302- AND 303-TYPE CONNECTORS AND ASSOCIATED PROTECTOR UNITS DESCRIPTION

1. GENERAL

1.01 This section describes the 302- and 303-type connectors and associated protector units.

1.02 This section is reissued to include information on the AT-8697-F designation strip and the AT-8696-B designation labels for identifying split cable counts on the 303-type connector. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

> ***Note:*** The term ***connector*** is applied to distinguish the newer cable terminating devices (300-, 301-, 302-, and 303-type connectors) from the term ***protector*** which has been applied to cable terminating mounting assemblies, such as the C50, E50, etc.

1.03 The 302A1- and 302B1-type gold-plated terminal connectors are specified for use to terminate and protect outside plant cables on modular protector frames.

1.04 The 302A2- and 302B2-type solder-plated terminal connectors are specified for use to terminate and protect outside plant cables on double-sided conventional protector frames.

1.05 The 303-type solder-plated terminal connector is used for terminating and protecting outside plant cables on conventional main distributing frames.

1.06 The 303-type connectors are used in place of the 300-type connectors and the C- and E-type protectors on main distributing frames for a 100-percent increase in capacity. They are also used in place of the 301-type connectors and 444-type jacks, but there will be no saving in frame space. However, the 303-type connector is an improved design and is less expensive.

1.07 These connectors provide features for voltage protection, current protection, testing, identification of special circuits, and disconnection of the outside cable pair from the central office equipment.

1.08 The 303A1- and 303B1-type connectors can be modified to include the features of the 303A2- and 303B2-type connectors by the use of the D-180540 modification kit. This is covered in Section 201-208-802.

1.09 The classes of conductors entering a central office and the protection required are covered in Section 201-202-101 which describes types of protection.

2. DESCRIPTION

CONNECTOR PANEL

2.01 The 302-type connector and its installation in a modular protector frame are shown in Fig. 1. The 303-type connector is shown in Fig. 2 and 3. Fig. 4 shows 303-type connectors installed on a conventional main distributing frame.

2.02 Above each protector frame vertical (Fig. 1) are three designation cards indicating the vertical section number, the cable numbers supplying each of the 302-type connectors in the vertical section, and the hundreds group pair identification number for each of the 302-type connectors.

2.03 The pair number in the hundreds group for each jack on the 302-type connector is molded into the connector. Pair designation plates (Fig. 1) between every five rows of jacks are marked top and bottom to indicate the tens and units number of the adjacent jack or protector unit. Intermediate numbers are then easily obtained by their relative location to the identification plates.

2.04 The molded plastic panel of the 302- or 303-type connector is equipped with 100 groups of 5-pin grip-type terminals. On the 302A1- and 302B1-type connectors for modular protector

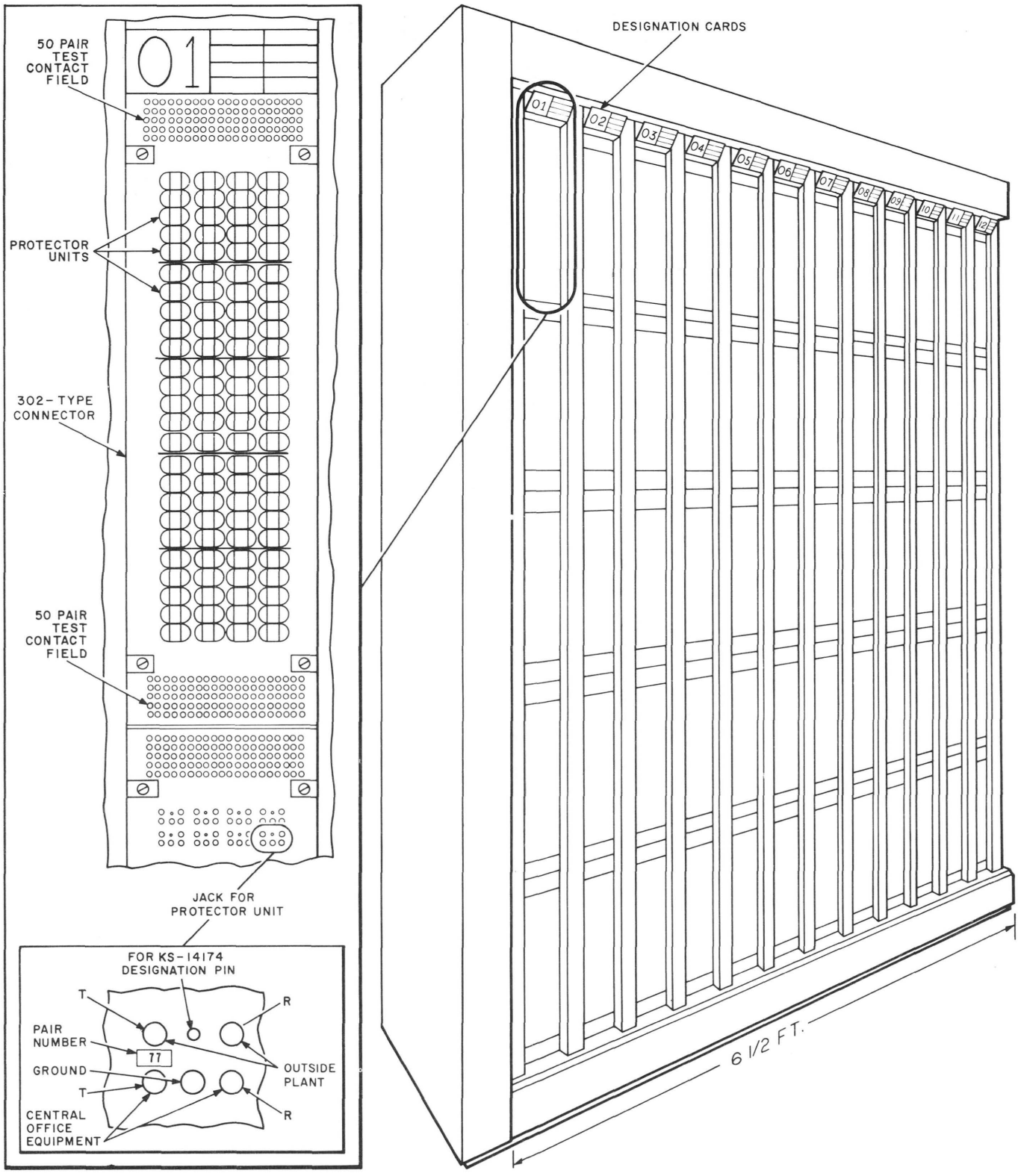

Fig. 1—302-Type Connector Installed in a Modular Protector Frame

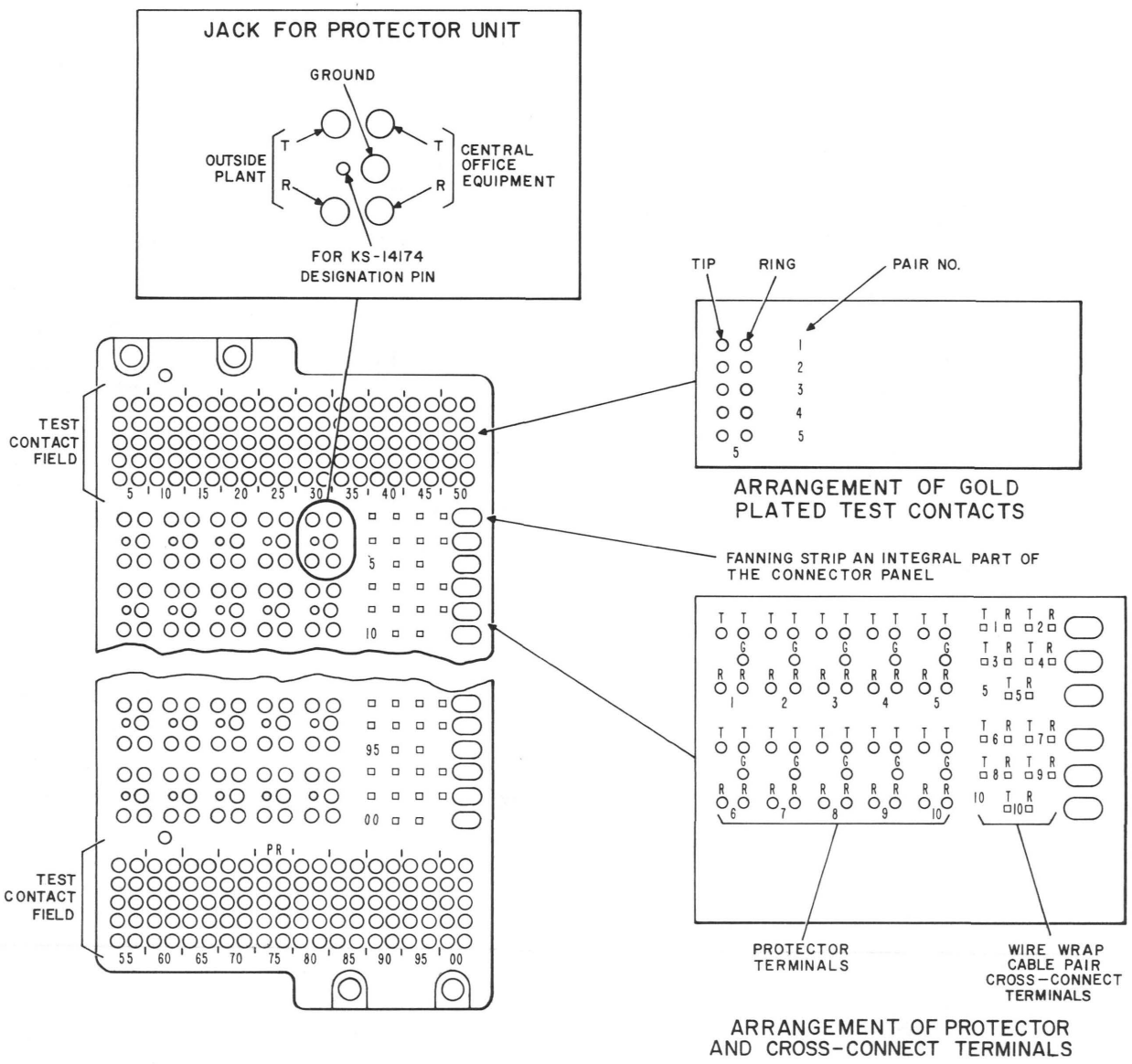

Fig. 2—303-Type Connector Panel

frames, four of thse terminals are gold-plated to provide contact for tip and ring connections. The fifth terminal is solder-plated and provides ground connection. On the 302A2- and 302B2-type connectors for double-sided conventional protector frames and on the 303-type connector, all five terminals are solder-plated.

2.05 Pair identification is provided on both the front and back of the connector by the provision of pair numbers molded into the connector.

2.06 Small colored designation pins, KS-14174, may be inserted at the protector unit location to identify special circuits and when present, require

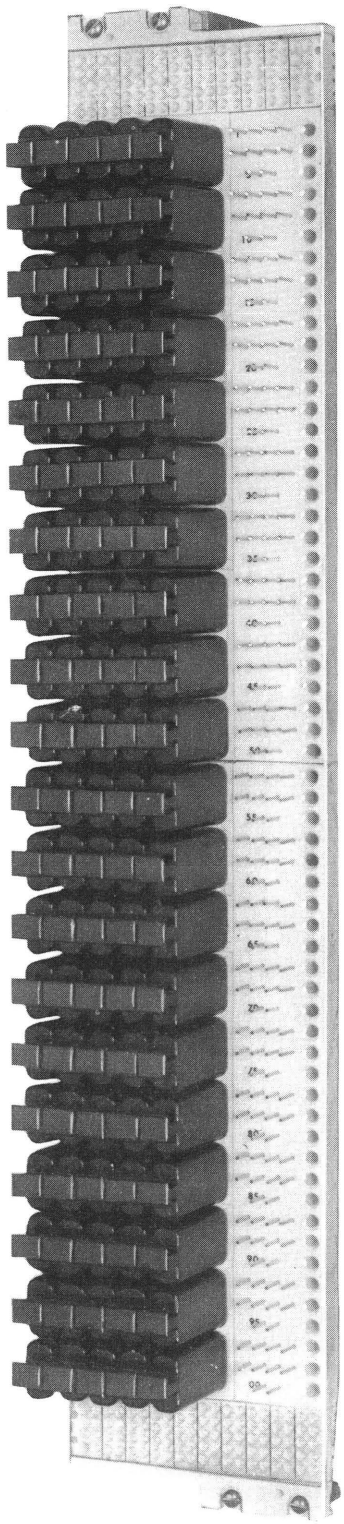

Fig. 3—303-Type Connector

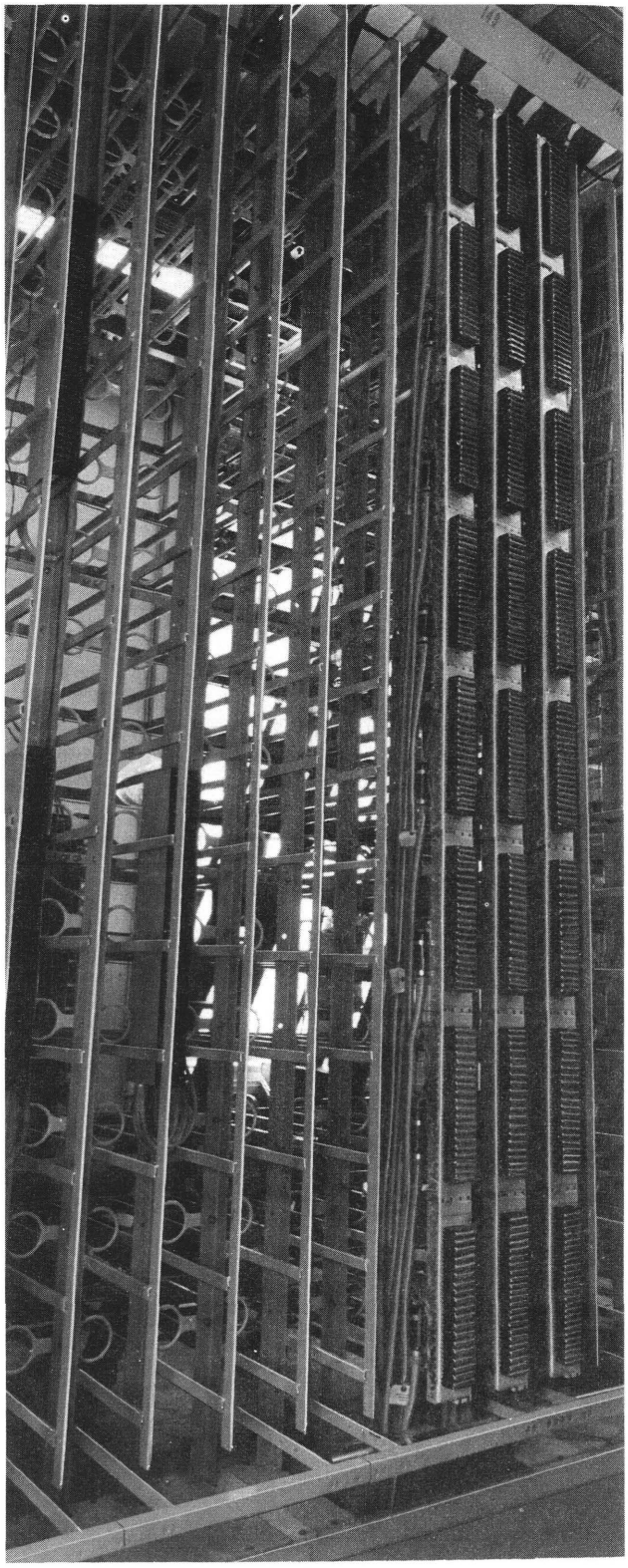

Fig. 4—303-Type Connectors Installed on a Conventional Main Distributing Frame

insertion of protector units of the same color. When no pins are present, black or gray protector units are inserted.

2.07 Gold-plated test contacts arranged in 50-pair groups are located at the top and bottom of the panel.

2.08 The test contacts are accessible from the front for attaching test connectors to accommodate the necessary test equipment.

Caution: The connector test contacts are gold-plated. Any abuse, such as locating tone with a probe, shorting or grounding pairs with long-nose pliers, etc, will damage the test contacts.

2.09 Each group of 50 test points on a 302- or 303-type connector is made accessible for test by attaching a test connector to the test contact field. For 302-type connectors, the D and G test connectors are provided. For 303-type connectors, the H test connector is provided.

2.10 Individual test contacts may be made accessible by using test cords designed for this purpose.

2.11 For description and method of installing test connectors and test cords, reference should be made to Sections 106-315-100 through 106-315-121.

2.12 Test points for special or sensitive circuits are protected from connection to test connectors by inserting a KS-19478 L1 guard (Fig. 5) into its T and R test points.

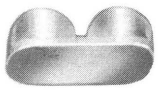

Fig. 5—KS-19479 L1 Guard

PROTECTOR UNITS

2.13 Presently manufactured protector units are shown in Fig. 6 and 7. Protector units designed for the 302A1- and 302B1-type connectors (Fig. 7) have four gold-plated contact pins and one solder-plated ground pin. Protector units designed for the 302A2-, 302B2-, and 303-type connectors (Fig. 6) have five solder-plated contact pins.

2.14 Older-type protector units for the 302A1- and 302B1-type connectors were larger than presently manufactured protector units as shown in Fig. 7.

2.15 When the protector units are inserted into a jack group on the connector panel, they provide the following contacts for one pair:

(a) Tip and ring to outside plant conductors (long pins)

(b) Tip and ring to central office equipment (short pins)

(c) Ground which also serves as a polarizing pin (center pin).

2.16 Voltage protection only is provided by two pairs of carbon blocks which are enclosed by the plastic cap of the 3A protector unit as shown in Fig. 6 and 7. These units are used on circuits where sneak current protection is not required.

2.17 The 4A-type protector unit with carbon blocks and heat coils is used on circuits requiring both voltage and sneak current protection.

2.18 The 5A-type protector unit (dummy) may be used when no protection is required.

2.19 When the protector units are fully inserted into the connector, the outside plant and central office equipment is connected and protection is provided. Ground, for protection purposes, is provided for the heat coils and carbon blocks through the grounding pin of the protector unit. The grounding pin is connected to a bar. These bars are grounded by the mounting screws securing the connector to the frame.

2.20 When the protector unit is pulled out to the detent position, the central office equipment is disconnected to isolate outside pairs for testing purposes. In this position, protection is still provided on the outside cable pair. Pulling

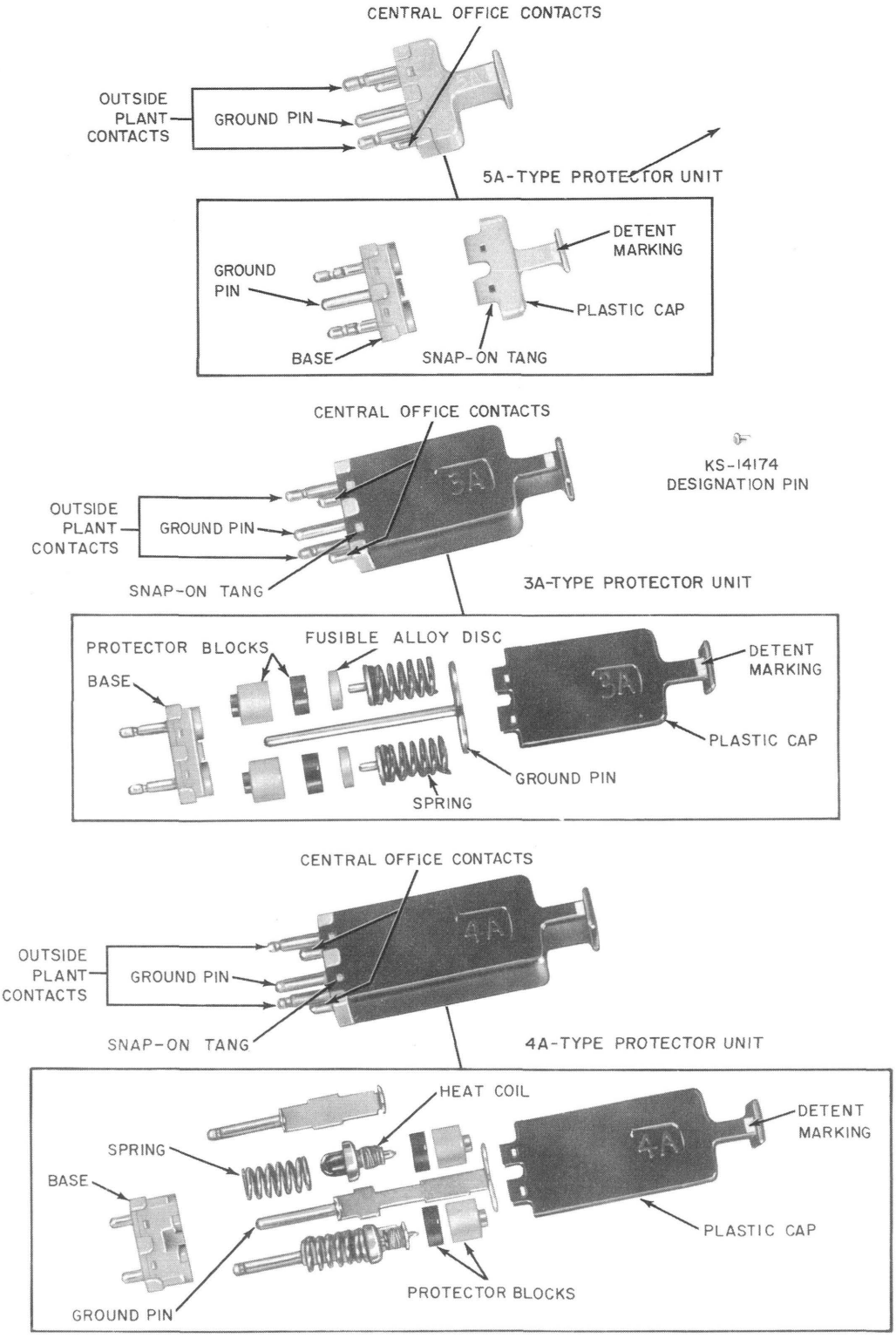

Fig. 6—Presently Manufactured Protector Units and Designation Pin

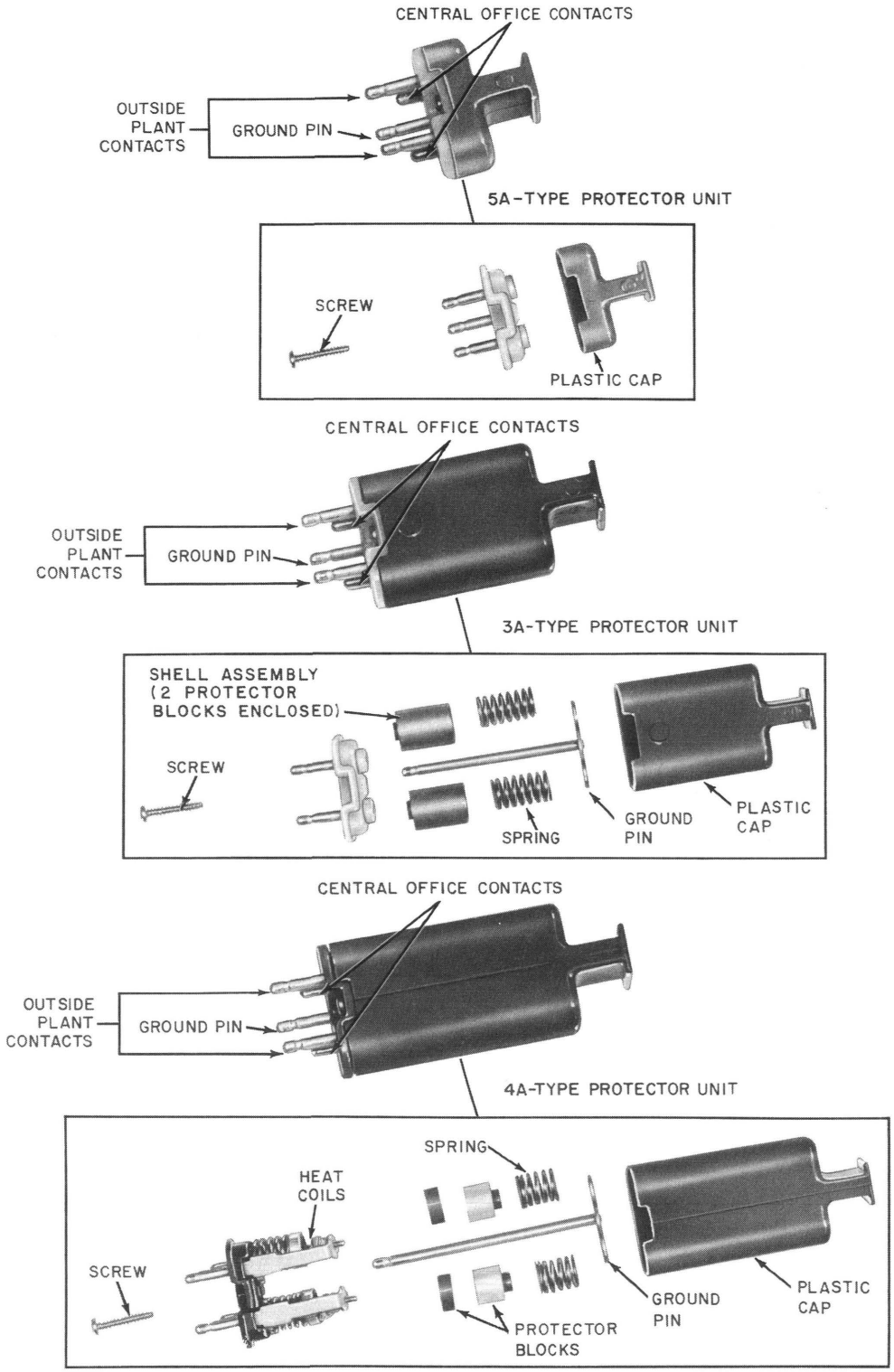

Fig. 7—Older-Type Protector Units for 302A1 and 302B1 Connectors

the protector unit out completely then removes all protection.

2.21 Three types of protector units (Fig. 6 and 7) can be used with the 302- and 303-type connectors. The 3A-type protector unit nominally provides 500-volt protection and is used with circuits which do not require current protection, such as exists with the No. 1 Electronic Switching System (ESS). The 4A-type protection unit nominally provides 500-volt protection and has head coils for current protection. The 5A-type protector unit is a dummy protector and is used where outside plant cable is not exposed and heat coils are not required. These types of protector units are readily identified by their length. The 5A-type unit is shortest, the 3A-type unit is of intermediate length, and the 4A-type unit is longest.

DESIGNATION PINS

2.22 The type of circuit is associated with the color of the protector unit. Table A lists the different circuits with the code number for each of the three types of protector units usable with the 302- and 303-type connectors.

2.23 Except for regular service, a designation pin (Fig. 7) with list number, given in Table A, is to be inserted in the hole provided in the jack group of the 302- or 303-type connector. For regular service (standard circuit), no designation pin is used.

REMOVING AND INSTALLING PROTECTOR UNITS

2.24 To remove a protector unit, the projection of the plastic cap is grasped with the thumb and forefinger and pulled past the detent position.

2.25 Any protector units which are defective or suspected as defective can be disassembled and inspected using the 760B tool. Test and repair method for 302- and 303-type protectors is covered in Section 201-208-501.

2.26 To install protector unit, the protector unit is held by the projection of the cap so the two long pins are at the top if installing on 302-type connector. The two long pins are at the left-hand side if installing on 303-type connector. The pins of the protector unit are then inserted into the jack of the connector. If a special designation pin appears in the designation hole of the jack, the cap of the protector unit must be the same color. Inserting the protector unit to the detent stop position provides line protection but does not connect to the central office equipment. Inserting the protector unit until it is completely seated in the jack and past the detent stop position connects the circuits through to the central office equipment.

3. DESIGNATION STRIP AND LABELS

3.01 When a split cable count occurs on a 303-type connector, the AT-8697-F designation strip is required as an accessory to the connector for cable and cable pair identification.

3.02 The AT-8697-F designation strip is a white polyvinyl chloride card, approximately 2 inches wide and 15 inches long, that is riveted to a full-length narrow steel hinge. The plastic card is lined vertically and horizontally, such as to correspond to the 5 columns and 20 rows of protector locations on the 303-type connector.

3.03 As shown in Fig. 8, the hinged portion of the designation strip is mounted to the left side of the 303-type connector by utilizing the three existing screws on the ground bar.

3.04 The AT-8696-B designation labels are affixed to the AT-8697-F designation strip (Fig. 9) for identifying the end of one cable and the beginning of another. The labels are preprinted with black numerals and are made of a thin polyvinyl chloride film which is backed with a pressure sensitive adhesive.

3.05 The AT-8696-B designation labels are furnished in two different sizes. Type B-1 is 1/4 inch wide by 1/2 inch long and has 3/16-inch high black numerals. Type B-2 is 3/8 inch square and has 5/16-inch high black numerals. Both type labels are available in either a yellow (B-1Y or B-2Y) or white (B-1W or B-2W) background to distinguish separate cable identities.

3.06 The type B-1 AT-8696-B designation labels are used to identify the cable pairs and are affixed to the respective lined blocks on the AT-8697-F designation strip. A complete set of type B-1 labels consist of 27 sheets, each sheet containing 100 labels, and are consecutively numbered from 1 to 2700.

TABLE A

PROTECTOR UNIT AND DESIGNATION PIN IDENTIFICATION

CODE	CAP AND DESIGNATION PIN COLOR	PROTECTOR BLOCKS (2 PAIRS EACH)	HEAT COILS (2 EACH)	CONTACT PIN PLATING [1]	CIRCUIT IDENTIFICATION	LIST NO. OF KS-14174 DESIGNATION PIN
3A1A	Black	32B & 33B	None	Gold	Standard Circuit	*
3A2A	Green	32B & 33B	None	Gold	Open Circuit	4
3A3A	Red	32B & 33B	None	Gold	Special Circuit	7
3A4A	Yellow	32B & 33B	None	Gold	PBX Battery	5
3A5A	Black	32B & 33B	None	Solder	Standard Circuit	*
3A6A [2]	Green	32B & 33B	None	Solder	Open Circuit	4
3A7A	Red	32B & 33B	None	Solder	Special Circuit	7
3A8A	Yellow	32B & 33B	None	Solder	PBX Battery	5
4A1C	Black	32B & 33B	80A	Gold	Standard Circuit	*
4A2C [2]	Green	32B & 33B	81A	Gold	Open Circuit	4
4A3C	Red	32B & 33B	80A	Gold	Special Circuit	7
4A4C	Yellow	32B & 33B	79A	Gold	PBX Battery	5
4A5C	Black	32B & 33B	80A	Solder	Standard Circuit	*
4A6C [2]	Green	32B & 33B	81A	Solder	Open Circuit	4
4A7C	Red	32B & 33B	80A	Solder	Special Circuit	7
4A8C	Yellow	32B & 33B	79A	Solder	PBX Battery	5
5A1D	Gray	None	None	Gold	Standard Circuit	*
5A2D [2]	Green	None	None	Gold	Open Circuit	4
5A3D	Red	None	None	Gold	Special Circuit	7
5A4D	Yellow	None	None	Gold	PBX Battery	5
5A5D	Gray	None	None	Solder	Standard Circuit	*
5A6D [2]	Green	None	None	Solder	Open Circuit	4
5A7D	Red	None	None	Solder	Special Circuit	7
5A8D	Yellow	None	None	Solder	PBX Battery	5
5A9D	White	None	None	Solder	Reversed Tip and Ring	
429F [3]	White	32B & 33B	80A	Solder	Reversed Tip and Ring	

TABLE A

PROTECTOR UNIT AND DESIGNATION PIN IDENTIFICATION (CONT)

Note 1: Protector units with gold-plated contact pins are used on 302A1 and 302B1 connectors. Protector units with solder-plated contact pins are used in 302A2, 302B2, and 303-type connectors.

Note 2: No continuity between outside plant and central offices.

Note 3: Code designation is plug instead of protector unit.

* If no pin is used, standard circuit is indicated.

3.07 The type B-2 AT-8696-B designation labels are used to identify the individual cables and are affixed under the "cable" heading on the AT-8697-F designation strip. Each sheet of labels contain 6 rows of numerals from 0 to 9 and 12 blank labels. The blank labels are included in the event a cable suffix letter must be marked to identify a cable.

3.08 The AT-8696-B designation labels are furnished on paper-backed sheets and are scored for ease of removal. Pointed tweezers are recommended for removing the labels from the sheets and for applying the labels to the designation strip.

3.09 Labels should be applied carefully in that after they adhere to the designation strip, they are dificult to reposition or remove. If a label must be changed, it may be more convenient to apply a new label over the existing one, rather than remove it.

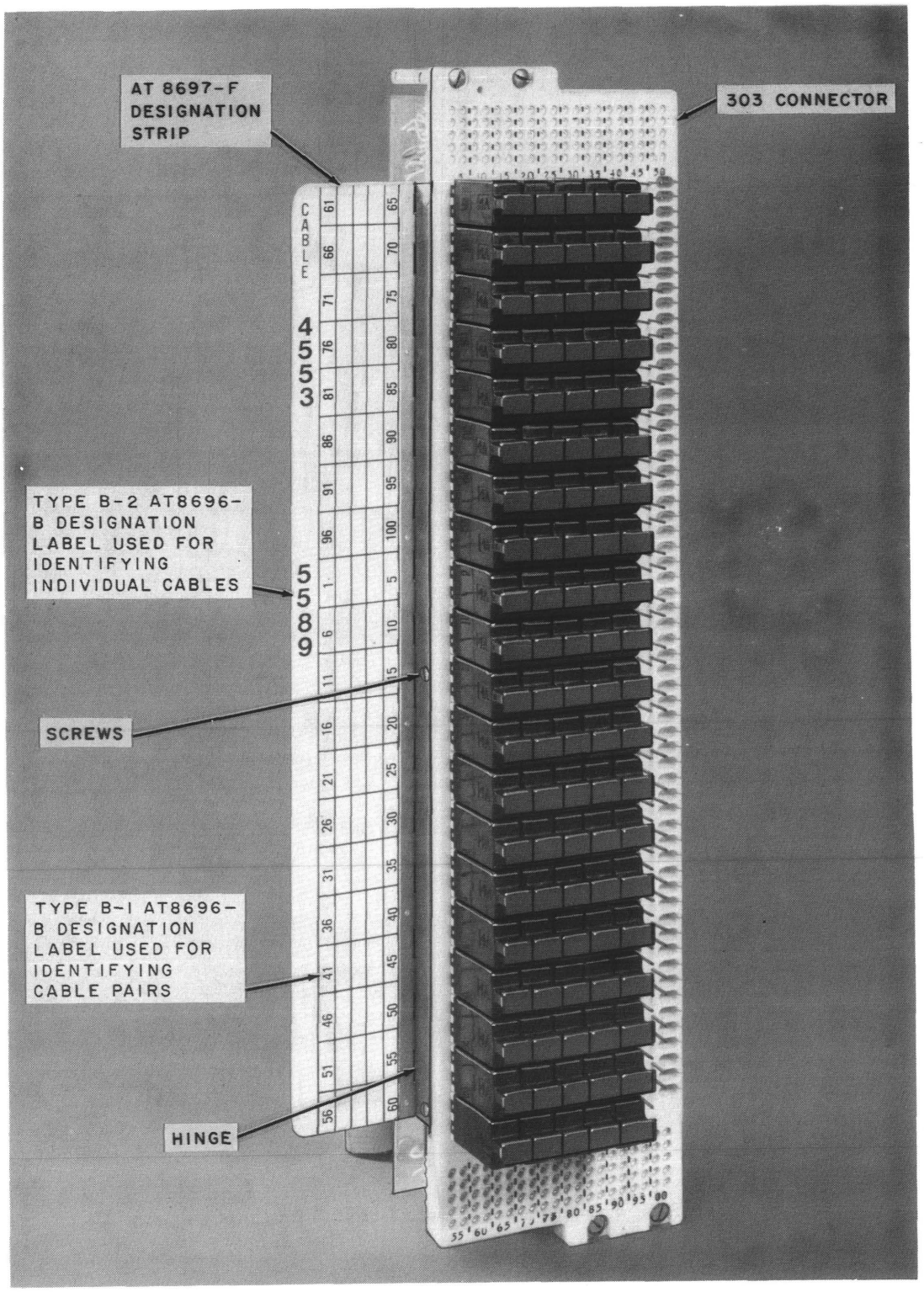

Fig. 8—AT-8697-F Designation Strip Mounted on 303-Type Connector

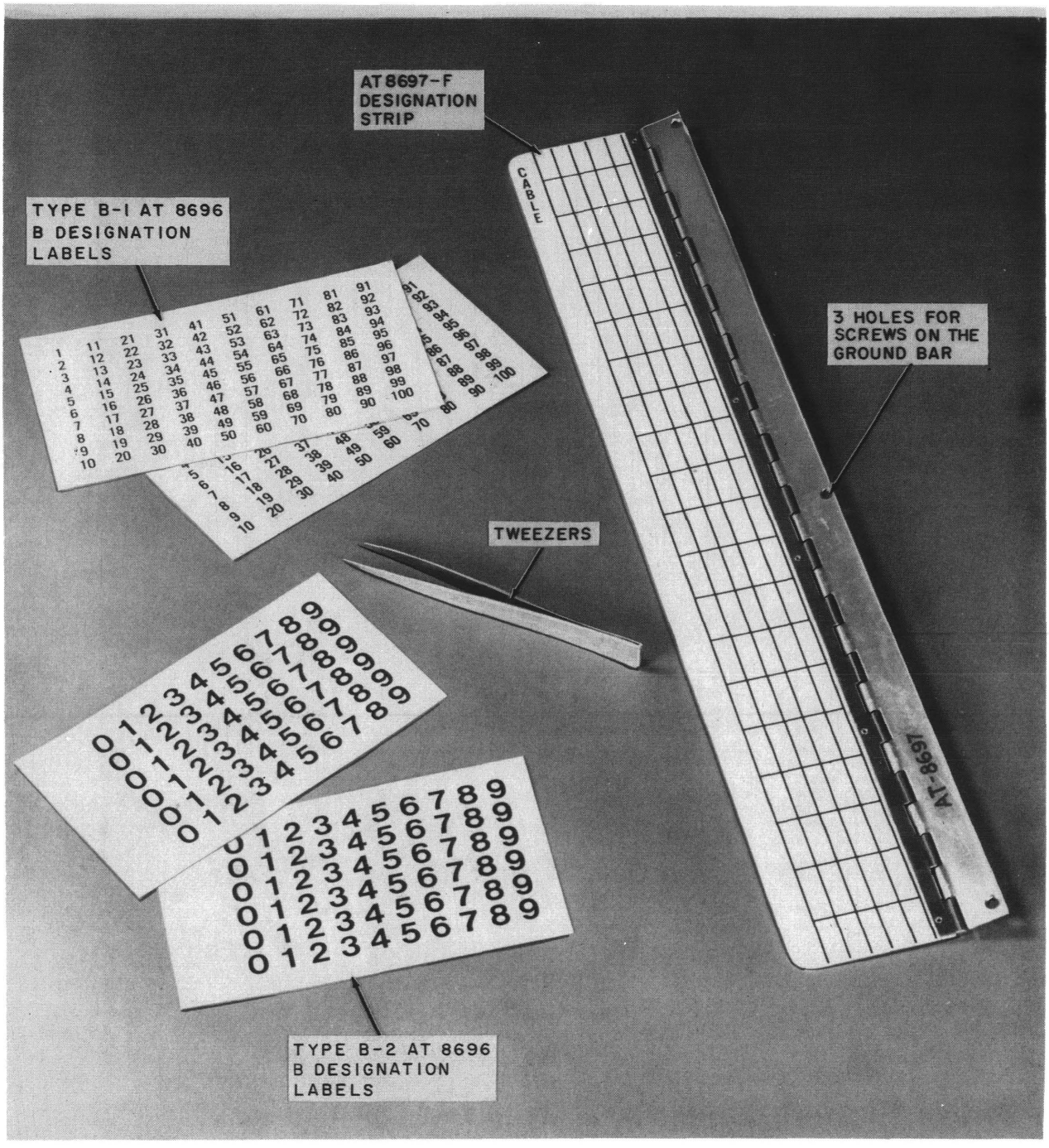

Fig. 9—AT-8697-F Designation Strip and AT-8696-B Designation Label