

**"COSMIC*" I MAIN DISTRIBUTING FRAME SYSTEM
DESCRIPTION**

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1. GENERAL

1.01 This section contains a general description of the COSMIC I main distributing frame system and associated hardware elements which make up the system. The associated hardware elements consist basically of a modular subscriber main distributing frame SMDF, protector frames PF, tie-pair distributing frame TPDF, and a test/talk system. The SMDF consists of modules that terminate outside plant, line equipment, and tie cables from the TPDF and other frames.

1.02 The reasons for reissuing this section are

listed below. Since this reissue is a general revision, no revision arrows have been used to denote significant changes. Equipment Test Lists are not affected.

- (1) Change title from Common Systems Main Inter-Connecting Frame (COSMIC) Description to COSMIC I Main Distributing Frame System
- (2) Change all COSMIC references to COSMIC I.
- (3) Change general description, paragraph 1.01, to define basic hardware elements of the COSMIC I system.
- (4) Add 112C-series connecting blocks to paragraphs 2.08, 2.10 and Fig. 7.
- (5) Change No. 1 Crossbar equipment connecting block from 78C1D-100 to 78C3A-100 in paragraph 2.10(f) and Fig. 7.
- (6) Add 78C2A-50 and 78C2B-50 connecting blocks to paragraph 2.10(j), (k), and Fig. 7.
- (7) Add 308-type connector for use on the PF.
- (8) Remove description and reference to W2HA and W2FF, modular PF bridging cords.
- (9) Remove description and reference to W4P, modular PF input/output test cord.
- (10) Remove description and reference to W4CR and W4CL modular PF varley test cords.
- (11) Add an 872A wire insertion tool for use with 78-type connecting blocks manufactured between August 1977 and April 1978.
- (12) Add wire reel KS-21955 LI in paragraph 6.10 and new Fig. 35.
- (13) Add Part 9, BSP references for related information.

1.03 The object of the COSMIC I main distributing frame system is to provide a complete package of hardware and software which will:

- Eliminate or reduce the major engineering limitations of the ESS modular distributing frame through new design
- Establish and maintain a computer aided assignment and record keeping system

- Provide a viable set of engineering methods and programs for planning, implementing, and growth of the COSMIC I main distributing frame system.

- Retain the desirable operating features of the existing modular frame and introduce additional labor saving methods.

1.04 The primary benefits of the COSMIC I main distributing frame system are as follows:

- To provide a single-sided working area for a one-person jumper running operation
- To provide a low frame height to eliminate large rolling ladders and mezzanines
- To provide quick-clip terminals for rapid connections and disconnections
- To provide a high density terminal field which, when used with the computer system for main frame operations (COSMOS) administrative program of record keeping, maintains a field of *short jumpers* by the use of preferential assignment.

1.05 Miscellaneous equipment, such as E repeaters, dial long lines, trunk cables, trunk equipment, and sleeve leads for No. 5 Crossbar and other subscriber electronics *cannot* be terminated on the COSMIC I main distributing frame. These miscellaneous equipments are terminated on other types of frames.

2. MODULAR DISTRIBUTING FRAME

MODULAR FRAMEWORK

2.01 The COSMIC I main distributing frame, after installation (Fig. 1), consists of modules 6 1/2 feet wide, 1 1/2 feet deep and 8 feet high; between each module is a 1.0 foot wide vertical wiring channel. A sketch of the modular arrangement is shown in Fig. 2. Each module contains eleven shelves of connecting blocks and ten horizontal wiring channels. The top and bottom shelves contain ten 50-pair connecting blocks each. The remaining nine shelves contain either ten 100-pair connecting blocks, sixteen 64-pair connecting blocks, or some combination of 100-pair and 64-pair blocks. The termination capacity of a module will range from 10,000 to 10,216 pairs de-

pending on equipment and cable layout. Each frame lineup has an upper and lower express trough which runs its entire length and is used for running jumpers between non-adjacent modules.

2.02 A 115-volt ac appliance outlet is mounted in the rear base of the frame on every other half-module. The wiring and appliance outlets are enclosed in integral sheet metal power conduit.

2.03 The modular MDF provides terminal fields (modules) with large capacities (approximately 10,000 pairs each). Each module terminates either outside plant cables or line equipment plus tie cables on the rear of the frame. The outside plant and line equipment modules are alternated down the length of the frame lineup.

2.04 Outside plant and line equipment appearances are interconnected by means of jumper wire which are run on the front side of the frame. When assigning a line equipment or tie pair to a cable pair, the initial target zone is having the assigned line equipment or tie pair in a module adjacent to the cable pair module. This is called the short jumper universe and may contain up to 20,176 pairs. All jumpers within this universe can be run without using the upper or lower express troughs and are therefore called **short jumpers**. Jumpers which use the upper or lower express troughs to connect non-adjacent modules are called **long jumpers**.

2.05 The size of the short jumper assignment universe, coupled with the high percentage of short jumper assignments generated by COSMOS or the Simplified Modular Frame Administration System (SMFAS) results in limited useage of the upper and lower express troughs for long jumpers. This allows these troughs to be used for handling cable throws and line equipment transfers for load balancing.

2.06 Another advantage is that although cables will be spread over the entire frame length, larger cable complements can be used without adversely affecting the equipment visibility of each cable pair. For loop cables, there is a one-to-one relationship between each 302 or 308 connector on the PF and a 100-pair block on the loop cable (outside plant) module. The five 302 or 308 connectors in each modular PF vertical can be cabled to five consecutive 100-pair connecting blocks (half a shelf in a facilities cable module). Identification of the PF and main

frame (MF) loop cable locations is clearly noted on the program for arrangement of cables and equipment (PACE) labels attached to each framework. This allows the frame attendant to move from the PF pair location to the MF loop pair location or vice versa without consulting a translation guide.

2.07 End Guards: End guards are provided for each end of the PF, MDF, and TPDF lineups. All end guards are 8 feet high. Fig. 3 illustrates an end guard mounted on a PF.

CONNECTING BLOCKS

2.08 The 78C and 112C series connecting blocks are designed specifically for the COSMIC I MDF and TPDF framework. Because of differences in the terminals, 78C and 112C connecting blocks may not be intermixed on the same frames. New features of the connecting blocks include the following.

- **A snap-in feature which allows the blocks to be installed in a matter of seconds.** Because of this feature, the blocks can be wired immediately adjacent to the framework (from the front or rear) with the aid of a portable wiring shelf and then snapped into the frame. **The installer has excellent visibility and accessibility during wiring.** Blocks are shipped separately from the framework which allows ordering only those blocks initially required. Blocks needed for growth can be ordered and installed in the future as required.
- **Angled entrance slots** in the fanning strips retards jumper wire movement out of the fanning strip preventing torsional fatigue and breaking.
- **The fanning strips are color coded** to denote the connecting block function as follows:
 - (a) Blue—Loop Pairs
 - (b) White—Tie Pairs
 - (c) Ocher yellow—ESS
 - (d) Green—Crossbar
 - (e) Orange—Step-by-Step

The fanning strip numbering is hot-stamped at the factory to eliminate all field stenciling and associated maintenance.

- **The 78-type block terminal fields are color coded** in a red checkerboard pattern, and the 112-type block in a blue checkerboard pattern. This is to eliminate parallax problems and facilitate terminal pair identification. Another difference between the 78-type and the 112-type connecting blocks is that the 78-type has a welded bifurcated terminal and the 112-type has a 3-beam construction. They are not mixed on the same frame because each block requires different tools for making jumper connections.

2.09 Three sizes of connecting blocks are provided for the COSMIC-I main distributing frame as follows:

- **One-hundred pair blocks** (4 paired rows by 25 columns, Fig. 4) for loop cables, electro-mechanical switching equipment, and tie pair requirements
- **Sixty-four pair blocks** (4 paired rows by 16 columns, Fig. 5) for ESS requirements
- **Fifty pair blocks** (2 paired rows by 25 columns, Fig. 6) for the top and bottom "half shelves" of each module for loop cable and/or tie pairs.

2.10 Figure 7 illustrates the fanning strip codes and formats. A detailed description of each connecting block follows.

- 78C1A-50 or 112C1A-50 (50-pair, tie cable block):** This block is equipped with 100 terminals arranged in 25 columns with four terminals in each column. The two fanning strips are color coded white, indicating that tie cable is terminated on the rear face. This block provides cross-connection capacity for 50 pairs, numbered 01 to 50, in normal use and 100 pairs when fully bridge tapped. Up to ten of these blocks may be installed on each of shelves 1 and 11 of the MDF.
- 78C1B-50 or 112C1B-50 (50-pair block for loop cable pairs):** This block is identical to the 78C1A-50 or 112C1A-50 connecting block except the fanning strips are color coded blue, indicating that loop cable pairs (outside plant) are terminated on the block. Up to ten of these blocks may be installed on each of shelves 1 and 11 of the MDF.
- 78C1A-100 or 112C1A-100 (100-pair tie cable block):** This block is equipped with

200 bifurcated terminals arranged in 25 columns with eight terminals in each column. The fanning strips are color coded white, indicating that tie cable pairs are terminated on the block. This block provides a cross-connection capacity of 100 pairs in normal use and 200 pairs when fully bridge tapped. Up to ten such blocks may be installed on shelves 2 through 10 of the MDF.

- 78C1B-100 or 112C1B-100 (100-pair block for loop cable pairs):** This block is identical to the 78C1A-100 or 112C1A-100 except the fanning strips are color coded blue, indicating that loop cable pairs (outside plant) are terminated on the block.
- 78C1C-100 (100-pair step-by-step connecting block):** This block is identical to the 78C1A-100 except the fanning strips are color coded orange, indicating that step-by-step line equipment cable is terminated on the block.
- 78C3A-100 (100-pair No. 1 crossbar line equipment):** This block has fanning strips color coded green, indicating that crossbar line equipment cable is terminated on the block.
- 78C2A-100 (100-pair No. 5 crossbar line equipment):** This block has fanning strips color coded green, indicating that crossbar line equipment is terminated on the block.
- 78C1A-64 or 112C1A-64 (64-pair No. 1 ESS connecting block—4:1 line concentration ratio (LCR):** This block is equipped with 128 twin terminals arranged in 16 columns with eight terminals in each column. The fanning strips are color coded ochre yellow, indicating that ESS line equipment is terminated on the block. The numbering pattern on the side faces of the fanning strip with smaller red characters is suitable only with ESS equipment having a 4:1 LCR. Up to sixteen 64-pair blocks may be installed on shelves 2 through 10 of the MDF.
- 78C2A-64 or 112C2A-64 (64-pair No. 1 ESS connecting block—2:1 LCR):** The fanning strips are also color coded ochre yellow, indicating that the ESS line equipment is terminated on the block. The numbers located on the side faces of the fanning strips (with smaller characters) aid in locating the ESS equipment having a 2:1 LCR.
- 78C2A-50 or 112C1A-50 (50-pair tie cable block):** This block is equipped with 100

terminals arranged in 25 columns with four terminals in each column. The two fanning strips are color coded white, indicating tie cable pairs are terminated on this block. The capacity of this block is 50 pairs, numbered 51 to 99, in normal use and 100 pairs when fully bridge tapped.

(k) **78C2B-50 or 112C2B-50 (50-pair block for loop cable pairs):** This block is identical to the 78C2A-50 or 112C2A-50 except the fanning strips are color coded blue, indicating that loop cable pairs (outside plant) are terminated on the block.

2.11 Designations: Designation card holders are mounted at the top center of the front of each module. A numbered card is inserted into each card holder to number each module. Numbering depends on the lineup and floor plan of the COSMIC I main distributing frame. **An adhesive backed, computer-generated label is attached to each wire retainer bar and is covered with a clear plastic snap-on guard for protection.** These labels identify the cable, equipment or tie pair locations on the MDF and related locations on the PF vertical or TMDF vertical. The labels also identify the shelf number, side, block number, cable number, count, and associated PF connectors or equipment descriptions.

2.12 A framework filler panel is used to cover openings in the COSMIC I main distributing frame where connecting blocks are to be installed at a later date, or to fill unused openings in the frame. Two sizes of framework filler panels are available; a wide size (4-1/2 inches) for shelves 2 through 10 and a narrower one (3-1/4 inches) for shelves 1 and 11. All framework filler panels are approximately 32 inches long and are made of thin plastic with top and bottom lips for **snap-in** installation. Both sizes may be cut to the desired length with scissors. These panels are available in blue for loop cable modules, ocher yellow for switching equipment modules, and white for shelves 1 and 11 on all modules.

PROTECTOR FRAME (PF)

2.13 Two types of modular PFs are available; each is 6 1/2 feet wide by 8 feet high and has 12 verticals. The ED-1A220-31 (Fig. 3) PF mounts only 302-type connectors. Each vertical terminates 5, 302-type connectors with a capacity of 100 pairs per connectors for a total of 500 pairs per vertical or 6,000 pairs

per module. The ED-97898-31 PF mounts only 308-type connectors. Each vertical terminates eight 308-type connectors with a capacity of 100 pairs per connector for a total of 800 pairs per vertical or 9,600 pairs per module. The PF uses 3-, 4-, or 5-type protectors which are inserted in the 302-type or 308-type connectors. See Section 201-222-103 for warning markers and guards.

TIE-PAIR DISTRIBUTING FRAME (TPDF)

2.14 The COSMIC I main distributing frame system may or may not require the use of a TPDF. For most small wire centers of 25,000 loop cable pairs (ultimate) or less, a single COSMIC I main distributing frame lineup is adequate. If additional special service frames or toll intermediate distributing frames (IDFs) are needed in the wire center, tie pairs may be provided directly from the MDF frame to the additional frames. All tie cables and equipments are spread along the entire length of the MDF. More than 25,000 loop cable pairs using a single lineup or more than one lineup of COSMIC I frames requires the use of a TPDF. The TPDF framework is identical to the COSMIC I main distributing frame. All TPDF connecting blocks are color coded white.

TEST/TALK SYSTEM (T/TS)

2.15 The Test Talk System (T/TS) is designed with the objective of systemizing wire center communication needs. It is a multichannel communications system with complete channel availability at all areas of the MDF and its associated modular PF. Noise levels are kept low through the use of headsets for talking. Since the frame attendant needs only a few tools for the MDF and PF, the headset is not expected to be a burden. The T/TS uses the following components:

- (a) Communications Panel KS-21316 L1 (Fig. 8)
- (b) Communications Panel KS-21316 L2 (Fig. 9)
- (c) Test Panel KS-21317 L2 (Fig. 10)
- (d) Transmitter Panel KS-21318 (Fig. 11)
- (e) Transmitter/Test Panel KS-21315 L2 (Fig. 12)
- (f) Transmitter/Test Panel KS-21315 L3 (Fig. 13)
- (g) Test/Talk Panel KS-21315 L4 (Fig. 14)

- (h) Test/Talk Panel KS-21315 L5 (Fig. 15)
 - (i) Transmitter Test/Talk Panel KS-21393 L1 (Fig. 16)
 - (j) Transmitter Test/Talk Panel KS-21393 L2 (Fig. 17)
 - (k) Loudspeaker Box Assembly KS-21347 L1 and L2 (Fig. 21).
- 2.16** Figures 8 through 17 show the T/TS panels. Miniature jacks are used to provide the needed channel capacity. The communications test and transmitter panels, (a), (b), (c), and (d) mount on the line equipment modules. The transmitter/test and test/talk panels, (e) through (j) mount on the single sided PF.
- 2.17** A monitoring insert assembly KS-21315 L6 (Fig. 18) is used for future growth of talk channels.
- 2.18** An insert assembly, KS-21315-L7 (Fig. 19) is also available for mounting test trunks requiring lamp appearances.
- 2.19** Some early installations used the KS-21315 L1 PF test-talk panel (Fig. 20). This panel is manufacture discontinued.
- 2.20** Communications needs are served by telephone circuits (supplied through miniature jack pairs) on the MDF communications panel and the PF test-talk panels. The telephone jacks are wired to provide the following communications services: repair service bureau (RSB), loop plant (LP), intra-frame, and inter-MDF. Thus, all communications needs are provided at the frames where the testing functions must be performed. Because of the panel spread, all channels are available throughout the frame system. The allocation of channels to the four functions previously mentioned depends on individual wire center needs.
- 2.21** The test panel, KS-21317 L2 (Fig. 10), provides test battery and ground and telephone circuits. It also provides a test and talk link between the MDF, the equipment frames and the PF.
- 2.22** The T/TS transmitter panel KS-21318 (Fig. 11) mounts on the MDF and TPDF and is used to call frame personnel on loudspeakers.
- 2.23** The transmitter test panel KS-21315 L2 (Fig. 12) mounts on the even numbered modules of the PF.
- 2.24** The transmitter test panel KS-21315 L3 (Fig. 13) is the same as the KS-21315 L2 panel but does not have the transmitter, "push to talk," button or "call lamp." Mounting is on the odd numbered modules of the PF.
- 2.25** The test/talk panel, KS-21315 L4 (Fig. 14) has a capacity of 75 channel locations; three of these are plugged and can not be used. Twenty of the channels are multiples of the MDF talk channels and the remaining 52 locations can be used for additional talk channels or miscellaneous test trunk appearances not requiring a lamp. Any test trunk appearances requiring a lamp uses an alternate jack mounting KS-21315 L7 (Fig. 19).
- 2.26** The test/talk panel, KS-21315 (Fig. 15) is an alternate for the KS-21315 L4 panel but has a capacity of 67 channels.
- 2.27** The transmitter test/talk panel KS-21393 L1 (Fig. 16) is mounted between the verticals of the PF on every tenth vertical starting with vertical 5. It is used when lamp monitoring is not required.
- 2.28** The transmitter test/talk panel KS-21393 L2 (Fig. 17) is identical to the KS-21393 L1 except this panel provides lamp monitoring.
- 2.29** The loudspeaker box assembly KS-21347 L1 or L2 (Fig. 21) is mounted on the frame superstructure at approximately 10-foot intervals along the MDF, PF, and TPDF.
- 2.30** RSB testing is initiated through paging a frame attendant over loudspeakers to a specified channel and area of the PF or MDF. If a frame attendant cannot immediately reply, the RSB can be alerted through the use of one of the transmitters. The frame attendant answers RSB calls by plugging the headset into the proper channel in the requested area of the frame. From that point on, all communication associated with the testing operation is private. Channel occupancy is indicated at the RSB by lights at the LTD positions.
- 2.31** A KS-21396 jack mounting (Fig. 22) which clamps on the cable side fanning strip of conventional MDFs is available. This jack mounting has full size jacks and requires the use of a 60B (large plug) headset. The jack mounting provides three communication channels between a COSMIC I main distributing frame and a conventional MDF located in the same building.

2.32 The KS-21395 L1 and L2 jack mountings (Fig. 23) clamp on the cable side fanning strip of conventional MDF and are similar to and provide the same function as the KS-21396 jack mounting. Each of these units, however, has five miniature jack channels and required the use of a 60D (small plug) headset. The KS-21395 L1 has a lamp monitor for each channel. The L2 does not have lamp monitors.

3. TEST/TALK SYSTEM CIRCUITS

A. Local Frame Talk Line

3.01 The local frame talk line is used for communications between the COSMIC-I main distributing frame and its associated PF.

3.02 The local frame talk line unit has a capacity of three talk-line circuits. J-1P019A L1 provides the first talk-line circuit and each J-1P019A L2 provides an additional talk line circuit.

B. Inter-Frame Loudspeaker and Talk Line

3.03 The inter-frame loudspeaker and talk line is normally connected between the COSMIC I main distributing frame and a conventional MDF. When a headset is connected at one frame, a paging connection is established to the other frame. A response can then be made at the other frame by using a headset. After the answer has been received, the paging connection is disconnected and replaced by a private talk channel. Up to three private channels may be provided in addition to the inter-frame loudspeaker. An option that provides for channel-occupancy indicator lamps may be available.

3.04 The inter-frame loudspeaker and talk line circuit consists of the following two units:

- **Amplifier and control unit**—This unit (J-1P019B L1, L2) provides for an interframe loudspeaker between the COSMIC I main distributing frame and a conventional MDF.
- **Inter-frame talk line unit**—This unit (J-1P019C L1) provides for an interframe talk line between the COSMIC-I main distributing frame and a conventional MDF.

C. Local Test Desk (LTD) Frame Talk Line

3.05 The local test desk frame talk line is the communications link between the MDF and the

LTD. Operation of the assigned key at the LTD establishes a connection to the MDF. The indicator lamp (optional) at the frame flashes a signal to the frame attendant. Where indication lamps are not provided, initial contact with frame attendants is established by the conventional loudspeaker. When the connection is established with the headset, the indication lamps stop flashing.

3.06 Frame attendants may call the LTD operator by connecting a headset to the assigned trunk-talk jack, which in turn causes the lamp at the LTD to flash. When the LTD key is operated, the lamp stops flashing and the talking path is established.

3.07 The LTD frame talk line consists of three units:

- **The LTD to frame, short-loop talk line**—This unit (J-19019D L1) provides one LTD to frame, short loop talk line.
- **The long-loop talk line unit for the LTD end**—This unit (J-19019E L1, L2, L3) provides one LTD to frame, (LTD end) talk line.
- **The long-loop talk line unit for the frame end**—This unit (J-19019F L1, L2) provides one LTD to frame (frame end) talk line.

D. Frame Maintenance Telephone Line

3.08 The frame maintenance telephone line is used to extend telephone lines to the MDF. Incoming calls flash the lamps at key telephone and at the MDF. The call can be answered by connecting a headset to the assigned jack. When the call is answered, the lamp stop flashing.

3.09 The maintenance telephone line unit (J-19019G L1) provides one maintenance telephone line; J-19019G L2 will provide a second line if required.

4. MODIFIED CIRCUITS

A. Main Distributing Frame (MDF) Loudspeaker Circuits

4.01 The MDF loudspeaker circuit and the remote testing loudspeaker circuit have been modified for use in the COSMIC I main distributing frame area. Both of these circuits provide two-way loud-

speaker communication between the LTD and the MDF. New loudspeakers have also been added as needed.

B. Test Circuits

4.02 Test circuits patched to lines at the PF have been modified to provide new patch cords and jacks at the PF. These test circuits are test "shoes", wheatstone bridge trunks, and intermittent trouble trunks. The access jacks are mounted in the PF jack panel (KS-21315-L4 or L5) for which jack mounting inserts are available.

C. Talk and Miscellaneous Circuits

4.03 Headphone communication between frame attendants and central office maintenance personnel is provided by telephone jacks at both the MDF and PFs. These jacks are wired to the frame talk line or to miscellaneous circuits in the central office served by the COSMIC I main distributing frame. The MDF has six telephone jack pairs that are multiplied in the frame lineup. Similarly, six 3-conductor spare jacks are provided for connection to the spare jack multiple in the central offices. Each switching entity within an office has its own telephone and spare circuit.

5. CORDS AND ADAPTERS

A. KS-21386 L1 Miniature Plug Adapter (Fig. 24)

5.01 A KS-21386 L1 miniature plug adapter is used on the MDF and PF. The adapter allows frame attendants to plug in headsets (or 4-conductor test cords such as the W4CL or W2FM) that are equipped with the large size plug ends into miniature jacks.

B. KS-21387 Test Set Patch Cord (Fig. 25)

5.02 A KS-21387 3-conductor test set patch cord is used on the MDF and PF. This adapter allows frame attendants to adapt existing test equipment with 3-conductor cords equipped with the standard size 3-conductor plug to 3-conductor miniature spare jack positions on test panels.

C. W2GY Service Observing Cord (Fig. 26)

5.03 The W2GY service observing cord has a black nylon braided jacket and consists of two tinsel conductors with vinyl insulation. The jack end is

equipped with a special jack designed to install on a pair of .045-inch square terminals spaced 7/16-inch apart on the rear of 78C-type connecting blocks. The plug end is equipped with a switchcraft TT251 plug. DC resistance is .21-ohms per foot. Standard length is 9 feet.

5.04 The service observing cord is used for inter-connecting ESS line equipment appearances to service observing jack appearances on the rear of the MDF.

D. 60D Headset (Fig. 27)

5.05 The 60D Headset is a light weight "on-ear" head telephone set designed for use with the COSMIC I main distributing frame system. The 60D headset is the same as the 60B except it is equipped with an L4CS cord which has the miniature plug for the T/TS miniature jacks.

5.06 The standard 60B headset may be used with the frame T/TS by using the KS-21386 L1 miniature plug adapter.

6. MISCELLANEOUS HARDWARE ITEMS

WIRE

6.01 A new jumper wire, which has been coded DT-24P distributing frame wire, is used with the COSMIC I main distributing frame system. This wire is a twisted pair with 24 AWG solid copper conductors and an irradiated polyvinyl chloride (IPVC) insulation. The new wire is both smaller in diameter and lower in cost than other conventional distributing frame wire. It also has a slicker insulation which makes dead wire removal easier.

TOOLS

A. Wire Insertion Tools (756C, 756C2, 872A)

6.02 The 756C wire insertion tool consists of a double-ended wire insertion head mounted in a plastic handle and insulated with a black nylon coating (Fig. 28). One end of the insertion head is designed for installing a 24-gauge conductor into the twin clip terminal of the 78-type connecting blocks. The other end is designed for installing a 22 gauge conductor into the connecting blocks with single clip terminals of the 78-type connecting block. The insertion head can be rotated to either position by loosening

SECTION 201-222-101

ing the screw, rotating it 180 degrees, and retightening the screw to hold the head firmly in position. Since the 756C wire insertion tool does not have a cut off blade, the conductor must be cut to proper length prior to making the electrical connection to the connecting block. The 756C2 wire insertion tool is used for installing connections on the **112-type** connecting blocks.

6.03 The 872A (Fig. 29) wire insertion tool is a direct replacement for the standard 756C tool for installations equipped with 78-type connecting blocks manufactured between August, 1977 and April 1978. The 872A tool consists of a two piece molded handle, a flexible insertion blade, and a wire direction knob. The handle is red in color, has "872A" molded in a recessed area and is factory marked "THIS SIDE UP" and "THIS SIDE DOWN." This is used to orient the blade's non-restrictive and restrictive slots with the terminal assembly. The proper use of this tool is shown in Fig. 30.

B. Wire Removal Tool (724A)

6.04 The wire removal tool (Fig. 31) is provided for removing conductors from the connecting blocks. The tool consists of a two-pronged fork with an insulated handle. The fork is sized to fit around a clip and underneath the seated conductor. Use of the 724A tool insures long terminal clip reliability as well as eliminating the possibility of disturbing or degrading adjacent wire connections during removal of wire from the terminals.

C. Connecting Block Removal Tool (KS-21345)

6.05 The connecting block removal tool (Fig. 32) is a steel tool with a wooden handle. It is designed with small inclines on the face of the tool. Connecting blocks are removed from the MDF by aligning the inclines on the face of the tool with the **snap-in** locks on the top rear of the connecting block and pressing the connecting block towards the front of the MDF. This action releases the top of the connecting block, allowing it to tip forward. Complete removal is afforded by lifting the connecting block off the frame engaged in the groove in the bottom connecting block fanning strip. After carefully aligning the tool initially with the snap-in locks on the connecting block, a very rapid forward movement of the tool will provide an easier releasing action.

ROLLING WORK PLATFORM

6.06 The KS-21415 L1 and L2 rolling work platform (Fig. 33) is used in telephone central offices on

low height frames. The rolling platform is built of wood and is finished with clear varnish to protect and bring out the grain.

6.07 The KS-21415 L1 rolling work platform is an A-frame ladder consisting of 10-inch high steps on both sides, with a 20-inch high work level, 18 inches wide by 36 inches long and a 15 by 18 inch folding step 30 inches from the floor. This step is normally fastened in the up position unless it is required to service upper frame shelves. Safety rails on each side project 30 inches above the platform limiting access by way of the steps. Spring loaded retracting casters support the unoccupied platform allowing it to be moved. The casters retract when weighted and each leg rests directly on the floor. Rubber bumpers on the rail legs are standard safety accessories.

6.08 Rolling work platforms were designed for use on all frames not exceeding 8 feet in height and in aisles 24 inches or greater in width. Portable ladders of this type can be used efficiently as one unit may serve two or more aisles. A 48-inch aisle between frames is sufficient space for two ladders to pass, while double access to the platform permits passage through a narrow aisle without removing the work platform.

6.09 The KS-21415 L2 rolling work platform (Fig. 33) is equipped with a slide mechanism for mounting the KS-8047 or KS-21955 wire reel horizontally beneath the platform. The reel pulls out for convenient replacement of a wire coil. A latch is provided to lock the reel centrally under the platform. Wire reel and platform combinations increase efficiency of systems with short jumper assignment methods.

WIRE REEL

6.10 The wire reel assemblies KS-8047 L2 (Fig. 34) and KS-21955 L1 (L1 (Fig. 35) may be used with the MDF, PF, and TPDF frames. An automatic brake is provided to prevent the wire reel from **free wheeling** when the wire is pulled from the reel. Tension on the wire releases the brake. Wire is fed from the reel through the brake assembly.

7. ENGINEERING ASSISTANCE PROGRAMS

PROGRAM FOR ARRANGEMENT OF CABLES AND EQUIPMENT (PACE)

7.01 The MDF frame loop cable, tie cable, and equipment terminations are engineered with PACE which provides the following features:

- Distributes the loop cable, tie cable, and equipment terminations in an optimal manner for preferential assignment.
- Generates an adhesive backed label for identification of equipment and cables on the MDF, PF and TPDF. Labels are covered with a clear plastic guard for protection.
- Generates and maintains the official office records, thereby eliminating much of the manual drafting effort.
- Generates and maintains a frame directory of equipment and pair locations for use by the frame force.
- Provides an input tape to COSMOS or SMFAS which constructs the file of loop cable pairs, line equipment, and tie pairs on the MDF, TPDF, and modular PF.

7.02 The PACE functions are provided by the Western Electric Regional Center engineers upon receipt of the appropriate input information from the telephone company. PACE is an integral and essential element of the COSMIC I main distributing frame system.

7.03 A viable frame operation is not possible unless the data base is accurate and assignment rules are followed precisely. This is especially true for modular frames which require rigid adherence to preferential assignment because only limited long jumper space is available. The only two computer based systems which are applicable to the COSMIC I main distributing frame system are COSMOS and SMFAS.

8. ADMINISTRATION SYSTEMS

A. Computer System for Main Frame Operations (COSMOS)

8.01 COSMOS is a mini-computer based system which provides a central data base of informa-

tion, accessible and useful to many areas of the telephone company, and preferential assignment of line equipment, tie pairs, and bridge lifters. COSMOS is applicable to any type MDF or combination MDFs in a wire center. Moreover, COSMOS can run more than one wire center, with the limitation that the working lines being served by COSMOS not exceed approximately 200,000 lines. Although the major objective of COSMOS is preferential assignment, COSMOS has broad capabilities and performs many functions for dial administration, plant assignment, repair service, etc. Conversion to COSMOS requires that the existing plant and traffic records be input and compared and that any existing discrepancies be resolved. Record conversion can be a lengthy and somewhat expensive process. However, the conversion process turns up more than enough "lost" line equipment and cable pairs to make the conversion worthwhile.

B. Simplified Modular Frame Administration System (SMFAS)

8.02 SMFAS is a time shared system which in effect is only an assignment module. There is no inventory of the existing associations between cable pairs, line equipment, tie pairs, etc, nor are their statuses known. SMFAS only assigns line equipment to cable pairs, given that both the desired cable pair and a list of available line equipment have been input. SMFAS will select the best (shortest jumper) line equipment for the given cable pair. SMFAS will assign tie pairs, No. 5 crossbar equipment, and ESS line equipment only. Because SMFAS does not have a central data base or a file system, conversion is very rapid.

9. Reference

9.01 The following Bell System Practices contain related information:

201-208-100	3-, 4-, and 5-Type Protector Units—Description
201-208-101	302- and 308-Type Connectors—Description
201-208-102	302- and 308-Type Connectors—Associated Cord and Plugs
201-219-101	Protector Frames—Description
201-222-102	COSMIC I Main Distributing Frame System—Types of Protection

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201-222-103 Common Systems Main Inter-Connecting Frames (COSMIC)—Warning Markers and Guards

Connecting Blocks—78C-Type—Description

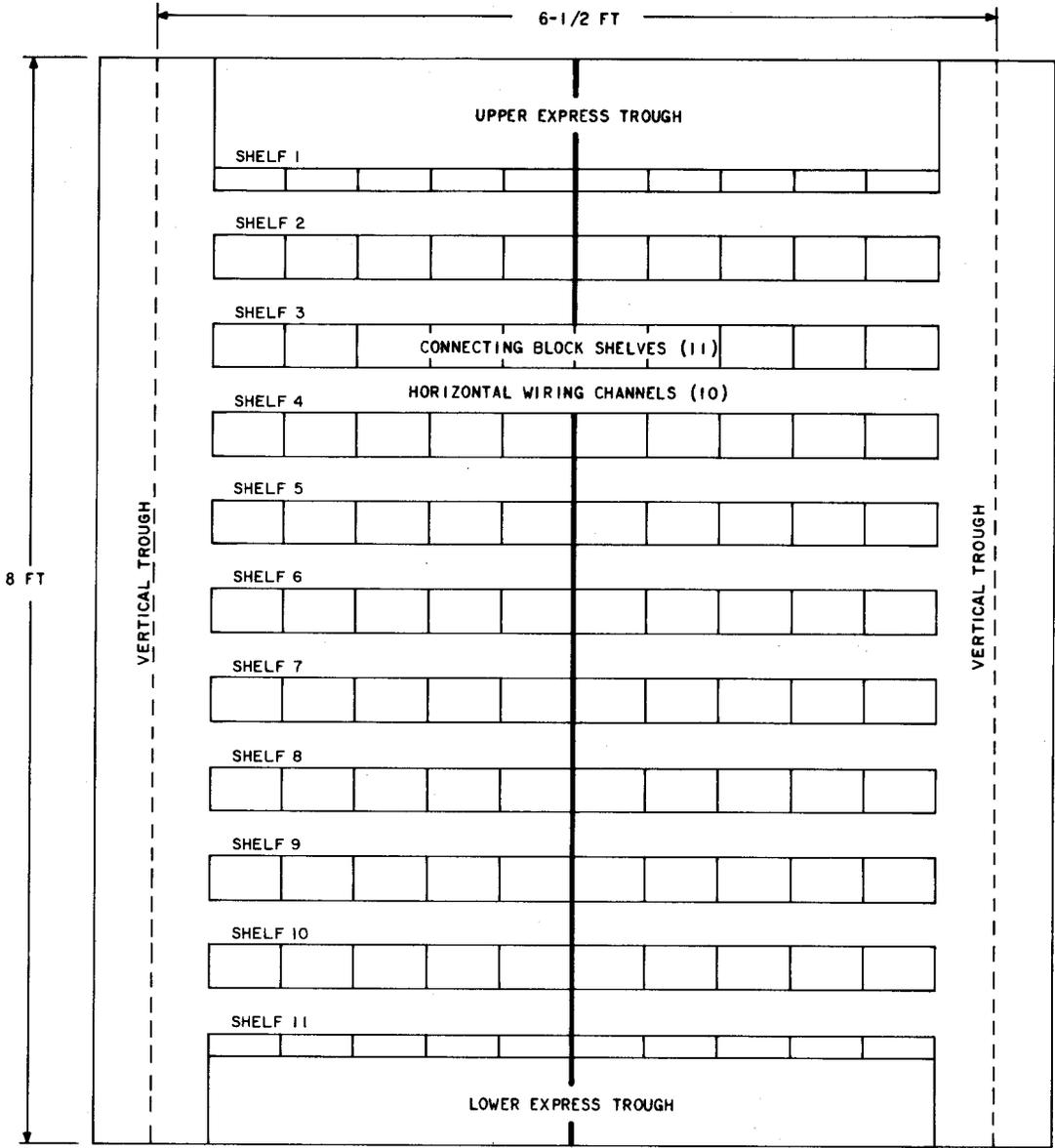
201-222-105 Common Systems Main Inter-Connecting Frames (COSMIC)

201-222-301

Common Systems Main Inter-Connecting Frame (COSMIC)—Method of Making Connectings



Fig. 1 —COSMIC I Main Distributing Frame System Installation



- NOTES:
- 1. MAXIMUM DEPTH OF FRAMEWORK IS 1-1/2 FT.
 - 2. FANNING STRIPS, WIRE DRESSING GUIDES AND MANY DESIGN DETAILS NOT SHOWN.

Fig. 2—COSMIC I Main Distributing Frame Module Sketch

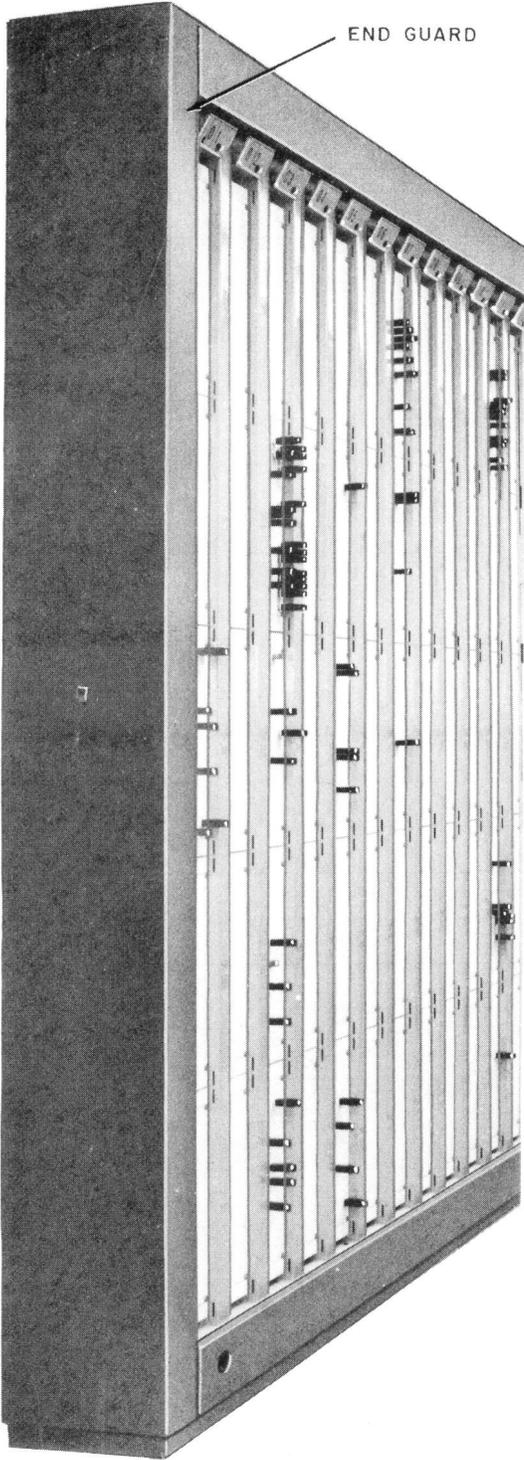


Fig. 3—Protector Frame End Guard

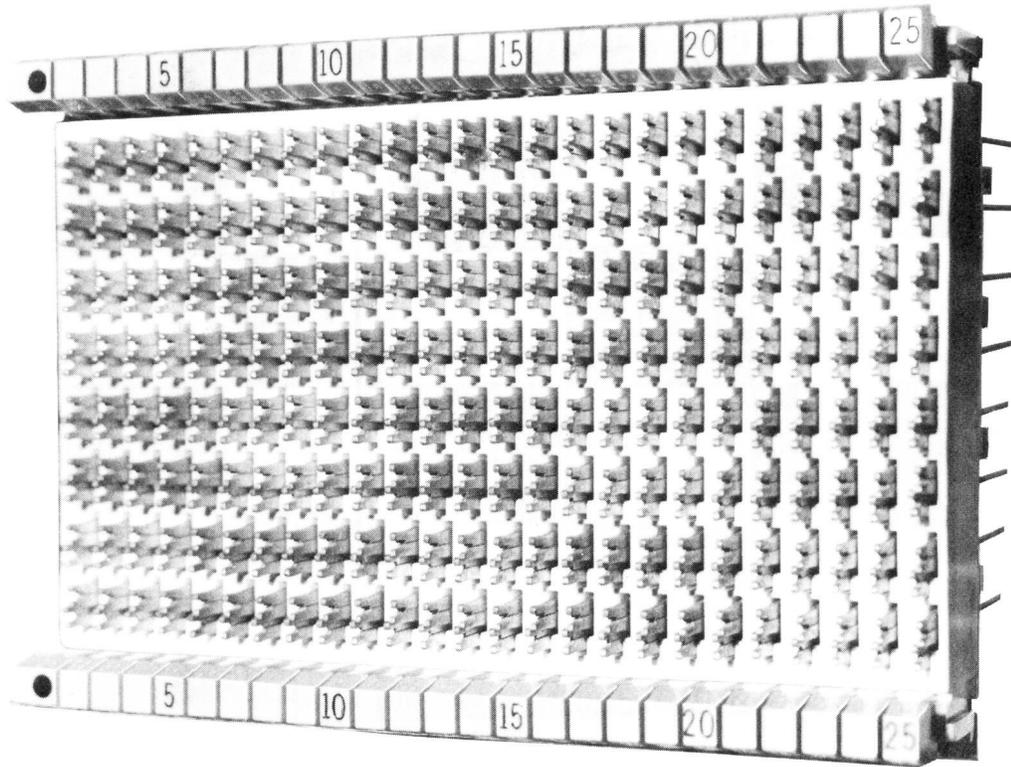


Fig. 4—100-Pair Connecting Block

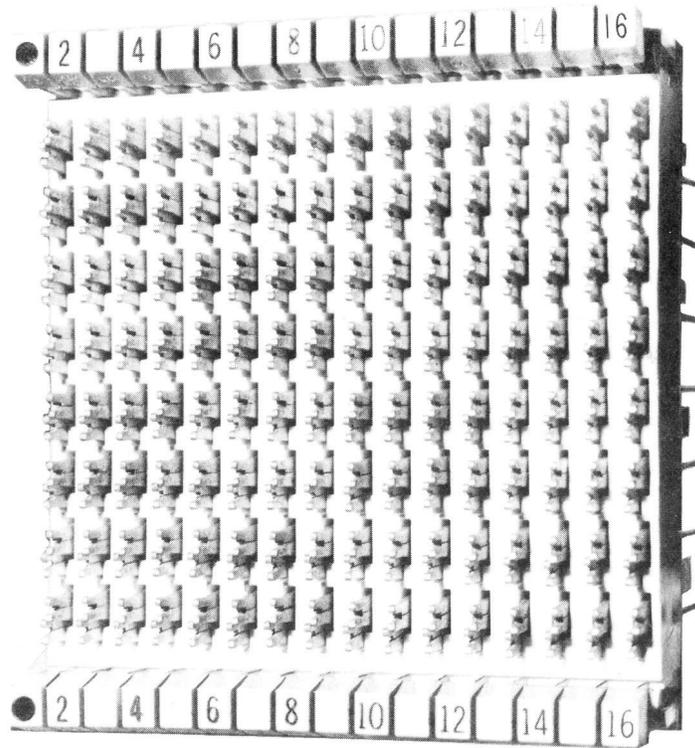


Fig. 5—64-Pair Connecting Block

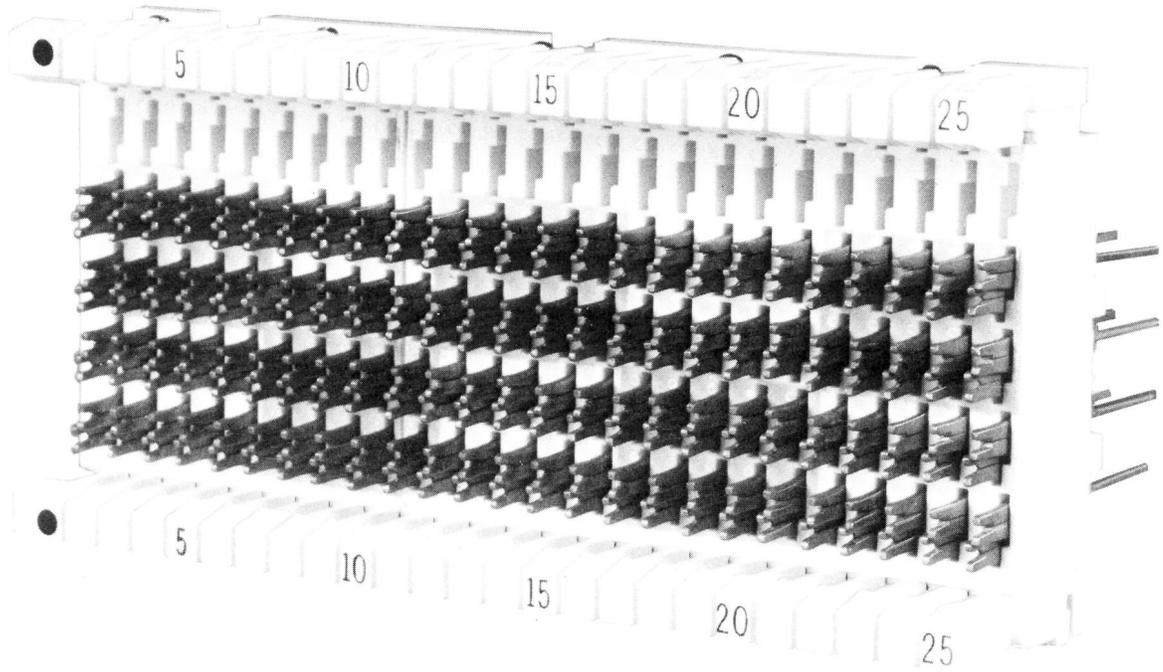
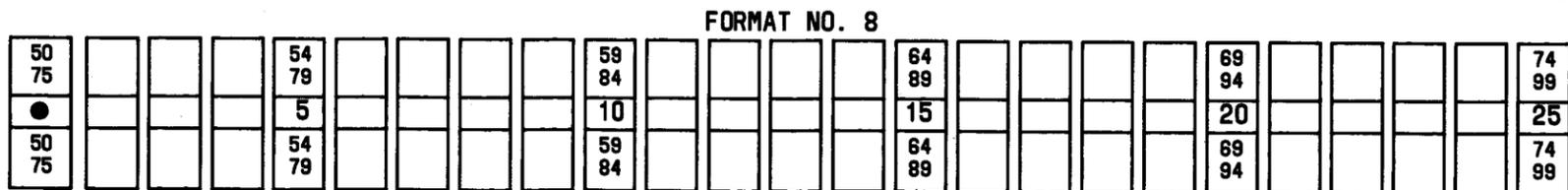
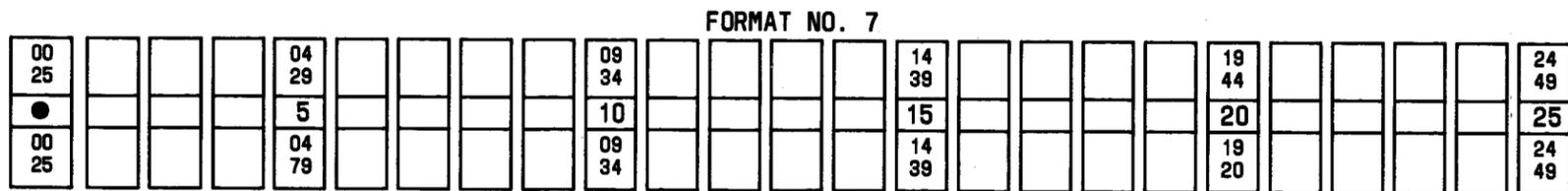
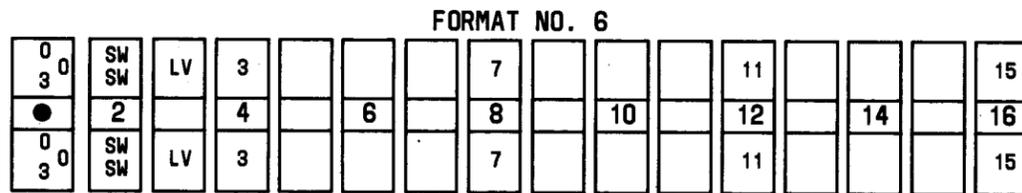
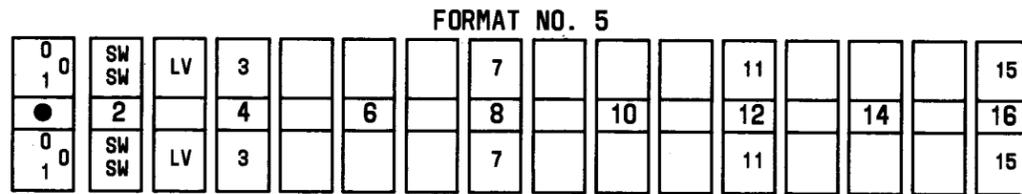
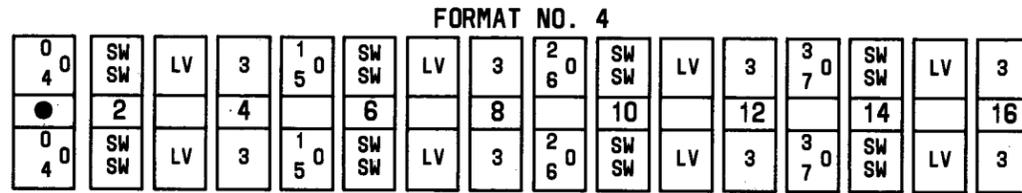
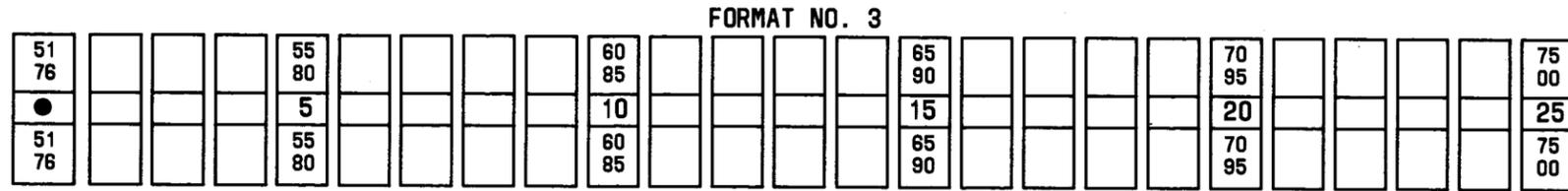
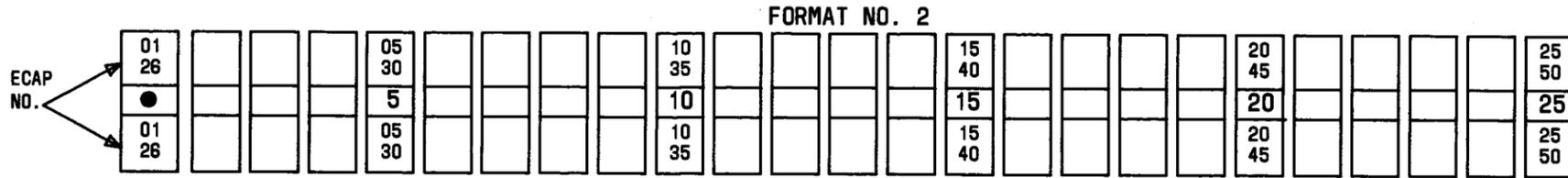
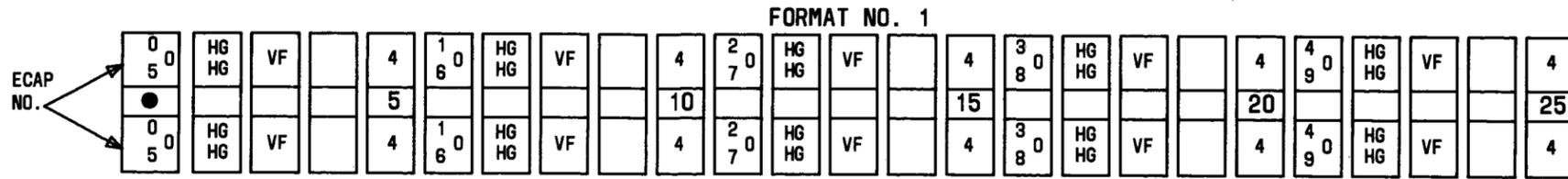


Fig. 6—50-Pair Connecting Block



CODE	CODE	CAPACITY	APPLICATION	FANNING STRIP COLOR	FORMAT NO.	
					TOP	BOTTOM
112C1A-50	78C1A-50	50 PR.	TIE PAIRS	WHITE	2	2
112C1A-64	78C1A-64	64 PR.	ESS (4:1)	YELLOW	5	6
112C1A-100	78C1A-100	100 PR.	TIE PAIRS	WHITE	2	3
112C1B-50	78C1B-50	50 PR.	LOOP DISTRIBUTION	BLUE	2	2
112C1B-100	78C1B-100	100 PR.	LOOP DISTRIBUTION	BLUE	2	3
-	78C1C-100	100 PR.	STEP-BY-STEP	ORANGE	2	3
112C2A-50	78C2A-50	50 PR.	TIE PAIRS	WHITE	3	3
112C2A-64	78C2A-64	64 PR.	ESS (2:1)	YELLOW	4	4
-	78C2A-100	100 PR.	NO. 5 CROSSBAR	GREEN	1	1
112C2B-50	78C2B-50	50 PR.	LOOP DISTRIBUTION	BLUE	3	3
-	78C3A-100	100 PR.	NO. 1 CROSSBAR	GREEN	7	8

Fig. 7—Fanning Strip Formats

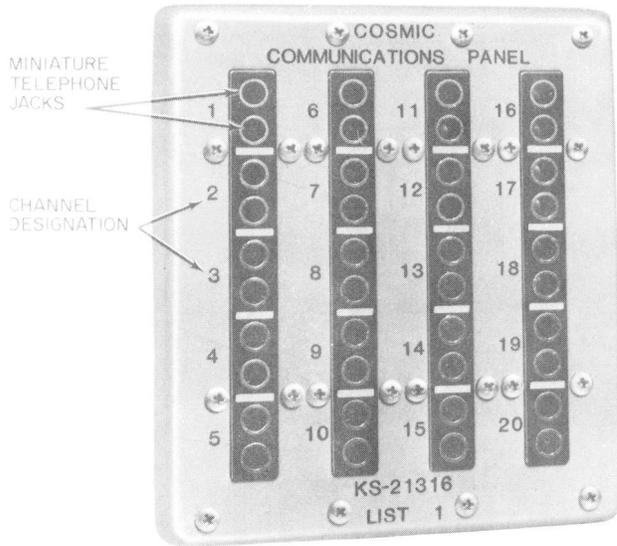
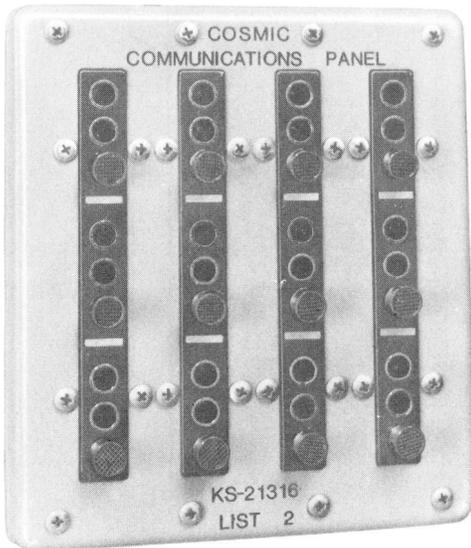


Fig. 8—KS-21316 L1 Communications Panel



12 CHANNELS EQUIPPED WITH JACKS AND LIGHT EMITTING DIODES (LEDS)

Fig. 9—KS-21316 L2 Communications Panel

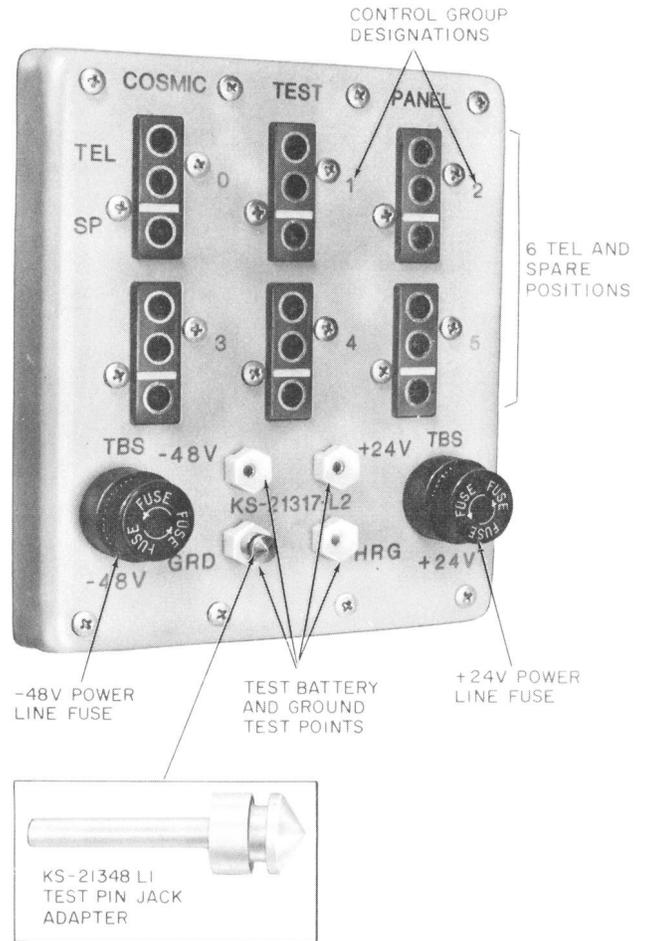


Fig. 10—KS-21317 L2 Test Panel

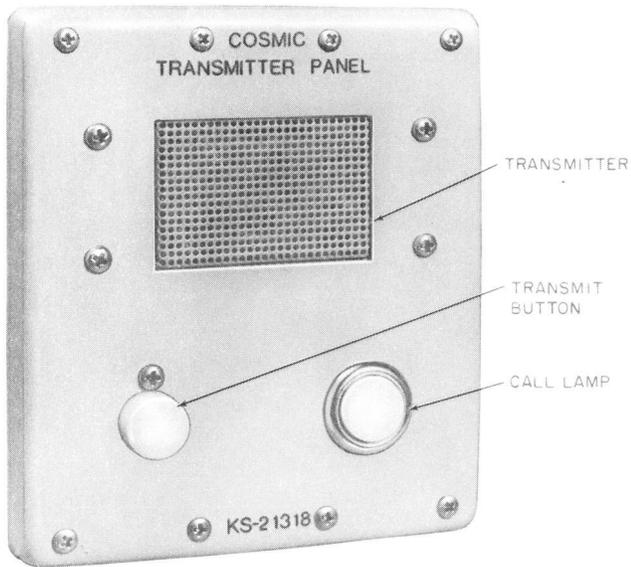


Fig. 11—KS-21318 Transmitter Panel

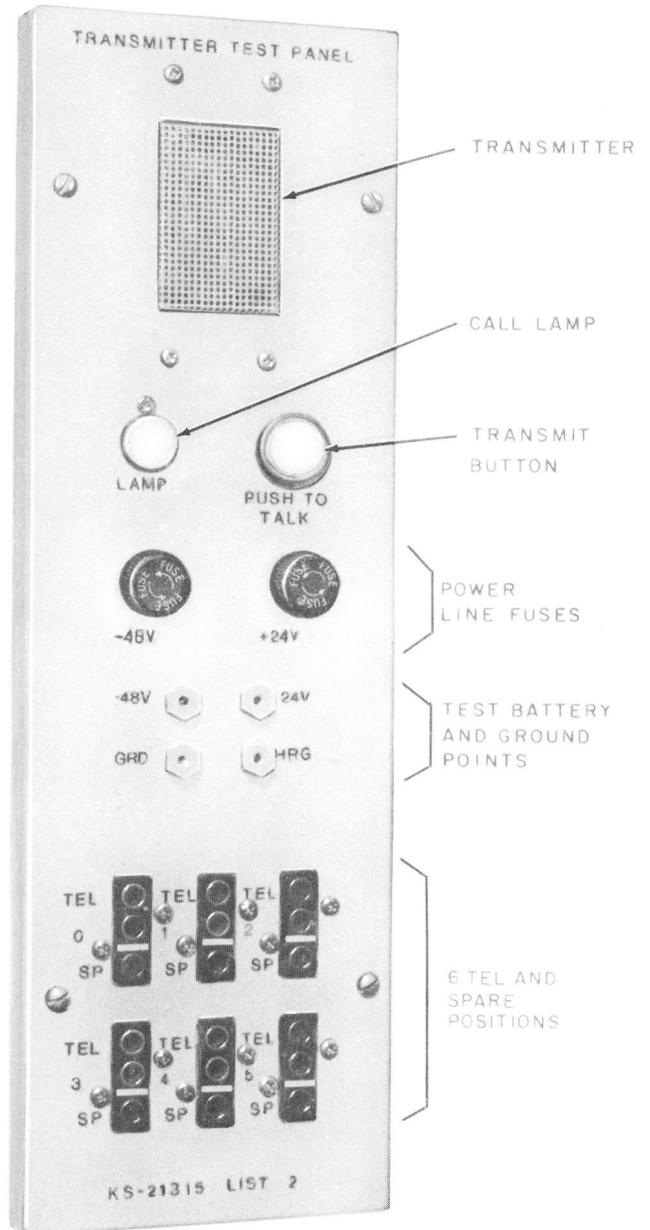
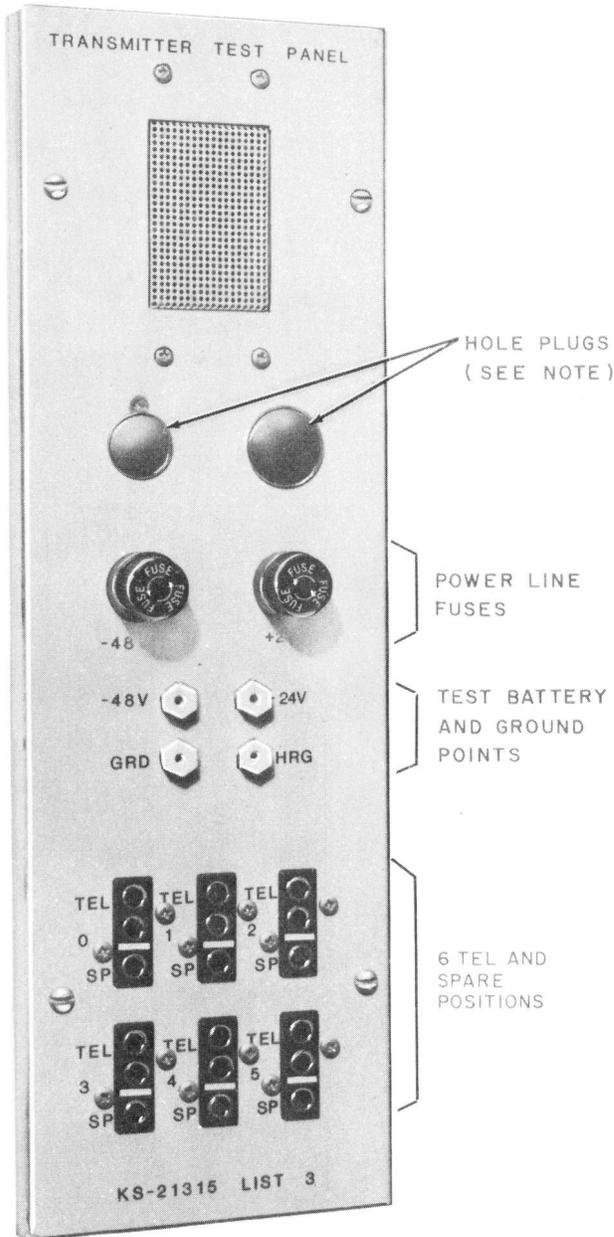


Fig. 12—KS-21315 L2 Transmitter Test Panel



NOTE:
 KS-21315 L3 DOES NOT HAVE THE TRANSMITTER, CALL LAMP, OR TRANSMIT BUTTON, THE LAMP HOLE AND PUSH TO TALK SWITCH HOLES ARE PLUGGED.

Fig. 13—KS-21315 L3 Transmitter Test Panel

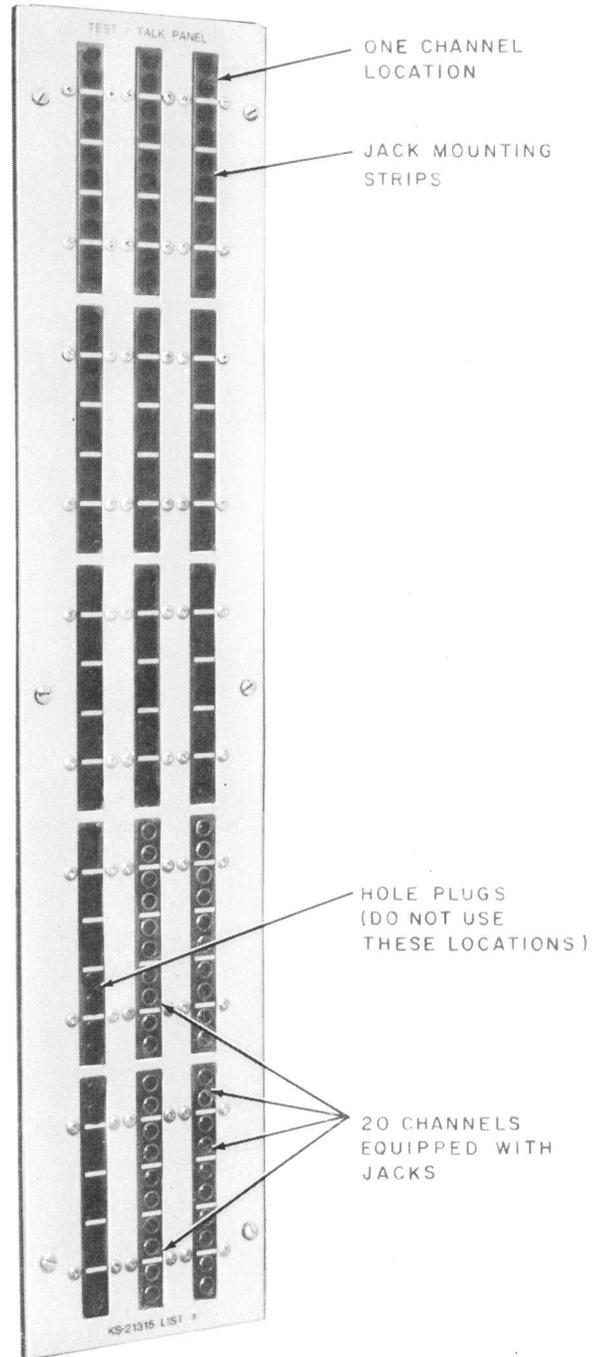


Fig. 14—KS-21315 L4 Test/Talk Panel

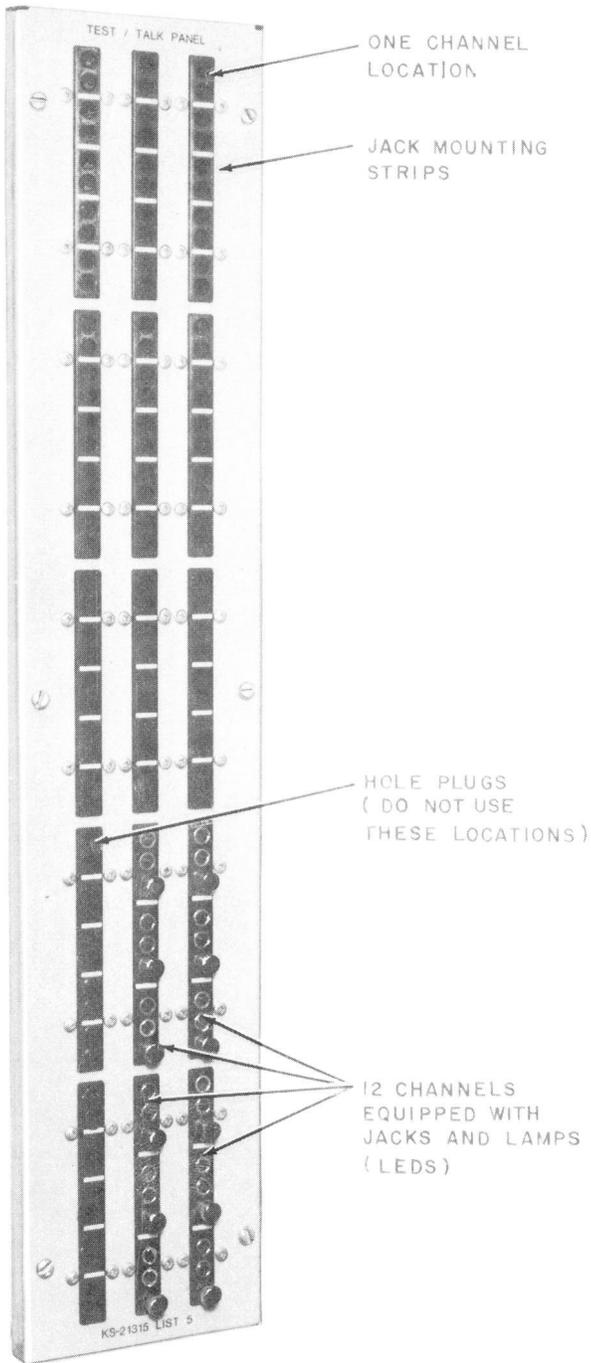


Fig. 15—KS-21315 L5 Test/Talk Panel

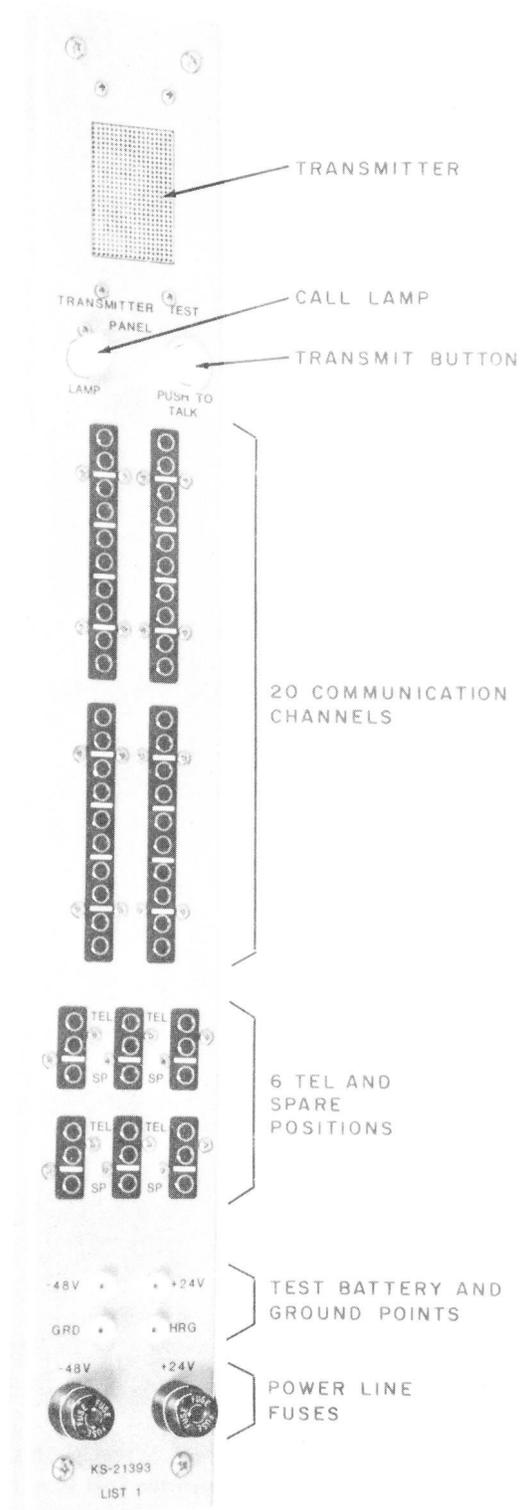


Fig. 16—KS-21393 L1 Transmitter Test Panel

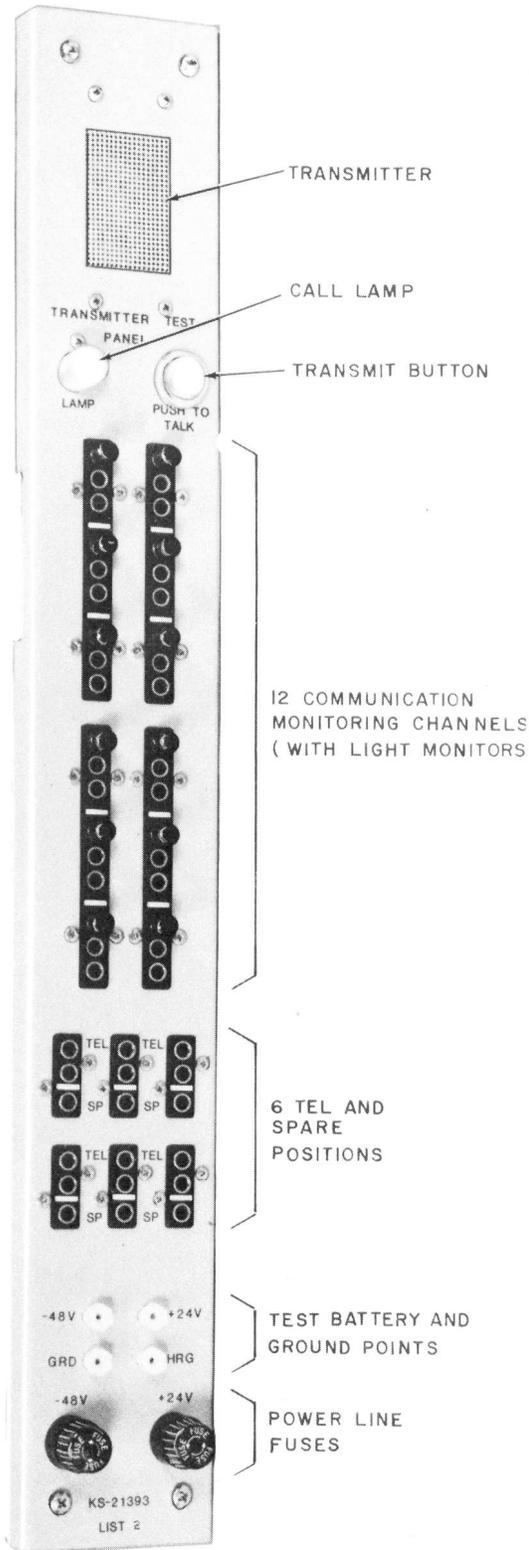


Fig. 17—KS-21393 L2 Transmitter Test Panel

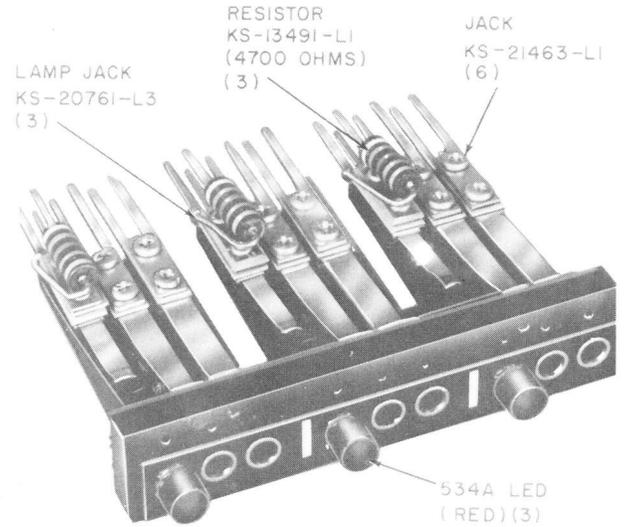


Fig. 18—KS-21315 L6 Monitoring Insert Assembly Containing Three Fully Equipped Channels

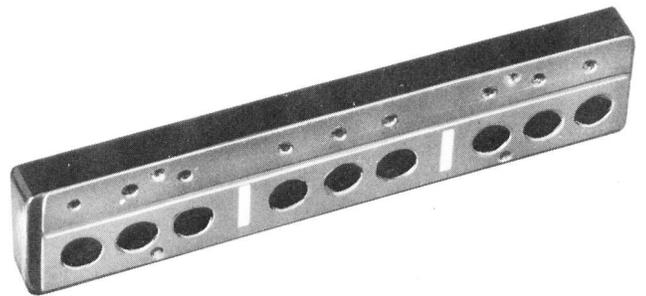
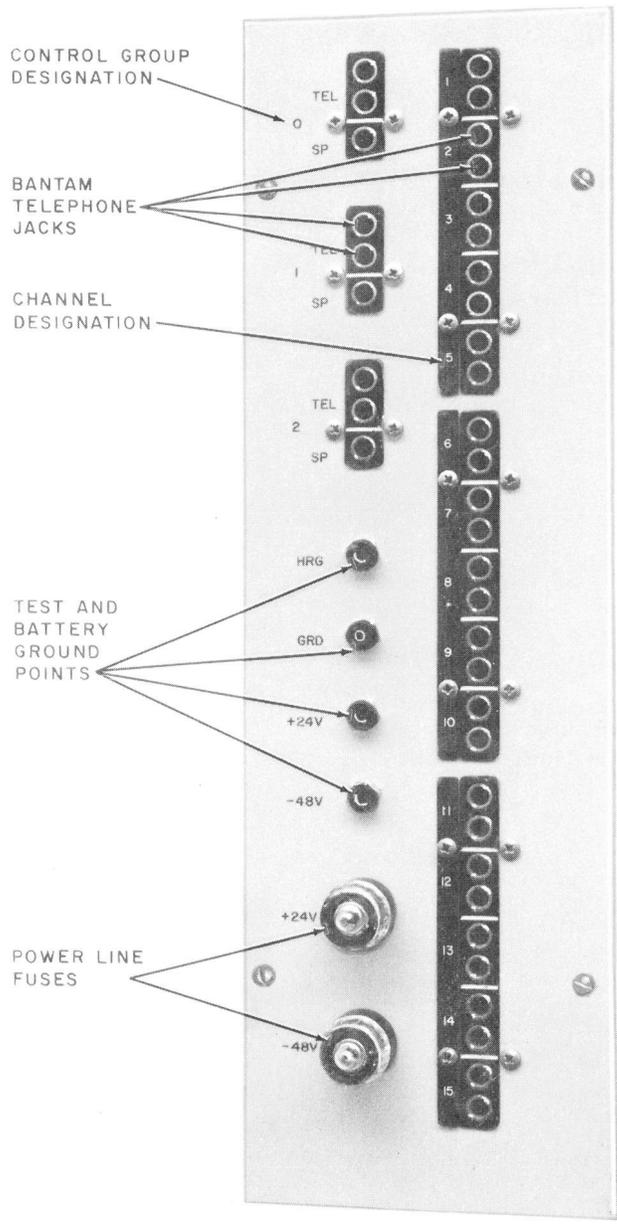
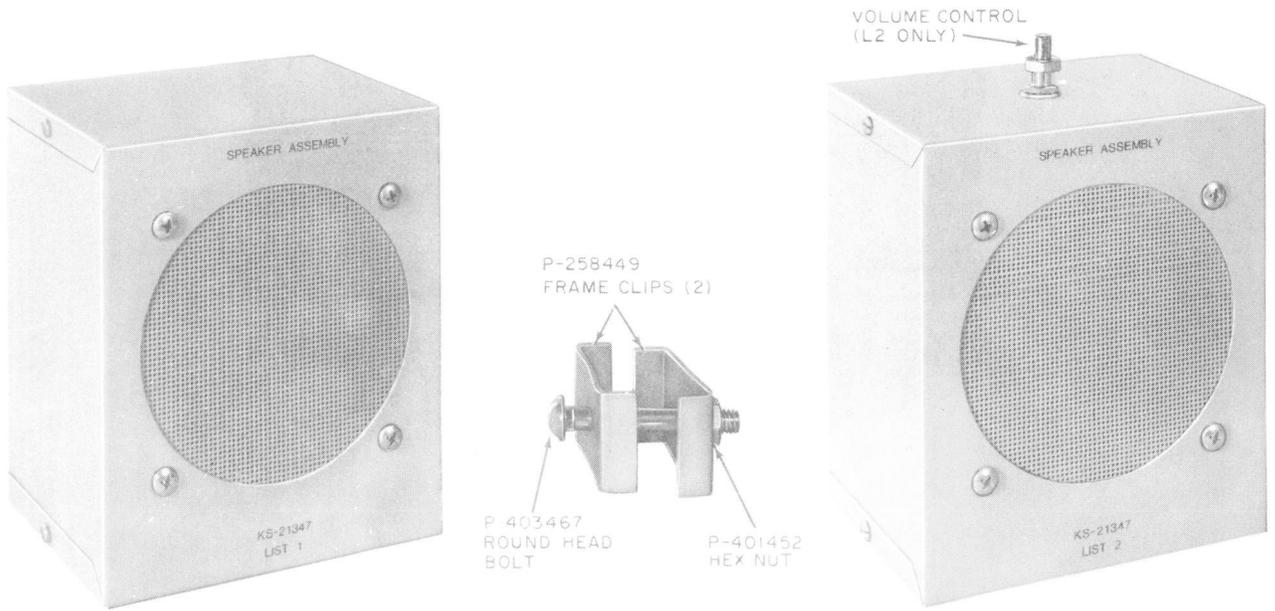


Fig. 19—KS-21315 L7 Jack Mounting Insert Used for Test Trunk Appearance Requiring Lamps (See KS-21315 L4)



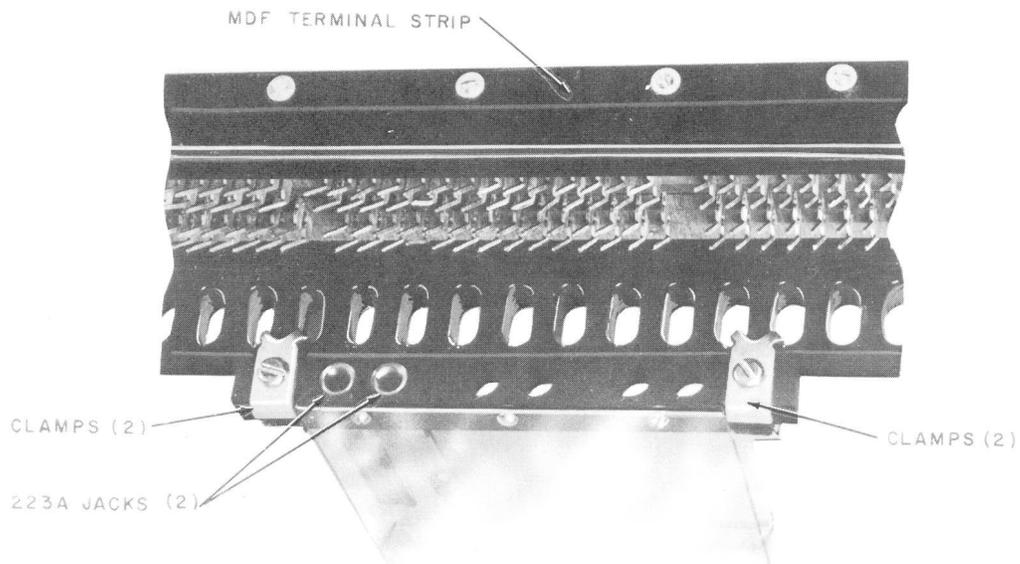
**Fig. 20—KS-21315 L1 Protector Frame Test/Talk Panel
(Manufacture Discontinued)**



KS-21347 L1 SPEAKER BOX ASSEMBLY IS USED TO SUMMON FRAME PERSONS TO PRIVATE COMMUNICATION CHANNELS.

KS-21347 L2 SPEAKER BOX ASSEMBLY WITH VOLUME CONTROL IS USED IN FRAME ADMINISTRATION AREA ONLY.

Fig. 21—KS-21347 Loudspeaker Assembly



A JACK MOUNTING USED ON CONVENTIONAL MAIN DISTRIBUTING FRAMES. MOUNTS UP TO THREE CHANNELS CONSISTING OF TWO 223A JACKS EACH, ON .625 INCH CENTERS BETWEEN ASSOCIATED JACKS. INTENDED FOR USE WITH THE 60B HEADSET FOR INTERFRAME COMMUNICATIONS FOR THE COSMIC TEST/TALK SYSTEM.

Fig. 22—KS-21396 Interframe Communications Jack Mounting for Test/Talk System (Full Size Jacks)

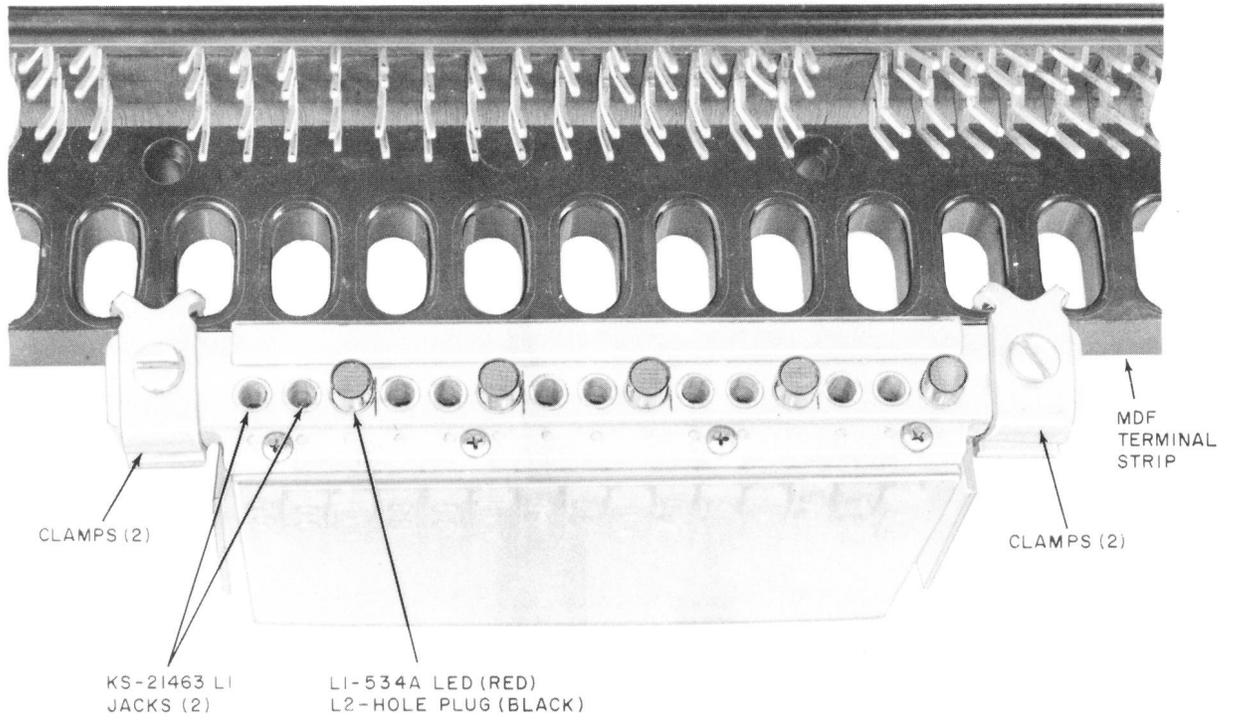


Fig. 23—KS-21395 L1 and L2 Interframe Communications Jack Mounting for Test/Talk System (Miniature Jacks)

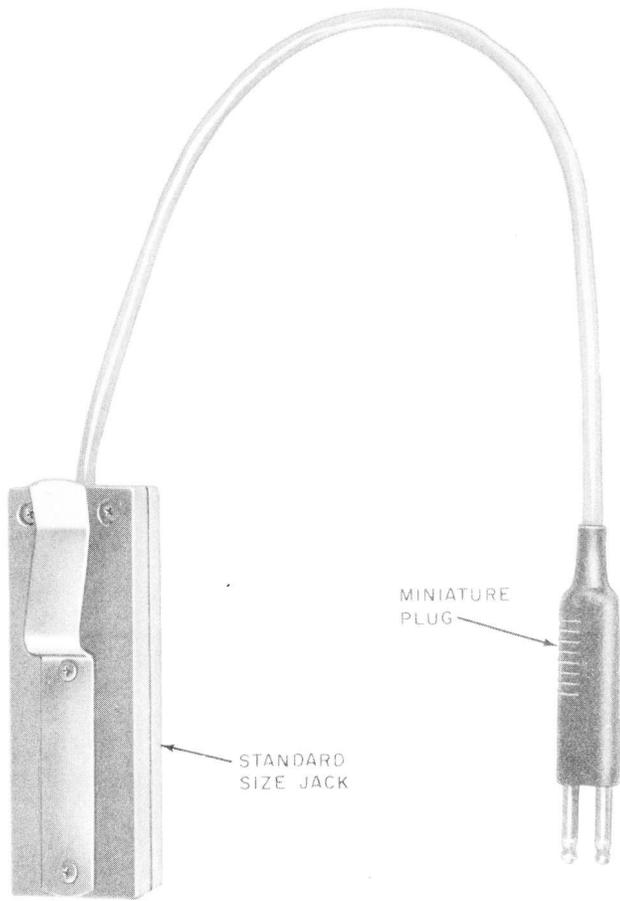


Fig. 24—KS-21386 L1 Miniature Plug Adapter

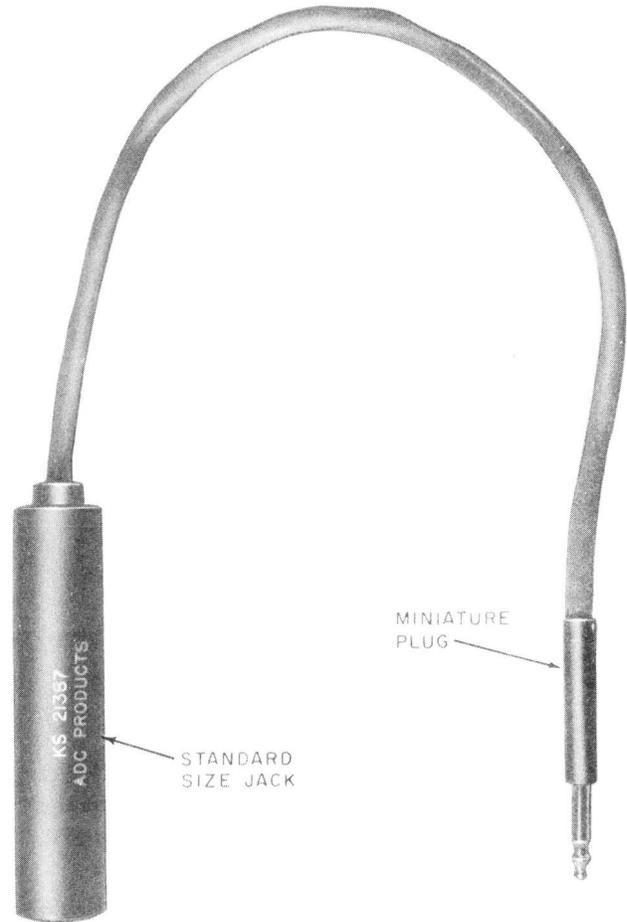


Fig. 25—KS-21387 Test Set Patch Cord



Fig. 26—W2GY Service Observing Cord

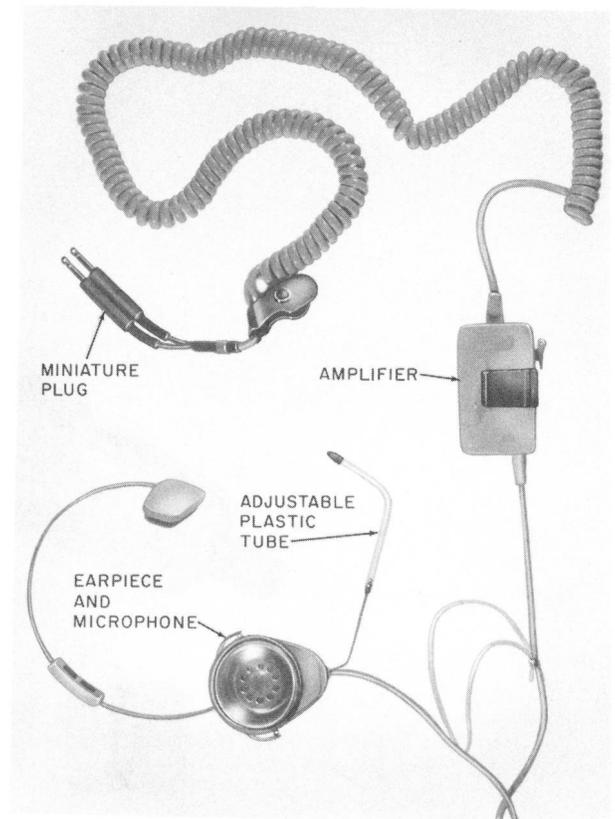


Fig. 27—60D Headset



END FOR 78AI-64



END FOR 78C SERIES

Fig. 28—756C Wire Insertion Tool

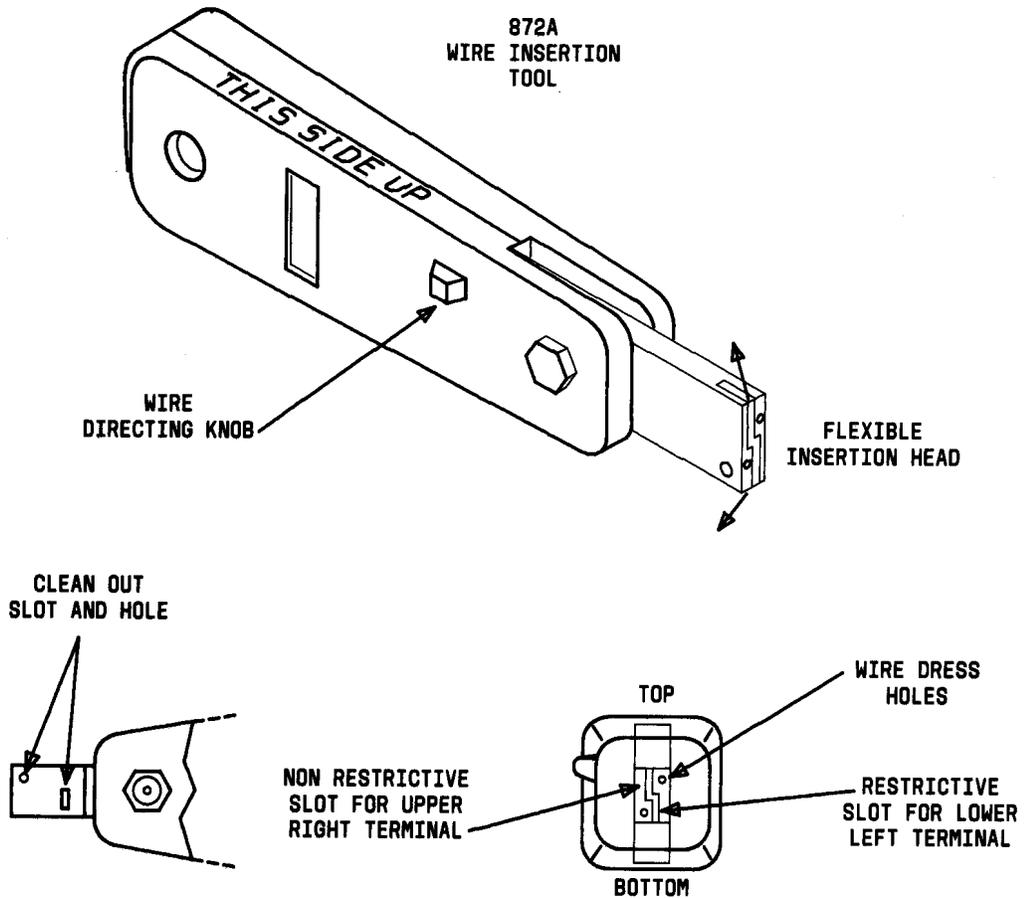


Fig. 29—872A Wire Insertion Tool

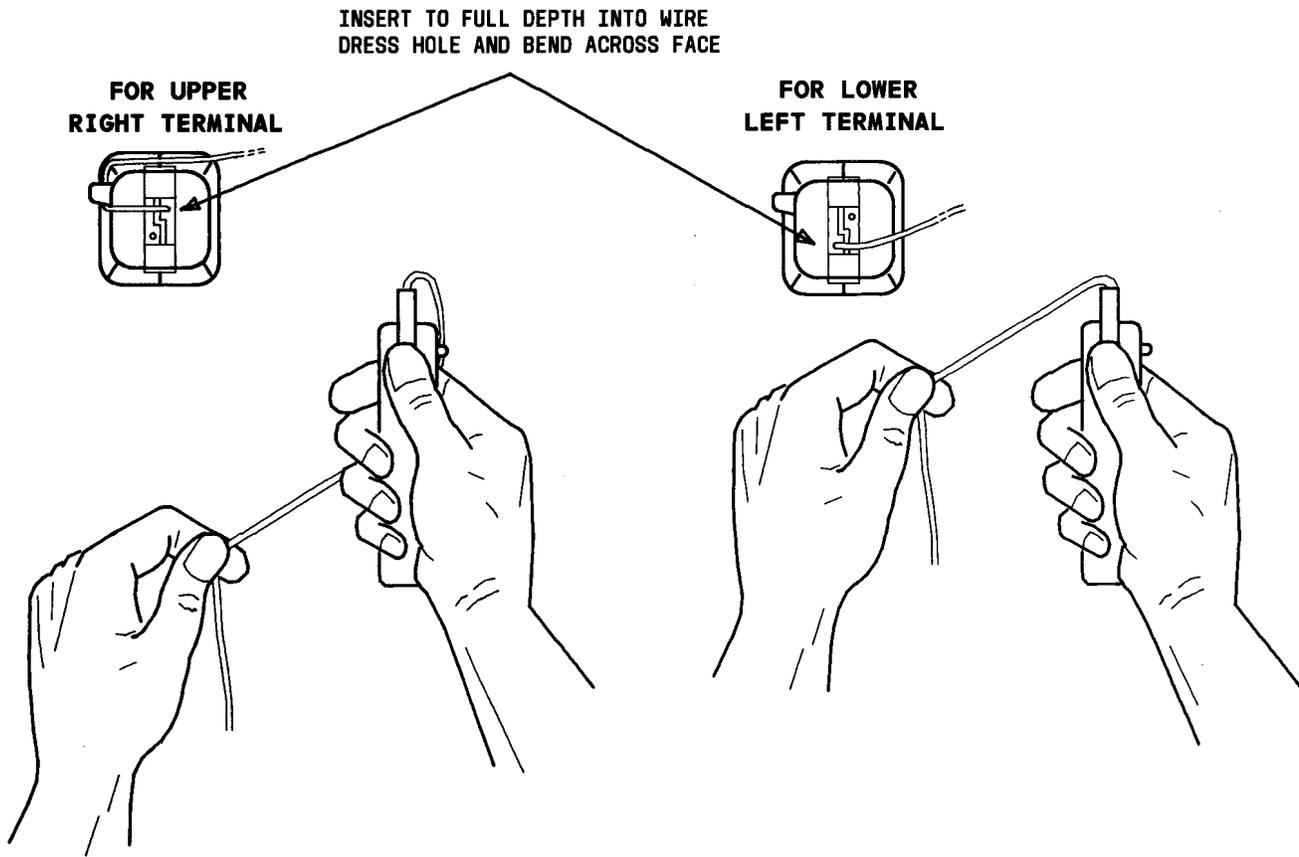


Fig. 30—Proper Method of Using 872A Tool



Fig. 31—724A Wire Removal Tool



Fig. 32—KS-21345 Connecting Block Removal Tool

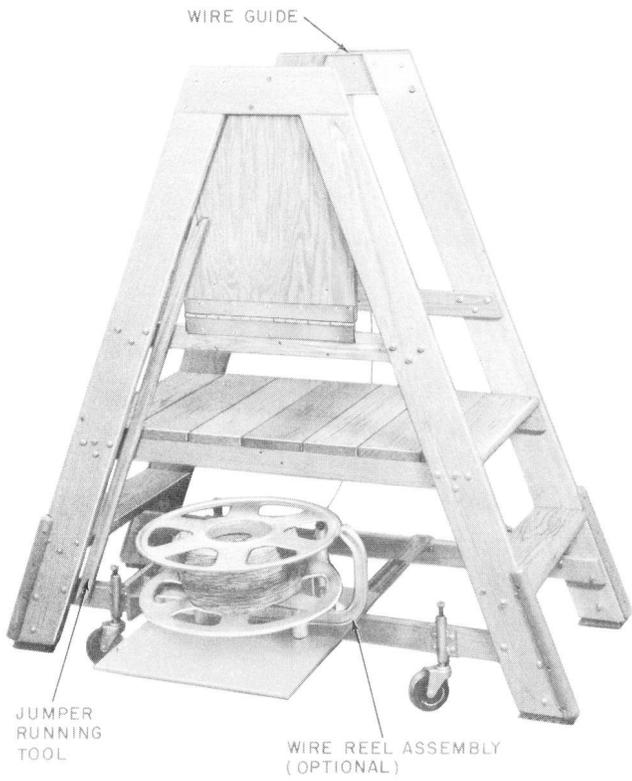


Fig. 33—KS-21415 L1 or L2 Rolling Work Platform (Wire Reel Extended)

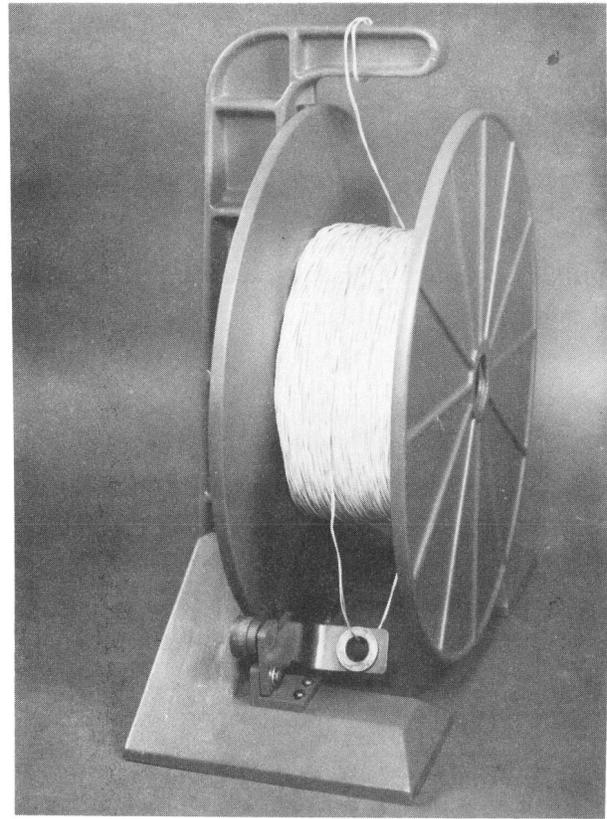


Fig. 35—KS-21955 L1 Wire Reel

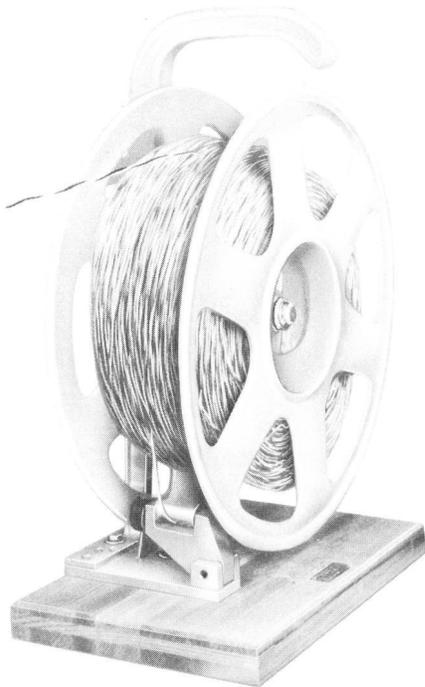


Fig. 34—KS-8047 L2 Wire Reel Assembly