

## ESS MODULAR DISTRIBUTING FRAMES

### METHOD OF MAKING CONNECTIONS

#### 1. GENERAL

**1.01** This section covers methods of running jumpers and making connections to the connecting blocks on ESS modular distributing frames. A description of the ESS distributing frames is covered in Section 201-221-101.

**1.02** Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

#### 2. FRAME COMPONENTS AND TOOLS

##### A. 66G- or 78A1-Type Connecting Blocks

**2.01** The 66G- or 78A1-type connecting blocks are identical except for the terminal clips mounted in the blocks. The 66G-type connecting block is rated A and M; therefore, only the 78A1-type connecting block is illustrated in Fig. 1.

**2.02** These blocks consist of a molded plastic panel equipped with 128 tin-plated single-clip terminals arranged in 16 rows with 8 terminals in each row. The terminals for both the 66G- and 78A1-type blocks are designed for use with 22-gauge wire. A slotted fanning strip is attached with screws to each side of the block. These blocks provide a cross-connection capacity of 64 pairs. The 66G- and 78A1-type blocks are intended for use on trunk distributing frames.

##### B. 66H- or 78B1-Type Connecting Blocks

**2.03** The 66H- and 78B1-type connecting blocks are identical except for the terminal clips mounted in the blocks. The 66H-type block is rated A and M; therefore, only the 78B1-type block is illustrated in Fig. 2.

**2.04** These blocks are similar to the 66G and 78A1 connecting blocks, respectively, except they are equipped with bifurcated twin-clip terminals instead of the single-clip terminals. The bifurcated twin-clip terminals provide a capacity of two cross-connections for each of the 64 pairs. These blocks are intended for use on main or intermediate

distributing frames. They are also equipped with slotted fanning strips.

##### C. 756D or 714E2 Wire Insertion Tool

**2.05** The older type 714E wire insertion tool used with the 66G- and 66H-type connecting blocks is rated MD and has been replaced by the 714E2 wire insertion tool which is an improved version. The older type 756B2 wire insertion tool used with the 78A1 and 78B1 connecting blocks is also rated MD and has been replaced by the newer 756D tool.

**2.06** These tools consist of a double-ended wire insertion head held in a plastic handle. Due to the similarity of these tools, only the 756D wire insertion tool is illustrated in Fig. 3. One end of the insertion head is designed for inserting a wire into the single-clip terminal of the 66G- or 78A1-type connecting block. The other end is for inserting the wire into the twin clip of the 66H- or 78B1-type connecting block. The insertion head can be rotated to either position by loosening the screw, rotating the head 180 degrees, and retightening the screw to hold the head firmly in position. Since neither the 714E2 nor the 756D tool has a wire cut-off blade, the wire must be cut to the proper length before seating into the slot of the terminal.

##### D. 724A Wire Removal Tool

**2.07** The 724A wire removal tool (Fig. 4) is used to remove a wire from the single-clip terminal or twin-clip terminal of either series connecting block. The wire removal tool consists of a two-prong fork with an insulated handle. The prongs of the fork are sized to fit around the clip beneath the seated conductor. Use of the tool reduces the possibility of disturbing or degrading adjacent wire connections during the removal of a wire.

#### 3. METHODS OF MAKING CONNECTIONS

##### A. Running Jumpers

**3.01** To avoid interference with other jumpers, run the jumpers in the most direct way

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and on top of other jumpers, except as stated in the following note. Jumpers being transferred from one set of terminals to another should not be allowed to catch or twist around other jumpers. The majority of connections will be within the same vertical.

**Note:** Intravertical cross-connections of 3 feet or less in length should be placed behind the existing cross-connection.

**3.02** Dress all jumpers to the back of the vertical troughs as neatly as possible. Place the jumper between the retaining rings and push to the rear.

**3.03** Jumpers from one vertical to another (intervertical) should be run through either the upper or lower jumper wire troughs according to which trough provides the shortest path for the jumpers. If the frame has a divided upper jumper wire trough, the long jumpers (jumpers between terminals that are separated by ten or more verticals) should always be run in the upper section of the divided trough at the top of the frame. When placing two cross-connections on a terminal, where one is an intravertical and one is an intervertical, identify the intervertical cross-connection, if necessary, by placing a single wrap of 1/2 inch gray plastic tape on the wire just outside the fanning strip.

**3.04** The upper wire trough is accessible through a wiring channel at the top rear of each vertical trough. Jumpers can be passed through this channel by using a KS-20096 L1 wiring needle (Fig. 5). The needle is passed through the wiring channel into the upper trough where the end of the jumper is attached to the eye of the needle. By withdrawing the needle, the jumper is pulled through the wiring channel into the vertical trough. This procedure is used on both ends of the jumper wire.

### B. Amount of Slack

**3.05** Leave 10 to 12 inches of slack in all jumpers. When a jumper is transferred, the slack may be used but the jumper should not be taut. The slack should be dressed back from the terminal strip. Less slack may be used where cross-connections are short and the trough is filled. Avoid excessive slack in the troughs.

### C. Terminating Connections

**3.06** It is not necessary to strip the insulation from the wire prior to making a connection. The terminals are so designed that the insulation is broken at the point of contact sufficiently for electrical contact when the wire is inserted into the terminal slot.

**3.07** Before previously connected wires can be reconnected, the end of the wire containing the broken insulation must be cut off.

**Caution:** *Once wires are terminated and are within the confines of the fanning strip, do not remove from the fanning strip for tracing or for identification. A wire being traced may be identified by jiggling the wire in the fanning strip and slipping a piece of spaghetti on the terminal that moves.*

**3.08** To place the wire in the terminals, proceed as follows:

(a) Grasp the 714E2 or the 756D tool, as shown in Fig. 6, in such a manner that pressure will be applied with the palm of the hand while holding the tool loosely with the thumb and fingers.

**Note:** It is recommended that several trial connections be made on unused clips to gain experience in the use of the wire insertion tool before making actual connections.

(b) Place the wire insertion tool near the terminal.

(c) Insert wire in hole adjacent to the appropriate opening in tool face as shown in Fig. 7A.

(d) Bend wire down across opening and pull taut by bending back under the tool blade. See Fig. 7B.

(e) Hold wire and tool in this position and approach terminal.

(f) Engage the wire in the slot of the terminal and rotate the wire into the fanning strip slot.

(g) Align the wire insertion tool over the terminal so the tool will slide straight forward.

(h) To make the termination, allow the terminal to guide the tool during the actual insertion of the wire (Fig. 8). The tool has an internal stop to keep it from inserting the wire too deeply. Seat the wire in the terminal. After the wire has been seated, the tool should be withdrawn, straight out. In case unusual resistance or "feel" is encountered, remove the wire, clip the end, prepare as before, and reconnect.

**Caution:** *Do not wiggle or rock the tool as this may promote wire breakage. Excessive pressure or striking the tool may push the terminal through the block.*

(i) Examine each connection. Tin scraped from a terminal may indicate a connection with excessive conductor damage.

(j) Perform the same steps for the mating wire of the pair.

(k) For "back taps" proceed as in (a) through (i), except bend the wire up across the opening as shown in Fig. 7C.

**3.09** Dress the wire into the slot in the fanning strip on the side of block nearest the clip connections. All wires are to be dressed into the fanning strip, etc, before seating them. See Fig. 9 and 10.

**3.10** The wire is placed into the slot of the terminal according to the dressing pattern shown in Fig. 11.

#### D. Removing Connections

**3.11** Place the 724A tool fingers astraddle the terminal beam and under the wire. Grasp the tool as shown in Fig. 12 and pull the wire from the terminal and away from adjacent terminals.

**3.12** Remove small pieces of insulation remaining around the terminals with an insulated tool such as the KS-6320 orange stick or R-1102 fiber spudger.

#### E. Designation of Special Service Lines

**3.13** Identification and protection of special service terminals are provided by clip-terminal insulators. These are narrow U-shaped channels made of red nylon.

**3.14** The C clip-terminal insulator (Fig. 13) is for use on the 66G or 78A1-64 connecting block.

**3.15** The D clip-terminal insulator (similar to Fig. 13) is for use on the twin-clip terminals of the 66H or 78B1-64 connecting block.

**3.16** The C-clip or D-clip terminal insulator is long enough to insulate the tip and ring terminals.

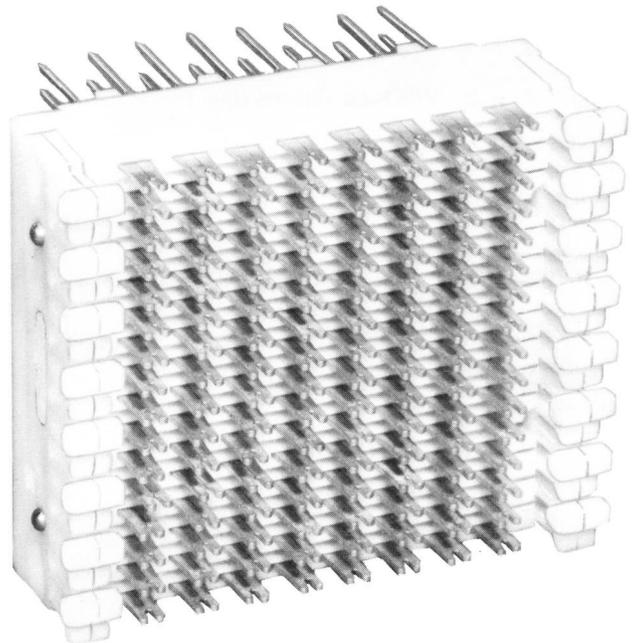


Fig. 1—78A1-64 Connecting Block

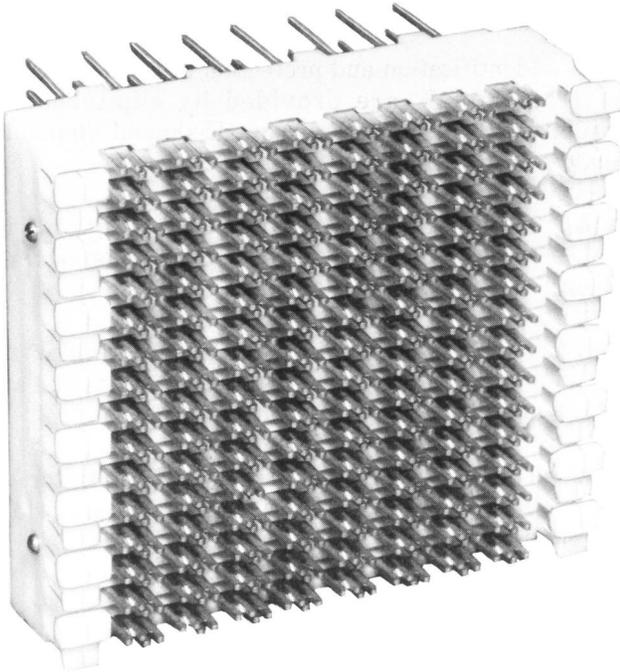
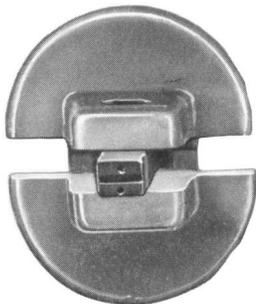


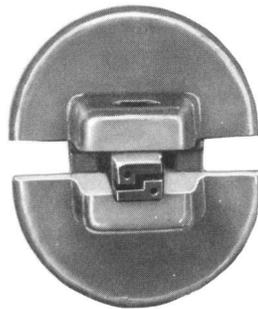
Fig. 2—78B1-64 Connecting Block



Fig. 4—724A Tool



END FOR 78AI-64



END FOR 78BI-64

Fig. 3—756D Wire Insertion Tool

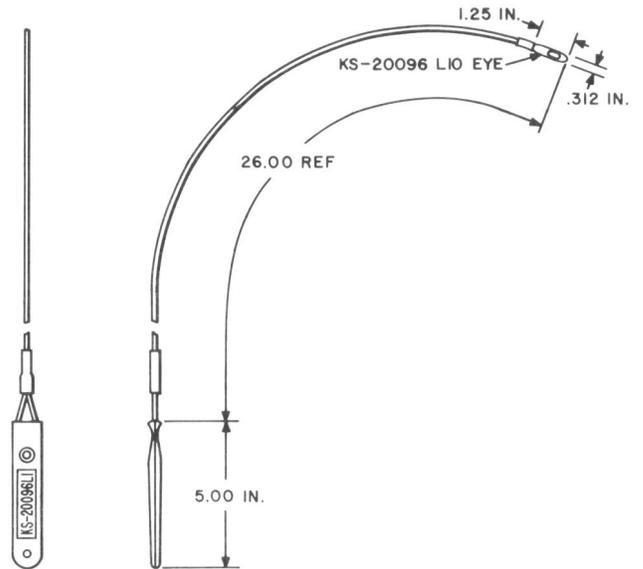
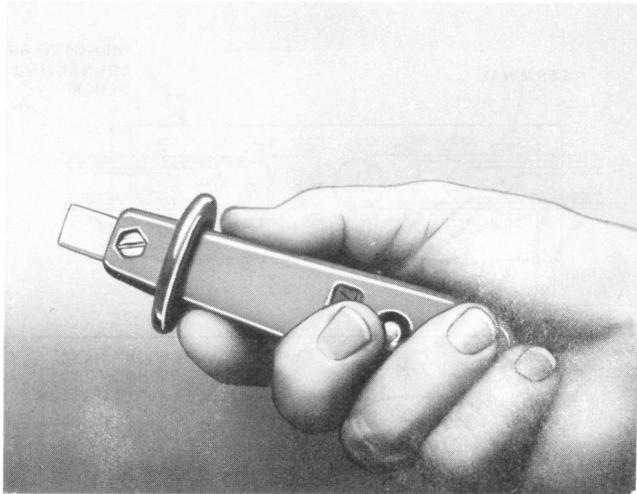
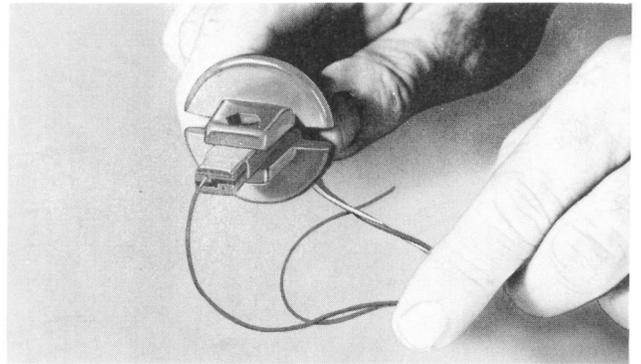


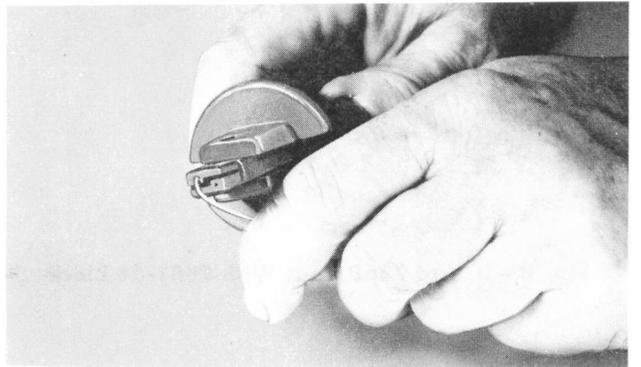
Fig. 5—KS-20096 L1 Needle



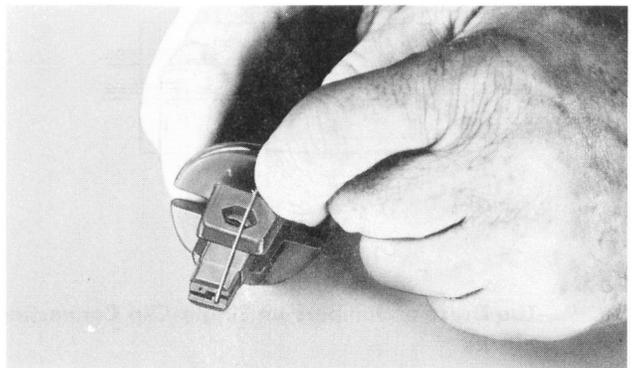
**Fig. 6—Proper Method of Holding 714E2 or 756D Tool**



A



B



C

**Fig. 7—Proper Method of Using 714E2 or 756D Tool**

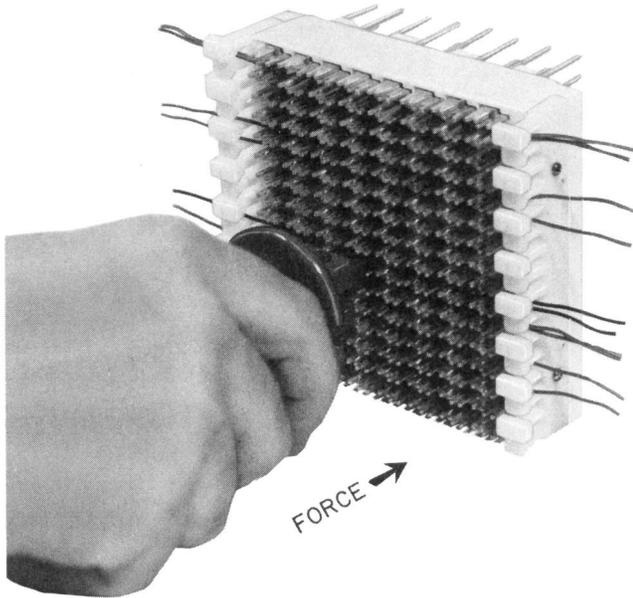


Fig. 8—Use of 756D Tool With 78B1-64 Block

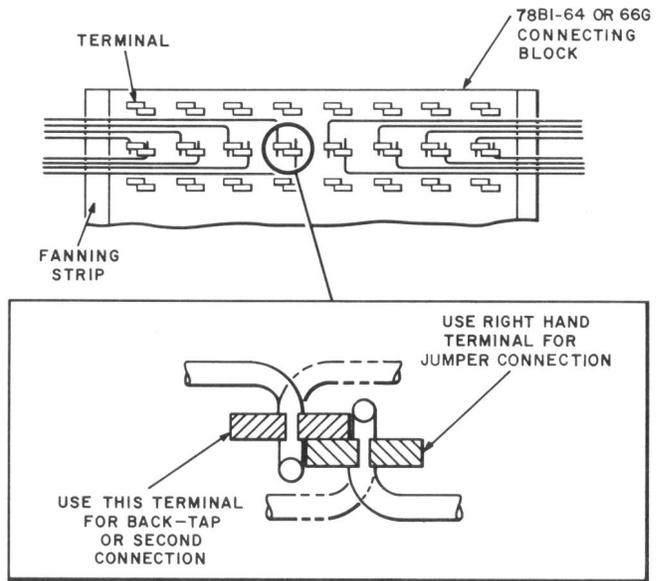


Fig. 10—The Dress of Jumpers on Twin-Clip Connecting Blocks

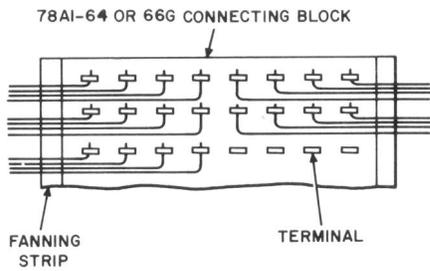
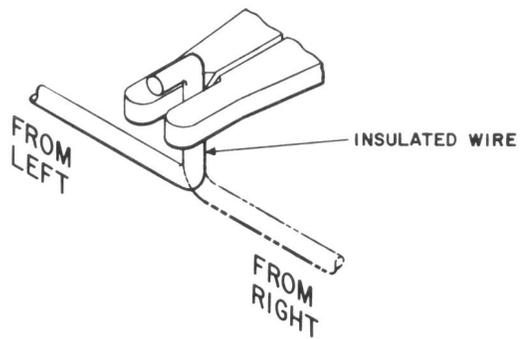


Fig. 9—The Dress of Jumpers on Single-Clip Connecting Blocks



VIEW LOOKING DOWN ON TERMINAL OF 78A1 CONNECTING BLOCK. TERMINAL OF 66G BLOCK SIMILAR

Fig. 11—Placing Wire on Terminal

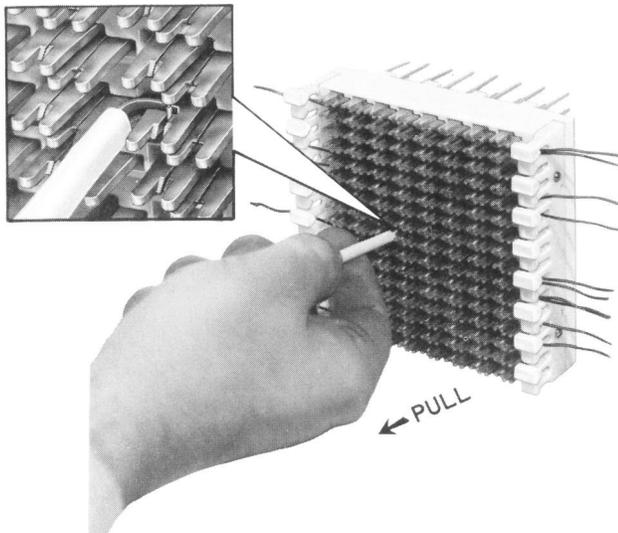


Fig. 12—Use of 724A Tool

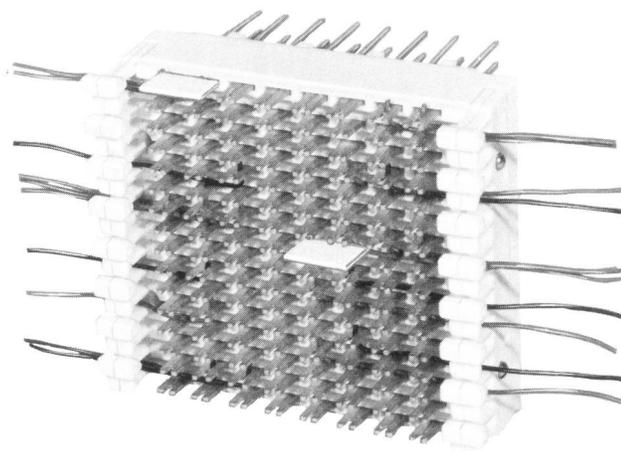


Fig. 13—Special Service Marking on 78A1-64 or 66G Block