

## CONNECTING BLOCKS AND WIRING BLOCKS—88-TYPE

### 1. GENERAL

**1.01** This section covers the identification, installation, and maintenance of the 88-type wiring blocks and 88-type connecting blocks for terminating inside wiring cables.

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

**1.03** The 88-type wiring and connecting blocks are compact connecting blocks designed for key telephone systems or similar installations. They may be used at any indoor locations now employing the 66-type blocks and associated backboards. The wiring blocks are modular with terminations in a 25-pair, even-count, color-code basis. They reduce wall space requirements, installation time, improve pair identification, and permit easy expansion of cross-connect fields. Cables are terminated on the wiring block index strip on a permanent basis; rearrangements and changes are made with cross-connect wire on the top side of the connecting blocks.

**1.04** Information for installing and wiring connecting blocks, using the 88-type connecting and wiring blocks in Outside Plant application, is not covered in this practice. Refer to Section 631-050-120.

**1.05** For information about protective devices used on special service circuits requiring Special Service Protection or Special Safeguarding Measures, refer to Section 460-110-100.

**1.06** Information on key telephone systems, wiring methods for 88-type wiring blocks, and typical running cable arrangements for key system installations, will be found in Section 518-010-101.

### 2. IDENTIFICATION

#### 88-TYPE WIRING BLOCK

**2.01** The 88-type wiring block (Fig. 1) is made of flame retardant plastic with molded index strips. Separate backboards are not required. Each index strip has 50 slots to accommodate a 25-pair

cable or a color binder group for terminating PE or PVC 22-, 24-, 26-gauge wire without removing insulation. The index strips are color-coded white, red, black, yellow, violet, from left to right, in 5-pair segments to match the color coding of even-count cables. The various parts of the wiring block are shown in Fig. 1.

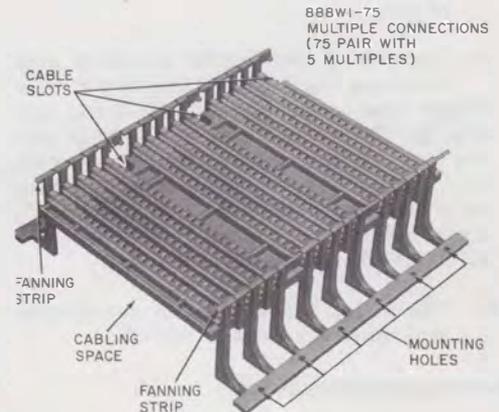
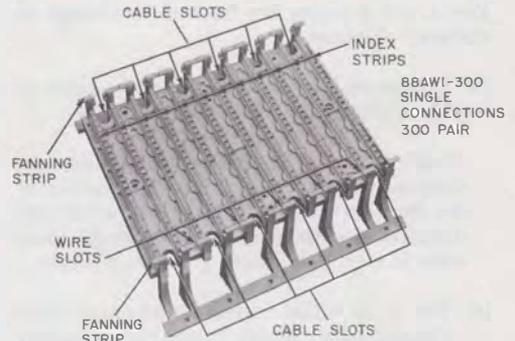


Fig. 1—88-Type Wiring Block

## SECTION 461-608-100

**2.02** The letters and numbers (eg, 88AW1-100) of the complete code designation provide the following information:

- (1) 88—basic type of terminal block.
- (2) The first suffix letter indicates basic style as follows:

A—legs with feet - single connections

B—legs with feet - 5 connections (multiple).

The A and B styles are for wall mountings on customer premises.

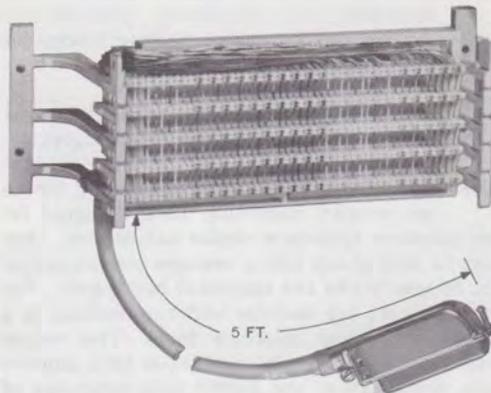
- (3) The second suffix letter denotes color of the wiring block: W—indicating white.

**Note:** All codes of 88-type wiring blocks are supplied in white only. The application of the block is indicated by the use of colored designation strips (separately ordered), which come in blue, red, yellow, green, and purple.

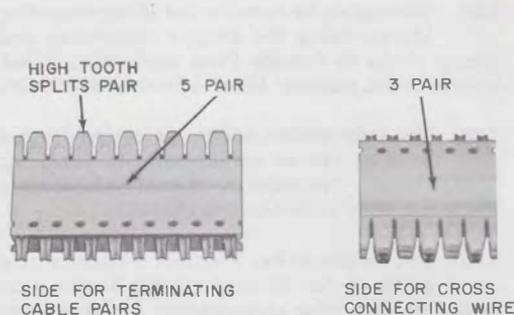
- (4) The third suffix numeral assignment is to identify minor design differences resulting from engineering or manufacturing improvement.
- (5) The number following dash indicates number of pairs.

- (6) The letter C following the number of pairs indicates the block is supplied with a factory-wired connector-ended cable 5 feet long (Fig. 2). The blocks are factory-wired to give five multiples for each conductor. On prewired blocks, extra multiples can be provided using the 3-way bridging adapter, KS-19252, L2 (PCP), for no more than ten multiples. Refer to Section 461-200-101 for information on adapters.

are available in 3- and 5-pair blocks. The clips for terminating the cables are designed to terminate PE or PVC 22-, 24-, or 26-gauge wire without the removal of insulation.



**Fig. 2—88B-Type Wiring Block With Connector Cable**



**Fig. 3—88-Type Connecting Block**

**2.03** The wiring blocks used in key system applications are shown in Table A.

### 88-TYPE CONNECTING BLOCK

**2.04** The 88-type connecting block (Fig. 3) consists of a flame retardant, plastic-molded strip equipped with double-ended, quick-clip metal connectors. When mounted on the wiring block, the bottom end makes connection with the cable conductors in the index strip, and the top end provides connections for cross-connect wires. They

**2.05** The following is the coding arrangement for the 88-type connecting block. The letters and numbers (eg, 88BSW1-5) of the complete code designation provide the following information.

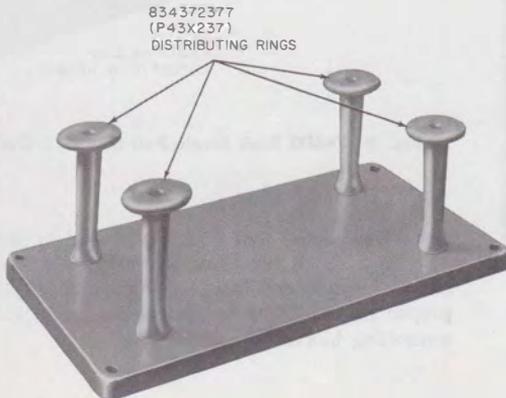
- (1) 88—basic type connecting block.

- (2) The first suffix letter indicates basic style; ie, the letter B indicates that the clips are gold-plated and protrude from one side of the connecting block.
- (3) The second and third suffix letters denote color; this is a double letter for two color blocks. The codes presently assigned are SW (Slate White—one side slate, one side white).
- (4) The third suffix numeral is assigned to identify minor design difference resulting from engineering or manufacturing improvement.
- (5) The number following dash indicates the number of pairs (three or five pairs).

**2.06** The different colored sides of connecting blocks aid in pair identification when installed on the wiring blocks as outlined in 3.17. Connecting blocks are shown in Table A.

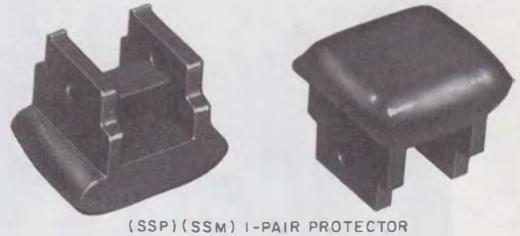
#### ASSOCIATED APPARATUS

**2.07** The 188A1-type backboard (Fig. 4) for cross-connecting wire is used to provide a wiring channel for horizontal movement in large installations. It is made of four 834372377 (P-43X237) distributing rings mounted on a metal panel 1/2-inch thick by 10-3/4 inches long by 6-1/2 inches wide.



**Fig. 4—188A1 Backboard**

**2.08** The AT-8660 F clip terminal insulator (Fig. 5) is used to mark special service circuits requiring Special Service Protection or Special Safeguarding Measures. The F clip terminal insulator mechanically protects one pair and may be located in adjacent pair positions without interference to protect any number of pairs.



**Fig. 5—AT-8660 F Clip Terminal Insulator**

**2.09** The 88A retainer (Fig. 6) is used on top- or bottom-mounted blocks to form a fanning strip slot for the cross-connecting wire.

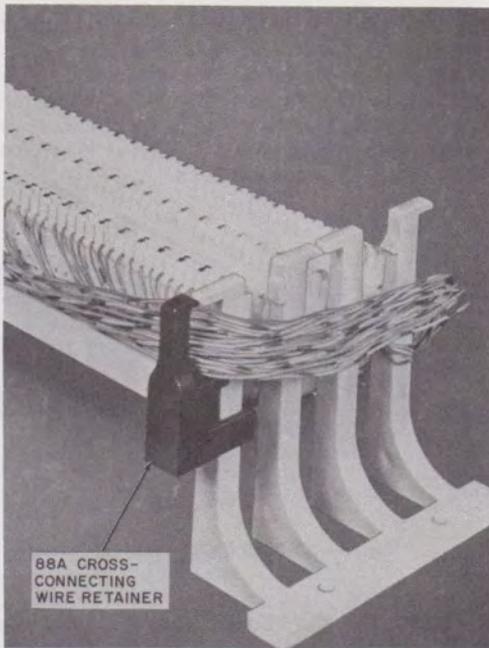
**2.10** The "C" test cord (Fig. 7) is attached to a wall-mounted 101B2 wire terminal, located so the cord plug will reach all 88-type blocks, and is left in place for testing purposes.

#### TOOLS

**2.11** The 5-pair insertion tool (Fig. 8) consists of the 788B1 tool head mounted in the 788A1 tool handle. The single-pair insertion tool (788D3) is supplied as a combination of the handle and insertion head. The reversible ends of the head provide either insertion-cutoff or insertion only (Fig. 9).

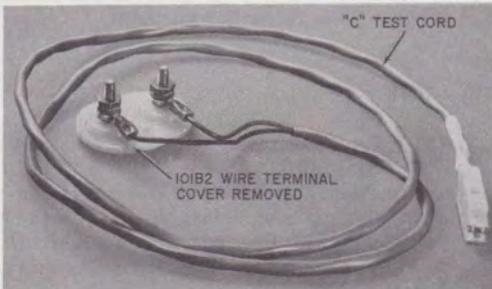
**2.12** The 788B1 5-pair insertion tool head (Fig. 8) is used to seat five cable pairs at one time or to insert a 3- or 5-pair connecting block on the index strip of the wiring block. The 788D3 insertion tool head is used to seat a single cable pair.

**2.13** The 788C1 cutoff tool head (Fig. 10) mounts in the 788A1 tool handle and is used to cut five cable pairs at one time on the index strip after proper insertion.



88A CROSS-CONNECTING WIRE RETAINER

Fig. 6—88A Wire Retainer



"C" TEST CORD  
101B2 WIRE TERMINAL COVER REMOVED

Fig. 7—C Test Cord and Terminal Block



788A1 TOOL HANDLE  
788B1 TOOL

Fig. 8—5-Pair Insertion Tool



TOOL HANDLE  
INSERTION TOOL HEAD  
BLACK DENOTES CUTTING SIDE  
INSERTION AND CUTOFF TOOL HEAD

Fig. 9—788D3 Tool, Single-Pair Insertion/Cutoff

2.14 The 788H1 tool (Fig. 11) is used to perform the same functions as the 788B1 tool but has a spring-loaded handle designed to supply the proper impact force to seat cable conductors or connecting blocks.

2.15 *Ordering Guide (Blocks and Tools)*

Fig. 10—788C1 Tool, 5-Pair Cutoff Head



Fig. 11—788H1 Tool, Impact Insertion

- Block, Wiring, 88-Type (refer to Table A)
- Block, Connecting, 88-Type (refer to Table A)
- Strip, Designation
  - 188AG1—100 (green, two per package)
  - 188BB1—100 (blue, two per package)
  - 188BP1—100 (purple, two per package)
  - 188BY1—100 (yellow, two per package)
  - 188CR1—25 (red, one per package)
- Insulator, Terminal, Clip F, AT-8660 (as required)
- Retainer, 88A (as required)
- Backboard, 188A1 (as required)
- Tools (refer to Table B)
- Cord, Test C
- Terminal, Wire 101B2.

TABLE A

## WIRING BLOCKS AND CONNECTING BLOCKS

CODE (NOTE)	COLOR	CAPACITY (PAIRS)	TYPE	APPLICATION	SIZE (INCHES)
88AW1-100	White	100	Wiring Block	All Fields	10¼ x 3½
88AW1-300		300			10¼ x 10¼
88BW1-25		25*		Red Field	10¼ x 3½
88BW1-25C		25*			10¼ x 3½
88BW1-75		75†			10¼ x 10¼
88BW1-75C		75†			10¼ x 10¼
88BSW1-3 88BSW1-5	Slate/ White	3 5	Connect. Block	All Wiring Blocks	

*Note:* Code ending in C indicates block is supplied with a 5-foot length of connector cable terminated.

\* Five multiples of one 25-pair cable.

† Five multiples of three 25-pair cables.

TABLE B

## TOOLS

ORDERING CODE	DESCRIPTION	REMARKS
Handle, 788A1	Tool Handle	For 788B1 or 788C1 Tools
Tool, 788B1	5-pair Insertion Head	Order Handle Separately
Tool, 788C1	5-pair Cut-off Head	
Tool, 788D3	1-pair Insertion/ Cut-off Tool	Consists of Head and Handle
Tool, 788H1	5-pair Insertion	Impact Type

### 3. INSTALLATION

**3.01** The 88-type wiring blocks are usually arranged in a vertical array for small installations and in an expandable horizontal array for large installations. The size of the job, space available,

and future expansion should be considered in determining the mounting arrangement. The length of cross-connecting wires should be kept to a minimum. Where there are less than 78 station lines and/or 120 stations, the vertical array may be used. For over 78 station lines and/or 120

stations, the expandable horizontal array should be used. Refer to Section 518-010-101 for physical arrangement of the color-coded wiring blocks.

**3.02** Wiring blocks may be added to existing blocks following the pattern established for centralized key telephone installations. Refer to Section 518-010-101.

**3.03** Mount the 88-type wiring blocks with index strips horizontal on a smooth wall surface using fasteners appropriate for the type of wall surface.

**3.04** Cables are considered permanent and are always placed on the index strip of the wiring block, never on top of the connecting block. Rearrangements can be made as required with cross-connecting wire on top of the connecting blocks.

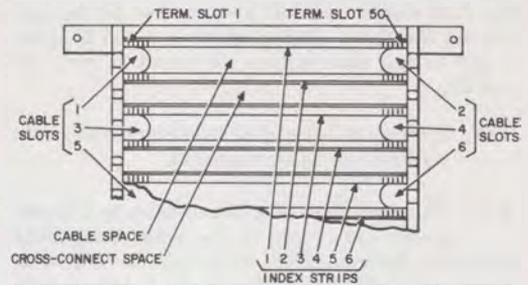
**3.05** Cabling can enter the array of wiring blocks from either top or bottom. Fish cables behind installed wiring blocks as follows:

- (a) When station or equipment cable enters from the top, use No. 6 twine with a weight. Drop behind wiring block and use wire hook to fish through proper cable slot. Pull cable down through cable slot.
- (b) When cable enters from the bottom, drop weighted No. 6 twine through proper cable slot and down behind the wiring blocks. Pull cable up through cable slot.

**3.06** Cable slots are numbered with the odd numbers on the left and the even numbers on the right, from top to bottom (Fig. 12). In the red field, only the odd number cable slots on the left side are used.

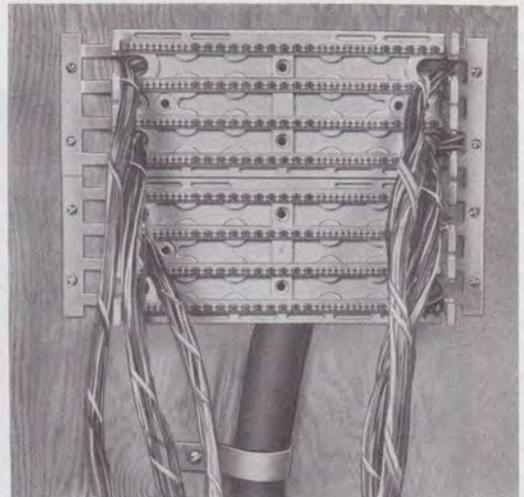
**3.07** When running 25-pair station cables, leave jacket on until cable has been threaded through the proper cable slot. Start cable 1 through slot 1 to row 1, cable 2 through slot 2 to row 2, etc.

**3.08** Remove the cable sheath for multiple binder cables, approximately twice the length of the wiring block, allowing the sheath end to extend under the backboard. The cable is separated into 25-pair groups with their proper identification (color binder). The 25-pair binder groups are threaded



**Fig. 12—Numbering Plan for 88-Type Wiring Block**

through the cable slots provided in the backboard (blue-white through cable slot number 1 to row 1, orange-white through cable slot number 2 to row 2, green-white through cable slot number 3 to row 3, brown-white through cable slot number 4 to row 4, etc (Fig. 13).



**Fig. 13—200-Pair Cable in Cable Slots**

**3.09** The index strips start with number 1 at the top and continue downwards in consecutive order. The index strip slots are numbered consecutively from left to right with number 1

the first slot on the left and number 50 the last slot on the right. Pair number 1 would be slots 1 and 2, and pair number 25 would be slots 49 and 50.

**3.10** Terminations are made following the sequence outlined in 3.11 through 3.21.

**3.11** The conductors of a 25-pair cable or a binder group are placed in the index strip slots following the even-count color code starting with white-blue in slot 1, blue-white in slot 2, white-orange in slot 3, etc (Fig. 14). The conductors should not be taut; some slack is desirable. The high tooth on the index strip splits the conductors of a pair. Light finger pressure is sufficient to cause the conductor to be held in the index strip. Place all 25 pairs and check for split pairs, missed slots, etc.

**3.12** After all pairs are placed in a pair of index strips adjacent to a cable space, the 788B1 or 788H1 insertion tool is used to seat the conductors in the index strip (Fig. 15). Start at the end of the index strip nearest the cable entrance and work across the block. Make sure conductors are

bottomed in the index strip, especially when using larger gauge wire. Use only enough pressure to seat conductors: **Do not hammer on 788B1 insertion tool.**

**3.13** On wiring blocks used to provide key line service multiples (red field), the conductors are placed across the five index strips, again using a light finger pressure to place (Fig. 16). Conductors should not be tight.

**3.14** Seat the conductors in the same manner described in 3.12.

**3.15** Cut off excess wire using the 4-pair cutoff tool (Fig. 17). Conductors should be perpendicular to index strip for ease in cutting.

**Caution:** *Do not use diagonal pliers or electrician scissors due to the possibility of cutting more than one wire at a time or causing shorts between conductors. Doing so may cause circuit damage to solid-state devices used in key telephone systems or PBXs.*

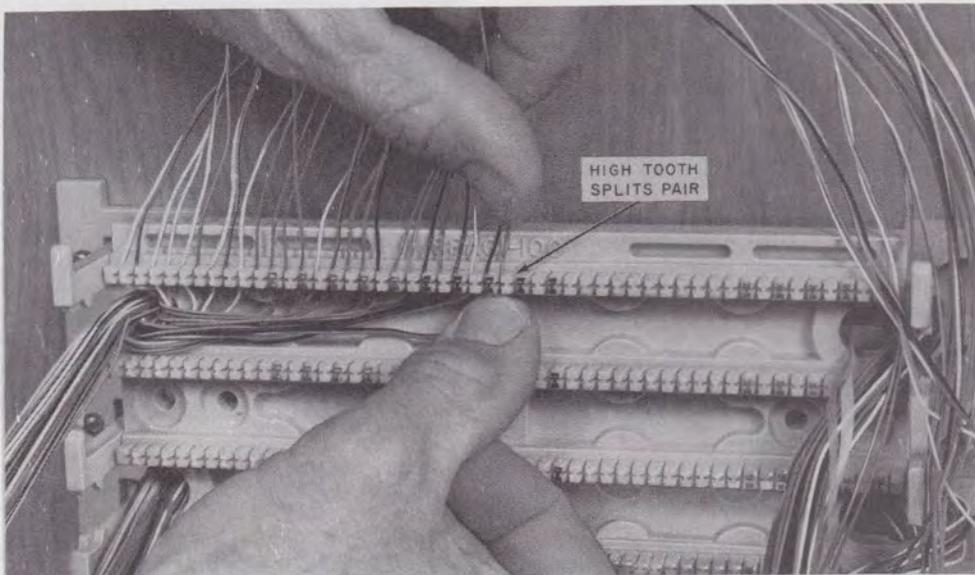
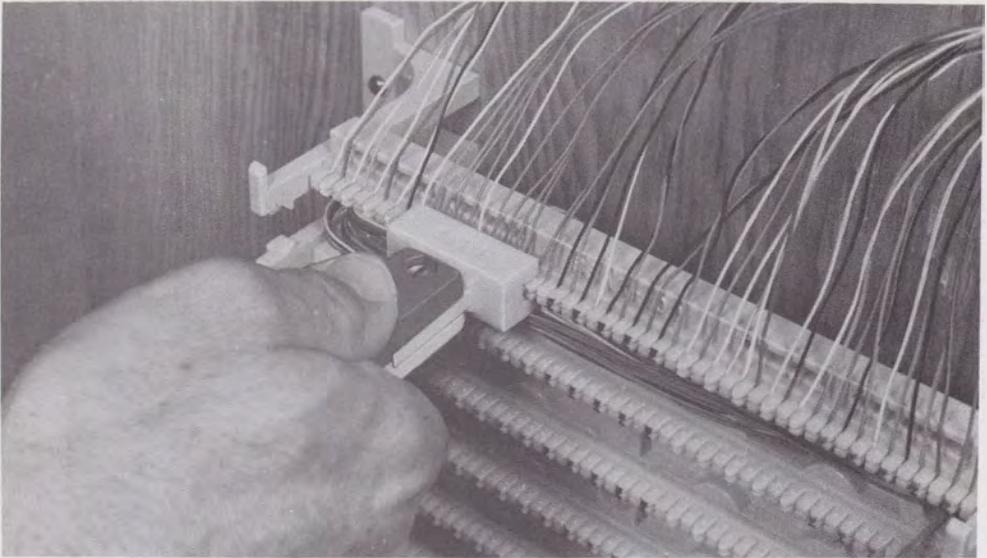
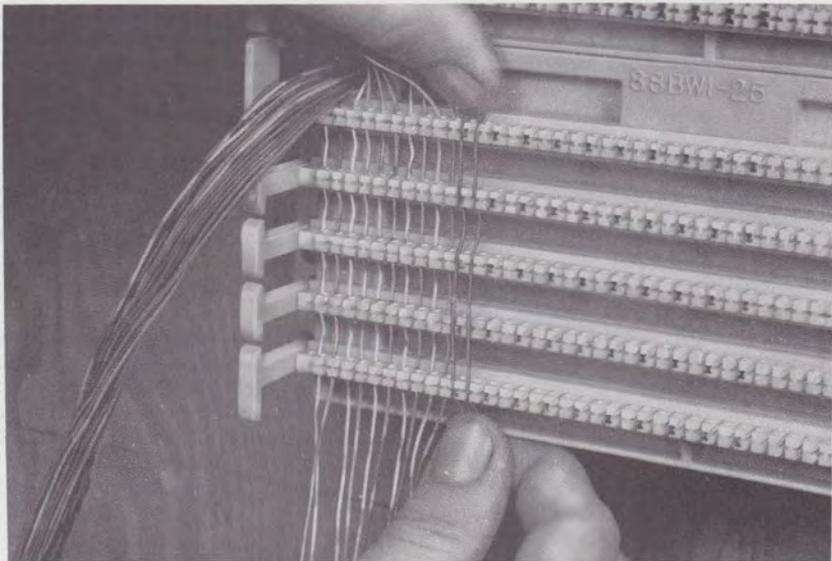


Fig. 14—Placing Conductors in Index Strip



**Fig. 15—Seating Conductors in Index Strip**



**Fig. 16—Multiple Connections in Red Field**

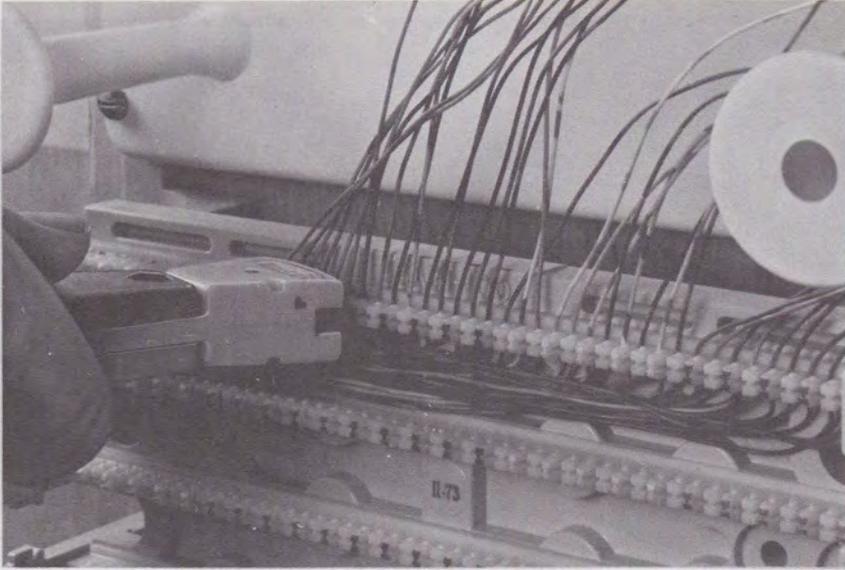


Fig. 17—Cutting Excess Wire

**3.16** The conductors are electrically terminated by placing an 88-type connecting block on the wiring block using the insertion tools. Properly align connecting block in the index strip (Fig. 18), then seat the block with a straightforward motion (do not rock) using the 788B1 or 788H1 tool.

**3.17** The slate-white 88-type connecting blocks aid in pair identification. Place the blocks on the index strip starting with the white side up at the extreme left and alternating slate and white sides for the remainder of the strip (Fig. 19). Use the 5-pair connecting block where it is desirable to identify even-count color groups. Use the 3-pair blocks where the six leads of key system line circuits are terminated such as in the blue field. Place blocks only as required.

**Caution:** *88-type blocks are designed to prevent split pairs. Connecting blocks must be properly located on the index strip to prevent block breakage during insertion. Low teeth of the index strip engage the shallow cavities of the connecting blocks, and high teeth engage the deep cavities. To prevent damage to the conductors and*

*to seat the connecting block with the least effort, it is imperative that proper alignment is made before applying pressure to seat the connecting block. The connecting block is properly seated when a click is heard. Do not hammer on insertion tool.*

**3.18** After all connecting blocks have been seated, snap the appropriately colored designation strip in the wiring block (Fig. 20). Mark the designation as required for later identification of lines or stations.

**3.19** Insert the F-type, 24-gauge cross-connect wire into the connecting block slots as shown in Fig. 21. Light finger pressure is sufficient to insure retention of the wire in its proper location. Leave the 2 inches of slack in the wire for tracing and repairing. Cross-connect wire may be routed through either fanning strip for shortest wire runs.

**3.20** Using the 788D3 tool with the head properly positioned, seat and cut off the excess wire as shown in Fig. 22.

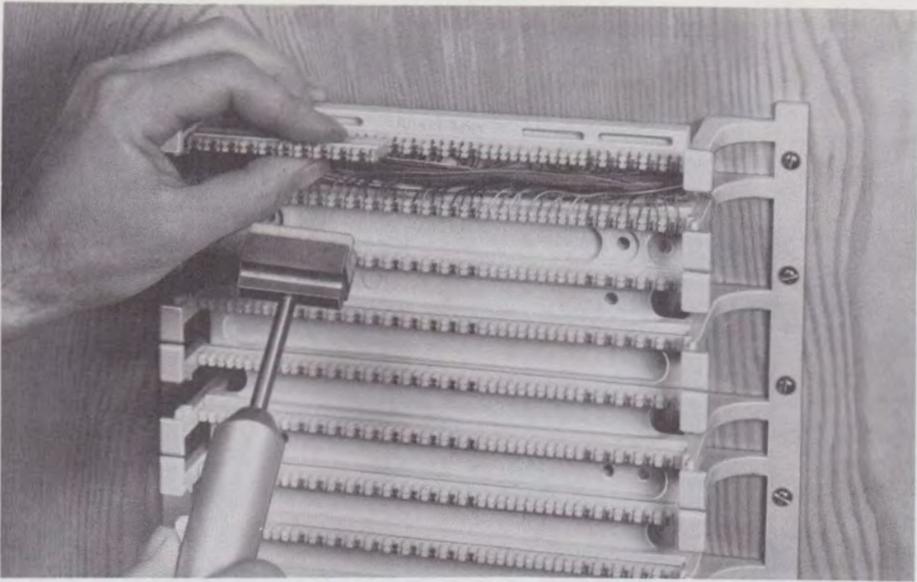


Fig. 18—Connecting Block Placed on Index Strip

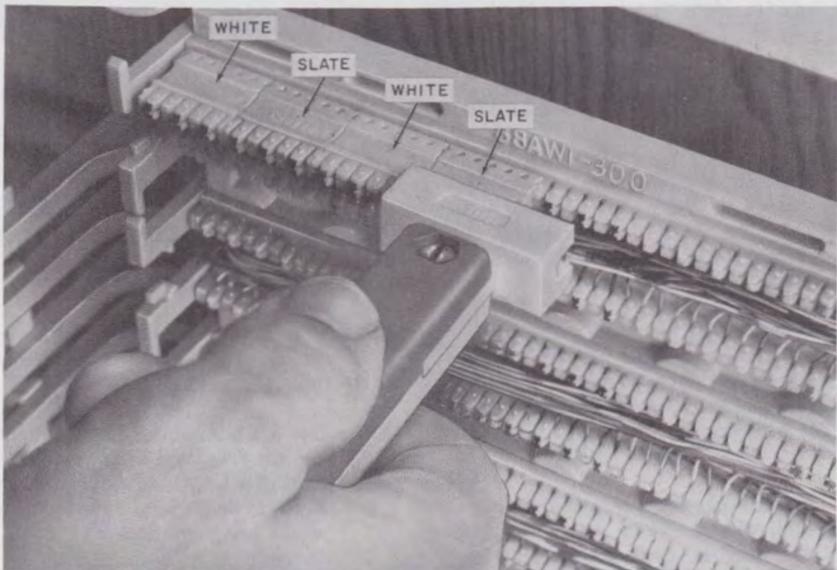


Fig. 19—Seating Connecting Block on Index Strip

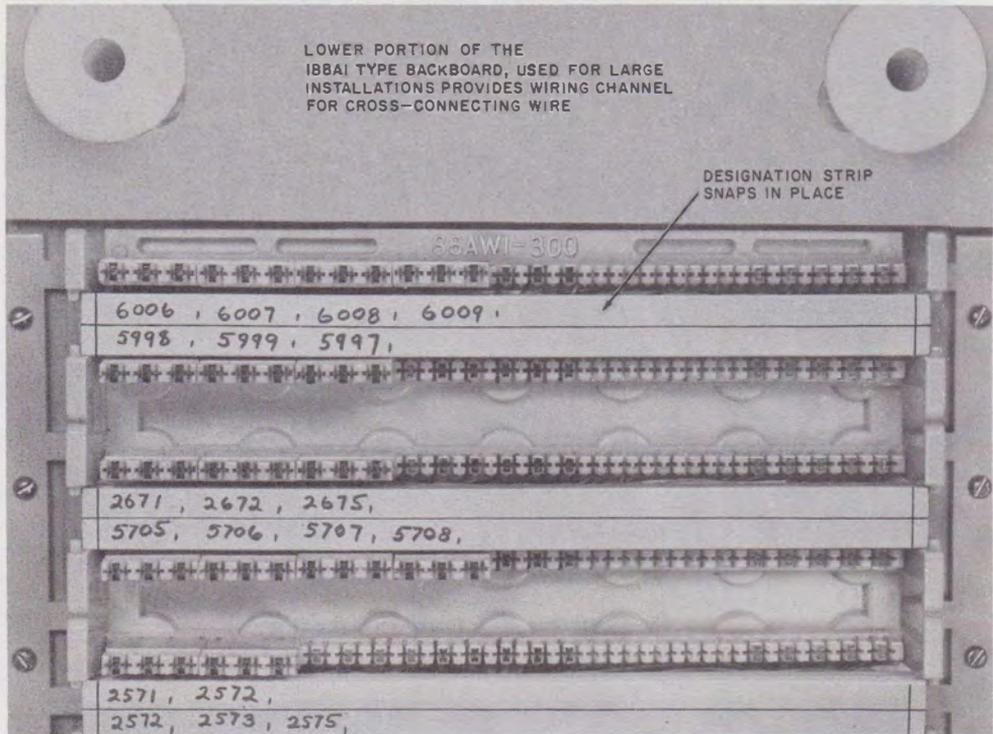


Fig. 20—Marked Designation Strips on Wiring Block

**3.21** To remove a cross-connect wire, use long-nose pliers to grip the wire where it enters the connecting block (Fig. 23) and pull straight out. Remove any fragments of insulation remaining on the clip or its cavity.

**3.22** To reterminate a wire which has been removed for rearrangement or testing, cut off the old contact area, pull slack, insert using long-nose pliers (Fig. 24), and terminate as above.

**3.23** D station wire (22 gauge) is treated as station cable and fanned out in the index strip. Where D station wire is used, it should be kept to a minimum. Cross-connecting wire of 24 gauge on top of the connecting block can be moved on and off (take new bite) as many times as necessary.

**3.24** Never terminate drop or block wiring on 88-type wiring blocks; always terminate on protectors or other blocks, and cross-connect using 24-gauge wire to 88-type wiring blocks.

**3.25** More than five multiples of a given feature can be provided, when required, using one of the following methods:

- Use a KS-19252, L2 (PCP) bridging adapter and the precabled wiring blocks (88BW1-25C or 88BW1-75C) to obtain ten multiples. Refer to Section 461-200-101 for information on the bridging adapter.
- If the need for additional multiples is known at the time the blocks are cabled, 15 multiples can be provided using an 88BW1-75 wiring

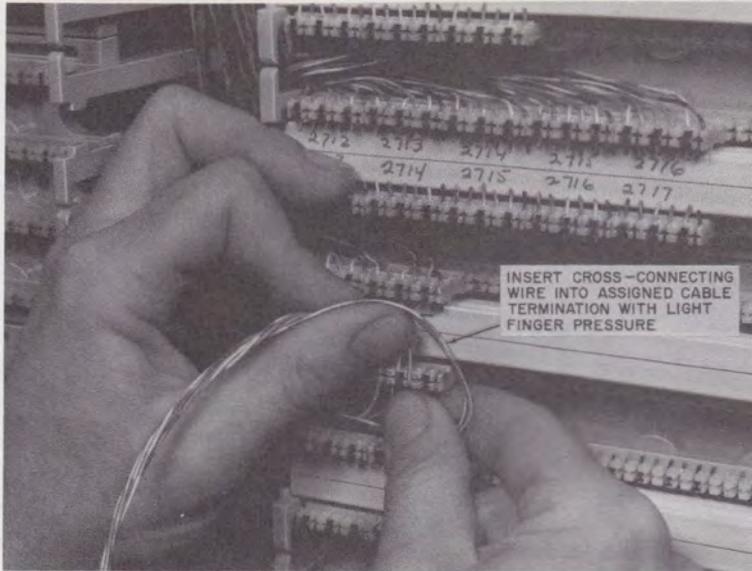


Fig. 21—Inserting Cross-Connect Wire

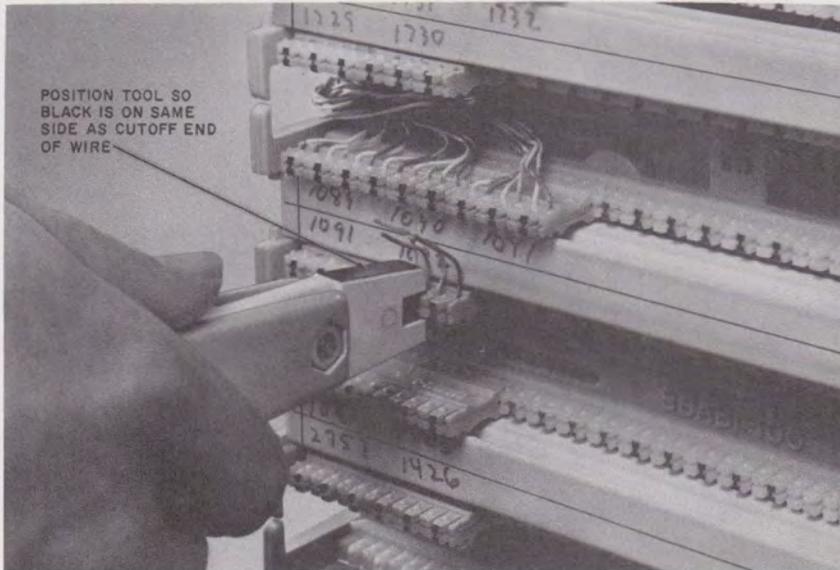


Fig. 22—Terminating Cross-Connect Wire

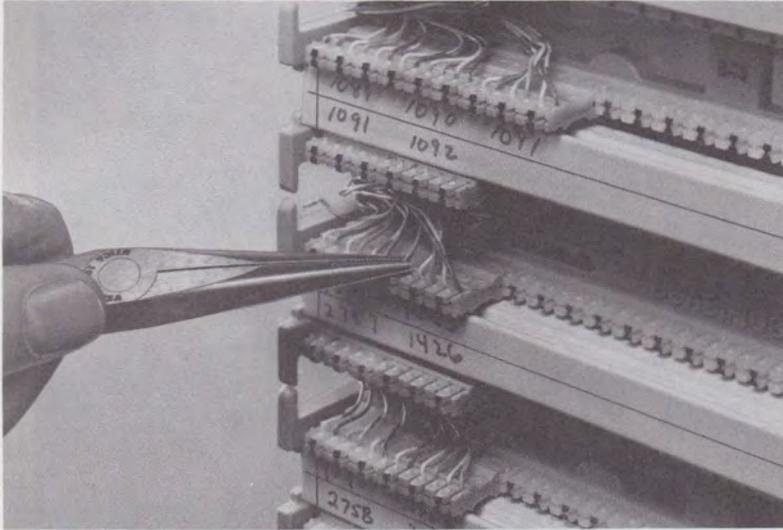


Fig. 23—Removing Cross-Connect Wire

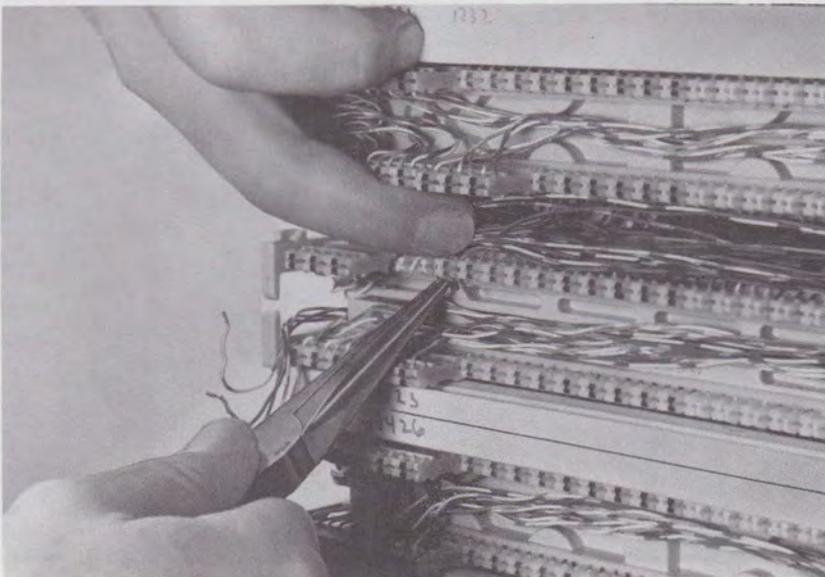


Fig. 24—Reterminating Cross-Connect Wire

block and placing the cable end in all 15 index strips.

- Where additions require more multiples than available, use one of the multiples to jumper to an unused or added wiring block. The jumpers should originate in the last appearance of the initial wiring block and terminate in the index strips of the new wiring block.

#### 4. MAINTENANCE

**4.01** Connecting blocks would normally not be removed from wiring blocks except as follows:

- (a) When the cable is being removed.
- (b) To repair a cable conductor on the wiring block.
- (c) To replace a defective connecting block. Always tag and identify all cables and their next point of termination.

**4.02** There is no prescribed method of repairing a damaged connecting block; the connecting block must be replaced as follows:

- (a) Tag and remove the cross-connecting wires from the connecting block.
- (b) Remove the designation strip from the wiring block.
- (c) Using a pair of combination or side-cutting pliers, grip the 88-type connecting block firmly in the center as shown in Fig. 25, then gently pull with a slight up-and-down motion to release the connecting block from index strip. **Do not reuse connecting block.**
- (d) If the cable conductors were pulled out of the index strip on the wiring block, replace them as follows after cutting off old contact portion of wire:

- (1) Using a pair of long-nose pliers as shown in Fig. 24, grip each removed conductor individually and pull to obtain slack; then reposition the conductors in their original position on the index strip (be careful not to split pairs). If enough slack cannot be obtained to reposition the conductor in the index strips,

it will be necessary to piece out the conductor (use wire having the same colored insulation and gauge; splice with Bell System or other approved connectors).

- (2) Using the single-pair insertion tool, seat the conductor firmly in the bottom of the index strip (Fig. 26).
- (e) Place a new 88-type connecting block as outlined in Part 3 and replace the designation strip.
- (f) Replace the tagged cross-connecting wires in their original position as outlined in Part 3 after cutting off old contact part of wire.

**4.03** In the event it becomes necessary to replace a cable due to trouble or rearrangements, follow the procedures in the following paragraphs:

**Caution: Do not cut a working cable. Doing so may cause system troubles or cause surge currents that can damage electronic components.**

**4.04** One method of cable rearrangement requires an unused index strip as follows:

- (1) Cut off existing inside wiring cable at the blue wiring block and remove designation strip.
- (2) Replace cable, using old cable to pull in new if in duct.
- (3) Remove sheath of new cable and cut down on a vacant index strip.
- (4) Install new connecting blocks on index strip in same position as old index strip.
- (5) At the cable cutoff in Step 1, trace each 3-pair jumper back to its origin on the red wiring block.
- (6) Remove the old jumpers, one at a time, and run new jumpers, terminating on the new index strip.
- (7) Replace designation strip, marking as required.

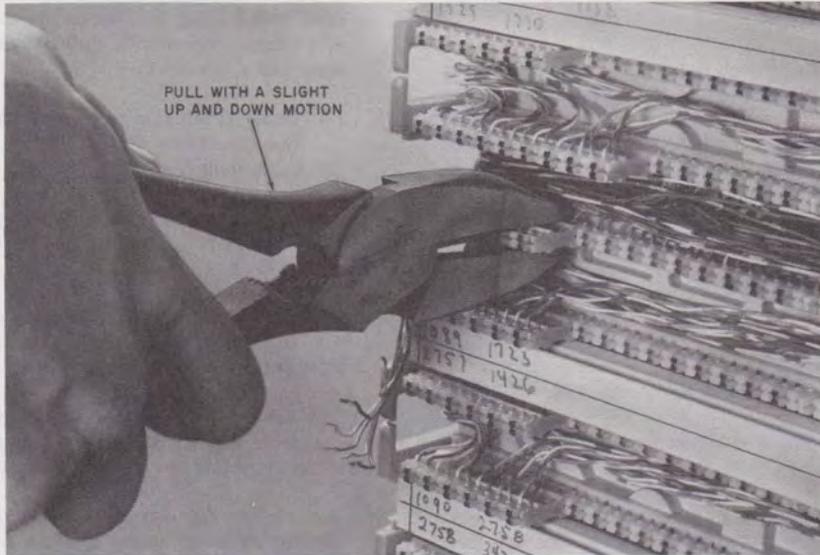


Fig. 25—Removing Connecting Block

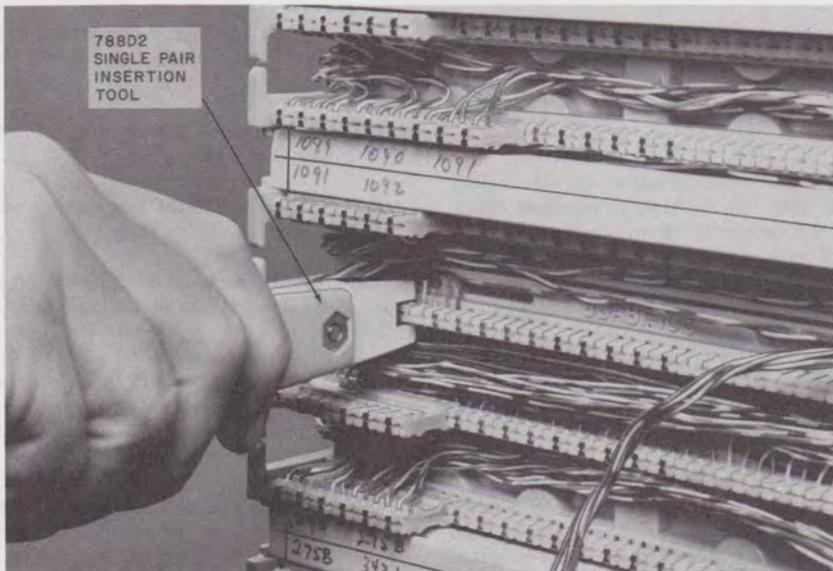


Fig. 26—Seating Conductors With Single-Pair Insertion Tool

(8) Remove connecting blocks and IW cable from old index strip. This strip can be used in future rearrangements.

**4.05** An alternate method of cable rearrangement uses the existing index strip as follows:

- (1) Cut off the IW cable at the blue wiring block and remove the designation strip.
- (2) Replace cable, using old cable to pull in new cable if in duct.
- (3) Remove each 3-pair jumper from the connecting blocks, tagging each with its location.

(4) Remove the connecting blocks and the stub ends of the cutoff cable.

(5) Cut down the new cable on the index strip and install new connecting blocks in the same positions, as required.

(6) Rerminate jumpers in proper position on connecting blocks, making sure to cut off old contact area.

(7) Replace designation strip, re-marking if required.