

**DIGITAL TEST ACCESS CONNECTOR (DTAC)  
DESCRIPTION AND OPERATION  
SWITCHED MAINTENANCE ACCESS SYSTEM 5A/5B (SMAS 5A/5B)**

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**1. GENERAL**

**1.01** This section provides the description, operation, and acceptance testing of the Digital Test Access Connector (DTAC) circuit. The DTAC interfaces between the Switched Access Remote Tests System 1A (SARTS 1A) and the Digital Access and Cross-Connect System (DACS) providing the capability to remotely access and test special service circuits through DACS. The DTAC can also be used locally in a stand-alone mode to gain access to the DACS test port without Switched Maintenance Access System 5A/5B (SMAS 5A/5B).

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

**1.03** The DTAC will provide local test access for all voice frequency operational modes using the jacks, keys, and lamps in the DTAC. Access for local test of digital signal zero (DS0) digital data circuits in DACS will be provided through the SMAS 5 from a local test port (jack, key, and lamp access panel) and not from the jack field provided in the DTAC. The SARTS 1A remote test system has the capability

of gaining SMAS 5 access to the DTAC, using the DTAC operational modes, and testing circuits appearing on DACS. Figure 1 illustrates the SARTS/DACS interface. One DTAC is required for each active test port, which consists of two D4-channels

**1.04** The DACS terminates up to 128 digital signal one (DS1) digital signals (digroups) each of which contains 24 DS0 channels. Digroup 001 is used for test access; the other 127 are used for cross-connection, providing up to 3048 individual channel terminations or 1524 through circuits. The DACS will electronically cross-connect, or map, any channel of the 3048 channels to any other channel. Up to twelve voice frequency or DS0 test access ports are provided by digroup 001 through a D4-channel bank to permit bridging or splitting test access on any circuit cross-connected by DACS.

**1.05** Administrative ports are provided by DACS for the communication links necessary for cross-connection and disconnection of the test access. An administrative terminal is required to access DACS to bring the desired circuit to the DTAC for local testing. A Remote Test System 5A (RTS 5A) enhancement, the data link module (DLM) with a data link interface (DLI), provides the communication link to DACS for remote testing. At least one DLI is required for each DACS, and the DLM can accommodate up to eight DLIs.

**1.06** The DTAC provides the following four different interfaces to the D4-channel bank units:

- (1) Four-wire transmission only for voice frequency circuits
- (2) Six-wire voice frequency circuits with two-state signaling
- (3) Eight-wire voice frequency circuits with four-state signaling (local testing only)
- (4) Four-wire digital data DS0 circuits.

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The selection of a DTAC is made locally by cross-connecting a channel to a DACS test point number with the test monitor command from the administrative terminals. The selection may also be made by the entry of a SMAS access number locally from the jack, key, and lamp access panel (J, K & L ACC PNL) or remote from SARTS 52A test position with the DACS access (001) command.

**1.08** To enable the DTAC to provide the four different interfaces between SMAS and DACS and to permit SARTS testing to take place, two 4-wire voice frequency E&M dual (4E&MD) test channel units for voice frequency interfaces and two digital signal zero data port (DS0 DP) channel units for the Digital Data System (DDS) interface are required. If a DTAC is not to be used for both voice frequency and DDS testing, only the appropriate channel units, per DTAC, are required to meet the selected interface condition.

**1.09** The DTAC provides a through connection between the two D4 4-wire dual E&M channel units for both transmission and signal paths when it is in the idle or no-access mode for voice frequency circuit testing. An independent through connection is provided between the two DS0 DP channel units when the DTAC is in the idle or no-access mode for digital data testing.

**1.10** The signaling paths through the DTAC in the idle state convert an on-hook or off-hook on either the E1 or E2 lead from the facility channel unit to a corresponding M1 or M2 lead on-hook or off-hook and apply it to the equipment channel unit. The E1 and E2 leads from the equipment channel unit are converted to the corresponding M1 or M2 lead status and applied to the facility channel unit.

When local test access is being used, the control commands for DACS are entered on the local DACS terminal.

**1.12** The 600 ohm, 0 dBm transmission test level at the A and B jacks on the DTAC is adjusted using the adjustable pads in the D4-channel units.

## 2 EQUIPMENT DESCRIPTION

**2.01** The DTAC panel (Fig. 2) contains control keys, jacks, and lamp indicators.

**2.02** The DTAC connects directly to the SMAS 5 stage 1 distribution network (SIDN) replacing

a maintenance connector distribution network and five maintenance connectors.

**2.03** The DTAC is configured to provide one of the four different interfaces between the channel units of the D4-channel bank and the SMAS 5 by the 5-digit SMAS access number. Three of these interfaces can be accommodated by using the 4-wire dual E&M channel units; the fourth interface requires the DS0 DP channel units. The leading digit of the 5-digit SMAS access number selects one out of a group of four super quadrants (5, 6, 7, or 8) in the SMAS network. The second digit determines the quadrant (A, B, C, or D) of the SIDN to which the DTAC is connected. The third digit of the SMAS determines the maintenance connector number (connected to the dual rail from the SIDN). For DTAC operation this digit is either 0 or 5. The last two digits are configuration numbers that determine an interface to the DTAC and are dependent on the quadrant as follows:

Configuration	Quadrant			
	A	B	C	D
4W	01	25	49	73
DDS	08	32	56	80
6W	09	33	57	81
8W	20	44	68	92

For example: To access the second DTAC on the first level of the first SIDN, quadrant B of leading group digit 6 in the 4W voice frequency configuration would require SMAS number 60525.

**2.04** Each of the 4 DTAC configurations is assigned one of the 24 possible access numbers for a given quadrant and leading digit group, resulting in 20 unused numbers out of the possible 24.

**2.05** The DTAC in the 4-wire voice or DDS test mode provides full splitting access to the A and B transmission pairs making both the test and nontest directions available to the remote ports through SMAS 5 access or to local ports for DDS testing.

**2.06** In the 6-wire voice frequency mode, the DTAC provides splitting access in the test direction selected by the remote test port. The nontest direction will be left open.

**2.07** The signaling leads in the 6-wire mode are provided with direct bridging and full splitting access to the remote and local test ports. The direct bridging is connected to the S1 (E1 and M1 leads) signaling path of the D4-channel unit. When splitting access at the signaling, both the S1 and S2 (E2 and M2 leads) signal paths connect the E1 and E2 equipment (EQPT) leads together, the E1 and E2 facility (FAC) leads together, the M1 and M2 EQPT leads together, and the M1 and M2 FAC leads together from the two 4-wire dual E&M D-channel units. When the signaling paths are split, the signaling state from a given direction on the S1 and S2 paths are combined by the DTAC. If both paths are in the on-hook state, an on-hook will be sent to the test port. If one or both paths are in the off-hook state, an off-hook will be presented to the test port.

**2.08** In the eight-wire voice frequency access mode, the four transmission leads and the four signaling leads are accessed by the DTAC. The DTAC provides high impedance bridging on the transmission leads and direct bridging for the two sets of signaling leads to the test port. Splitting will provide a connection from the test port to the selected EQPT or FAC channel unit. The DTAC sets the supervisory conditions on the outgoing signaling leads in the nontest direction where the signaling leads are split.

**2.09** The DTAC provides the proper class mark code for the 2-/4-wire and 6-wire configurations and also provides a 6-wire class mark for the 8-wire operational mode to satisfy the remote test system controller.

### 3. OPERATION

**3.01** Figure 3 illustrates the interfaces for the voice frequency test modes.

#### A. Local Test Access From a DTAC

**3.02** Local access into DACS is obtained through the administrative terminal. Three commands (test monitor, split, and release) are used at the local terminal to select a DTAC for the access. Section 365-301-501\* provides DACS test access commands.

**3.03** The DTAC provides jack access for local testing of the transmission and signaling leads on a voice frequency circuit accessed by DACS. The A and B FAC jacks (Fig. 2) bridge the transmission

pairs while the A and B EQPT jacks are used to split the transmission pairs. The S jacks are used for 2-state (E&M split access) signaling while the S1 and S2 jacks are used for 4-state (through E&M access) signaling. All signaling jacks are normal with splitting access.

**3.04** The four E&M monitoring lamps (Fig. 2) are under control of the MON key to monitor the S1 and S2 signal paths from both the FAC and EQPT directions of circuits accessed via DACS. A lighted lamp indicates an on-hook; an off lamp indicates an off-hook.

**3.05** The four keys (OFF-HK M1, OFF-HK M2, OFF-HK E1, and OFF-HK E2) are used to control the signaling state transmitted on the S1 and S2 signaling paths in both the EQPT and FAC directions. When the keys are operated, off-hooks are provided and lights the lamp in the key. When the key is released, an on-hook is provided. Once the four signal states are selected, the TEST key is operated to apply the selected signal states. Operation of the TEST key also splits all signaling paths. Releasing the TEST key restores all signaling states to on-hook. A signaling test set plugged into a signaling jack (S, S1, or S2) will override the condition entered in the test circuit for that signaling path.

#### B. Access From SARTS

**3.06** The SARTS remote test port and local test ports have the capability of gaining SMAS 5 access to the DTAC and to utilize all the DTAC operational modes except the 8-wire mode for testing circuits appearing on DACS. When accessed by SMAS, the TPB lamp will be lighted providing a local indication that the DTAC is busy and accessed by SMAS 5. Local access should not be attempted when the TPB lamp is lighted.

### 4. MAINTENANCE LOOPBACK

**4.01** The maintenance loopback circuit is used to isolate the DTAC from the D4-channel units to verify proper circuit operation. The DTAC can be locally placed in one of its four circuit configurations by dialing the proper SMAS 5 access number and then can be placed in a maintenance loopback mode by operation of the nonlocking maintenance (MTCE) key on the DTAC.

### 5. ACCEPTANCE TEST

**5.01** The tests in this section ensure that the DTAC circuitry is working properly and should be completed for acceptance of new installation.

\*This practice has not been issued as of this date. Consult future issues of indexes as to the availability of this document.

PAGE 53 824-102-117  
 CONNECTED TO ENH SHELVES  
 AND RTS VIA JMC BUS  
 CP33, 62 + 208H/ P.4.  
 CP56 (MAX 8)

TWISTED PAIRS (2) IF  
 LESS THAN 2000 FT -  
 OR 2027 DA A SET  
 (CD 1P112-01)  
 FS11-13.5

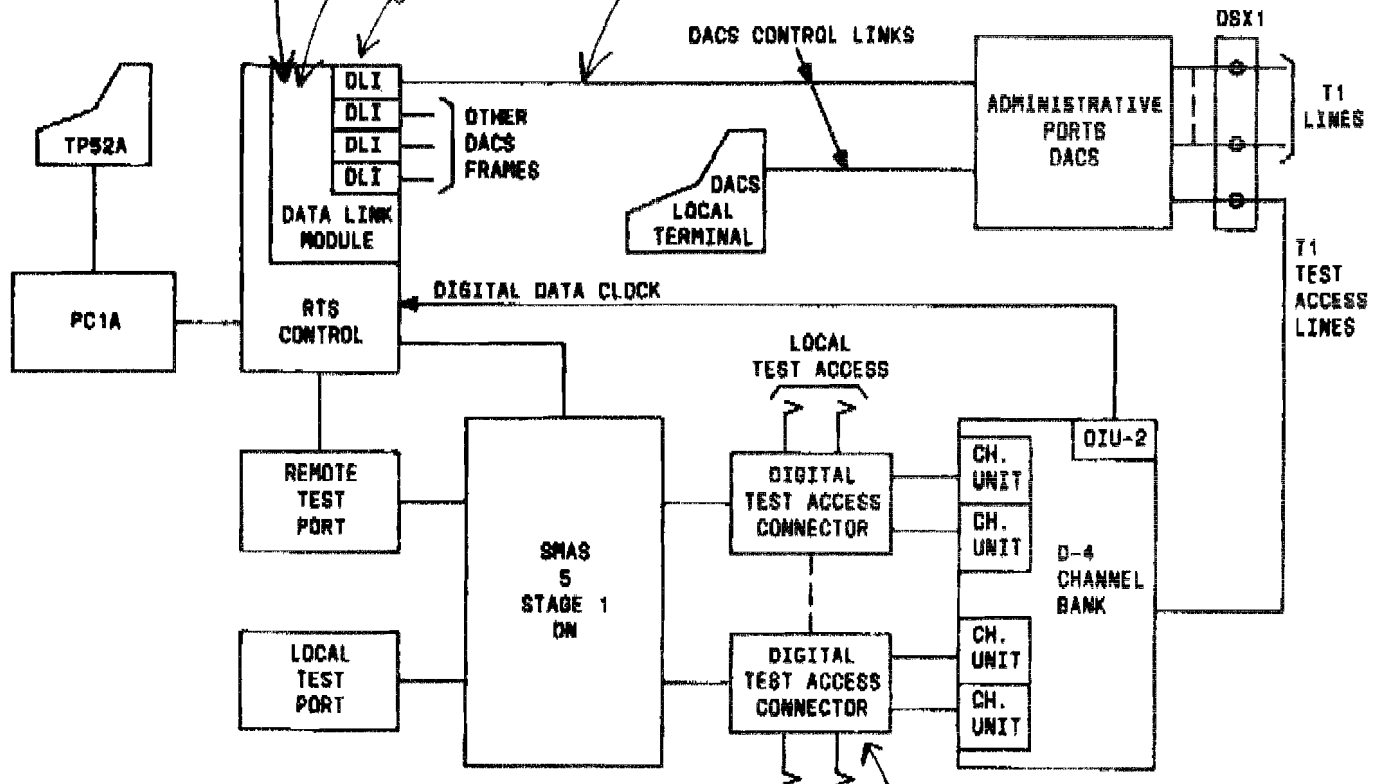


Fig. 1—SARTS/DACS Interface

CONNECTED  
 LIKE MSC OR DN  
 FROM STAGE 1  
 (PAGE 11 667-303-110)

### DACS NETWORK CONFIGURED FOR DS-1C TERMINATIONS IN A CROSS-CONNECT MODULE

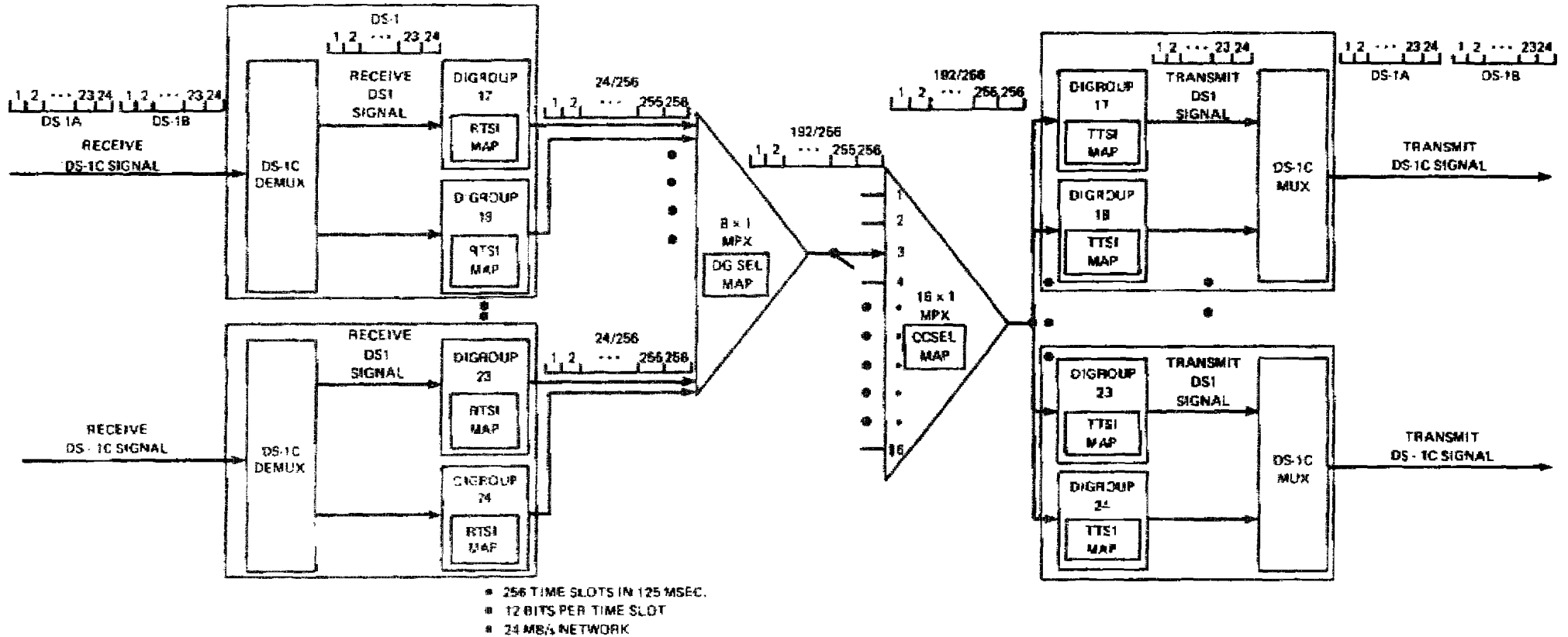
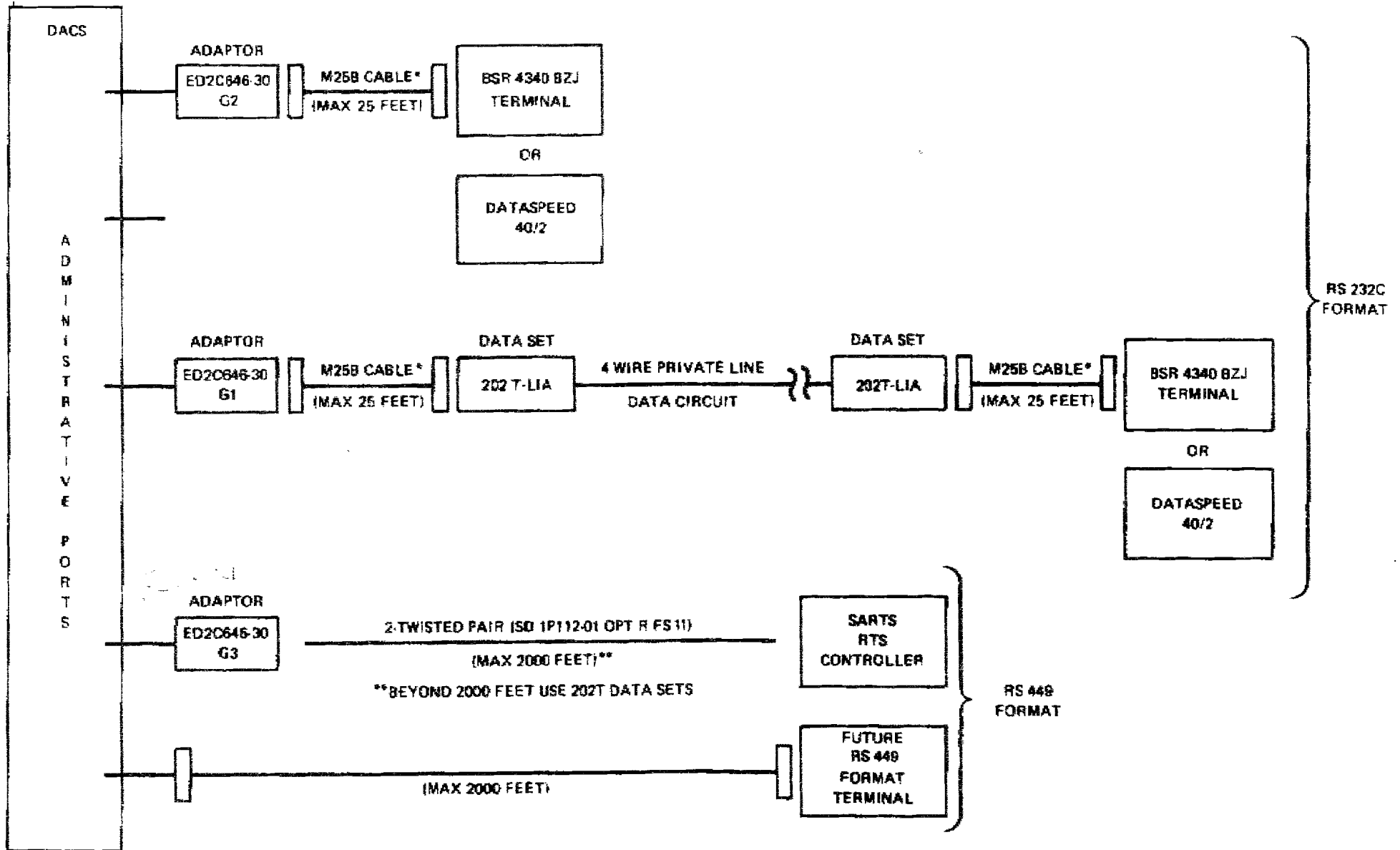


FIGURE 3

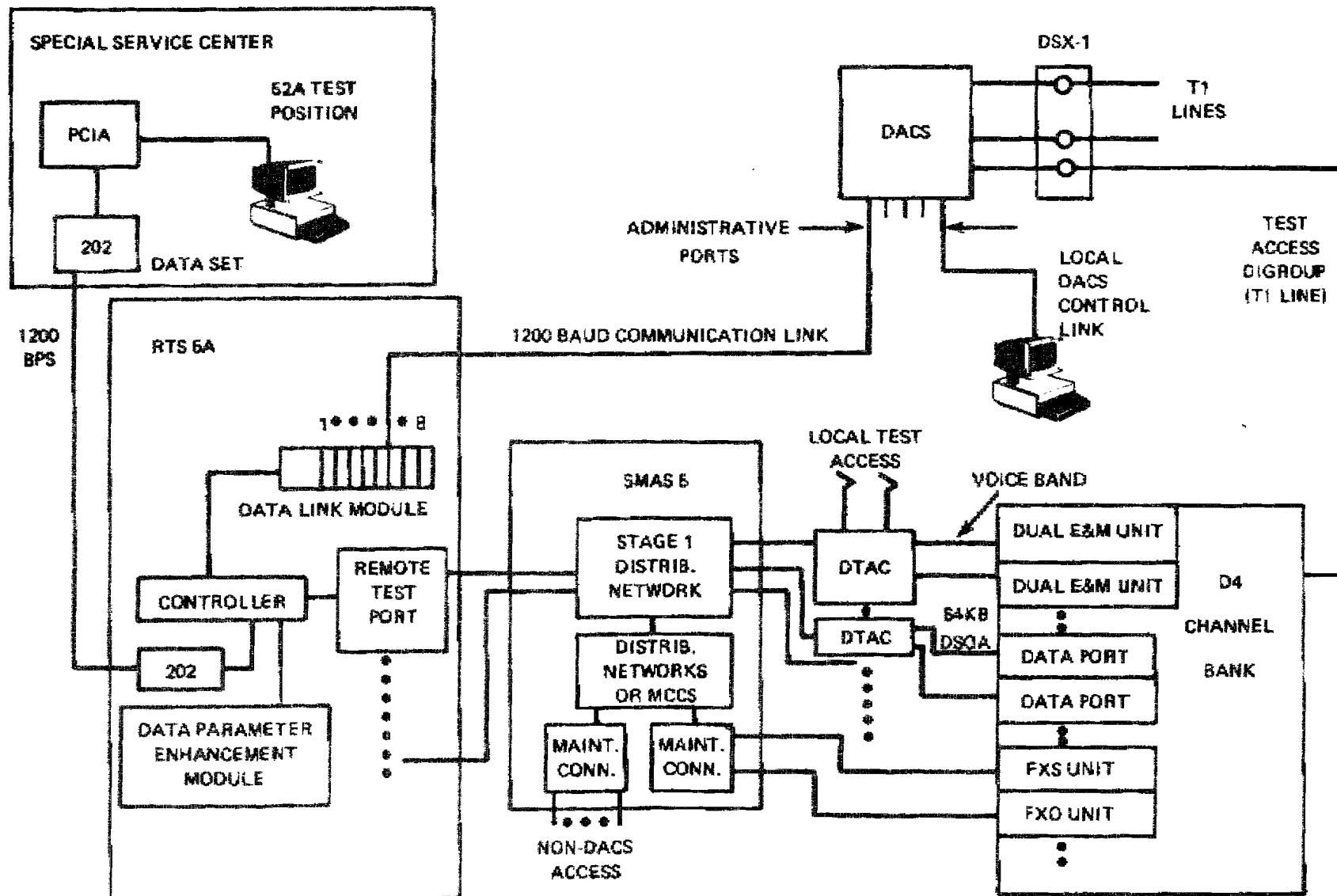
# DACS ADMINISTRATIVE PORT CONFIGURATIONS



\*SD986-301 IS BEING CHANGED TO ALLOW USE OF A M26A CABLE IN SERIES WITH THE M25B CABLE TO ACCOMMODATE LENGTHS BETWEEN 25 AND 50 FEET

FIGURE 4

# SARTS/DACS INTERFACE FOR DS-1 TEST FACILITIES



DACS = DIGITAL ACCESS CROSS CONNECT SYSTEM  
 DTAC = DIGITAL TEST ACCESS CONNECTOR  
 MCC = MAINTENANCE CONNECTOR CONTROLLER

FIGURE 12

09/20/89 12:12 SYSTEM SUPPORT MILW. RM 403 B 006

**DT ACCESS CONNECTOR) AND  
CONNECTOR INTERFACE TESTS**

B of leading group digit 6 in the 4W VF (voice-frequency) configuration would require SMAS number 60525.

its  
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*SMAS 5-4W  
3-4W  
DIGITAL DATA  
7-8  
2-3*

**8.02** This procedure ensures that continuity exists from the J, K, & L ACC panel through the accessed DTAC LT relay. Practice 667 303-112 provides the description and operational tests of the DTAC.

**PROCEDURE**

- the SMAS access numbers for the DTAC configurations.
- , & L ACC panel, set the SMAS NO selector to the DTAC SMAS access number for 2/4
- t A, depress and release BID key
- ent:** The ACC lamp is lighted.
- d release ACC key.
- ent:** The MO and 2/4W lamps on test port A are lighted.
- d release LT key.
- ent:** The MON lamp is off and the LT lamp is lighted.
- it tone to the F jack on the A side and the TMS to the E jack on the B side of the test port.
- ent:** The TMS measures send level  $\pm 1.0$  dB.
- one to the F jack on the B side and the TMS to the E jack on the B side.
- ent:** The TMS measures send level  $\pm 1.0$  dB.