SECTION 256-050-,208
ISSUE 4, MAY, 1972
GTE STANDARD

CABLING METHODS
CONNECTING SWITCHBOARD CABLE
(WRAP AND SOLDER METHODS)

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1. GENERAL

1.01 This section is reissued to present the methods to be used when connecting switchboard cables by the wrap and solder methods. The information concerning the solderless wrap methods of connecting switchboard cables has been removed and is now in Section 256-050-21 I. The methods of connecting switchboard cables to "quick-connect" blocks is covered in Section 256-l 52-200. Due to the extensive changes, marginal arrows used to indicate the areas of change have been omitted. Remove and destroy all copies of Section 256-050-208, Issue 3.

2. RECOMMENDED TOOLS AND MATERIALS

2.01 The following tools and materials are recommended to facilitate performing the various connecting operations described in this section:

(a) Bag, Connecting.

(b) Iron, Soldering, 3/8 inch.

(c) Mat, Installers.

(d) Spudger, Wire.

(e) Stripper, Wire.

3. PREPARATION

3.01 The individual wires shall be connected in accordance with the color codes as called out in the appropriate 702 Specification, job drawings and/or in the manner prescribed in the specific GTE Practice applicable to the equipment being used. To avoid errors, the color code should be verified each time that the specific conductor is handled.

3.02 Framework details that may block or hinder the necessary wrap and solder operations should be temporarily removed. For example, the removal of the guardrail from the horizontal side of a distributing frame will facilitate connection of the conductors to the underside of terminal blocks which are mounted on the bottom row of the distributing frames.

3.03 All equipment beneath and adjacent to a work location is to be protected from falling solder and wire ends. The use of a connecting bag and an installers mat to catch the falling particles and scrap wire ends is essential. When connecting additions to existing terminal blocks containing working circuits and/or previously connected conductors, it is recommended that a sheet of non-conductive fiber be used to protect the previously made connections. See Figure 1 for an example of this protective measure.

3.04 When forms are to be connected, the proper position of the skinners in relation to the terminals must be maintained. Support the legs of the form by temporarily tying with lacing twine so that the form cannot be moved from the desired position during the connecting operation.

3.05 Prior to skinning the conductors in forms, cut-off all the conductors to be skinned approximately l-l/2 inches beyond the skinning point. Grip the conductors in back of the skinning point to prevent loop wires from pulling out of the form. This will also prevent damage to the conductor insulation caused by pulling against the

stitches or possible breakage of the skinners when removing the conductor insulation.

4. STRIPPING THE INSULATION

4.01 Each conductor is to be stripped of the insulating cover at the correct length to provide a firm and neat connection at its assigned terminal. The recommended method of dressing conductors while marking and connecting onto a terminal block is by the use of a wire spudger. After the conductors have been fanned through the fanning strip of the terminal block, hold the wire spudger between the fanning strip and the first row of terminals to prevent the conductors from pulling out of their proper position. Refer to Figure 2.

4.02 When stripping plastic insulated conductors, use the appropriate wire stripping tool which is designed for the gauge of wire to be stripped. Using the wrong wire stripping tool may cause either incomplete cutting of the insulation or may cut the wire as well as the insulating cover.

4.03 For the wrap and solder connections, only one conductor is to be stripped at a time. Strip the conductor of its insulating cover by pulling away from the skinner point with a straight pull, taking care not to nick, scrape, or damage the wire with the stripping tool. See Figure 3.

4.04 As shown in Figure 2, mark each conductor by bending the wire back over the pin. As shown in Figure 4, strip the insulation from the conductor so that the insulation comes up to the notch in the connecting terminal. As shown in Figure 5, mark the conductors separately for each row on the terminal block. Strip the wires of each row and connect them before proceeding to the next row on the terminal block.

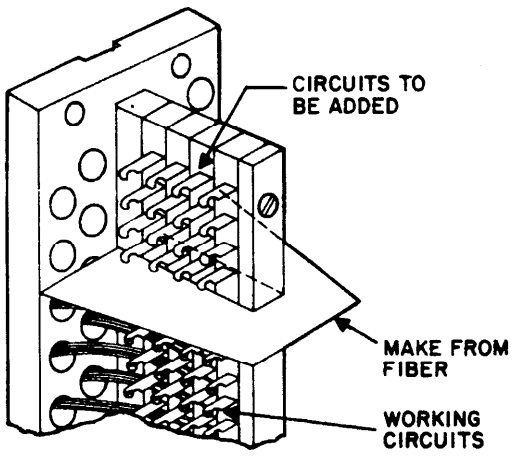

Figure 1. Protecting Working Circuits With Sheet of Fiber.

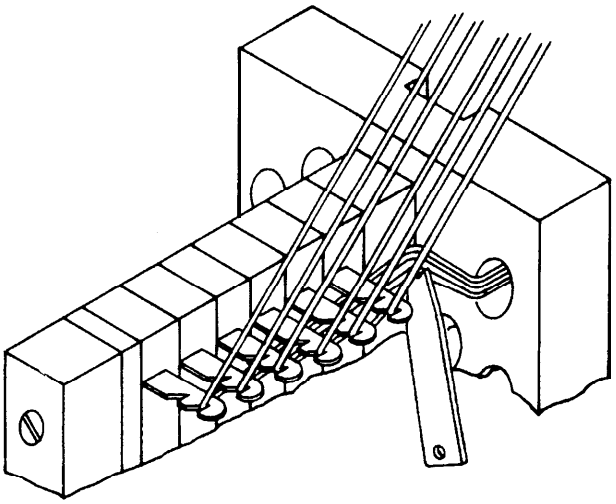

Figure 2. Using Wire Spudger for Dressing Wires and Marking Skinner Lengths for Connecting.

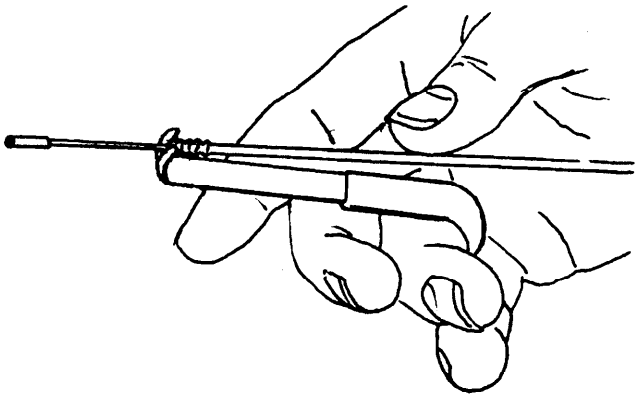

Figure 3. Use of Wire Stripping Tool.

5. CONNECTING THE WIRES

Connecting a Single Wire per Terminal

5.01 When connecting only one conductor to a terminal on a block, connect on the outside notch of that terminal as shown in Figure 6a. There are, however, special circumstances when the conductor will be connected to the inside notch. These are as follows:

(a) On all cables terminating on the Linefinder bank terminal blocks of non-electronic central offices.

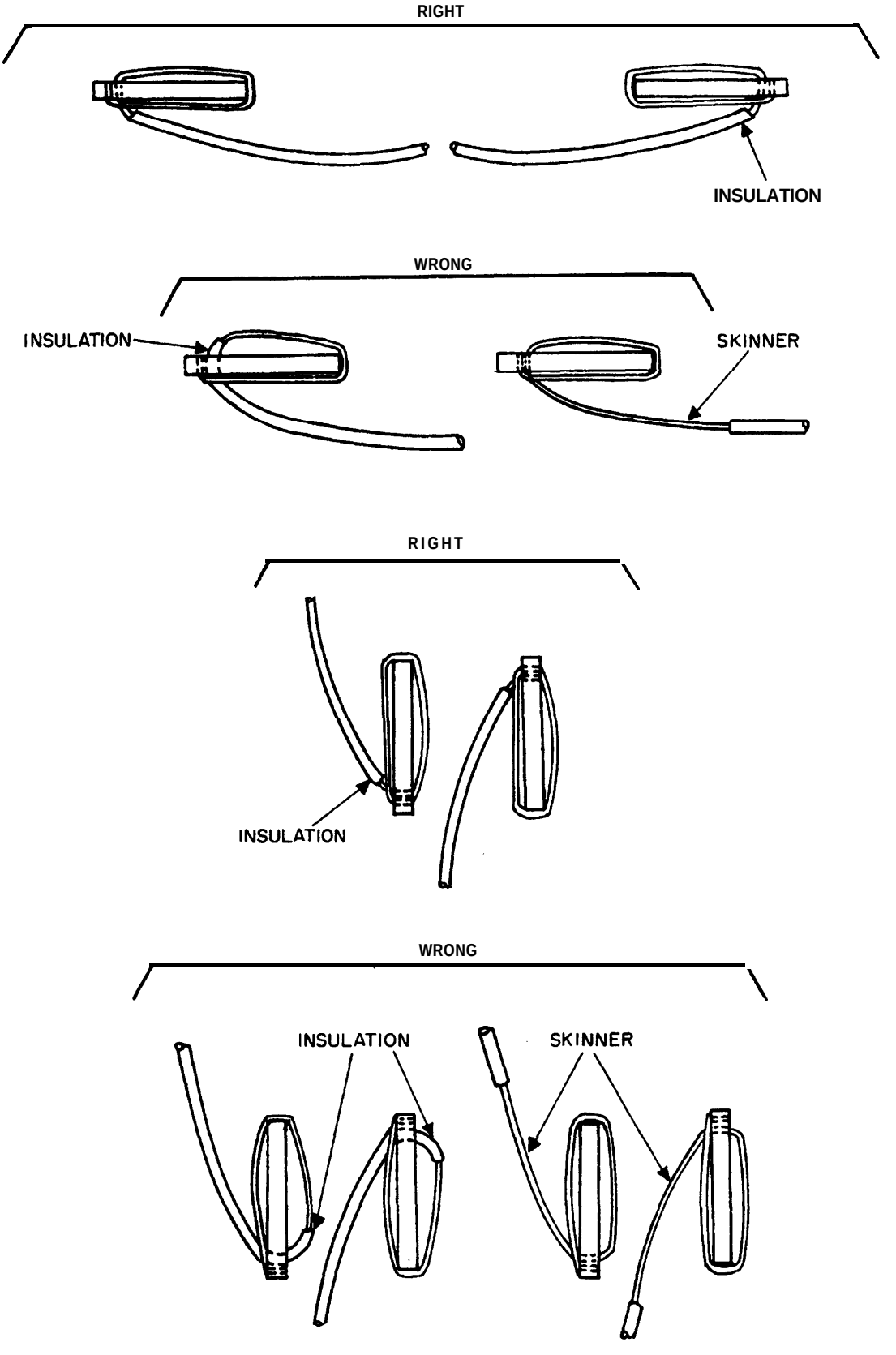

Figure 4. Method of Connecting Wires.

(b) On all circuits that will eventually be multipled. The "IN" lead(s) will always terminate on the inside notch of the terminal on the block and the "OUT" lead(s) will always terminate on the outside terminal notch.

Connecting Two Wires per Terminal

5.02 Normally, connections of two wires per terminal represent multiples or "IN" and "OUT" connections of two separate cables. In such applications the following guidelines shall be observed :

(a) When cables terminate on rotary connector bank terminal blocks:

(I) Cable from the HLIDF to the first connector shelf in the rotary group shall be connected on the inside of the terminal block.

(2) The multiple cable bridging shelves shall be connected on the outside notch on the preceding shelf and on the inside notch on the succeeding shelf. This rule will apply through and including the last appearance of all rotary groups.

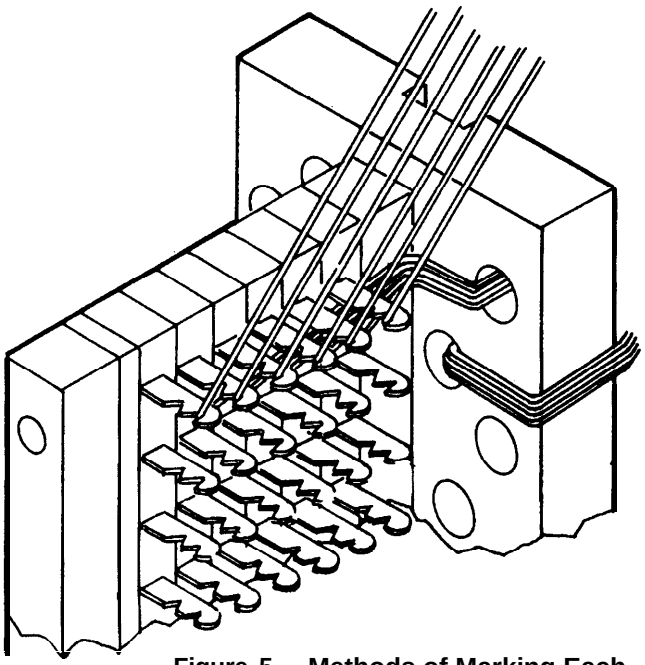

Figure 5. Methods of Marking Each ROW Separately.

(b) When placing shelf-to-shelf signal lead multiples, the "feeder" leads from the signal distributing strip shall be terminated on the inside notch of the signal block on the top shelf. The multiple leads shall be terminated on the outside notch of the preceding shelf and on the inside notch of the succeeding shelf.

NOTE: Should a condition exist that requires two connections per pin that are not multiples, both wires may be terminated in the outside notch.

Connecting Three or Four Wires per Terminal

5.03 When three wires are terminating on the same pin, one wire will be connected to the inside notch and the other two shall be connected to the outside notch. See Figure 6b.

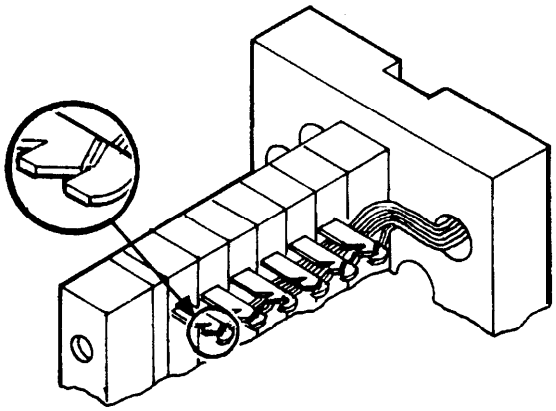

Figure 6a. Connecting 1 or 2 Wires per Pin.

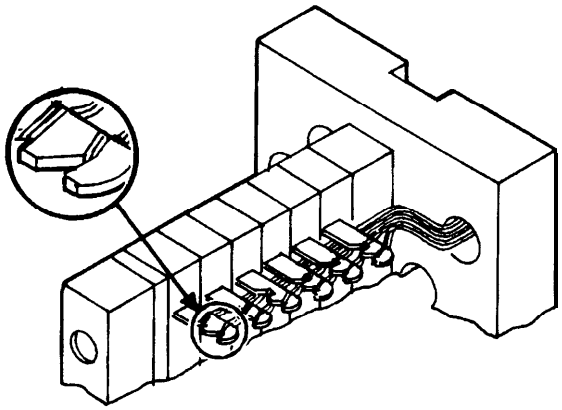

Figure 6b. Connecting 3 or 4 Wires per Pin.

Terminal Blocks.

5.04 When four wires are terminating on the same pin, two wires will be connected to the inside notch and two wires will be connected to the outside notch.

5.05 Wires in the same notch shall be out of the same cables where applicable.

5.06 Cables connected in the inside notch shall be buzzed and soldered before connecting the outside notch.

5.07 Quadded cable (two matched twisted pairs twisted together to form each quad) should always be provided for cabling composite equipment and the associated repeat coil equipment to the frame. This is to reduce cross talk between circuits. When connecting composite equipment, always connect the talking pair (T&R) leads of side 1 (Sl) and the talking pair (T&R) leads of side 2 (S2) using mated pairs for the same quad.

Making Final Connections

5.08 After wrapping the wire around the correct notch, exert reasonable force while pulling parallel to the pin, or use a snapping action to break off the excess wire.

5.09 Before soldering, observe if any portion of the insulation is in contact with the terminals. If the insulation is touching, carefully move it away with a spudger or similar tool to a distance of not more than 3/32 of an inch.

5.10 By connecting enough wires before starting to solder, the lost motion resulting from frequent changing of tools will be kept at a minimum. However, soldering too many wires without a pause may cause the soldering iron to lose its proper soldering temperature before the operation is finished. Experience will show the approximate number of connections best suited to the working conditions.

NOTE: Connections must be soldered on the same day the wires are connected to the blocks. In no case should connections remain unsoldered overnight. The connections could become oxidized or be overlooked or forgotten resulting in an unsatisfactory condition.

5.11 Remove all unsightly flux so that the soldered connection is neat and clean. Examine each soldered connection in a complete row as the work proceeds to make sure the proper wires have been connected to the terminals and that each connection is acceptable. For further information on soldering techniques, refer to the appropriate section in the 256-010 series of GTE Practices.