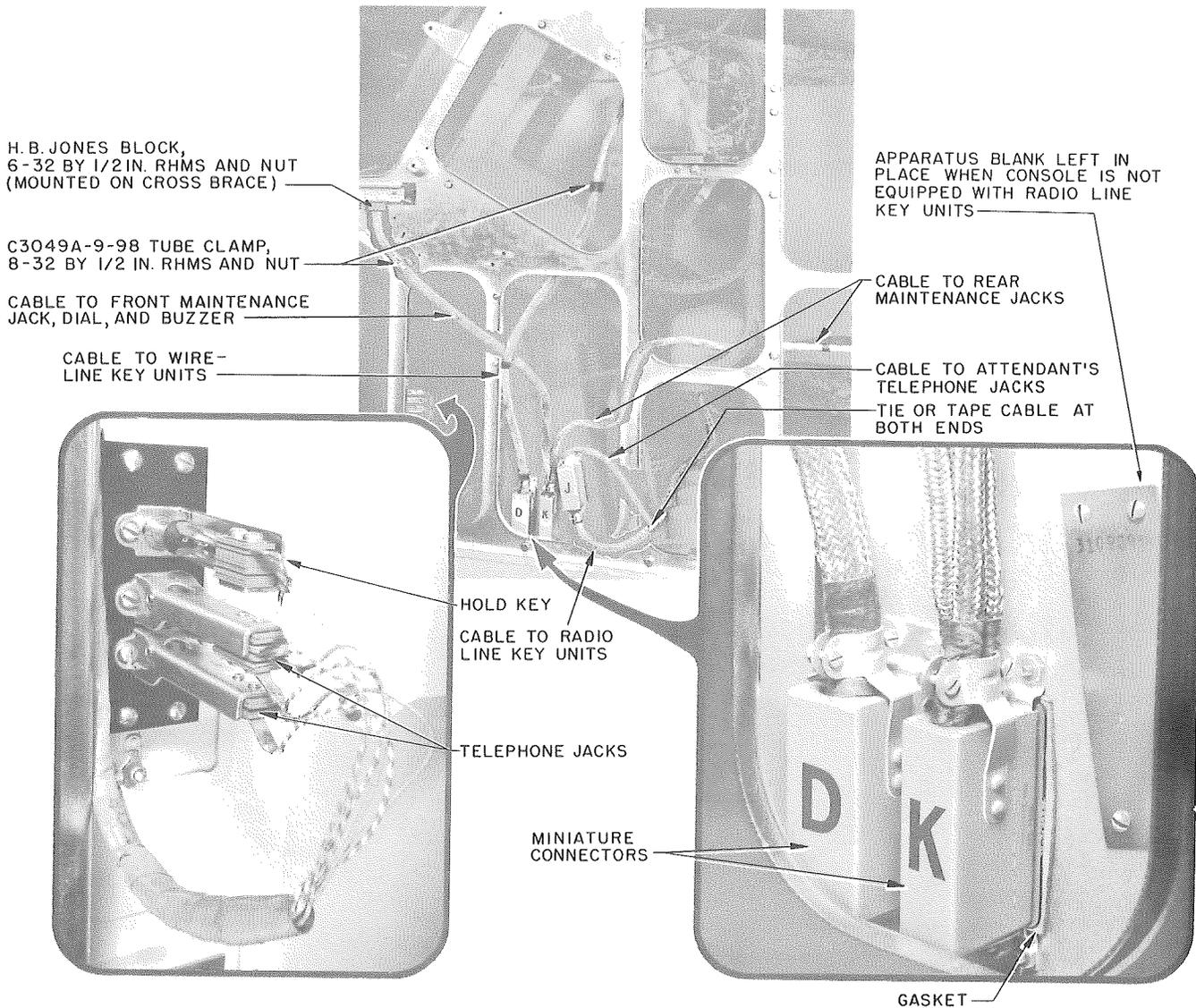


Fig. 3 – Mounting Arrangement of Cables in Situation Display Console, Right Side

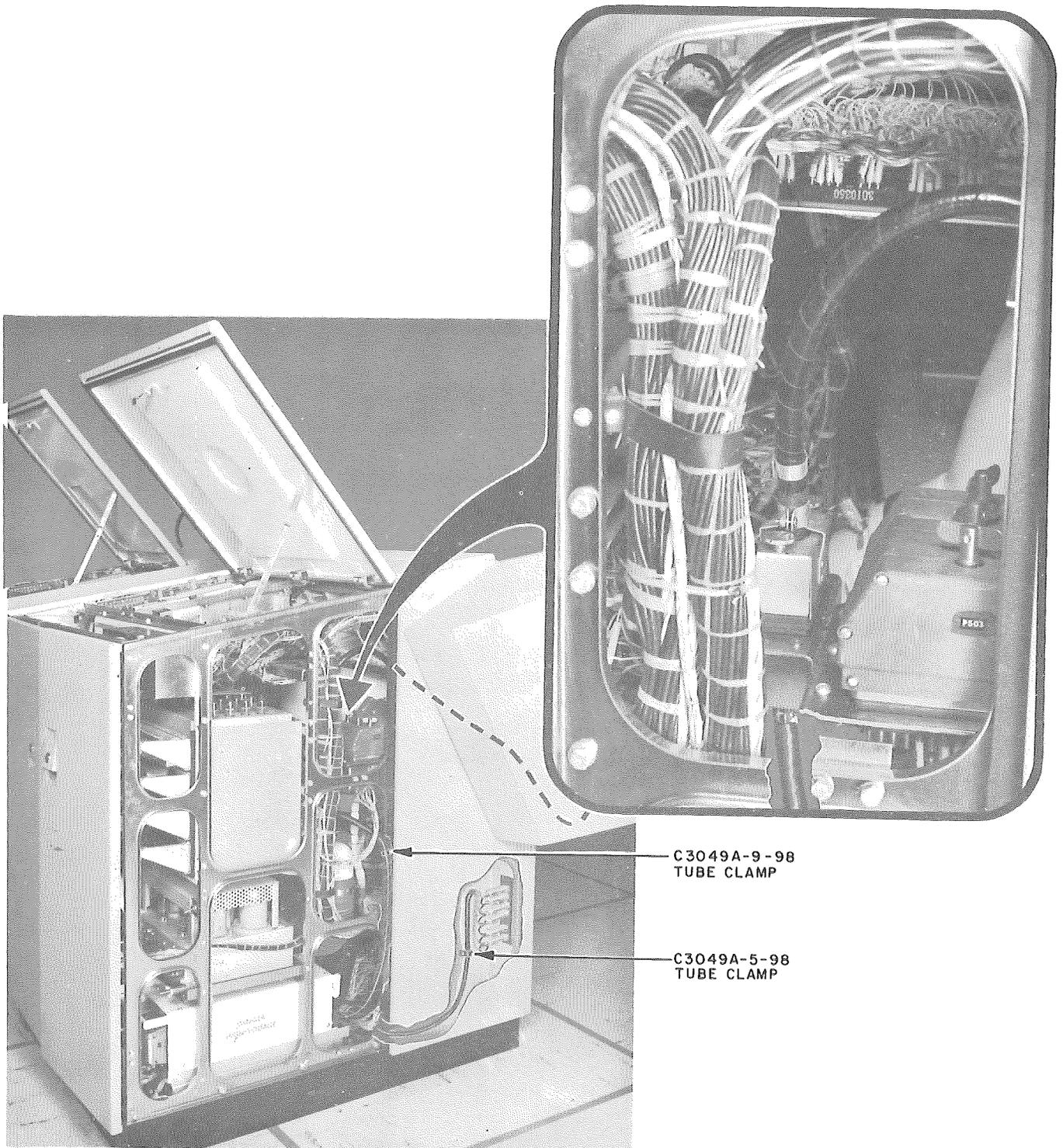


Fig. 4 — Mounting Arrangement of Cables in Situation Display Console with Wing Unit, Left Side

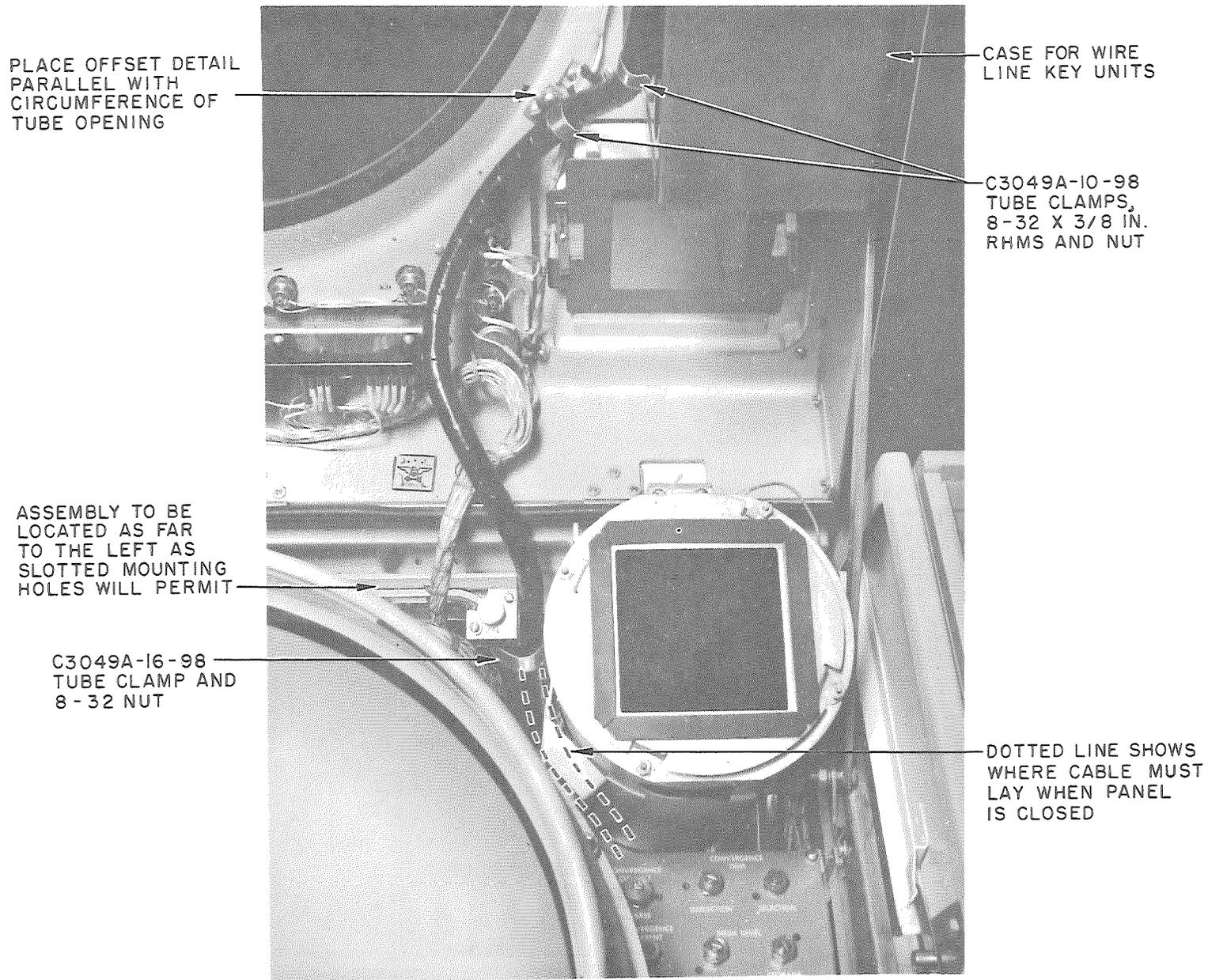


Fig. 5 — Mounting Arrangement of Cable to Wire-line Key Units, Front Panel of Console Open

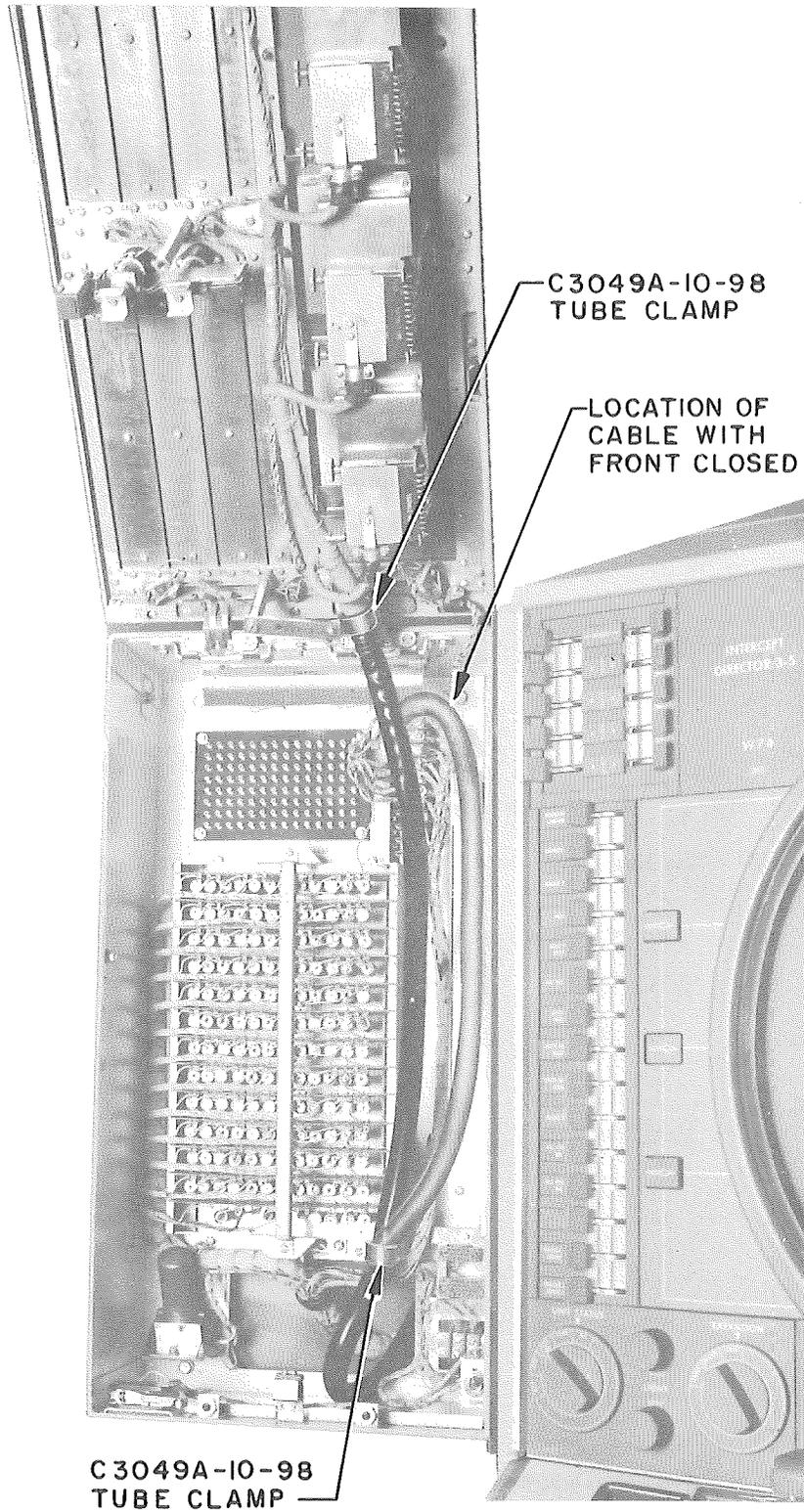


Fig. 6 – Cable Arrangement and Key Units in Wing Unit of Situation Display Console, Interior View

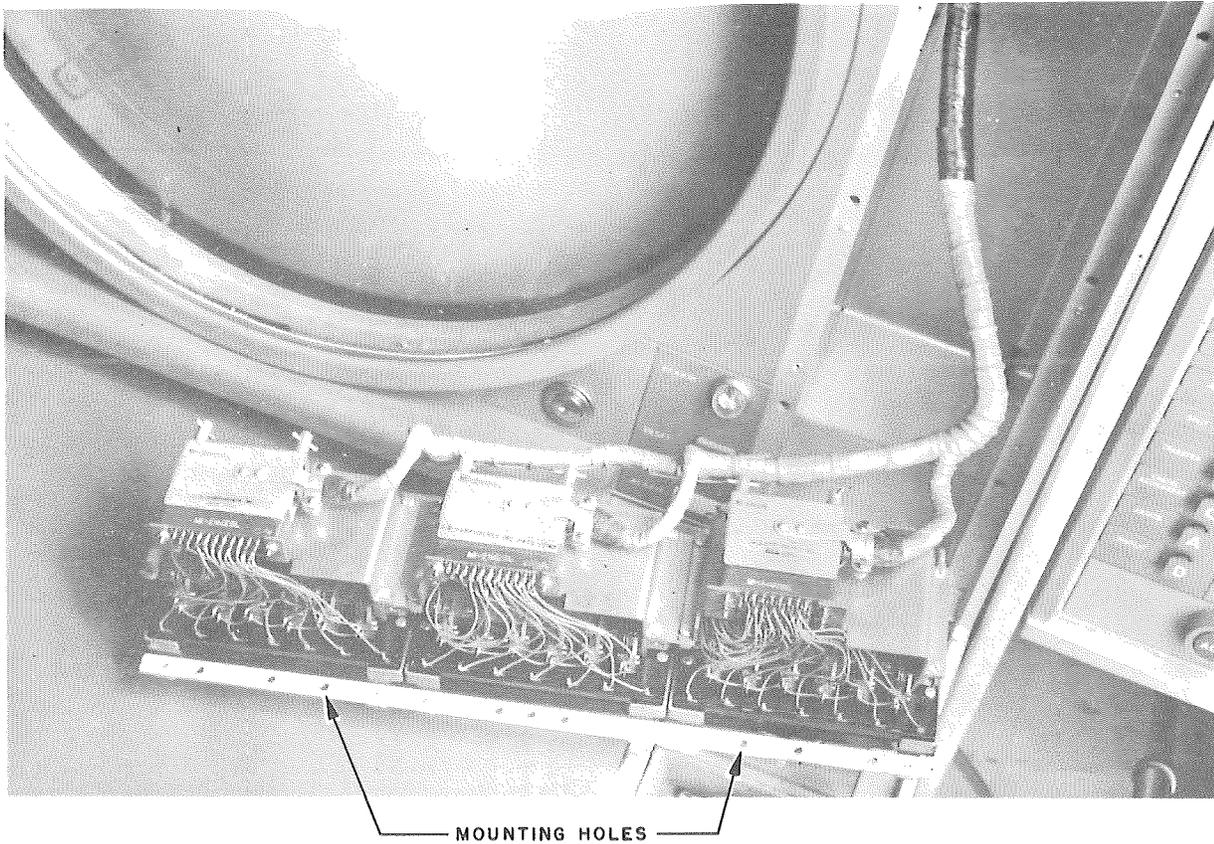


Fig. 7 – Wire-line Key Units, Rear View, Located in Situation Display Console

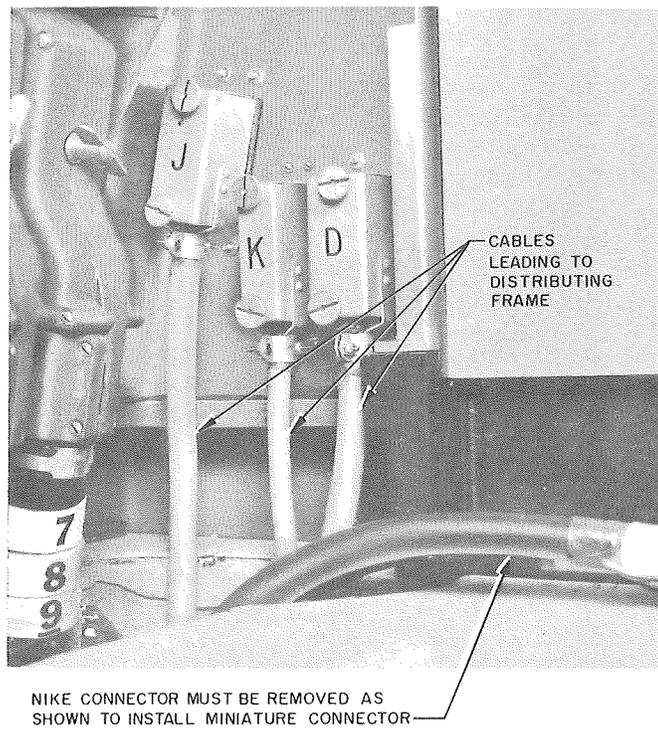


Fig. 8 – Miniature Connectors Located in Right Side of Knee Well in Situation Display Console

4.00 CONSOLE, AUXILIARY (Fig. 1, 9, 10, 11, 12, 13)

Front view of auxiliary D console is shown in Fig. 1.

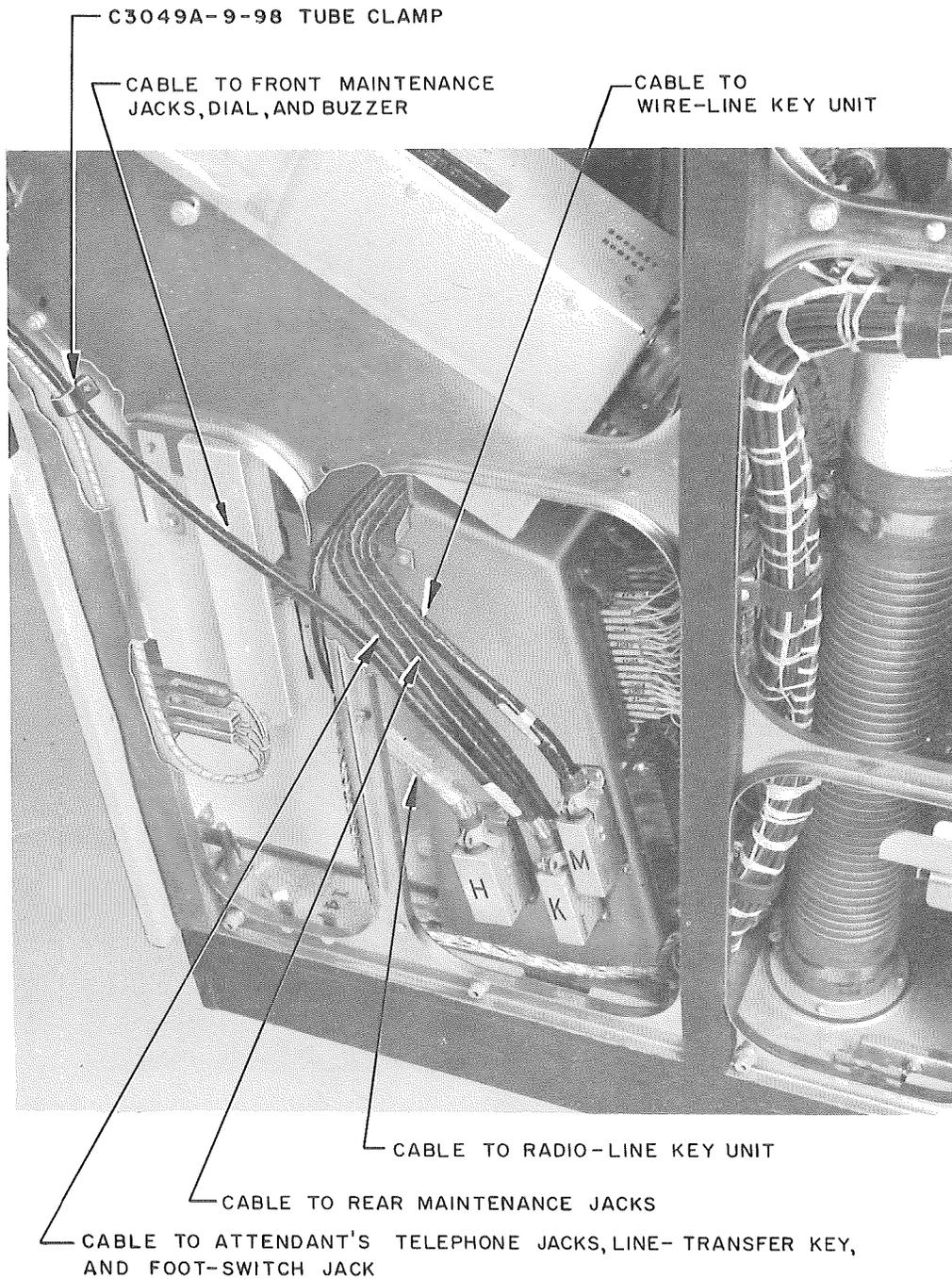


Fig. 9 — Mounting Arrangement of Cables in Auxiliary D Console, Right Side

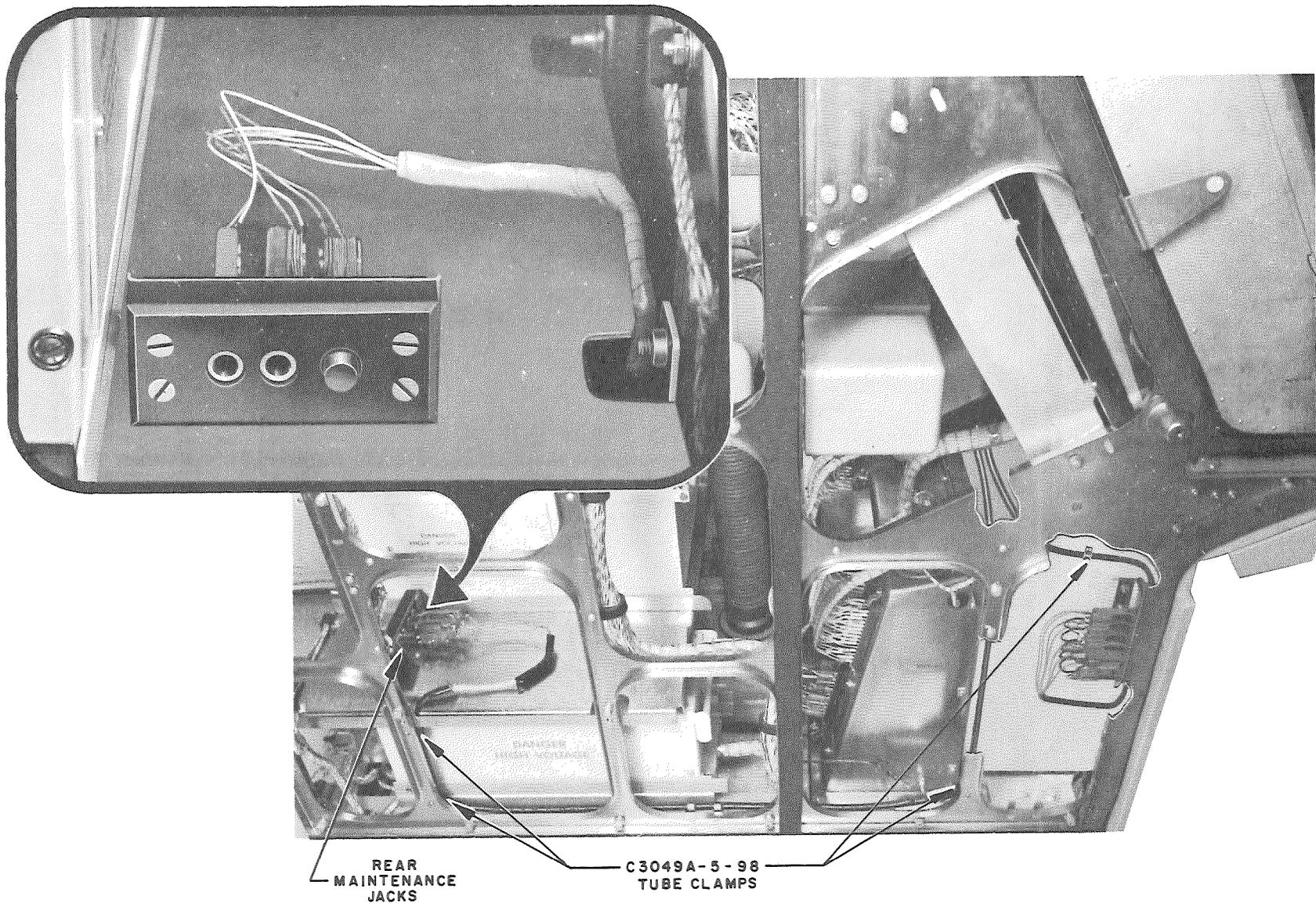


Fig. 10 — Cable and Jack Arrangement in Auxiliary D Console, Left Side

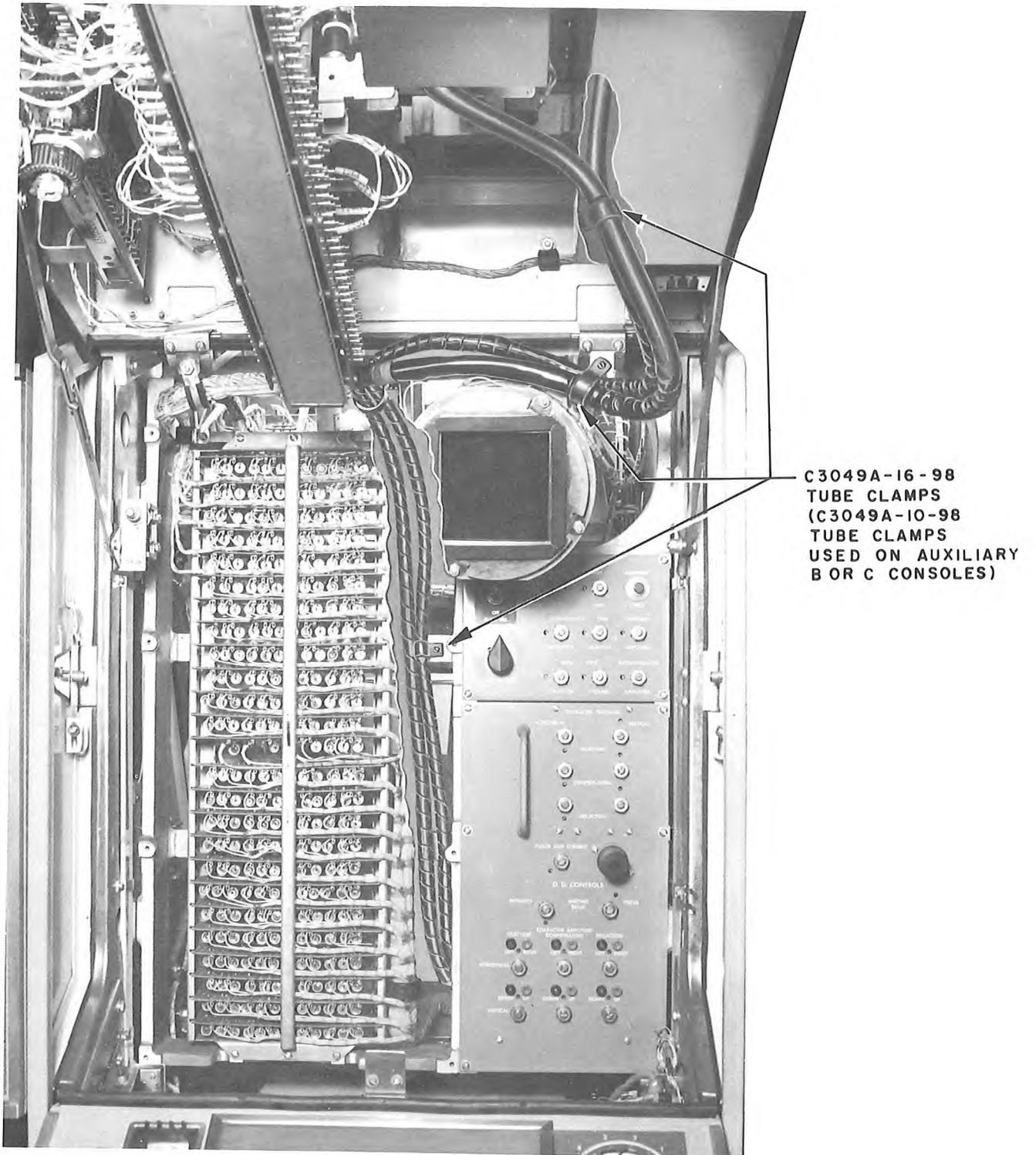


Fig. 11 – Cable Arrangement in Auxiliary D Console, Front Open

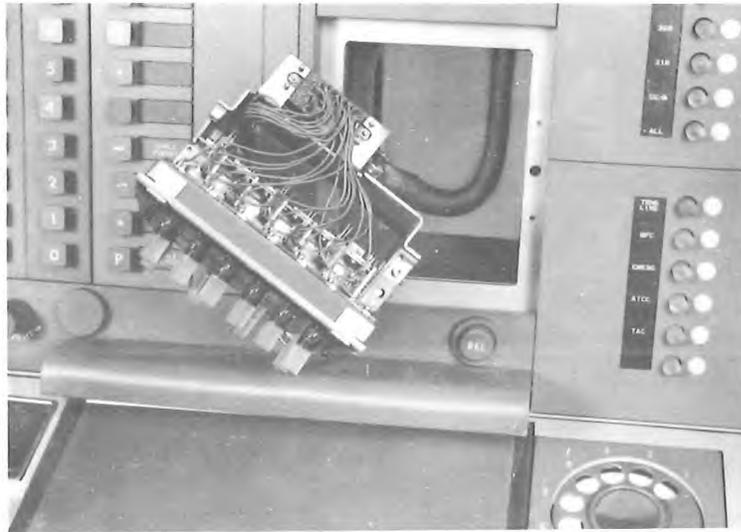


Fig. 12 – Single Key Removed in Auxiliary D Console, Front View



NIKE CONNECTOR MUST BE REMOVED AS SHOWN TO INSTALL MINIATURE CONNECTORS

CABLES LEADING TO DISTRIBUTING FRAME

Fig. 13 – Auxiliary D Console, Right Side of Knee Well, Showing Cables Which Lead to Distributing Frame

5.00 CONSOLE, MAINTENANCE (Fig. 14, 15, 16, 17)



Fig. 14 — Maintenance Console, Front View

LOCATION OF CABLE WITH FRONT CLOSED

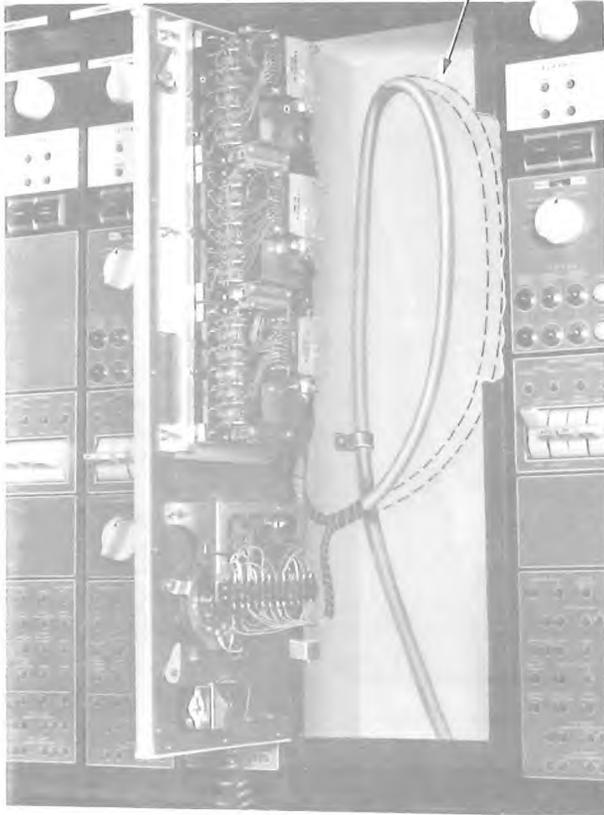
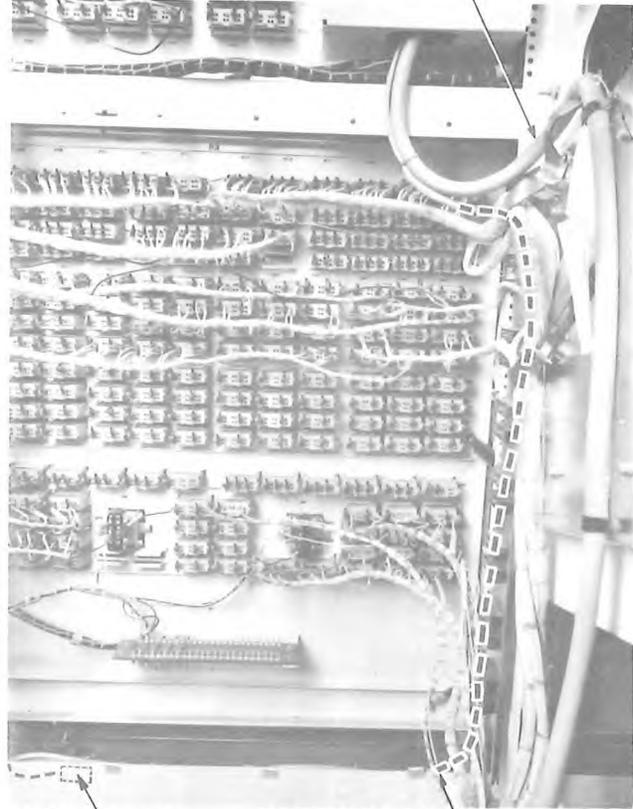


Fig. 15 – Key Panel, Rear View, Maintenance Console

CABLE LEADING TO DISTRIBUTING FRAME

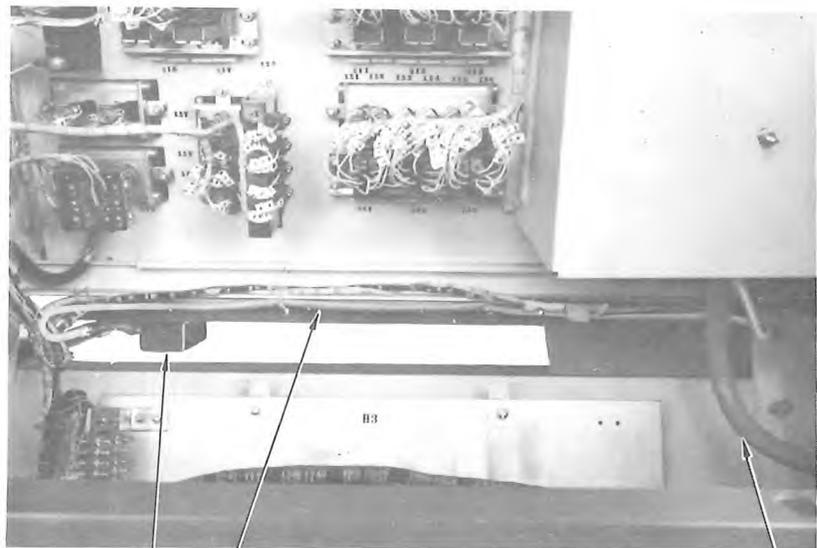


MAINTENANCE JACKS
IN BASE MOULDING

CABLE BETWEEN TELEPHONE PANEL
AND MAINTENANCE JACKS

Fig. 17 – Maintenance Console, Rear View, Showing
Cable Arrangement Leading to Key Units

Fig. 16 – Maintenance Console, Rear
View, Showing Cabling to
Maintenance Jacks Under
Front Shelf



MAINTENANCE
JACK UNDER
SHELF

CABLE BETWEEN
TELEPHONE PANEL AND
MAINTENANCE JACK

CABLE LEADING TO
DISTRIBUTING FRAME

6.00 CONSOLES, GAP FILLER RADAR DATA MAPPING AND GAP FILLER INPUT MONITOR (Fig. 18, 19, 20)

If the cable harness is to be installed after the IBM equipment has been placed, the power

supply must be removed to allow the installation of the cable harness (see Fig. 20). When placing the plugs into the jacks at the bottom of the console, care should be exercised to avoid breaking the wires at the plug.

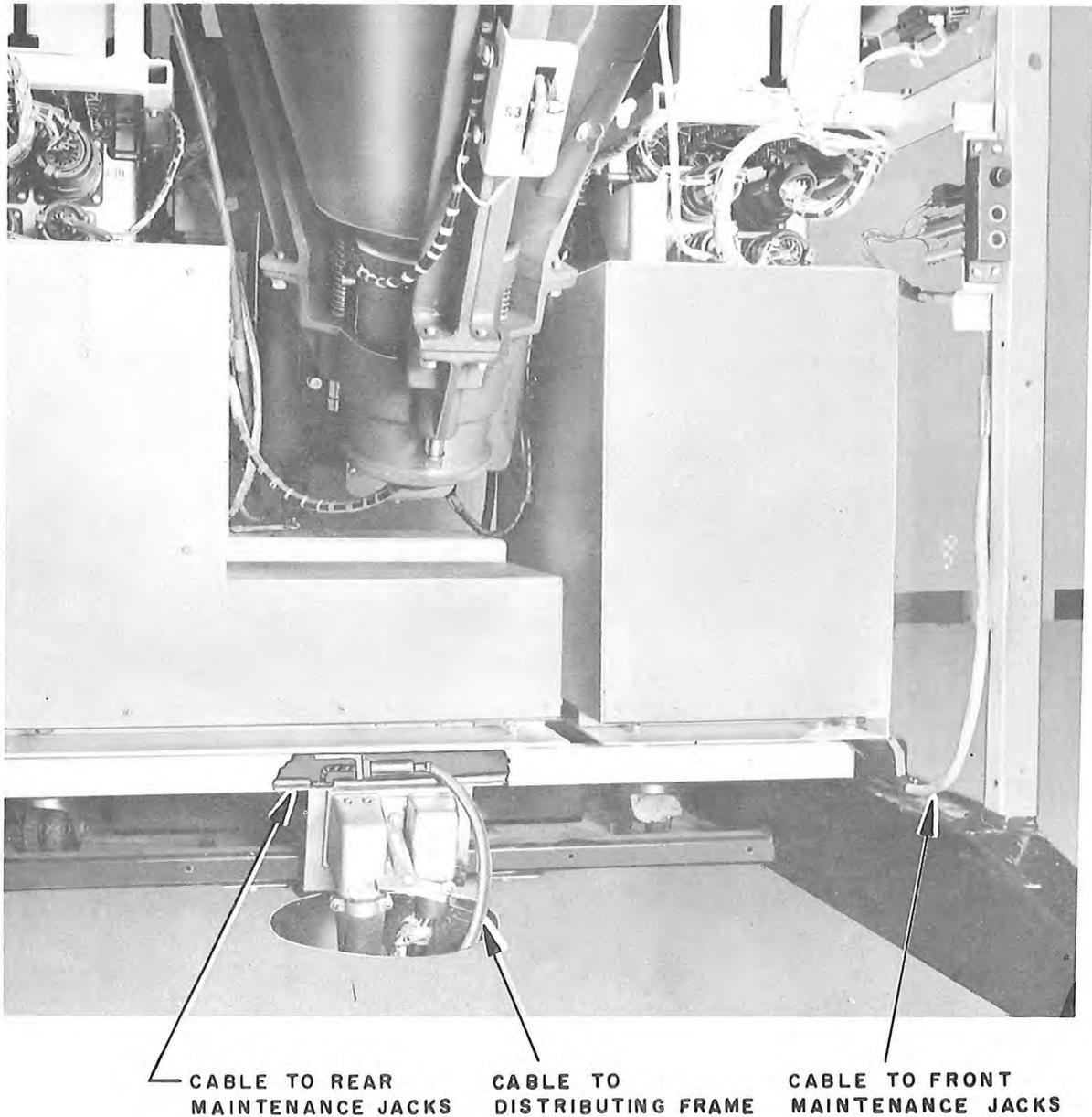


Fig. 18 – Mounting Arrangement of Cables in Gap Filler Radar Data Mapping or Gap Filler Input Monitor Console, Front View

Fig. 19 — Gap Filler Radar Data Mapping or Gap Filler Input Monitor Console, Rear View

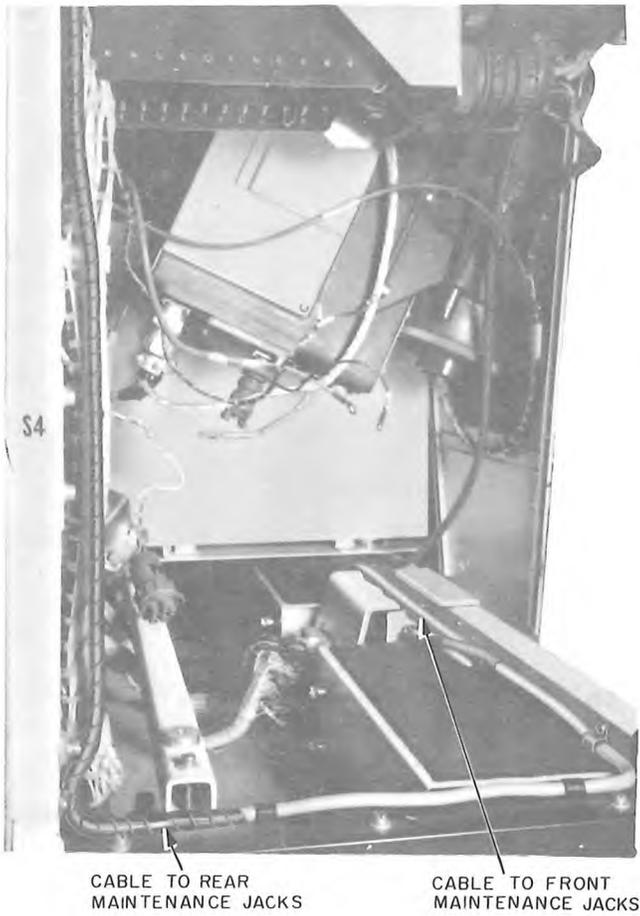


Fig. 20 — Gap Filler Radar Data Mapping or Gap Filler Input Monitor Console, Showing Removal of Power Supply to Allow Installation of Cable Harness and Connectors, Left-side View

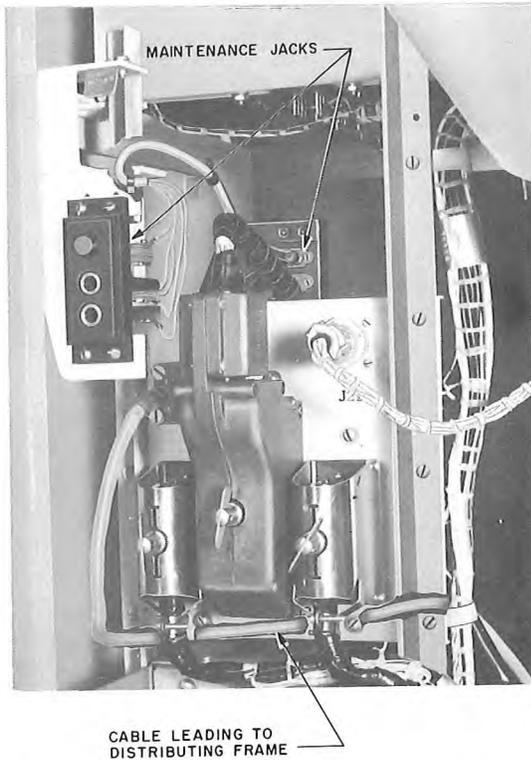


Fig. 21 – Arrangement of Cables in Long-Range Input Monitor, Front View

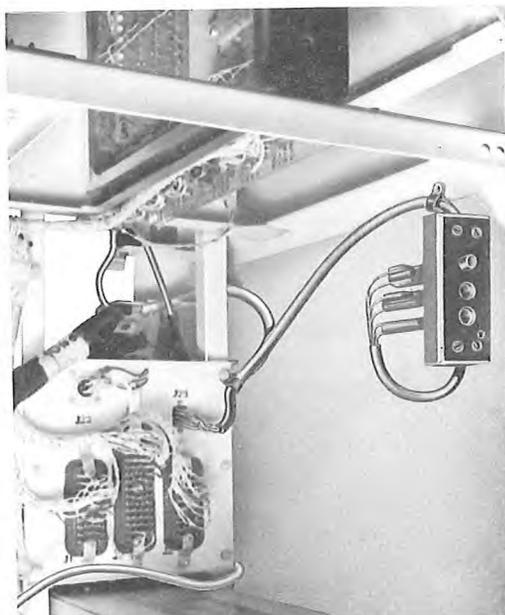


Fig. 22 – Arrangement of Cable and Maintenance Jacks in Long-Range Input Monitor, Rear View

7.00 CONSOLE, LONG-RANGE INPUT MONITOR (Fig. 21, 22)

8.00 CONSOLES AND FRAME MODULES, LONG-RANGE RADAR OR TEXAS TOWER

Console, Azimuth Range (Fig. 23, 24, 25, 26)

8.01 Auxiliary key assembly must be fastened to top portion of console only, so that console may be opened (see Fig. 23).

.190-24 x 1/2 RHM SCREWS, SPRING-LOCK WASHERS, AND HEX. NUTS

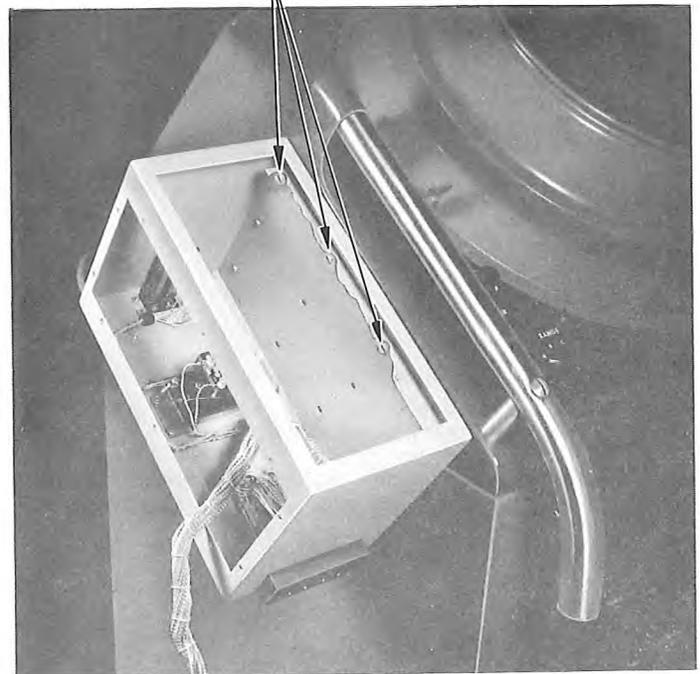


Fig. 23 – Console, Azimuth Range, Auxiliary Key Assembly Fastening Arrangement

8.02 A 7-type bell can be used as optional equipment for noisy locations if the sound produced by the buzzer is not adequate (see Fig. 24).

8.03 The 750E apparatus unit equipped with a 3A faceplate is used at long-range radar sites (see Fig. 26). At Texas towers, the 750E apparatus unit is equipped with a 15A faceplate, 6K41 dial, D5U cord (5 inches long), and 52A lamps.



Fig. 24 – Console, Azimuth Range, Showing Rear View of Auxiliary Key Assembly and Cable Arrangement

Console, Range Height

8.04 Installation is similar to azimuth range console except that auxiliary key assembly is fastened to the stationary portion of the console, therefore excess slack is not needed in the cable.

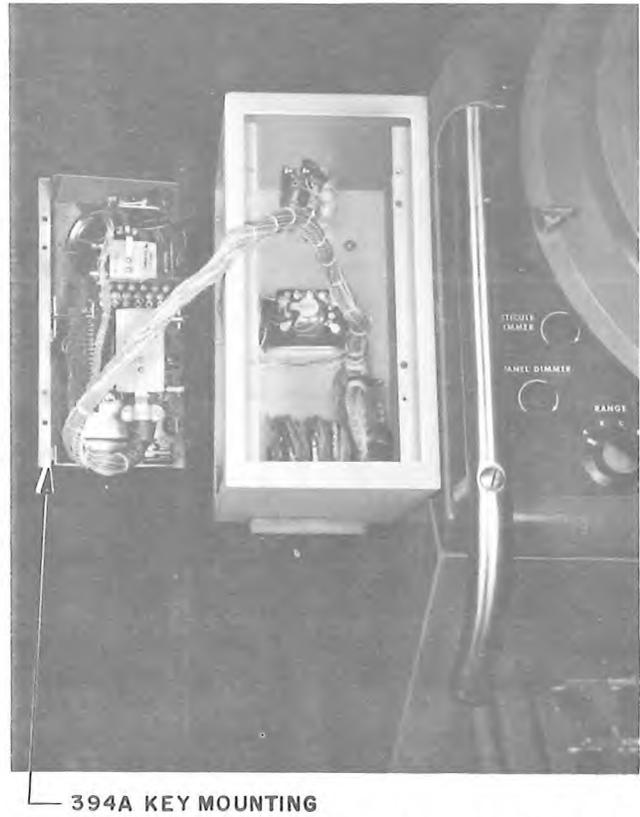


Fig. 25 – Console, Azimuth Range, Auxiliary Key Assembly, Interior View



Fig. 26 – Console, Azimuth Range, Auxiliary Key Assembly, Completely Assembled

Frame Modules (Fig. 27, 28)

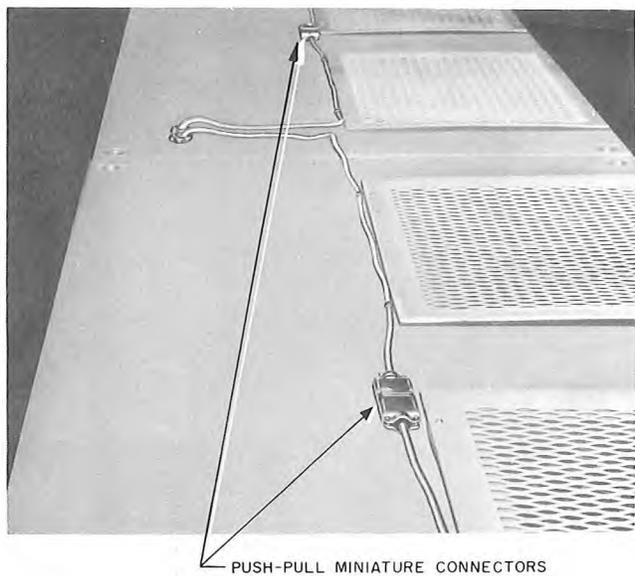


Fig. 27 - Channel A or B Frame Modules, Top View, Showing Cable and Connector Arrangement



Fig. 28 - Power Control Frame Module, Showing Cable and Connector Arrangement

9.00 CONSOLE, COMMAND POST, STAFF DESK (Fig. 29, 30, 31)

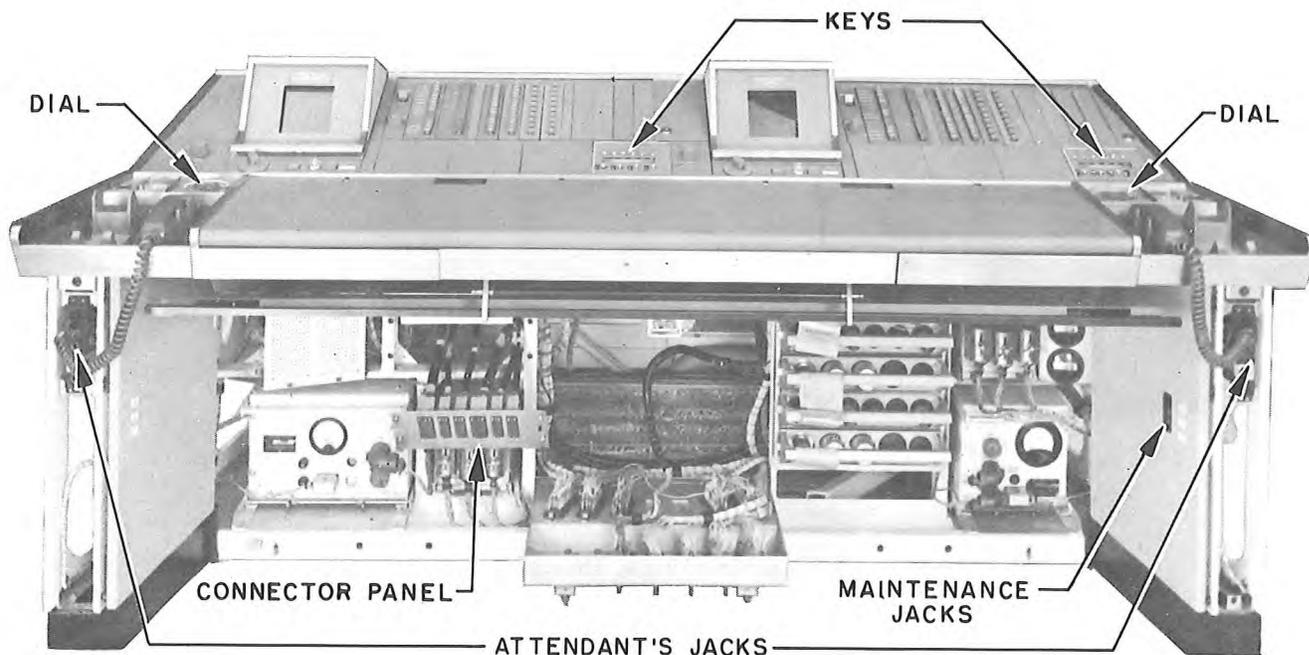


Fig. 29 - Staff Desk, Front View

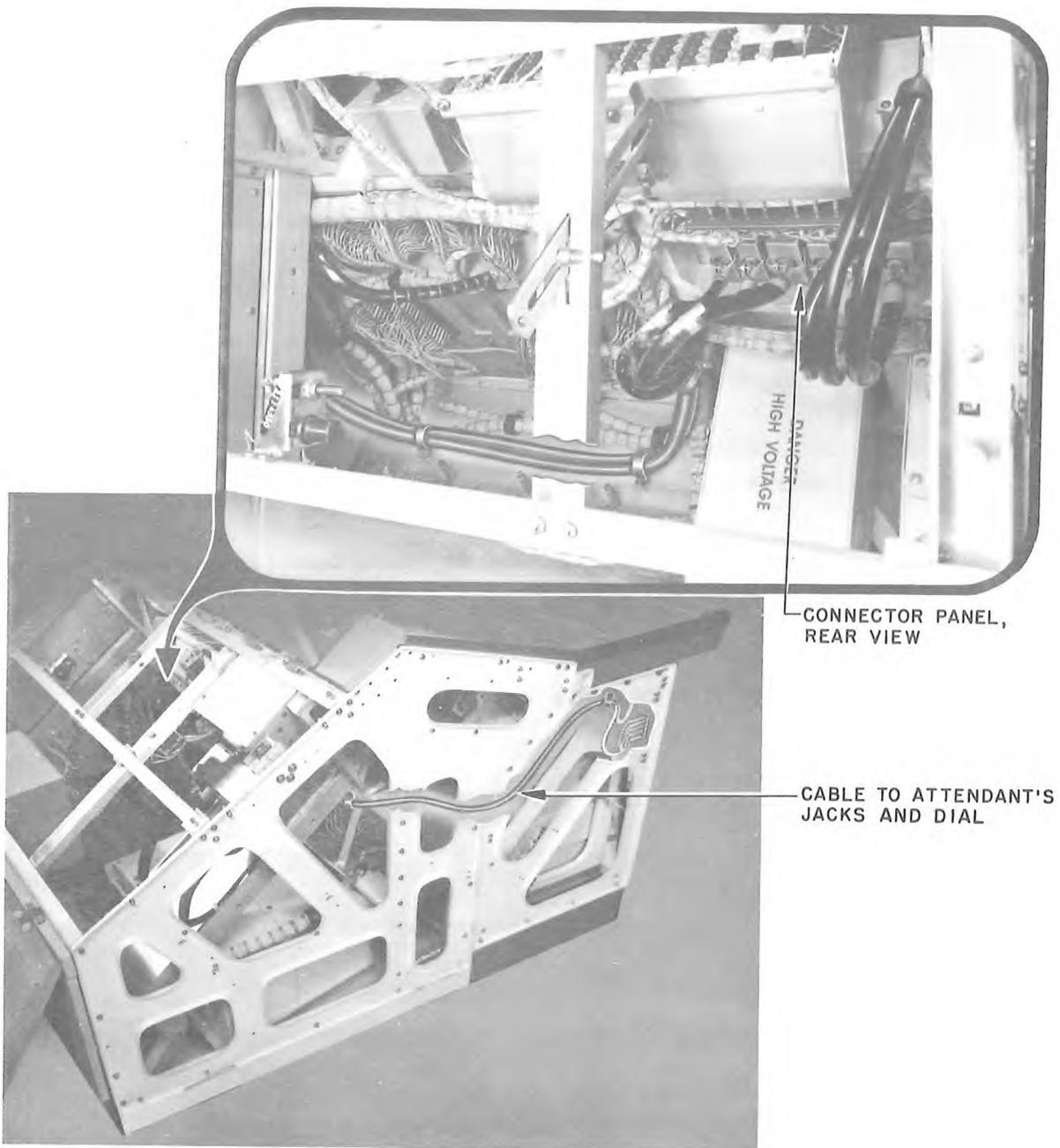
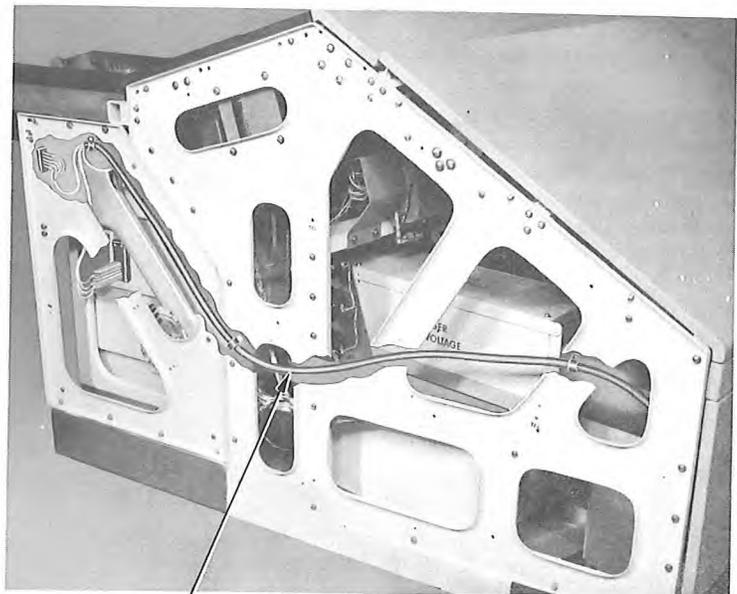


Fig. 30 — Staff Desk, Left Rear View, Showing Cable Arrangement

Fig. 31 — Staff Desk, Right-side View, Showing Cables Leading to Jacks Located in Right Leg



CABLE TO ATTENDANT'S JACKS,
DIAL, AND MAINTENANCE JACKS

10.00 CONSOLE, COMMAND POST, COMMAND DESK (Fig. 32, 33, 34)

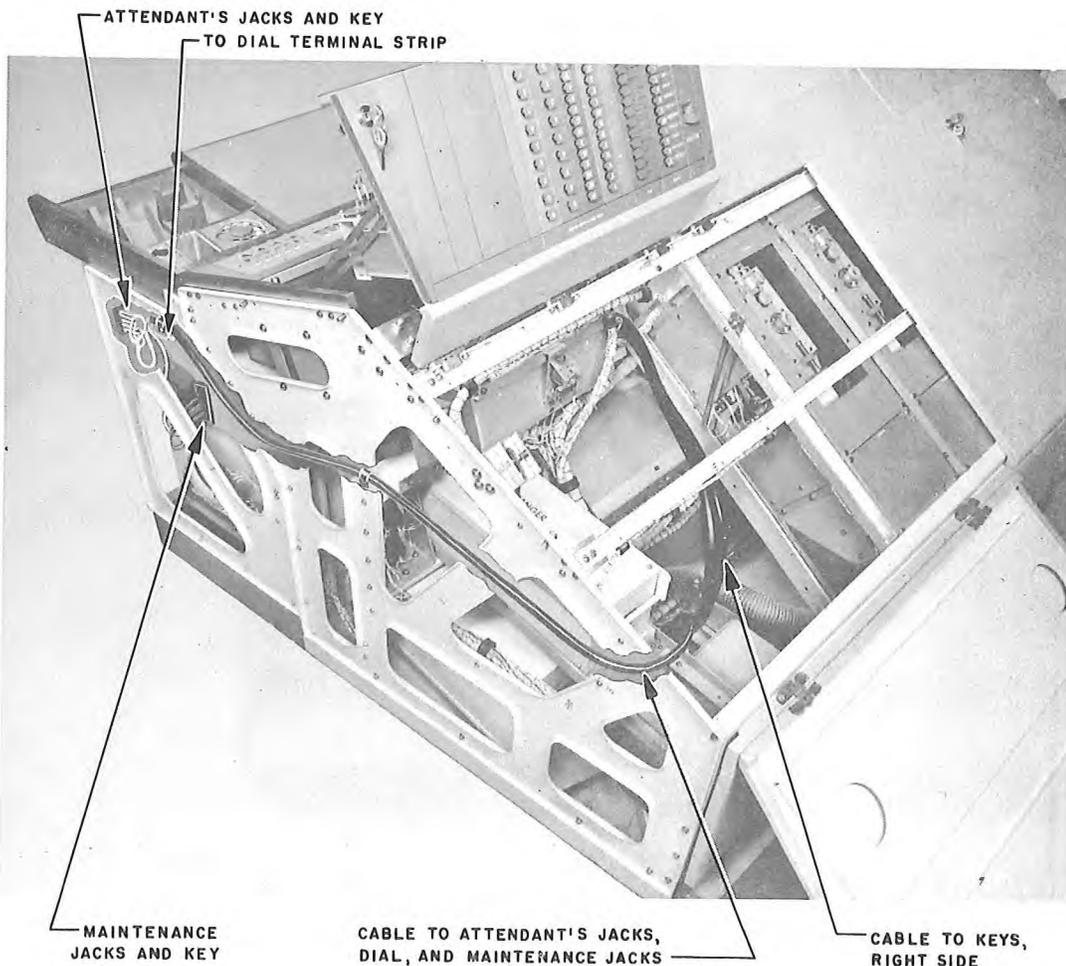


Fig. 32 — Command Desk, Right-side Rear View, Showing Cable Leading to Jacks Located in Right Leg

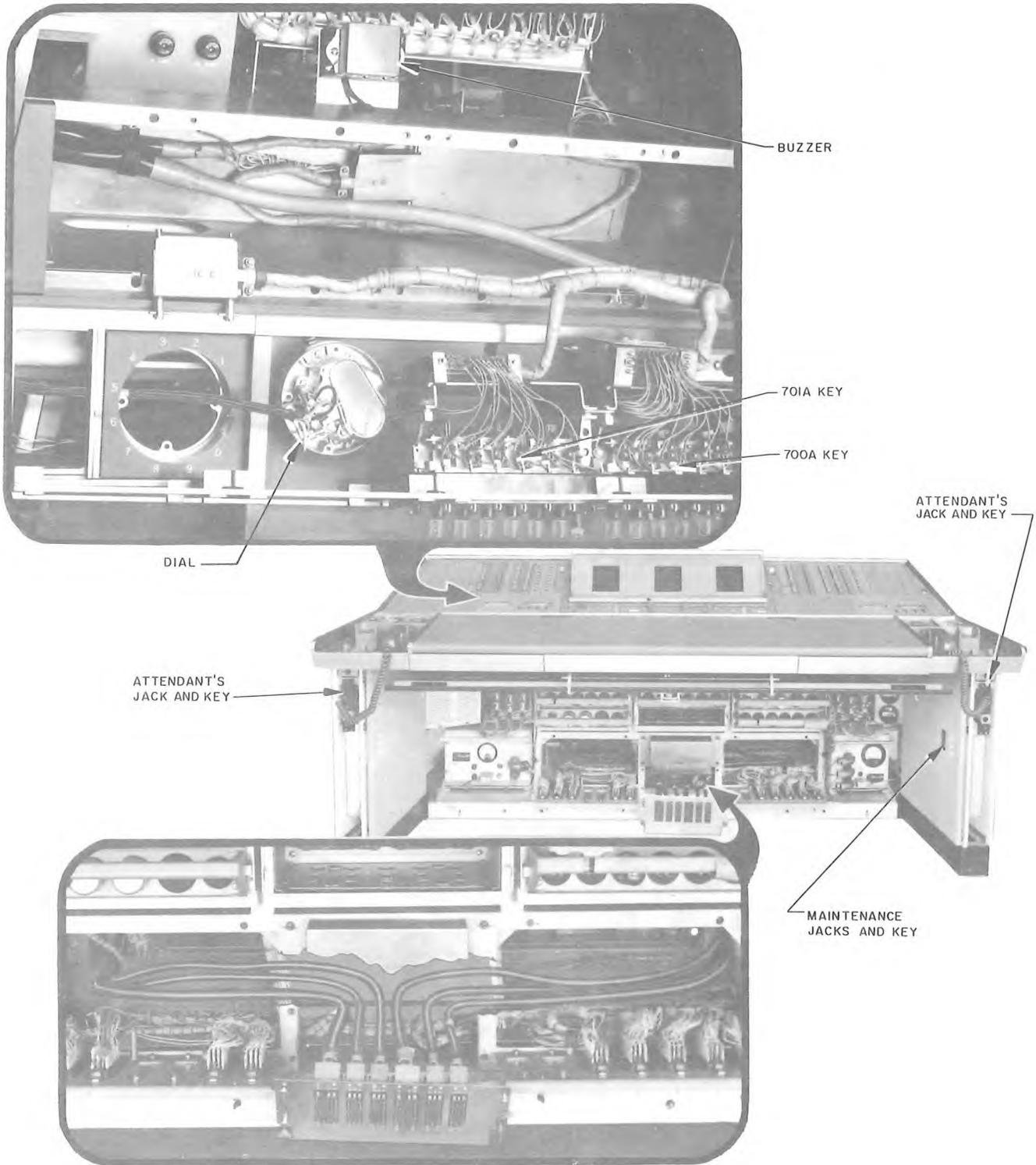


Fig. 33 – Command Desk, Front View

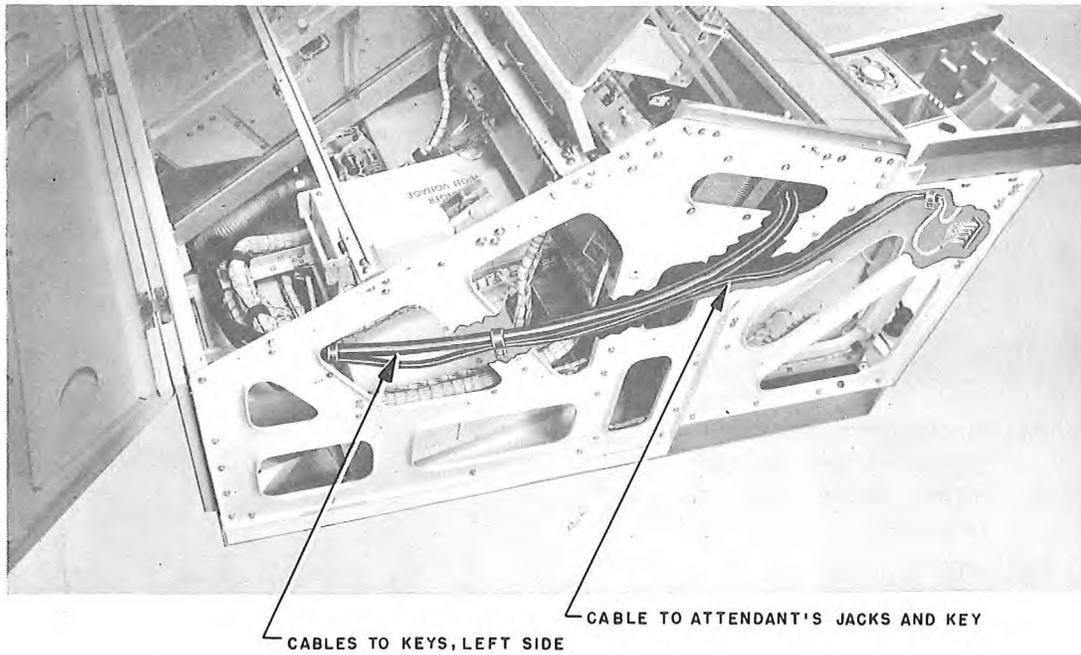


Fig. 34 - Command Desk, Left-side Rear View, Showing Cables

11.00 COMPUTER FRAMES (Fig. 35, 36)

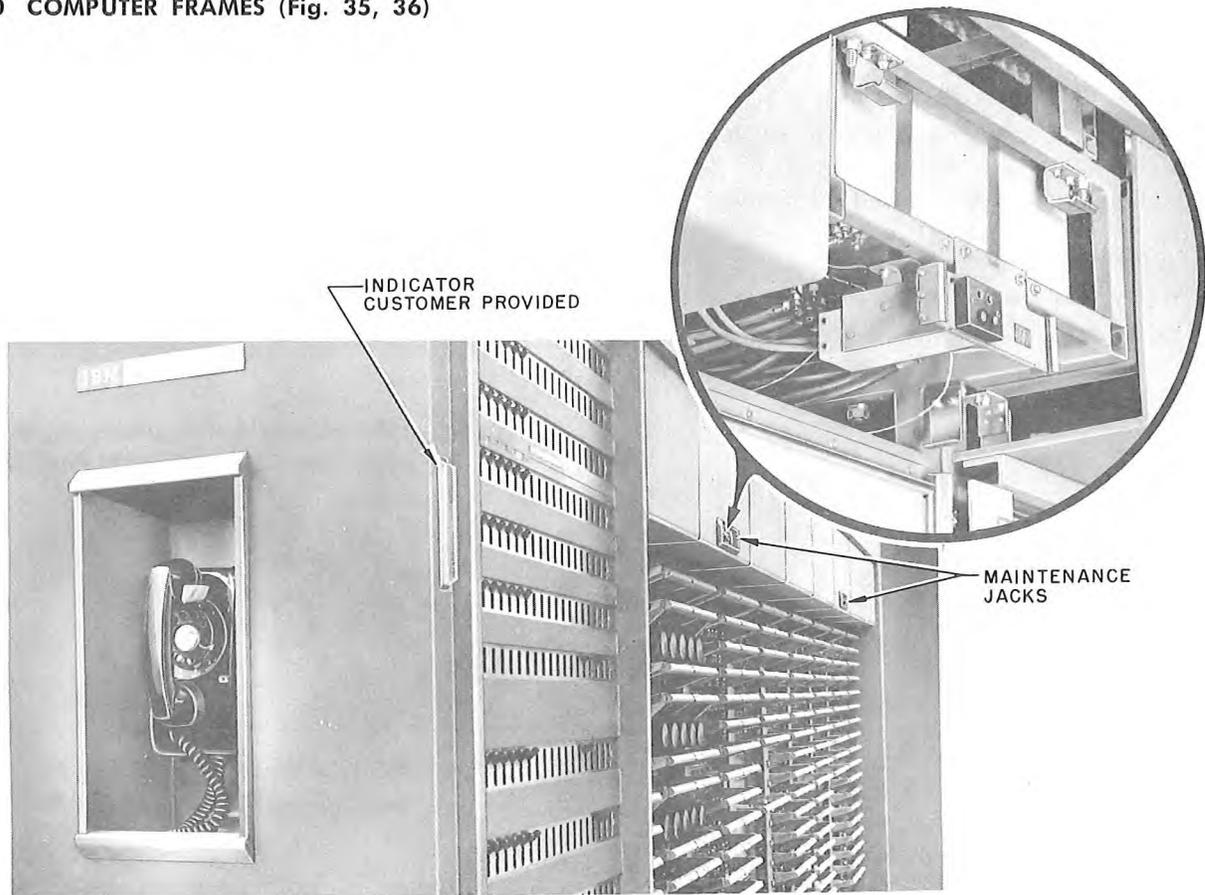


Fig. 35 - Maintenance Jack Mounting Arrangement on Computer Frame

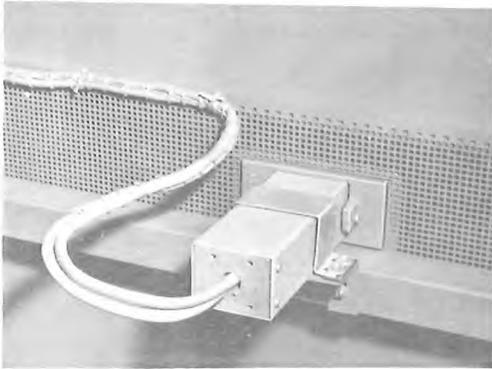


Fig. 36 — Maintenance Jack Mounting and Cable Arrangement, Inside Top of Computer

12.00 FLUSH MOUNTING OF KEY UNITS

12.01 When key units are linked together, the shaft, latch-bar arm, spring, and bushing must be removed from all units but one. When one of the keys is an originating unit, these parts are left in this unit. When keys linked together do not include an originating unit, these parts are to be left in the bottom key unit.

12.02 Key units to be installed in a console must first be mounted on a key mounting and must have P-11C938 plates installed before mechanical linkage is joined and adjusted.

12.03 To adjust the assembly:

- A jig must be provided locally per drawings B-940301 and B-940302.
- Place the assembled units on the jig (see Fig. 37).

- With the screws in the P-11C938 plates loosened, fasten the side bars securely to the jig.
- Lower the jig assembly, and tighten the screws of the P-11C938 plates as shown in Fig. 38.
- Refer to the section entitled 700-type Modular Station Apparatus, Assembly and Installation for further information on key installation.



Fig. 37 — 700-type Key Unit Assembly Jig with Key Units in Place, Upright Position

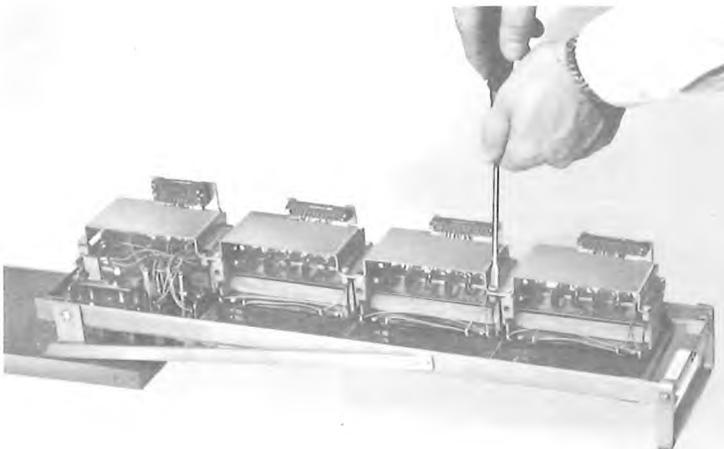


Fig. 38 — 700-type Key Unit Assembly Jig with Key Units in Place, Lowered Position

13.00 SURFACE MOUNTING OF KEY UNITS

13.01 Key units may be assembled to form a single operating unit for mounting in apparatus cases, as shown in Fig. 39. Only one dial unit and one originating key unit are required for each assembly. Additional supplementary key units may be added as required. When more than one unit is required, they must be coupled together and have linkage connected before cables are terminated and before they are placed in the apparatus cases.

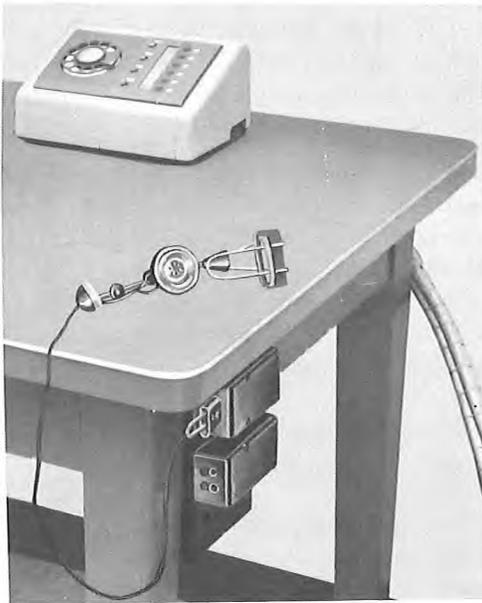


Fig. 39 – Key Units, Surface Mounted

13.02 When more than one case is required, apparatus cases must be coupled together as shown in Fig. 40. The cases are held adjacent to each other, with the left case lower than the right case. The left case is then raised until the cases are flush; this engages an interlock assembly and holds them together at the top. Two screws must be placed at the bottom of the cases to hold the bottoms together and to secure the top interlock assembly. The ends of the apparatus cases are assembled in the same manner as are the individual cases.

13.03 Reference should be made to the section entitled 700-type Modular Station Apparatus, Assembly and Installation for further information on key installation.

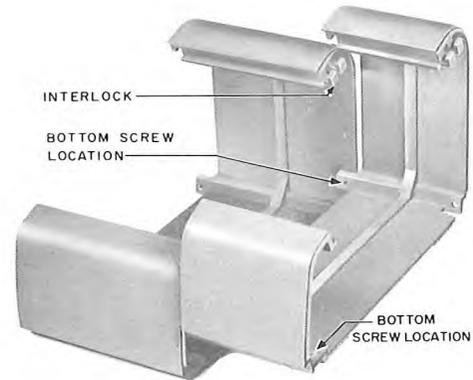


Fig. 40 – Assembly of Apparatus Cases

14.00 DESIGNATION STRIPS AND FACEPLATES

14.01 Designation strips have transparent lettering on a black background and, when used in console-mounted key units, are illuminated by an adjustable level of white back lighting.

14.02 The common-key designation strip on the originating key unit is provided as a part of the faceplate as the designations are the same in all installations.

14.03 The P-10C334 designation strips for line keys may be ordered through the Western Electric Company or directly from Cushman Brothers Company, Incorporated, New Canaan, Connecticut, in accordance with plant engineering letter (PEL) 5910 and plant engineering memo (PEM) 6632. The strips are mounted under a transparent plastic window on the key unit faceplate to show designations for six line keys. Replacement of an entire strip is required whenever a change in designation is made.



The designation strips used on command-post consoles are in a horizontal position. When ordering, be sure to specify just how the characters should be oriented so that they can be read by those seated at the desk.

14.04 Designation strips are placed by sliding them into a groove in the faceplate which is open at the top end.

14.05 Faceplates should fit against the surface of the apparatus case and should not interfere with the operation of the push buttons or dial.

14.06 In those cases where there is a relatively high level of ambient light and the bright-

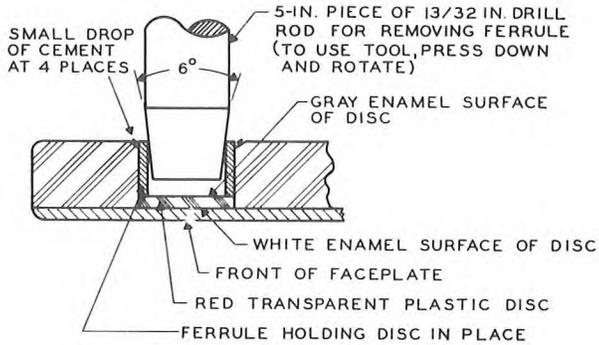


Fig. 41 — Procedure for Disassembly of Light Filters in 1- and 2-type Faceplates

ness of the line lamp signals is not high enough to attract attention, an increase in brightness can be attained by removing the gray enamel from the light filters in the faceplate. This is done by:

- Breaking the cement joints holding the disc retaining ferrule in the faceplate. This is accomplished by inserting a tapered rod into the ferrule and twisting it. (See Fig. 41.)
- Removing ferrule and disc.
- Removing gray enamel from disc by rubbing the gray enameled surface with fine emery paper and finishing with extremely fine abrasive paper to polish surface of disc.

Note: Do not remove white finish from front of disc.

- Replacing disc and ferrule.

- Cementing the ferrule to the faceplate at four points with a small drop of nitrocellulose type cement. This cement can be obtained by ordering: from Ambroid Company, Boston, Massachusetts (cement, Ambroid, liquid, 1 3/4 oz tube); or from E. I. Dupont De Nemours and Company (cement, Duco, 1 3/4 oz tube).

15.00 MINIATURE CONNECTORS

15.01 Miniature connectors are used to provide rapid connection and disconnection of cables. All cables, whether used wholly within the consoles or between the central distributing frame and the consoles, are furnished equipped with miniature connectors.

Note: Miniature connectors on cables placed between the central distributing frame and the console sites should be protected from damage until the connectors are coupled together. For protection, the connectors should be placed in a G-type terminal box and the cover closed with tape.

15.02 Miniature connectors are composed of the parts shown in Fig. 42.

15.03 Connector terminals are designated either by numbers or letters. The end of the connectors at which the designation (1 or A) begins is referred to as the low designated end. Certain numbers and letters which may be confusing have been omitted. (See Fig. 43, 44, and 45.)

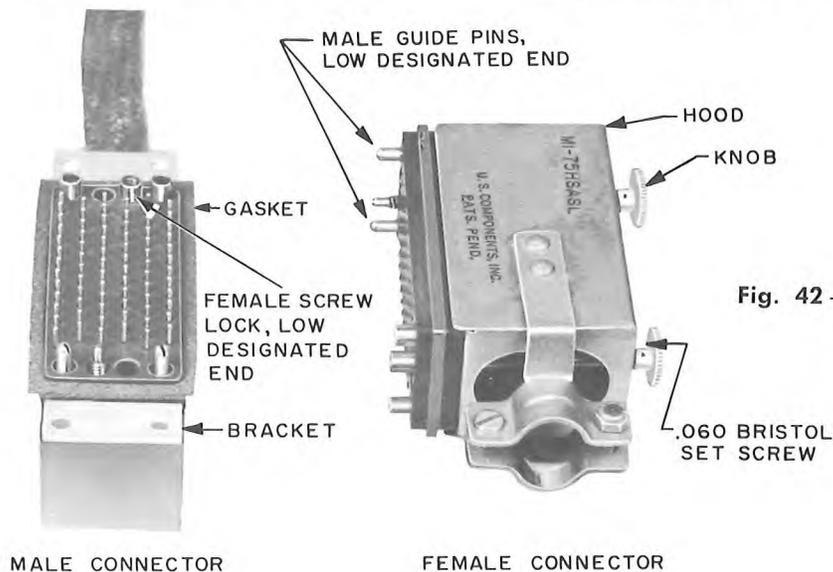


Fig. 42 — Component Parts of 75-type Miniature Connectors

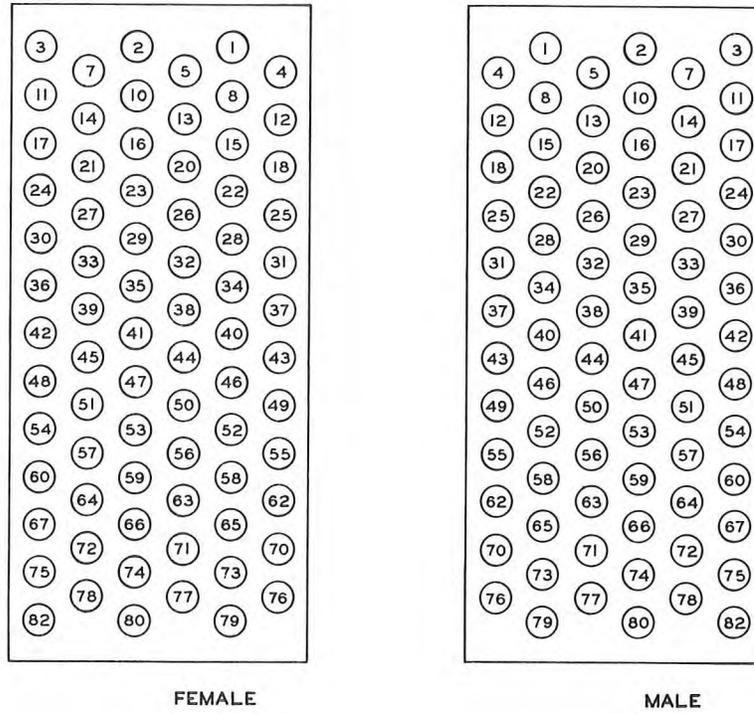


Fig. 43 – 75-type Terminal Side Numbering

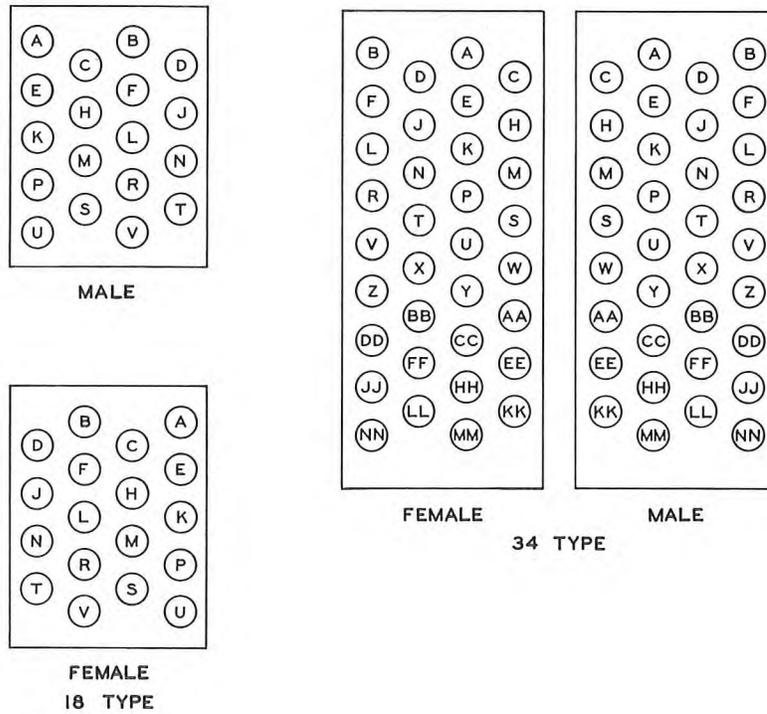


Fig. 44 – 18- and 34-type Terminal Side Lettering

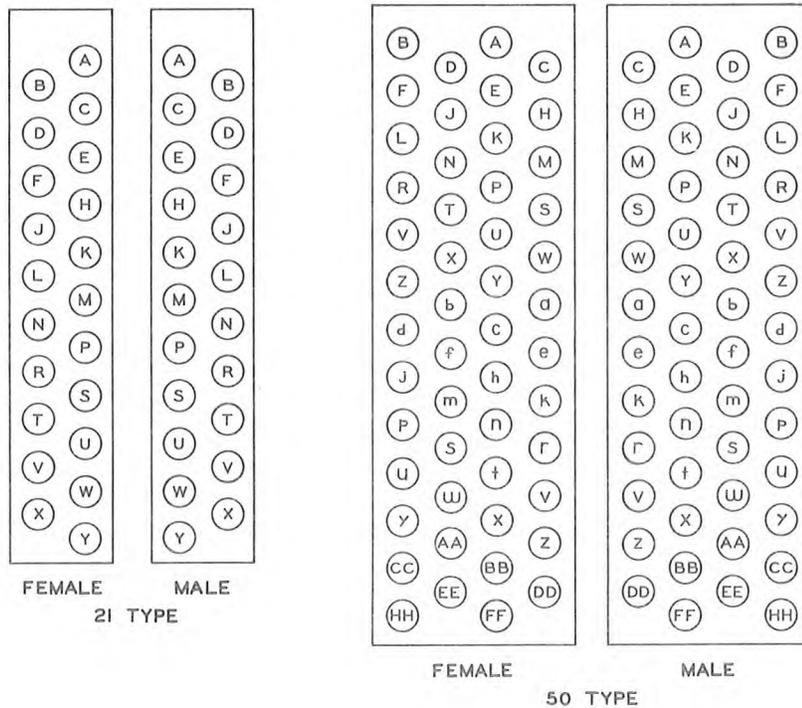


Fig. 45 — 21- and 50-type Terminal Side Lettering

15.04 If it is found necessary to terminate a cable to a miniature connector, the following operations are recommended:

- Disassemble the miniature connector as follows:
 1. Remove the four corner guide pins.
 2. Separate the connector from the hood.
 3. If the cable enters from the side of the hood, remove the screw-lock shaft nearest the cable entrance.
- Mount the miniature connector vertically on a board, and fill all the terminals with solder as shown in Fig. 46. Use the 0.035 solid-wire solder of 60 per cent tin and 40 per cent lead, containing antimony and bismuth, furnished by the Western Electric Company.

Note: Do not use a resin core solder.

- Place the insulator in the hood.
- Place the hood on the cable.

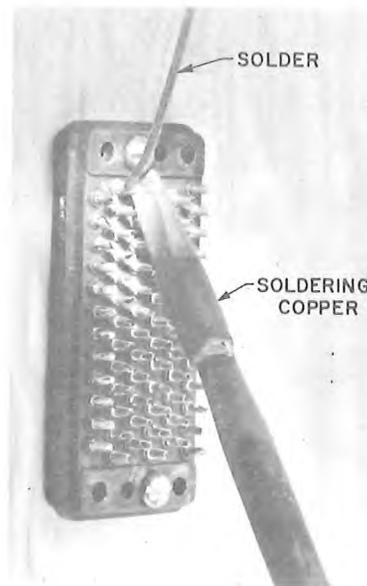


Fig. 46 — Filling Terminals of Miniature Connector with Solder

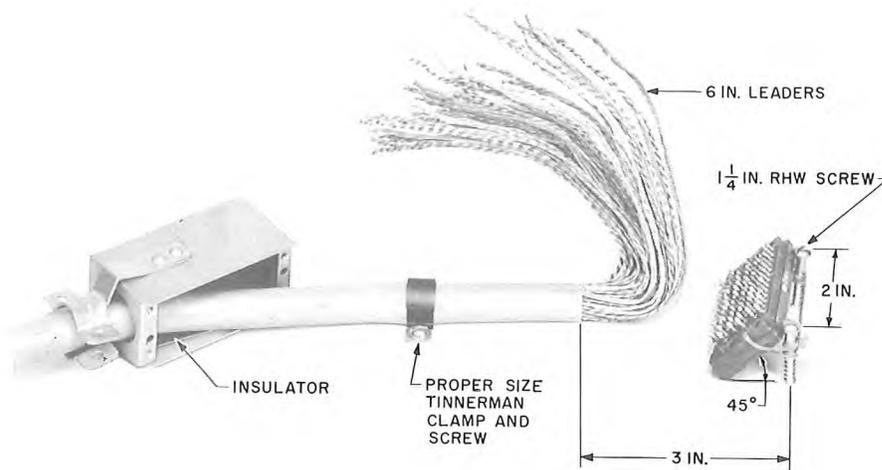


Fig. 47 — Preparation of Cable and Miniature Connector for Terminating

- Remount the miniature connector on the board and secure cable as shown in Fig. 47.
- Place a bushing through the leaders at the cable entrance end and tape to the cable. Place the bushing off-center for 50- and 75-type miniature connectors, and center the bushing for 21- and 34-type miniature connectors. Use the screw-lock hole in the hood as a guide for aligning the bushing.
- Cut cable pairs to the same length and terminate. Remove insulation for 1/8 of an inch.
- Dip wire ends in a standard alcohol resin flux; use a shallow container to avoid getting flux on the insulation.

THINK Use caution. Flux is flammable.

- Melt solder in the terminal and insert the wire.

Note: Excessive flux or solder on the terminals must be avoided. After a termination is completed, the terminal pins should still float freely in the block.

15.05 When all pairs are terminated, assemble the miniature connector as follows (see Fig. 48) :

- Tape the spare conductors and form the cable.
- Assemble the miniature connector with the cable entrance opening of the hood at the desired end.
- Place the screw-lock shaft through the

bushing and the hood, and secure its knob by means of the Bristle set screw.

- The male screw locks and guide pins must be placed in the low designated end of the female connector; on the male connector, the female screw locks and guide pins go in the low designated end (see Fig. 42).
- Place the hood on the miniature connector and assemble all the parts.

15.06 As the miniature connectors are being coupled together, even tension must be maintained on each screw lock to prevent breaking the miniature connector. Screw locks should be rotated one turn, alternating back and forth until connectors are seated. To uncouple miniature connectors, the reverse procedure should be followed.

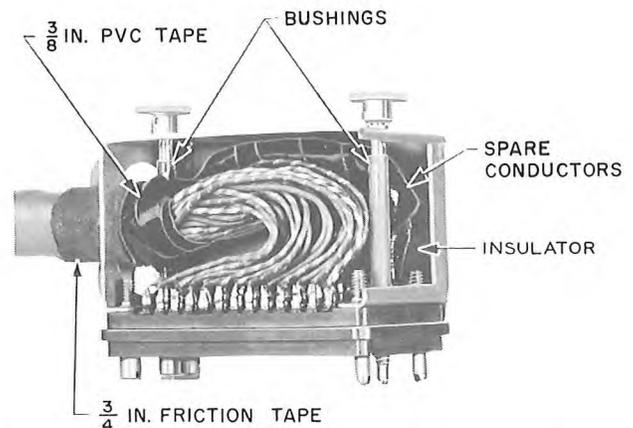


Fig. 48 — Assembled Miniature Connector, Cutaway View