SWITCHED MAINTENANCE ACCESS SYSTEM (SMAS) MAINTENANCE CONNECTORS GENERAL INFORMATION

CONTENTS PAGE

1. GENERAL

1.01 This section describes maintenance connectors and how they are used in Switched Maintenance Access Systems (SMAS). A companion section, 667-000-001, describes access point information. Maintenance connectors perform the actual access in the various SMAS.

1.02 When this section is reissued, the reason for reissue will be given in this paragraph.

1.03 Maintenance connectors have been designated as types 1, 2, and 3. Table A shows each type of connector including the SD numbers, J numbers, use, etc. Figures 1, 2, and 3 are pictures of these maintenance connectors. All three occupy 3 inches of frame space and are designed for direct plug-in mounting in a standard 23-inch bay.

1.04 Maintenance connectors are capable of accessing 24 VF circuits on a one-at-a-time basis. They are wired into the transmission paths (and in some instances the signaling path) of a circuit. When the circuit is in its normal condition, the transmission (and signaling) paths are connected through trunk maintenance (TM) relay contacts inside the connector. When a circuit is accessed the TM relay operates and connects the circuit to SMAS in a high impedance bridging mode. Circuit continuity is maintained through the maintenance connector bus (see Fig. 1 and 2 in the Appendix). This mode is used to verify circuit conditions, etc. If further testing is required SMAS will cause relays to operate in the connector to split the circuit toward the equipment or facility. Once the circuit is split in the required direction, various transmission, AC and DC measurements, and signaling tests can be made.

1.05 Access and control functions are accomplished by miniature wire spring relays mounted on printed circuit boards. (Decoder/driver integrated circuits are utilized in the type 3 maintenance connector.) The relays are normally in the released condition and power may be removed from the maintenance connectors without affecting customer

TABLE A

TYPE OF MTCE. CONN & SD NUMBER	OPTIONS	CKT TYPES	J-98622	WHERE USED IN SMAS	CONNECTORIZED	MFG RATING	CLASS MARK
1 SD1C288-01	NA	+7, -16 Dry (Non-Metallic)	AA	3	No	A&M	Open
2 SD1C454-01	—Y	+7, -16 Dry (Non-Metallic) AFT, D3, UTE	AN	3	No	A&M	Open
			BL	3	Yes	STD	Open
	Y	VAR, Wet Metallic Only MTF - 4ESS only	AP	3	No	A&M	GRD
			BM BL L2	3 3	Yes Yes	MD STD	GRD GRD
	S, T	Any Metallic or Non-Metallic D-Type Chan. Bk DF X-Conn	BL L1 BL L2, L3	3 3	Yes Yes	MD STD	1.96KΩ to GRD 1.96KΩ to GRD
			BM BL L2	3 3	Yes Yes	MD STD	1.96KΩ to GRD 1.96KΩ to GRD
	S, —Y	Any	BL L1 BL L2, L3	4 & 5 4 & 5	Yes Yes	MD STD	Open Open
			BM BL L2	4 & 5 4 & 5	Yes Yes	MD STD	Open Open
3 SD1C605-01	NA	Any	BT L1	3, 4, & 5	Yes	MD	825Ω to GRD
3 SD1C605-02	NA	Any	BT L3 BT L2, L3	3, 4, & 5	Yes	STD	825Ω to GRD

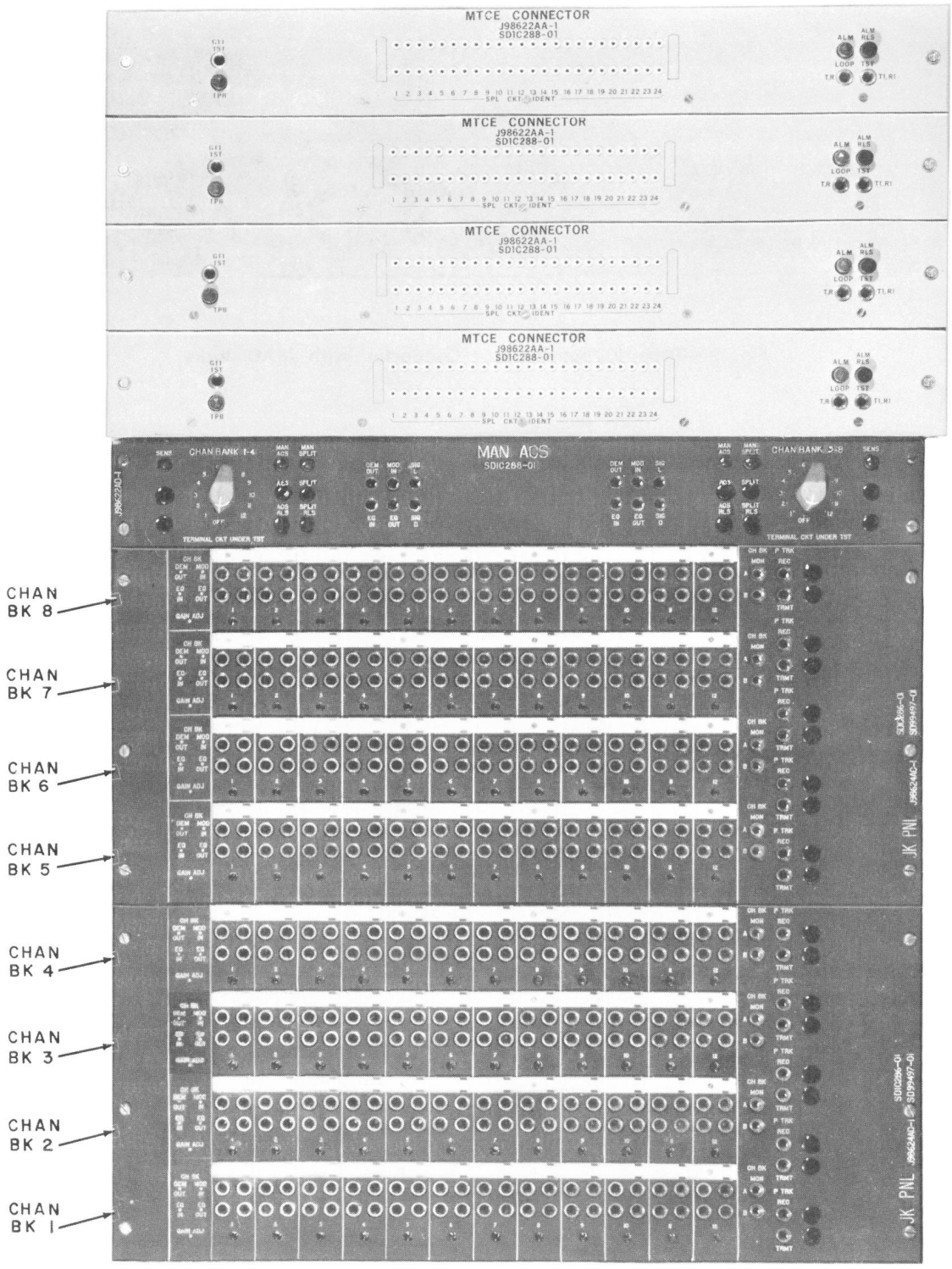

Fig. 1—Type 1 Maintenance Connector, VF Patch Jacks, and Manual Access Panel

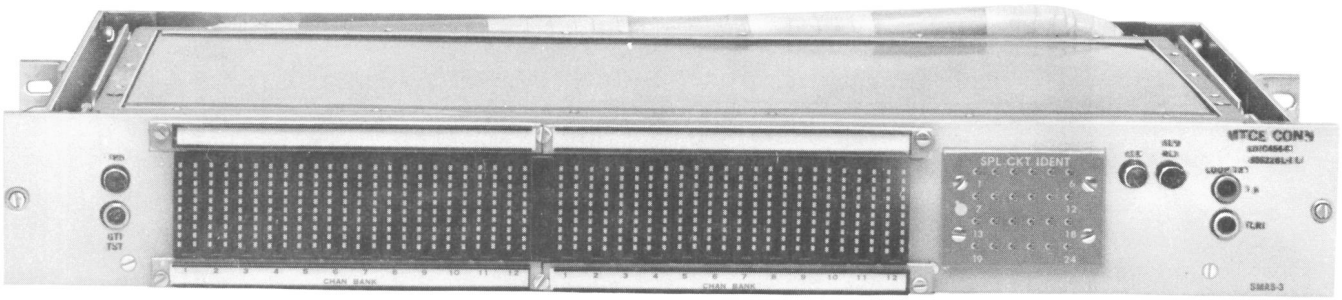

Fig. 2—Type 2 Maintenance Connector With MAC Jacks

circuits. The connectors slide forward on a track without affecting the SMAS access configuration and thus easy access to components for maintenance is possible.

1.06 To summarize, a maintenance connector contains all the relay circuitry necessary to access and split any one of 24 circuits toward the facility or equipment for maintenance or testing purposes.

2. CIRCUIT FUNCTIONS—COMMON TO TYPE 1, 2, AND 3 MAINTENANCE CONNECTORS

A. Special Circuit Identification

2.01 All three types (1, 2, and 3) of maintenance connectors have special circuit identification capability. Local plant forces can insert a plug-in diode to cause a control signal to be sent to the SMAS indicating a special circuit has been accessed. The diode code is referenced in the respective SD drawing.

> ***Note:*** The need for special class marking is indicated on the circuit layout record by entries in space allotted for priority classification or it is indicated by local practices.

B. Test Position Busy

2.02 When a maintenance connector is accessed, a test position busy (TPB) lamp lights on the maintenance connector front panel. When the connector is in use and it receives a control signal requesting another access, a control signal is sent from the connector to the SMAS indicating the busy status. By this means the SMAS denies the second access attempt without disturbing the initial access. Thus, if one of the 24 SMAS numbers is accessed in a maintenance connector the remaining 23 SMAS numbers are blocked from access until the first access is released.

C. Alarm Condition

2.03 If access of a maintenance connector results in an alarm condition caused by component failure within the connector, a control signal is sent to the SMAS indicating same. Simultaneously the TM relay is prevented from operating thereby preserving circuit continuity. The alarm condition stands in at the maintenance connector until the alarm release (ALM RLS) key located on the maintenance connector panel is released.

D. Class Marks

2.04 Class marks (see Table A) originate in the maintenance connector. Control signals are sent back to SMAS. The type 1 maintenance connector class marks are used to configure the type 3 maintenance line. They are also used to prevent access from those maintenance lines which are not capable of controlling the connector for which access has been attempted. Types 2 and 3 maintenance connector class marks are used to configure the local access test port in SMAS 4 and/or the local test port in SMAS 5. This results in proper relay operation during access regarding splitting direction, control of monitor, etc.

E. Multipin Access Connectors (MAC)

2.05 Multipin access connector (MAC) jack panels consist of 24 connectors, each of which permits splitting access to metallic, or unitized facility terminal (MFT or UFT) signaling and

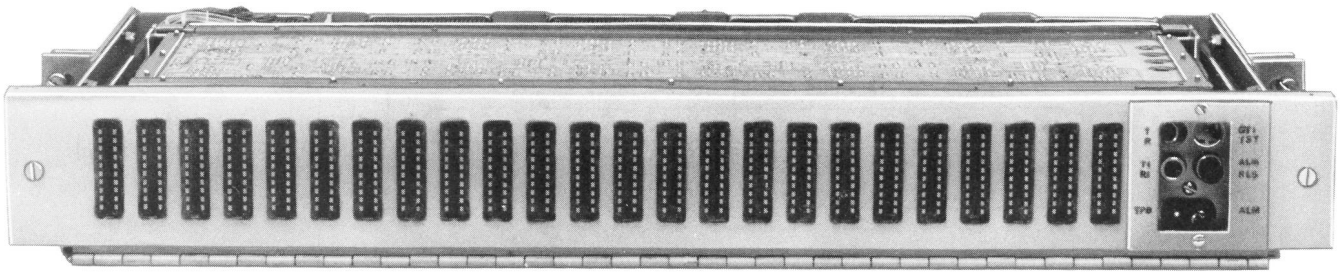

Fig. 3—Type 3 Maintenance Connector With MAC Jacks

transmission loads for a type 3 maintenance connector or to a general 6-wire access point for a type 2 maintenance connector. They are typically built into the unitized facility terminal frames.

2.06 The MAC jack panels in conjunction with manual access and communication panels (also built into UFT frames) furnish equipment aisle long term testing, circuit order lineup, adjustments, and patching capability. Wiring options supply 4-wire or 6-wire patching as required. As shown in Fig. 4, the MAC jacks are located between the circuit and the maintenance connector access relays and may be used to isolate a particular circuit while not tying up the maintenance connector.

2.07 MAC jack panels are optional with the type 2 maintenance connector. (When available, they are built into the connector.) In some cases, MAC jack panels will not be optional with the type 3 maintenance connector. A separate MAC jack panel (J98622BS) is provided for some MFT bays. This MAC jack panel was designed with a cavity which is used to house the type 3 maintenance connector. The combination of the two gives the appearance of a single unit. For MFT bays (with SMAS) which do not have MAC panels, a mounting with a faceplate is required for the type 3 maintenance connector.

2.08 The MAC jack panel (J98622BS) does not furnish the same access points as the type 3 maintenance connector. The MAC jack panel provides access to all four transmission ports associated with MFT transmission units and signaling lead access on the A (switch) side of the MFT.

F. Loop Test Feature

2.09 The loop test feature allows a testperson to verify circuit continuity from the testing position through the maintenance connector loop relay and back to the test position.

3. TYPE 1 MAINTENANCE CONNECTOR—DESCRIPTION

3.01 The type 1 maintenance connector was designed for and is used in SMAS 3 exclusively. It is used as part of a consolidated bay of office equipment using F type signaling units. The connector provides through connections in the transmission and signaling paths of 24 unaccessed VF office terminal circuits or allows remote or manual access to any one (on a one at a time basis) of the 24 office circuits for purposes of testing and maintenance.

3.02 The transmission path may be split in either direction (but not both simultaneously) for testing and measurement purposes. Signaling leads may be split to form a side loop. See 4.02 through 4.04 for other uses of signaling leads.

3.03 This connector has adjustable resistors which are used to compensate for the transmission loss of leads between the connector and a ***centralized VF Patch Field.*** These resistors are fixed at 33.2 ohms when used with a ***decentralized VF Patch Field.***

3.04 When the transmission leads are split, the four concentrator leads used for transmission testing are either connected to the equipment (E) direction of the transmission leads or to the facility (F) direction, as determined by a control signal from the SMAS 3 maintenance line circuit. This results in splitting the leads and providing test access in a single direction. For a more detailed circuit description, refer to Appendix 1.

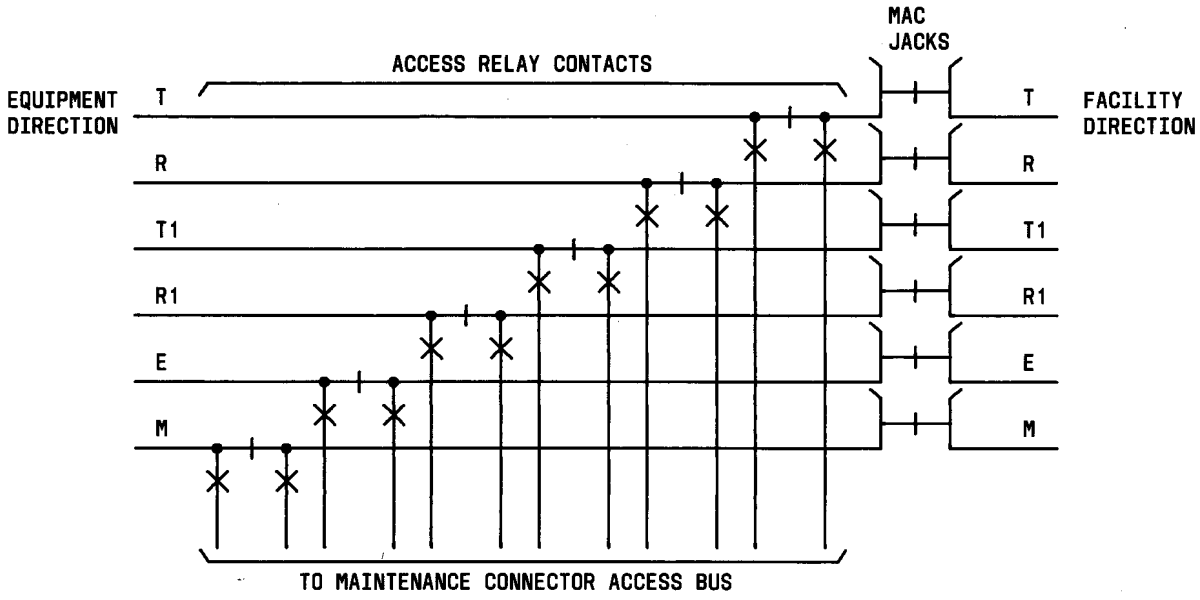

Fig. 4—Maintenance Connector Access Arrangement With MAC Jack

4. TYPE 2 MAINTENANCE CONNECTOR—FUNCTIONS

4.01 The type 2 maintenance connector is intended for accessing 6-wire access points, such as those derived in carrier terminals. It is equipped with six 50-pin connectors for use in the connectorized cable environment. (Older versions were not connectorized.) This connector is also available with multipin access connectors (MAC) (see 2.05).

4.02 Transmission leads (T&R, T1 & R1) are accessed between the carrier and signaling interface. The other two points are used

- for the signaling leads (E&M, A&B, SX & SX1), or
- 2-wire leads (T&R) on special service extensions.

One advantage of the T&R arrangement is that a single access code will give the tester both the carrier side and the metallic extension side of a 2-wire special services signaling unit—usually a large percentage of the provided special service circuits.

4.03 This connector's access points for 4-wire transmission leads are used to bridge or split the circuit. When split, measurements may be made in either direction, ***but only one direction at a time.***

4.04 The signaling access point can also bridge or split the leads ***but both directions are available simultaneously for looping or splitting.*** For a more detailed circuit description, refer to Appendix 1.

4.05 The type 1 and type 2 maintenance connectors are similar except for the following:

(1) The type 2 connector can be arranged with MAC jacks.

(2) The type 1 connector can be used with a centralized VF patch field.

5. TYPE 3 MAINTENANCE CONNECTOR—FUNCTIONS

5.01 The type 3 maintenance connector is intended for accessing 2-wire and 4-wire access points. It is equipped with four 50-pin connectors for use in the connectorized cable environment. This connector normally accesses 24 4-wire circuits. Any single access code (1 of the 24) can be used to access two 2-wire circuits since the two (A&B) access points may be split independently. This allows the equivalent of 48 2-wire circuits to be assigned to a type 3 maintenance connector. The 2-wire and 4-wire circuits can be mixed on the same connector. The type 3 maintenance connector provides a ***looped split.*** Both equipment and facility directions are available to the tester when

the access point is split. For a more detailed circuit description, refer to Appendix I.

6. APPLICATION

6.01 Maintenance connectors are used in both the unitized facility terminal and distributing frame environment. In some instances both may be used to establish access at two points within a circuit. Maintenance Connector Application Schematic, SD-1P138-01-A1, should be used to aid personnel in determining cross-connect information. Figure 5 is an example showing three common arrangements.

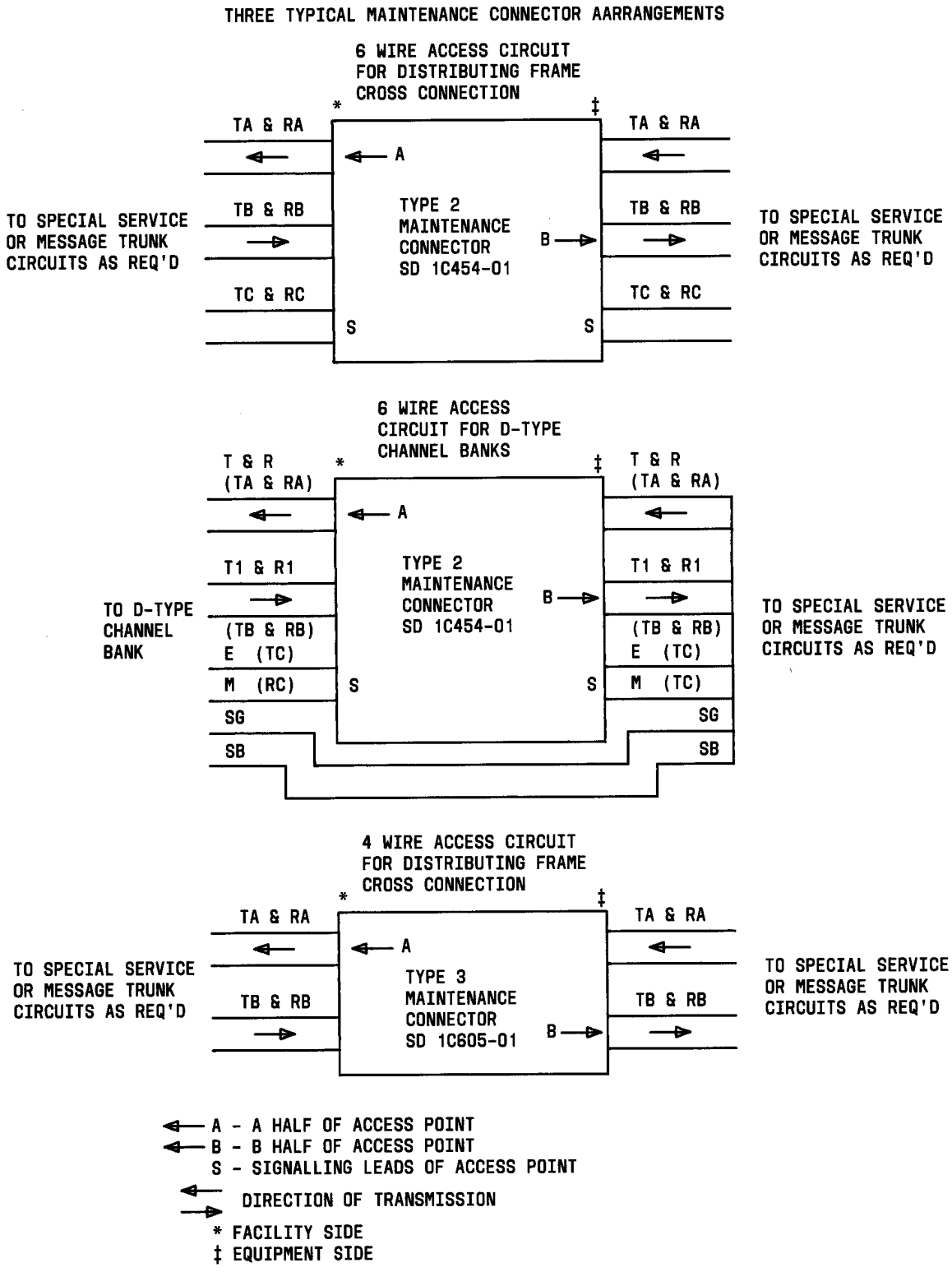

Fig. 5—Three Typical Connector Arrangements

SWITCHED MAINTENANCE ACCESS SYSTEM

(SMAS)

MAINTENANCE CONNECTORS

SIMPLIFIED DESCRIPTION

1.01 This appendix is included to give the user more detailed information regarding the circuitry (electrical operation) of Maintenance Connectors.

Type 1 and 2 Maintenance Connector

1.02 Refer to Fig. 1. Access relays, trunk maintenance (TM), are normally in the released condition, permitting continuity to the 6-wire access point. When a SMAS access is made, the selected TM relay operates closing the facility side of the A and B transmission points through to the high impedance monitoring transformers. High impedance monitoring and circuit continuity for each transmission access point and signaling access point are arranged locally within the maintenance connector. If the connector receives a control signal to split toward the facility, the SL relay interrupts continuity of both transmission access points, switches out both monitor transformers, and delivers the facility side of both access points to the SMAS. Similarly, if the maintenance connector receives a control signal to split toward the equipment side, the SD relay interrupts continuity of transmission access points, switches out both monitor transformers, and delivers the equipment sides of both transmission access points to the SMAS. In both cases (split toward facility or split toward equipment) independent control is retained over the split/monitor status of the signaling access point. Under split conditions, either the facility direction of both transmission access points ***or*** the equipment direction of both transmission points is delivered to the SMAS ***but not both***. Regardless of the split/monitor status of the transmission access points, if the maintenance connector receives a control signal to split signaling, both sides of the signaling access point are delivered to the SMAS. Therefore, transmission testing is independent of signaling testing and vice versa.

Type 3 Maintenance Connector

1.03 Refer to Fig. 2. Access relays, trunk maintenance (TM), are normally in the released condition permitting continuity to the 4-wire (or pair of 2-wire) access points. When a SMAS access is made, the TM relays operate closing the facility direction of the A and B transmission points through to the high impedance monitoring transformers. High impedance monitoring and circuit continuity for each transmission access point are arranged locally within the maintenance connector. If the connector receives a control signal to split the A access point, the SP2 relay interrupts A access point continuity, switches out the A monitoring transformer (T2), and delivers both sides of the A access point to the SMAS. Similarly, if the connector receives a control signal to split the B access point, the SP1 relay interrupts B access point continuity, switches out the B monitoring transformer (T1), and delivers both sides of the B access point to the SMAS. In the type 3 maintenance connector, split/monitor control of the A access point is independent of that of the B access point. In addition when an access point is in the split condition, both sides of the access point are delivered to the SMAS, permitting testing in the facility and equipment directions simultaneously.

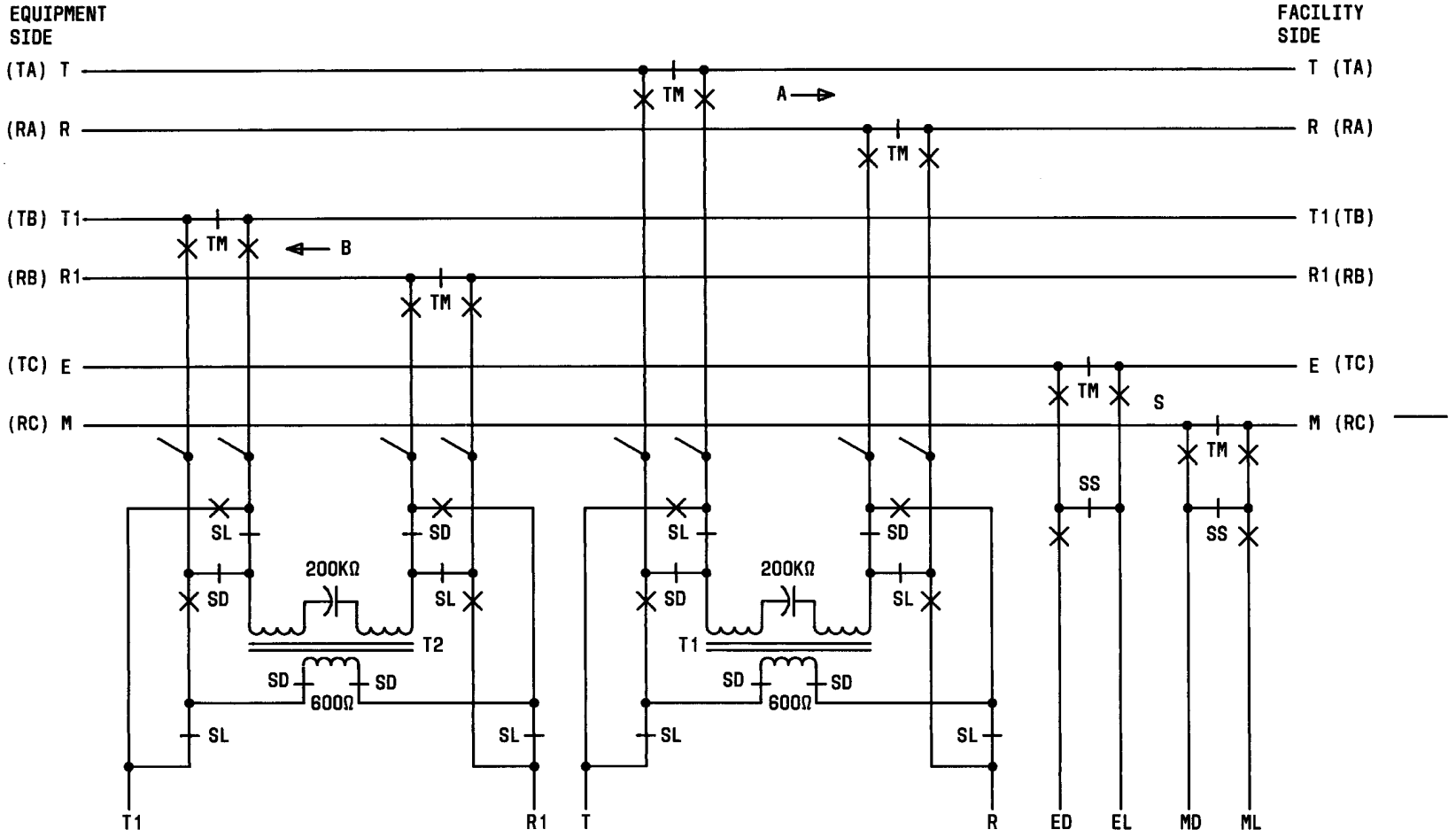

Fig. 1—Type 2 Maintenance Connector Simplified Access Arrangement

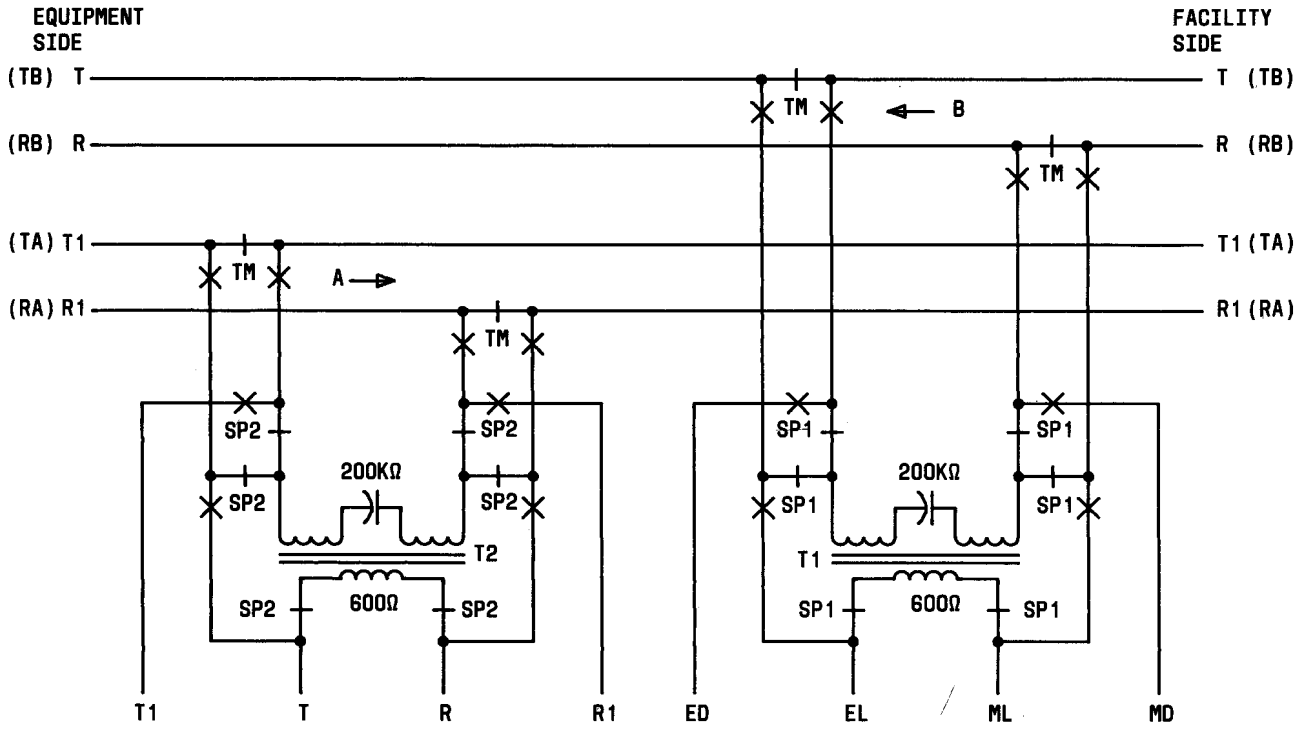

Fig. 2—Type 3 Maintenance Connector Simplified Access Arrangement